Norwegian University of Life Sciences

Master's Thesis 2022 30 ECTS
School of Economics and Business

The Effect of Trade Agreements on Trade in Mali: Implications for the African Continental Free Trade Agreement

Jørgen Rønold
Master of science in economics

Acknowledgments

I would like to thank my supervisor Roberto J. Garcia, for his guidance, support, and inputs,

My employer and colleagues, for the opportunity to do this degree, and for their support and flexibility,

Marine, for her support and patience.

Contents

Table of figures

Table of Tables

1. Introduction

In 2018, the African Continental Free Trade Agreement (AfCFTA) was formed. It is the largest free trade agreement (FTA) formed since the WTO's founding in 1995, and is projected to increase trade within Africa by more than 50 percent according to the UN (Luke, 2019). This thesis is interested in how the AfCFTA may affect trade in Mali, a weak African economy with some of the worst preconditions for economic activity and trade on the continent. There is a consensus that the agreement will lead to an overall increase in trade. However, there is more uncertainty as to whether all countries will benefit, and to what extent. In the media debate on the AfCFTA, experts argue that the smaller and relatively less developed countries will be disadvantaged by the agreement, by allowing the more developed economies on the continent to compete more freely against the weaker industrial sectors of less developed countries (Witschge, 2018).

Mali is a severely underdeveloped country and has a more urgent need for economic opportunities, compared to the continent as a whole. Thus, understanding the effect of AfCFTA on trade in Mali, or the lack thereof, is all the more important. While there are some available case studies on how the AfCFTA will affect a country or a sub-region (Bayale et al., 2020; Ndonga et al., 2020; Pasara & Dunga, 2020), an in-depth study on the impact of the agreement for Mali's trade is lacking. Looking at the case of Mali is also a way to stress test the agreement with regards to its ability to provide opportunities for trade for the countries that are the most in need. One of the fundamental motivations behind the AfCFTA is to contribute to achieving the African Union's (AU) Agenda 2063. One important way that it is expected to play a role is through contributing to achieving the UN Sustainable Development Goals (SDGs). Of particular relevance are SDG 1 no poverty, SDG 2 zero hunger, SDG 3 good health and well-being, SDG 8 decent work and economic growth, and SDG 9 industry, innovation and infrastructure (Luke, 2019). Considering these motivations behind the AfCFTA, looking closer at the case of Mali is highly relevant.

The Norwegian government has supported the negotiations and operationalization of the AfCFTA. The government sees their role in supporting the AfCFTA as part of their effort to strengthen

economic development, that mainly focusses on achieving inclusive economic growth and job creation in its partner countries (Government of Norway [GoN], 2021b). The government's overall policy objectives for Africa are the UN SDGs (GoN, 2021b), which is also reflected in the Norwegian Agency for Development Cooperation's strategy (GoN, 2021a). Thus, the strategic objectives of the AfCFTA are aligned with Norwegian foreign policy objectives. The government notes that Mali is both an extremely vulnerable state, a least developed country (LDC), and a "Seriously Off-Track Country", (GoN, 2018a). Norway has strengthened its diplomatic efforts towards Mali since 2018, by defining it's policy strategy for the Sahel region further through the "Sahel strategy", further revised in 2021 (GoN, 2018b, 2021c). Some important strategic objectives defined by the first strategy were preventing and resolving conflict, political stability and security, and inclusive social, economic, and political development. In the second edition, the objectives were modified to improving governance, resolving conflicts, and inclusive and sustainable development. The latest Sahel strategy includes AfCFTA in its description of challenges and possibilities for the region, where it is presented as a positive development that "gives hope" for strengthened intra-African trade and economic development (GoN, 2021c). The idea that the AfCFTA will contribute to Norway getting closer to achieving its development goals is a central motivation for this thesis. The SDGs are important criteria for success for Norwegian development policy, and Mali is identified as a targeted partner country. Given that Mali is severely underdeveloped, important in Norwegian development policy, and that the MFA links the AfCFTA and trade and economic development in Sahel, it is relevant to ask how the AfCFTA will affect trade in Mali. This would serve to inform the MFA on a prioritized area and contribute to further develop the MFAs strategy and effort in Mali and the Sahel region.

This thesis seeks to add to the body of knowledge that informs policy making in Norway regarding development in Mali and the Sahel region, by contributing to the discussion on how the AfCFTA will affect trade in Mali. I use historical data on trade and econometric methods to study what impact the existing free trade agreements, that are comparable to the AfCFTA, have had on Mali's trade. The trade policy I study is the Economic Community of West African States (ECOWAS), which is the free trade agreement that currently regulates trade between Mali and 14 other countries in West Africa.

From the point of view of Mali, the terms of trade that are envisaged under the AfCFTA are similar to the ones currently in place in ECOWAS, with the difference that AfCFTA operates on a continental scale, and not a regional one as is the case for ECOWAS. Thus, ECOWAS membership should serve as a relevant comparison with the AfCFTA, as it contains similar trade policies, only on a regional scale. To discuss whether AfCFTA will affect trade in Mali tomorrow, it is interesting to ask if it matters for Mali's trade to be part of ECOWAS today. The research question used to study the effect of free trade agreements for Mali's trade is "has ECOWAS integration led to increased trade for Mali?".

A gravity model of trade (GMT) is used to answer this question. GMT is the central econometric method for empirically analyzing trade flows and the effect of trade policy for the last 50 years (Kepaptsoglou et al., 2010), and the most used for empirical evaluations of free trade agreements in particular (Hoekman & Kostecki, 2009). I construct a dataset for Mali's trade with its partners from the UN Comtrade database (2021b) and a relevant set of explanatory variables. The dataset covers a period of 15 years from 2006 to 2019. It contains observations for 54 countries, who are chosen from three categories based on their closeness with Mali, geographically and in terms of trade policy. In total, the sample gives a total of 810 potential observations. Central among the explanatory variables is the dummy variables that indicate whether the trade partners are part of ECOWAS. By estimating the effect of being part of ECWOAS on trade, i.e., whether the trade polices of ECOWAS have an effect on trade for Mali, I can make an empirically founded argument on how the AfCFTA might affect Mali's trade. The discussion draws on central arguments in economic theory. As the thesis is anchored in the field of economics and uses data observations on trade measured at the Malian border, it will not include an analysis on the political considerations regarding the AfCFTA as a whole, nor Mali's political intent to actually implement the agreement, nor any other domestic political considerations in Mali that could affect the potential of the AfCFTA to contribute to Mali's trade.

Mali's trade position can be summarized as using gold exports to pay for its imports of goods and services. Mali's exports are dominated by gold trade to Switzerland, South Africa, and UAE, none of which are part of ECOWAS. Imports are more diversified and originates mainly from other ECOWAS members, and big international traders France and China. My main hypothesis for the research question

is that Mali's trade is not very sensitive to being part of ECOWAS. Thus, I expect that being part of ECOWAS will not have a considerable effect on trade in Mali. The reasoning behind this hypothesis is mainly that because Mali's exports are dominated by the gold trade, which is conducted with non-ECOWAS states, I expect the gold trade to have an important overall impact that would serve to reduce the effect of being in ECOWAS on total trade. I expect that the effect of being in ECOWAS is larger for the imports side. This is because trade data indicate that ECOWAS countries are important sources for Mali's imports. In sum, I expect that the effect from the exports side that would downplay the importance of ECOWAS will be stronger than the effect from the imports side, that would suggest a bigger effect from ECOWAS.

The Central Bank of West African States (BCEAO in French), which Mali is part of, emphasize that Mali should improve its capacity to refine raw materials, to reduce import demand (2022). Furthermore, Mali should diversify its exports, increase added value on exports, invest in the industrial sector to reduce the trade deficit in non-gold goods, stimulate specialization in its services sector, and provide better business opportunities in growth sectors such as agriculture and industry to attract foreign direct investment (FDI). These recommendations will inform discussion on the impact of the AfCFTA.

The thesis is structured in chapters, where chapter 1 is the introduction. Chapter 2 gives a background of Mali's economic situation, the political economy of the country, and challenges for trade. This will establish a basis for later discussion on the potential effects of the AfCFTA. Chapter 3 provides relevant economic theory and a literature review. I introduce fundamental concepts of international trade to describe how and why developing countries engage in international trade. I discuss the phenomenon of Free Trade Agreements (FTA), their role in Africa and the overall impact of the AfCFTA. A theoretical discussion on the impact of the AfCFTA for Mali serves as a basis for generating hypotheses. In Chapter 4, I present and discuss the dataset further, and discuss the theoretical literature on the GMT model. Then I present my research design, with my hypotheses and the specific methods that will be used for estimating the GMT. Chapter 5 presents and interprets the results from modelling. I discuss the results with reference to my hypothesis and trade theory. Chapter 6 summarizes findings and concludes on the research question.

2. Mali: political economy, trade, and challenges for trade

2.1. The economy of Mali and its environment

Geographically, Mali is part of the Sahel region, which includes Mauritania, Mali, Burkina Faso, Niger, and Chad. The Sahel region is among the least developed regions in the world, and Mali is defined as a least developed country (LDC) by the UN. The five countries currently rank 157, 184, 182, 189 and 187 respectively on the 2020 UN Human Development Index for 189 countries. All countries are among the "low human development" category. According to the index, a Malian citizen has a life expectancy of 59,3 years, 2,4 mean years of schooling and a gross national income per capita of $ 2,269 (United Nations Development Programme [UNDP], 2020). Among other macroeconomic indicators, Mali had a GDP of $17,280 billion with a growth rate of 4,7% in 2019 (World Bank, 2022). The sectoral contribution to GDP in 2017 was 41,8% from agriculture, 18,1% from industry and 40,5% from services (Central Intelligence Agency [CIA], 2022). Mali has a very young population, with 47,3 of the population below the age of 15 in 2019. Among adults, the 2019 employment level was 54,1% (World Bank, 2022). Trade as percentage of GDP for 2019 was 63,6% (World Bank, 2022).

Mali's economic and political relations lie primarily within the West African region through the 15-country political and economic union ECOWAS, including larger regional economies such as Nigeria, Ivory Coast and Ghana shown in Figure 1. ECOWAS constitutes a regional trade agreement (RTA), giving Mali access to an integrated regional market and preferential trade conditions. ECOWAS also provides other political and administrative functions, e.g., in health and security (African Union [AU], 2022). Mali's monetary policy is determined by its participation in the West African Economic and Monetary Union (WAEMU), providing Mali with the Franc CFA currency that is pegged to the Euro and issued by the Central Bank of West African States (BCEAO) located in Senegal. Participating in these institutions gives Mali stability in terms of regional trade and monetary policy, while at the same time reducing the country's ability to autonomously develop its economic policy.

Figure 1 Mali's location in West Africa (United Nations [UN], 2022)

Mali has been marked by increasing political instability and insecurity since 2012. The country is still affected by a rebellion that broke out that year in its northern regions. The rebellion included both political militias fighting for independence for the northern regions, and jihadist groups. On request from the Malian authorities, France launched a military intervention in 2013 to stop the jihadist groups, who had become dominant in Northern Mali and were advancing southwards. The military intervention restored control over northern cities and forced the jihadist groups to take refuge in rural areas. The UN peace-keeping mission MINUSMA has been deployed to the country since 2013 and peacekeepers are still providing stability to the northern regions following the peace agreement between the Malian government and the political militias signed in 2015. As a parallel development, terrorist groups linked to al-Qaida and ISIS have consolidated and gained influence since 2013. Today, the groups represent a threat to the population in large parts of the country, and are causing a rapidly deteriorating security situation nationally (Nsaibia & Weiss, 2020).

In addition, and not unrelated, Mali is currently amid a political crisis that broke out when parts of the armed forces launched a military coup in 2020. The coup has led to a prolonged period of unconstitutional rule under a military junta. During this period, Mali's membership in ECOWAS has been suspended, and the junta has been negotiating the terms for a transition to democratic rule with their regional neighbors in ECOWAS. The parties initially agreed for the junta to hold elections and give up power by February 2022. However, the junta made few efforts to organize elections and were warned by the ECOWAS during the fall of 2021 that they could be subject to sanctions if they were to fail to honor their promises. The junta notified the ECOWAS that they would run a national, separate process to determine the election schedule, and that they would not be able to hold elections within the original, agreed timeline. As a response, ECOWAS in November 2021 introduced sanctions against a list of persons in the Malian transitional authorities, accused of delaying the elections. In 2022, the Malian government informed the ECOWAS of the result of their national scheduling process, that would allow the junta to stay in power for an additional five years. ECOWAS imposed severe sanctions on Mali in January 2022, severely restricting trade, and access to liquidity from the BCEAO.

While these developments surely have been and will continue to be important factors to explain the low economic development in Mali, they are not a focus of this thesis. I will study the impact of AfCFTA without considering these factors. However, the political instability in Mali serves to further underscore the country's need for development and economic opportunities and is part of the background for Norway's engagement in the country. Important projects supported by Norway in Mali lie at the intersection between development and security, and relate to the 2015 peace agreement (Government of Norway, 2021b). Norwegian military engagement in Mali has primarily taken place through the UN mission MINUSMA, which the government sees as a way to ensure long-term development by stabilizing the regions affected by conflict (Government of Norway, 2018a). Thus, the political situation is important to understand the rationale behind Norway's engagement and cooperation with Mali, which is the central motivation behind this thesis.

2.2. Mali's trade

Building on the data used in the modelling part of this thesis, I provide an overview of Mali's imports and exports for the 2006-2019 period. Data is gathered from UN Comtrade database (UN, 2021b). This data is based on trade reported by the Malian government. Notably, data from 2009, 2013, 2014 and 2015 are missing, which may be linked to the internal unrest and security situation in that period. I also use the dashboard provided by the Observatory of Economic Complexity (2021) to get an overlook over Mali's imports and exports by country and product class to guide my queries in the Comtrade database. For product classification, I have selected a sample of product classes with the highest trade value, based on the Harmonized Commodity Description and Coding System (HS) and classified at the Chapter level. A complete overview over trade data in the dataset is presented in Table 8 in the appendix.

An important remark on data quality, in addition to missing data for some years, is that inaccurate data reported is also a concern with this dataset. UN Comtrade data reveals that there is a significant difference between Mali's reported exports of gold and the destination countries reported imports of gold from Mali. The Global Initiative Against Transnational Organized Crime (GI-TOC) (2022) have shown how Mali are underreporting their exports to the UAE, and argue that the reason is that a big part of gold flows from Mali to the UAE are illicit. This might explain why in Figure 2 we do not see the same discrepancy in reporting on gold trade between Mali and Switzerland. Regardless of the reason, this poses a problem as an important share of total trade is unobserved.

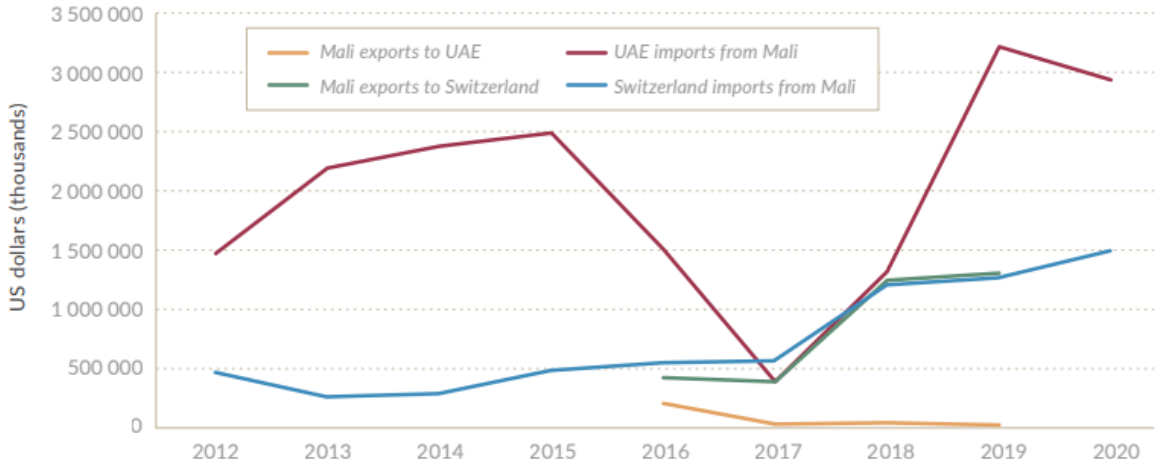

Figure 2 Gold trade between Mali and UAE, Switzerland. Both reporters included. (Global Initiative Against Transnational Organized Crime, 2022)

In the modelling part of the thesis, I will include three categories of trading partners. First, all 14 ECOWAS countries are included (excluding Mali) to get the full picture of Mali's trade with ECOWAS. Secondly, there is the category of non-ECOWAS African countries, that Mali's top 20 trade partners, who are geographically close partners and will participate in the AfCFTA, but that are outside Mali's current FTA. Third, Mali's top 20 trade partners outside Africa are included. A full list of the countries included is available in Table 7 in the appendix. Looking closer at the three groups of countries in our selection, we see from Figure 3 that trade started out being balanced between the groups in the start of the period, but trade has become increasingly dominated by non-African partners. This is mostly at the expense of non-ECOWAS African countries. An important factor that explains is the patterns in trade with gold importing partners. Trade with South Africa is at a stable level between USD 1000 and 1500 million in the period, while both the UAE and Switzerland emerges from no trade to equaling South Africa, in the case of Switzerland, and surpassing South Africa in the case of the UAE.

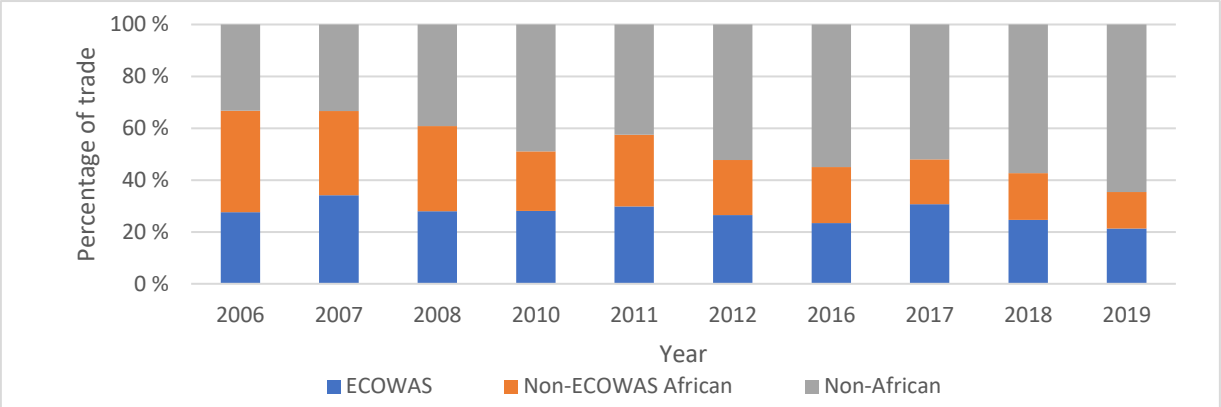

Figure 3 Trade by partner group (including UAE reported trade)

Regarding Mali's exports, some relevant remarks can already be made by looking at the OEC dashboard for 2019 data. Mali's exports are lopsided, with gold exports representing 92,4% of the total export value by product class, and Switzerland and the United Arab Emirates together representing 92,2% of the total export value by trade partner. The BCEAO (2022) provide 2020 data that confirms Mali's economic dependance on its gold mining industry. In 2020, gold represented 82 percent of Mali's export value, with cotton (6 percent) and meat (3 percent) as the other main export products. The dominance of gold has increased since 2016, as the value of gold exports has doubled, while the value

of exports excluding gold has been decreasing. Gold is mainly traded to countries positioned in the global gold trade outside Africa, like Switzerland or the United Arab Emirates, and to South Africa on the continent.

The UN Comtrade data for Mali's exports in 2019 shown in Figure 4 shows how Switzerland and South Africa together accounted for 72% of Mali's exports, and that the top ten export markets together accounted for 93% of all Mali's exports. Contrary to data from OEC, the United Arab Emirates are not shown to be an important export destination for Mali in 2019 in UN Comtrade data based on Mali's reporting. As for neighboring ECOWAS states, they make up only 11% of Mali's exports market (2019), where Côte d'Ivoire, Burkina Faso and Senegal are the biggest buyers of Malian goods, shown in Figure 5.

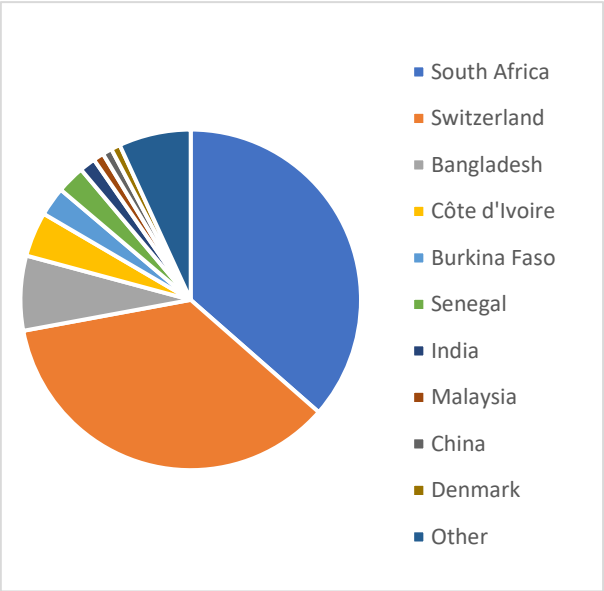

Figure 4: Mali's top ten export markets 2019. (UN, 2021b)

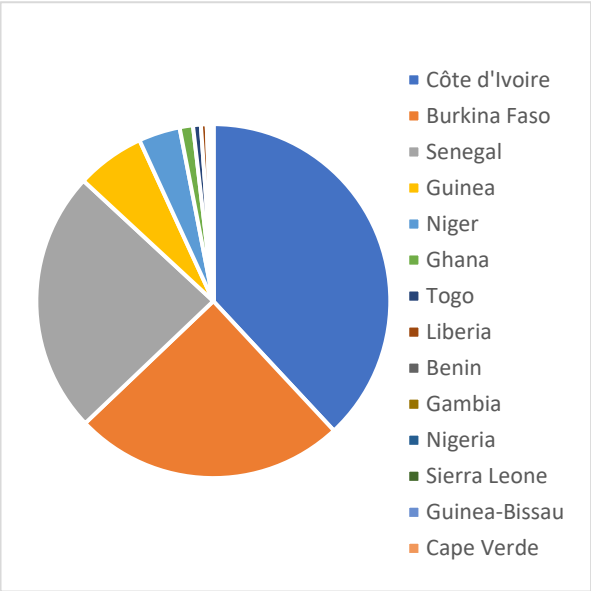

Figure 5: Mali's exports to ECOWAS countries 2019. (UN, 2021b)

Looking closer at Mali's reported exports over time in Figure 6, we see that the market is completely dominated by important gold importers South Africa and Switzerland. Yet, from a 2006 situation, where South Africa represented around 70% of Mali's exports, there are signs of diversification. Firstly, the gold exports are more evenly shared between South Africa and Switzerland through the period. Secondly, the ECOWAS neighbors and cotton importing Bangladesh begin to make an indent in the statistics as we approach 2019. Especially Bangladesh is rising from a negligible part of

exports, to becoming the third largest market by 2019. This is linked to the development of cotton exports.

