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AFRICAN CONTINENTAL FREE TRADE AREA THROUGH THE NEW ECONOMIC GEOGRAPHY

A case study of Richards Bay, South Africa

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ABSTRACT

In a world economic scenario strongly affected by COVID-19, the African Continent certainly deserves special attention due to its complexity and its many possible courses of economic development. One of the paths that is emerging is The African Continental Free Trade Area (AfCFTA), an opportunity to increase integration, making the area more competitive in the global context.

The importance of the AfCFTA for the global economy is underlined by the fact that it would create the free trade area with the largest number of countries involved, with more than 1.3 billion people affected and a total GDP estimated at over 3.4 trillion US dollars.

The present dissertation aims to interpret such a complex phenomenon using the Core-Periphery model. This paradigm was still considered reliable for interpreting the directions of the possible future in the developing countries by Paul Krugman's "The New Economic Geography, Now Middle Aged" in 2010.

In conclusion, the case study of Richards Bay, South Africa, is presented as a possible core in the emerging Core-Periphery dynamic. In detail, the Richards Bay Industrial Development Zone (RBIDZ), a state-owned industrial development company, has the responsibility of encouraging international export competitiveness. With the aim of clustering small manufacturing enterprises around the City's main industries, RBIDZ offers tax incentives, infrastructure and utilities, simplifying administrative requirements and providing customs support services.

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INTRODUCTION

We are living in a particularly interesting era, where changes involving the global context are occurring rapidly. In this scenario heavily influenced by the COVID-19 pandemic, the strategies in moving towards the future are manifold, and these can return many possible scenarios.

In particular, this study aims to focus on changing economic dynamics. More specifically, to investigate what could become the economic geography of a continent with high growth potential, the African continent.

Considering the territorial economic structure in a given territory as extremely important for trade relations, it is interesting to investigate how the continent might structure itself. This is even more given the entry into force of an agreement that, by unifying the entire continent under the same trade rules, proposes to change the scenario. Ultimately, giving an interpretative model of reality, in order to hypothesise its future, allows giving an interpretative framework to a multiplicity of actors, both economic and political. This was done in the past by Krugman, who theorised the core-periphery model to investigate the evolution of the American economy. Along with him, other authors have used the same tools in interpreting the European economic landscape, especially following the European Union. More recent studies have successfully applied this model to China's astonishing growth. Following the same logical direction in this dissertation, we want to investigate the future of the African continent.

For this purpose, this study considers the agreement for the African Continental Free Trade Area and how it, through its repercussions on the territory, can determine new spatial locations for the African economy. All this is done by trying to verify the possible emergence of geographic concentration dynamics.

With the above aims in mind, this study sets out in the first chapter the agreement, the context in which it is implemented, its objectives and application steps. In the second chapter, the structure of the Krugman model is presented, emphasising its variables and the

elements that influence them, recalling its applicability and contemporary contextualisation. In the third chapter, we get to the heart of the matter, exposing the consequences of the agreement by re-reading them through the core-periphery model. To do so, the variables of the model are taken into account and analysed in relation to the entry into force of the agreement. In the last chapter, space is given to a case study, which is useful in order to give a real and localised dimension to the dynamics analysed.

Concerning the identification of precise dynamics, they are so to the point of drawing hypotheses about the future and not through the reading of dynamics already fully realised or inaction. Although the work is based on reliable sources, as far as data and inferences about the future are concerned, and as far as the model to which the data is applied is robust, the future can only be hypothesised. Despite this, inferences can be used in conjunction with other tools to interpret and guide the future or at least to be prepared for it by taking the most favourable actions.

CHAPTER 1: AFRICAN CONTINENTAL FREE TRADE AREA

1.1. Context and Background

Africa is a large and varied continent, which is extremely heterogeneous from many points of view. It is therefore useful to identify some of the peculiarities of this geographical area in order to get into the context of analysis.

The variety of the fifty-four states on the continent under analysis is wide. In terms of size, there are at the extremes seven countries with a population of less than 1.5 million and three with more than 100 million, among them a diversified range (Table 1.1). It is also interesting to note that only 15 countries are landlocked. Although more than a quarter of the world's population lives in Africa, total income is around 5 per cent of that produced globally. Half of the countries are classified as low-income countries, eighteen as lower-middle-income, eight as upper-middle-income and one as high-income. These are the foundations on which the continent bases its economic and commercial situation. It is worth emphasising that the wide diversification present on the territory also involves trade openness. The rate of imports and exports varies between 38 per cent and 140 per cent of GDP. [Abrego et al.,2020, p.10]

Table 1.1 African Country Indicators, 2016

Country	GDP PPP (US$bns)	Openness (Percent of GDP, goods/services)	Population (Millions of persons)	Income Group	Average Applied Import Tariffs	Effective Non-Trade Measures (NTM)	Trade within Africa as a ratio of total trade
Egypt	1,132.1	31	90.2	Lower middle	6.6	14.6	...
Nigeria	1,090.1	21	183.6	Lower middle	11.3	15.0	8.9
South Africa	742.2	61	55.6	Upper middle	4.5	2.7	19.0
Algeria	609.6	58	40.8	Upper middle	8.9	14.6	2.8
Morocco	281.4	77	34.5	Lower middle	3.8	...	4.8
Angola	185.6	55	27.4	Lower middle	10.2[a]	9.5	6.5
Sudan	178.0	24	39.6	Lower middle	12.1[d]	16.0	4.0
Ethiopia	177.4	36	91.2	Low	12.1[a]	2.5	7.2
Kenya	152.9	37	45.5	Lower middle	10.6[b]	3.9	15.3
Tanzania	150.3	41	48.7	Low	8.6	21.1	20.5
Tunisia	130.5	92	11.4	Lower middle	3.9[a]	...	6.6
Ghana	121.2	89	27.6	Lower middle	10.8	3.8	11.8
Côte d'Ivoire	88.3	62	24.3	Lower middle	10.6[a]	14.3	25.1
Cameroon	84.6	41	23.7	Lower middle	15.8[b]	3.6	16.8
Uganda	83.4	46	36.6	Low	7.9[a]	2.4	25.7
Zambia	65.3	73	16.7	Lower middle	4.0[a]	2.5	41.4
Democratic Republic of the Congo	65.0	56	84.1	Low	10.2[b]	9.5	32.3
Senegal	39.6	54	15.4	Low	9.0	18.2	26.0
Mali	38.2	64	18.3	Low	7.6	4.6	50.4
Madagascar	37.5	69	24.9	Low	9.4[a]	9.5	8.8
Botswana	37.4	95	2.2	Upper middle	0.6	9.5	49.7
Libya	37.0	...	6.4	Upper middle	...	...	...
Gabon	35.8	71	1.9	Upper middle	14.4[c]	1.8	6.4
Mozambique	35.1	107	28.8	Low	4.2[b]	9.5	29.7
Burkina Faso	33.0	63	18.4	Low	9.6[a]	4.3	20.6
Zimbabwe	32.4	65	14.5	Low	5.7[a]	...	83.5
Equatorial Guinea	31.2	76	0.8	Upper middle	15.6[e]	...	9.3
Republic of Congo	29.7	177	4.2	Lower middle	16.4	9.5	28.1
Chad	29.0	64	11.9	Low	14.2[c]	9.5	7.4
Namibia	26.3	92	2.3	Upper middle	1.0	9.5	57.2
Mauritius	26.0	96	1.3	Upper middle	0.8	6.8	15.0
Guinea	24.4	88	12.7	Low	11.9[d]	9.5	14.1
Benin	23.6	46	10.8	Low	11.6	9.5	18.1
Rwanda	22.8	55	11.6	Low	7.3	4.8	32.4
Malawi	21.1	75	18.6	Low	4.2[a]	5.0	37.7
South Sudan	20.7	119	12.2	Low	...	9.5	...
Niger	20.4	50	18.2	Low	9.6	9.5	18.3
Somalia	18.0	77	...	Low	...	9.5	...
Mauritania	16.4	89	3.8	Lower middle	11.4[b]	9.5	9.5
Togo	12.2	87	7.6	Low	10.3	9.5	31.6
Eswatini, Kingdom of	11.1	89	1.1	Lower middle	0.6[b]	9.5	85.5
Sierra Leone	10.9	62	7.2	Low	10.3[d]	9.5	20.2
Eritrea	8.8	26	5.8	Low	5.4[f]	9.5	5.5
Burundi	7.8	30	10.5	Low	6.1[a]	9.5	32.5
Lesotho	6.6	119	1.9	Lower middle	2.4[b]	9.5	68.4
Liberia	5.8	91	4.4	Low	12.2[b]	9.5	2.0
Cabo Verde	3.5	104	0.5	Lower middle	10.9[a]	9.5	2.2
The Gambia	3.4	44	2.0	Low	12.7[c]	9.5	34.4
Djibouti	3.3	77	1.0	Lower middle	17.6[b]	...	15.9
Central African Republic	3.2	54	4.9	Low	13.9[a]	9.5	14.0
Guinea-Bissau	2.9	63	1.7	Low	9.9[b]	...	13.2
Seychelles	2.6	200	0.1	High	4.3	9.5	8.0
Comoros	1.3	62	0.8	Low	7.4[b]	...	15.4
São Tomé and Príncipe	0.6	80	0.2	Lower middle	10.4	9.5	18.2
Total Africa	6057.8		1170.4				
Proportion of world (percent)	4.8		16.1				
Median	30.5	63.8	11.9		9.6	9.5	17.5

Source: Abrego et al.,2020, p.36

Note: a-2015; b-2014; c-2013; d-2012; e-2007; f-2006. Bns = billions; PPP = purchasing power parity.No data are available for the Republic of Saharawi, a full member of the African Union, which also signed the AfCFTA agreement.

1.1.1 African Trade

Looking at intra-regional trade, we can see that it has grown and is growing in recent years, although it remains relatively low compared to that of Europe or Asia. This growth is mainly due to the expansion of trade in raw materials and increasingly stable macroeconomic and institutional conditions with the creation of interregional agreements. Indeed, it has gone from 9 per cent of total African trade within its borders in the early 2000s to 17 per cent in 2017. [Abrego et al.,2020, p.11]

The main component of this trade, however, remains trade in foodstuffs and manufactured goods, in contrast to external trade where raw materials play the leading role with more than half of total exports. Conversely, imports are dominated by chemical products, machinery, equipment and manufactured goods. With regard to internal trade, the Southern African Development Community (SADC) and the EAC have been the driving factors in percentage terms. [ibidem]

Having said that, it is important to remember once again that Africa does not have a commercial hub, as in Asia, Europe and North America. If we look carefully, however, we can see that South Africa is a hub for the south of the Continent, as it also supplies intermediate goods to all the areas it serves. Indeed, South Africa is one of the leading trading partners for fourteen African countries and is integrated into the global value chains of China, the USA, Germany and India. While this function is partly fulfilled by South Africa, the rest of the continent lacks a systemic global exporter that contributes to value creation. The need to identify an entity to facilitate supply chain and integration into global value chains is therefore identified. [ibidem]

Focusing now on the wide range of trade regimes on the Continent, we can identify three main elements that characterise the context under analysis. In the area in question, there are individual agreements between different countries and states outside the continent. The individual agreements are different and some of them fall under the Generalized System of Preferences, a preferential tariff system that provides tariff reductions on various products, duty-free treatment for less developed countries, and preferential access to the US market
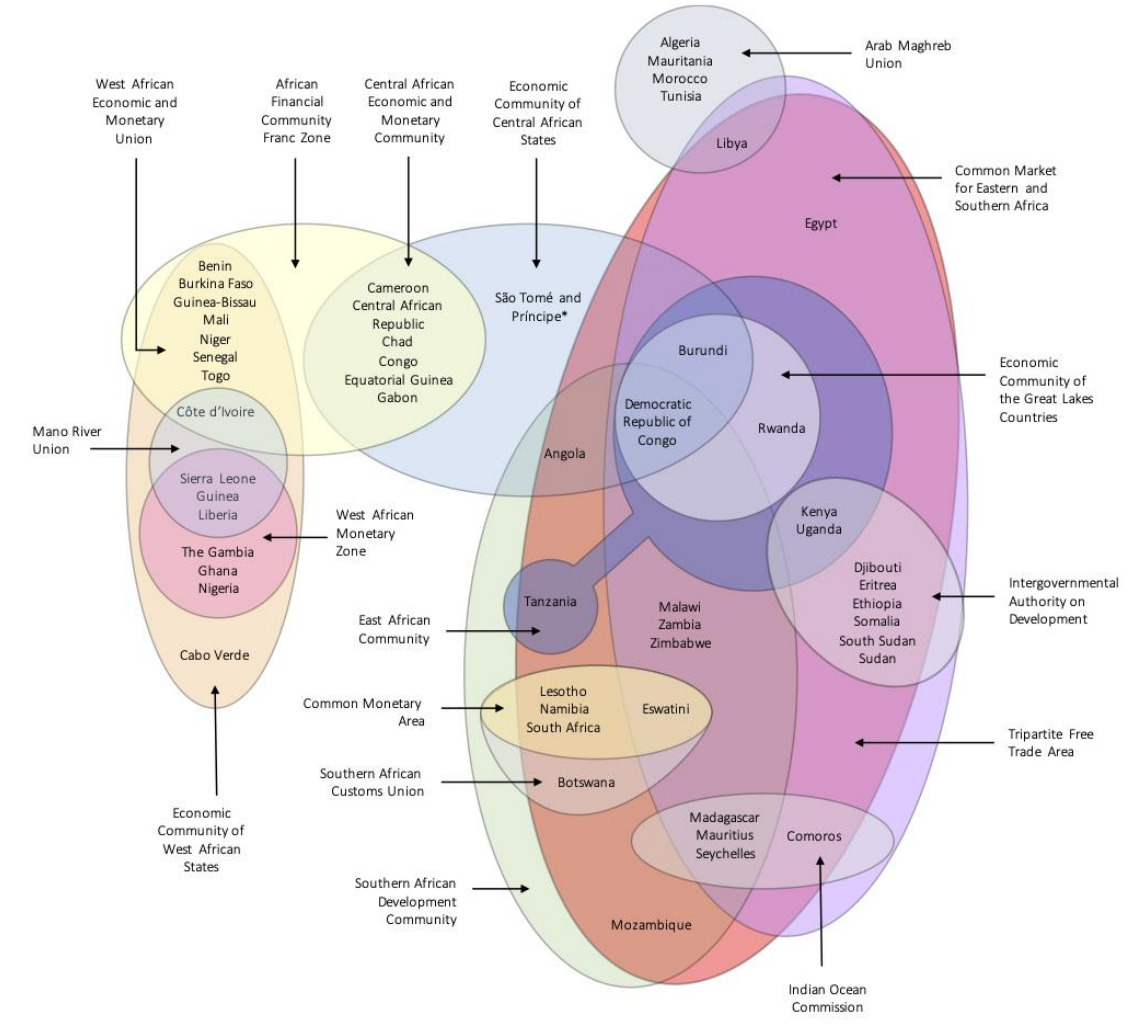
under the African Growth and Opportunity Act. On a different level are regional agreements, both within and outside Africa. These include, for example, the agreements made with the European Union. [ibidem]

Another level is that of the intra-African agreements (Figure1.1). Although intra-African agreements have contributed to the significant expansion of intra-regional trade over the last 20 years or so, they have not been fully efficient. This is due to the poor implementation of these agreements, often due to the weak institutional infrastructure to support them, or to the overlapping of several integration systems, which has led to high levels of confusion and non-implementation of agreements because they are conflicting or poorly integrated. Other factors that have hampered the functionality of these agreements and thus the implementation of economies of scale have been the lack of dedicated and efficient infrastructure, the lack of integrated internal regulations supporting the agreements or poorly trained workers.

With regard to trade barriers, interregional agreements have reduced trade tariffs between the continent's states and outward unilateral measures have led to a significant reduction in taxation from an average of 21.7 per cent in 1997 to 11.8 per cent in 2016 (Table 1.2). [Abrego et al.,2020, p.13]

Despite this, non-tariff barriers, such as non-tariff trade measures or infrastructure gaps or other transaction costs, remain high for most African countries (Figure 1.2). The most common non-tariff trade measures are sanitary and phytosanitary measures followed by technical measures(Table 1.3). Specifically, a major constraint is the scarcity of infrastructures such as the quality of ports or air transport (Table 1.4). In this regard, the world bank already in 2009, for example, stressed the importance of developing an efficient land transport system on the continent given its geographical structure to encourage trade and intra-regional commerce. The Presidential Infrastructure Champion Initiative was launched in 2011 and the Program for Infrastructure Development in Africa was adopted in 2012, but these and other initiatives take a long time to become really relevant. [ibidem]

Figure 1.1 Regional Trade Agreements in Africa, 2019

West African
Economic and
Monetary
Union

African
Financial
Community
Franc Zone

Central African
Economic and
Monetary
Community

Economic
Community of
Central African
States

Algeria
Mauritania
Morocco
Tunisia

Arab Maghreb
Union

Libya

Egypt

Common Market
for Eastern and
Southern Africa

Benin
Burkina Faso
Guinea-Bissau
Mali
Niger
Senegal
Togo

Cameroon
Central African
Republic
Chad
Congo
Equatorial Guinea
Gabon

São Tomé and
Príncipe*

Burundi

Democratic
Republic of
Congo

Rwanda

Economic
Community of
the Great Lakes
Countries

Côte d'Ivoire

Angola

Mano River
Union

Sierra Leone
Guinea
Liberia

West African
Monetary
Zone

Kenya
Uganda

Djibouti
Eritrea
Ethiopia
Somalia
South Sudan
Sudan

Intergovernmental
Authority on
Development

The Gambia
Ghana
Nigeria

Tanzania

Malawi
Zambia
Zimbabwe

Cabo Verde

East African
Community

Lesotho
Namibia
South Africa

Eswatini

Tripartite Free
Trade Area

Common Monetary
Area

Botswana

Economic
Community of
West African
States

Southern African
Customs Union

Madagascar
Mauritius
Seychelles

Comoros

Southern African
Development
Community

Mozambique

Indian Ocean
Commission
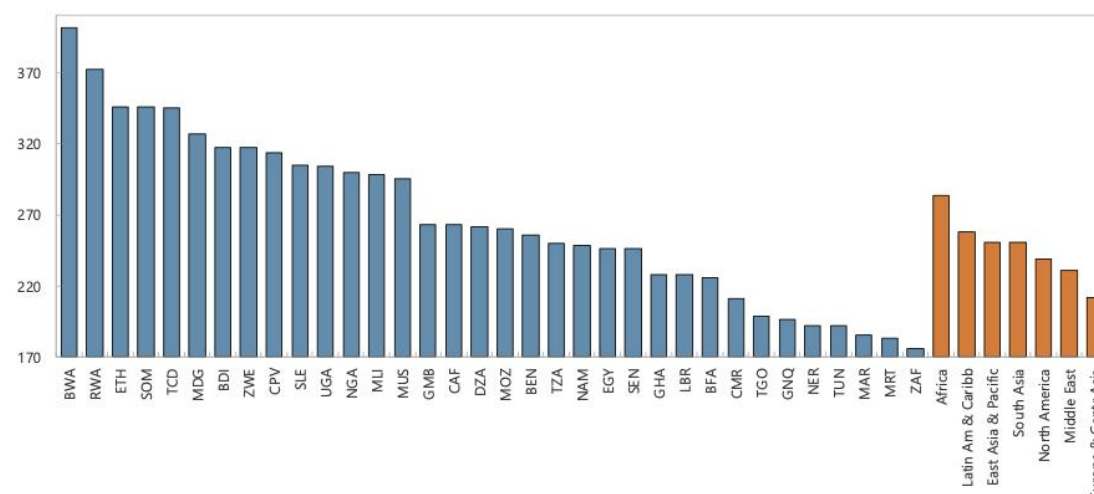
Source: Abrego et al.,2020, p.12

Table 1.2 Average Percent Applied Effective Tariffs, 2016 (per cent)

	Intra-regional	Effectively Applied (AHS)	Most Favoured Nation (MFN)
Africa	**5.0**	**11.8**	**12.5**
AU-recognized regional economic communities			
Arab Maghreb Union (AMU)	5.0	8.9	14.0
Common Market for Eastern and Southern Africa (COMESA)	5.0	8.9	11.0
Community of Sahel-Saharan States (CEN-SAD)	12.0	12.1	13.1
East African Community (EAC)	0.0	11.6	12.8
Economic Community of Central African States (ECCAS)	9.0	14.4	14.6
Economic Community of West African States (ECOWAS)	11.0	12.4	12.2
Intergovernmental Authority on Development (IGAD)	9.0	13.5	16.1
Southern African Development Community (SADC)	4.0	7.7	9.2
Other preferential trade agreements			
Central African Economic and Monetary Community (CEMAC)	0.0	18.5	17.8
West African Economic and Monetary Union (WAEMU)	9.0	12.4	12.2
Southern African Customs Union (SACU)	0.0	6.0	7.7
Indian Ocean Commission (IOC)	0.0	5.0	5.1
Comparators			
Latin America and the Caribbean (LAC)	...	9.9	10.5
Association of Southeast Asian Nations (ASEAN)	1.0	5.0	6.3
Southern Common Market (MERCOSUR)	0.0	11.1	12.1

Source: Abrego et al.,2020, p.13

Note: AHS—effectively applied tariff (simple average); MFN—most-favored nation—tariff (simple average). For IGAD, the entries for AHS and MFN tariffs are for 2016 for Kenya and Uganda, 2015 for Ethiopia, and 2013 for Sudan.

Figure 1.2 Per cent of Intra-African Non-Tariff Trade Barriers, 2016 (Ad valorem equivalent, per cent)

Source: Abrego et al.,2020, p.14

Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

Table 1.3 African Union: Non-Tariff Trade Measures, 2018 (Number of measures in place)

	SPS	TBT	ADP	CV	SG	SSG	QR	TRQ	XS
Benin	6	2							
Botswana	3	103							
Burkina Faso	6								
Burundi	8	13							
Cabo Verde	4								
Cameroon		8							
Central African Republic	3	10							
Congo, Republic of		3							
Côte d'Ivoire	19						15		
Congo, Democratic Republic of	2								
Egypt	87	207	15						
Eswatini, Kingdom of	2	1							
Ethiopia					1				
Gabon		2							
The Gambia	2	2							
Ghana	5	9							
Guinea	11	1							
Kenya	92	770							
Liberia	1	3			3				
Madagascar	37								
Malawi	16	18							
Mali	21	2					20		
Mauritius	17	8					9		
Morocco	56	26	13		4			16	
Mozambique	6	14							
Namibia		1							
Nigeria	29	8							
Rwanda	1	215							
Senegal	7	14							
Seychelles	4	4					6		
South Africa	61	278	32		3			53	62
Tanzania	2	292							
Togo	11	2							
Tunisia	2	27			3			13	
Uganda	56	999							
Zambia	4	88			1				
Zimbabwe	6	1							
Africa	587	3068	60		15		50	82	62

Source: Abrego et al.,2020, p.15
Note: ADP = anti-dumping; CV = countervailing; QR = quantitative restrictions; SG = safeguards; SPS = sanitary and phytosanitary; SSG = special safeguards; TBT = technical barriers to trade; TRQ = tariff-rate quotas; and XS = export subsidies.

