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# An Empirical Insight into Inter-Africa Trade Benefits

**Ngonidzashe Chiranga**

*Economics Department: Tshwane University of Technology, Polokwane Campus, South Africa*
*Email: chirangan@tut.ac.za*

Inter-African trade has been identified in International Economics as one of the engines of economic growth that motivated the birth of the African Continental Free Trade Area (AfCFTA) in Kigali in 2018. However, AfCFTA only began trading in 2021 and there is still little empirical evidence to adequately appraise its impact. As such, most African countries have largely continued trading with the rest of the world. However, a pessimistic and repetitive narrative has portrayed the South-South trade outcomes as not yielding meaningful net trade benefits for African countries. This study addresses the following research questions. Firstly, what is the empirical situation regarding net exports to GDP (trade openness) of inter-African trade for the time (2015-2023)? Also, using probability, are there any notable variances between the expected trade openness from an Inter-African ex-ante perspective and the Inter-African ex-post scenario? This study attempts to answer these questions using expected trade openness to GDP data and stylized African trade facts from 2015-2023 which has proven to be a useful tool in analyzing trade outcomes. Also, modelling the probability of success and failure from a Binomial distribution to measure expectations helps unlock the unknown benefits that inter-African trade presents to the African Continent. The novelty of this study hinges on these contributions. Firstly, debunking the misconstrued narrative without empirical evidence repeatedly emphasises that inter-African trade ex-ante will fail against the narrative that it does not fail ex-post as the two are mutually exclusive events. Secondly, the contribution to the stock of empirical evidence on the progress of Inter-African trade regarding the net exports to gross domestic product (trade openness).
**Keywords:** "AfCFTA", "Intra-African Trade", "Trade challenges", "Trade prospects"

## 1. Introduction

Intra-African trade has been around 12% and 14% for the past 20 years, which is relatively

low compared to Asia's intra-regional trade, which has been averaging between 51% and 53%, North America averages between 53% and 54%, and Europe averages between 67% and 69% (Parshotam, 2018). On the other hand, Inter-African trade has generally been low around less than 15%. Several authors[1] have expressed a negative and repetitive pessimistic narrative based on qualitative studies that inter-African trade is not beneficial to African member states. Can there be tangible trade benefits for African member states under a cloud of trade pessimism like this?

Pessimism based on intuition without empirical ventilation cannot be a scientific basis for condemning a free trade policy. In this respect, several research questions start popping up. What is the empirical situation regarding net exports to GDP (trade openness) of inter-African trade for 2015-2023? Can there be scientific truths in the negative qualitative sentiments shared by pessimists that indeed there are no realisable South-South trade benefits? Also, using stylized trade facts helps to give clarity and provide economic indicators that help provide clarity on the matter. Specifically, for the trading years 2015-2023, it becomes imperative to try and understand if there are possibilities of trade gains for African member states divided on economic geography, based on being landlocked or having a coastline. Certainly, trade gains are not the same for these unique groups of countries. Using expected trade openness outcomes borrowing from Binomial probability expected trade openness outcomes, it is possible to simulate the gains ex-ante from the gains ex-post. In a way, there is a need to assume that for trade to prosper, there is a need for peace and political stability. As such, the sample of African countries considered in the study is divided into landlocked countries and coastal countries, either at war or not at war. However, it should be noted that for the simulation to occur, only economically small African countries are heavily affected by war and internal political instability. This implies the 5 biggest economies in Africa [2]may have internal conflicts that are contained, and this may not affect trade significantly which does not hold for smaller nations as trade is entirely disrupted by internal conflict.

To this end, the novelty of this study hinges on these contributions. Firstly, debunking the misconstrued narrative often portrayed without empirical evidence that repeatedly emphasises that inter-African trade ex-ante will fail against the narrative that it does not fail ex-post as the two are mutually exclusive events. Secondly, the contribution to the stock of empirical evidence on the progress of inter-African trade regarding the net exports to gross domestic product (trade openness) but modeled with the probability of success and failure from a Binomial distribution to measure expectations which helps unlock the unknown benefits that Inter-African trade presents.

The rest of the paper is structured as follows, section 2 presents the stylized economic indicators from Africa and a historical overview of the peace and conflict situation of landlocked and at-peace African countries with a coastline. Thereafter, section 3 presents a review of the literature for this study. Afterwards, section 4 is the research methods which are followed by section 5 is the Discussion of the results. Lastly, section 6 is the conclusion and

[1] Chukwu, Agbanike, and Anochiwa (2021), Cloete (2019), Cofelice (2018), Vhumbunu (2020), Hollington (2021) and Kassa, Edjigu, and Zeufack (2022).