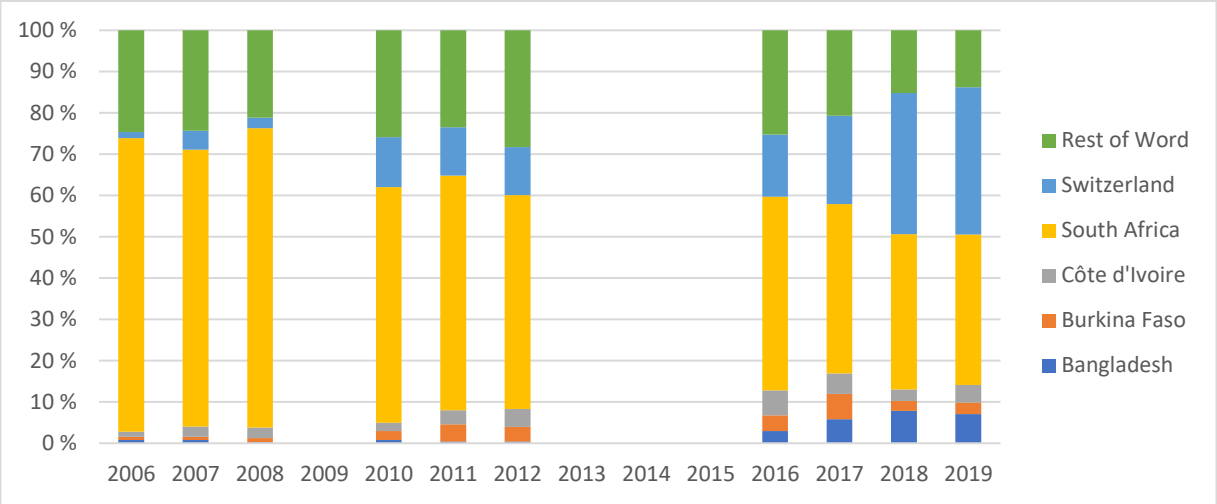

Figure 6: Mali's top export markets by year (not including UAE). (UN, 2021b)

Just as the export markets are dominated by gold buyers, Mali's exports are dominated by gold as per 2019 data in Figure 7. In fact, as South Africa and Switzerland together accounted for 72% of exports, gold accounted for precisely 72% as well. This shows with all clarity how Mali is a gold exporting country, with undiversified export markets. Behind gold are notably agricultural products cotton and live animals.

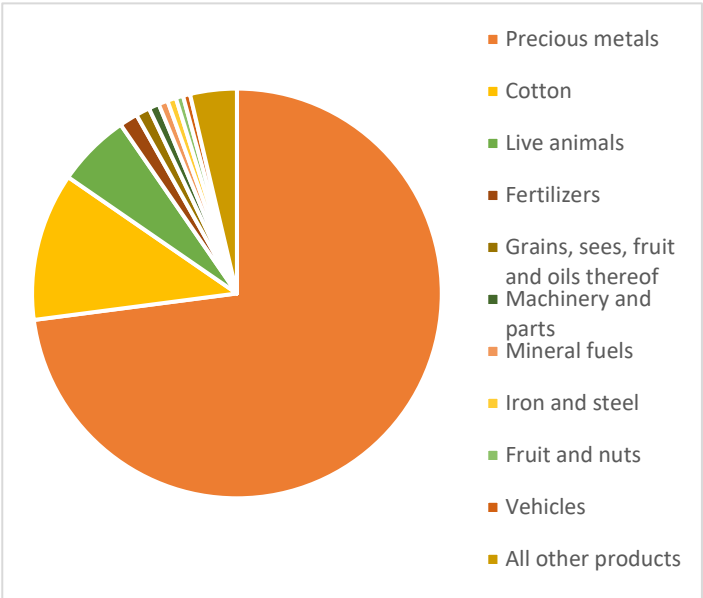

Figure 7: Mali's exports by product type, 2019. (UN, 2021b)

Figure 8 show how the composition of Mali's exports has developed over time. The total value of Mali's exports has more than doubled over the period and growing steadily, with the exception of a dip in 2017 that is due to a reduction in gold export volumes. At the same time as the total import value has increased, the gold value has equally more than doubled. Gold has remained as the dominant Malian export good throughout the period. The gold price is undoubtedly important for the Malian export market. Yet, the development in Malian trade value cannot be explained by gold prices alone. In the 2006-2012 period, the increase in gold prices was clearly larger than the increase in both gold export value and total export value. From 2012 to 2019, the gold export value and the total export value increased by around 50% while the gold price fell by some 15%. While gold is the dominant export good, there is nevertheless a positive development in non-gold goods and the value of non-gold goods has more than doubled throughout the period.

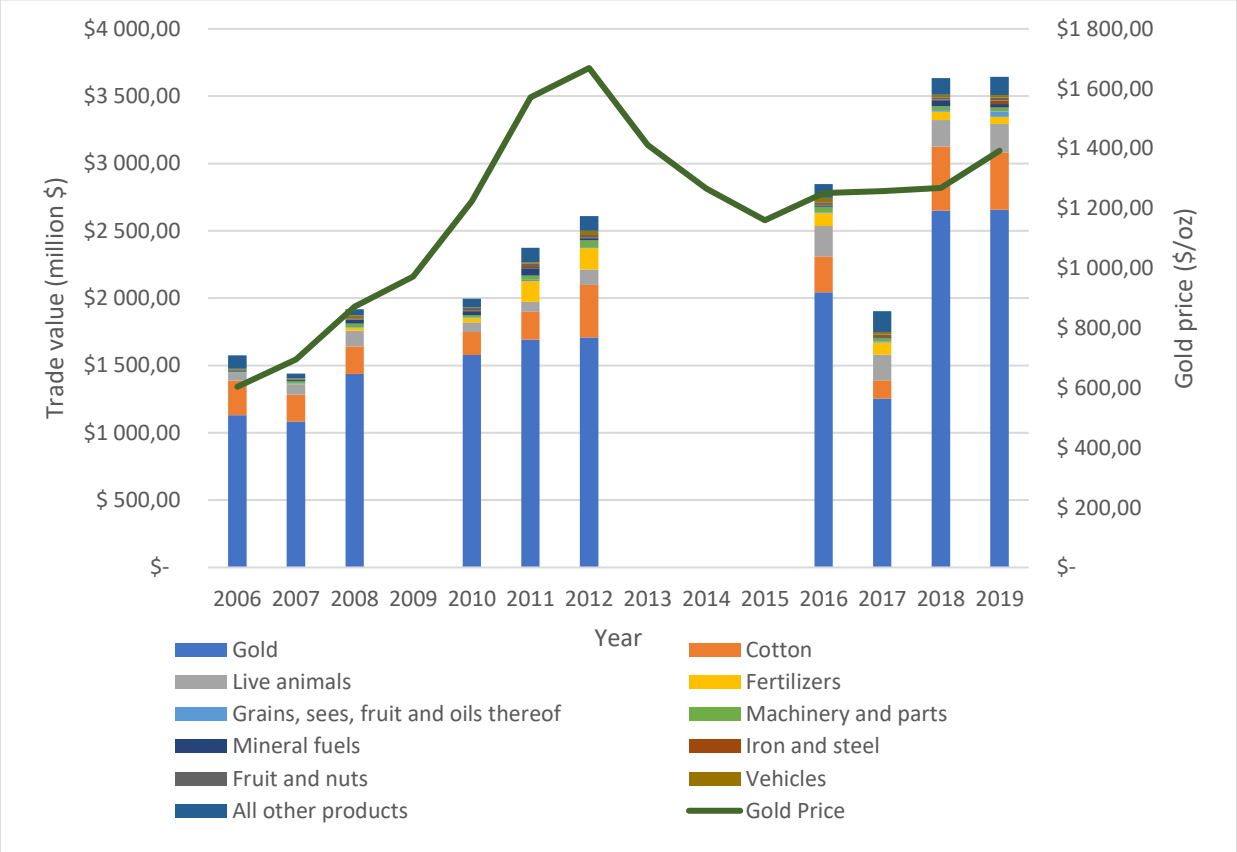

Figure 8: Mali's export by year and product type (UN, 2021b) combined with average yearly gold prices (World Gold Council, 2022)

Mali's import market is more complex. Figure 9 reports the 14 most imported product classes, which together account for more than 70% of Mali's imports. We observe that fossil fuel (HS 27) is has been the most important import good in Mali throughout the period. Also, manufactured goods like machinery (HS 84, 85) and vehicles (HS 87) are important product classes. Together, these four product classes account for half of Mali's imports in 2019. In Figure 10, the overall development of total imports is positive within the period, and trade value has more than doubled. Yet, from the available data, it appears that imports decreased abruptly in 2011, and only managed to surpass 2010-levels in 2019.

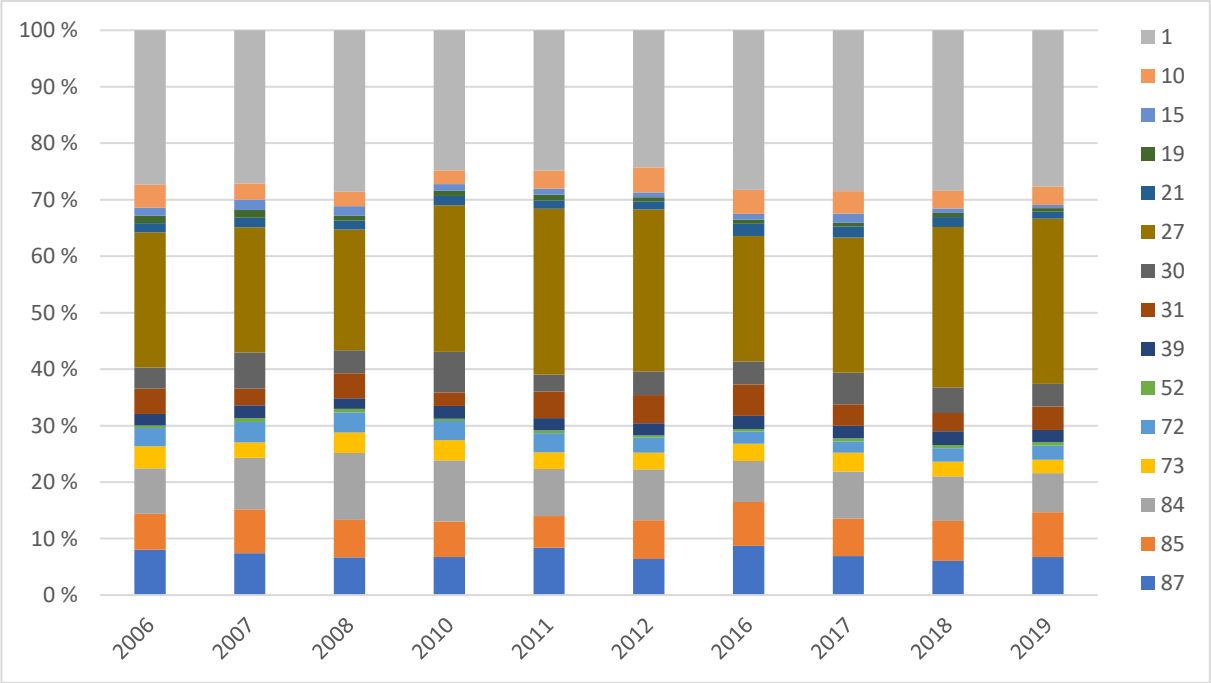

Figure 9 Mali's imports of a basket of 14 important product classes, as percentage of total imports. "1" is a generated class to capture all other trade.

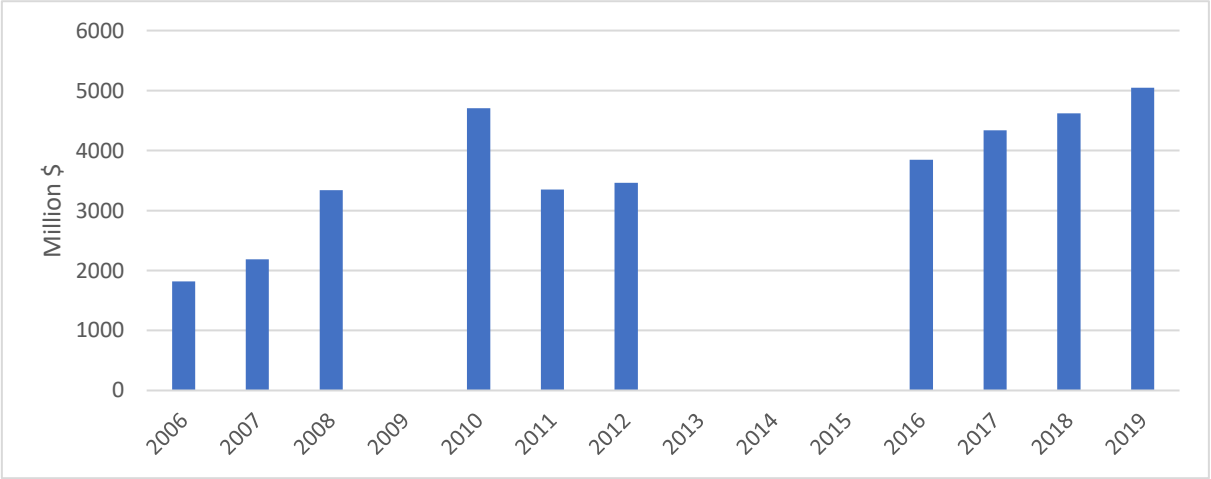

Figure 10: Value of total imports to Mali by year. (UN, 2021b)

Four countries supply around half of Mali's imports, as shown in Figure 11. These are the larger African neighbor countries and ECOWAS members Senegal, and Cote d'Ivoire, with seaports that can serve landlocked Mali, in addition to the former colonial power France, that still holds influence in West Africa, and the world-leading exporter China. The trade volume from France is steadily decreasing while China is becoming increasingly important, and Senegal is the biggest importer to Mali. By closer examining the data for composition of products from each of these countries, the importance of Senegal and Cote d'Ivoire stems from their considerable supply of fossil fuels. China and France supply a more diversified range of products. China's trade to Mali consists largely of electrical machinery and vehicles, but also non-electrical machinery, iron and steel, and iron and steel articles. France principally supplies pharmaceuticals, but also electrical and non-electrical machinery, vehicles, and cereals.

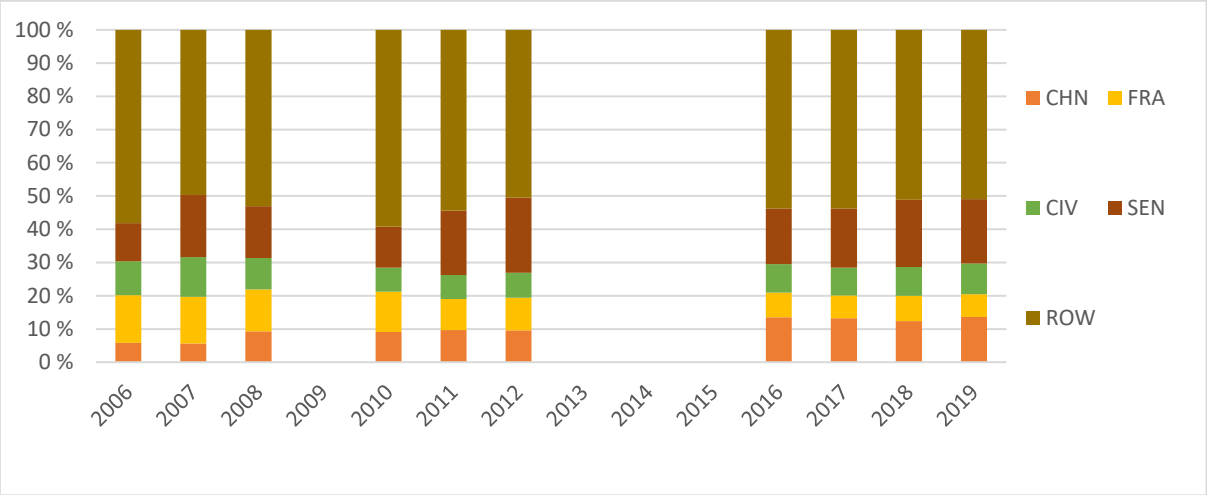

Figure 11: Market shares top exporters to Mali.

Mali's trade position can be summarized as using gold exports to pay for its imports of goods and services. Mali's dependence on fossil energy imports and on gold for trade revenues leaves the country exposed to variations in the global prices for these goods. The recommendations from the BCEAO in their 2020 report on Mali's balance of payments and external position summarizes the economic challenges the country is facing (2022). They emphasize that Mali should seek to improve its capacity to refine raw materials, to reduce import demands. Furthermore, Mali should diversify its exports, increase added value on exports, invest in the industrial sector to reduce the trade deficit in non-

gold goods, stimulate specialization in its services sector, and provide better business opportunities in growth sectors like agriculture and industry to attract foreign direct investment (FDI).

2.3. Introducing the AfCFTA

The AfCFTA was established by the AU during an extraordinary session in Kigali, Rwanda in March 2018 (AU, 2018). While the agreement is not yet in force, by July 2019 it had been signed by all AU member countries except Eritrea and ratified by 27 countries. The main outcome of the agreement is that it aims to create a single African market for trade in goods and services. This would be the largest such agreement since the establishment of the WTO, with a total population of 1.26 billion people and a GDP of $ 2.14 trillion. The agreement is designed such that 90 percent of all tariffs would be progressively eliminated during a 5-year period for the 21 non-least developed countries and a 10-year period for the remaining 33 LDCs. The remaining 10 percent of tariffs concern sensitive products, whose tariffs can be reduced in the longer term, and products that will remain outside the tariff-free scheme pending regular renegotiations (UNCTAD, 2018). Currently, there is a large number of regional FTAs (or regional trade agreements, RTAs) on the continent, where states participate in one or more RTAs on a sub-continental level. Thus, within a decade, the agreement would merge the exisiting regional trade liberalization initiatives that currently overlap. African countries have been slower to engage in regional trade liberalization compared to other parts of the world. Gérout et al. (2019) notes that the replacements of RTAs by the AfCFTA is the last step in a process that have been ongoing for over 50 years. The formation of the Organization of African Unity in 1963 was a non-binding starting point for African economic integration, followed by more political commitments during the 1979 Monrovia Summit and the 1980 Lagos Plan of Action. Legal commitments and institutions were put in place with the Abuja Treaty of 1991. The 2012 Boosting Intra-Africa Trade agenda of the AU focused on reducing the number of RTAs that served as a last step before finally negotiating and establishing the AfCFTA.

The important overarching motivations for the AU when establishing the AfCFTA are defined in the AU Agenda 2026[1], and the AfCFTA signatories emphasize achieving deeper economic

[1] The AU describes the Agenda 2063 as the continent's strategic framework for the 21st century

integration, developing the agricultural sector, improving food security and fostering industrialization and economic transformation (AU, 2018). Luke (2019) notes that using trade as a tool to diversify, becoming less dependent om commodities, and promoting industrial development, will also contribute to achieving several of the UN sustainable development goals (SDGs), and most importantly, to SDG 1, ending poverty. With regards to existing trade agreements and commitments, the AfCFTA seeks to remove the barriers to intra-African trade posed by the many and overlapping RTAs, while remaining consistent with WTO by using language and concepts established in the organization (Ndonga et al., 2020). As all African countries fall within the IMF's definition of "emerging and developing countries" category (International Monetary Fund [IMF], 2020), it is evident that economic development will be a central objective for the AfCFTA. We have seen that the majority of AfCFTA signees, including Mali, are LDCs. These are countries that are "confronting severe structural impediments to sustainable development" and are "highly vulnerable to economic and environmental shocks and have low levels of human assets" (UN, 2021a). In view of this, the question of whether the AfCFTA can increase trade will be important, both at the overall level and for an LDC, such as Mali, that is given special attention in this thesis.

3. Theory and literature review

Fundamental concepts of international trade are introduced to describe how and why developing countries engage in international trade. A presentation of key concepts and principles in international trade is provided to serve as the basis for a discussion on the proliferation of regional FTAs, the role of FTAs in Africa, and the overall impact of the AfCFTA. Finally, a discussion on the impact of the agreement for Mali serves as a basis for generating hypotheses that will guide the modelling part of the thesis.

3.1. International trade and developing economies

The usual starting point for economic theory on international trade is the Ricardian model based on the concept of comparative advantage, where the differences in productivity of labor across industries are unevenly distributed across countries and economies. This gives rise to the possibility of gains through trade in goods, where countries export goods for which they have a comparative advantage, and import goods for which they are at a disadvantage (Krugman et al., 2018). Building on the Ricardian model, the Heckscher-Ohlin model included other production input factors related to the country's resources, such as capital and technology, to explain how comparative advantage determines trade, in what is called factor-proportions theory (Krugman et al., 2018).

Developing countries are characterized as having an abundance of labor, but a scarcity of capital, which tends to be intensively used in industrial production. Efforts to improve the manufacturing sector to be able to supply manufactured goods for the domestic market has been an objective for developing countries seeking economic development through industrialization since the 1950s. The efforts in the post-WWII period to achieve this resulted in policies that restricted trade. The infant industry argument that was advanced held that the government needed to impose restrictions on imports to protect the domestic manufacturing sector and allow it time to develop without risking being outcompeted by international rivals. However, after a few decades, this policy had produced few positive results. The "learning-by-doing" period of protection did not produce mature firms able to compete in the domestic or international markets. From the 1980s, developing countries started switching strategy

to focusing on trade liberalization, which has since been the dominant trend in trade policy among developed countries. Under this strategy, countries seek to use the possibilities offered by increased trade and deeper integration to specialize in producing goods where they have a comparative advantage and can get efficiency benefits from economies of scale. Another argument is that increased trade will lead to more transfer of knowledge and technology, that can lead to more structural transformation in a given economy (IMF, 2019). Average tariff rates for all developing countries have steadily decreased in the 1980-2010 period, and over the 1960-2014 period, both imports and exports as a percentage of GDP have significantly increased. However, the results of the liberalization strategy have so far been mixed, and the mechanisms that explain the success and failure of these two strategies remain debated (Krugman et al., 2018).

The tradeoff that the developing countries faced is summarized by Woolcock (2003) as a 'trilemma of international trade'. Figure 12 illustrates a situation where countries can only choose two of three positions in trade relations: trade autonomy, trade liberalization and participation in a multilateral trade system. If a country wants autonomy to set its own terms for trade, and trade internationally, it cannot be included in a multilateral trade system. If a country wants to trade based on participation in a multilateral trade system, it will lose its autonomy to set its own trade policy and domestic regulation affecting trade.

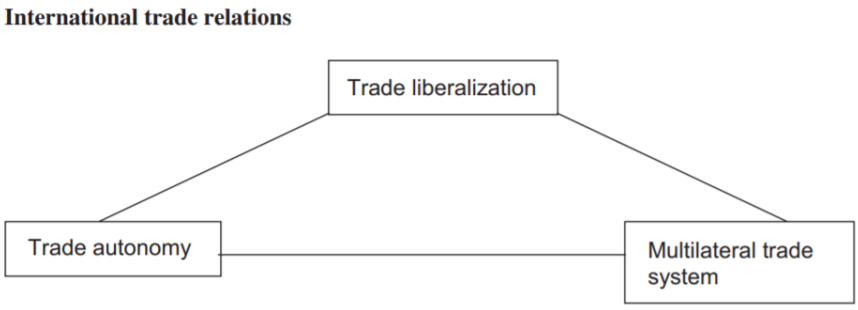

Figure 12 Trilemma of international trade (Woolcock, 2003)

3.2. International trade agreements – concepts and principles

In its essence, trade agreements are contractual agreements between two or more countries that determine their trade relationship and the terms for conducting international trade between members (Encyclopaedia Britannica, 2019). There are mainly three types of policy instruments that can be put in place by a country or a group of countries that affect their international trade. These are measures that affect the quantities that are traded, measures that affect the price of traded goods or services, and regulatory measures that indirectly affect the quantity or price of traded products (Hoekman & Kostecki, 2009). The prime example of a measure affecting prices is tariffs – a tax imposed by a country on products that crossing its borders. The corresponding example of a measure affecting quantities is quotas – a limit on the quantity of a product that is allowed to cross the border as imports or exports. As these measures (including indirect measures) affect the quantity or price of a good in the market, it constitutes government intervention in the market. Several types of products are traded internationally, among them are goods, services, and intellectual property. These product types are different in nature and are often treated separately when countries engage in international trade agreements. There exists a variety of types of goods, and different types may be subject to different trade measures and policy. The main system for classifying goods is the HS code, which gives a hierarchy of goods classification, from the general to the more specific.