Table 1.4. Infrastructure Gaps and Trade-Related Transaction Costs in Africa, 2012–16

Variable	Africa	Sub-Saharan Africa	Advanced Economies	Middle East and North Africa	South America	Central America	South Asia
Level of infrastructures:							
Container port traffic per capita (WDI)	0.09	0.07	0.75	0.31	0.12	0.38	0.09
Air transport passengers, per capita (WDI)	0.23	0.25	2.6	1.36	1.43	0.93	0.1
Quality of port infrastructure,(1=low to 7=high) (WDI)	3.64	3.64	5.35	4.34	3.65	4.15	3.51
Liner shipping connectivity index (max=100) (WDI)	14.38	12.72	50.64	24.68	24.16	16.36	27.27
Infrastructure efficiency score, (1=low to 5=high) (LPI)	2.32	2.34	3.75	2.59	2.56	2.43	2.45
Customs efficiency score, (1=low to 5=high) (LPI)	2.35	2.39	3.58	2.44	2.52	2.5	2.42
International shipments efficiency score, (1=low to 5=high) (LPI)	2.52	2.52	3.56	2.81	2.76	2.81	2.68
Timeliness efficiency score, (1=low to 5=high) (LPI)	2.87	2.86	4.09	3.12	3.21	3.1	3.03
Overall logistics efficiency score, (1=low to 5=high) (LPI)	2.49	2.51	3.74	2.71	2.77	2.69	2.62
Trading costs:							
Burden of customs (1=inefficient to 7=efficient) (WDI)	3.6	3.6	5.0	4.0	3.5	3.7	3.8
Time to export (days) (DB)	29.3	30.9	10.2	21	19.8	15.4	30
Time to import (days) (DB)	36.4	38.5	9.3	25.6	24.3	15.3	31.5
Cost to export (USD per container) (DB)	2,149	2,302	1,054	1,340	1,809	1,181	1,696
Cost to import (USD per container) (DB)	2,819	3,056	1,102	1,600	2,020	1,329	1,877

Source: Abrego et al.,2020, p.16
Note: Units-Container port traffic per capita: Annual number of flow of containers of twenty-foot equivalent units (TEUs), divided by total population. Air transport passengers, per capita: Annual number of air transport passengers carried, divided by total population. Quality of port Infrastructure: It measures business executives' perception of their country's port facilities and scores ranked from 1 (extremely underdeveloped) to 7. Liner shipping connectivity index: It captures how well countries are connected to global shipping networks; the maximum value was 100 in 2004. Infrastructure efficiency score: Quality of trade- and transport-related infrastructure ranked from 1 (lowest quality) to 5. International shipments efficiency score: Efficiency of the clearance process ranked from 1 (lowest efficiency) to 5. Timeliness efficiency score: Timeliness of shipments in reaching destination within the scheduled or expected delivery time ranked from 1 (lowest timeliness) to 5. Overall logistics efficiency score: Composite index of previous LPI indicators, ranked from 1 to 5. Burden of customs: It measures business executives' perceptions of their country's efficiency of customs procedures; ranked from 1 (lower efficiency) to 7. LPI variables are from 2016. DB and WDI variables are averaged for 2012-15.

Other components that limit international trade are, for example, very poor logistics and an unfertile business environment. Regarding the first aspect, for example, The IMF Regional Economic Outlook (IMF 2019) estimates that if the level of African logistics were comparable to the global average, its foreign transactions would rise by more than 12 percentage points. On the second aspect, the most evident shortcomings are those of access to credit, which limits entrepreneurship. In addition, there is a lack of adequate financial infrastructure to help make international payments faster and easier, which is why swap

agreements and multi-currency clearing centres are needed to reduce currency risks and increase controls on banking institutions. [ibidem]

Another limiting aspect for entrepreneurship is the low access to highly specialised and trained human capital.

1.2. The African Continental Free Trade Area

In this complex scenario comes the need and opportunity for the creation of the African Continental Free Trade Area (AfCFTA). The AfCFTA was created with the political will to create an institution with a juridical value to unify the African market in order to promote not only economic but also social development through trade between member states and outside the continent, focusing on an inclusive socio-economic development model. With these aims in mind, the AfCFTA is committed to complying with all the guidelines of the World Trade Organisation and the African Union Agenda 2063. [Kuhlmann and Agutu, 2020, p.3]

The AfCFTA is the world's largest free trade area and was created on 21 March 2018 following the 10th extraordinary summit of the African Union, where almost all countries signed the AfCFTA agreement. The agreement involved 55 countries and 1.3 billion people (Figure 1.3). This means that the AfCFTA has a gross domestic product of 3.4 trillion dollars under its umbrella.

Complementing the favourable start of the AfCFTA, also on 21 March 2018, two other initiatives were launched at the continental level, the Protocol on the Free Movement of Persons and the Single African Air Transport Market(STAATM). [Apiko et al., 2020,p. 2]

The agreement officially entered into force on 30 May 2019 with ratification by the first 22 countries. The next step was taken on 7 July 2019, when the operational phase was launched, establishing the five operational instruments of the AfCFTA. These five instruments are the online negotiating forum, the monitoring and elimination of non-tariff barriers, a digital payments system and the African Trade Observatory. Little more than a year

later, in August 2020, The African Union Commission inaugurated the AfCFTA secretariat in Accra, Ghana. The official start of the exchanges, however, was postponed due to the global pandemic caused by COVID-19 from July 2020 to 1 January 2021 when it officially came into effect although more symbolically than actually. [The World Bank, 2020, p.11]

Figure 1.3 AfCFTA member countries

Source: The World Bank, 2020, p.12
Note: Status is as of October 29, 2019. AfCFTA
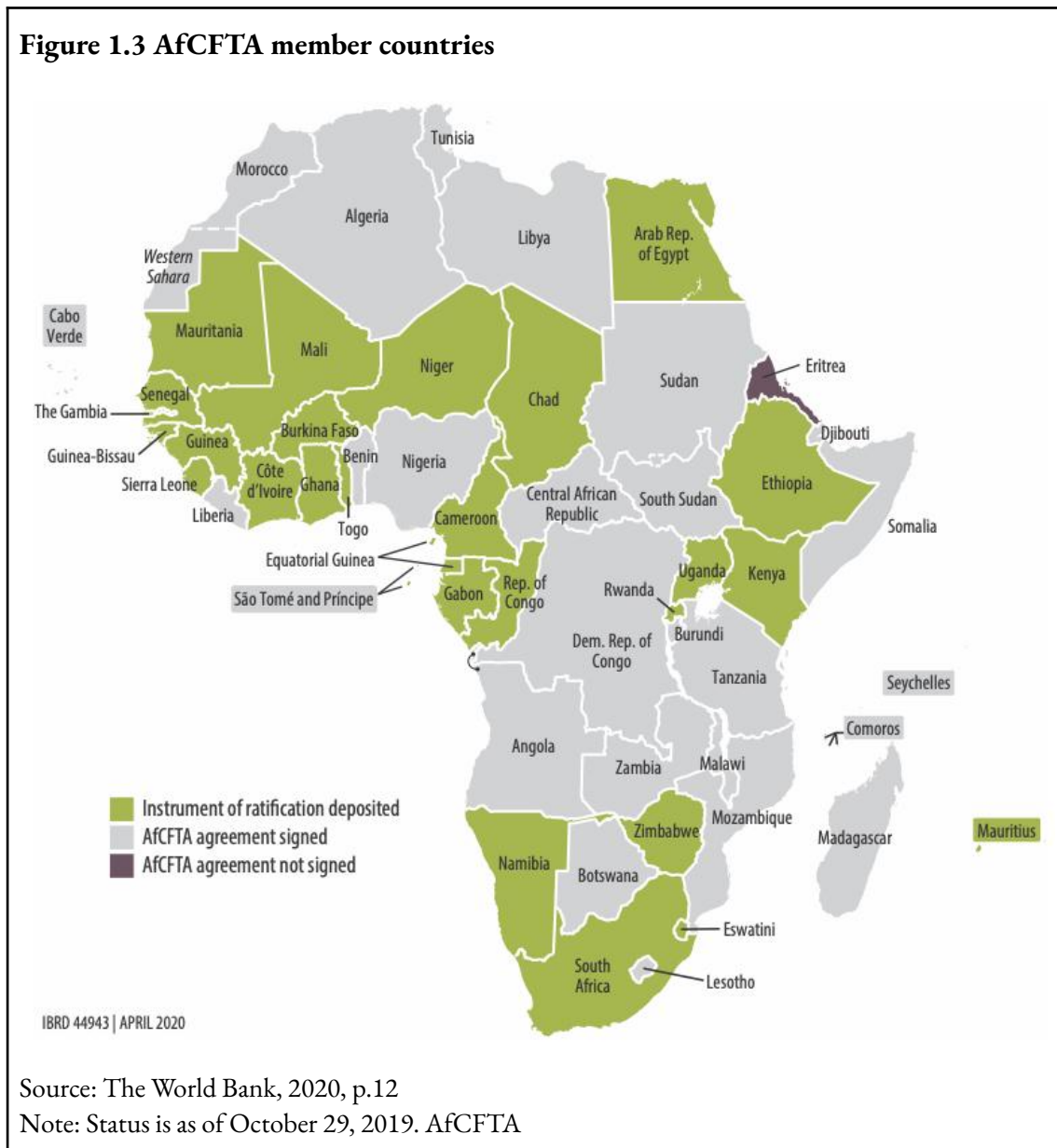
Although the agreement itself is a major revolution, it has its roots in other agreements aimed at African continental integration. The 1991 Abuja Treaty establishing the African Economic Community and the 2000 Constitutive Act of the African Union established the legal basis for a pan-African trade pact, building upon the Organisation of

African Unity (OAU) established under the 1980 Lagos Plan of Action. It was precisely the Constitutive Act of the African Union signed in 2000 that laid the groundwork for a free trade agreement in 2012. [Kuhlmann and Agutu, 2020, p. 3]

It should also be remembered that AfCFTA also has its roots in the negotiations of the Tripartite Free Trade Area (TFTA). The TFTA is composed of the Southern African Development Community (SADC), the Common Market for Eastern and Southern Africa (COMESA), and the East African Community(EAC). [Abrego et al.,2020,p.16]

1.2.1. The Content of the AfCFTA

The agreement we are now presenting has three consecutive phases that provide for certain flexibility on the part of the adhering states, which can progress in the agreements following a variable geometry.

The first one focuses more on trade in goods and services and dispute settlement [Apiko et al., 2020,p.2]. Specifically, this part of the agreement also deals with rules of origin (ROO), non-tariff barriers (NTBs), customs cooperation, trade facilitation, transit, trade remedies, sanitary and phytosanitary measures (SPS), and technical barriers to trade (TBT).[Kuhlmann and Agutu, 2020, p.5]

Rules of origin were a particularly debated point, since they establish the added value quotas that a product must acquire in a given country in order to receive more or less preferential excesses in the various markets. In this respect, the risk is that overly permissive or badly managed ROOs lead to flows of goods with low added value on the market. Goods might transit through a country enjoying favourable taxation in order to enjoy only the tariff advantages. Similarly, too restrictive and rigid rules could create problems in supply chains, which is one of the main objectives of the free trade area.[The World Bank, 2020, p.15].

Specifically, the agreement foresees the elimination of tariffs on 90 per cent of tariff lines within five years, with the exception of least developed countries, which are given a ten-year time frame. Of the remaining 10 per cent, for 7 per cent individual countries can opt

for a gradual reduction over a certain period for products deemed sensitive, while for 3 per cent they can opt to maintain the current status.[Apiko et al., 2020,p.3].

On the services side, the areas identified as key are five: financial services, transport, telecom/information technology, professional services, and tourism. [The World Bank, 2020, p.15].

As mentioned above, non-tariff barriers are a fundamental issue for the development of the continent and the functionality of the agreements. Indeed, Annex 5 of the agreement provides for the establishment of institutional structures to mitigate these previously categorised barriers. The intention is to create a monitoring model and effective tools to counter these barriers. Also within this scheme, individual countries commit to producing, publishing and implementing effective plans to reduce non-tariff barriers. [Abrego et al.,2020,pp.17-18].

Other vital points are the implementation of a protocol for the free movement of people between member countries, eliminating the use of visas, or customs harmonisation.[ibidem].

The second phase includes the facilitation of intra-African investments, agreements on intellectual property and competition. The third phase focuses on e-commerce. [Apiko et al., 2020,p.2].

The AfCFTA has eight strategic objectives:

1. creating a single market for goods and services, facilitated by the movement of people;
2. contributing to the movement of capital and people and facilitating investment;
3. creating a continental customs union;
4. expanding intra-African trade;
5. resolving the challenges of overlapping memberships in Regional economic arrangement;
6. promoting sustainable and inclusive economic development;
7. boosting industrial development;

8. enhancing competitiveness;

[Abrego et al.,2020,p. 17]

In order to pursue these objectives, AfCFTA has set seven operational objectives:

1. eliminate tariffs and non-tariff barriers to trade in goods progressively;

2. liberalize trade in services progressively;

3. cooperate in matters of investment, intellectual property rights, and competition policy;

4. cooperate in all trade-related areas;

5. cooperate in customs matters and the implementation of trade facilitation measures;

6. establish a mechanism for the settlement of disputes concerning members' rights and obligations;

7. establish and maintain an institutional framework for the implementation and administration of the AfCFTA.

[ibidem]

Looking at the structure from the point of view of institutional figures, it is outlined in Article 9 of the treaty and provides for the establishment of an assembly to provide strategic guidance to the agreement, a council of ministers, a committee of trade ministers of the individual member states to which the implementation phases of the agreements are entrusted. In addition, a secretariat with a legal personality is established, which will have its own autonomy of action although it will be financed by the African Union and directed in its roles and responsibilities by the above-mentioned council of trade ministers. [ibidem].

In conclusion, it should be emphasised that in addition to the aforementioned objectives, gender equality, inclusive and sustainable development, industrial diversification, support for regional values, agricultural development in general and the fight for food security remain key objectives of AfCFTA.The whole ecosystem is also expected to attract foreign investment, thus fuelling the virtuous circle. [Apiko et al., 2020,p.1]. The multiplicity of interests involved ensures that the AfCFTA's support is not only domestic but also that the international community wishes it to succeed.

1.2.2. AfCFTA and the Regional Integration

Given that the AfCFTA covers a very large territory where several regional agreements are already in place between the countries involved, it is appropriate to shed light on how these fit into the agreement under analysis. One of the objectives of the AfCFTA is to simplify trade regimes on the continent and to do this it seeks to build on all the good practices already implemented by individual regional economic communities. Harmonisation between the different regulations in place is not easy and to overcome this, Article 19 states that

"regional economic communities, regional trading arrangements and custom unions, which have attained among themselves higher levels of regional integration than under this Agreement, shall maintain such higher levels among themselves". [The World Bank, 2020, p.18].

To date, among the eight regional economic communities recognised by the African Union, the most advanced are the Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC), Economic Community of West African States (ECOWAS), and Souther African Development Community (SADC).[Kuhlmann and Agutu, 2020, p.9].

The above highlights two things, both that regional economic communities are an integral part of the negotiation, and that they will continue to exist and have different speeds with each other and with respect to the negotiation itself. These dynamics will certainly create complicated relational architectures between states, regional communities and AfCFTAs. [Apiko et al., 2020, p.3].

Still, with reference to regional economic communities, it is important to remember that their harmonisation is made even more complex by the fact that they fall under different legal regimes.

Table 1.5 Policy areas covered in Africa's subregional PTAs and AfCFTA

	East African Community (EAC)	Common Market for East and South Africa (COMESA)	South African Development Community (SADC)	Economic Community of West African States (ECOWAS)	West African Economic and Monetary Union (WAEMU)	South African Customs Union (SACU)	Economic and Monetary Community of Central Africa (CEMAC)	African Continental Free Trade Area (AfCFTA)
Tariffs on manufactured goods	✓	✓	✓	✓	✓	✓	✓	✓
Tariffs on agricultural goods	✓	✓	✓	✓	✓	✓	✓	✓
Export taxes	×	✓	✓	×	✓	×	✓	✓
Customs	✓	✓	✓	✓	×	✓	×	✓
Competition policy	✓	✓	✓	×	✓	✓	✓	✓
State aid	✓	✓	✓	×	×	×	✓	×
Antidumping	×	✓	✓	✓	×	×	×	✓
Countervailing measures	×	✓	×	×	×	×	✓	✓
STEs	×	×	✓	×	×	×	×	✓
TBTs	✓	✓	✓	×	×	✓	✓	✓
GATS	✓	✓	✓	✓	✓	×	✓	✓
SPS measures	✓	✓	✓	×	×	✓	✓	✓
Movement of capital	✓	✓	×	✓	✓	×	✓	✓
Public procurement	✓	×	×	×	×	×	×	×
IPRs	✓	✓	×	✓	×	×	×	✓
Investment	✓	✓	✓	×	×	×	×	✓
Environmental laws	✓	✓	×	✓	×	×	✓	×
Labor market regulations	✓	✓	×	×	×	×	×	×

Source: The World Bank, 2020, p.17

Note: ✓ = policy area covered; × = policy area not covered; AfCFTA = African Continental Free Trade Area; GATS = General Agreement on Trade in Services; IPRs = intellectual property rights; PTAs = preferential trade agreements; SPS = sanitary and phytosanitary; STEs = state trading enterprises; TBTs = technical barriers to trade.

CHAPTER 2: NEW ECONOMIC GEOGRAPHY

With the second aim of giving an interpretative model for the future of the AfCFTA we look at Paul Krugman's interpretative theory of the international economy, and its evolution.

Taking a step back it is important to remember how interpretive models are useful not only for reading the world but also for making inferences about the future. Both components are in the last instance the main tools for the good political management of the course of history both at the economic and social levels. In addition, the structuring of the industrial network in one way or another can lead to choices for private actors, which in turn have a new impact on social and political life.

Now let us look at Krugman's model in steps.

2.1 Geography and Trade

In the following, we will analyse the 1991 publication by P. Krugman entitled "Geography and Trade". Specifically, we will analyse and report the most useful parts of the entire publication for the purpose of this dissertation.

As the author himself tells us in the preface, the publication is a collection of three lectures given during the "Gaston Eyskens lectures at the Catholic University of Leuven, in Belgium". Right from the start, the author warns the audience about the informality of the content, but despite this, the result that follows is the basis of an interpretative perspective that is not at all obvious or unserious. The author confesses that it was at that time that he became interested in the mobility of factors in relation to international trade. In this period there arose in Krugman the awareness that he was moving away from the classical international economy where resources are completely immobile but where goods can be exchanged without cost. As he himself states

"What I found myself gravitating towards was a style of model in which factors of production were perfectly mobile but in which there were costs to transporting goods. In other words, I found myself doing something closer to classical location theory than to international trade theory". [Krugman,1991]

2.1.1 Center and Periphery

The first lesson opens with a chapter on "Center and Periphery", where the author gives his definition of Economic Geography:

"I mean "the location of production in space"; that is, that branch of economics that worries about where things happen in relation to one another."[ibidem]

The author considers that the analysis of international trade does not use the insights of economic geography or localisation theory. Furthermore, he argues that the models thus constructed are unrealistic because of the adimensionality that countries acquire since they are represented as points within which factors of production can be transferred instantaneously and without cost from one activity to another, in the same way, that trade between countries is treated.

Krugman believes that simplifications do not always come to harm the interpretative models of reality, indeed sometimes these are very useful, but in this case "exclusion of important issues and, above all, of important sources of evidence"[ibidem] can damage the final results. In order to resolve this issue, the author considers it useful to focus on the internal analysis in the countries, on the different growth of the different regions, or even more specifically on the different regional specialisation. These steps are useful in order to start with a simplified, small-scale model and then move on to a broader generalisation where instead of the relationships between individual localities within a country we can move on to apply the model on a larger, even international scale. It is precisely the international level that we will need in the next chapter to consider the impacts of the AfCFTA on the core-periphery dynamics.

2.1.1.1 Why Choose a Geographical Approach to Economic

Even before turning to the reasons and modalities of the modelling, it is useful to recall why a geographical approach to economic analysis is useful for investigating the structural dynamics of a country, or as anticipated of a set of countries. The reasons for choosing Krugman's modelling for this work are the same as those that led the author to define it in the first place.

Indeed, the author aims at explaining, even before presenting his thesis, what it is that does not convince him in the way international economics has been approached so far. Specifically, he proposes to

"talk briefly about why international economists don't acknowledge that they are doing geography and why they should".[ibidem]

Krugman believes that in order to effectively investigate the location of economic activity in space, it is necessary to move away from the approach of perfect competition with constant returns used up to that time. Another criticism is the fact that literature has focused too little on the structure of the market and too much on the shape of the areas of an idealised market where resources and plants have an optimal arrangement.

The author begins by emphasising that for him the fundamental issue in the geography of economic activities is concentration. To emphasise the point he uses the example of the United States of America where most of the population lives along the two coasts of the ocean and the Great Lakes and where the population is once again polarised around a few densely populated areas. Already we start to identify how geographic concentration can be a passive symptom of increasing returns. From here two roads open; if the increasing returns are purely external to the firms one can use the tools of competitive analysis, while if they are internal to the firms one must necessarily appeal to models of imperfect competition. Neither of the two models is considered perfect but they certainly succeed in having theoretical validity by reducing the problem of dealing with increasing returns.

Leaving aside the historical evolution of thinking on these issues, Krugman believes that *"we can now admit to ourselves that space matters and try to bring geography back into economic analysis".*[ibidem]

Having reached this point, it is necessary to list the reasons why it is necessary to study economic geography. There are three reasons:

- *"the location of economic activity within countries is an important subject in its own right."..."the allocation of production between regions is an issue as important as international trade".*[ibidem]
- *"the lines between international economics and regional economics are becoming blurred in some important cases"*[1] [ibidem]
- *"the most important reason to look again at economic geography is the intellectual and empirical laboratory that it provides."*[ibidem]

With the first lesson of "Geography and Trade", K. wants to shed light on the importance of economic geography. In detail, he wants to deal with increasing returns and their effect on the economy and how they play a decisive role in determining the geography of the economy. The model that is developed next is one in which

"the interaction of demand, increasing returns, and transportation costs drives a cumulative process of regional divergence."[ibidem]

2.1.1.2 The Rise of Inspiration

The author takes the U.S. Manufacturing Belt as an inspiring case in order to explain the geographical concentration. The area mentioned is located in the northeast of the state, where most of the manufacturing industries have been concentrated since the 19th century, with the exception of those involved in the processing of raw materials and those aimed at

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[1] *"One need only mention 1992 in Europe: as Europe becomes a unified market, with free movement of capital and labour, it will make less and less sense to think of the relations between its component nations in terms of the standard paradigm of international trade"*[Krugman,1991].

satisfying strictly local consumption. The development of this concentration cannot be seen in the nearby supply of mineral materials, which were first delocalised and then imported. Neither does agricultural production seem to have a role, since the little production was carried out according to the fact that there was urban concentration and not vice versa.

Krugman, therefore, identifies the trigger for this concentration as the advantages for firms of being close to other producers. In fact, this gravitation also explains why this area has remained over time even when primary production has moved elsewhere. Similarly, in this dissertation, a case study will be presented that was the trigger for the desire to verify whether or not there were any dynamics at work that could be traced back to the core-periphery and whether or not these were influenced by the entry into force of the AfCFTA.

To understand now the reasons for the initial concentration, Krugman appeals to a model that explains why they aggregated, bringing out the geographical concept as a result of demand-side externalities.

2.1.1.3 Assumptions and Results, The Creation of a Model of Geographic Concentration

Turning now to the formulation of the model, it *"relies on the interaction of increasing returns, transportation costs, and demand"* [ibidem]. K. argues that if the economies of scale are sufficiently relevant then producers will decide to serve the market from one location. The location chosen will depend on the minimisation of transportation costs, so the choice will fall on a place with the highest concentration of local demand, which is concentrated where most producers are concentrated. This circle tends to be self-perpetuating, creating ever-larger agglomerations where a production centre was initially created.

To demonstrate this, consider a country with only two production regions (East and West), and only two types of products. Let us assume that one of the two types is agricultural products, which by their nature are linked to the land, and therefore that the population linked to the production of these goods is split between 50 per cent and 50 per cent in the

two regions. Manufacturing products can be produced in one or both regions.In the case of production in one place there will be transport costs, in the case of production in both areas there will be twice the fixed costs associated with the plant. The labour force will be proportional to the level of production for each zone and the demand will be proportional to the population of each region.

The author exemplifies this model numerically, but for the purposes of this section, only the results obtained are reported, since the complete and generic demonstration will be presented later. At the end of the logical process it is shown that the direction of history depends essentially on three parameters:

"...sufficiently strong economies of scale; ...sufficiently low costs of transportation; and ...sufficiently large share of "footloose" production not tied down by natural resources."[ibidem]

2.1.1.4 Transport Networks When Regions Increase in Number

Krugman points out that in the case where three regions are considered, and transport costs are equal between them, the most densely populated region will attract the highest concentration of production. This is provided if the following conditions are met: if the market in this region is large enough compared to the others and if the fixed costs are large enough compared to the transport costs.

If instead of three regions we consider four regions and if the transport costs between only two of them are relatively low, then the most likely scenario is that between the two regions with the lowest transport costs we would have such a link that they could be considered as a single region. This implies that companies will concentrate on these two regions with all other conditions being equal, in order to exploit the advantages of the combined market. The main reason for a possible reduction in transport costs is the presence of economies of scale in transport itself. If the two regions increase trade between them in the case of roads and railways, no economies of scale can be created. In the case of other transport, on the other hand, an increase in the frequency and efficiency of the vehicles

themselves, both in terms of size and technology, can lead to economies of scale. Efficient transport means lower costs, which in turn increase the attractiveness of the two areas under consideration.

"It is possible in principle to imagine this transportation network effect as an independent source of geographical concentration of industry that is, to set up a model in which the local market size effect that is the driving force for our basic model is absent. In practice, of course, the two effects work together."[ibidem]

2.1.1.5 Trends of Change

With regard to the possibilities of change in the equilibria, the author points out that the core-periphery model tends to reinforce itself due to the fact that the location of demand positively influences the location of production and vice versa. However, it is useful to remember that although equilibria tend to remain stable, changes can occur and these tend to occur rapidly. *"In fact, a gradual change in underlying conditions can at times lead to explosive, or more accurately, catastrophic change."* [ibidem]. In addition, change can be influenced by expectations of the future.