[2] South Africa, Nigeria, Egypt, Algeria and Ethiopia.

policy implementation.

## 2. AFRICA'S STYLIZED ECONOMIC INDICATORS

From Figure 1, Africa is nested in the middle of the other continents and surrounded by the North and South Atlantic Ocean and the Indian Ocean a gateway for moving goods via the sea across continents. There are 16 landlocked AfCFTA member states of which 12 are considered peaceful or currently not engaged in conflict excluding the 4 countries at war. [3] On the other hand, 35 countries with a coastline and are peaceful are included excluding Senegal, Sao Tome, Mozambique, Gabon, The Gambia, Somalia, Libya, Western Sahara, and The Gambia to mention just a few.


Figure 1: Africa's position in the world

Source: Map Data (2024)

From Table 1, the five biggest African economies including South Africa, Egypt, and Algeria are at peace. However, Nigeria and Ethiopia have their share of internal civil unrest. Despite these internal conflicts, there is little evidence to suggest that intra-African trade is affected as the situation has largely been contained which has a direct bearing on international trade. Does it mean trade can thrive despite the presence of war? That remains unclear but outside the focus of this study.

Table 1: The top 5 economies in Africa's economic and conflict position in 2024

| Country | Nominal GDP (Billion US$) | Per capita US$ | Conflict Scenario |
|---|---|---|---|
| South Africa | 373 233 | 6 451 | At peace |
| Egypt | 347 594 | 3 225 | At peace |
| Algeria | 266 780 | 5 722 | At peace |
| Nigeria | 252 738 | 1 110 | Internal Civil Conflicts |

[3] Burkina Faso, Central African Republic, Chad and South Sudan.

| | | | |
|---|---|---|---|
| | | | • Boko Haran Conflict<br>• Violence in the North and South<br>• Agitations by separatists |
| Ethiopia | | | Internal Civil Conflicts<br>• Ethiopian civil conflict (2018–present) ·<br>• Oromo conflict (1973–present)<br>• Gambela conflict (2000-present) |

Source: Ajayi (2024)

## 3. REVIEW OF LITERATURE

There is a wider agreed consensus in International Economics that tariffs and import quotas often reduce welfare whereas trade liberalisation improves welfare (Feenstra, 2015). However, Winters, McCulloch, and McKay (2004) doubted the existence of benefits accruing equally to low-income countries. Furthermore, Ackah and Morrissey (2007) agreed that poor economies do not often take advantage of new opportunities that trade liberalisation presents. Some economists have usually been antagonistic to Regional Economic Communities(RECs) as they prefer multilateral or unilateral liberalisation which is premised on the belief that regional integration is accompanied by a diminishing of risks associated with trade diversion (Bhagwati, 1992). However, evidence by Rose (2004), found robust results using the Poison Pseudo Maximum Likelihood Method (PPML) that regional trade agreements have a positive effect on bilateral trade flows.

Contrary to econometric and methodological differences, Mold (2022) diffuses this narrative by providing stylized trade facts that prove a stronger degree of regional integration in Africa than elsewhere in the world. Furthermore, the recalculated trade intensity of intra-African exports is found to be as high as 38 to 42 percent of total trade. The question that still is puzzling is why this repetitive negative pessimistic narrative already condemns South-South trade as not yielding positive results and to what end does this line of reasoning stand to benefit?

Also, Mold (2022) attempted to demystify this misconstrued narrative by highlighting that the donor community may be seeking to prolong their continued stay in troubled African economies by making unverified qualitative speculations that seek to maintain the status core that there won't be any beneficiary South-South or South-North trade. It is time to debunk this reasoning and base conclusions on tangible empirical evidence using stylized trade facts and work out expectations based on probability bearing in mind trade can never provide equal benefits for either landlocked or coastal countries or economically bigger or smaller African member states. This is what this study attempts to do by looking at the expected trade openness

outcomes ex-ante (2015 to 2020) and ex-post (after 2021 to 2023). The oversimplification narrative that South-South trade is non-beneficiary based on Vinerian trade outcomes of trade diversion is rather simplistic and borders on perpetuating pessimism which undermines the very core inter-African trade hinges on. Surely Africa is endowed with so many base metals, a youthful population, and vast untapped virgin forests. It is rather a worrying thought that Africans are viewed as incapable of coming up with a successful free trade agreement and that kind of narrative needs to be backed by scientific evidence otherwise it becomes speculative intuitions that have no basis in academic debates.