The natural starting point for describing trade agreements is the World Trade Organization (WTO) and its role in international trade. With 164 member countries, the WTO provides the framework for a significant portion of international trade and represents a basis for other trade agreements. The WTO, established in 1995, represents a further development of the General Agreement on Tariffs and Trade (GATT) from 1947, and has kept the organizational structure and principles from GATT. The basic idea behind the WTO is that open and transparent markets contribute to increasing welfare, resonating with central theories in international trade described in section 3.1. The role of the WTO is to provide a structure for establishing and enforcing rules for trade policies (Hoekman & Kostecki, 2009). The WTO established a set of principles and rules that are agreed upon by member states, and that subsequently form a least common denominator for other trade agreements. As most countries are

WTO members, they already conduct trade based on WTO rules, and additional bilateral or multilateral agreements then serves as a further trade liberalization integration between a more restricted group of states, all while respecting the WTO framework.

The core principles of trade in WTO, developed under GATT, restricts how and in which form states can interfere in international trade through national policy. One of these principles is nondiscrimination. The principle of nondiscrimination has two elements. First is the concept of most favored nation (MFN). The MFN rule states that the lowest tariff rates a country sets for a type of good from a given country must also be applied on the same good for all other countries. Thus, all member states receive the most favorable trade conditions. This rule assures that no country is discriminated against compared to other countries. The next part of the nondiscrimination principle concerns the terms for competition between international and domestic actors in a country. The national treatment rule assures that foreign goods are not subject to heavier direct or indirect taxation or some other domestic regulation more stringent than that applied on similar domestic goods. The foreign goods are given the same treatment in terms of taxation or other conditions (e.g., product safety standards) as national goods (Hoekman & Kostecki, 2009). Another principle is that tariff levels are determined in terms of an upper bound, what is called a tariff binding. When countries agree to bind tariffs at a certain level for a product class, they cannot impose tariffs beyond the bound level without compensating suppliers (Hoekman & Kostecki, 2009). The last principle, the prohibition of quantitative restrictions, is important because restrictions on quantities traded is inconsistent with non-discrimination (Hoekman & Kostecki, 2009).

From the principles, we have seen that tariffs must be applied in a nondiscriminatory fashion and that they must be bound at a certain level. However, there are exceptions. The exceptions make room for countries to be members of the WTO and at the same time apply trade policies that goes against WTO rules. One exception is that countries are allowed to participate in ‘preferential trade agreements’ without violating the MFN rule. Preferential trade agreements are ‘smaller’ agreements, where members negotiate other, more preferential tariffs than the ones they are committed to by the WTO (Hoekman & Kostecki, 2009).

Another exception is that developing countries can receive preferential tariffs, and create regional FTAs or bilateral trade agreements, without coming in conflict with WTO rules, as long as they do not raise barriers to other countries (Sampson, 2003). LDCs also enjoy several exceptions, including freedom to raise tariffs, lower level of obligations, and more flexible implementation timetables.

3.3. Regional Trade Agreements (RTA) – trading outside the WTO

The AfCFTA, by its name, is a continental free trade agreement – A free trade agreement at the scale of a continent. In an FTA, countries removes tariffs on trade between member countries, while keeping their original tariff structure against outsiders (Hoekman & Kostecki, 2009). In trade theory this kind of trade agreement is referred to as an RTA, a trade agreement between several countries within a region. In addition to FTAs, there are other forms of forming regionally integrated economic and political structures. Table 1**Error! Not a valid bookmark self-reference.** shows different forms of integration, where FTA is the least comprehensive and most common form. The others are different forms of unions and include progressively larger parts of a country's economic policy, ultimately also government itself in a political union (Sampson, 2003).

Table 1 Stages of deepening regional integration (Sampson, 2003)

Depth of integration	Trade liberalization	Common commercial policy	Free movement of factors	Common monetary and fiscal policy	Common government
Free trade agreement	Yes				
Customs union	Yes	Yes			
Common market	Yes	Yes	Yes		
Economic union	Yes	Yes	Yes	Yes	
Political union	Yes	Yes	Yes	Yes	Yes

The term region can mean a large and established entity like the continent Africa, a less formal "region" of countries sharing proximity, or even a small number of countries (as low as two) that have no common "region" nor define the agreement's participants as constituting a region. The number and forms of RTAs has been rapidly increasing the last decades and is becoming a more and more important way to

coordinate trade policy between WTO members. Historically, the European countries were responsible for the first 'wave' of RTAs in the 1960s, while the US (1980s) and East Asian countries (2000s) followed. African countries only more recently engaged in RTAs on a larger scale. As of 2009, globally there were over 200 active RTAs and over 400 RTA in some stage of being created (Hoekman & Kostecki, 2009). While the RTAs in principle go against WTO rules, they are made possible through exemptions that need to be notified to the WTO, to ensure its compliance with WTO rules. The phenomenon has been called regionalism and is defined by the WTO as "actions by governments to liberalize or facilitate trade on a regional basis, sometimes through free trade areas or customs unions". This form of regional integration, where governments and politicians are the actors, is distinguished from regionalization, which describes trade facilitation that is instigated by market actors (Woolcock, 2003).

When discussing the reasons why countries form an RTA, the motivations appear to be varied, just like the RTAs themselves. From an economic perspective, Hoekman and Kostecki (2009) argue that RTAs make sense for a given country because they improve market access for the country's exporters compared to what they get under the WTO structure, and it improves their credibility as a trading partner by showing political will to improve market conditions for international suppliers. They also point to RTAs as a way for countries that want more commitments within the WTO to put pressure on the organization to negotiate better terms, and to a possible domino effect that may arise when outsiders get relatively worse terms of trade. According to Woolcock (2003), part of the reason why RTAs have become more widespread has to do with issues in negotiating global multilateral agreements in the framework of GATT and WTO. While the GATT in the first 50 years was successful in including countries in different stages of development, this has changed since the Uruguay Round in the late 1980s and early 1990s. During that round of negotiations, the decision-making process was perceived as "undemocratic, and the outcome favored rich countries over poor countries, and the interests of corporations over individuals." Woolcock argues that the realization that achieving agreement at the global level had become harder played to the favor of RTAs. He holds that RTAs are easier to achieve because there are fewer members, and the interests of the members can be more easily aligned. In other

words, the bureaucratic and institutional constraints were less important for RTAs, and this allowed more agreements to take form at the regional level. Interestingly, Woolcock foresaw at the time of writing in 2003, when most RTAs took form in the Global North, that RTAs would become more abundant in the developing world, in continents like Asia, Latin America and Africa. The topic of this thesis almost two decades later suggests that his assessment may have been precise. Also, since Woolcock's publication in 2003, the global negotiations only appear to be more difficult to conclude, as the Doha Development Round, the latest negotiation round initiated in 2001, went on for over a decade without concluding and now appear to lay dormant.

In addition to economic and institutional reasons, there may be political motivations behind forming RTAs. According to neo-classical theories in international trade, regionalism is always politically motivated (Gavin & Van Langenhove, 2003). Sampson (2003) identifies motivations from a commercial, economic strategic and political perspective. In the case of the EU, he points to strategic motivations as an important factor, as the formation of a union was important for reconciling former enemies from the second world war. For the future, the EU would serve as a source of economic and political stability in Europe, a wider motivation than just the motivation of optimizing welfare in an economic sense. A similar economic-political dynamic was the US consideration when forming the NAFTA, that a tight integration with Mexico would mean a strong commitment from Mexico to undergo political reforms that would reduce Mexican poverty, and as a consequence benefit the US by reducing problems from immigration (Sampson, 2003). Gavin and Van Langenhove (2003) also show that countries that do not pursue liberal economic policies also have entered into RTAs, as has the case for several RTAs in Africa and South America. Another potential motivation can be domestic policy. If domestic companies want to gain access to certain overseas markets, they can put pressure on government to negotiate an RTA and gain commercial advantage, as was the case for some US sectors who supported forming the NAFTA (Sampson, 2003).

A central debate on RTAs is whether they are the best suited tool for stimulating trade, that is whether the net effect of RTAs on trade is positive, or if they represent an obstacle for initiatives for global FTAs. This question has been dubbed as RTAs either being 'building blocks' or 'stumbling

blocks' for a global trading system by Bhagwati (1991). Bhagwati (2008) argued that preferential trade agreements undermine free trade. A basic paradox between the global agreements like WTO and RTAs is that RTAs violate the important WTO principle of non-discrimination. Under this principle, all countries should receive equal terms for trade, yet the point of creating an RTA is to give privileged terms to its participants (Sampson, 2003). Bhagwati (1995) argues that all FTAs inherently give preferential treatment to members and give rise to discriminatory conditions for trade. He proposes that they should be called Preferential Trade Agreements to put emphasis on their contradiction of WTO principles. Principles aside, the question also remains as to what the global net effect of RTAs is. While it may stimulate trade within the agreement, it may also reduce trade with countries outside the agreement, who receive relatively less favorable terms. This argument is related to the concept of trade diversion proposed by Viner (1950). If a trade agreement leads to trade being diverted from one country to another because of unequal terms, there may be a reduction in total welfare. An extension of this argument is that RTAs may lead to a 'polarization of benefits' between regions, countries and economic sectors (Pasara, 2020). The effect of RTA on the world trade system is also complicated by the abovementioned point that the RTAs are made for a variety of reasons, ranging from commercial, economic, strategic, political or a combination of these reasons, where increasing trade and creating economic effects may not be the primary goal.

Levy (1997) uses economic arguments to conclude that bilateral FTAs (a variant of RTAs) can undermine, and under no circumstances increase, political support for multilateral agreements. He makes this argument by calculating utility levels and using these values as a measure of voter's valorization of different trade policies, where voters will assure support for the policy that secures them the biggest gain. He finds that "in a Heckscher-Ohlin model, it is not politically possible for a bilateral agreement to supplant multilateral free trade, and it can under certain conditions undermine multilateral trade." His general principle is that the more popular a bilateral agreement is, the more likely it will be that the agreement will undermine multilateral trade. The idea is that 'intermediate' agreements (a state between full free trade and no trade agreements) makes the cost benefit analysis of entering into a multilateral agreement change to the detriment of multilateral agreements. These kinds of analyses fall

within what Woolcock (2003) describe as old regionalism theory, that were based on calculating trade creation and trade diversion using partial equilibrium analysis of the welfare effects of trade policy. This is opposed to new regionalism theory that takes into account the dynamic effects of RTAs, according to Woolcock. This theory recognizes the importance of generating economies of scale that can come from RTAs, a factor that is especially important for developing economies that need to specialize and rationalize production, to increase their competitiveness on the export market. In addition to this perspective, both Sampson (2003) and Hoekman and Kostecki (2009) note that the available body of empirical studies finds that RTAs have had a net positive effect and have contributing to promoting international trade, effectively representing 'building blocks'.

There can be many different motivations behind creating an RTA, and the purpose of the agreement shapes the way and extent to which economic integration takes place between member countries. Economic, institutional, and political considerations are among the possible motivations for entering into an agreement. Woolcock's (2003) argument, that developing countries have not had a good experience with the WTO, which in the last decades has been perceived to prioritize the interests of industrialized countries in the Global North, may be important to consider when I continue with a discussion on the experience with RTAs in Africa. One important takeaway for this thesis is that when RTAs can have different motivations and different objectives, we need to carefully understand the objectives and use those as a benchmark when arguing whether an RTA is effective or not.

3.4. RTAs in Africa – the starting point for integration to an African CFTA

One of the most prominent features of trade within the African continent is the central role of RTAs. The landscape is marked by several regional agreements, in the sense that different geographic regions on the continent have their own RTA. Thus, the continent is divided in free trade clusters, and the deepest level of trade integration for a given country is among its closest neighbors, and not the continent as a whole. These clusters are reminiscent to what Bhagwati (1995) called the "spaghetti bowl phenomenon", when FTAs proliferate and create a complex web of different trade relations. Figure 13

provides an overview over African RTAs, including the eight RTAs that are recognized by the AU[2], called Regional Economic Communities (REC).

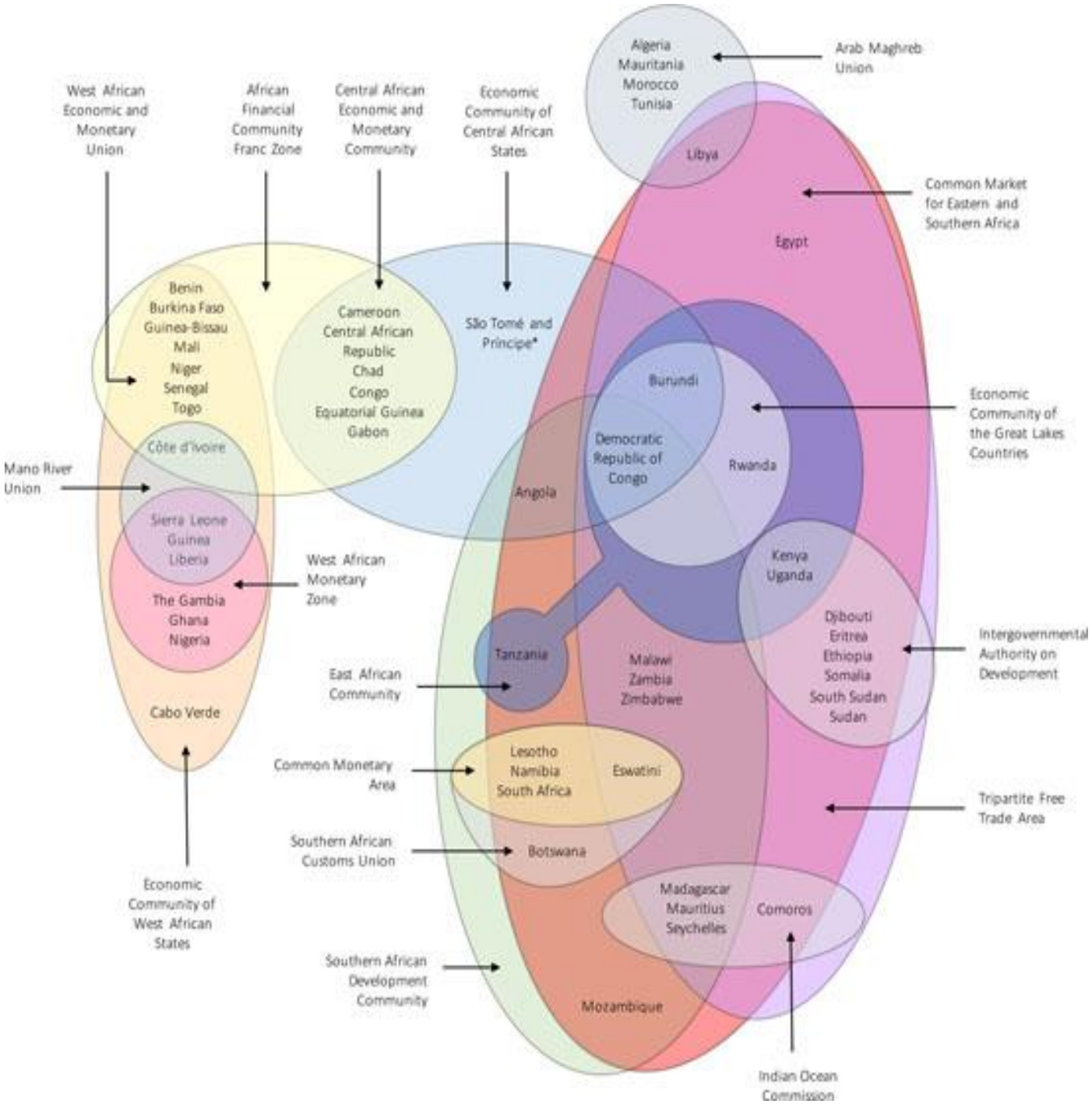

Figure 13 Regional Trade Agreements in Africa. Abrego et al. (2020)

[2] Arab Maghreb Union (UMA), Common Market for Eastern and Southern Africa (COMESA), Community of Sahel–Saharan States (CEN–SAD), East African Community (EAC), Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), Intergovernmental Authority on Development (IGAD), Southern African Development Community (SADC).

According to the IMF (2019), the RECs contribute to boosting intra-African trade, which has experienced a notable increase the last decades. The economies of the continent have also become more trade oriented, with imports and exports making up an increasing share of GDP. In fact, in 2017, trade within the RECs constituted three-quarters of all trade within the continent. Figure 14 illustrates how members of RECs benefit from preferential tariffs compared to other countries within and outside the continent.

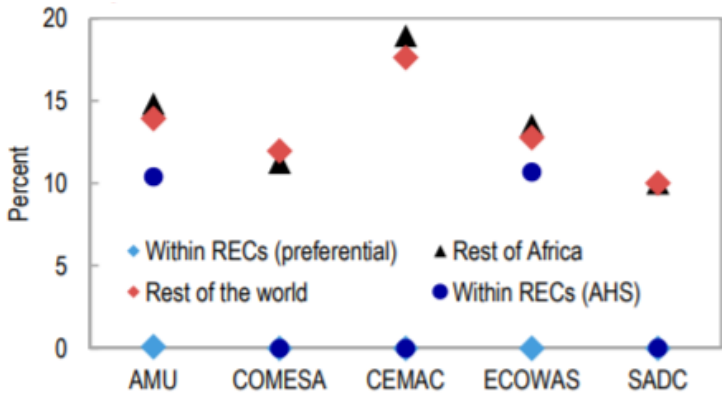

Figure 14 African RECs and average tariff rates (IMF, 2019)

An important feature of the intra-African trade noted by the IMF is that it is more diversified than the trade flowing out of the continent. Figure 15 illustrates that in global trade in general, Africa represents a source of cheap, unprocessed, raw materials like minerals, while within the continent, Africa is a source of more value-added goods and manufactured products that can contribute more directly to transforming and developing national economies.

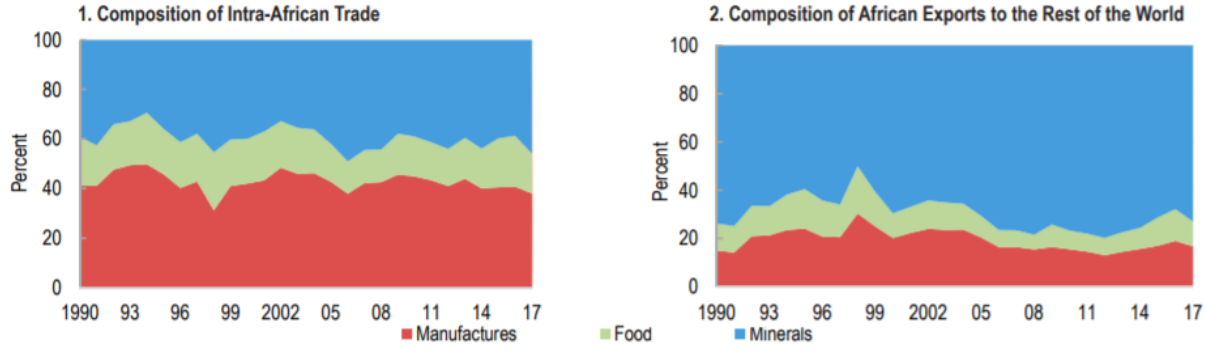

Figure 15 Composition of African exports within and outside the continent (IMF, 2019)

3.5. The AfCFTA – benefits and disadvantages

In the debate on the effects of AfCFTA, relevant questions are what the overall effects of AfCFTA are, and more importantly, whether the effects of the AfCFTA benefit some more than others, and what are the traits of countries and economies that benefit less or are disadvantages by the agreement. These perspectives are necessary for forming hypotheses on how the agreement will affect Mali that are anchored within the academic debate. It is rather uncontroversial to claim that the overall effect of the AfCFTA, as it is supposed to work, will improve welfare within the continent. According to the UN commission for Africa, eliminating tariffs has a potential to increase intra-African trade by 52,3 percent, and all African countries will enjoy increased exports and welfare (Luke, 2019). The UN Conference on Trade and Development (UNCTAD, 2018) estimate that under a complete removal of tariffs, the continent would gain $16,2 billion in welfare, increase GDP by 1-3%, increase employment by 1,2%, increase intra-African exports by 33% and decrease trade deficit by 50%. One effect that contribute to these numbers, according to UNCTAD, is that there will in fact be a trade diversion effect that will play to the advantage of African countries. This means diverting trade away from developed markets, a form of trade diversion that is more palatable in the eyes of the WTO, as it benefits developing countries. African countries already export more high-tech goods within that out of the continent. UNCTAD claims that the counties can take advantage of this fact along with the new possibilities from the AfCFTA to further diversify and improve quality and quantity of domestic production. The IMF (2019) points out that the continent also will become more attractive for FDI, that can further contribute to economic transformation. Without countering the description of the potential overall effects, there are still points of moderation to consider.

One point concerns the structural weaknesses of African trade, that restricts the potential of the agreement. The IMF describes many African countries as having below average logistics and infrastructure. This constitutes physical, non-tariff bottlenecks for trade that will remain unchanged with the introduction of the AfCFTA, and the effect of poor infrastructure is accentuated by the long distances on the continent (IMF, 2019). These factors, along with others such as ineffective customs services, represent non-tariff trade costs, and the IMF concludes that Africa has some of the highest such costs in

the world. Ndonga et al. (2020) widens the scope and look at the sum of 'endogenous' factors in African economies, including logistics, but also regulations and the quality of government and institutions. Their argument is that economic projections, specifically the one from UNCTAD (2018), look at exogenous factors (like the tariffs), but fail to consider the role of endogenous factors to explain the low level of development in African economies and trade. Pasara (2020) adds to the description of weak endogenous factors by noting that in terms of economic policy, many African countries are still pursuing protectionist policies, and can use non-tariff barriers despite entering into the agreements and lowering tariffs. Going further still from the purely economic arguments, Pasara sees several institutional and political obstacles that may prevent the agreement to be realized in its intended form. One unquestionably negative effect of the AfCFTA, at least in the eyes of African ministries of finance, is the loss of income from tariffs, which is an important source of income for many states with a strained public budget (Ndonga et al., 2020). The loss is calculated at $4,1 billion by the UNCTAD, a number that does not swing the overall welfare effect over in negative territory. UNCTAD notes that these tax revenues are quite modest, due to the currently relatively limited intra-African trade. However, a political argument can again be made, that it can be difficult to get political buy-in for this kind of revenue loss at the domestic level (Pasara, 2020). In sum, economic arguments for the potential benefits from this yet to be realized agreement are more positive than the arguments based on political and technical realities. While the question of whether the AfCFTA will become reality surely is fundamental, this thesis is best served by focusing on the economic aspects of the agreement and their potential to impact trade.