To explain the rationale behind the sudden change we always consider two regions (East and West). In the initial situation, the West region has a smaller population and therefore also less agricultural population. This respecting what has been said so far implies that manufacturing production is exclusively in the East. If in such a scenario there is a shift of agricultural population from East to West at some point the two areas will have similar populations and therefore the advantage of manufacturing in the East will end. Beginning to produce in the West will further increase the population and fuel the manufacturing shift from the East to this region.

A small change in agricultural population can trigger a rapidly self-sustaining process causing much larger changes. Although these changes can and tend to occur very rapidly,

predicting them is still very difficult, given the often random nature of the triggers for the whole process.

2.1.1.6 The Role of Expectations

Focusing now on the role of expectations, and self-fulfilling prophecies they often lead to unexpected results if not analysed by reading the intrinsic dynamics in expectation-driven actions. Let us expound the behaviour suggested by Krugman by always considering two regions (East and West). Let us assume that manufacturing production is all in one area due to economies of scale large enough to offset transport costs and that this is a stable equilibrium. Added to this is that there are costs to choosing to move and that not everyone can move at the same time. The choice to move therefore includes the need to stay in that area for some time. This implies that the decision to move or not to move depends more on individuals' projections of the future than on the present state of things. In addition, however, the individual's projections are on the present value of future salaries, which depend on the number of workers in each region. So in the end the decision of individuals depends on the expectations of the decisions of others.It is precisely this logical process that underlies self-fulfilling prophecies.

This implies that irrespective of current real wages if there is a perception that one of the two zones in the future will give higher real wages, there will be a migration to that zone. Regardless of whether the prediction is correct or not, such an attitude will lead to the concentration of manufacturing workers in that zone, thus producing higher real wages. Thus fulfilling the prophecy.

Krugman points out, however, that projections into the future can exceed the initial advantage only under certain conditions.

- *"the rate at which workers and firms can move must be rapid enough relative to the rate at which future wage differentials are discounted that the future advantage of one region can matter more than the current advantage of another."*[ibidem]

- *"increasing returns must be strong enough that an expected future shift in population distribution moves the real wage differential quickly".*[ibidem]
- *"the starting position must not be too unequal: if enough manufacturing is concentrated in one region, this initial advantage may be too much for even the most optimistic expectations about the other region to overcome."*[ibidem]

Finally, it should be stressed that in these dynamics the political component plays a fundamental role in directing expectations. In addition, expectations towards the future can be positive, as in the description above, as well as negative, reporting opposite results.[2]

It should be emphasised that the role of expectations assumes a major weight when considering deliberate actions to modify the plan of the economic geography of a territory. Economic policy actions, such as treaties and regulations implemented in reaction to what is assumed to be the future, fall under this heading, as we shall see later.

2.1.2 Extensive Construction of the Core-Periphery Model

This section presents the core-periphery model in its most extensive form. This model differs both in its assumptions and in its results from the classical models used in the interpretation of the international economy. Usually, models with fixed resources and mobile products with zero transport costs are used, whereas here the opposite is true. In addition, Krugman proposes a variety of possible long-run equilibrium situations that are determined and influenced by both the past and expectations of the future.

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[2] In Appendix B Krugman mathematically generalises the relationship between history and expectation and concludes by saying: "What does this model have to say about reality? My guess is that for core-periphery issues at a grand level, history rules, and expectations at best help it along. The pace at which capital and labor can shift between regions is simply too slow to imagine otherwise: I do not believe that it is realistic to imagine that events at the level of, say, the rise of the sunbelt can happen fast enough potentially to constitute self-fulfilling prophecies.
When it comes to smaller-scale events, however, I am not so sure. The rise and decline of individual cities, and perhaps of somewhat larger regions, may indeed sometimes be the result of self-fulfilling optimism and pessimism."[Krugman,1991]

2.1.2.1 Assumptions of the Model

The model is based on a reality in which there are only two countries (East and West) and only two goods (agricultural and manufactured goods) are produced. For agricultural products, a homogeneous production is considered, with constant returns in a market of perfect competition. For manufactured goods, product differentiation is considered, in an economy of scale and a market with monopolistic competition. In this model, it is assumed that consumers do not have preferences based on personal taste. *"Welfare is a Cobb-Douglas function[3] of consumption of agricultural goods and a manufactures aggregate"*[ibidem].

$$U = C_M^{\pi} C_A^{(1-\pi)}. \tag{A.1}$$

Where p is the consumption share of manufactured goods.

The production of manufactured goods is expressed in an aggregate way through a CES (Constant Elasticity of Substitution) function of the consumption of manufactured goods.

$$C_M = \left[\sum_i c_i^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}. \tag{A.2}$$

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[3] A functional form, named after its originators, that is widely used in both theoretical economics and applied economics as both a production function and a utility function. Denote aggregate output by Y, the input of capital by K, and the input of labour by L. The Cobb–Douglas production function is then given by

$Y = AK\alpha L\beta$

where A, α, and β are positive constants. If $\alpha + \beta = 1$ this function has constant returns to scale: if K and L are each multiplied by any positive constant λ then Y will also be multiplied by λ. The Cobb–Douglas production function has also been applied at the level of the individual firm. With this production function, a cost-minimizing firm will spend a proportion α of its total costs on capital and a proportion β on labour. When the Cobb–Douglas function is applied as a utility function the inputs, K and L, are replaced by the consumption levels of two types of good, say, X and Y. With this utility function a utility-maximizing consumer will spend a proportion α of their budget on good X and a proportion β on good Y. The Cobb–Douglas function can also be extended to include three or more arguments.[Black et al,2009]

This function is useful because as long as many goods are produced the elasticity of demand for each individual good is s.

For the factors of production, only two categories are assumed, one for each production sector, farmers and workers, who cannot change their sector of employment over time. The numerical distribution of farmers and workers is taken as 1-p farmers where p are the workers, the consequence of which is that wages will be equal for the two categories at the equilibrium point.

The assumptions concerning geographical distributions: farmers are fixed and distributed equally to (1-p)/2 for the two areas, workers, on the other hand, have complete mobility and this is determined by the real income in the two different areas.

The assumptions pose constant returns to scale for the production of agricultural goods, while in the production of manufactured goods we have returns to scale that follows a linear cost function, specifically in each individual production there is a fixed cost in terms of labour.

$$L_{Mi} = \alpha + \beta\, x_{Mi}. \tag{A.3}$$

The last variable taken as an assumption concerns transport costs. For agricultural goods the costs are assumed to be zero, thus facilitating the analysis. For manufactured goods, the costs are present and *"take Samuelson's "iceberg" form, in which only a fraction of a good that is shipped arrives (so that in effect transport costs are incurred in the good shipped)"*[ibidem]. Specifically, t<<1 is considered the ratio between shipped and arrived good.

2.1.2.2 Pricing and Competition

In the market, there will be monopolistic competition. This is because there is a large variety of producible goods, with economies of scale, and firms will be induced to produce different goods than their competitors. Whatever the product in question is, it will have a

demand elasticity of s . For this reason, the profit-maximising price is given by *"a constant markup over marginal cost"*.[ibidem]

$$p_i = \frac{\sigma}{\sigma-1} \beta w,$$ (A.4)

In the above equation consider w the wage rate of manufacturing workers.

That said, profits will be brought to zero if the barriers to entry are zero.

$$(p - \beta w)x = \alpha w.$$ (A.5)

If the above happens, and there are zero profits, meaning that the difference between the selling price and the variable costs is zero, the price is equal to the average cost. It follows that average cost and marginal cost are expressed as s/(s-1) thus expressing the measure of economies of scale.

It is now evident how economies of scale in equilibrium can only be expressed as a function of s. S is a parameter more related to tastes than to technologies but taken in these terms it *"acts as a sort of inverse index of the importance of increasing returns"*.

"The zero-profit and pricing conditions together imply that the output of a representative manufacturing firm is".[ibidem]

$$x = \frac{\alpha(\sigma-1)}{\beta}.$$ (A.6)

The level of production, expressed in number of manufactures in a region, considering a resident workforce of LM can thus be expressed as follows

$$n = \frac{L_M}{\alpha + \beta x} = \frac{L_M}{\alpha\sigma}.$$ (A.7)

2.1.2.3 Sustainability of a Core-Periphery Pattern

The analysis now focuses on the sustainability of a situation in which in one of the two areas all manufacturing production and in the other all agricultural production is concentrated, verifying whether this situation can be defined as a situation of equilibrium.

To continue the analysis, let us assume that the manufacturing core is concentrated in the East while the agricultural periphery remains in the West.

The forces holding the core together are

"(1) the desire of firms to locate close to the larger market, and (2) the desire of workers to have access to the goods produced by other workers." [ibidem]

The forces that tend to break the core

"is the incentive of firms to move out to serve the peripheral agricultural market. " [ibidem]

Now we move on to see whether the centripetal forces are strong enough to maintain the core. To do this, remember that, under the chosen units, the wage rates of workers and farmers will be equal at the equilibrium point.

As a consequence of the fact that the East will have half the farmers with an income equal to (1-s)/2, plus all the workers with an income equal to s, then the total income of the East is equal to

$$Y^E = \frac{1+\pi}{2}. \tag{A.8}$$

specularly, for the reverse reasons, the total income of the West is

$$Y^W = \frac{1-\pi}{2}. \tag{A.9}$$

Assuming that such a situation can only be maintained if there is no incentive for a firm to move to the West, it must be examined whether such incentives are present.

"Let n be the (large) number of firms currently producing in the East. Then the sales of each of these firms will be".[ibidem]

$$s^E = \frac{\pi}{n}. \qquad\qquad (A.10)$$

Only if a company was able to attract workers from the West could it open in this area. In order to do so, the company would have to guarantee higher wages in order to allow its workers to buy all the goods that are produced in the other area, which will cost more as a result of transport. Specifically, remember that the price would be 1/t given the fraction of the product that arrives in the new zone as a result of transport. The general price index will therefore be t-p times higher. Thus only if the firm is willing to pay wages equivalent to t-p of the wages in theEast will it be able to attract workers to theWest.

"But the price charged by a firm is a fixed markup on its marginal cost, which in turn is proportional to wages. So the price charged by a new Western firm win exceeds that of established Eastern firms in the ratio"[ibidem]

$$p^W = p^E \tau^{-\pi}. \qquad\qquad (A.11)$$

In addition, for a consumer in the East, the price will be higher than the price charged by the company due to transport costs, specifically, the price will be 1/t higher, so ultimately the relative price will be pw/tpE. Speculary and for the same reasons in theWest the relative price of products from the East will be tpw/pE.

All this implies that

"A 1 percent increase in the relative price of the Western good reduces the consumption of that good relative to the consumption of a representative Eastern product by o percent. Because of the higher price, however, the higher price reduces relative expenditure by only s-1 percent. We can use this result to derive the value of the sales of a defecting firm. Bearing in mind the incomes of East and West, it is". [ibidem]

$$s^W = \frac{\pi}{n}\left[\frac{1+\pi}{2}\left(\frac{p^W}{p^E\tau}\right)^{-(\sigma-1)} + \frac{1-\pi}{2}\left(\frac{p^W\tau}{p^E}\right)^{-(\sigma-1)}\right]. \qquad (A.12)$$

If we now divide by equation (A10) we will have an equation expressed in relation to an enterprise located in the East

$$\frac{s^W}{s^E} = \frac{1+\pi}{2}\tau^{(1+\pi)(\sigma-1)} + \frac{1-\pi}{2}\tau^{-(1-\pi)(\sigma-1)}. \qquad (A.13)$$

It might seem that it is profitable to shift production if sw/sE=1 because of the mark-up on marginal costs leading to a surplus. In reality, this is not true *"because the fixed cost that must be covered by operating profits is also incurred in labour, and is therefore also higher for a defecting firm in the ratio t-p."* [ibidem]

It is thus profitable to move the firm if and only if:

$$s_W/s_E > \tau^{-\pi}. \qquad (A.14)$$

now let k be equal to tpSw/SE

$$K = \frac{\tau^{\pi\sigma}}{2}\left[(1+\pi)\tau^{\sigma-1} + (1-\pi)\tau^{-(\sigma-1)}\right]. \qquad (A.15)$$

So if K>1 it will be profitable to move the production to the new area, and vice versa if K<1 the core-periphery equilibrium is maintained. K depends on three parameters:

"p, the share of manufactures in expenditure; t, which is an inverse measure of transportation costs; and s which is inversely related to equilibrium economies of scale". [ibidem]

2.1.2.4 Determinants of the Nature of Equilibrium

As we have seen, K is fundamental to determine whether the core-periphery pattern can remain in equilibrium or not. In order to assess how K can remain stable over time, it is

necessary to verify how its components affect its value and how when one changes the others must change to that purpose. Considering K around one the effect of p, the share of manufactured goods in the expenditure, on K is:

$$\frac{\partial K}{\partial \pi} = \sigma K \ln(\tau) + \tau^{\sigma\pi}\left[\tau^{\sigma-1} - \tau^{-(\sigma-1)}\right] < 0. \qquad (A.16)$$

A higher share of p has a negative effect on K. This means that as the share of income in manufacturing increases, the core-periphery pattern is more likely to take hold. Krugman tells us that there are two reasons:

"First, the size of the wage premium that must be paid by a defecting firm which gives rise to a forward linkage, becomes stronger. Second, the relative size of the core market, which gives rise to a backward linkage, also becomes stronger."[ibidem]

Let now turn to the second variable, transport costs, with reference to A15 when t=1 then K=1, zero transport costs determine irrelevant location, vice versa if t is very small K tends to

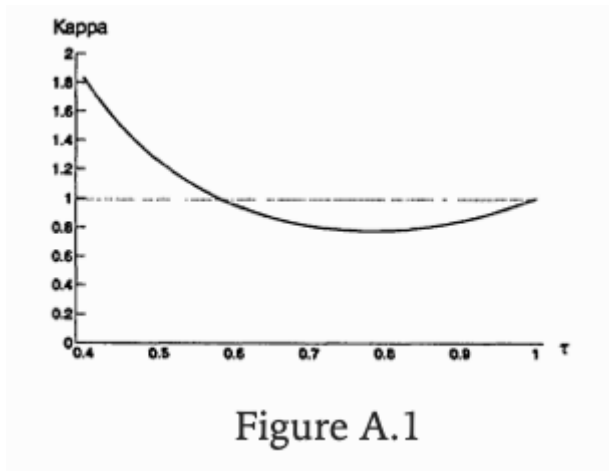$$\lim K_{\tau \to 0} = \frac{1}{2}\tau^{1-\sigma(1-\pi)}. \qquad (A.17)$$

So K becomes very large for a small t. Except in cases where there are very large economies of scale or very large p.

If we differentiate A15 for t

$$\frac{\partial K}{\partial \tau} = \frac{\sigma\tau K}{\tau} + (\sigma-1)\frac{\tau^{\sigma\pi}}{2}\left[(1+\pi)\tau^{\sigma-2} - (1-\pi)\tau^{-\sigma}\right]. \qquad (A.18)$$

for t close to 1 the expression is always positive.

If we take into account everything that has been said so far, K as a function of t has this form

Figure A.1

It is evident that only in the presence of relatively low transport costs is a core-periphery pattern sustainable.

"The case where s(1-p)<<1 can also now be interpreted. This is a situation where economies of scale are so strong, and the share of manufactures so large, that workers will have a higher real wage in the location with a larger manufacturing sector even if transportation costs are infinite".[ibidem]

We now evaluate the effect of the last variable, o

$$\frac{\partial K}{\partial \sigma} = \pi K \ln(\tau) + \frac{\tau^{\pi\sigma}}{2}(\sigma-1)\ln(\tau)\left[(1+\pi)\tau^{\sigma-1}-(1-\pi)\tau^{-(\sigma-1)}\right]. \quad (A.19)$$

By comparing this function with the derivative of k as a function of t we see that if the latter is negative (where we have a core-periphery pattern) then the derivative with respect to o is positive.

Analysing now the boundary line delimited by K, keeping o constant, we find the critical value of t as a function of p

$$\frac{\partial \tau}{\partial \pi} = -\frac{\partial K/\partial \pi}{\partial K/\partial \tau} < 0. \quad (A.20)$$

"Thus the boundary in p,t space is downward sloping, as shown in figure A.2. Given our earlier discussion, it must intersect the vertical axis at t = 1, and the horizontal axis at p=(s-1)/s."[ibidem]

Figure A.2
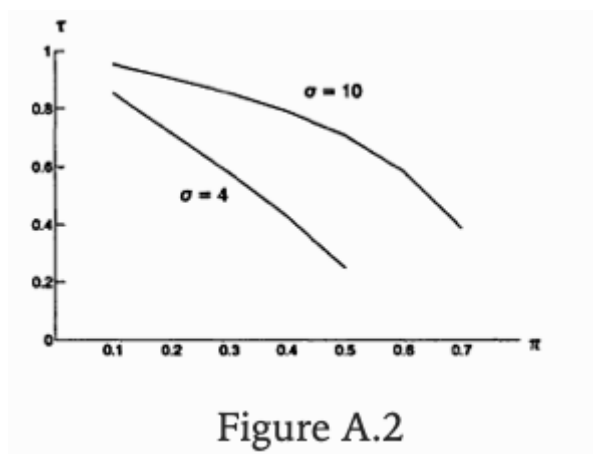
"This boundary will be shifted out if o is increased. We know that".[ibidem]

$$\frac{\partial \pi}{\partial \sigma} = -\frac{\partial K / \partial \sigma}{\partial K / \partial \pi} > 0. \qquad (A.21)$$

We deduce that if the importance of economies of scale decreases, the boundary will be shifted to the right, and sustaining a core-periphery pattern will be more difficult.

In conclusion, this formal model is

"A pattern in which one location emerges as the manufacturing core, while the other becomes an agricultural periphery, depends on some combination of large economies of scale, low transportation costs, and a large share of manufacturing in expenditure".[ibidem]

2.1.3 Industry Location Incentives

This section aims to investigate the reasons that determine the location of enterprises. In fact, there are factors that facilitate the concentration of industrial companies in one place, factors that make the centralisation of activities extremely favourable. Krugman wants to

build on Alfred Marshall's model to construct a more contemporary one. Marshall identifies three reasons for localisation.

If firms in an industry are concentrated in one place, there will be a high concentration of highly skilled workers, or workers with skills related to that industry. This causes both an easier placement of such workers, who have access to a large number of companies, and makes it easier for companies to find workers with the required skills.

If firms in an industry are concentrated in one place, firms supplying secondary goods to those firms will also concentrate in that area. This implies that by exploiting economies of scale such subsidiary firms can exploit a high level of technology at low costs by being able to supply their product to a multiplicity of firms operating in the same sector in that territory.

Furthermore, if companies in an industry are concentrated in one place, a kind of ecosystem is created where information flows more quickly due to physical proximity. This triggers what are called technological spillovers.

2.1.3.1 The Role of the Labour Market

Krugman suggests a simple way to identify the weight that the labour market plays within the core-periphery dynamics.In order to analyse more specifically the formation of a common labour market, consider two firms that use the same skilled labour force between them, but that have an unrelated demand for this labour force, and that may choose to settle arbitrarily in one of two possible areas. Consider also that the two firms may be subject to good and bad times. In good times they employ 125 workers, in bad times 75. Let us further assume that the total number of workers is 200, so that they are in perfect equilibrium with demand.

Given this situation, if the two firms decide to establish themselves in two different areas, they will have access to 100 labour units. This means that in good times they would have a lack of 25 workers, as they could not take advantage of this favourable situation. On the contrary, in the bad ones, there would be an oversupply of labour of 25. If, on the other

hand, the two companies decide to establish themselves in the same area, statistically it could happen that the two firms sometimes alternate good and bad periods so as to be able to exploit, although not always, the advantage given by good periods. Looking at it from the workers' point of view, if the companies were in the same area they would also enjoy the advantage and therefore there would be a lower average unemployment rate.

It is useful to remember that in order to create a common labour market it is essential that companies can choose to produce only in one area. If the opposite were the case and they could produce in both areas, two identical ecosystems would be created, eliminating polarisation. This is not the case if there are sufficient economies of scale to make it convenient to produce in one place.

The author, therefore, argues that it is the interaction between increasing returns and uncertainty about the future that creates the conditions for labour market pooling. Krugman explains that although there are three possible equilibria taking into account the preferences of firms and workers, the equilibrium in which the result leads to the concentration of firms in both areas is the least stable. Consequently, equilibria will tend to be found where production is concentrated either in the East or in the West.

Furthermore, the author elaborates the issue of labour pooling by relating it to wage setting. Krugman argues that even in the presence of flexible wages the advantage of having a common market remains. By creating a common labour market the wage rate will be lower than if there were two separate company towns, and this is to the advantage of the workers. At the same time, however, companies will enjoy higher profits. This is because if a firm is isolated it will set higher wages in good times and lower wages in bad times without varying the number of workers employed. Conversely, if the market is common, the firm will pay a constant wage derived from the average of the two and will employ more workers in good times and fewer in bad times. This means that the advantage for the firm in paying lower wages in good times outweighs the disadvantage in paying higher wages in bad times.

To what has been said so far, it should be added that although firms prefer a less competitive labour market, and therefore tend to want to produce in both regions, workers,

on the contrary, prefer a more competitive one and therefore concentrate in one. Since a more competitive market is always more efficient, it will be the workers who will get the situation most favourable to them; efficiency will lead to the construction of a single market.

2.1.3.2 Intermediate Inputs

Another element that plays a role in industrial location is intermediate inputs. The author elaborates on the issue of intermediate inputs, arguing that sufficient economies of scale are essential for a localised industry to be able to support several specialised suppliers and increase the overall efficiency of the system. Only if there are increasing returns will a large production centre have considerable advantages over a smaller centre. The author points out that it is not true that localised industrial centres emerge only in the presence of higher costs in the transport of intermediate goods rather than final goods.

"In fact, localisation will tend to occur unless the costs of transporting intermediates are particularly low compared with those of transporting final goods. And a general reduction in transport costs, of both intermediates and final goods, will ordinarily tend to encourage localisation rather than discourage it."[ibidem]

Krugman argues that given that the concentration of production of intermediate goods depends negatively on transport costs and positively on the share of "foot loose" demand and the importance of economies of scale, a model can be recreated that replicates the core-periphery model.

"In particular, the role played by the share of manufactures in the core-periphery model is here taken instead by the share of the industry's output that is used as an intermediate good rather than directly for final demand. Given this, we see that lower transport costs make industrial localisation more likely, even if the cost of transporting intermediates falls along with that of transporting final goods."[ibidem]

2.1.3.3 Technological Spillovers

The last component taken into consideration are the technological spillovers, last because although they have an effect it is considered to be if not irrelevant at least not definable, so it must be considered an incentive but certainly not among the main ones. Actually, Krugman sees technological spillovers as playing an "important role in the localisation of some industries"[ibidem], he does not consider them to be of remarkable importance. More generally, considering the flow of information, they are difficult to assess objectively, measure or control and this implies that it is very difficult to make any kind of inference about them.

Furthermore, the author argues that

"evidence does not show that high technology industries are not localised. What it shows is simply that low technology industries are also localised. Whatever drives industries to concentrate in one place, it is not solely a matter of technological spillovers"[ibidem].

2.1.4 The Core Periphery Model: an International Perspective

The reasoning so far has considered a national or regional dimension, now it is interesting to see what happens if the reference context becomes the international one. Krugman himself sets this goal

"I suggested the usefulness of taking nations out of the story of interregional trade; now I have to try to put them back in"[ibidem].

It is immediately clear that the author wants to move from a vision that focuses on nations to a broader one that takes into account the relationships between them.

In order to succeed in the above-mentioned aim, it is useful to define the concept of nation. The author chooses to start the definition by explaining what a nation is not. Remaining in the world of economics, it does not make sense to speak of a nation insofar as the interactions between economies do not only take place between territories separated by a

political border, but rather, as we have seen, they take place between neighbouring small areas such as cities or clusters of small cities. Where labour markets, the supply of intermediate goods and knowledge spillovers are shared. There is no reason to think that national boundaries matter even when considering the core-periphery model where what matters are transport costs and market size. In the economic analysis of increasing returns, however, the national dimension is often considered, believing that large nations enjoying economies of scale export more goods. In reality, this is influenced by the domestic policies of individual nations.