## 4. RESEARCH METHODS

The sample of all African countries that trade globally is considered in the study for the period (2015- 2023). However, to model using Binomial expected trade to GDP outcomes. In this respect, some underlying assumptions are made as follows. Firstly, the opportunity of Inter-Africa trade succeeding or failing is equal to a probability (p= 0.5) and that for failing (p=0.5) Second, consideration is made that for successful inter-African trade to occur there is supposed to be peace and no war. Thirdly, countries at war that have a high probability that trade does not occur are not considered as trade candidates. Lastly, consideration is made to subdivide African countries on being landlocked or having a coastline as trade benefits have different outcomes due to geographic differences. This implies in this study 12 not at war but landlocked African countries are considered and 23 coastal but peaceful African countries are also considered giving a total sample of 35 countries considered. This implies that the probability that a landlocked African country is not at war is 12/35 whilst that of a coastal and peaceful African country is 23/35. The combined probability of inter-Africa trade being either successful or a failure given a landlocked or coastal country is given in Figure 2.

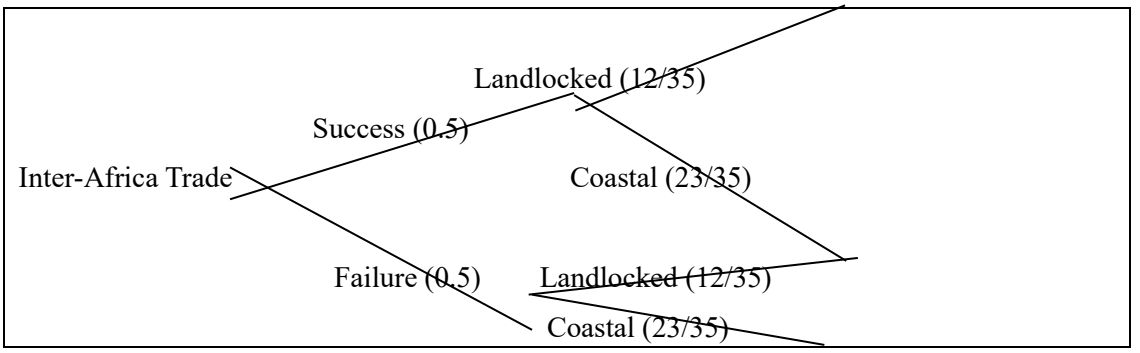


Figure 2: Tree diagram for the probability of success or failure of Inter-Africa trade

Source: Own Compilation

This implies the probability of successful Inter-African for a given landlocked peaceful country is considered as 0.17 [4]and that for the coastal and not at war is 0.33. This forms the basis of using a Binomial distribution that considers the probability of success or failure of an outcome. According to García-García, Fernández Coronado, Arredondo, and Imilpán Rivera

[4] 0.5*12/35=0.17 and 0.5*23/35=0.33

(2022), a Binomial distribution involves several repetitive trials and success only occurs when $X$ occurs in $n$ trials. Furthermore, the experiment has $n$ identical trials with each outcome, the probability of inter-African trade succeeding $p = 0.17$ for landlocked peaceful AfCFTA members and $p = 0.33$. The Binomial probability distribution according to Siegel (2016) is as follows;

$$P(X) = \frac{n!}{x!(n-x)!} c^x d^{n-x} \quad \text{.....(1)}$$

Where $c$ =probability of success

$d = 1 - c$ is the probability of failure

$X$ is the binomial variable $0.1.2. etc$

Following Sydsæter, Strøm, and Berck (2005), they found that Newton's Binomial formula can be expressed as an equation 2 as follows

$$\sum_{i=o}^{n} \binom{n}{i} p^{n-1} q^i = (p+q)^n \quad \text{.....(2)}$$

This follows that the simulation formulae are as follows:

$$1 + 2 + 3 + \cdots + n = \frac{n(n+1)}{2} \quad \text{.....(3)}$$

This follows that $E(X) = np$ which can be applied to calculating the expected trade outcomes from an ex-ante point and ex-post to simulate expected net trade over GDP for the various African members separated on a geographic basis.

## 5. FINDINGS

Figure 3 shows that before 2021 there have been steady negative trade-to-GDP outcomes for all African landlocked countries in general but after 2021( ex-post) landlocked countries show worsening trade openness which may agree in principle to earlier sentiments by qualitative pessimists like Chukwu et al. (2021), Cloete (2019) and Cofelice (2018).