Continuing with looking closer at how the agreement will impact different countries differently, it is central to properly recognize whether and how the agreement produces inequality in outcomes for its members. An often-repeated argument in literature is that while the total welfare increases, the economic gains can be unevenly distributed, and that it is the most advanced, most diverse, and most industrialized economies that have most to gain from liberalizing trade on the continent. As an example, the IMF (2019) states that "more diversified and manufacturing-oriented economies, existing regional trade hubs, and small economies—already relatively more open to international competition—are likely to benefit more from regional trade integration than agriculture-oriented and natural-resource-based

economies." It is harder to get a sense of exactly how much less the least developed countries can hope to gain, and if there is a potential for a negative outcome for some. One possibility is that the industry of more dominant economies will outperform actors in weaker economies and leave them worse of, effectively mirroring the infant industry argument within the continent. Studies on trade liberalization in Africa have found that the benefits are skewed towards regionally dominant countries that are large, developed and coastal, at the expense of small, landlocked countries (Pasara, 2020). Pasara holds the possibility open that there may be a trickle-down effect of increased trade from more established industries, but this effect must be perceived as attractive for the actors downstream to accept staying in the trading scheme. In addition, as there are many less developed countries, the competition will be harder for these countries who all compete based on their advantage of cheap labor, whereas the few developed economies get protection from similar competitors outside the continent (Ndonga et al., 2020). There is also the valid consideration for policy-makers that the effects may create winners and losers across industries and sectors in the same country (IMF, 2019).

This discussion has uncovered a few characteristics of countries that are more and less likely to gain relatively large benefits from the AfCFTA. While these characteristics may be suited to predict the differences on outcome on an aggregate level, there is still an important room for single countries to form their experience with the AfCFTA into success or failure, depending on how they shape endogenous factors considering the agreement and their economic profile. Ndonga et al. (2020) interestingly note that "realization of the AfCFTA's potential to contribute to member countries' economic growth will largely depend on how such members are able to restructure their export sectors." This will be an important consideration to bring into conceptualizing the AfCFTA's impact on Mali.

3.6. The AfCFTA and Mali: what to expect?

An important measure of success in achieving increased trade from the RTA is that it allows countries to develop their exporting sectors. Countries with a little diversified exports sector may miss out on gains from the agreement. Ndonga et al. (2020) study the potential for Malawi to benefit from the AfCFTA. They conclude that the country's "heavy reliance on one agricultural product for export

(tobacco), and Malawi's lacking in technology that can help it diversify its exports" means that it will miss out on many of the benefits of the AfCFTA. This spell out a scenario in which Mali may also find itself, and one that leaves limited possibilities for increased trade through the AfCFTA. Mali has a very little diversified export sector, with a heavy reliance on gold mining, and that reliance on gold trade also exposes the economy to volatilities in the gold price. In addition, scholars point out that tariffs already are low on raw materials. The potential for gains in this sector is thus restricted in comparison to intermediary and final goods, and raw material-producing countries should develop a capacity to transform their raw materials domestically to benefit from this possibility (Luke, 2019). Gold is arguably one of the more challenging raw materials to transform for added value, compared to other minerals or to fibers like cotton, where Mali also has a certain exporting capacity. In addition, gold ingots are also a final product as an investment object and does not require transformation. Mali's trade statistics show that that there are only three big buyers of Mali's gold. In their estimates on the effects of fully tariff-free trade in Africa, UNCTAD researchers (2018) find that the mining sector is the only sector that is expected to have a negative development in terms of employment growth, shown in Figure 16.

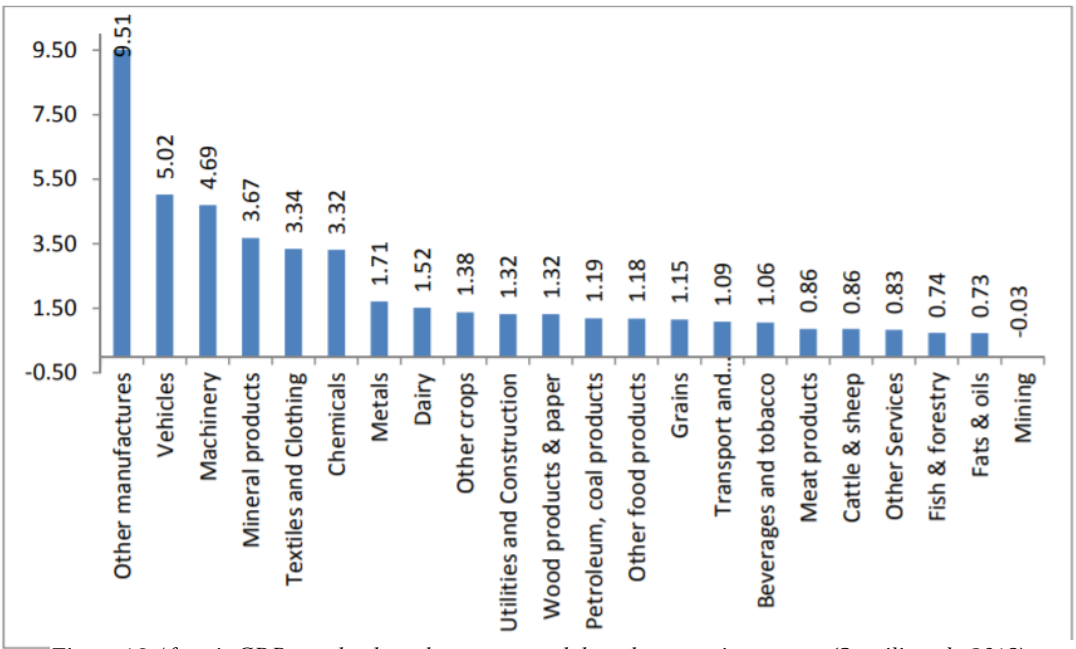

Figure 16 Africa's GDP weighted employment growth by sub-sector, in percent. (Saygili et al., 2018)

Lowering tariffs on Mali's imports have the potential of increasing welfare in the Malian economy as illustrated in Figure 17. As tariffs are lowered or removed, the price for a certain quantity supplied deceases, as the suppliers can now offer the product at a lower, tariff free price. One could assume that a part of the decreased cost for suppliers is still included in the price, to improve profits, but we disregard that element here for the sake of simplicity. With the new supply curve, a new equilibrium will be found at P'*, Q'*. This new equilibrium will mean a welfare gain corresponding to the area A for the Malian importers. This could mean Malian consumers getting more products at a lower price, and Malian agriculture and industry getting more factors of production for a lower price. In addition to directly increasing welfare, this could lead to increased productivity in the Malian economy. On the other hand, Malian producers may be disadvantaged as the face lower prices from competitors on the continent, much like the infant industry argument. The actual effect would depend on the types of products imported, on Mali's capacity to produce these products domestically, and on whether the change in quantity traded or prices has the biggest effect. In addition, there is the possibility of trade diversion, in which the AfCFTA would lead to importing other goods from African countries that are currently imported from outside the continent. This kind of trade diversion will benefit the African exporters who otherwise would have been priced out of the Malian market, and not Malian consumers.

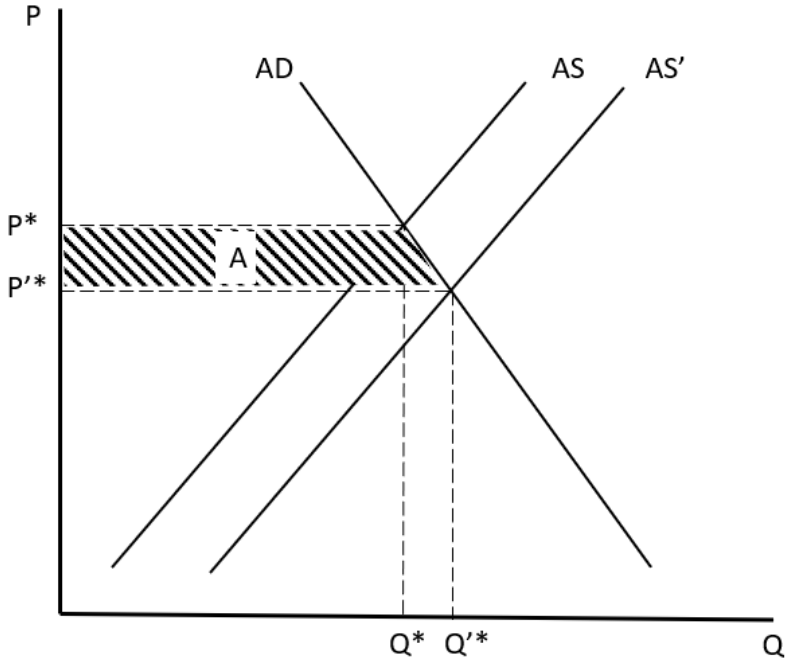

Figure 17 Market effects of lowering tariffs with no trade diversion

Important imports from the African market are energy sources. Removing tariffs on these products would give important welfare effects in Mali on the imports side. As energy is an input in production, it may also stimulate domestic economic development and diversification. However, at present it is not possible to know what products will be exempted from tariff removal. The products that are protected from tariff removal either through being listed as sensitive products or on the exclusion list are decided by each country. The lists of these sensitive and excluded products are not yet available.

4. Data and Modelling

This chapter discusses the theoretical model and the data that will be used for an econometric analysis of the impact of being part of ECOWAS on trade in Mali. I will develop a dataset and use a specification of the gravity model of trade (GMT) to estimate the effect that being part of FTAs have on Mali's trade today. The findings will guide a data-driven discussion on the potential of increased trade in Mali by entering the AfCFTA.

4.1. Data

Data on trade flows are gathered from the UN Comtrade database (2021b). I choose to include data for the 2006-2019 period, as these are the latest available data and make up a sufficiently long time period for using a panel data approach. The data that are used on Mali's imports and exports are reported by Mali. This means that the quality of the data is limited by Mali's accuracy in reporting. For four years (2009, 2013, 2014, 2015), Mali has not reported any data on trade. Thus, the four years must be excluded from the sample, as the explained variable is missing. In total, this will give 594 observations. I use data on GDP gathered from the IMF World Economic Outlook database (2021). For the distances between trading partners, I use the great circle distances in kilometers between the capital of Mali and the capitals of the respective trading partners, found in the "Great Circle Distances Between Capital Cities" database (Byers, 1997). Data for the remaining dummy variables, such as being part of ECOWAS, speaking French, and being a bordering country, is easily obtained from maps, institutional websites, and encyclopedic information.

As for the countries to include, I distinguish between three categories of trading partners. First, all 14 ECOWAS countries are included (excluding Mali) to get the full picture of Mali's trade with ECOWAS. Secondly, there is the category of non-ECOWAS African countries. Mali's top 20 trade partners in this category are included as a set of geographically close partners that are outside Mali's current FTA but participate in the AfCFTA. Third, Mali's top 20 trade partners outside Africa are included. A full list of the countries included is available in Table 7 in the appendix. These partners are expected to account for a large share of Mali's trade and should be included as they are expected to have

important impacts on both the "attractor" and the "obstacle" variables in the GMT. Charles (2021) uses the Ivory Coast's exports as the dependent variable and includes all African countries, but no non-African countries. This strategy is not suitable for my study and comparing Charles' strategy to mine explains some central points on how my model should be specified. Mali has a little diversified export sector, dominated by gold exports to a limited number of non-ECOWAS countries. Thus, we should not expect an effect of being member of ECOWAS on exports. As my research question is about the effect of ECOWAS on total trade, that variable, and not on exports alone, should be the dependent variable and a more diverse set of trading partners should be included.

We have seen that there is an issue with discrepancies in data on quantities of gold traded between Mali and the UAE. Looking closer at this phenomenon, we see in Figure 18 that it is quite new, starting in 2010. Mali reports negligible quantities for all years except 2016, while the UAE reports important quantities each year since 2010. Interestingly, UAE's imports from Mali are booming in the 2013-2015 period, where Mali is not reporting any trade, and a rebellion is taking place in the country. UAE's imports drop sharply in 2015, then increases equally sharply, to the point that in 2019, the quantities of gold imported by the UAE that are not reported by Mali is higher than Mali's reported exports from all other countries combined.

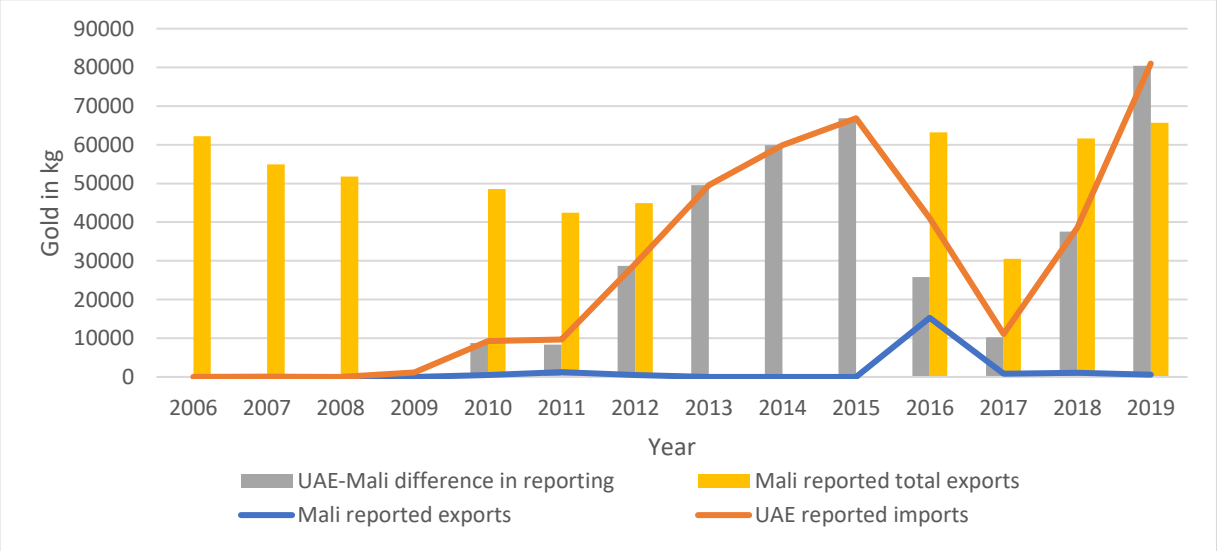

Figure 18 Differences in data on gold exports from Mali to UAE, depending on reporter

As South Africa, Switzerland and UAE are identified at the three dominant importers of Malian gold across all sources, I look at the discrepancies in reporting between these three countries and Mali. The data show that UAE reports more trade than Mali, Switzerland is very much aligned with Mali in reporting, and South Africa is heavily underreporting. The numbers reveal that South Africa does not report any imports from Mali in the period. There is no indication from the data that links UAE's overreporting to South Africa's underreporting. Thus, my strategy will be to use UAE's reported data on trade with Mali, to include the full extent of trade that is observable, while I keep Mali's reporting for South Africa, Switzerland, and all other countries. The data included in our selection captures more than 90 percent of Mali's reported trade for all years, based on Mali's reported exports and exports. When we use the data reported by UAE in our selection, the value of trade in our selection is bigger than Mali's total reported trade.

I am also interested in looking at trade patterns excluding gold trade. Figure 19, that is based on Mali's reporting only, shows clearly that the three countries that should be considered as the gold importers from Mali are the UAE, South Africa, and Switzerland. Including data for the UAE would only further demonstrate this point. Also, gold imports are dominating these countries' trade with Mali (Figure 20).

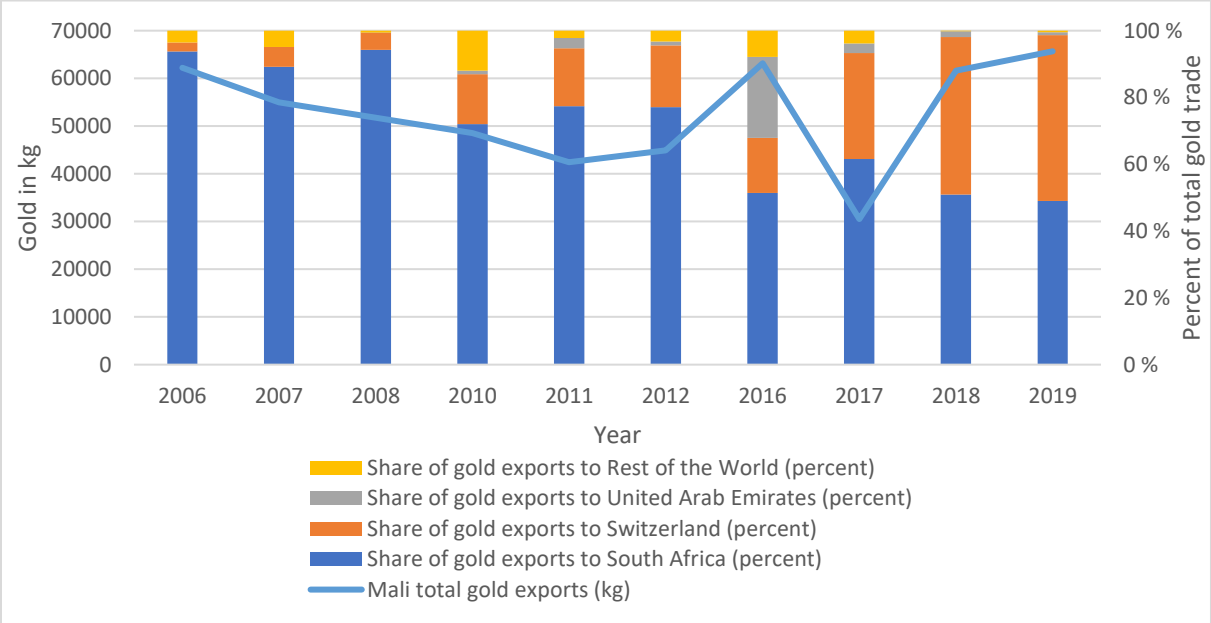

Figure 19 Biggest destinations for Mali's gold exports, based on Mali's reporting (by quantity in kilograms)

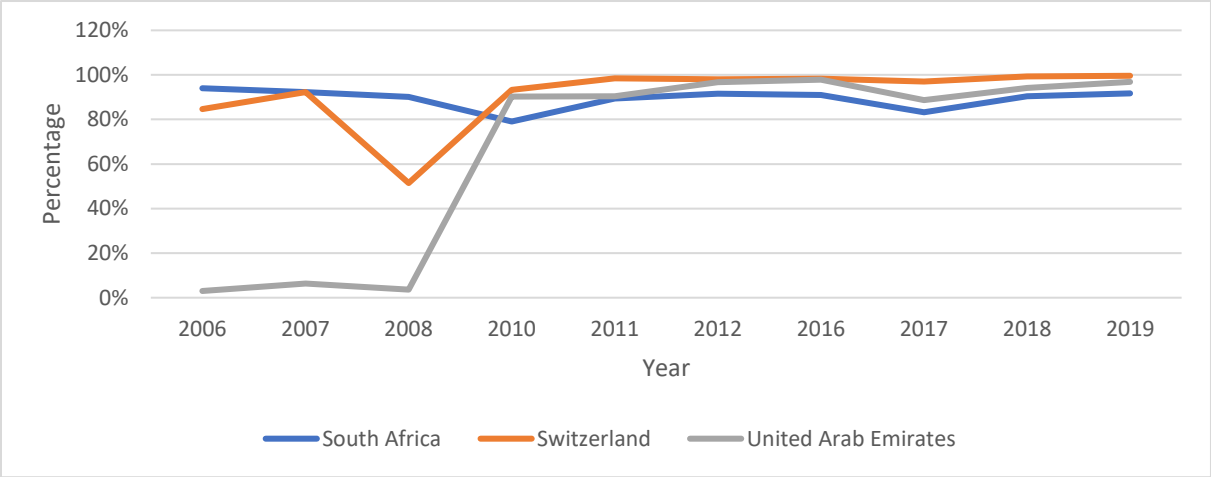

Figure 20 Major gold importing countries' share of total trade with Mali coming from gold imports

When we remove the three gold importing countries from the selection, we see in Figure 21 that Mali's trade with non-ECOWAS African countries is negligeable in all years. This can have important consequences for the research question in this thesis and the discussion on the effect of AfCFTA. As Mali trades so little with non-ECOWAS Africa today, Mali may not benefit from entering into the AfCFTA in form of increased trade. Another argument is that since Mali trades a lot with FTA partners in ECOWAS, Mali may benefit a lot from the AfCFTA, as extending the advantages of the FTA in ECOWAS to all African countries could increase trade with African countries and make the mix of partners more balanced.

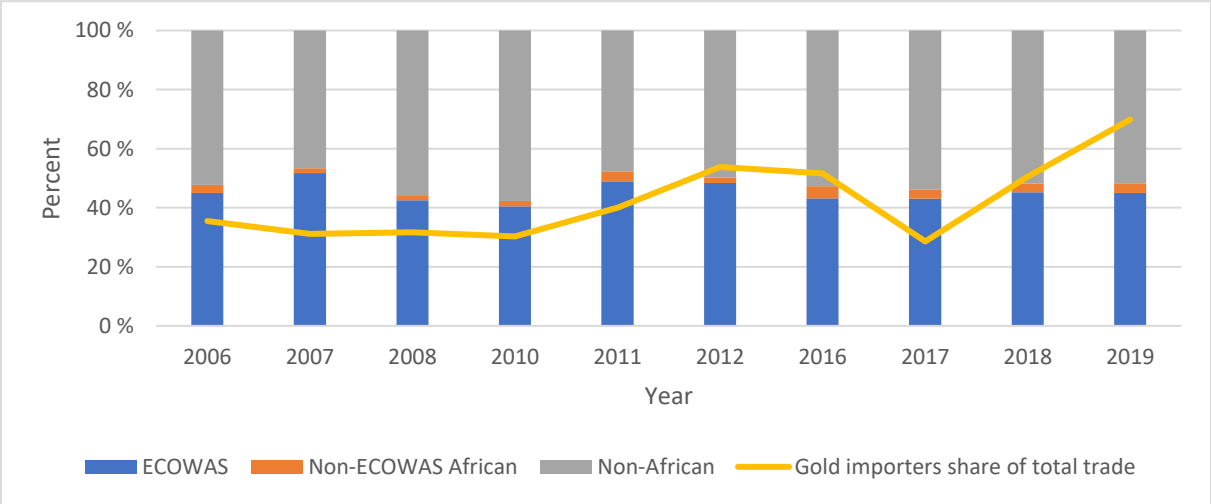

Figure 21 Trade by partner group exluding gold importing countries (South Africa, UAE, Switzerland)

4.2. Theoretical and empirical foundations for the gravity model of trade

The gravity model of trade (GMT) is the central theoretical concept for the modelling part of this thesis. This section discusses the model theoretical validity, issues, and developments in research methods. The discussion provides a theoretical foundation for determining the model specification that is most suitable for the econometric analysis to perform.

The current literature on modelling and analyzing trade flows distinguishes between simulation models that determine impacts on changes in a simulation of reality, and econometric models that predict the impact of changes based on historical, actual data (Kepaptsoglou et al., 2010). Within simulation models, computable general equilibrium (CGE) models are widely used. However, the simulation models like CGE require the researcher to provide a range of parameters that go into the simulation. Thus, the parameters, the simulation model and its results have weak theoretical foundations and unknown statistical properties (Kepaptsoglou et al., 2010), and econometric models are more robust.