Given these considerations, it is clear that national borders are more relevant in their political dimension, which then affects the economic one, than in their pure economic-geographical dimension. In particular, national borders often act as a restriction on the movement of productive factors. It is political rules that limit the movement of goods, capital or labour. These regulations can be more or less strict and thus affect more or fewer restrictions depending on the field. Today, regulations on the movement of capital and goods tend to be more permissive than those on the movement of labour *"...in any case the point is that countries should be defined by their restrictions."*[ibidem]

This is a decisive factor when we talk about trade agreements whose main objective is to lower barriers between countries, and this is the case with the AfCFTA. If there is immobility of labour and capital between nation-states but trade is completely free, then there would be no barriers to the business location. Each territory would export the products of the industries it has and import those it does not have, developing situations of industrial clustering in individual countries. Krugman explains this masterfully, through a fable by Paul Samuelson readapted to increasing returns.

"Once upon a time, Samuelson supposed, there was an economy that was in equilibrium. (Strange how quickly the romance of the fable fades!) Capital and labour worked together freely, producing capital-intensive and labour-intensive "goods alike. But the factors of production grew arrogant, daring to challenge heaven, and an angel descended and divided them into nations.

Capital from one nation could henceforth work only with labour from that same nation and the angel did not divide the capital and labour equally."[ibidem]

In this scenario, if the factors of production were not divided too unequally, it would still be possible to create an integrated economy. Nations with an advantage in the use of capital would produce capital-intensive products, while others would produce labour-intensive products. Under these assumptions, if the angel has not been too cruel and the countries are not too small or lacking the minimum amounts of capital and labour to have industrial establishments for trade, the gains from the integrated economy will be exactly the same.

"And trade will be beneficial both because of the gains from implicit trade in factors and because of the ability to realise the gains from localisation."[ibidem]

2.1.4.1 Core Periphery Transnational Dynamics

We now take the size of economies and no longer their specialisation as the object of analysis. It has been shown that the interaction between increasing returns and transport costs can explain divergences in the development of different regions starting from different initial conditions.The author wonders whether small regions need to fear that larger regions will drain companies from their small centres.

The above parallelism does not necessarily apply if one takes into account that countries are not regions and vice versa.A large country is made up of many regions and not of a few large regions, what changes substantially from a large to a small country is the number of regions within it and not necessarily the size of those regions. Given these premises, the size of the country will not be a determinant in favouring more or less favourable regions.

In order to demonstrate this, Krugman says it is necessary to think of the core-periphery model where a discrete number of regions are involved. For the purposes of

demonstration let us assume that they are arranged in a circle and for the same reason that their number is six.

Figure 3.1   Figure 3.2
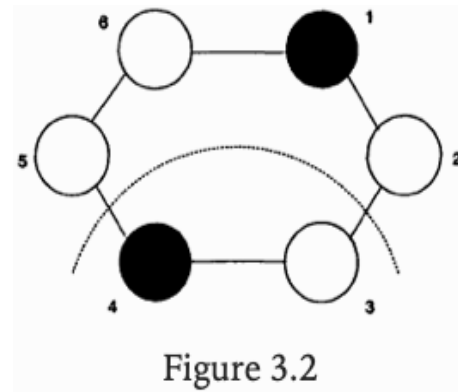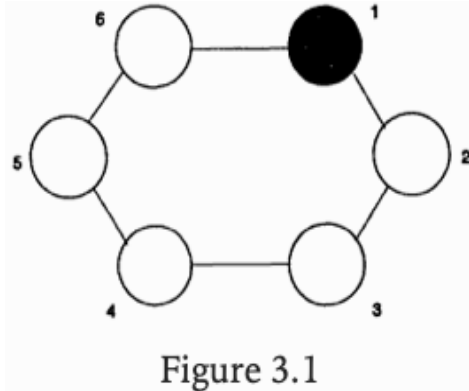
Let us further suppose that transports can only occur along the line, and therefore cannot jump from one region to another. As in the demonstrations considered so far, let there be only two types of people, farmers, equally distributed, and workers free to move.

In this scenario, the options are multiple,

"If transport costs are low, economies of scale large, and the share of footloose industry in national income large, the result will be a single core; if the reverse is true, there may be no core at all; intermediate levels will support a multiple-core structure".[ibidem]

What has been said so far is what happens with multiple regions. In the case that these are separated by a national border (fig. 3.2) and that the two countries have high barriers to trade we will have a situation in which the two countries will develop their own cores due to low factor mobility. In the large region a large core and in the small region a small core. If at a later stage these two countries join together in one economic relation the end result is that if

"If the integrated economy ends up with only one core, then region 1, with its head start, will presumably attract all the manufacturing away from region 4. But if the integrated economy ends up with two cores, manufacturing in region 4 will actually expand at the expense of region 1, as it gains access to its full natural hinterland".[ibidem]

It is important to remember not to treat countries as units of analysis but always to look at the geographical structure of production. This is all the more true the more barriers between countries are limited.

2.1.4.2 Good Reasons for Integrated Economy

In this section, while using premises that are not entirely appropriate for policy analysis, we follow Krugman's thinking in order to investigate whether

"may well be an incentive for countries to try to use trade protection and/or other policies to make sure that they get the core, or at least prevent their nascent core from being pulled away by neighbours".[ibidem]

To do so, he models the following reality. A world with only two regions where the welfare of farmers is a function of transport costs is described by Figure 3.3

Figure 3.3
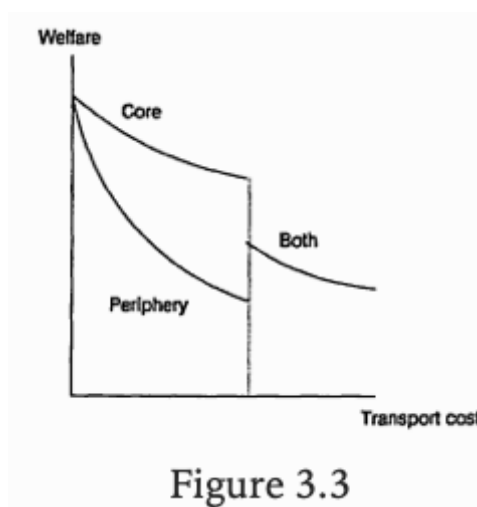
As can be seen, if transport costs are high there is no core-periphery model, the regions are equal and the farmers have the same level of welfare. If transport costs decrease welfare increases due to increased trade. If transport costs fall sufficiently the two regions are differentiated into core and periphery, where the core is manufacturing and the periphery agricultural. In this case, the periphery has much lower welfare due to having to import all goods at a still high transport cost. As transport costs decrease the price difference between

goods consumed in the core and those transported to the periphery decreases to a hypothetical equal welfare if costs reach zero. However, this welfare is higher than at the start because of lower transport costs, and location no longer matters.

With this in mind, it can be deduced that, especially in the case of a region that becomes a periphery, good integration can be beneficial while limited integration can be much less so. If, on the other hand, transport costs are on the limit to create a divergence between core and periphery, it is precisely there that political actions can determine whether an area will become core or periphery in the short term. This implies that with core periphery dynamics in place or in the near future, good planning, both political and economic, are crucial in order to achieve the best possible results.

2.1.5 Concluding Thoughts

In conclusion, what emerges from what has been said so far is that transaction costs in space and economies of scale are factors that substantially influence reality. Economies of scale lead producers to concentrate activities in a few places. Transaction costs lead to firms locating where demand is highest and this usually happens where other producers are concentrated. These components lead to self-perpetuating circles over time once started. Krugman argues that *"Regional comparisons offer a huge, almost untapped source of evidence about how our economy really works..."* [ibidem]

"Economic geography is also of considerable policy relevance. Regional issues are important in and of themselves"... "a geographic perspective is also useful in offering an alternative approach to international economic issues"[ibidem]

What makes the study of economic geography stimulating for the author, and not only for him, is that in reality, at the end of the day, there are many aspects determined by history and accidents.

2.2 The New Economic Geography, Now Middle-Aged

With Geography and Trade (1991), Krugman revolutionised classical approaches to international economics and laid the foundations for analysing industrial concentrations from a new angle. The core-periphery model, the basis of his theory, opened the way for what is known as the "New Economic Geography". As a result of the innovation proposed to K., several criticisms have been made to which, twenty years later, the author has tried to reply. In order to complete the look at Krugman's theories on the concept of core and periphery and the rise of the new economic geography, let us now see what points the author has analysed at a distance of so much time. The paper we will now analyse demonstrates once again the consistency of Krugman's theories when interpreted in the new historical context by adapting the scope. This is extremely useful for us to robust future considerations within this work in the dynamics involving the AfCFTA. The paper is entitled "The New Economic Geography, Now Middle-Aged" and was published in 2010 and presented at the Association of American Geographers conference.

Krugman confesses in the introduction how 20 years earlier he had hoped that economists would focus on a neglected but important aspect of economics and confesses that he is happy that this, even following its publication, has happened. He also hoped that the new approach he proposed would gain strength as more economies integrated, something that has happened as a result of European integration, for example, where these tools have also been used directly by institutions. The author also confesses a certain complacency for the large number of studies that have been done on empirical data with the tools he proposed to address important economic issues through regional and urban data.

Despite these premises, two criticisms have been most often directed at the author. The first comes from geographers who accuse him of not having presented anything particularly new with his 1991 study and that the proposed reduction in complexity does more harm than good. The second criticism is that he accuses the new economic geography of being too bound up with issues that are more than a century old and of being of little use in interpreting today's world. In the following analysis, the first criticism is briefly addressed

and the second in more detail. In fact, the second criticism is partially accepted insofar as it is true that attention must be shifted elsewhere, specifically to developing countries, to ensure that the interpretations made remain true.

2.2.1 A Model of Economic Geography

Krugman in answering the first critique says that he predicted that economic geographers would be resentful of the rise of the new geographical economy. But he also states that the reaction has been harsher than he expected. He refers to Martin(1999), for example, who states that economic geography proper focuses on real places and their relationship to history and individual factors and therefore cannot accept abstract modelling. In fact, it is precisely the aim of the new economic geography to develop abstract models in order to attract mainstream economists who believe that abstract modelling is a fundamental part of the useful profession of interpreting the world and directing its future. Persuasive talk about the roots of problems is not useful in pointing the way forward but rather in telling the story of how a certain point was reached. The author argues that mainstream economists want to follow Keynes' lead and provide answers that are useful. Not only policy guides but also, crucially, the ability to answer the "what if" question, to understand how changing one factor can change the story. This can only be done through abstract modelling and this is what the new economic geography aims to do. The ultimate aim is to provide the rules by which the world is governed, and here attempts at general modelling are still premature. An article of proper geography hardly satisfies a reader of economic abstraction because it hardly ever answers the "what-if" question, and this implies that however good the article may be it is not useful for the economist.

2.2.2 The Reasons for Core Periphery Model

Krugman states that, unlike the attempts that came before him, which did not receive much attention, in his article, he did not want to be as realistic as possible but to propose a

model that could give interesting food for thought. In order to do this, the model had to be neoclassical in a wide sense, *"in which economic outcomes can be represented as the equilibrium that results when maximising individuals interact."*[Krugman, 2010]

Another key feature of the model is that it does not have tautological explanations. Therefore, agglomeration theories had to be derived from fundamental factors such as transport costs or economies of scale and ignore non-measurable components such as the influence of information. Another constraint was that there should not be too much space between hypotheses and conclusions to facilitate interpretation and reading. Already from the statement of the hypotheses, possible conclusions had to be perceived. In addition, the model had to guarantee a multiplicity of results as the starting parameters changed. The model also needed to be easy to verify.

The core-periphery model was created on the basis of all these premises, and despite all the simplifications mentioned in the previous pages, it proved to be illuminating. The model, in fact, despite using tools familiar to economists, produces quite innovative results.

"There was a sort of phase transition from dispersed activity to a core-periphery pattern when transport costs fell, economies of scale grew larger, or the share of manufacturing in the economy expanded. And there were multiple equilibria - the possibility that either region could end up as the manufacturing core after that phase transition. Driving all this was the interaction among economies of scale, transport costs, and market size. Increasing returns at the plant level created an incentive for geographical concentration of the production of any given good; transport costs created an incentive to locate plants close to large markets (and large sources of goods from other plants); but the location decisions of producers themselves determined the location of large markets. Under the right circumstances, this could produce a circular causation in which concentrating production fed on itself. But that wasn't a necessary result, because the "centripetal" pull of market size was opposed by the "centrifugal" force of dispersed natural resources. All of this popped out of the math in a very gratifying way."[ibidem]

The new economic geography has, after all, led to an emphasis on the tangible causes of economic concentration and a neglect of the intangible ones, which are perhaps too often overlooked.

2.2.3 The Core Periphery Model; A Model Still Relevant

In the following, the author does some self-analysis, realising that the modelling he proposed no longer covers exactly the realities for which it was created, but it is also true that it gives us the elements to verify its robusticity one more time. In fact, many of the realities that were analysed in the past no longer exist, many of the clusters of the past have disappeared. Moreover, old clusters have not been replaced by new ones.

Identifying the industrial location, especially in the US but also in Europe, is thus more complicated than it used to be. Empirical data show that specialisation peaked between 1900 and 1950 but is now declining very rapidly. There is little specialisation in the global north today, although it persists, otherwise, there would be no justification for so much trade and movement between different regions. But specialisation is very subtle and difficult to detect, and this means that even agglomeration economies follow patterns that are difficult to discern. This means that the new economic geography, with its tangible forces, is less and less applicable to location patterns in advanced economies.

Krugman is aware that his early studies dating back to 1991 focused exclusively on advanced economies and specifically on the United States. But he justifies this with factors related to the convenience of studying territories for which it was easy to find the necessary data. Today, economic growth is happening more in China and other emerging countries, so it is these that deserve renewed interest. Taking China as an example, one can see that although it is still substantially poor (Krugman refers to the Chinese situation in 2010) it is very reminiscent of the economic situation of the now advanced countries around 1900. This implies that the new economic geography can be applied with some satisfaction in this context. Indeed, there are very strong core-periphery patterns, with mass migrations to the coasts. Although, unlike in the past, production is destined for a foreign market, there are

many parallels with the 20th century. A multitude of industrial clusters have emerged in China and numerous case studies verify the classical forces of labour localisation. In addition, the theories of localisation of specialised inputs also seem to be verified. As the global context has changed, the new economic geography must be interpreted in a dimension where trade takes place globally. This can be done by integrating the new theory of trade, although the latter was the basis for the initial study in 1991.

In conclusion, it turns out that the approaches of the new economic theory are still fully relevant for understanding rapidly developing economies. It should also be noted that the repetition of situations similar to those seen in the past might suggest that institutions matter less than is believed. One might be inclined to argue that they are the ones who enjoy the advantages that the longa manus of the market offers, modifying themselves to accommodate more advantageous economic outcomes.

2.3 To Sum Up

To sum up, in this chapter we have seen how since '91 Krugman has set the course for redefining the study of economic geography. With "Geography and Trade" of 1991 and "The New Economic Geography, Now Middle-Aged" of 2010, interpretative tools have been provided for reality, which are well suited to all economies that are undergoing strong change. This is regardless of whether they are of the past or present. The concept of core and periphery and its implications determine not only the possible reading of the dynamics of industrialisation but also the tools that political institutions can use to define their regulatory framework in order to support the future of an economy, or a region. These applications derive directly from the fact that the model set out so far has the peculiarity of remaining very much in touch with reality.

Where there are the right combinations of transport costs, economies of scale and market size, companies will tend to concentrate where there are other companies of a similar nature. This phenomenon is highly relevant insofar as it is able to change reality in a very decisive way. Industrial clusters change the economic, political and social geography of a

territory and, if linked to a wider network, may even change the history of a continent, as we shall see later.

CHAPTER 3: AFRICAN CONTINENTAL FREE TRADE AREA THROUGH THE NEW ECONOMIC GEOGRAPHY
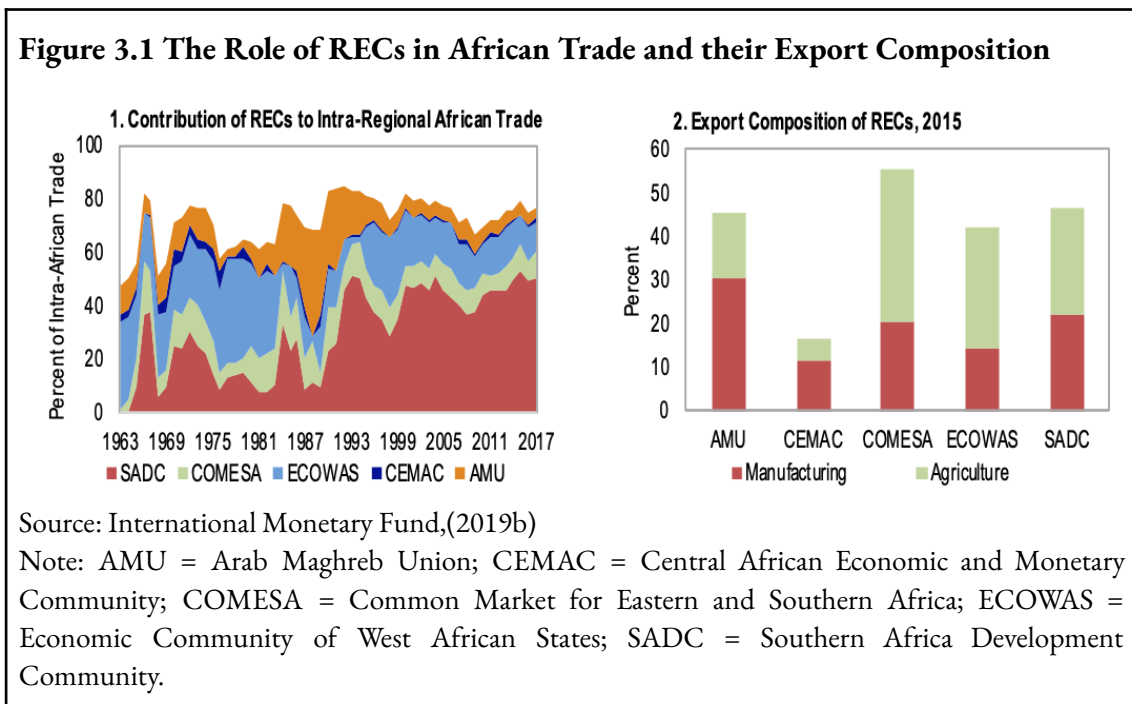
After having presented the African Continental Free Trade Area in the first chapter, and analysing the foundations of the New Economic Geography in the second, the aim now is to analyse the treaty through the instruments proposed by Krugman. This is to outline a possible imminent scenario in case the treaty acquires full and total disruptive power in changing the economy of the African continent. The following considerations are based on the assumption that the AfCFTA will take shape as planned by its creators, overcoming the problems linked both to the COVID-19 pandemic, which has considerably slowed down both trade and the treaty's implementation work, and to the multi-speed harmonisation of regional and subregional treaties already present on the continent.

We have seen in previous chapters how, in a multi-national context, economic integration between nations is crucial for the emergence of a core-periphery pattern. Trade integration makes it easier for countries to specialise in goods and services for which they have a comparative advantage and to exploit economies of scale. This improves not only their productivity but also their growth. Other factors that arise as a result of trade integration are technological diffusion and the creation of new opportunities in the regions. The AfCFTA aims to achieve these objectives by stimulating inter-regional trade, attracting investment and creating more efficient supply chains.

Ultimately, therefore, tariff and non-tariff barriers determine whether or not there is an integrated economy and thus whether or not there are industrial cores. Indeed, tariff and non-tariff barriers can be seen as a component of transport costs in Krugman's model as they cause low factor mobility. Following this line of reasoning, we move on to analyse the evolution of tariff and non-tariff barriers within the continent following the implementation of the AfCFTA and the possible effects.

3.1. The Trend of The Last Decades

In order to present a trend, which has actually been going on for some time, and which could be given a boost by the AfCFTA, it is useful to give a brief overview of what has happened so far. Moreover, Regional Economic Communities can be taken as a model, simplified in both size and function, of what the treaty under consideration could do. In recent decades, there has been a surge in intra-African trade as can be seen in Figure 3.1.

Figure 3.1 The Role of RECs in African Trade and their Export Composition

Source: International Monetary Fund,(2019b)
Note: AMU = Arab Maghreb Union; CEMAC = Central African Economic and Monetary Community; COMESA = Common Market for Eastern and Southern Africa; ECOWAS = Economic Community of West African States; SADC = Southern Africa Development Community.
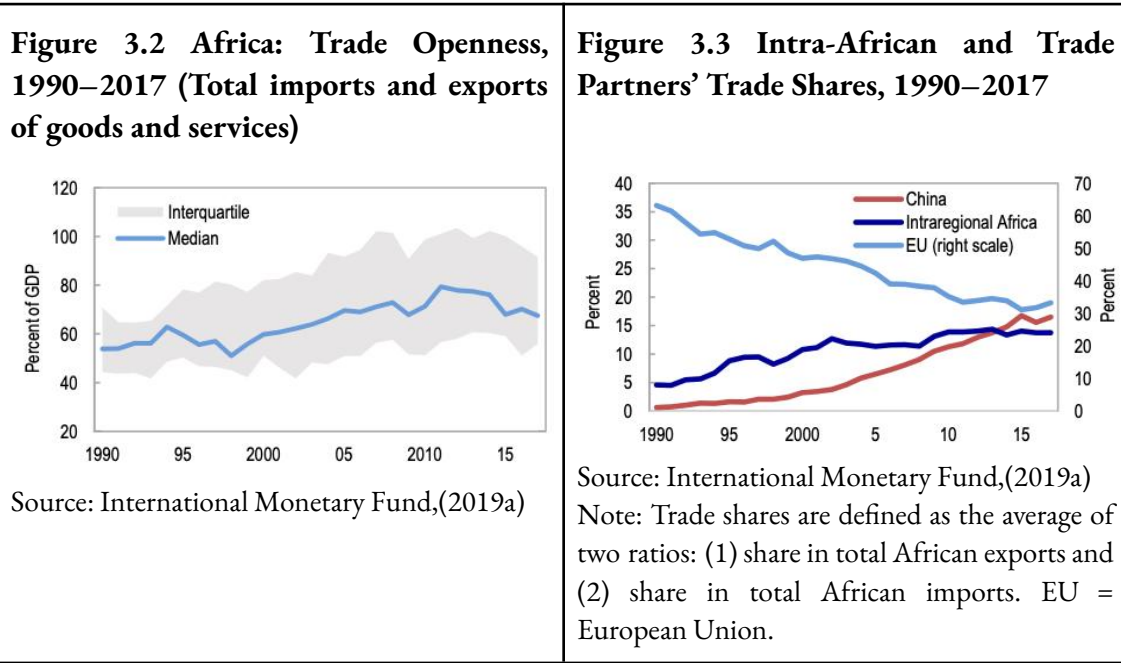
In 2017, about 75 per cent of African intra-regional trade took place within five RECs with a predominance of SADC. As can be seen again in Figure 3.1, the level of integration and trade diversification go hand in hand[4].[International Monetary Fund, 2019b, pp. 36-37]

African trade more generally has grown a lot in recent years, between 1990 and 2017 trade openness increased from 53 per cent to 67 per cent of GDP. The import and export of services have also increased considerably from $27 billion to $90 billion between 1990 and 2017 as shown in Figure 3.2. Following the same pattern, intra-regional trade increased a lot from 5 per cent to 12 per cent of GDP also between 1990 and 2017 as shown in figure 3.3. This is in line with the curves seen in most emerging economies. However, it should be remembered that there is a strong component of informal trade in Africa, including

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[4] Not all regions had the same level of growth Appendix 1

cross-border trade, and the data shown does not take this into account.[International Monetary Fund,2019a. p.41]

| Figure 3.2 Africa: Trade Openness, 1990–2017 (Total imports and exports of goods and services)	Figure 3.3 Intra-African and Trade Partners' Trade Shares, 1990–2017
  Source: International Monetary Fund,(2019a)	 Source: International Monetary Fund,(2019a) Note: Trade shares are defined as the average of two ratios: (1) share in total African exports and (2) share in total African imports. EU = European Union.

With the expansion of intra-regional trade, trade hubs have emerged, most notably Ivory Coast, Kenya, Senegal and South Africa. The latter alone accounts for 35 per cent of total imports (Figure 3.4). Smaller economies also seem to be well integrated, while major economies such as Algeria, Egypt and Nigeria do not participate very actively in regional trade.[International Monetary Fund,2019a. p.42].

Figure 3.4 Trade Integration, 2015

Source: International Monetary Fund,(2019a)
Note: Countries ranked from largest to smallest GDP, excluding South Africa (appearing as a residual). For each country, trade share is the average of exports and imports as a share of total African regional trade. Relative regional trade integration defined as the ratio of the share of regional trade over the share of regional GDP.