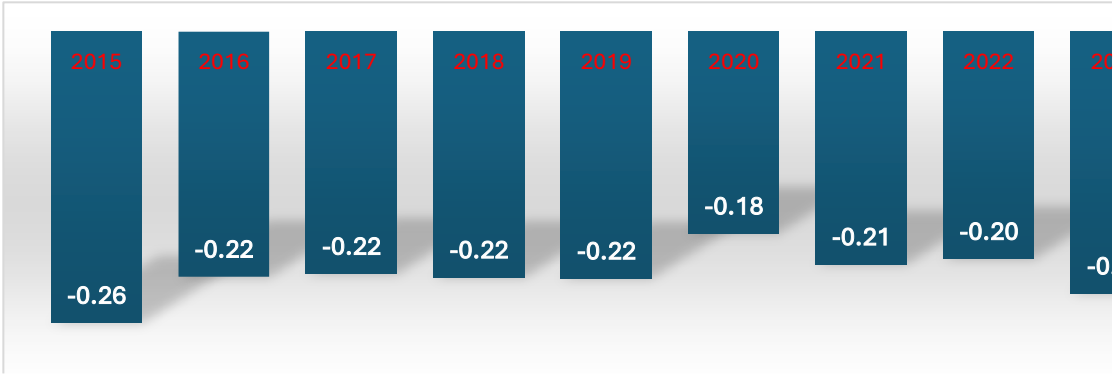


Figure 3: Total expected trade to GDP for African peaceful landlocked countries

Source: Own compilation from WDI (2015-2023)

From Figure 4, an analysis of countries that have a positive net trade balance to GDP suggests that Botswana's trade balance is tied largely to the global demand for diamonds, representing over 80 percent of the country's export revenues. On the other hand, Swaziland's main exports are sugar, wood pulp, cotton, beef, and soft drink concentrates. The main export partner is South Africa (60 percent of total exports) followed by Mozambique, Botswana, Namibia, and Norway. Further, Copper and cobalt are among Zambia's main exports while non-traditional exports include cotton, coffee, fresh flowers, burley tobacco, gemstones, and maize (corn) among others. However, most landlocked African members experienced negative expected trade-to-GDP outcomes driven mainly by more imports than exports.

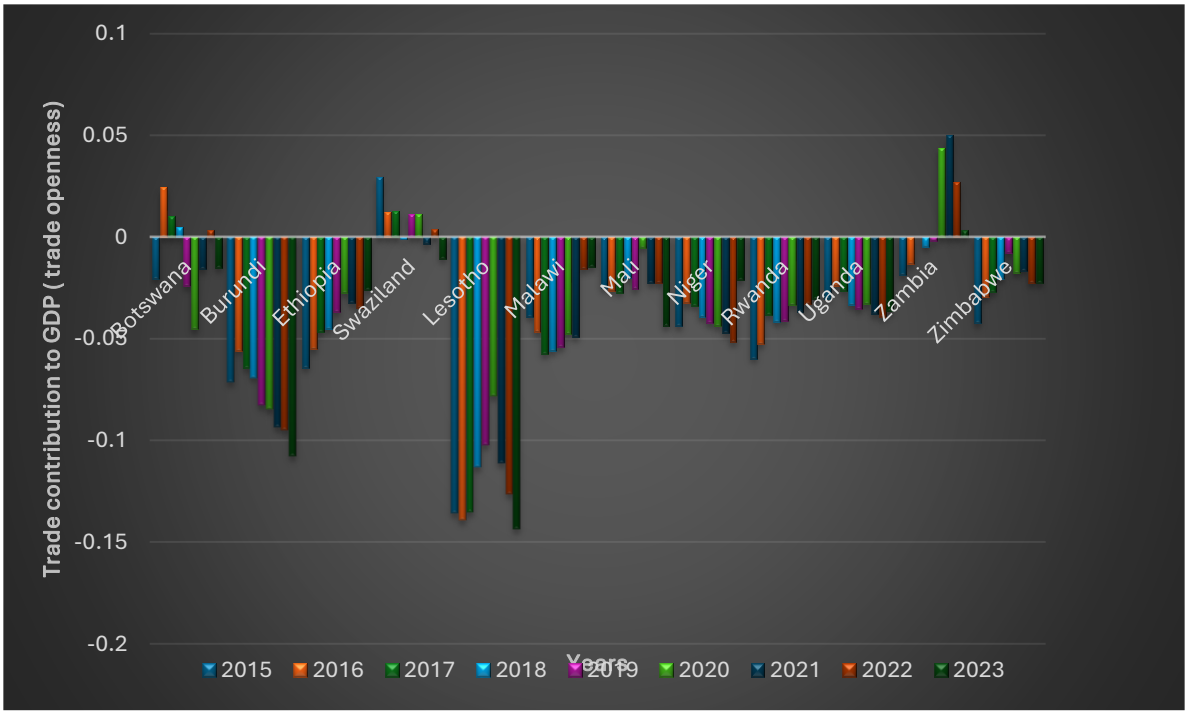


Figure 4: Total expected trade to GDP for African peaceful landlocked countries

Source: Own Compilation from WDI (2015-2023)