The GMT has been the central econometric method for empirically analyzing trade flows and the effect of trade policy for the last 50 years (Kepaptsoglou et al., 2010), and the most used for empirical evaluations of FTAs in particular (Hoekman & Kostecki, 2009). The model, dubbed the "workhorse of applied international trade literature" (UN, 2016), is attractive to applied researchers because it has produced "some of the clearest and most robust findings in empirical economics" (Leamer & Levinsohn, 1995). The GMT interests policy researchers as it can give estimates of a trade policy's impact on trade, and the model is a reference for research questions related to policy evaluation (UN, 2016). Thus, the GMT is particularly suited to explain and predict the effects of FTAs, and using the GMT for this purpose has been a particular interest of the literature on the GMT (Martinez-Zarzoso, 2003). While it does a good job at explaining trade flows and have been developed further during the last decades, the model is still lacking in theoretical background (Kepaptsoglou et al., 2010). Theoretical issues will be further discussed below.

The origin of the GMT is often credited to Tinbergen (1962), who expressed the model as in equation (1),

$$Trade_{ij} = \alpha \frac{GDP_i \times GDP_j}{Distance_{ij}}$$

(1)

where trade between country i and j is explained by the size of the two countries measured in GDP, that attracts trade, and distance, that discourages trade. A central idea in the GMT that has remained unchanged is that distance serves as a proxy variable for transportation costs, both in the direct sense that transporting goods over longer distances is more expensive, but also indirectly, as distance can also approximate time for perishable goods, synchronization costs for producers who needs to time the arrival of production inputs to avoid bottlenecks, and transaction costs like the cost of finding trading partners and establishing relations. Income (GDP) and cost (distance) are variables that are justified by economic theory (Batra, 2006) and captures "deep regularities in the pattern of international trade and production" (UN, 2016).

Scientific progress since the 1970s has improved the theoretical support for the GMT, adding new variables and refining the explanatory variables in the model (Martinez-Zarzoso, 2003). Notably, researchers have expanded the model by including variables that account for geographical, historical and cultural factors (Batra, 2006). This process has generated greater variation in model specification, and more diverse results in empirical applications (Martinez-Zarzoso, 2003).

Both bilateral trade flows and exports are widely used as the dependent variable in the GMT. The explanatory variables are either factors that indicate demand and supply of trading countries, and factors that represent obstacles to trade flows (Kepaptsoglou et al., 2010). In equation (2), the model includes several often-used extensions to the original model (De Benedictis & Salvatici, 2011):

$$\ln X_{ij} = \ln G + a_1 \ln GDP_i + a_2 \ln GDP_j + a_3 D_{ij} + a_4 B_{ij} + a_5 TradePol_{ij} + \varepsilon_{ij}$$

(2)

where X_{ij} measures trade flow in value between country i and country j, G is a regression constant, GDP_i is country i's capacity for trading, GDP_j is country j's capacity for trading, D_{ij} is the distance between country i and j, B_{ij} is a dummy variable for indicating that country i and j share a border (adjacency), $TradePol_{ij}$ is a dummy indicating a certain trade policy shared between country i and j, ε_{ij} is a random error term and the a terms are coefficients to be estimated. This gives a model that provide estimators of the effect of the economic attractors, distance, and policy on trade between two countries. Expressing the model in a logarithmic (ln) form ensures that the elasticities of trade flows are constant with respect to GDP and D.

The unit for measuring demand and supply for trade GDP_i are measures of the size of the country's economy and markets. Measures that are used in research include GDP, GDP per capita, population and size. GDP per capita gives a relevant measure of purchasing power that distinguishes between levels of economic development that may not be captured by GDP alone, and can serve as a proxy for the capital-endowment ratio (Kepaptsoglou et al., 2010). In applied research, GDP per capita is more often used when the outcome variable is bilateral trade flow by product type, while GDP is used to explain aggregate flows (Martinez-Zarzoso, 2003).

The above model includes a term for measuring distance and whether the countries share a border. The distance term is a proxy variable for transportation costs. Only a few studies have tried to capture transportation costs through more detailed and more computationally demanding analyses (Kepaptsoglou et al., 2010). Other variables that are proposed to measure factors that are argued to affect trade and often measured by a dummy variable are sharing the same language, being a landlocked country, sharing currency, and being or having been under the same colonial rule.

The term for trade policy is used to measure the effect of participating in a customs union or FTA, and is also usually measured with a dummy variable (Kepaptsoglou et al., 2010). This variable is

often treated as a proxy for tariff levels. However, obtaining precise data on tariff levels is often much more difficult, and determining the effect of a given FTA is also interesting for political economic analysis. This is especially relevant for the research question in this thesis.

The Ordinary Least Squares (OLS) method is the technique that has been the most used for estimating the coefficients for loglinear specifications of the GMT (Kepaptsoglou et al., 2010). For the OLS estimates of the GMT to be valid, the general econometric theory conditions must be met. The errors must be orthogonal, i.e., having means zero and be uncorrelated with each of the explanatory variables. Errors must be homoscedastic, i.e., be independently drawn from for a normal distribution with a fixed variance. Lastly, none of the explanatory variables can be a linear combination of other explanatory variables (full rank). OLS is still the most used technique today, despite criticism of the method (Kepaptsoglou et al., 2010). I will address the different points of criticism, starting with the more fundamental issues that can be explained in the context of a basic GMT in equation (2), then I will discuss the more recent theoretical developments that expands the model further.

Among the most discussed issues with the GMT is endogeneity, i.e., when the explanatory variable(s) is correlated with the error term and yield biased and inconsistent coefficient estimates. While distance and adjacency can be considered as exogenous (Baier & Bergstrand, 2007), other variables are more problematic. The term for demand and supply for trade, whether measured by GDP or GDP per capita, may be endogenous as both theory and empirics suggest that trade can also impact income (Batra, 2006). Baier and Bergstrand (2007) refer to this type of endogeneity as simultaneity bias, but argues that this can be ignored. Their argument is that net exports normally make up only a tiny share of a country's GDP, the model uses gross exports (and imports) that reduces the link to GDP further, and each observation in the GMT is the trade flow between a country pair, that yet again is a tiny share of each country's total exports and considerably less so of its GDP. The concept of trade creation and trade diversion that has been discussed in chapter 3 is also relevant in the discussion on endogeneity. If countries 1 and 2 are trade partners, and the trade between country 1 and 3 changes due to policy changes such as the formation an FTA, the impact this may have on trade between country 1 and 2 is not captured by the GMT as specified in equation (2) (UN, 2016). Endogeneity is clearly an

issue for the trade policy variable. One type of endogeneity issue that is relevant is omitted variables bias, where the GMT fail to consider factors that determines the likelihood that two countries participate in an FTA. The logic is that the choice of entering an FTA is correlated with other political choices that contribute to determining the level of trade and are unobservable by the model (Baier & Bergstrand, 2007). More liberal economies would trade more and also be more inclined to form FTAs, creating a "circular causal chain between policies and trade" (UN, 2016).

Another endogeneity issue with the trade policy variable is measurement error bias, where the dummy variable for an FTA does not precisely measure the true trade policy variable and would positively correlate with the error term. Intuitively, this could be remedied by including a continuous variable to measure trade liberalization. The tariff rate is a candidate, but reliable data are hard to find and the FTA contains many other measures than just fixing tariff levels (Baier & Bergstrand, 2007). Among other, less debated issues that are relevant for the GMT is multicollinearity, when explanatory variables are linearly correlated (Batra, 2006). Potential cases where this may become an issue could be if the decision to participate in an FTA is correlated with geographical proximity and testing for the presence of multicollinearity is necessary. Trade between countries can be zero, which poses an issue when using the GMT in the loglinear form. Techniques to solve this can be to omit these observations from the dataset or to define a limit for observations that are included, like only including the biggest trade partners (Batra, 2006).

A starting point to address the issue of endogeneity is to determine whether cross-sectional data or panel data are best suited to give robust results with regards to the theoretical conditions. Using cross-sectional data would mean to study the question of the impact of FTA as a "treatment effect" problem, trying to determine an average treatment effect (ATE) from being in an FTA on trade flows (Baier & Bergstrand, 2007). Given that the issue is that the FTA variable possibly is correlated with the error term, a common method is the Heckman selection model that implies identifying instrumental variables (IVs) for the FTA variable. However, this becomes an issue as the endogeneity argument implies that the FTA variable is related to unobservable factors that influence the FTA decision, making IV estimation unreliable (Baier & Bergstrand, 2007). In addition, the alternative Heckman control-function

approach is criticized by Baier and Bergland (2007), who note that is it likely that "the vast number of variables that are correlated cross-sectionally with the probability of having an FTA are also correlated cross-sectionally with trade flows, preventing elimination of the endogeneity bias using cross-sectional techniques". They suggest that cross-sectional GMTs give biased results for the effect of FTAs and note that standard econometric textbooks suggest using panel data for these kinds of issues. On a more general level, Kepaptsoglou et al. (2010) argue that given that time, exporter and importer characteristics are natural factors to determine bilateral trade flows, excluding the time dimension, as one does by using cross-sectional data, could give inconsistent results, while panel data includes this dimension. Thus, their meta-study finds that most GMT studies use panel data.

Given that panel data is preferred in the literature and by empirical scholars, Baier and Bergland (2007) discuss whether it is appropriate to use random effects (RE) or fixed effects (FE) to estimate the model, or to difference the data and use OLS. They argue theoretically that RE should not be used, as the zero-correlation assumption between unobservable variables and FTA for the RE approach is unlikely, given the original argument as to why the FTA variable has endogeneity issues. Their empirical argument is based on research that clearly shows that the Hausman Test for FE versus RE rejects the RE approach. Kepaptsoglou et al. (2010) highlight that FE is the only alternative unless one would like to estimate time-invariant effects, and find further empirical support that FE giving more robust results than RE.

The development in the GMT that possibly has raised the most attention in the last decades is the inclusion of the "multilateral resistance" term. The term was introduced by Anderson and van Wincoop (2003) and has been developed further and is setting much of the agenda in the current debate on GMT specification (Kepaptsoglou et al., 2010). Their main contribution with the multilateral resistance term is a model that gives consistent estimates (Anderson & van Wincoop, 2003), and they expand the scope of GMT by including sub-national regions as units who trade between other regions within the same country or regions in other countries. The multilateral resistance term itself is a price index that is unobservable but derived from a demand function and expressed as an implicit function of distance, borders, and income shares, including an unobservable trade cost factor term. Their model "indicated

that costs of bilateral trade between two regions are affected by the average trade cost of each region with the rest of its trading partners (the so-called lack of multilateral resistance) and provided evidence of border effects on trade, using a non-linear least squares (NLS) model" (Kepaptsoglou et al., 2010). Baier and Bergstrand (2009) note that this approach "can potentially generate consistent, efficient estimates of gravity-equation coefficients and comparative statics, but it is computationally burdensome relative to OLS and subject to measurement error associated with internal distance measures". They go on to present a simplified version that uses region-specific FEs and removes much of the computing introduced by Anderson and van Wincoop by approximating the multilinear resistance term and keeping the sub-national regions as the trading entities. Finally, Baier and Bergland (2009) argue that empirical researchers face a tradeoff. The first option is the "full scale" Anderson-van Wincoop model that is most theoretically consistent, but computationally burdensome and exigent on data collection. The second option is the "intuitive model" using FEs. This is the most used, traditional GMT but without the same theoretical support as the Anderson-van Wincoop model. Third is the model developed by Baier and Bergland, that is computationally easier but still requires data on a regional level.

4.3. Research strategy and model specification

Based on the descriptive statistics on Mali's economy and trade, what is known about the AfCFTA, and the theoretical discussion on FTAs, I formulate a strategy to answer the research question "has ECOWAS integration led to increased trade for Mali?". The trade situation in Mali before the policy change is identified. We have then discussed what the AfCFTA is, how such an agreement is expected to work, and how it resembles ECOWAS. Lastly, we introduce a model, the gravity model of trade, on a set of relevant data to look for evidence of the impact of the FTA on trade. I will study the effects of being part of ECOWAS on Mali's trade. The main avenue for answering the research question is by using the GMT. Being part of ECOWAS today serves as a proxy for being part of AfCFTA tomorrow. Thus, combining empirical observations on the effect of being part of ECOWAS on trade, and theoretical arguments, will enable us to discuss the effect of entering into AfCFTA on Mali's trade.

Going into the modelling part of the thesis, I further develop the research question, "has ECOWAS integration led to increased trade for Mali?". The modelling studies the effect of being part

of ECOWAS on Mali's trade, as a proxy for being part of AfCFTA. One possible outcome is that as Mali trades so little with non-ECOWAS Africa today, Mali will not benefit from entering into the AfCFTA in form of increased trade. Alternatively, since Mali trades a lot with FTA partners in ECOWAS, Mali may benefit a lot from the AfCFTA as extending the advantages of the FTA in ECOWAS to all African countries would increase trade with African countries and make the mix of partners more balanced. My main hypothesis for the research question is that Mali's trade is not very sensitive to being part of ECOWAS. Thus, I expect that being part of ECOWAS will not have a considerable effect on trade in Mali. The reasoning behind this hypothesis is mainly that because Mali's exports are dominated by the gold trade, which is conducted with non-ECOWAS states, I expect the gold trade to have a big overall impact that would reduce the effect of being in ECOWAS on total trade. I expect that the effect of being in ECOWAS is larger for the imports side and will be more aligned with theory. This is because trade data indicate that ECOWAS countries are important sources for Mali's imports. In sum, I expect that the effect from the exports side that would downplay the importance of ECOWAS will be stronger than the effect from the imports side, that would suggest a bigger effect from ECOWAS.

Based on the discussion in 4.1., I prefer intuitive models over the theoretical models with a multilateral resistance term, mainly because I will not be able to find data on the regional level for Mali and the relevant trading partners that will be included. The computational challenge of using a model based on the "full scale" Anderson-van Wincoop model is also considered to be outside the scope of this thesis. This means that the results may suffer from lacking precision due to not having the multilateral resistance term. While this approach can be criticized on theoretical grounds, it is still in line with academic practice in empirical research, as "since Anderson and Van Wincoop, most relevant studies have employed fixed effects techniques for developing gravity models" (Kepaptsoglou et al., 2010).

While the literature points to FE regression model is the most reliable among the "intuitive" econometric approaches when using a GMT to study the effect of trade policy, the issue of time-invariant effects prevents the use of the FE model in this case. The issue is that the ECOWAS dummy is time

invariant, i.e., for all countries, they are either part of ECOWAS or not during the entire period and the values of the dummy variable are the same for all years. As the fixed effects model looks for changes in the dependent variable due to change in the independent variable between years for a country, it will not be able to produce any results when there is no change in the independent variable. For the same reason that we cannot use fixed effect models to find the effect of being in ECOWAS on trade, we risk including endogeneity bias from unobserved time-invariant heterogeneity. At the same time, we could argue that the effect of any unobserved time-invariant bilateral variables that influence both the decision to participate in ECOWAS and the value of trade is hard to meaningfully interpret, as there is no decision being made for any country during the period in question, and the. Actually, it is not entirely true that the ECOWAS dummy is time invariant for all countries. There is one exception, Mauritania, that withdrew from ECOWAS in 2010. While this means that the fixed effects model will generate a result for the ECOWAS dummy, it is very difficult to rely on this estimate that is based on only one country. We should also expect the results to be insignificant. In any case, there are other time invariant dummy variables that we would like to test, and the fixed effects model would not allow this.

Thus, we need alternatives. Our discussion shows that random effect models are considered in the literature as weak models for the GMT. A compromise between fixed and random effects, that can be used when fixed effects are preferable in theory but not applicable in practice, is to use a between effects (BE) model. This model looks at the panel data in a different way than the fixed effects model, by rather looking for the expected difference in the dependent variable between two individuals, depending on the values of their independent variables. As far as we are interested, this is very much like asking "what is the expected difference in trade with Mali between a partner that is part of ECOWAS and a partner that is not". Another alternative is the Hausman Taylor model, that works much like a random effects model, but controls for fixed effects by using the time-varying variables both to estimate their coefficients and as instruments for endogenous time-invariant variables. Hausman and Taylor argue that the model is more efficient than the fixed effects model, and importantly, that it allows for time-invariant variables (Hausman & Taylor, 1981). Unfortunately, we lack appropriate instrumental variables (IVs) in our dataset, and thus the Hausman Taylor model cannot be used.

The selection process is summarized in Figure 22, where I have made choices on using the GMT and not simulation models, and I include a time element with panel data. I have chosen an intuitive model instead of a theoretical model, and I have will mainly use between effects (BE) regression for this intuitive model.

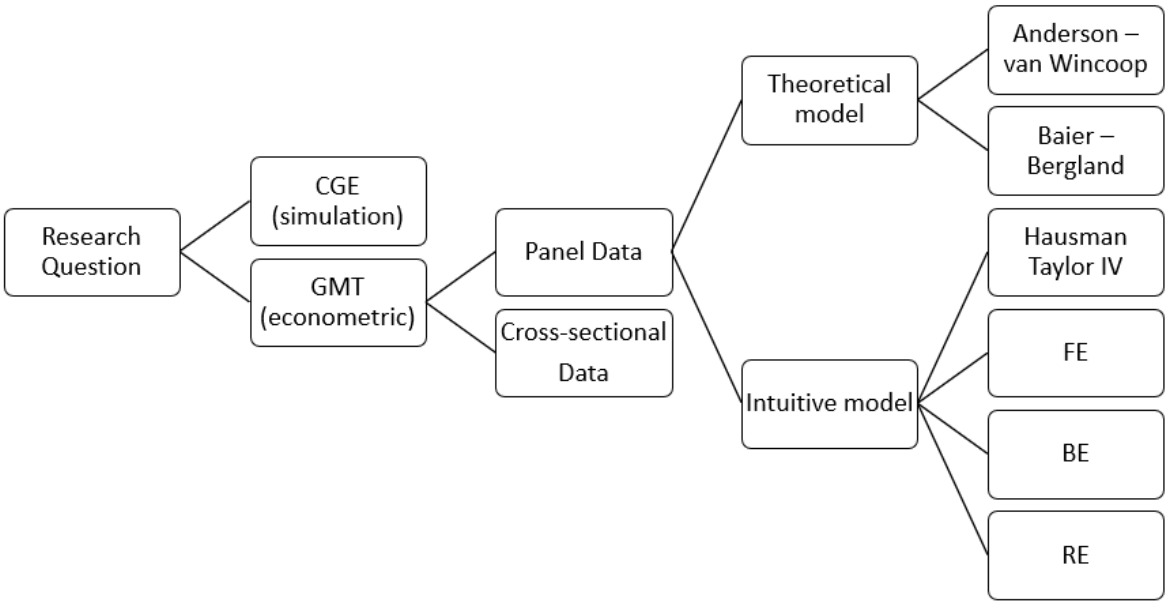

Figure 22 Process for choosing a gravity model

The main interest of the modelling is to study the causal inference of ECWOAS on trade flows. Thus, I am primarily interested in specifying a model that give results on the association between these two variables, and not in specifying a model that gives the whole and complete account of all variables that explain trade flows. Based on this, I will specify a model that contain the FTA variable and just enough additional variables to account for other factors influencing trade flows. I use equation (2) as a reference to formulate the following model in equation (3),

$$\ln X_{MALI,PARTNER,t} = \mathrm{G} + a_1 \ln GDP_{MALI,t} + a_2 \ln GDP_{PARTNER,t} + a_3 \ln D_{MALI,PARTNER} + a_4 B_{PARTNER} + a_5 ECOWAS_{PARTNER,t} + \varepsilon_{it}$$

(3)

where $X_{MALI,PARTNER,t}$ is the trade value between Mali and the partner i in time t; $GDP_{MALI\ t}$ is the GDP of Mali in time t, $GDP_{PARTNER\ t}$ is the GDP of the partner in time t, $D_{MALI,PARTNER}$ is the distance between Mali and the partner in kilometers, $B_{PARTNER}$ is a dummy variable for indicating that Mali and the partner share a border (adjacency), $ECOWAS_{PARTNER\ t}$ is a dummy for indicating that the partner is member of ECOWAS in time t, a_i are the coefficients to be estimated and ε_{it} is the error term.

I will use data on GDP instead of GDP per capita, as we have seen that GDP is used to explain aggregate flows. I do logarithmic transformations on the data on GDP and trade. An important idea in my model is that Mali is currently part of ECOWAS and will become part of AfCFTA. Thus, from the perspective of Mali, the free trade scheme currently in place under ECOWAS will be extended to be valid for all African countries. By testing what effect being in ECOWAS has on Mali's trade, accounting for other factors like distance and adjacency, I can make an argument on how Mali's trade is affected by being in an FTA that is closely similar to what the AfCFTA will be. By expressing the equation in a log transformation, I can expect to find a percentage effect of the partner being in ECOWAS on trade between Mali and the partner.

I experiment with other commonly used variables: sharing the same language, being a landlocked country, sharing currency, and being or having been under the same colonial rule. Most of these partly overlap with ECOWAS-membership. Notably, the currency dummy measures being part of the West African Economic and Monetary Union (WAEMU). The currency union comprises a subset of eight ECOWAS member including Mali, and WAEMU members are listed in Table 7 in the appendix.

Many ECOWAS members, with some notable exceptions like the large economy Nigeria, have the same colonial history as Mali has with France. The colonial history also explains why Mali and several ECOWAS countries speak French and share the Franc CFA currency (formerly named Franc of the French Colonies in Africa). Thus, we can expect a high correlation between the colony, language, and currency variable, and possibly also between these and the ECOWAS variable. At the same time, there

are many African countries outside ECOWAS who also have a colonial history with France and have French as an official language. It will be interesting to compare the ECOWAS dummy with the colonial and the French dummy to see if trade between non-ECOWAS African countries can be explained by this shared culture factor.

As for the data on trade to use, I will use in total four variations of the dataset. First, I will include all trade and all trade partners and use reporting from UAE for that country, to increase reliability. Second, I will use a limited version of the same data, excluding UAE, South Africa, and Switzerland, the three big gold importing countries. Third, I will use data for exports only. Fourth, I will use data for imports only. This allows me to break up the main hypothesis further and to test if being part of ECOWAS has an effect on Mali's total trade, on Mali's trade excluding gold, on Mali's imports and on Mali's exports. One advantage of looking at exports and imports separately is that it opens more possibilities for modelling. Specifically, Poisson pseudo-maximum-likelihood (PPML) models are proposed for this case (Silva & Tenreyo, 2006) and have been used in similar studies (Charles, 2021). Advantages of using the PPML model are that it is good as handling autocorrelation, multicollinearity and heteroskedasticity. Thus, the preferred models for different data selections are summarized in Table 2.

Table 2 Model selection for different data samples

	Data	
	All trade	Import/Export
Model	BE	PPML

5. Results and discussion

This chapter will explain my econometric analysis of the data in Stata and present the results from the analysis. I will discuss the results is light of the theory and hypotheses presented previously. First, I compare the BE model to other relevant models. Then, I study different specification of the GMT. Lastly, I differentiate between data samples used, studying total trade, exports and imports separately.

5.1. Comparing models for estimating the GMT

Taking a closer look at the data in view of uncovering insights on the effect of ECOWAS on trade, looking at the relationship between trade, GDP and ECOWAS membership is interesting. With inspiration from the basic GMT proposed by Tinbergen that uses the product of the country pair's GDP as an independent variable, I plot the logarithmic value of trade and the product of GDP (Figure 23). We see that apparently, ECOWAS members trade more for a given economic size (GDP). Of course, this result is before we adjust for distance. For now, as we know that ECOWAS partners are close to Mali, we might also claim that the figure shows that ECOWAS countries are closer than Mali's other trading partners, and because of that they trade more relative to their size. Anyhow, the plot suggests that there is a positive relationship between size and trade, as we should expect.