It is interesting to note the difference between trade within the continent and how it differs from trade outside it. Indeed, exports have focused especially on the export of raw materials (with 75 per cent of total exports between 2007 and 2017), leaving very little room for manufactured goods. What is encouraging, on the other hand, is that trade within the continent has been predominantly of more diversified nature and with much greater technological content. Specifically, 40 per cent of trade was in manufactured goods, 44 per cent in minerals, and 16 per cent in agricultural products.

More diversified economies tend to trade more within the continent (figure3.5). [ibidem].

Figure 3.5 Intra-African Trade versus Trade with the Rest of the World, 1990–2017

Source: International Monetary Fund,(2019a)
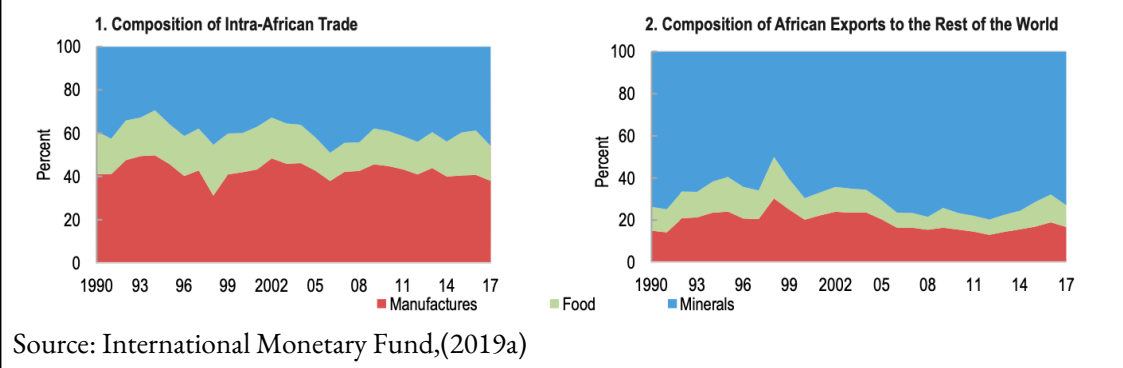
Although these data suggest a certain direction, they should not obscure the fact that trade in Africa is still less strong in high-tech products and has weak value chains compared to other areas of the world.

"Compared with other regions, intra-regional trade in Africa is more focused on minerals and less on manufacturing. Moreover, intra-industry trade in Africa is lower than in other regions, signalling less regional value-chain integration." [International Monetary Fund,2019a. p.4]

Looking at the structure of the market within the continent it is clear that while within the RECs there is a fairly large trade build-up due to fewer tariff barriers, there remains a certain division between the individual RECs. Moreover, the unevenness in trade flows within the different RECs seems to indicate the strong relevance of non-trade barriers, since

for the same tariff reduction it must necessarily be these elements that influence the lower trade mobility.[International Monetary Fund, 2019a. p.44].

3.2 AfCFTA Trade Integration and Tariff Barriers

Now let us consider tariff barriers, which are one of the most easily identifiable and important elements when considering barriers to trade between one country and another. In this respect, we will now consider their role and the benefits of reducing them within the AfCFTA. As seen above, and as suggested by Krugman, a decrease in barriers is equivalent to an increase in the probabilities of the emergence of core-periphery dynamics to exploit economies of scale in larger markets.

Empirical analyses of RECs show how lowering tariffs can increase trade, especially in the areas of mineral, manufacturing and agricultural economies (Figure 3.6). The AfCFTA calls for a reduction in tariffs on 90 per cent of trade within the continent but now let's look at two possible scenarios. More specifically, according to a study conducted in 2018 for UNCTAD (United Nations Conference on Trade and Development), if there is a total reduction in tariff barriers, this would lead to an increase in intra-African exports by 33 per cent, but this would only translate into an increase of 2.5 per cent of total exports, given that trade within the continent is not the predominant part. In the more probable case that some product categories are excluded from tariff elimination, estimates are around a more credible 24 per cent increase in intra-continental trade and a more modest 1.9 per cent increase in total exports.[Mesut Saygili et al, (2018)].

Figure 3.6 Elasticity of Intraregional Trade to Tariffs by Industry(Intraregional RECs' imports as a share of total imports, 2015)
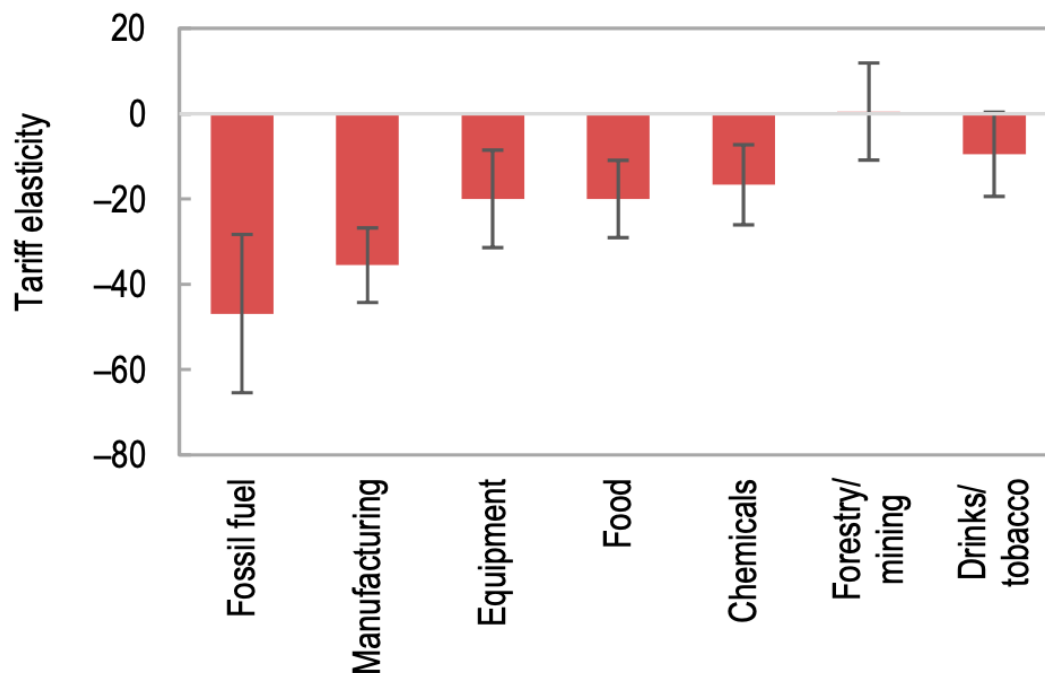
Source: International Monetary Fund,(2019a)

Note: Industries ordered from highest to the lowest share of intra-Africa trade. Bars indicate the tariff sensitivity. Whisker lines indicate 95 per cent confidence intervals.

3.3 AfCFTA Trade Integration and Non-Tariff Barriers

As already mentioned, non-tariff barriers are a key determinant of trade integration. Non-tariff barriers play a very important role in trade dynamics, in some cases more than tariff barriers. This is because, while tariff barriers can be eliminated, reduced or modified through, although complicated, regulatory changes, non-tariff barriers are more complex to identify, weigh and ultimately manipulate.

Non-tariff barriers such as inefficient services, poor infrastructure and excessively slow and expensive transport, together with complicated administrative processes or excessive bureaucratisation, slow down transnational trade opportunities considerably, even if tariffs are favourable or zero. Regulations concerning quotas of exportable or importable products, regulations concerning the designation of origin or health regulations, or minimum technical

standards are just some of the other tariff barriers that play an important role when they differ from country to country. It can be argued that the reduction of non-tariff factors is essential in order to be able to fully enjoy the benefits of reduced tariff barriers. For these regions, harmonisation of the aspects described above and investment in strategic areas are key components for the success of AfCFTA.

Having said that, it is important to recall that the continent currently has some of the highest non-tariff trade costs in the world, as shown in Figure 3.7. Recent studies based on models that take into account world trade show that the non-tariff components that most influence trade between countries, even within a special economic area, are logistics, infrastructure and credit[5] (Appendix 2).[International Monetary Fund, 2019 a. p.46]

Trade logistics are considered to be the most important component when it comes to non-tariff barriers, deficiencies in this area can lead to dramatic effects on trade. On the African continent, in particular, the most important components are those related to customs and trade mediation services. It is estimated that if Africa could bring its quality level in logistics up to the world average, it could increase inter-regional trade by more than 12 per cent.

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[5] "The main results are the following:
• Trade logistics turn out to have the highest "importance score" in terms of the direct effect on trade. 13 These findings are obtained after controlling for other "fundamental" variables that may affect a country's trade. These include: (1) the geographic feature of the country, represented by an indicator for whether the country is landlocked or coastal; (2) the economic structure, represented by the share of agriculture in GDP and the share of manufacturing; (3) whether the country is a commodity exporter or not; (4) the economic status of the country, proxied by its LIC status, the emerging and developing economy status, whether the country is "small" or not, and the country's per capita GDP. As a useful indication, "importance score" measures the increase in the model's prediction error after the variable's values are randomly changed, so a variable with the highest importance score has the highest prediction power on the dependent variable, which is the trade-to-GDP ratio in our case. This result highlights the importance of trade logistics as a "soft" infrastructure, which is crucial for trade facilitation.
• Physical infrastructure turns out to be the second most important non tariff factor. The measurement of physical infrastructure is a PCA index produced using eight indicators, including qualities of roads, railroads, ports, air transport, airline, electricity, mobile, and landlines."
[International Monetary Fund,(2019b),p.50])

Figure 3.7 Nontariff Trade Costs, 2015 (Tariff equivalent)

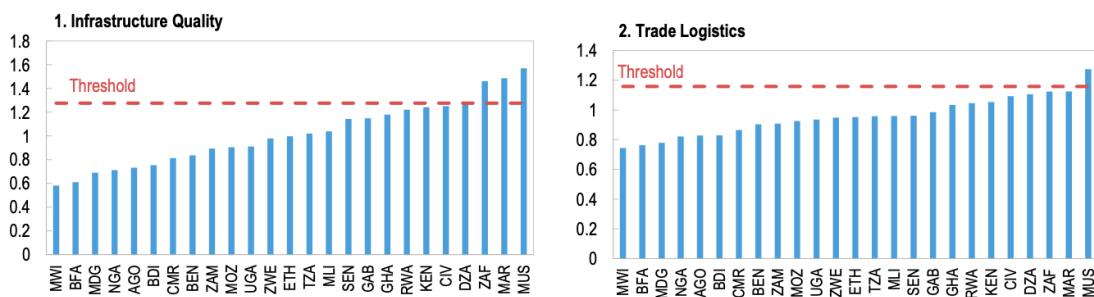Source: International Monetary Fund,(2019a)
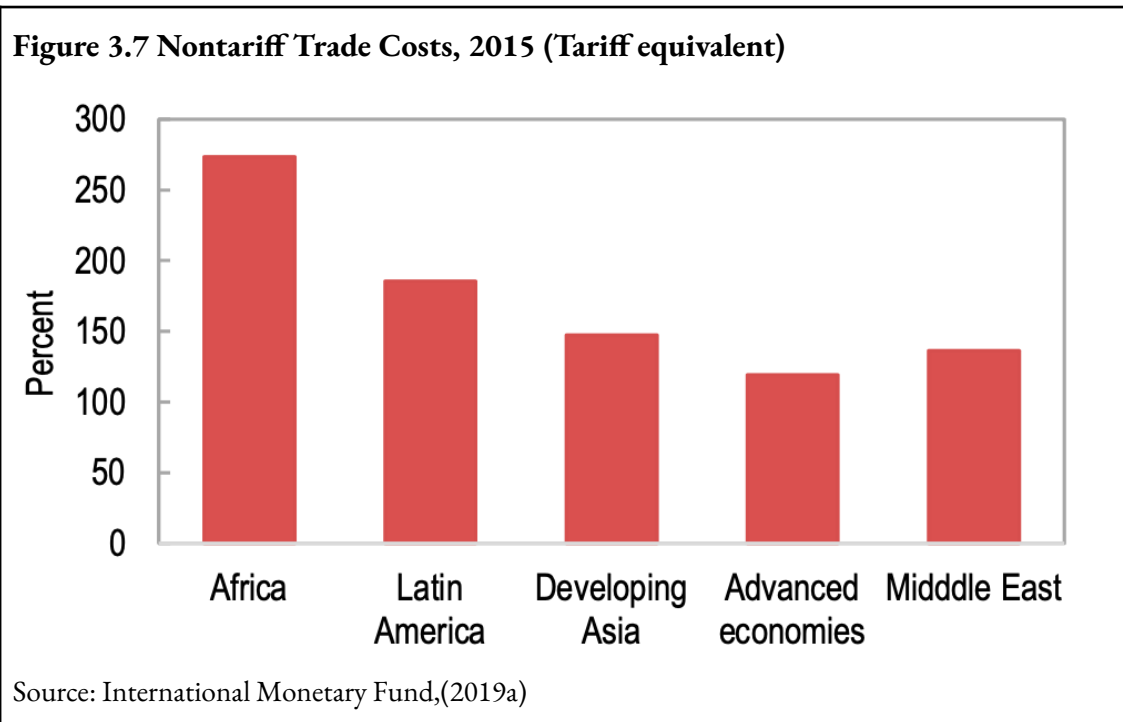
Infrastructure, together with trade logistics, is one of the two most important components, although with a slightly lower incidence. Many countries are working to improve this aspect, and this will have a significant impact on the success of the AfCFTA. There is a long way to go since to bring the quality of infrastructure up to the world average, a 40 per cent improvement is needed, but this would result in an estimated 7 per cent improvement in trade flows. [ibidem] (Appendix 3)

Credit is a key component of the entrepreneurial well-being of an economy. Two factors could be particularly relevant in the case analysed, harmonisation of payment systems (with the borderline case of creating a common currency) and foreign investment. According to a recent report published by the United Nations Conference on Trade and Development, with regard to foreign investment, although there has been a decline in investment in the African continent in recent years, the reduction is attributable to the pandemic situation and levels are expected to return to a pre-pandemic situation in the course of 2022. Furthermore, it appears that the AfCFTA will play a key role in attracting foreign investment with special reference to special economic zones. This could lead to a major change in both the industries and countries to which these funds are directed. According to a study conducted by the

African Economic Zones Organization, foreign direct investment into the special economic zones is expected to increase by 15 per cent when taking into account those from the members of the agreement, and by 30 per cent when taking into account intercontinental investments. Investments will be directed, after the implementation of the AfCFTA, more towards agriculture and food, light manufacturing, textiles and electronics. This follows fairly closely the trends of recent years, but the entry into force of the treaty could bring about a transition from raw materials, mining and hydrocarbons, to investment in higher value-added industries. [United Nations Conference on Trade and Development, 2021b.]

In conclusion, it can be said that although action on tariff barriers is easier to implement, it loses much of its effectiveness if it is not adequately supported by reforms aimed at removing all non-tariff barriers that limit its results. Crucial from this point of view is infrastructure, and this is where the continent's economic fortunes and the success of the AfCFTA will be decided. Infrastructure on the continent is weak, and if we look at the areas far from the coasts, the situation becomes even more pronounced. This aspect is fundamental both because a third of the nations do not face the sea, which indicates a generalised infrastructural weakness, and it is also fundamental for identifying the areas of the possible emergence of productive cores as we will see later. Remaining focused on the areas distant from the sea, it is necessary to underline how in these areas the logistics tend to be weaker, implying lower effectiveness of tariff reductions (Figure 3.8).

Figure 3.8 Infrastructure and Trade Logistics Gaps in Africa

Source: International Monetary Fund,(2019a)
Note: Thresholds are estimated using the fixed-effect panel threshold model by Hansen (1999). The thresholds identify structural breaks that divide the estimation equation into two regimes with different tariff-trade elasticities.

3.4 AfCFTA Trade Impact

A recent study by the World Bank, published in 2020, estimated the impact of the AfCFTA through a projection up to 2035, taking into account both tariff and non-tariff barriers. Evaluating the effects on trade following economic integration is useful for assessing, within Krugman's model, how large the economy under consideration actually is, and which are its growth possibilities due to reductions in the cost of mobility. In line with all other studies, considerable growth in trade within the territory involving the AfCFTA is expected. (Appendix 4-5-6).

Compared to the baseline, the forecasted increase in total exports is around 29 per cent. More specifically, intercontinental exports show a substantial growth of 81 per cent and extra-continental exports of plus 19 per cent. These data give us a measure of how this treaty is certainly very important for trade between the countries of the continent, but it also has a far from a negligible effect on trade outside it. This is especially true if we consider the fact that such a substantial increase in exports within the continent would, however, lead to intercontinental trade having a specific weight on total trade of "only" 20 per cent. From a monetary point of view, the forecasts, calculated for 2035, suggest a rise from $294 billion to $532 billion in intra-continental trade, if all factors being equal, the implementation or non-implementation of the AfCFTA takes place. Now when we look at the different sectors we see that there is a certain difference in the percentages, both within the different sectors and, as can be imagined, a considerable difference between the increase in exports within and outside the continent. In decreasing order, we find manufacturing exports at plus 110 per cent inside the continent and plus 46 per cent outside, agricultural exports at plus 49 per cent inside and plus 10 per cent outside, and services are estimated at plus 14 per cent inside and plus 4 per cent outside. These findings indicate that the effect of the AfCFTA, in export terms, is to stimulate the manufacturing sector more. The assumption that can be made is that to ensure this kind of growth, major expansions of industrial capacity are certainly necessary. In support of this,

"In volume terms, manufacturing exports dominate the export picture for Africa. Of the US$2.5 trillion in exports projected in 2035 for Africa, US$823 billion are in manufactures; US$690 billion in natural resources; US$191 billion in agriculture; and the remaining US$256 billion in services. Of the total growth in exports of US$560 billion, the increase in exports of manufactures represents some US$506 billion-an increase of US$220 billion within Africa and US$286 billion with the rest of the world." [World Bank, (2020),p.46].

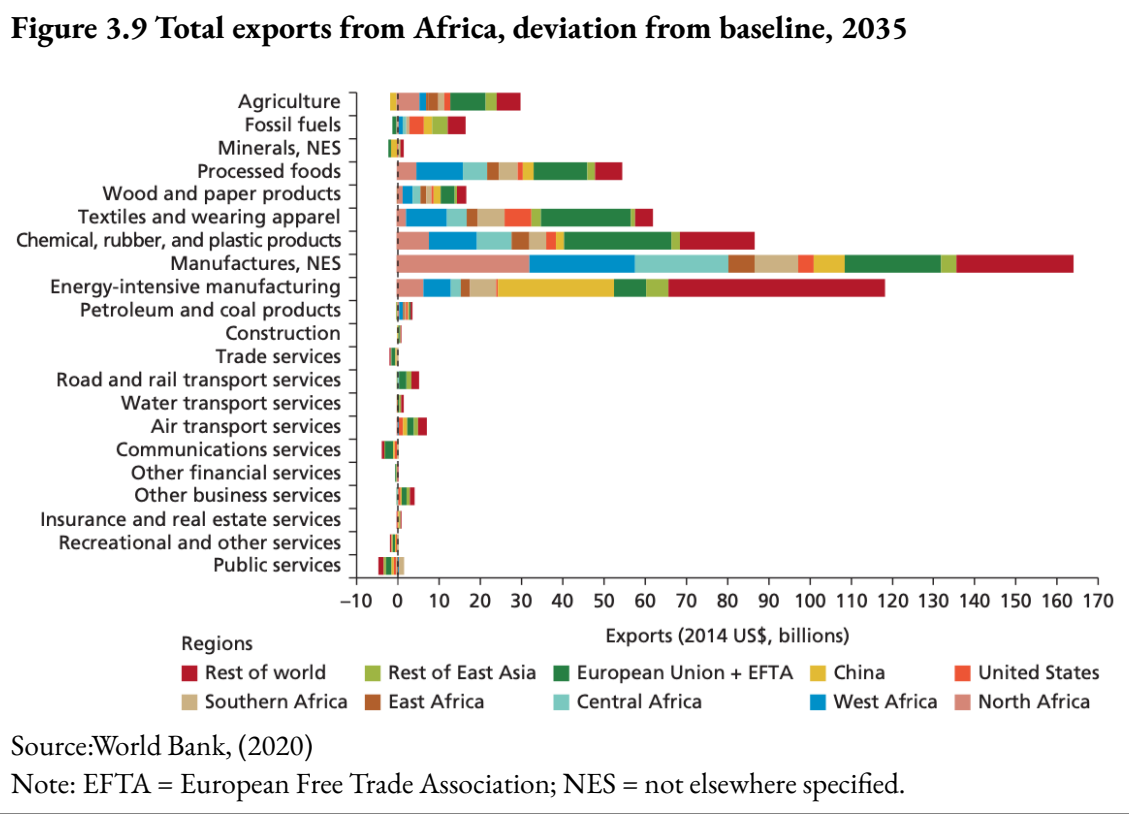It is therefore clear that the manufacturing market accounts for a substantial part of the estimated increase.

Looking now at the destination of exports. The implementation of the AfCFTA has an effect of 6 per cent, taking the increase in destinations, again projected for 2035, from plus 15 per cent to plus 21 per cent. Taking manufactures into account, the increase is from 24 per cent to 32 per cent (Appendix 4). In this scenario, however, it is essential to underline that trade diversion[6], even with the implementation of the AfCFTA, is very low within the continent. This is because the decline in exports to non-continental countries in favour of continental countries is relatively low, almost negligible and concentrated in a few areas, particularly in services and mineral components. Looking now specifically at the expansion of exports within the continent, we see that the leading sector is manufacturing, followed by energy-intensive manufacturing, chemicals, etc. (Figure 3.9).Among the services, personal health care and education stand out, but particular attention should be paid to transport (air, road, rail) and all business services. (Figure 3.9)

The other side of the coin are imports. In this respect, imports are expected to increase by 41 per cent compared to the world as a whole. Specifically, however, there is a 102 per cent increase within the region and a 25 per cent increase outside the continent (Appendix 6). The share of intra-continental trade rises from an estimated 18 per cent to 25 per cent when the implementation of the agreement is taken into account. This is also due to

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[6] The term "trade diversion" refers to the diversion of trade from a more efficient exporter to a less efficient one, due to the fact that with the implementation of trade agreements the total cost of the good decreases due to the tariff reduction. So although the cost of the good is higher, it is cheaper when compared to goods from countries where taxation is not as favourable

the fact that with the implementation of the AfCFTA there is an estimated reduction in imports from outside the continent, which however remain relatively high (from plus 82 per cent to plus 75 per cent). Intercontinental imports, on the other hand, with the implementation of the agreement increase from an estimated 18 per cent to 25 per cent in 2035 (Appendix 5). Referring again to trade diversion, it is important to note that there is also a significant increase in imports from countries outside the agreement and the sector with the largest increase is that of manufactures. It can therefore be assumed that there is no trade diversion in imports either. The most significant expansion of imports is recorded not only in the manufacturers' sector, but also in chemicals, rubber and plastics, and processed foods. Services still remain a marginal part but there is an increase especially in business services. (Figure 3.10)

Figure 3.9 Total exports from Africa, deviation from baseline, 2035

Source:World Bank, (2020)
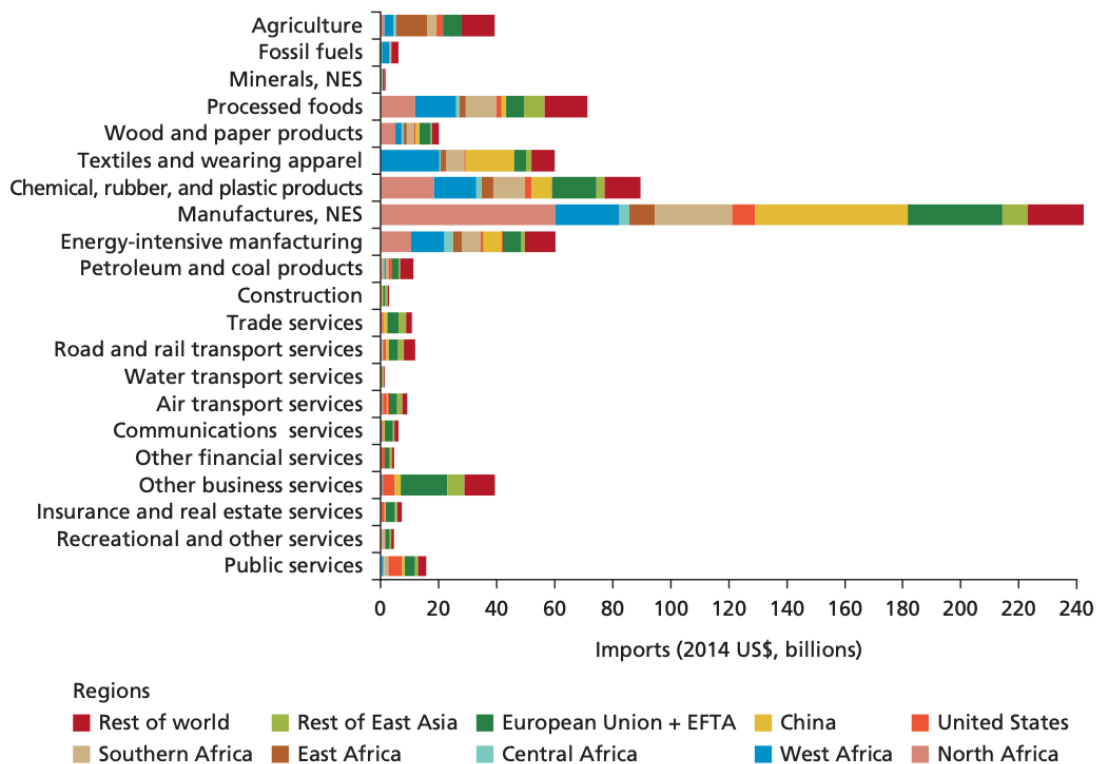Note: EFTA = European Free Trade Association; NES = not elsewhere specified.