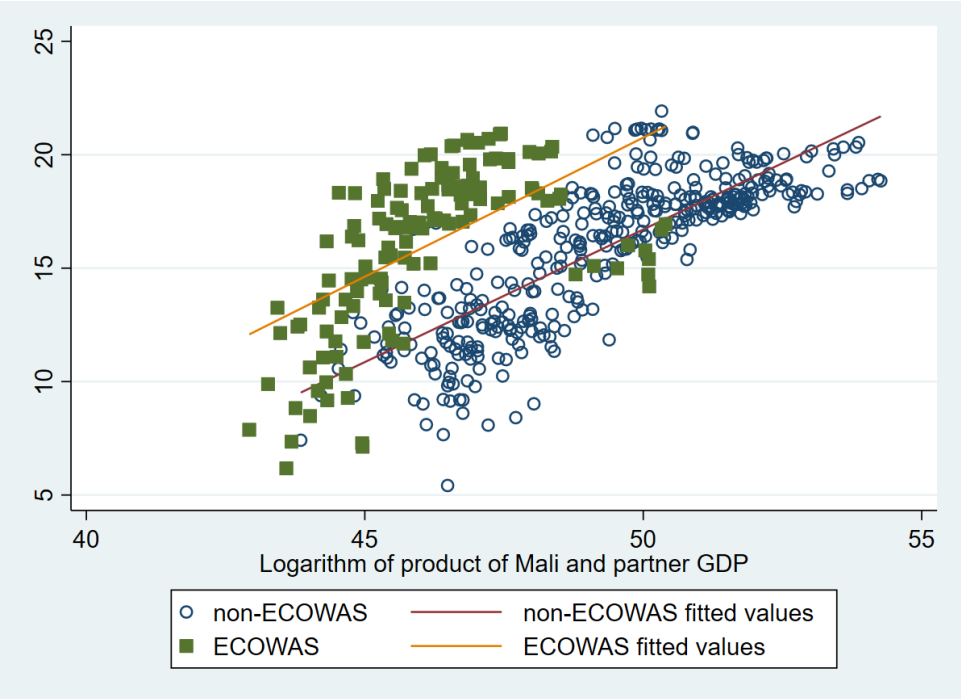

Figure 23 plotting logarithm of trade value (y axis) and GDP (x axis)

A similar plot for distance and trade is less telling (Figure 24). Besides confirming that ECOWAS countries are close to Mali, we do not learn much about any relationship between distance and trade. If anything, there is a weak suggestion of a positive relationship, which would betray the theoretical argument that distance hampers trade. It is wiser to note that there is no clear visual indication that distance and trade are related.

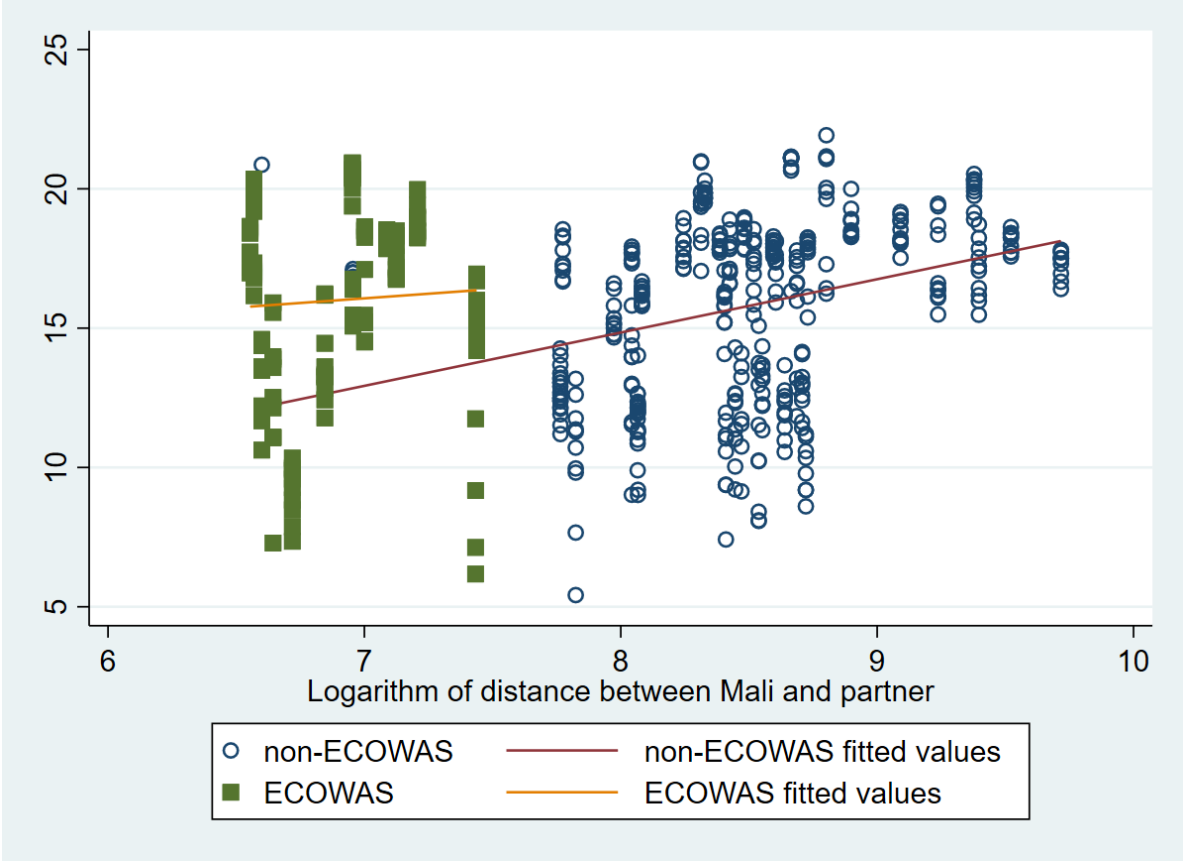

Figure 24 Relationship between logarithm of trade (y axis) and distance (x axis)

At the outset of the econometric analysis, there is a need to test and compare models for estimating coefficients of the independent variables with total trade as the dependent variable and dependent variables as described in equation (3),

$$\ln X_{MALI,PARTNER,t} = G + a_1 \ln GDP_{MALI,t} + a_2 \ln GDP_{PARTNER,t} + a_3 \ln D_{MALI,PARTNER} + a_4 B_{PARTNER} + a_5 ECOWAS_{PARTNER,t} + \varepsilon_{it}$$

Results for the FE, BE, RE and OLS model are reported in Table 4.

Table 3 Estimation results for different models for total trade

$\ln X_{MALI,PARTNER,t}$	FE model	BE model	RE model	OLS model
$\ln GDP_{PARTNER,t}$	0.73	1.22***	1.09***	0.73*
	(0.51)	(0.16)	(0.15)	(0.32)
$\ln GDP_{MALI,t}$	1.11**	-6.93	0.90***	1.11***
	(0.39)	(11.2)	(0.25)	(0.26)
$\ln D_{MALI,PARTNER}$	-0.34***	-0.19	-0.59	-0.34***
	(0.055)	(0.73)	(0.31)	(0.066)
$B_{PARTNER}$		2.68**	3.03**	-0.36
		(0.95)	(0.96)	(1.54)
$ECOWAS_{PARTNER,t}$		2.54*	0.73	-0.16
		(1.15)	(0.68)	(0.37)
G	-25.5**	146.5	-28.4***	-26.0***
	(8.13)	(259.4)	(6.52)	(6.23)
R^2	0.192	0.674		0.914
Adjusted R^2	0.188	0.640		0.903

Note: Standard errors in parentheses. * denote statistical significance at the 5% level, ** at the 1% level, *** at the 0,1% level

While the four estimations produce different results in term of significance for partner GDP, each estimation produce positive and quite similar coefficients. Notably, the fixed effects model does not give a significant result, but standard deviations stay within positive territory. Estimation results for Mali's GDP are significant and positive for most models, except for the between-effects model, where the coefficient is insignificant and quite high in a negative direction, yet with even bigger standard errors. For the other models, results are significant and rather close to each other. GDP has a positive effect on

trade, consistent with expectations. Results for the distance variable from the fixed effects model are significant at the 0.1% level, as also for the OLS model. As expected, all models give negative signs for the coefficient for distance. The adjacency dummy is significant and positive for the between- and the random effects model, and insignificant and negative for the OLS model. The ECOWAS dummy is significant and positive in the between-effects model, insignificant and positive in the random effects model and insignificant and negative in the OLS model. Thus, for the more trusted model, the stronger are the indicators that the ECOWAS effect is in fact positive. Adding an ECOWAS dummy term to the fixed effects (not reported), that would only capture the one observation for Mauritania, produces an insignificant coefficient for the dummy and gives only negligible changes in the coefficients for the other independent variables and the R-square. If we are to believe the results from the between-effects model, by being member of ECOWAS, a country could expect its trade with Mali to increase by 1167%, while the equivalent result for the random effects model is 107%. While it is too early to pass judgement on how big the effect is, this initial analysis indicates that being member of ECOWAS does in fact influence trade.

In terms of explanatory power as measured by the R-square is the OLS model, the between-effects model performs above 60%, while the fixed effects model's R-square at 19% leaves much to be explained. The difference between the fixed effects and the between-effects models could come from the fact that the between-effects model includes two time-invariant dummy variables that are significant and have large coefficients. As the fixed effects model gives standard deviation of residuals for each group of 2,46, we should not be tempted to treat the OLS model results as authoritative despite its high R-square. The between-effects model expressed here, with log of total trade as the dependent variable and using the full dataset is the base model, serves as reference when we introduce variations later.

Next, I study the effect of adding other dummy variables: sharing currency with Mali, sharing French as an official language, being a former French colony and being landlocked. Starting by looking at correlation coefficients between the six total dummy variables, there are some unsurprising observations. The highest correlation (65,44%) is found for the ECOWAS and the currency dummy, which should be expected as the countries that share the CFA currency with Mali are all part of

ECOWAS and form an "inner circle of economic integration" of ECOWAS countries who are also in a monetary union. Next, the correlation between currency and adjacency (51,05%) and currency and French (48,43%) tells us that this monetary is indeed an "inner circle" in geographical terms, and reflects a political reality that ECOWAS is divided in a former French colony block and a former English colony block. There are expected correlations between colony and adjacency (48,38%), French and colony (48,21%) and ECOWAS and adjacency (45,55). The couple ECOWAS and adjacency is interesting to discuss, as adjacency may capture an intermediary level of "closeness" to Mali between the ECOWAS partners and the rest of Africa. Mali is climatically, geographically, ethnically, and linguistically divided between a populous South with the commercial hub Bamako, that is oriented towards its southern neighbors who are French speaking ECOWAS member, and the rural, vast, and arid North that is oriented towards the Arab speaking North-African neighbors who, in turn, are part of trading communities in the Arab world and not ECOWAS. Thus, adjacency could be a measure to capture the effect of northern Mali being oriented towards its Arab neighbors. On the other hand, the trade flows that take place in the northern "sphere of interest" are likely to be lower, as the population is much lower, and much trade is likely to be undeclared as much of northern Mali is outside the governments control.

The estimation results show some variation across the dummies included. As reported in Table 4, model (2) is the same as the base model (1), but without the adjacency dummy. The effect of omitting adjacency on the other variable coefficients is modest. The variables remain at the same thresholds of significance as previously, with the same signs and mostly with quite similar coefficient values, except for the distance variable. Importantly, there is big effect on the ECOWAS dummy from including the adjacency, and the model is better at explaining the causes of trade, so the variable should be included. We see that the R-square is somewhat lower, so we have lost some explanatory power.

The same is not the case for model (3), where we include the currency, or the WAEMU dummy. This affects the ECOWAS dummy as it loses significance, and its coefficient becomes lower. Likely for reasons mentioned above, some of the effect of being in ECOWAS is rather explained by the currency union. Also, the currency dummy is not significant. This makes it interesting to look at how the model would look if we detached the two groups by making a new dummy variable for being part of ECOWAS

Table 4 Estimation results for alternative specifications of the between-effects model

BE models ln $X_{MALI,PARTNER,t}$	(1)	(2)	(3)	(4)	(5)
ln $GDP_{PARTNER,t}$	1.22***	1.31***	1.23***	1.22***	1.23***
	(0.16)	(0.17)	(0.16)	(0.17)	(0.16)
ln $GDP_{MALI,t}$	-6.93	-4.93	-5.51	-8.31	-5.51
	(11.2)	(11.9)	(10.9)	(11.7)	(10.9)
ln $D_{MALI,PARTNER}$	-0.19	-0.91	-0.33	-1.46*	-0.33
	(0.73)	(0.73)	(0.72)	(0.64)	(0.72)
$B_{PARTNER}$	2.68**		2.07*	2.54*	2.07*
	(0.95)		(0.99)	(1.05)	(0.99)
$ECOWAS_{PARTNER,t}$	2.54*	2.59*	1.59		
	(1.15)	(1.22)	(1.23)		
$WAEMU_{PARTNER,t}$			1.99		3.58**
			(1.09)		(1.25)
$ECOWASonly_{PARTNER,t}$				-0.58	1.59
				(1.04)	(1.23)
G	146.5	103.9	114.3	189.4	114.3
	(259.4)	(276.5)	(253.9)	(270.7)	(253.9)
R^2	0.674	0.621	0.696	0.643	0.696
Adjusted R^2	0.640	0.590	0.657	0.606	0.657

Note: Standard errors in parentheses. * denote statistical significance at the 5% level, ** at the 1% level, *** at the 0,1% level

without being part of the WAEMU. In the group of ECOWAS, but not WAEMU members, or ECOWAS-only group, we find non-French speaking, non-adjacent countries (except Guinea) that trade with Mali on ECOWAS terms, but who are not as closely integrated with Mali as the WAEMU countries are. This may be a better measure of ECOWAS membership as a proxy for the effects of the AfCFTA, as the ECOWAS-only countries have trade conditions with Mali that more closely resembles what the AfCFTA will be. When we use the ECOWAS-only dummy in model (4), we get counter-intuitive results with a negative sign for being in ECOWAS that makes one wonder if this specification makes sense. However, by including the WAEMU dummy in model (5), things look clearer. As one could expect, the results are identical to model (3) for all variables except the WAEMU dummy, that now get significant and bigger coefficients. Now, there is also a logic to the story, that the deepest level of integration in WAEMU has a bigger and more significant effect tan the relatively less deep integration in ECOWAS only. This is an interesting observation for the thesis. It may give a deeper understanding of ECOWAS as a proxy for the AfCFTA, and a clearer view of what the effect of being in ECOWAS is. Model (5) challenges the partial conclusion from our first set of models by defining a model that explains trade better, where ECOWAS membership no longer has a significant effect on trade, yet still has positive coefficient, but less so than in model (1). Introducing more dummy variables for language, colony and being landlocked in the model does not yield significant coefficients, and as we also know that there are issues with collinearity, there is no strong argument to include these further.

5.2. Estimating the GMT with variations in data samples

Having studied different variables to include, another topic to look closer at is data selection. We have a set of 54 countries in our base selection, with some from ECOWAS, some from non-ECOWAS Africa and some non-African. With inspiration from other similar studies (Charles, 2021), it would be interesting to see how results would change if we include African countries only, i.e., leave out the non-African category. Also, given the big share of total trade for a very limited number of countries who import gold from Mali, I would also look compare results when gold importers South Africa, UAE and Switzerland are excluded. Results are reported in Table 6.

Table 5 Estimation results for different sample selections

BE models	Full sample		African countries only		Gold importers excluded	
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln X_{MALI,PARTNER,t}$						
$\ln GDP_{PARTNER,t}$	1.22***	1.23***	1.42***	1.47***	1.18***	1.20***
	(0.16)	(0.16)	(0.31)	(0.30)	(0.15)	(0.15)
$\ln GDP_{MALI,t}$	-6.93	-5.51	-0.38	1.93	-5.57	-4.17
	(11.2)	(10.9)	(13.6)	(13.2)	(10.3)	(9.99)
$\ln D_{MALI,PARTNER}$	-0.19	-0.33	-1.16	-1.54	-0.12	-0.26
	(0.73)	(0.72)	(1.38)	(1.36)	(0.68)	(0.66)
$B_{PARTNER}$	2.68**	2.07*	2.29	1.52	2.80**	2.20*
	(0.95)	(0.99)	(1.19)	(1.23)	(0.88)	(0.91)
$ECOWAS_{PARTNER,t}$	2.54*		2.00		2.79*	
	(1.15)		(1.79)		(1.06)	
$ECOWAS\ ex\ WAEMU_{PARTN}$		1.59		0.75		1.85
		(1.23)		(1.87)		(1.13)
$WAEMU_{PARTNER,t}$		3.58**		2.91		3.80**
		(1.25)		(1.81)		(1.15)
Constant	146.5	114.3	-2.76	-54.4	114.9	83.3
	(259.4)	(253.9)	(313.6)	(304.5)	(238.9)	(232.3)
R^2	0.674	0.696	0.617	0.655	0.712	0.735
Adjusted R^2	0.640	0.657	0.548	0.578	0.680	0.699

Note: Standard errors in parentheses. * denote statistical significance at the 5% level, ** at the 1% level, *** at the 0,1% level

Overall, models (3) and (4) for African countries only have lost significance for several variables, as compared to the baseline models (1) and (2). Trade data in this sample is dominated by South African gold imports, followed by trade with local economic hubs Senegal and Ivory Coast, who are both border countries, and ECOWAS and WAEMU members, and provide several important goods to Mali, like energy. The lower R-square for models (3) and (4) also indicate that our specifications are not performing as well for the sample with African countries only. Like for other data samples and model specifications, we also see here that the between-effects models manage to obtain significant coefficient estimates for partner GDP that are consistent with theory. Also, like other data samples and model specifications, this is not the case for Mali GDP, however, estimation results are closer to zero (3) and positive (4). While results are weak and insignificant, we can note that the effect of ECOWAS (3), ECOWAS only (4) and currency union (4), are all lower for the African sample than in the full sample. To take the ECOWAS only variable as an example, this would translate to mean that the effect of being in ECOWAS on trade with Mali, is bigger when comparing with non-ECOWAS countries in the full sample than with African countries only. But again, the results are not significant, and standard errors are large enough that the opposite result is also plausible.

The story is somewhat clearer in model (5) and (6), where gold importers are excluded. Estimation results for GDP and distance variables are closely similar to the base models, with a slight reduction in values for all variables. However, unlike the African sample, this sample gives significant WAEMU membership coefficient, more precise estimations for our dummy variables, and higher R-square values. This is understandable when we see in Figure 25 how the gold importers are outliers when it comes to trade value, making the sample more dispersed. Importantly, looking at the value of the ECOWAS only dummy, it is more precisely estimated in model (6) than in model (2), going from a p-value of 0,204 to 0,110. The value for the ECOWAS only dummy is also higher, and we are getting closer to being able to argue that the value of ECOWAS only is in fact positive, as confidence intervals narrow down. While the trade statistics become prettier when we disregard Mali's dominant source of exports, we also get a distorted view of reality. Excluding gold exports means that the models (5) and (6) mostly account for imports. Imports are interesting by itself, but from Mali's perspective, the most

interesting aspect of being part of an FTA is how this contributes to stimulating exports. Thus, it is interesting to do estimates for trade disaggregated by imports and exports.

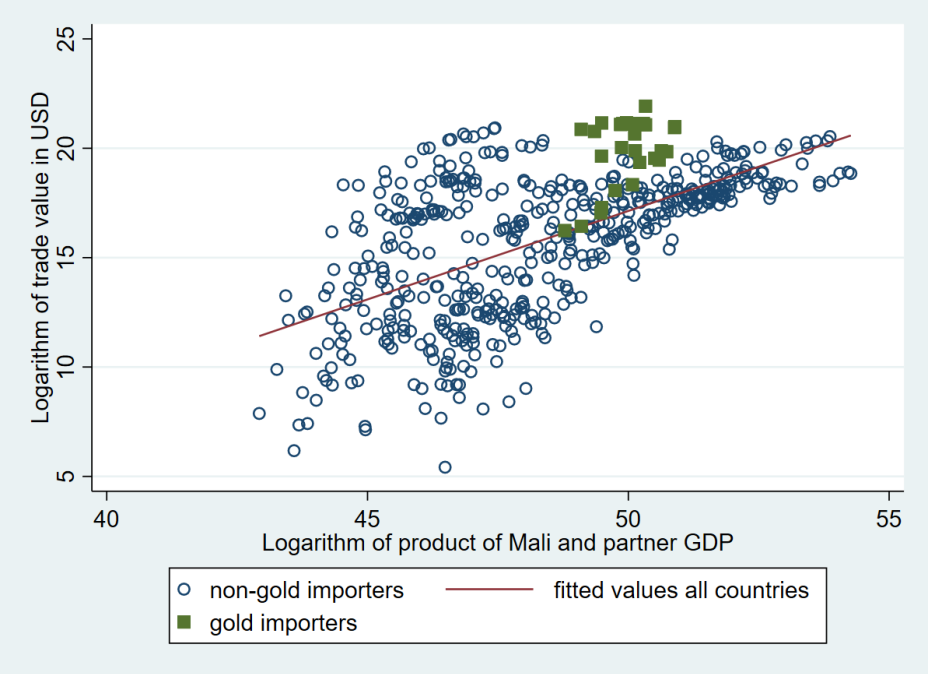

Figure 25 plotting logarithm of trade value and GDP with gold importers highlighted

Estimation results for different data selections with respect to exports and imports are reported in Table 6. There are big differences in results between export and import data, and there are big differences between models for each dataset. The difference in results between models is not a big concern, but rather a sign that the PPML model that has been introduced is a more suitable model. The difference between export and import data, on the other hand, reveals interesting traits about Mali's trade patterns that gives statistical support for some more general arguments on how ECOWAS membership affects, and how we can expect the AfCFTA to affect, Mali's trade. A significant and negative coefficient for ECOWAS-only serves to further underscore that being part of an FTA is of little help when the gold market is the factor that dictates the terms for Mali's exports. One immediate observation is that the specification in the PPML model (2) is able to describe exceptionally little of Mali's exports, with an R-square of 0,023. It is understandable that the GMT with our specification fails

Table 6 Estimate results for exports and imports as dependent variables

	(1)	(2)	(3)	(4)	(5)
Model	BE	PPML	PPML	BE	PPML
Dependent variable	ln EXP	EXP	EXP	ln IMP	IMP
Sample	Full sample	Full sample	Gold importers excluded	Full sample	Full sample
ln $GDP_{PARTNER,t}$	0.99***	0.13*	0.27**	1.34***	0.64***
	(0.18)	(0.064)	(0.088)	(0.14)	(0.041)
ln $GDP_{MALI,t}$	2.01	1.43	1.10**	3.68	0.45
	(3.19)	(0.77)	(0.38)	(5.40)	(0.23)
ln $D_{MALI,PARTNER}$	-0.55	0.044	0.93**	-0.63	0.021
	(0.84)	(0.44)	(0.31)	(0.67)	(0.18)
$B_{PARTNER}$	2.71*	0.076	2.00***	1.30	0.39
	(1.19)	(0.35)	(0.20)	(0.94)	(0.26)
$ECOWAS\ ex\ WAEMU_{PARTNER,t}$	1.04	-2.47***	1.09***	1.60	0.67
	(1.57)	(0.57)	(0.32)	(1.21)	(0.37)
$WAEMU_{PARTNER,t}$	2.65	-0.25	2.60***	4.10**	3.74***
	(1.52)	(0.44)	(0.30)	(1.19)	(0.32)
G	-54.3	-19.1	-24.8**	-99.9	-10.3
	(75.3)	(19.3)	(8.80)	(125.4)	(5.86)
Observations	469	469	439	508	508
R^2	0.513	0.023	0.291	0.721	0.442
Adjusted R^2	0.451			0.685	

Note: Standard errors in parentheses. * denote statistical significance at the 5% level, ** at the 1% level, *** at the 0,1% level

to describe Mali's exports when a very small group of three gold importers, who are not part of ECOWAS and have varying distance and GDP, make up around 80% of Mali's export value across the selection and time period. The data simply show that Mali's exports are very little diversified. Once again, it is useful to exclude gold importers from the selection to get a sense of Mali's export marked without taking account of the gold trade. In the model without gold importers (3), all estimation results are significant, and with the exception of the distance variable, consistent with theory. The model is better at explaining the factors that influence trade, but the explanatory power remains modest with an R-square of 0,291. The results indicate that Mali's exports that are not gold, are in fact affected by adjacency, being part of ECOWAS only and being part of WAEMU. This difference in results between Mali's gold dominated total trade and the non-gold trade is an important observation with implications for AfCFTA, and more generally, Malian trade policy and economic integration. Looking at imports in model (5), results differ greatly from total exports. While the estimation results for imports are not all that strong, they somewhat indicate that ECOWAS membership has a positive effect on imports. The R-square of 0,442 is higher than for exports without gold importers, but still modest.