In conclusion, it is interesting to note that a significant expansion of trade is expected due to the implementation of the AfCFTA. This expansion concerns both imports and exports and in both cases, the manufacturing sector plays a pivotal role. Moreover, it is important to underline that this expansion is generalised and not concentrated only within

the continent, to the disadvantage of movements with the rest of the world. This excludes a dynamic of trade diversion, but rather highlights the creation of trade and therefore not a decrease in the general welfare. The gains from trade creation resulting from the implementation of the AfCFTA exceed, according to the data reported, the losses in the short run due to the slight physiological trade diversion.

Figure 3.10 Total imports from Africa, deviation from baseline, 2035

Source: World Bank, (2020)
Note: EFTA = European Free Trade Association; NES = not elsewhere specified.

3.5 AfCFTA Labour Market, Real Income and Welfare

Now, in order to have a more complete overview of the effects that the complete application of the AfCFTA could have on the continent, let us briefly look at three other important components of the integrated economy that the treaty proposes to implement. The three elements we will now analyse are the Labour market, Real Income and Welfare.

These variables are also important insofar as they will be useful in the final interpretation of the AfCFTA through the core-periphery model.

3.5.1 Labour Market

To date, the labour market in Africa is characterised by high unemployment and a lot of informal work. These components make accurate forecasts of labour market trends difficult. Recent studies have shown that a rapid liberation of trade has a negative effect on transitional unemployment, with no reallocation between different sectors but mainly within the same sectors of origin. Reallocation, dictated by trade openings, occurs mainly from less productive firms to more productive ones, but always within the same sector. Transitional unemployment is due to the fact that trade opening initially causes a strong import which has negative effects on employment, these elements decrease over time due to the increase in production and thus employment [Abrego et al.,2020,p.23-24].

Focusing on labour mobility and not on its growth, taking into consideration the African continent, there is a tendency to consider that the location of labour by activity depends essentially on demographic trends and urbanisation. It is estimated in absolute terms that unemployment will fall from 35.9 per cent in 2020 to 29.7 per cent in 2035. The implementation of the AfCFTA is expected to play a major role in the level of employment. In particular, it is expected that the continent will experience an increase in the volume of workers, especially in areas such as energy-intensive sectors (steel and aluminium), public services, and services in general. The different countries, given their different structures, are expected to have important differentiations in the areas where employment growth will occur (Appendix 7). [World Bank, 2020,p.60]

3.5.2 Real Income

In absolute terms, it was expected that due to globalisation, the income gap would narrow, favouring less-skilled workers, but this has not happened. Inequality between

countries has increased due to the fact that the income gap between skilled and unskilled workers has increased.[International Monetary Fund, 2019 a. p.50].

Turning now to the effects of the implementation of the AfCFTA on real incomes, they are positive for all countries, although all studies in this field agree that the changes determined by the implementation of the treaty will not be so great. This is mainly because tariff barriers within the continent are already relatively low and therefore most of the change must be attributed to the reduction of non-tariff barriers. We have seen that the latter is more complicated. Considering both tariff and non-tariff barriers, the most optimistic models predict a 5 percent increase in income gains. [Abrego et al.,2020,p.19].

Less optimistic studies predict gains from tariff liberalisation and reduction of non-tariff barriers, also considering the access to markets outside the continent, of no more than 2.4 per cent by 2035. It should be added, however, that when all other beneficial components of AfCFTA implementation are taken into account, real income could increase by up to 7 per cent by 2035 [World Bank, 2020,p.44]. What is relevant to mention, however, is how these increases do not fall uniformly across the continent. There are countries that reach an increase of 13 per cent and others that reach only 2 per cent (Appendix 8). This is due to the fact that countries that are already relatively more open are benefiting less from the implementation of the agreement than those with a more closed economy. Other disparities are determined by the increase in wages, which does not occur uniformly but in accordance with sectors. In absolute terms, the AfCFTA is expected to reduce the wage premia for high-skill work due to the fact that the remuneration for unskilled work is growing at a higher rate (Appendix 9).[World Bank, 2020,p.62]

Let us assess more specifically the differences across sectors. Estimates from a model assuming only two sectors, manufacturing and agriculture, suggest that the impact of increased trade on income inequality is small, but has different effects on the two economies. Specifically, in agricultural (or natural resource dominated) economies, trade integration reduces income inequality. The poor tend to be more concentrated in rural areas where increased exports increase their incomes. Specifically in manufacturing economies, trade

integration increases income inequality. This is because increased exports tend to favour firms with highly skilled workers, who will see their incomes rise at the cost of others. In both cases, intermediate inputs enjoying a tariff reduction would increase performance in both directions.(Figure3.11) [International Monetary Fund,(2019a). p.50].

Figure 3.11 Change in Gini Coefficients and Income Shares (Percent change from 1 per cent increase in trade openness)
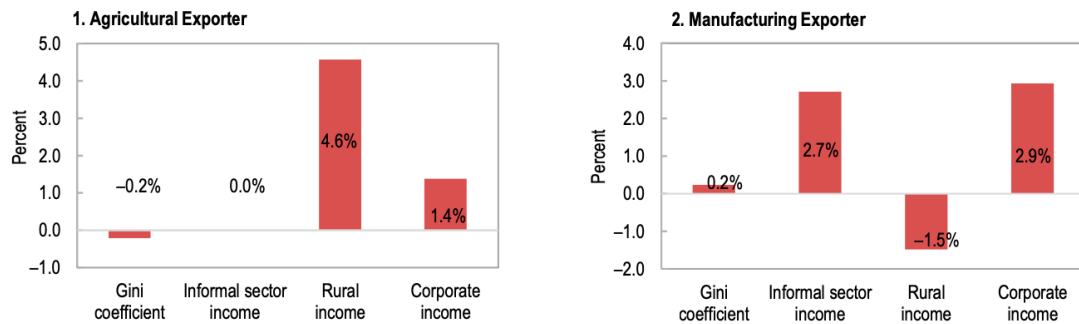
Source: International Monetary Fund,(2019a)
Note: The Gini coefficient is estimated to decline by 0.2 per cent for each 1 per cent increase in trade flows. Hence, if the AfCFTA is expected to increase trade flows by 16 per cent (see previous sections), the Gini coefficient could decline by as much as 3 per cent from its initial level.

It can therefore be concluded that in the medium-term trade integration does not lead to significant income inequality but that in the short run it does. The negative effects fade as economies harmonise over time.

3.5.3 Welfare

Assuming that trade integration will be successful only if the overall welfare of the countries involved increases, let see now the estimates. As we have already seen, the reduction of trade barriers allows the countries involved in the AfCFTA to expand their trade, this causes an inevitable increase in total welfare. Trade integration could lead to trade diversion, by foregoing goods from more efficient countries but outside the agreement, but this, as already seen, happens to a very small extent. Thus, welfare gains are guaranteed by the creation of new trade. Recent studies show that although the benefits vary from country to country, on average there is a positive trend in welfare gains due to the elimination of tariff

barriers and even more due to the reduction of non-tariff barriers. Specifically, simulating a total reduction of tariffs and 35 per cent of non-tariff barriers in a perfectly competitive market, in a long-term perspective, the following results were obtained.

Consistent with the existing low tariff level, the elimination of tariffs alone would lead to an average welfare increase of 0.05 per cent. Considering also the reduction of non-tariff barriers the increase in average welfare reaches 1.7 per cent. If the combined effects of the two factors are taken into account the total gain at the continental level is 2.1 per cent (Table3.1).

Table 3.1 Baseline Estimates and Sensitivity Analysis (In Percent)

	Baseline		
	A. Tariff elimination only	B. NTB reduction 35%	C. Tariff elimination and NTB reduction
Percent increase welfare SSA, weighted	0.07	2.10	2.60
Percent increase welfare Africa, weighted	0.05	1.70	2.11
Percent increase welfare Rest of the World, weighted	0.00	0.00	0.00
Percent increase welfare World, weighted	0.00	0.03	0.04
	Sensitivity analysis		
	Baseline: Tariff elimination and NTB reduction	Sensitivity 1: Tariff elimination and NTB reduction of 25%	Sensitivity 2: Tariff elimination and NTB reduction of 45%
Percent increase welfare SSA, weighted	2.60	1.22	4.65
Percent increase welfare Africa, weighted	2.11	0.97	3.83
Percent increase welfare Rest of the World, weighted	0.00	0.00	0.00
Percent increase welfare World, weighted	0.04	0.02	0.08

Source: Abrego et al.,2019

The projections also show that there is much disparity in welfare gains between countries and this is determined by how open their economies are. The more open a country's economy is, the higher the welfare gains are, so those who move from a very closed to a very open condition will have the largest welfare gains (Appendix 10-11). This is also why smaller countries tend to benefit more from trade integration. The sectors driving this increase in welfare are manufacturing and agriculture, because these are the sectors that benefit most from reduced barriers. In detail, 60 per cent of the increase in total income comes from the manufacturing sector and 16 per cent from the agricultural sector (Appendix 12). [Abrego et al.,2019,p.21-22-23]

Now focusing on a scenario more relevant for the application of Krugman's model, let us see what happens in the case where, with the same barrier reduction mentioned above, we consider a market without perfect competition. The projection results determine that in the case of imperfect competition the estimated welfare gains are lower (Table 3.2).

	A. Tariff elimination only		B. NTB reduction 35%		C. Tariff elimination and NTB reduction	
Regions	Increase Welfare (MC), percent	Increase Welfare (MLZ), percent	Increase Welfare (MC), percent	Increase Welfare (MLZ), percent	Increase Welfare (MC), percent	Increase Welfare (MLZ), percent
Weighted SSA	0.06	0.05	2.00	1.50	2.48	2.41
Weighted Africa	0.05	0.04	1.54	1.20	1.92	1.89
Weighted Rest of World	0.00	0.00	0.01	0.01	0.01	0.01
Weighted World	0.00	0.00	0.04	0.03	0.05	0.05

Table3.2 Welfare Changes Under Imperfect Competition (In Percent)

Source: Abrego et al.,2019
Note: MC denotes the monopolistic competition (Krugman) case, and MLZ the Melitz case.

This suggests two things, that in the case of imperfect competition it is not necessarily true that tariff reductions increase welfare despite the increase in trade. It also suggests that

"for most African countries, overall scale effects are not very strong. This reflects the fact that countries do not always have a comparative advantage in sectors with strong returns to scale." [Abrego et al.,2019,p.23]

The difference between perfect and imperfect competition in terms of total welfare gains, when considering reductions in both types of barriers, goes from 2.1 per cent in the former to 1.9 per cent in the latter.

"Importantly, due to scale effects, some larger economies (e.g., South Africa, Nigeria) gain more from NTB reduction under the imperfect competition framework- especially under the Krugman model compared to the baseline"[Abrego et al.,2019,p.23].

As regards disparities between sectors and between countries, the two models find very similar results. In all cases, however, a reduction of barriers on intermediate goods leads to an even greater gain in total welfare, thanks to the fact that, as already mentioned, importing intermediate goods at a lower cost helps to produce final goods at a lower cost and thus increase margins and product variety. It should be added that the above model does not take into account the capital accumulation, innovation or information diffusion effects of

trade integration and therefore probably underestimates the total welfare benefits of implementing the AfCFTA [Abrego et al.,2020, p.20].

3.6 The New Economic Geography Pattern for the AfCFTA

As has been said several times in this dissertation, interpretative models of reality are useful not only to verify what has happened, but also to hypothesise future scenarios based on the interpretation of the hypotheses on the evolution of the variables involved. The results obtained can be useful for directing political choices and those of economic actors. These choices are based not only on data but also on the perception of reality and expectations regarding the future. The attitudes of these two entities always have an effect on each other.

Having made this premise, which helps to define the intentions of the following paragraph, after having reported on Krugman's model, in chapter two, and after having set out the projections on Africa's economic future, following the implementation of the AfCFTA, we now see how these variables fit into Krugman's interpretative model of reality. This is to determine whether there is a possibility of the emergence of core-periphery models within the continent, with the consequent repercussions on the African territory. We recall once again that the fundamental elements for the development of this dynamic are sufficiently strong economies of scale, sufficiently low transport costs, and a sufficiently large share of "free" production not constrained by natural resources.

Let us start now by saying that, following Krugman's interpretative model, with the application of AfCFTA we should think of the continent no longer as a group of states but as a group of regions. This is because, as we have seen, the agreement aims to drastically reduce tariff barriers. The regions in question will not have advantages or disadvantages depending on the size of the states they belong to, but exclusively on the political actions of the states themselves.

Similarly, as the author suggests, we cannot consider the cost of factor mobility to be zero, as classical models tend to do, but we must weigh this cost. This is where non-tariff

barriers to trade come in. As we have seen, although these tend to be high, AfCFTA is committed to working towards reducing non-tariff barriers. This will lead to a substantial reduction in factor mobility costs. So far, although the direction taken seems favourable, it is quite clear that foreign investment, logistics and infrastructure are improving, especially in coastal areas and much less so in land-locked areas. This could lead to significant differences within the continent. In addition, the benefits of economies of scale in transport are concentrated on air and sea transport, leaving land transport exposed.

Considering the demand for manufactured goods, we have seen that with the implementation of the treaty, it will grow substantially. This is due to an increase in general welfare which, as we have seen, increases demand for both agricultural products and, above all, manufactured goods. In fact, as we have seen, the manufacturing component is the prominent one in both imports and exports, especially looking to the future. In addition, the poor population will benefit most from the entry into force of the treaty. In fact, it is estimated that income will grow most for the unskilled, and since they are the majority of the population, it can be assumed that there will be a general increase in demand within the continent, and that it will grow at a faster rate than global trends.

Turning now to increasing returns, we have seen that to date it seems that African states are not focusing on those economies that guarantee them. This is a key point in determining whether or not geographic concentration dynamics should arise. With the implementation of the AfCFTA, public policies but also entrepreneurial inclinations should shift towards economies that guarantee the exploitation of economies of scale such as manufacturing and this seems to be supported by the above data.

We can therefore conclude that, following Krugman's model, the emergence of core-periphery patterns is plausible provided that all the conditions that the AfCFTa aims to promote are met. The reduction of tariff and non-tariff barriers, the growth of factor mobility, the growth of welfare and demand, and the increase in both intra- and extra-continental trade make the emergence of geographical concentrations seem possible. In addition, as Krugman reminds us, expectations play a fundamental role in the evolution of

these dynamics. Both the political and business community is eager to exploit the advantages that can arise from the integrated market, and to do so it is useful to concentrate similar production in a single place where it is possible to find a specialised labour market, the availability of intermediate and secondary inputs, and to enjoy the advantages deriving from technological spillovers and the spread of information. Institutions tend to facilitate these processes because it is advantageous, Krugman tells us, and it seems that the AfCFTA fits into this dynamic. Through regional economic communities these dynamics have already been seen to move, but in an incomplete way (as already mentioned Ivory Coast, Senegal, Kenya, and South Africa).

In line with what has been said so far, the emergence of core-periphery patterns is considered plausible, especially given the nature of the arrangement of non-tariff barriers and transport, it is assumed that the cores will concentrate along the coasts. Some such realities are already emerging and an example is given in the next chapter.

CHAPTER 4: CASE STUDIES OF RICHARDS BAY

After having analysed the possible impacts of the AfCFTA on the emergence of core-periphery patterns, we now analyse a territorial reality located in South Africa, precisely on the northern coast. This cluster is in line with the dynamics seen so far, where institutions (public and private) create ad hoc hubs of attraction to exploit the advantage of being the first to move in relation to other countries to create industrial clusters in their territories, which, according to the dynamics set out in the previous chapters, are destined to become increasingly large and important. Although the treaty has not yet acquired its full force, dynamics of this kind are already emerging, both in view of the treaty's entry into force and driven by the regional economic communities that already exist. No place could be more favourable than a coastal area with a natural harbour, where economies of scale can be achieved not only in production but also in transport and intermediate goods. This is exactly what is happening in Richards Bay (South Africa). This chapter will explore this reality as a case study. The ultimate aim is not to lose touch with reality and to see how the dynamics of economic geography are actually expressed in practice and how expectations for the future influence them.

Taking a step forward, what we are going to present is a case of an industrial agglomeration built through a well-defined project in a context that is already highly productive but with important gaps. Richards Bay Industrial Development Zone is the entity that proposes to resolve these shortcomings in order to create a highly attractive nucleus that can trigger virtuous and growing dynamics of industrial agglomeration. It does this by focusing on bringing together suppliers of intermediate and secondary goods, developing the circulation of information, attracting investment, developing infrastructure and facilitating commercial logistics, and basically reducing what we have seen as some of the non-tariff barriers.

4.1 Richards Bay History and Perspectives

In order to present the case we want to consider now, let us briefly place it in the specific space and context in which it arises. It has been said that the national analytical dimension when regulatory harmonisation takes place from an international perspective is no longer very relevant but the dimensions of individual geographical areas are much more so. While this is true, in a context such as South Africa, where harmonisation is not yet complete, the singularities of each nation still carry a significant specific weight. This is slightly mitigated by the fact that by administrative construction South Africa leaves the individual regions a great degree of room for manoeuvre on territorial regulation. In spite of this, it seems only proper, before going into detail, to briefly mention something about South Africa, since it is the location of Richards Bay.

After 1994, with the advent of the first free elections, and also thanks to democratic dynamics, the country has seen fifteen years of great progress in development. The country experienced rapid economic growth that led to macroeconomic stability and reduced poverty. However, in the 2010s there was a gradual deterioration of institutions and a slow socio-economic decline. This slow deterioration was enhanced with the advent of the global Coronavirus Disease 2019 (COVID-19) pandemic. South Africa had the highest rate of infection in the entire continent by mid-June 2021. However, this led to a rapid response by the government, which reacted strongly to the health crisis by creating tools for both the population and businesses in need. The difficulties faced can also be measured by the fact that the country's GDP fell by 7 per cent in 2020. In fact, at the end of the year, the average South African is estimated to be 18 per cent poorer than before the pandemic, bringing the average real income down to what it was in 2005. In the same year, the number of people in extreme poverty increased by 10 per cent. Dramatic as this crisis was, it forced the government to react quickly and strongly in order to restore economic growth, reverse the negative trend, address the health and social crisis and thus ensure macroeconomic stability.[World Bank Group,2021, p.1]. For this purpose, the "Economic Reconstruction and Recovery Plan" was created at the end of 2020 and reforms that the country has needed for more than a decade were put in place.

"South Africa has strong foundations to reshape its socio-economic trajectory, including: (a) a democratic political system and independent, constitutionally entrenched institutions such as the South African Reserve Bank; (b) modern, sophisticated sectors (e.g. finance, food and beverages, food processing, food processing and marketing, etc.). finance, food and beverages, mining, agriculture, and tourism) that can serve as building blocks for the rest of the economy; (c) a well-developed infrastructure network of roads, ports and bridges; (e) abundant mineral and natural resources; and (d) a key role in the development of the African continent (and its own subregion) and an anchor in other key regional partnerships (Southern African Development Community - SADC - and the Southern Africa Customs Union - SACU)." [World Bank Group, 2021, p.2].

Ultimately, the government has undertaken strategies to promote competition and support the business environment, while also paying attention to environmental sustainability, supporting micro small medium enterprises, strengthening value chains, while also focusing on infrastructure investments [ibidem]. After great growth and a subsequent period of stagnation, therefore, South Africa now faces a turning point and major changes, which could be supported, as we have seen, by the entry into force of the AfCFTA.

Turning now to focus more specifically on the region we are interested in, Richards Bay is considered a successful place because of its extraordinary growth within the South African context, if one thinks that until the 1960s what is now a thriving international port, with a thriving economy, was a small fishing village. In 1997 the population plus that of Esikhaweni has estimated at only 98,000 and in 1993 Richards Bay accounted for about 1 per cent of South Africa's GDP [Hall, 2000, p. 93]. It was not until the early 1970s that the port of Richards Bay began to grow. The area saw rapid development after being selected as an area to absorb the growing traffic in African ports, especially that of nearby Durban. The project came about under the specific intention of the national transport agency to exploit the natural morphological characteristics of the area. [ibidem]. In fact, Richards Bay lies on the Mhlathuze lagoon, which has a seabed conformation that is perfect for the large ships that sail the seas today; they are flat and very wide, which allows for easy dredging. In addition, the area was situated in a flat and scarcely populated territory, perfect for urban and industrial

development. Another unique feature was the proximity to Durban, which allowed for easy extension of the railway lines, thus providing direct access to the entire rail network. The last but not least advantage was the fact that within a few kilometres of Richards Bay are some of the most important raw material reserves on the continent, especially those of coal.[ibidem]. These were the features that gave the impetus for the bay's expansion, but there has been continuous investment to make it increasingly competitive. Despite becoming South Africa's leading port in terms of weight carried in the early 2000s, there were still significant structural problems with the local economy. The area remained dominated by large, low value-added companies with little capacity to employ workers.In addition, the upstream and downstream connection of these companies with smaller or supporting companies had serious limitations. Already in those years, therefore, there were complaints about a great lack of infrastructure and fears for the future of the local economy. The main problem was identified in the institutional coordination between the government, the port and large industries. [ibidem]

To date Richards Bay is one of the fastest-growing economies among South African provinces and by extension Africa in general, with an average annual growth rate of over 4.3 per cent. The port still remains heavily export-focused but imports are growing at a considerable rate.. The city now aims to be a dominant district hub and commercial centre in the region, both looking towards the sea and inland (King Shaka Airport is only 145 km away). The municipality to which it belongs has more than 400,000 estimated inhabitants and it contributes more than 16 per cent to the national GDP [Chetty et al, 2014, p. 79]. Production today is concentrated on exportable products such as iron derivatives, steel, paper, food and drink, all of which require sophisticated production techniques. Mining is no longer limited to coal, but for example, the entire country's needs for titanium, zircon and pig iron are met from this territory. [Chetty et al, 2014, p. 79]

In such a prosperous context, but one that is not exploiting its full potential, there is a need to make up for the deficits that still exist in terms of effective infrastructures, agglomerators of skills and assistance for companies that support the large industries already present. In fact, creating a more dynamic economic environment around static, albeit large, companies is one of the most effective ways, as seen earlier, of attracting investment and

triggering a virtuous circle around what can effectively become an industrial core.[De Langen, 2004].

Figure 4. South Africa-Richards Bay map

Source: google maps

4.2 Richards Bay Industrial Development Zone

Recently born, the Richards Bay Industrial Development Zone (RBIDZ) is a state-owned entity located within the province of KwaZulu-Natal in the Northern Coast of South Africa, boasting a fully serviced industrial land that is linked to the Port of Richards Bay, which we remember as the deepest natural harbour of the African continent. RBIDZ's proximity to the port, which is only 2.5 km away, allows cost-effective transportation of bulk goods via road, rail and overhead conveyor systems. In the past, it used to be the largest coal export facility in the world, with a planned capacity of 91 million tons per year. Surely the connection with an international seaport is one of the fundamental points that enable the RBIDZ to cope with the global economy, together with the strategic position between the

Southern African Development Community, Africa and the international markets. Indeed, RBIDZ is well integrated within the railway and road network that connects South Africa and the rest of the continent: not even 160 km separate Richards Bay from Durban (one of the most important seaports), and Johannesburg (the largest city in the country) is only 487 km away. It is only 380 km away from Maputo too: easy access to Mozambique is granted by the newly built Maputo-Katembe bridge, which represents the gateway to Southern Africa [Veeran, 2021]. But what really makes it competitive is the ability to attract investments, due to several reasons. First of all, an Industrial Development Zone (IDZ), that is defined by SARS[7] as a

"purpose-built industrial estate, linked to an international air or sea port, which contain one or multiple Customs Controlled Areas tailored for the manufacturing and storage of goods to boost beneficiation, investments, economic growth and, most importantly, the development of skills and employment",

provides investors with the required infrastructure. In this sense, the RBIDZ comprises 240 hectares of well-serviced land, equipped with everything needed for export-oriented production. Moreover, an IDZ should offer some kind of tax incentives that attracts qualified entities. The RBIDZ reduces the Corporate Tax from 28 per cent to 15 per cent for its clients, pledging to simplify the bureaucracy and all the administrative requirements by the establishment of a dedicated Customs Controlled Area [Veeran, 2021]. In some specific cases, it also provides a Value Added Tax exemption for supplies that are procured in South Africa. All this is made possible by the direct government support in terms of economic benefits, infrastructure construction and financial support.

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[7]SARS stands for South African Revenue Service.

SARS also defines the IDZ as part of a Secial Econiomic Zone "Special Economic Zones (SEZs) within South Africa are geographically designated areas set aside for specifically targeted economic activities to promote national economic growth and exports by using support measures to attract foreign and domestic investments and technology.

Categories of SEZs that may be designated as such by the Minister of Trade and Industry may include: Free ports; Free Trade Zones (FTZs); Industrial Development Zones (IDZs); and Sector Development Zones (SDZs)" [SARS, African Revenue Service, 2022])

Then, the RBIDZ appears to be a special economic zone aimed at international competitiveness, encouraging trade for the attraction of international and domestic investments. The main objective is to create a virtuous process made of investments, employment opportunities for South Africa and upgrading skills that enables the Richards Bay to become a hub of trade activities and regional development. The way to make this real is to cluster smaller manufacturing businesses around existing major industries in the City, as well as attract small-medium industrial operations through reasonable rentals, duty-free rebates and the unique opportunity to be close to such a growing hub. Such a highly industrialized urban complex already includes several significant industries, among the others South32 (the largest aluminium smelter in the Southern Hemisphere), Tronox, Richards Bay Minerals (two heavy sand mines), Richards Bay Coal Terminal (one of the leading coal terminals in the world), Foskor (Sulphuric Acid Company)[Veeran, 2021].

Paramount importance is given to the attraction of large manufacturing investors that are keen to bring their qualifying machinery, equipment and skills to South Africa by the establishment of an ad hoc Manufacturing Investment Programme and of a Foreign Investment Grant. Furthermore, an Automotive Incentive Scheme is also available for automotive component and light motor vehicle manufacturers. The aim is to bring big companies in the RBIDZ, in order to foster other enterprises to do so and create a profitable network of businesses, other than to increase the quality of the goods that are produced.

On the planning side, the RBIDZ also invests resources and competencies in order to undertake feasibility studies for capital goods manufacturers that are willing to get into projects outside South Africa with the ambition to increase local exports and stimulate the South African market of goods and services. For general investments, it is possible to apply to the Critical Infrastructure Programme, which is aimed to underline the pros and cons of each and every project and to point out possible criticalities connected with it, while the Investment Assistance is always available to support the investors for the export of South African products and services. But other than all of these advantages, the RBIDZ can boast absolute expertise in five leading sectors: Agro-Processing, Renewable Energy, Metals Beneficiation, Marine Industry Development and Techno Parks and ICT.

4.2.1 Agro-processing

The Agro-processing sector is designed for all those small and medium-sized agro-processing enterprises that are interested in product research and development for the transformation of local produce into value-added agricultural products and for the investment on the agro-business. South Africa's rich agro-processing history has led to the creation of a sophisticated and elaborate value chain ranging from agricultural inputs, equipment, packaging, and specialized logistics to marketing and retail. Indeed, South Africa is well suited for the cultivation of a wide range of crops, due to its diverse climatic and geological conditions. Generally speaking, South Africa has a temperate climate with the advantage of a high rate of rainfall, but the influence of the Atlantic and Indian Oceans on three sides creates a great variety of climatic zones and temperatures, ranging from the desert to the tropical. Great climate variety means great biodiversity: The country is ranked sixth out of the world's seventeen megadiverse countries.

In terms of agriculture, the key agricultural and related products include several goods that are exported all over the world. South Africa is one of the biggest maize exporting countries, with a production of 12.5 million tonnes registered in 2018, 1.9 million tons of grape and 1.7 million tons of orange [Food and Agriculture Organisation of the United Nations, 2022]. In the same year, with 19.3 million tons of sugarcane, South Africa was the 14th largest producer in the world, while it was the 7th largest producer of pears too. Other important productions include corn, wheat, fruits (e.g. apples, citrus fruits, table grapes, berries), vegetables, and nuts (e.g. groundnuts, pecan nuts, macadamias). Regarding the animal farms, an important role is given to beef, poultry, mutton, wool, fish and seafood. The provinces of Kwazulu-Natal (where RBIDZ is based), Limpopo, Mpumalanga and the Western Cape dominate South Africa's fruit and vegetable production. KwaZulu Natal and Mpumalanga are key hubs for sugar production too.

The RBIDZ has already earmarked 67 hectares of land on which the agro-processing infrastructure will be located, just two kilometres away from the Port of Richards Bay. Agro-processing activities at the RBIDZ comprise of two major categories. The first one

includes activities such as crop-drying, shelling/threshing, cleaning, grading and packaging, while the second one entails increasing the nutritional or market value of a commodity, and changing the physical form or appearance of the raw material, for instance, milling grain into flour, grinding groundnuts into peanut butter, pressing the juice out of fruit and so on and so forth.

The advantages of choosing the RBIDZ for the agro-processed products are multiple. The flux of goods that passes through South Africa clearly shows that the Richards Bay is well-located to become one of the major knots of the global raw material trade, as it emerges from the impressive growth in demand for agro-processed products, both at a local level and for the exports [International Trade Administration, 2022]. There is no doubt that an enterprise that works in this field may find such a growth interesting, concerning the level of the demand and the connected chance of profit. Furthermore, the same enterprise that is willing to invest knows that the Government is directly involved in the sector, considered a national priority: the state guarantees the sector and it is a key economic driver, removing bureaucratic obstacles and facilitating the transparency of the process. The RBIDZ constantly facilitates easy accessibility to government incentives schemes, that are offered by the Department of Trade and Industry and are available to RBIDZ investors.

But probably the best guarantee for an investor is represented by the fact that in the RBIDZ there is already a well-functioning supportive regulatory framework in place, it is not something on paper that must be implemented. The RBIDZ is already offering the investors technical assistance support and business facilitation, while it is directly involved in the optimization of the supply chain by providing appropriate logistic support. The development zone's network includes strategic linkages with local farmers that are available to produce or sell raw materials to potential purchasers. At the same time, these products can be stored in designated storage facilities and warehouses specially designed for the export of fresh and value-added products or for processed products. In addition to all these considerations, the aforementioned favourable climate conditions of the location, the variety of bio-climatic regions and typography allow for virtually any crop to be grown, which makes the RBIDZ

location basically a strategic location for the export and processing of a wide variety of stakeholders.

4.2.2 Renewable Energy

The world is desperate for innovative and eco-friendly energy solutions, which should be able to solve climate change and the ongoing energy crisis at once. The research in this field is making great strides, and most observers think that this will be the leading economic sector of the foreseeable future, with an entire global system to change and the energy industry to be converted. Millions of dollars are going to be funnelled for this purpose, and apparently, the RBIDZ is not going to miss this unique opportunity. There are stimulating investment opportunities that lie within the RBIDZ renewable energy sector, and strategic research is currently being conducted.

Concerning the production and use of renewable energy, the situation in South Africa is not very advanced so far. The country is currently highly dependent on coal-fired power stations for its energy supply, and the public utility Eskom – a state-owned company, the largest producer of electricity in Africa and the largest state-owned enterprise in South Africa [Index Mundi, 2022] - accounts for about 90 per cent of South Africa's electricity generation capacity, while the remaining 10 per cent is provided by independent power producers [RBIDZ, Special Economic Zone, 2022]. Eskom also operates the Koeberg Nuclear Power Station in the Western Cape Province, that is actually the only nuclear power plant in the African continent.

However, at the 2021 United Nations Climate Change Conference Western countries undertook to sustain the economic transition of South Africa from coal power to renewable energy, both in terms of competencies and funds. It is against this background that in South Africa a new law has just been passed, where a maximum of 100MW can be generated by independent parties without the need of a licence whatsoever [Veeran, 2021]. Such an evolution presents an opportunity for independent power producers to sell power directly to the grid, with no need for unpleasant and time-consuming licence applications.

Utility-scale projects in South Africa's clean energy sector are driven by the Renewable Energy Independent Power Production Procurement Programme, a project that is aimed at bringing additional megawatts onto the country's electricity system through private sector investment principally in the wind and solar, but taking into consideration also biomass and small hydro, among others. The Eastern Cape's renewable energy projects have created 18.132 jobs, sixteen wind farms and one solar energy farm since its inception in 2011, and the programme is attracting investments ever since [South African Government, 2022].

To sum up, both the international situation and the local response to the energy crisis that we are experiencing seem to be positive for the renewable energy sector in South Africa. The RBIDZ can offer to the investors' solar energy technologies and components manufacturing, such as solar panels, solar water geysers, timers and so on, but also wind turbines and the relative production of components, other than the possibility to sell power to the grid or to store the energy surplus through special equipment. RBIDZ's specialists are available for the adoption of energy efficiency improvement strategies and for the roll-out of renewable energy technologies.

4.2.3 Metals Beneficiation

For metals beneficiation is meant any process that improves the economic value of the ore, usually by removing the gangue minerals. There are many different types of beneficiation, such as disaggregation, physical separation or chemical separation. The maestry of these processes is of the highest importance for a mineral-rich country like South Africa, whose mineral reserves are among the most valuable in the world. Indeed, South Africa has the world's largest reserves of platinum group metals and manganese, and some of the largest gold, diamonds, chromite ore and vanadium deposits. It is the fifth-largest producer of gold in the world and one of the leading countries concerning mineral riches [USGS science for a changing world, 2022]. In addition, is the world's largest producer of chromium, platinum, vanadium, chrome, manganese, and vermiculite; the second producer of titanium, zirconium, rutile, ilmenite, and palladium. It is also the world's third-largest coal exporter and became

the world's third-biggest iron ore supplier to China in 2012, which represents the world's largest consumer of iron ore. Among the others, South Africa is also a big producer and exporter of cobalt, phosphate and uranium. Platinum, coal and gold are the three largest mining exports of the country.

With these numbers, the RBIDZ is a strategic location for all of those who are interested in the sale and purchase of minerals from South Africa and beyond. Apart from the incredible variety and richness of the African continent concerning the mining, the Richards Bay can offer a long experience with the metal treatment, with the possibility for an investor to gain the know-how and the technologies aimed at enhancing the competitiveness in this sector or to get access to the downstream manufacturing, including foundries and mini-mills for iron and steel. But the RBIDZ gives also the opportunity to focus on nobler – and more profitable – alloys. Titanium can be alloyed with several elements – such as iron, aluminium, vanadium and others – in order to create resistent, lightweight alloys for both civil and military purposes. Its lightness and strongness – it has the highest corrosion resistance of any other metallic element - makes it highly requested in particular for aerospace (jet engines, missiles and spacecraft to mention but a few) or very high-quality automotive components, industrial processes and medical prostheses. The RBIDZ directly supports the establishment of smelters and downstream production for titanium, while it can already boast the production of titanium dioxide pigments and of titanium metal for 3D printing applications, which appears to be an innovative and increasingly requested use [Veeran, 2021].

On the theme of metals beneficiation, the RBIDZ can make available industrial sheds, warehouse facilities and common facility centres. The recycling issue is taken very seriously by the RBIDZ's staff, that in the last years has gained experiences of all respect concerning this topic and the related management of hazardous and non-hazardous waste, for which common effluent treatment, solid waste disposal and all the necessary facilities are provided. Truck terminals, parking facilities, utility lines and firefighting systems are also an asset. Furthermore, the RBIDZ offers the possibility to become a member of a working metals beneficiation hub, in particular concerning the treatment of aluminium and derivative

products. The strategic advantage of becoming part of the hub is the possibility to cooperate with other departments, sharing the experiences, supporting technical upgrades and promoting industry development by encouraging the formation of clusters in the metals and aluminium pipeline.

4.2.4 Marine Industry Development

With a coastline that stretches for 2.500 km all along the South Atlantic and the Indian Oceans, South Africa is rightfully considered an important coastal country of the African continent and beyond. South Africa can boast eight major ports, including two of the world's top container ports and two of the world's biggest dry bulk ports, with capacity for Panamax, Capesize vessels and ultra-large container ships. The strategic location of the country enables it to serve all major oil fields in West and East Africa. Five of the country's major ports provide excellent oil rig and drillship repair and maintenance services at competitive rates. South Africa also offers world-class repair, refurbishment and maintenance services at highly competitive rates. Repair and maintenance costs are over 40 per cent lower compared to Korea, Japan, the Netherlands and Germany. Recently, the government of Pretoria has also launched a full-fledged strategic programme to support the so-called Ocean economy: Operation Phakisa. It consists of an initiative to fast track the implementation of solutions to critical development issues, that are highlighted in the National Development Plan 2030 [Operation Pakisa, 2022]. In this framework, the Government has prioritized the Ocean economy, setting a target to grow the Ocean economy's GDP contribution to 10 billion dollars by 2033. As a consequence, it is expected growth in the state investment in the near future, which could attract further investments in the private sector [National Planning Commission, 2012].

Despite its favourable geographic position and despite the proximity to some very rich fisheries, South Africa has a relatively small and underdeveloped aquaculture sector, contributing about 0,8 per cent to the country's fish production [Veeran, 2021]. This insignificant percentage makes South Africa about 50 per cent dependent on fish imports,

with all the related consequences. In this sense, aquaculture presents an attractive opportunity to reduce import dependency and to ensure a sustainable supply of fish and seafood products to South African consumers, with good considerations for a potential investor in this strategic sector. Aquaculture provides an attractive and sustainable alternative to provide a source of protein for South Africa's population and not only. The farming of freshwater species is concentrated in Limpopo, the Mpumalanga Lowveld and Northern KwaZulu-Natal. RBIDZ has been earmarked as one of the aquaculture development zones, making it a strategic place for investments in this sector, close to the main regional crossroads, protected by specific governmental actions and sustained by the competencies and infrastructures made available by the Richards Bay.

In particular, even in this field, the support of the RBIDZ varies from the supply of logistic services, such as the veterinarian structures or specific skills development programs for aquaculture, to the aquaculture equipment and technology, like the one used for processing and canning of fish and seafood, the water purification and filtration systems, local feed productions and so on. The main advantage, however, remains the vicinity between the open sea and a state-of-the-art facility, well-prepared to host cutting-edge machinery and ready to farm, process, stock and export freshwater and saltwater species all over Africa and the international market.

On the other hand, concerning the repair and maintenance field, the RBIDZ can offer the remarkable concession to exploit the full potential of an extensive and equipped infrastructure, that is used to undertake regular port operations on a daily basis and with the necessary know-how to embark on the realization of a next-generation ship and boat-building technology. The provision of maritime training services, storage, a deep supply chain and general logistics are included among the other services that the RBIDZ agrees to furnish.

4.2.5 ICT and Techno-Parks

Techno-parks, also known as technopoles, science parks, techno hubs or technology parks, are technologically advanced poles in a specific sector or field, usually affiliated with a

university, a research institute or directly funded by a government. These hubs are strategically located and allow the beneficiaries to share the acquired knowledge with one another, cushioning the costs of and reducing the timing for the research. In this way constant development is pursued, the innovation is promoted and the technology transferred, while research outcomes are continuously applied to the improvement of already existing products, to the generation of new ones or to the waste reduction and optimization all along the supply chain. The successful establishment of a techno-park means the creation of high-technology firms, that are able to foster the national economic development and to attract foreign direct investments at once. Flourishing examples of science parks are the Research Triangle Park in North Carolina, the Sophia Antipolis Science Park in France and the Cambridge Science Park in England.

Techno parks are essential in order to bring innovation, new technologies, economic growth and promote export. The RBIDZ is actively seeking investors to set up techno-parks in the Richards Bay Development Zone, in order to provide valuable insights and intellectual resources from which other sectors, such as the renewable energy and the marine industry, situated in the RBIDZ, can benefit immensely. This is the reason why the RBIDZ has identified the development of techno-parks as one of the priority sectors for the entire project to be successful. In particular, the administration has allocated 5 hectares to the development of the techno-park, which will be integrated into the industrial development complex. The idea is to integrate the park within the surrounding industries, making its outlets available for the other sectors and enterprises in Richards Bay. The techno-park will be divided into five specific zones. The first is the research zone, which includes laboratories, analytics and science hubs with all the due spaces, personnel and services. Then, there is the engineering zone, where the products will be developed and tested and where workshops and learning factories will be hosted in order to repeat the prototypes. A third zone will include the computer laboratories, the hi-tech material and the bandwidth. An educational and learning zone is going to be set up for creating a culture of innovation and science within the local community, especially among the youngsters and children, up to the university students. Finally, the pilot zone will host the final tests, looking for further innovations and

improvements of the products or catching potential flaws that were not noticed by the research and implementation team. This zone will also take care of the design and commercialization of the products, nurturing and monitoring the product or technology until its commercialized. A start-up incubation area will be installed in this zone too.

At the moment the RBIDZ is working closely with various parties and institutions in the development of a maritime skills centre and a renewable and green energy research centre within the techno-park, but it is open to widening the research field in case of specific needs. Researchers and specialists are available to help possible investors in their choices, evaluating together with the cost-benefit analysis of a possible project and closely following the works during the implementation phase. The RBIDZ is aware of the necessity of attracting the young generation within the project, that is the best one that can explore, practice and test innovative ideas for the success of the techno-park.

4.3 Final Considerations on RBIDZ

What has been said so far shows how, in a context already strongly characterised by the presence of large industries and a commercial port of prime importance, there is a need and space for improvements from the point of view of infrastructure and services. Especially to give space to all those businesses and activities that, by integrating themselves into the system, allow it to express its full potential.

For this purpose, the RBIDZ was planned even before it was created, following a 50-year vision from day one. The creation of an industrial development zone, led by the private sector but with large state participation, is part of the dynamics that we have identified in order to create increasingly attractive centres that can bring together a whole series of advantages in one place. The aim is to become one of the key hubs of an increasingly interconnected economy.

The main objective is to create a place: where economies of scale can be fully exploited in high value-added activities; where great attention is paid to transport efficiency;

where demand is ensured precisely by an ecosystem already with large companies in the area and for which specific sectors are identified; where technological spillovers are channelled and directed; where the aim is to ensure a complete chain both downstream and upstream with subsidiary companies and not only; where to concentrate supply and demand for labour and skills; where to concentrate supply and demand for goods.

To date, the main connection is to meet the core-periphery dynamics within the country but with a strong push towards external connections in terms of both imports and exports, and in terms of attracting investment and skills, and not least labour. In addition to this, South Africa is already part of a regional economic community and clusters such as the one described above enjoy these dynamics; with the entry into force of the AfCFTA it is assumed that RBIDZ, like other similar realities, can become a reference cluster not only for the nation in which it is located but for the entire continent.

CONCLUSIONS

In conclusion, the ultimate aim of this dissertation was to verify or at least make reliable inferences, as to whether, as a result of the entry into force of the African Continental Free Trade Area, there was the possibility of the emergence of core-periphery patterns delineating new economic geography of the African continent. We consider it useful to highlight an interpretative scheme of reality both to imagine the future and to choose the actions to be taken in this regard.

We have seen in this work how the African Continental Free Trade Area sets ambitious goals to create the world's largest integrated economy, with as many as 55 countries within it. The treaty, which seems to be slowing down due to the COVID-19 pandemic situation, aims to create a single market for goods and services, facilitating the mobility of people and the investments, through the elimination of tariff barriers and the mitigation of non-tariff barriers. All this, is primarily, to boost industrial development and increase competitiveness with the ultimate aim of increasing the general welfare of all countries involved.

We have seen how projections on the impacts of the African Continental Free Trade Area indicate that there are prospects for success in the intentions. As long as the implementation takes full shape and the problems related to the different speeds of the economic integration of regional economic communities can be mitigated. Furthermore, it should be emphasised that tariff barriers will be the first to be reformed, but it is also true that they already tend to be low, while much of the success will be played on non-tariff barriers, which on the contrary are difficult to identify and manipulate. Despite this, trade creation and not trade aversion is likely to occur and this gives hope, especially for the manufacturing sector. Indeed, it is assumed that there will be strong growth in demand for industrial products both within the continent and outside.

Thus, having made the necessary clarifications and emphasised the possible stumbles of the AfCFTA, should things go as planned, it seems possible that there will be an increase in core-periphery dynamics in a context no longer considered as the sum of individual nations

but as a large continent in its totality. The dynamics are expected to arise especially with reference to cores along the coasts and peripheries in the more inland areas. This is because, as Krugman suggests, as transaction costs fall, whether related to transport or not, cores are more likely to arise where economies of scale and the benefits of a common market for goods, including intermediate goods, and labour can be exploited. These cores will arise the more the African economy shifts towards production where increasing returns are applicable, which seems to be the case with the implementation of the AfCFTA. Moreover, since shipping, along with air transport, can exploit economies of scale, it is likely that cores will be located along the coasts, especially at the beginning, as there is not yet an efficient transport infrastructure inland. Building such a scenario at the outset, and given that these dynamics are self-perpetuating, it is difficult to assume that this trend will then reverse. This is even more true in view of the fact that the global economy involves interactions between all parts of the world, making the African continent much more accessible from the coast. This can significantly change the African economic-territorial aspect.

Finally, we would like to mention how expectations play a key role in the above-mentioned dynamics. If politicians and economic actors firmly believe in the establishment of certain dynamics and act accordingly, these dynamics are likely to happen. To this end, a real example was given where political and economic actors work together to create a core. In fact, believing in the first-come-first-served rule, which is applicable to clusters, it was emphasised that there are already realities that try to make the existing clusters, or those that are being created, real hubs of attraction. This not only with a look inside the continent but also outside.

Ultimately, it is believed that as a result of the full implementation of the African Continental Free Trade Area, it is likely that core-periphery dynamics will arise, that those already in existence will be strengthened, and that these will shape a different economic landscape of the African continent in the coming years.

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Appendix 1. Regional Trade Integration of African RECs

1. COMESA

2. AMU

3. CEMAC

4. ECOWAS

5. SADC

6. EAC
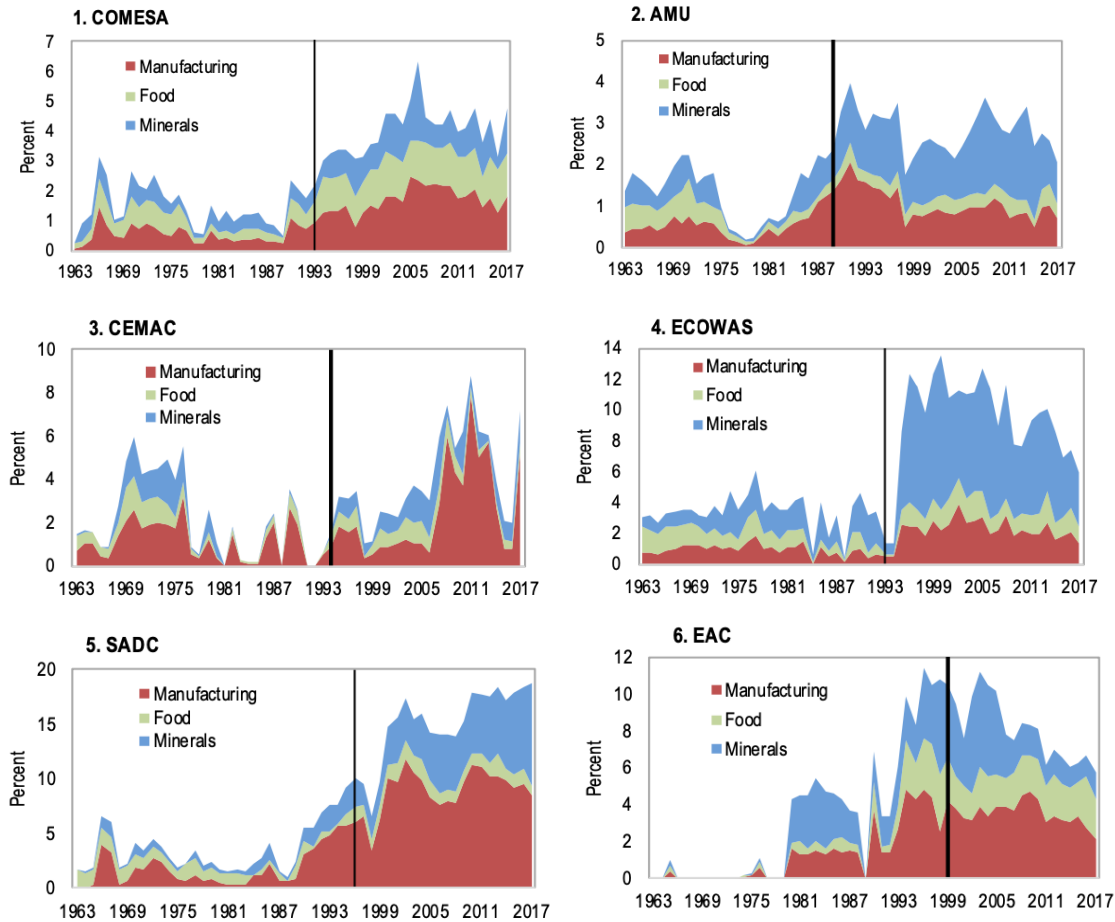
Source: International Monetary Fund,(2019b)

Note: Horizontal bars represent the year of establishment of the free trade area. The y axis represents REC's intra-regional trade as a share of total imports. AMU = Arab Maghreb Union; CEMAC = Central African Economic and Monetary Community; COMESA = Common Market for Eastern and Southern Africa; EAC = East African Community; ECOWAS = Economic Community of West African States; SADC = Southern Africa Development Community.