5.4. Research question, hypotheses, and quantitative arguments

The conclusions that can be reached based on the above analysis are restricted by the robustness of the methods that have been used. Data restrictions have prevented use of the more refined "theoretical" models for estimating GMT models, and also the fixed effects model that otherwise would have been the model of choice. Thus, the results suffer from potential shortages, such as inconsistencies in estimation, and are not as authoritative as they otherwise could have been.

The main question in the analysis was whether being part of ECOWAS have had an effect on Mali's trade in total. My main hypothesis for the research question was that Mali's trade is not very sensitive to being part of ECOWAS. The results are ambiguous, but weakly suggests a positive effect of being in ECOWAS. The most reliable model estimation that has been tested is the between-effects model with both an ECOWAS-only and a WAEMU dummy variable. The coefficient estimates for being part of ECOWAS-only is positive but not significant, thus the actual value is highly uncertain, and a negative value cannot be ruled out. However, the results indicate more strongly that being part of the

WAEMU, an inner layer of economic integration within ECOWAS, has had a positive effect on total trade. Thus, it is possible to argue based on the available data, that the economic integration that has taken place in Western Africa, with Mali's participation, has contributed to increasing Mali's total trade. This finding sits well with economic theory, as we should expect that deeper integration would lead to more trade. However, this result does not translate that easily into an argument on the effect of AfCFTA, as the WAEMU is a deeper form of economic integration and should not be used for comparison with the AfCFTA.

It is not so easy to claim that we have found a sound argument for that AfCFTA will positively influence Mali's overall trade. Looking closer at sections of Mali's international trade enables us to draw clearer conclusions. Acknowledging that Mali's trade, and certainly exports, are dominated by gold exports, it has been necessary to look at different model specifications that give an impression of Mali's trade without results being dominated by the weight of the gold trade. First, we have looked at all trade excluding trade with gold importing countries. This has given indications that the effect of being in ECOWAS is slightly higher when gold trade is excluded. However, coefficient estimates have remained insignificant. Coefficient estimates for currency union were also higher (and significant) with gold excluded. Thus, it appears that the gold trade is less impacted by economic integration and trade agreements, which could be expected.

Decomposing Mali's trade into exports and imports allow for using more robust method with Poisson Pseudo-Maximum-Likelihood models and gives three interesting and important results. Firstly, the export sector as a whole does not show any signs of benefiting from ECOWAS membership and the logic of the GMT model is not able to give any meaningful explanation of Mali's export market. Secondly, results clearly show that this is caused by the gold exports. Once gold is excluded, the estimated effect of being part of ECOWAS on exports is significant and positive. Yet, the R-square remains low. Thirdly, looking at imports, we get the same kind of results that we have gotten from previous models for total trade. The coefficient for the ECOWAS dummy has a positive sign, but is insignificant, while the coefficient for WAEMU is higher and significant. This brings us back to the

argument made for total trade, that it is likely that economic integration has had an effect on imports, but we cannot say for certain that the ECOWAS membership in itself has had a positive effect.

By estimating the effect of being part of ECOWAS on Mali's trade, and using ECOWAS as a simulation for AfCFTA, given that the two FTAs comprise similar trade policies, a few arguments can be made. Here, it is also important to remind that the integration through WAEMU, which is a tighter form of integration than ECOWAS and the AfCFTA, is where the biggest effect is found. Mali's export sector should not expect significant benefits from the AfCFTA, as long as Mali's exports remain dominated by gold exports. However, there may be a potential of AfCFTA for benefitting Mali's remaining export sectors. The actual effect will likely be heavily dependent on Malian policy and the government's ability to diversify the Malian exports. The expected effect of the AfCFTA on Mali's import sectors remains opaque. The evidence of being in ECOWAS having a positive effect on imports are not unequivocal. As for the effect of any increase in imports on Mali's economy in general, it would likely be more indirect than the effect from exports, as increased imports would count negatively in the GDP balance sheet but could stimulate the Malian economy as production factors would become cheaper.

6. Conclusions

This thesis studies whether Mali can expect increased trade from entering into the proposed African Continental Free Trade Agreement. The strategy for generating arguments is to answer the research question of whether ECOWAS integration has led to increased trade for Mali. We have seen that Mali is a poor African country with a low level of economic and human development. These factors both motivates the study and contributes to curbing expectations of how much Mali could benefit from the AfCFTA. It motivates the study because it underscores Mali's need for development and increased economic opportunities such as trade. The results from this thesis are thought to inform the Norwegian government on the relationship between economic development in Mali and the AfCFTA, as development in the Sahel region is recognized as a strategic objective by the Norwegian government and the government points to the AfCFTA as a policy that may have a positive impact on trade in Mali.

Low levels of economic and human development curbs expectations for the AfCFTA because it makes Mali disadvantaged compared to other African economies that compete for trade within the framework of the trade agreement. In the context of trade opportunities, the most important expression of Mali's lacking development is its homogenous export sector dominated by gold exports.

Econometric analysis of trade data based on the gravity model of trade is not able to establish a significant positive effect of being part of the regional FTA ECOWAS for Mali's trade. This result is the most important conclusion from this thesis and is in line with the thesis' main hypothesis. It also allows for the argument that since Mali's trade is currently not benefiting from an FTA with its surrounding countries, we should not anticipate an important effect for Mali's trade of participating in the AfCFTA. However, results indicate that Mali's trade benefits from being part of the WAEMU, a deeper level of trade integration. This implies that Mali's trade is in fact sensitive to economic integration and trade policy but may indicate that AfCFTA is not a sufficiently deep form of integration to give a significant effect on Mali's trade.

Decomposing trade data into exports and imports reveal much of why the effect of being in ECOWAS is lacking. Gold exports plays counter to economic intuitions behind the GMT, and dominates overall results, due to its important role in Mali's trade. While ECOWAS membership has a significant

and positive effect on Mali's exports with gold trade excluded, the effect is significant and negative with gold exports included. Results for imports remain insignificant. In addition to influencing the effect of being in ECOWAS on trade, Mali's big reliance on gold makes the country's exports rigid and likely less able to take advantage of new opportunities for trade as obstacles disappear under the AfCFTA.

While this thesis treats Malian trade and trade policy through the lens of economics, one comment related to policy can be made. Mali, under the rule of a military junta, is currently distancing itself from traditional partners, ECOWAS, and liberal economic policies. Mali is suspended from ECOWAS and engaged in a political and judicial tug-of-war with the ECOWAS states. Mali is subject to economic sanctions, and in a tighter partnership than ever before with Russia, a country that is also undergoing a rupture in terms of multilateral relations and subject to comprehensive sanctions. The question for the AU and West African countries then becomes the following: how to present AfCFTA to Mali in a way that makes it appear as an attractive project? If countries like Mali, that on economic and political grounds are the most marginalized countries on the continent, does not see a clear benefit from the AfCFTA, one could not expect them to be enthusiastic about the agreement. This reveals a challenge for the AU to shape and communicate trade policy in a way such that the less influential countries also will come onboard.

Further quantitative research should aim to make use of more ambitious models and data gathering methods. This would enable more robust findings. However, access to more detailed data on Mali's trade is likely to continue to be challenging. Once the AfCFTA comes into effect, it will also become possible to test the effect of AfCFTA more directly and empirically. Before that time, studies on domestic economic policy in Mali and their potential for diversifying Mali's exports would give important insights into Mali's possibilities for growth outside the gold sector, especially as results indicate that Mali's exports excluded gold shows signs of being more sensitive to trade policy. On a more general level, political analysis of African trade policy towards least developed countries could shed important light in on the debate on economic versus political objectives for the AfCFTA, and the likelihood of reaching the objectives.

References

Abrego, L., Zamaróczy, M. d., Gursoy, T., Issoufou, S., Nicholls, G. P., Perez-Saiz, H., & Rosas, J.-N. (2020). *The African Continental Free Trade Area: Potential Economic Impact and Challenges* (IMF Staff Discussion Note, Issue.

African Union. (2018). *Agreement Establishing the African Continental Free Trade Area*. Kigali, Rwanda Retrieved from https://ecotis.projects.ecowas.int/wp-content/uploads/2020/05/Agreement-establishing-the-AfCFTA-Consolidated-text-signed-21-March-2018.pdf

African Union. (2022). *Regional Economic Communities (RECs)*. Retrieved January 25 2022 from https://au.int/en/organs/recs#:~:text=The%20Regional%20Economic%20Communities%20(RECs,regional%20groupings%20of%20African%20states.&text=Generally%2C%20the%20purpose%20of%20the,the%20Abuja%20Treaty%20(1991).

Anderson, J. E., & van Wincoop, E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. *American Economic Review*, *93*(1), 170-192.

Baier, S. L., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? *Journal of International Economics*, *71*(1), 72-95. https://doi.org/10.1016/j.jinteco.2006.02.005

Baier, S. L., & Bergstrand, J. H. (2009). Bonus vetus OLS: A simple method for approximating international trade-cost effects

using the gravity equation. *Journal of International Economics*, *77*(1), 77-85. https://doi.org/10.1016/j.jinteco.2008.10.004

Batra, A. (2006). India's Global Trade Potential: The Gravity Model Approach. *Global Economic Review*, *35*(3), 327-361. https://doi.org/10.1080/12265080600888090

Bayale, N., Ibrahim, M., & Atta-Mensah, J. (2020). Potential trade, welfare and revenue implications of the African Continental Free Trade Area (AfCFTA) for Ghana: An application of partial equilibrium model. *Journal of Public Affairs*. https://doi.org/https://doi.org/10.1002/pa.2385

Bhagwati, J. (1991). *The World Trading System at Risk*. Princeton University Press.

Bhagwati, J. (1995). US Trade Policy: The Infatuation with Free Trade Agreements. In J. Bhagwati & A. Krueger (Eds.), *The Dangerous Drift to Preferential Trade Agreements*. AEI Press.

Bhagwati, J. (2008). *Termites in the Trading System: How Preferential Agreements Undermine Free Trade*. Oxford University Press. https://EconPapers.repec.org/RePEc:oxp:obooks:9780195331653

Byers, J. A. (1997). *Great Circle Distances Between Capital Cities*

Central Bank of West African States (BCEAO). (2022). *Balance des paiements et position extérieure globale du Mali - 2020*. https://www.bceao.int/fr/publications/balance-des-paiements-et-position-exterieure-globale-du-mali-2020

Central Intelligence Agency. (2022). *Mali*. https://www.cia.gov/the-world-factbook/countries/mali/

Charles, F. D. (2021). African continental free trade area: Is there a trade potential for Côte d'Ivoire? *Cogent Economics & Finance*, *9*(1). https://doi.org/10.1080/23322039.2021.1915932

De Benedictis, L., & Salvatici, L. (2011). The Gravity Model in International Trade. In L. De Benedictis & L. Salvatici (Eds.), *The Trade Impact of European Union Preferential Policies*. Springer. https://doi.org/https://doi.org/10.1007/978-3-642-16564-1_4

Encyclopaedia Britannica. (2019). Trade Agreement. In.

Gavin, B., & Van Langenhove, L. (2003). Trade in a world of regions. In G. P. Sampson & S. Woolcock (Eds.), *Regionalism Multilateralism and Economic Integration: The Recent Experience*. United Nations University Press.

Gérout, G., MacLeod, J., & Desta, M. (2019). The AfCFTA as yet another experiment towards continental integration. In D. Luke & J. MacLeod (Eds.), *Inclusive Trade in Africa: The African Continental Free Trade Area in Comparative Perspective*. Routledge.

Global Initiative Against Transnational Organized Crime. (2022). *West Africa Risk Bulletin* 3). https://globalinitiative.net/analysis/weaobs-risk-bulletin-3/

Government of Norway. (2018a). *Meld.St. 17: Partnerland i utviklingspolitikken*.

Government of Norway. (2018b). *Strategi for innsats i Sahel-regionen*. Retrieved from https://www.regjeringen.no/no/dokumenter/strategi_sahel/id2610507/
Government of Norway. (2021a). *Norad's strategy towards 2030*.
Government of Norway. (2021b). *St.Prp. nr. 1*.
Government of Norway. (2021c). *Strategi for norsk innsats i Sahelregionen (2021–2025)*. Retrieved from https://www.regjeringen.no/contentassets/3b9a879f14f943a69edd1d54ab3f6583/sahelstrategi_ny.pdf
Hausman, J. A., & Taylor, W. E. (1981). Panel Data and Unobservable Individual Effects. *Econometrica*, *49*(6), 1377-1398. https://www.jstor.org/stable/1911406
Hoekman, B., & Kostecki, M. M. (2009). *The Political Economy of the World Trading System* (third ed.). Oxford University Press. https://EconPapers.repec.org/RePEc:oxp:obooks:9780199553778
International Monetary Fund. (2019). *Regional economic outlook. Sub-Saharan Africa: recovery amid elevated uncertainty*. International Monetary Fund.
International Monetary Fund. (2020). *Database—WEO Groups and Aggregates Information*. Retrieved November 28, 2021 from https://www.imf.org/external/pubs/ft/weo/2020/01/weodata/groups.htm#oem
International Monetary Fund. (2021). *World Economic Outlook* https://www.imf.org/en/Publications/WEO/weo-database/2021/October
Kepaptsoglou, K., Karlaftis, M. G., & Tsamboulas, D. (2010). The Gravity Model Specification for Modeling International Trade Flows and Free Trade Agreement Effects: A 10-Year Review of Empirical Studies *The Open Economics Journal*, *3*, 1-13.
Krugman, P. R., Obstfeld, M., & Melitz, M. J. (2018). *International Economic Theory and Policy* (11th ed.). Pearson.
Leamer, E. E., & Levinsohn, J. (1995). *International Trade Theory: The Evidence*. National Bureau of Economic Research,.
Levy, P. I. (1997). A Political-Economic Analysis of Free-Trade Agreements. *The American Economic Review*, *87*(4), 506-519. http://www.jstor.org/stable/2951361
Luke, D. (2019). Making the case for the African Continental Free Trade Area. In D. Luke & J. MacLeod (Eds.), *Inclusive Trade in Africa: The African Continental Free Trade Area in Comparative Perspective*. Routledge.
Martinez-Zarzoso, I. (2003). Gravity model: An application to trade between regional blocs. *Atlantic Economic Journal*, *31*(2), 174-187. https://doi.org/10.1007/BF02319869
Ndonga, D., Laryea, E., & Chaponda, M. (2020). Assessing the Potential Impact of the African Continental Free Trade Area on Least Developed Countries: A Case Study of Malawi. *Journal of Southern African Studies*, *46*(4), 773-792. https://doi.org/10.1080/03057070.2020.1767888
Nsaibia, H., & Weiss, C. (2020). The End of the Sahelian Anomaly: How the Global Conflict between the Islamic State and al-Qa`ida Finally Came to West Africa. *CTC Sentinel*, *13*(7), 1-14. https://ctc.usma.edu/wp-content/uploads/2020/07/CTC-SENTINEL-072020.pdf
Pasara, M. T. (2020). An overview of the obstacles to the African economic integration process in view of the African continental free trade area. *Africa Review*, *12*(1), 1-17. https://doi.org/10.1080/09744053.2019.1685336
Pasara, M. T., & Dunga, S. H. (2020). Who Wins and Who Loses under the AfCFTA? A Simulation Analysis Across Ecowas Countries. *International Journal of Economics and Finance Studies*, *12*(2), 487-504. https://doi.org/10.34109/ijefs.202012215
Sampson, G. P. (2003). Introduction. In G. P. Sampson & S. Woolcock (Eds.), *Regionalism, multilateralism and economic integration: the recent experience*. United Nations University Press.
Saygili, M., Peters, R., & Knebel, C. (2018). *African Continental Free Trade Area:: Challenges and Opportunities of Tariff Reductions* (UNCTAD Research Paper No. 15, Issue. https://unctad.org/system/files/official-document/ser-rp-2017d15_en.pdf
Silva, J. M. C. S., & Tenreyo, S. (2006). The Log of Gravity. *The Review of Economics and Statistics*, *88*(4), 641–658.

Tinbergen, J. (1962). *Shaping the World Economy: Suggestions for an International Economic Policy*. The Twentieth Century Fund.
UNCTAD. (2018). *Policy Brief No. 67* https://unctad.org/webflyer/african-continental-free-trade-area-day-after-kigali-summit
United Nations. (2016). *The Gravity Model of International Trade: A User Guide*.
United Nations. (2021a). *Least Developed Countries*. Retrieved November 28, 2021 from https://www.un.org/development/desa/dpad/least-developed-country-category.html
United Nations. (2021b). UN Comtrade. In.
United Nations. (2022). *UN Map No. 4533*. https://www.un.org/geospatial/content/west-africa
United Nations Development Programme. (2020). *Human Development Report 2020*. http://hdr.undp.org/sites/default/files/hdr2020.pdf
Viner, J. (1950). *The Customs Union Issue*. Carnegie Endowment for International Peace.
Witschge, L. (2018). *African Continental Free Trade Area: What you need to know*. aljazeera.com. Retrieved November 7th from https://www.aljazeera.com/economy/2018/3/20/african-continental-free-trade-area-what-you-need-to-know
Woolcock, S. (2003). A framework for assessing regional trade agreements: WTO-plus. In G. P. Sampson & S. Woolcock (Eds.), *Regionalism, multilateralism and economic integration: the recent experience*. United Nations University Press.
World Bank. (2022). *World Development Indicators*
World Gold Council. (2022). *Gold prices*. Retrieved 20 February from https://www.gold.org/goldhub/data/gold-prices

Appendix

Table 7 *Countries included in the database, ranked by biggest trading partners*

ECOWAS	Top 20 non-ECOWAS Africa	TOP 20 non-African
Senegal*	South Africa	United Arab Emirates**
Côte d'Ivoire*	Morocco	Switzerland
Niger*	Mauritania	China
Burkina Faso*	Egypt	France
Benin*	Tunisia	Bangladesh
Ghana	Algeria	India
Guinea	Uganda	Germany
Togo*	Namibia	USA
Nigeria	Ethiopia	Italy
Gambia	Eswatini	Japan
Liberia	Kenya	Brazil
Sierra Leone	Libya	Turkey
Cabo Verde	Cameroon	Russian Federation
Guinea-Bissau*	Chad	Spain
	United Rep. of Tanzania	Netherlands
	Gabon	Belgium
	Dem. Rep. of the Congo	Finland
	Congo	Malaysia
	Mozambique	Australia
	Burundi	Ukraine

*Also WAEMU members
**As per data reported by the UAE

Table 8 *Trade value and GDP for the selection*

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Algeria	Total trade value	Million USD	2,6	3,3	7,3	4,7	13,5	3,7	2,3	2,6	3,9	16,3
	Exports to partner		1,7	2,0	2,4	3,1	11,6	1,9	0,0	0,0	-	0,0
	Imports from partner		0,9	1,3	4,9	1,5	1,9	1,8	2,3	2,6	3,9	16,3
	GDP Partner	Billion USD	117,0	135,0	171,0	161,2	200,0	209,1	160,0	170,2	175,4	171,1
Australia	Total trade value	Million USD	13,3	23,1	17,3	51,8	49,5	54,6	40,0	32,8	39,5	40,6
	Exports to partner		0,7	0,0	0,0	0,4	0,1	0,7	5,3	1,3	1,1	8,4
	Imports from partner		12,6	23,1	17,3	51,4	49,3	53,9	34,7	31,6	38,3	32,2
	GDP Partner	Billion USD	781,3	947,9	1 055,5	1 251,9	1 513,7	1 569,3	1 266,2	1 385,2	1 421,2	1 392,3
Bangladesh	Total trade value	Million USD	12,7	13,7	5,3	16,4	9,7	10,3	94,0	130,2	284,3	259,0
	Exports to partner		12,4	11,8	5,2	16,1	9,4	10,2	83,3	111,2	283,9	258,6
	Imports from partner		0,2	1,8	0,1	0,3	0,3	0,1	10,7	19,0	0,4	0,3
	GDP Partner	Billion USD	71,8	79,6	91,6	115,3	128,6	133,3	221,4	249,7	273,3	302,4
Belgium	Total trade value	Million USD	49,3	97,6	92,8	76,9	61,7	54,9	79,2	57,2	55,1	54,4
	Exports to partner		4,7	30,4	6,4	7,0	13,2	6,5	5,0	3,9	5,0	3,1
	Imports from partner		44,6	67,2	86,4	69,9	48,6	48,3	74,2	53,3	50,0	51,3
	GDP Partner	Billion USD	408,3	471,0	517,3	481,8	523,2	496,5	475,9	502,6	543,9	533,3
Benin	Total trade value	Million USD	165,6	99,0	89,2	473,1	270,6	176,2	106,4	83,4	173,3	106,2
	Exports to partner		1,8	1,5	14,6	5,4	16,6	3,9	5,6	3,6	17,2	1,4
	Imports from partner		163,8	97,5	74,6	467,7	253,9	172,3	100,8	79,8	156,1	104,7
	GDP Partner	Billion USD	7,0	8,2	9,8	9,5	10,7	11,1	11,8	12,7	14,3	14,4
Brazil	Total trade value	Million USD	49,7	42,4	59,9	67,0	76,8	58,0	46,5	67,9	52,4	88,0
	Exports to partner		11,9	6,0	1,1	0,1	0,3	0,3	0,1	0,0	0,1	0,9
	Imports from partner		37,8	36,4	58,8	67,0	76,5	57,7	46,4	67,9	52,2	87,2
	GDP Partner	Billion USD	1 107,6	1 397,1	1 695,9	2 208,7	2 614,0	2 464,1	1 796,6	2 063,5	1 916,9	1 877,8