Appendix 2. Nontariff Bottlenecks

Importance of Nontariff Bottlenecks (Optimized random forest importance ranking)	Africa: Potential Increase in Regional Trade(Percent change in trade flows)
	Note: Numbers on the horizontal axis indicate per cent change in each indicator to reach the world mean.
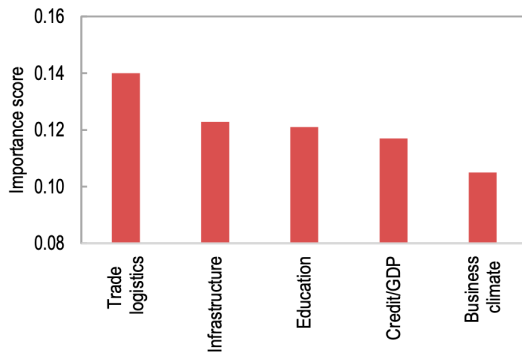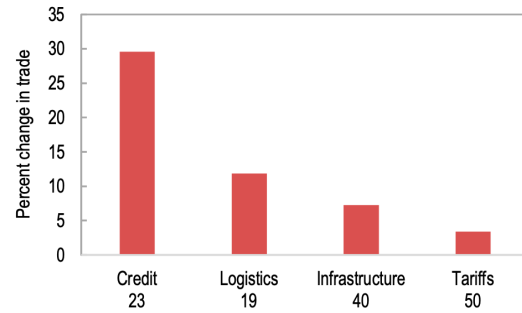
Source: International Monetary Fund,(2019a)

Appendix 3. The elasticity of Intra-African Trade to Infrastructure and Logistics Performance
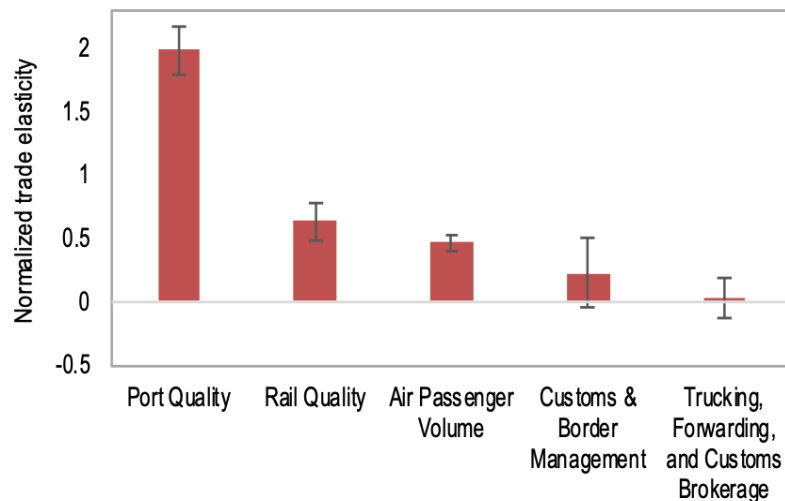
Source: International Monetary Fund,(2019b)
Note: The bars indicate the normalized trade elasticity and the whisker lines indicate 95 per cent confidence intervals.

Appendix 4. Exports under baseline scenario and AfCF (percent)

	Share of intra-AfCFTA exports in total exports			Intra-AfCFTA exports (% deviation from baseline)		
	Baseline		AfCFTA	AfCFTA	Tariff liberalization	Tariffs and NTBs
	2020	2035	2035	2035	2035	2035
Total, Africa	12	15	21	81	22	52
Senegal	36	41	50	63	20	58
Kenya	30	35	43	66	6	36
Namibia	33	32	39	59	20	51
Côte d'Ivoire	26	31	37	66	9	36
South Africa	25	30	37	44	15	33
Rwanda	17	26	33	38	4	19
Zambia	22	26	30	26	6	14
Malawi	21	24	29	34	5	23
Zimbabwe	23	26	28	59	2	29
Uganda	24	23	28	38	4	17
Tanzania	18	20	27	77	13	46
Mozambique	33	28	27	14	3	7
Morocco	7	9	26	278	144	245
Botswana	18	21	26	37	1	27
Burkina Faso	15	19	25	53	4	29
Egypt, Arab Rep.	8	10	22	237	55	129
Ethiopia	20	17	21	59	12	34
Mauritius	12	17	20	62	18	48
Cameroon	11	14	19	100	29	55
Tunisia	11	13	19	91	45	79
Ghana	9	10	16	94	32	64
Nigeria	8	10	15	83	13	38
Madagascar	7	9	10	33	9	21
Congo, Dem. Rep.	15	8	9	21	5	15

Source: World Bank, (2020)
Note: AfCFTA = African Continental Free Trade Area; NTB = nontariff barrier.

Appendix 5. Imports under baseline scenario and AfCFTA (percent)

	Share of intra-AfCFTA imports in total imports			Intra-AfCFTA imports (% deviation from baseline)		
	Baseline		AfCFTA	AfCFTA	Tariff liberalization	Tariffs and NTBs
	2020	2035	2035	2035	2035	2035
Total, Africa	12	18	25	102	22	52
Botswana	71	72	72	19	−1	11
Namibia	6	69	71	34	1	22
Zimbabwe	63	67	66	56	−1	17
Zambia	59	63	65	25	0	10
Malawi	44	53	58	24	5	15
Congo, Dem. Rep.	40	47	57	106	18	50
Uganda	26	38	48	57	5	16
Rwanda	31	39	46	35	1	11
Ghana	17	28	40	79	8	32
Mozambique	32	33	36	25	−2	15
Cameroon	14	20	35	188	68	97
Côte d'Ivoire	20	27	32	101	1	42
Senegal	17	2	32	78	27	59
Ethiopia	8	12	25	221	84	105
Kenya	14	20	25	89	5	29
South Africa	13	19	20	32	2	16
Madagascar	8	10	18	131	56	88
Tunisia	7	11	16	103	22	58
Mauritius	10	13	15	43	−1	21
Egypt, Arab Rep.	3	6	14	293	94	188
Morocco	6	9	12	79	7	39
Nigeria	4	5	9	157	38	75
Burkina Faso	45	59	6	50	7	21
Tanzania	13	21	2	103	−1	32

Source: World Bank, (2020)
Note: AfCFTA = African Continental Free Trade Area; NTB = nontariff barrier.

Appendix 6. Impacts of AfCFTA on trade of member countries, deviation from baseline, 2035
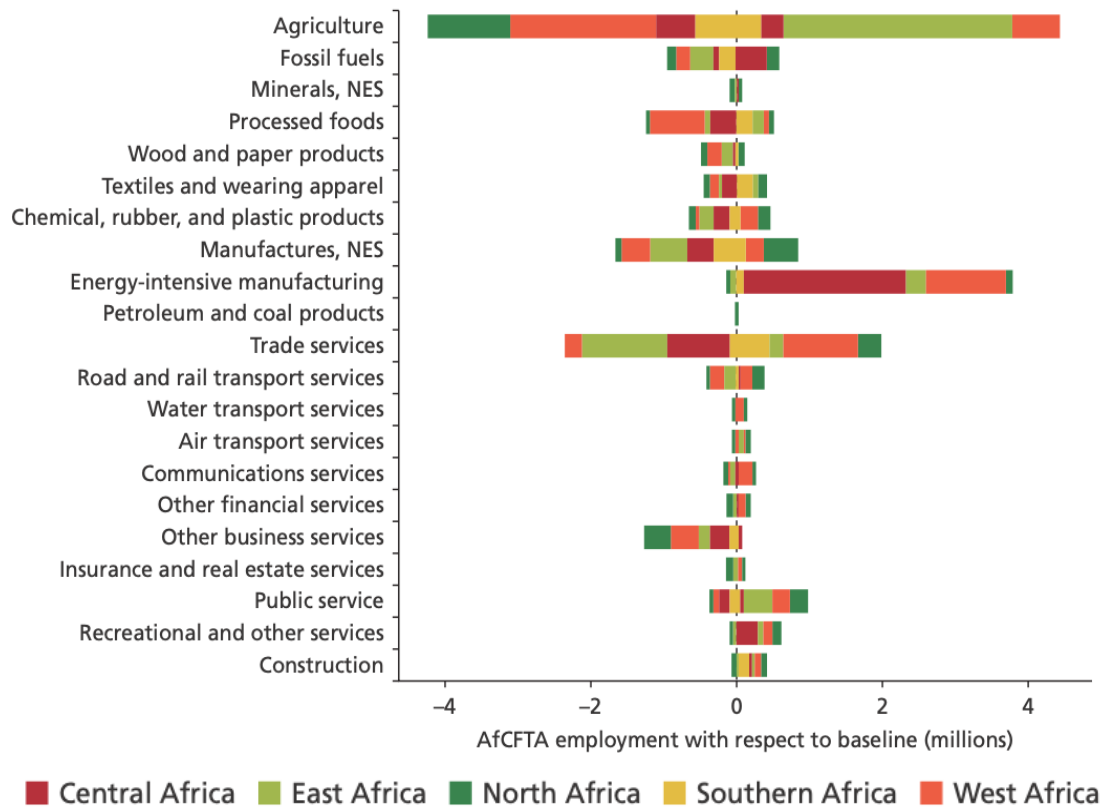
| | AfCFTA | | | | Non-AfCFTA | | | | World | | | |
| | Exports | | Imports | | Exports | | Imports | | Exports | | Imports | |
	%	2014 US$, billions	%	2014 US$, billions	%	2014 US$, billions	%	2014 US$, billions	%	2014 US$, billions	%	2014 US$, billions
Agriculture	49	12	72	19	10	17	62	20	15	29	66	39
Fossil fuel	8	3	8	3	2	13	7	2	2	15	8	5
Processed foods	91	29	118	40	45	25	44	31	62	55	67	71
Wood and paper products	98	8	125	12	68	8	31	8	80	17	54	20
Textiles and wearing apparel	195	22	240	29	47	39	43	31	64	62	70	60
Chemical, rubber, and plastic products	88	36	114	50	99	51	26	40	94	87	45	89
Manufactures, NES	177	97	213	121	69	67	25	121	108	164	44	242
Energy-intensive manufacturing	75	24	99	34	32	94	28	26	36	118	48	60
Petroleum and coal products	12	2	12	2	4	1	7	9	7	4	7	11
Construction	19	0	42	0	19	1	10	2	19	1	11	3
Trade services	9	0	25	0	-8	-2	32	11	-8	-2	32	11
Road and rail transport services	35	1	55	1	11	5	46	11	12	5	47	12
Water transport services	25	0	44	0	33	2	17	1	32	2	18	1
Air transport services	33	1	53	1	29	7	30	8	29	7	31	9
Communications services	11	0	29	0	-13	-4	42	6	-12	-4	41	6
Other financial services	13	0	32	0	-5	0	38	5	-4	0	38	5
Other business services	22	0	41	1	16	4	39	39	17	4	39	39
Recreational and other services	3	0	18	0	-7	-2	19	4	-7	-2	19	5
Public services	9	1	17	3	-10	-4	26	13	-5	-3	24	16
Insurance and real estate services	35	0	56	0	11	1	46	7	12	1	46	7
Minerals, NES	6	1	6	1	-2	-1	11	1	-1	-1	8	2
Total, agriculture	49	12	72	19	10	17	62	20	15	29	66	39
Total, manufacturing	110	220	137	288	46	286	26	267	62	506	44	554
Total, natural resources	8	4	8	4	2	11	8	3	2	15	8	7
Total, services	14	3	26	6	3	7	33	107	4	10	32	113
Total	81	239	102	317	19	321	27	397	29	560	41	714

Source: World Bank, (2020)
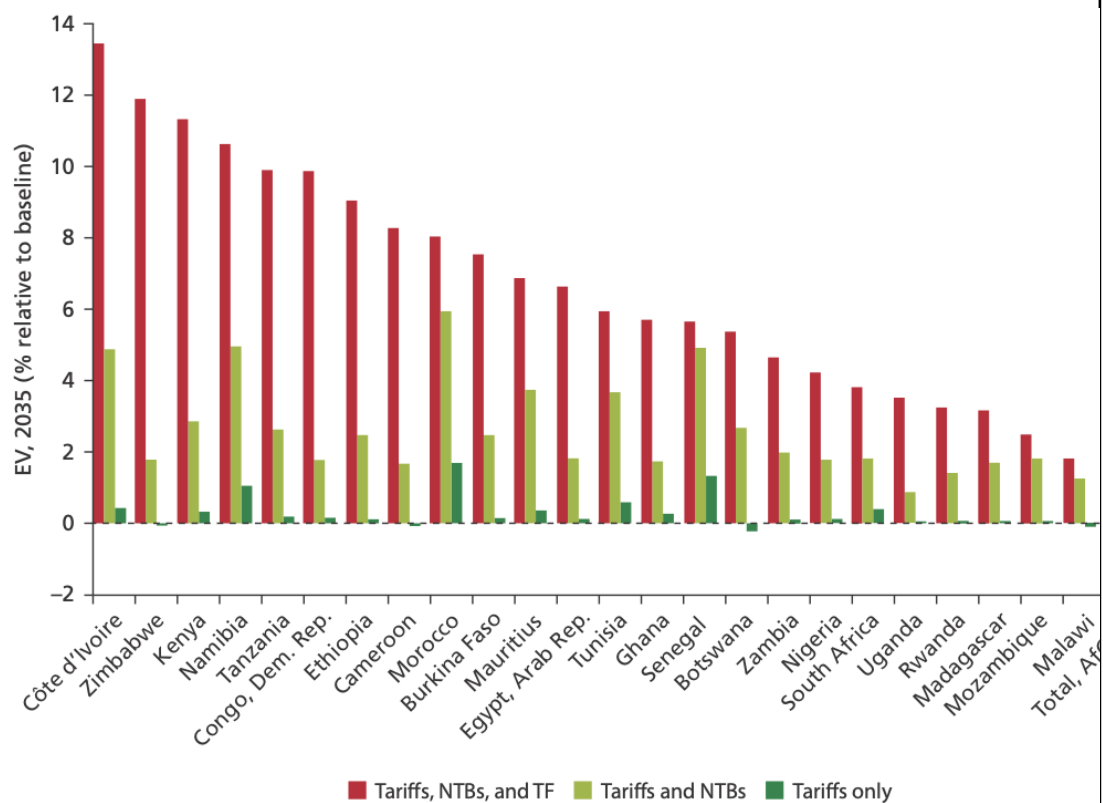Note: AfCFTA = African Continental Free Trade Area; NES = not elsewhere specified.

Appendix 7. AfCFTA employment change with respect to baseline

AfCFTA employment with respect to baseline (millions)

Central Africa ■ East Africa ■ North Africa ■ Southern Africa ■ West Africa

Source: World Bank, (2020)

Note: AfCFTA = African Continental Free Trade Area; NES = not elsewhere specified.

Appendix 8. Equivalent variation, percentage relative to baseline, 2035

Source: World Bank, (2020)

Note: Equivalent variation (EV) is the expenditure to attain utility in year t in any given simulation using base year prices. AfCFTA = African Continental Free Trade Area; NTB = nontariff barrier; TF = trade facilitation.

Appendix 9. Effects of AfCFTA on wages by skill

North Africa — Skilled: 0.93, Unskilled: 0.72
West Africa — Skilled: 0.51, Unskilled: 0.54
East Africa — Skilled: 0.67, Unskilled: 0.83
Central Africa — Skilled: 0.71, Unskilled: 0.78
Southern Africa — Skilled: 0.63, Unskilled: 0.63

Wages (percentage point change year-on-year with respect to baseline)
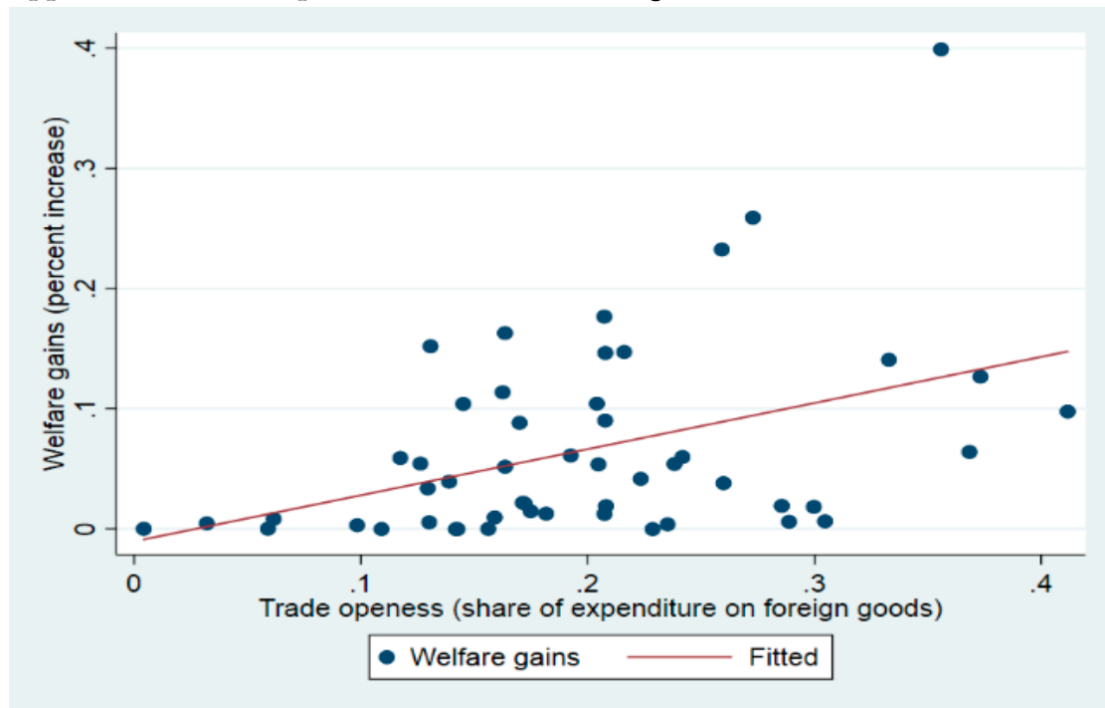
■ Skilled   ■ Unskilled

Source: World Bank, (2020)
Note: AfCFTA = African Continental Free Trade Area

Appendix 10. Country Distribution of Welfare Gains from Tariff Elimination and NTB Reduction (In Percent)

Increase in welfare
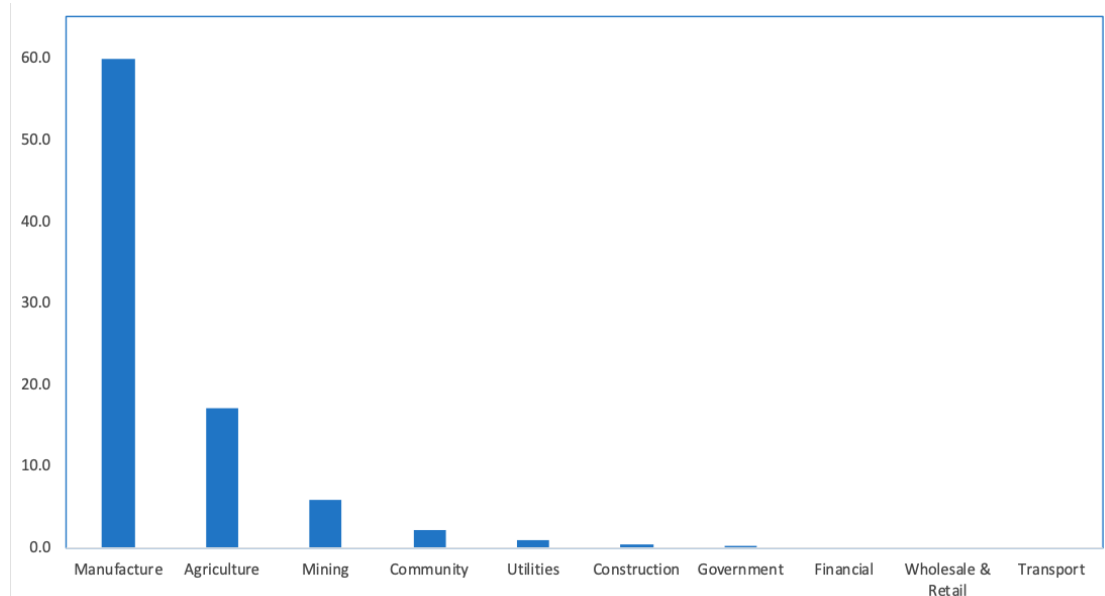African median

Percent increase

Countries in the AfCFTA
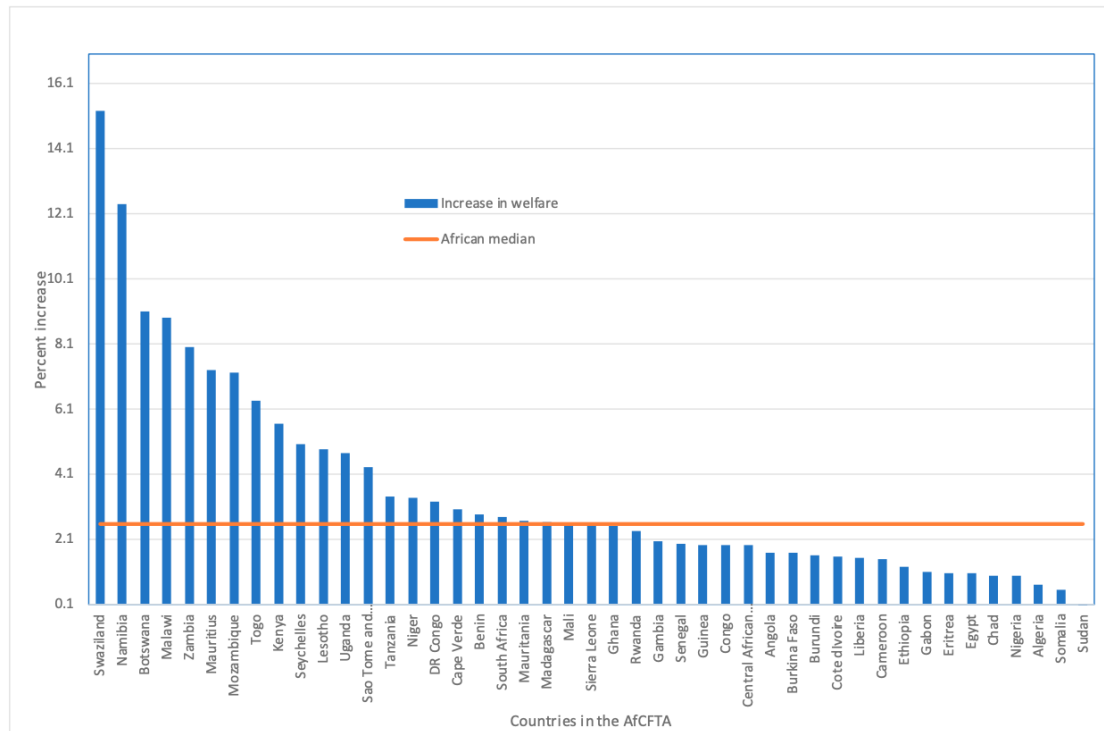
Source: Abrego et al.,2019

Appendix 11. Trade openness and Welfare Changes (Baseline)

Source: Abrego et al.,2019

Appendix 12. Sectoral Contributions to Income Changes—Combined Scenario (Baseline) (In Percent)

Source: Abrego et al.,2019