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Burkina Faso	Total trade value	Million USD	29,1	46,7	23,8	50,3	104,6	126,3	117,4	121,6	98,6	114,9
	Exports to partner		12,0	10,9	18,5	43,1	99,3	92,9	109,9	116,7	88,2	100,7
	Imports from partner		17,1	35,8	5,3	7,2	5,3	33,3	7,5	4,9	10,5	14,2
	GDP Partner	Billion USD	6,5	7,6	9,5	10,1	12,1	12,6	12,8	14,1	16,1	16,0
Burundi	Total trade value	Million USD	-	0,0	0,0	0,0	-	0,0	0,2	0,1	0,1	0,1
	Exports to partner		-	-	0,0	-	-	0,0	0,0	-	0,1	0,1
	Imports from partner		-	0,0	0,0	0,0	-	0,0	0,1	0,1	0,0	0,0
	GDP Partner	Billion USD	-	1,4	1,6	2,0	-	2,3	3,0	3,2	3,0	3,0
Cabo Verde	Total trade value	Million USD	0,0	-	-	0,0	-	-	-	-	0,0	0,1
	Exports to partner		0,0	-	-	-	-	-	-	-	-	-
	Imports from partner		-	-	-	0,0	-	-	-	-	0,0	0,1
	GDP Partner	Billion USD	1,2	-	-	1,7	-	-	-	-	2,0	2,0
Cameroon	Total trade value	Million USD	0,9	1,6	0,6	0,5	0,2	0,5	0,3	0,2	0,3	0,4
	Exports to partner		0,2	1,3	0,0	0,0	0,0	0,1	0,2	0,0	0,0	0,3
	Imports from partner		0,6	0,3	0,6	0,5	0,2	0,4	0,1	0,2	0,3	0,1
	GDP Partner	Billion USD	19,4	22,4	26,5	26,2	29,4	29,1	32,6	35,0	38,7	39,0
Chad	Total trade value	Million USD	0,1	0,1	0,5	0,0	0,0	0,0	0,0	0,0	0,1	0,3
	Exports to partner		0,1	0,1	0,5	0,0	0,0	-	0,0	-	0,1	0,3
	Imports from partner		0,0	-	0,0	0,0	-	0,0	0,0	0,0	0,0	0,0
	GDP Partner	Billion USD	7,5	8,7	10,4	10,7	12,2	12,4	10,2	10,1	11,0	10,9
China	Total trade value	Million USD	206,4	162,0	377,5	508,2	445,3	570,3	630,1	678,5	682,1	828,8
	Exports to partner		94,5	32,1	35,4	40,8	86,1	203,0	29,5	18,4	29,7	32,9
	Imports from partner		111,9	130,0	342,1	467,4	359,2	367,3	600,6	660,1	652,4	795,9
	GDP Partner	Billion USD	2 754,1	3 555,7	4 577,3	6 033,8	7 492,2	8 539,6	11 226,9	12 265,3	13 841,8	14 340,6
Congo	Total trade value	Million USD	0,1	0,2	0,1	0,2	0,3	0,3	0,2	0,0	0,1	0,1
	Exports to partner		0,0	0,2	0,1	0,0	0,0	0,0	0,1	0,0	0,0	0,1
	Imports from partner		0,0	0,0	0,0	0,2	0,3	0,3	0,1	0,0	0,0	0,0
	GDP Partner	Billion USD	8,1	8,8	11,6	13,2	15,7	17,7	10,2	11,1	13,6	12,8

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Côte d'Ivoire	Total trade value	Million USD	216,4	313,0	396,1	410,9	350,6	401,5	548,3	513,2	559,7	690,6
	Exports to partner		18,8	36,0	49,1	39,9	80,6	113,4	170,3	93,9	100,7	154,4
	Imports from partner		197,6	277,0	346,9	371,0	270,0	288,1	378,0	419,3	459,0	536,2
	GDP Partner	Billion USD	24,6	28,2	33,6	34,4	35,5	37,0	48,0	51,6	58,0	58,5
Dem. Rep. of the Congo	Total trade value	Million USD	0,0	-	0,0	0,1	0,2	0,2	1,2	0,1	0,2	0,2
	Exports to partner		-	-	-	0,0	0,0	0,0	1,1	0,0	0,0	0,1
	Imports from partner		0,0	-	0,0	0,1	0,2	0,2	0,1	0,1	0,1	0,1
	GDP Partner	Billion USD	14,4	-	19,5	21,5	25,9	29,4	36,6	38,0	47,1	50,4
Egypt	Total trade value	Million USD	4,1	1,3	4,0	12,0	10,5	7,1	11,0	7,5	9,8	26,0
	Exports to partner		0,0	0,0	0,0	0,2	0,0	0,4	0,1	0,0	0,0	0,3
	Imports from partner		4,0	1,3	4,0	11,9	10,4	6,7	11,0	7,5	9,8	25,7
	GDP Partner	Billion USD	112,9	137,1	170,8	230,0	247,7	278,8	332,5	236,5	250,3	302,3
Eswatini	Total trade value	Million USD	0,1	0,5	0,3	1,3	0,4	0,4	0,2	1,4	0,1	0,6
	Exports to partner		-	-	0,0	-	0,4	0,1	-	-	-	0,1
	Imports from partner		0,1	0,5	0,3	1,3	0,1	0,3	0,2	1,4	0,1	0,5
	GDP Partner	Billion USD	3,3	3,5	3,3	4,4	4,8	4,9	3,8	4,4	4,7	4,5
Ethiopia	Total trade value	Million USD	0,0	0,0	0,1	0,0	0,0	0,0	0,4	3,6	0,9	0,7
	Exports to partner		-	0,0	-	-	-	-	0,4	3,5	0,9	0,7
	Imports from partner		0,0	0,0	0,1	0,0	0,0	0,0	0,0	0,1	0,0	0,1
	GDP Partner	Billion USD	15,3	19,7	26,8	29,9	32,0	42,2	72,1	76,8	80,2	92,6
Finland	Total trade value	Million USD	0,4	0,5	0,1	8,7	16,0	16,9	30,5	53,3	37,1	41,8
	Exports to partner		-	-	-	0,0	0,0	0,1	3,2	1,0	0,5	1,8
	Imports from partner		0,4	0,5	0,1	8,7	16,0	16,8	27,3	52,3	36,6	40,0
	GDP Partner	Billion USD	217,1	256,4	285,7	249,6	275,6	258,5	240,7	255,6	275,8	268,8
France	Total trade value	Million USD	293,8	338,5	489,0	653,0	379,2	426,1	350,0	351,5	416,2	417,1
	Exports to partner		16,6	12,6	24,2	22,7	34,8	51,9	18,5	9,8	16,8	16,0
	Imports from partner		277,3	325,9	464,8	630,3	344,4	374,2	331,5	341,7	399,4	401,1
	GDP Partner	Billion USD	2 318,6	2 657,1	2 915,8	2 642,4	2 862,0	2 683,9	2 471,3	2 589,0	2 789,7	2 728,8

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Gabon	Total trade value	Million USD	0,1	1,2	0,2	0,5	0,1	0,1	0,3	0,6	0,3	0,2
	Exports to partner		0,1	0,2	0,1	-	0,1	0,0	0,1	0,4	0,1	0,1
	Imports from partner		0,1	1,1	0,1	0,5	0,0	0,1	0,2	0,2	0,1	0,1
	GDP Partner	Billion USD	10,2	12,5	15,6	14,4	18,2	17,2	14,0	14,9	16,9	16,9
Gambia	Total trade value	Million USD	0,6	0,2	0,6	0,8	1,9	10,7	0,1	0,4	0,6	11,2
	Exports to partner		0,0	-	0,0	0,0	0,1	0,1	-	0,1	0,1	0,5
	Imports from partner		0,6	0,2	0,6	0,8	1,8	10,6	0,1	0,3	0,5	10,7
	GDP Partner	Billion USD	1,1	1,3	1,6	1,5	1,4	1,4	1,5	1,5	1,7	1,8
Germany	Total trade value	Million USD	57,5	55,2	89,1	115,0	119,9	84,2	174,4	158,8	165,5	157,3
	Exports to partner		4,2	2,9	7,8	3,9	3,5	9,6	4,8	2,8	6,7	7,4
	Imports from partner		53,3	52,3	81,3	111,1	116,3	74,6	169,6	156,0	158,8	149,9
	GDP Partner	Billion USD	2 994,9	3 426,0	3 744,9	3 402,4	3 748,7	3 529,4	3 468,9	3 689,5	3 979,1	3 888,8
Ghana	Total trade value	Million USD	56,6	68,5	57,2	75,6	112,1	103,7	88,6	63,9	69,6	84,1
	Exports to partner		10,5	3,2	1,6	1,4	4,7	3,5	4,5	5,5	3,5	4,9
	Imports from partner		46,1	65,3	55,7	74,2	107,4	100,2	84,1	58,5	66,1	79,1
	GDP Partner	Billion USD	28,9	34,0	38,7	43,3	53,8	56,9	56,1	60,4	67,3	68,4
Guinea	Total trade value	Million USD	21,1	22,8	19,8	10,5	25,1	24,5	29,5	23,2	25,4	33,9
	Exports to partner		10,2	11,3	11,8	5,6	21,9	13,7	25,9	17,4	17,6	25,4
	Imports from partner		10,9	11,5	8,0	4,9	3,2	10,9	3,5	5,8	7,8	8,5
	GDP Partner	Billion USD	4,2	6,3	7,0	6,9	6,0	7,3	8,6	10,3	11,9	13,5
Guinea-Bissau	Total trade value	Million USD	0,0	0,0	0,0	0,0	0,0	0,0	0,0	-	0,0	0,0
	Exports to partner		-	-	0,0	0,0	0,0	0,0	0,0	-	0,0	0,0
	Imports from partner		0,0	0,0	-	-	-	-	-	-	-	0,0
	GDP Partner	Billion USD	0,6	0,8	1,0	0,9	1,2	1,1	1,2	-	1,5	1,4
India	Total trade value	Million USD	40,8	81,9	76,0	68,7	74,6	112,5	191,8	159,6	150,2	211,4
	Exports to partner		1,1	3,5	9,9	0,9	5,8	20,8	70,6	52,2	22,4	55,3
	Imports from partner		39,7	78,3	66,1	67,7	68,8	91,8	121,2	107,4	127,8	156,1
	GDP Partner	Billion USD	949,1	1 238,7	1 224,1	1 708,5	1 823,1	1 827,6	2 294,1	2 651,5	2 701,1	2 870,5

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Italy	Total trade value	Million USD	27,5	28,3	42,0	169,2	36,4	55,6	75,4	76,3	58,4	128,8
	Exports to partner		5,7	6,9	5,1	120,0	6,3	15,1	8,6	5,4	6,6	3,1
	Imports from partner		21,8	21,4	36,9	49,2	30,1	40,6	66,8	71,0	51,8	125,8
	GDP Partner	Billion USD	1 949,7	2 213,4	2 408,4	2 137,8	2 294,6	2 088,3	1 876,6	1 961,1	2 093,1	2 005,1
Japan	Total trade value	Million USD	49,9	42,9	98,8	123,3	62,1	48,9	85,5	93,1	83,8	99,2
	Exports to partner		1,8	1,8	6,8	1,7	2,0	7,9	6,8	6,5	3,9	0,9
	Imports from partner		48,2	41,1	91,9	121,6	60,1	41,0	78,7	86,6	79,9	98,3
	GDP Partner	Billion USD	4 601,7	4 579,7	5 106,7	5 759,1	6 233,1	6 272,4	5 003,7	4 930,8	5 036,9	5 135,9
Kenya	Total trade value	Million USD	0,8	0,6	0,2	1,7	0,3	0,2	0,1	0,2	0,9	0,5
	Exports to partner		0,0	-	0,1	0,1	0,1	0,1	0,0	0,1	0,0	0,0
	Imports from partner		0,7	0,6	0,2	1,6	0,2	0,1	0,1	0,1	0,9	0,5
	GDP Partner	Billion USD	41,8	50,4	48,3	45,4	46,6	56,4	74,8	82,0	92,2	100,5
Liberia	Total trade value	Million USD	0,2	0,3	0,1	0,1	1,2	0,0	1,1	0,8	5,8	8,1
	Exports to partner		0,2	0,3	0,1	0,1	1,2	0,0	0,6	-	1,1	2,2
	Imports from partner		-	-	-	0,0	-	-	0,5	0,8	4,6	6,0
	GDP Partner	Billion USD	1,1	1,3	1,7	2,0	2,3	2,7	3,3	3,3	3,3	3,1
Libya	Total trade value	Million USD	1,8	0,1	0,0	1,2	-	0,1	2,5	0,4	1,2	0,4
	Exports to partner		0,0	-	-	0,3	-	0,1	0,2	0,1	0,8	-
	Imports from partner		1,8	0,1	0,0	0,9	-	0,0	2,3	0,3	0,4	0,4
	GDP Partner	Billion USD	55,0	67,7	73,9	69,0	-	79,8	18,6	30,2	41,4	39,5
Malaysia	Total trade value	Million USD	5,3	8,6	13,8	30,1	25,7	135,1	56,8	10,6	83,4	41,3
	Exports to partner		1,9	5,1	2,5	24,1	16,5	129,3	52,7	6,2	78,7	36,5
	Imports from partner		3,3	3,5	11,2	6,0	9,1	5,8	4,1	4,4	4,7	4,8
	GDP Partner	Billion USD	170,4	202,7	241,8	258,6	302,2	318,9	301,3	319,1	358,8	365,3
Mauritania	Total trade value	Million USD	13,1	3,5	5,2	19,0	20,6	18,3	24,2	24,0	23,9	27,3
	Exports to partner		13,0	1,5	3,1	8,2	6,4	7,3	6,6	10,7	8,1	5,6
	Imports from partner		0,2	2,0	2,2	10,8	14,2	11,0	17,6	13,3	15,8	21,7
	GDP Partner	Billion USD	4,0	4,3	5,1	5,6	6,8	6,7	6,4	6,8	7,4	7,9

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Morocco	Total trade value	Million USD	18,6	17,5	25,9	30,0	53,7	32,9	113,6	90,3	87,4	85,0
	Exports to partner		8,1	6,7	5,8	1,9	15,1	9,2	16,3	10,4	7,1	6,4
	Imports from partner		10,5	10,8	20,1	28,1	38,6	23,7	97,4	80,0	80,3	78,5
	GDP Partner	Billion USD	68,6	79,0	92,5	93,2	101,4	98,3	103,3	109,7	118,1	119,9
Mozambique	Total trade value	Million USD	-	0,0	0,0	-	0,1	0,0	0,0	0,0	0,0	0,1
	Exports to partner		-	-	-	-	-	-	0,0	0,0	0,0	0,0
	Imports from partner		-	0,0	0,0	-	0,1	0,0	0,0	-	0,0	0,0
	GDP Partner	Billion USD	-	10,5	12,6	-	14,4	16,4	11,9	13,2	14,8	15,4
Namibia	Total trade value	Million USD	-	-	-	0,0	0,1	0,0	0,1	0,6	0,8	1,3
	Exports to partner		-	-	-	-	-	-	-	-	-	0,3
	Imports from partner		-	-	-	0,0	0,1	0,0	0,1	0,6	0,8	1,1
	GDP Partner	Billion USD	-	-	-	11,3	12,4	13,0	10,7	12,9	13,7	12,6
Netherlands	Total trade value	Million USD	16,6	15,9	24,8	112,7	27,5	24,0	68,7	161,1	55,9	61,0
	Exports to partner		1,2	0,1	1,6	1,9	2,6	1,5	12,5	9,1	14,9	16,5
	Imports from partner		15,4	15,8	23,2	110,8	24,8	22,5	56,2	152,0	41,0	44,5
	GDP Partner	Billion USD	734,0	848,7	951,8	848,1	905,1	839,5	783,8	833,6	914,5	910,3
Niger	Total trade value	Million USD	2,0	2,1	5,2	4,0	4,0	107,7	26,8	110,1	85,2	125,3
	Exports to partner		1,2	1,7	5,0	3,5	4,0	2,9	9,9	8,6	11,4	15,4
	Imports from partner		0,8	0,4	0,2	0,4	0,0	104,7	16,9	101,5	73,7	109,9
	GDP Partner	Billion USD	4,7	5,7	7,3	7,8	8,8	9,4	10,4	11,2	12,9	12,9
Nigeria	Total trade value	Million USD	2,5	3,6	3,2	8,9	7,1	4,9	2,5	1,5	17,9	22,8
	Exports to partner		0,1	1,9	0,6	1,1	1,3	2,4	0,7	0,4	0,8	0,4
	Imports from partner		2,4	1,7	2,7	7,8	5,8	2,5	1,8	1,1	17,1	22,4
	GDP Partner	Billion USD	222,8	262,2	330,3	369,1	414,1	461,0	404,6	375,7	421,7	448,1
Russian Federation	Total trade value	Million USD	10,1	4,8	75,7	49,7	84,4	84,2	66,9	59,0	54,9	72,3
	Exports to partner		-	0,0	0,0	0,0	29,0	21,7	4,9	1,1	0,3	0,2
	Imports from partner		10,1	4,8	75,7	49,7	55,4	62,5	62,0	57,8	54,6	72,1
	GDP Partner	Billion USD	1 060,9	1 393,4	1 779,1	1 633,1	2 046,6	2 191,5	1 280,6	1 575,1	1 653,0	1 690,1

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Senegal	Total trade value	Million USD	261,2	493,3	706,8	726,6	822,7	933,5	821,0	978,3	1 191,9	1 233,4
	Exports to partner		40,6	61,1	131,1	87,8	106,0	65,6	74,5	88,5	126,3	97,4
	Imports from partner		220,6	432,2	575,7	638,8	716,7	867,9	746,5	889,8	1 065,6	1 135,9
	GDP Partner	Billion USD	11,7	14,0	16,9	16,1	17,8	17,7	19,0	21,0	23,1	23,3
Sierra Leone	Total trade value	Million USD	0,0	0,2	0,8	2,0	2,2	1,7	0,2	0,1	0,1	0,7
	Exports to partner		0,0	0,1	0,8	2,0	2,2	1,7	0,0	0,0	0,0	0,1
	Imports from partner		0,0	0,1	0,0	0,0	0,0	0,0	0,2	0,1	0,1	0,6
	GDP Partner	Billion USD	1,9	2,2	2,5	2,6	2,9	3,8	3,9	3,7	4,1	4,1
South Africa	Total trade value	Million USD	1 151,7	1 045,5	1 541,3	1 437,2	1 505,3	1 458,2	1 461,4	933,6	1 507,3	1 446,1
	Exports to partner		1 084,0	966,0	1 390,1	1 139,2	1 349,3	1 351,8	1 337,3	780,2	1 367,6	1 328,4
	Imports from partner		67,8	79,5	151,2	298,0	156,0	106,3	124,1	153,3	139,7	117,6
	GDP Partner	Billion USD	304,1	332,7	316,5	417,3	458,7	434,4	323,5	381,3	404,7	387,8
Spain	Total trade value	Million USD	12,3	7,4	38,0	33,4	36,7	47,4	-	54,7	49,6	61,2
	Exports to partner		1,3	1,2	1,5	1,2	1,6	4,2	-	2,5	2,1	2,4
	Imports from partner		11,0	6,2	36,5	32,2	35,1	43,3	-	52,2	47,6	58,8
	GDP Partner	Billion USD	1 260,5	1 474,2	1 631,7	1 423,3	1 480,5	1 325,6	-	1 312,1	1 421,6	1 393,2
Switzerland	Total trade value	Million USD	25,4	70,2	91,8	254,2	281,6	307,4	433,9	414,6	1 250,0	1 302,6
	Exports to partner		22,6	65,6	49,0	241,6	279,2	303,6	428,2	407,8	1 243,1	1 298,0
	Imports from partner		2,8	4,7	42,8	12,6	2,4	3,8	5,7	6,8	6,9	4,6
	GDP Partner	Billion USD	443,9	493,9	570,1	602,9	721,7	692,4	695,4	704,8	736,1	732,5
Tanzania	Total trade value	Million USD	0,9	0,1	0,0	0,3	0,1	0,1	0,4	0,2	0,2	0,2
	Exports to partner		0,1	0,0	0,0	-	0,0	0,0	0,3	-	0,1	-
	Imports from partner		0,8	0,1	0,0	0,3	0,0	0,1	0,0	0,2	0,1	0,2
	GDP Partner	Billion USD	18,9	21,8	27,8	31,5	34,1	39,7	49,8	53,2	56,7	60,8
Togo	Total trade value	Million USD	91,0	89,1	63,5	107,4	42,1	20,0	19,7	18,8	27,0	29,3
	Exports to partner		0,9	1,8	18,4	2,0	6,4	2,0	1,2	2,5	2,1	2,9
	Imports from partner		90,2	87,3	45,1	105,4	35,7	18,0	18,5	16,3	25,0	26,4
	GDP Partner	Billion USD	3,2	3,6	4,5	4,6	5,2	5,2	6,0	6,4	7,1	7,2

Partner	Variable	Unit	Year									
			2006	2007	2008	2010	2011	2012	2016	2017	2018	2019
Tunisia	Total trade value	Million USD	8,5	7,6	11,3	12,1	13,5	7,8	7,2	10,4	14,8	17,6
	Exports to partner		1,7	1,1	2,4	0,7	0,7	2,3	0,2	0,3	0,3	1,2
	Imports from partner		6,7	6,4	8,9	11,4	12,9	5,5	7,0	10,1	14,5	16,4
	GDP Partner	Billion USD	34,4	38,9	44,8	44,1	45,8	45,0	41,8	39,6	40,1	39,2
Turkey	Total trade value	Million USD	7,6	5,3	12,6	22,9	38,4	32,9	43,8	68,9	114,2	77,0
	Exports to partner		0,7	0,3	0,2	1,2	2,7	2,9	12,3	23,4	19,5	5,5
	Imports from partner		6,9	5,0	12,5	21,8	35,6	30,0	31,6	45,5	94,7	71,6
	GDP Partner	Billion USD	555,1	680,5	770,8	776,6	838,5	880,1	869,3	858,9	779,7	760,5
Uganda	Total trade value	Million USD	0,1	0,0	0,0	0,1	0,3	0,1	0,3	0,2	0,2	1,6
	Exports to partner		0,0	-	-	-	0,1	-	0,0	0,0	0,0	0,0
	Imports from partner		0,0	0,0	0,0	0,1	0,2	0,1	0,3	0,2	0,2	1,6
	GDP Partner	Billion USD	14,1	17,5	22,4	24,7	27,5	30,9	29,6	31,4	34,2	38,0
Ukraine	Total trade value	Million USD	34,6	12,2	37,4	72,8	75,3	45,4	8,2	23,0	36,1	37,3
	Exports to partner		0,1	0,1	0,0	-	10,5	12,9	0,5	0,2	0,3	2,4
	Imports from partner		34,5	12,1	37,4	72,8	64,8	32,5	7,7	22,8	35,8	34,9
	GDP Partner	Billion USD	107,8	143,3	181,3	136,0	163,2	175,7	93,3	112,1	130,9	154,0
United Arab Emirates*	Total trade value	Million USD	11,3	13,7	32,4	337,8	502,3	1 502,2	1 556,7	435,0	1 416,6	3 322,7
	Exports to partner		0,3	1,1	3,1	306,1	458,4	1 453,7	1 527,1	387,5	1 332,9	3 218,8
	Imports from partner		10,9	12,6	29,3	31,7	43,9	48,5	29,5	47,4	83,6	103,9
	GDP Partner	Billion USD	222,1	257,9	315,5	289,8	350,7	374,6	357,0	385,6	422,2	417,2
USA	Total trade value	Million USD	94,5	86,1	237,4	484,4	88,5	103,1	109,2	154,5	163,9	153,4
	Exports to partner		2,8	4,5	16,0	63,1	5,4	7,9	8,0	9,9	20,4	11,1
	Imports from partner		91,7	81,6	221,4	421,3	83,1	95,2	101,2	144,6	143,5	142,3
	GDP Partner	Billion USD	13 815,6	14 474,3	14 769,9	15 049,0	15 599,7	16 254,0	18 695,1	19 479,6	20 527,2	21 372,6

*Data reported by the UAE

Norges miljø- og biovitenskapelige universitet
Noregs miljø- og biovitskapelege universitet
Norwegian University of Life Sciences

Postboks 5003
NO-1432 Ås
Norway