However, in coastal peaceful countries shown in Figure 5, there are 23 countries mostly oil-producing nations with a coastline that seem to benefit from positive net trade gains. Also, the African members who are not at war but have a coastline have a positive net trade to GDP outcomes showing that mainly oil-producing countries are chief inter-African trade beneficiaries. Congo's chief export is petroleum, which accounts for most of its export earnings with wood and wood products, including logs and sawn timber also notable exports. Also, there are significant imports including machinery and transport equipment, food and live animals, and basic manufactures. On the other hand, Petroleum now accounts for most of Equatorial Guinea's exports and contributes more than four-fifths of its gross domestic product (GDP). Algeria's economy is dominated by its export trade in petroleum and natural gas, commodities that, despite fluctuations in world prices, annually contribute roughly one-third

of the country's gross domestic product (GDP).

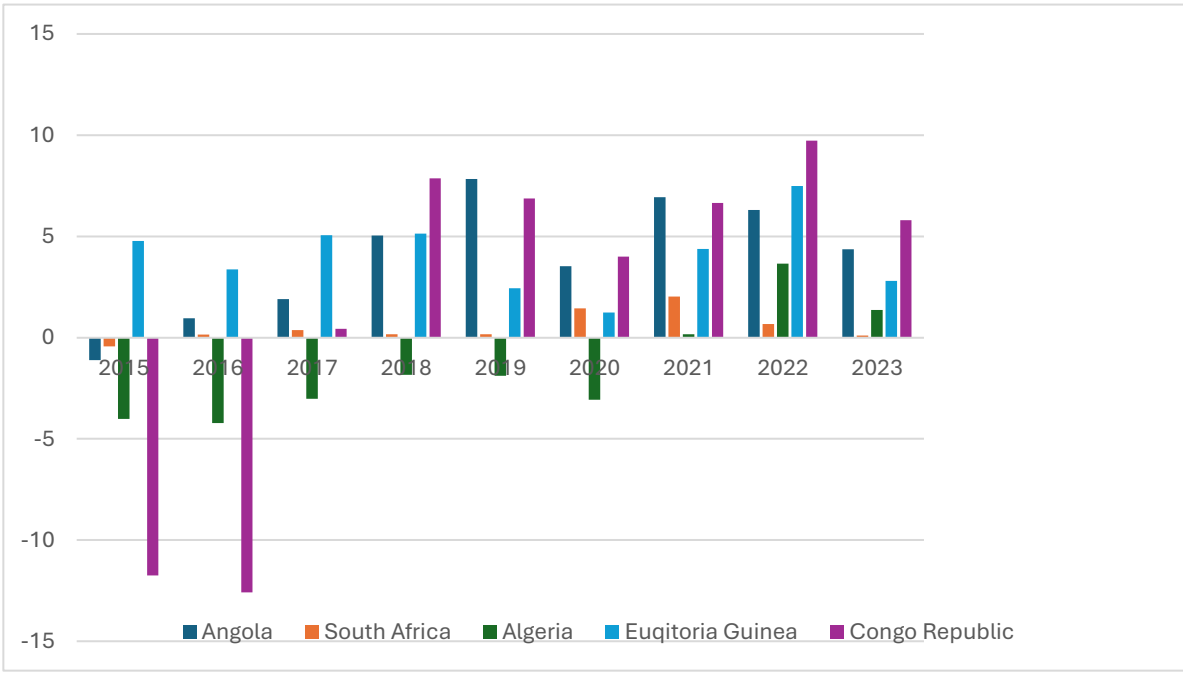


Figure 5: The biggest beneficiaries of trade in African peaceful and coastal countries

Source: Owner's compilation

Furthermore, Oil exports account for more than 95% of total exports. Additionally, Angola is a major exporter of diamonds and liquefied natural gas to the American, European, and Japanese markets. The only non-oil-dependent African country is South Africa which has partners in South Africa—besides other African countries—including Germany, the United States, China, Japan, the United Kingdom, and Spain. Chief exports include corn, diamonds, fruits, gold, metals and minerals, sugar, coal, and wool. Figure 6 shows that most oil and petroleum countries with a coastline are envisaged to benefit from intra-African trade and South Africa is the only non-oil producing country that stands to have a probability of success from trading in Africa.

## 6. CONCLUSION AND POLICY IMPLICATIONS

The purpose of this study was to empirically test if inter-African trade has any expected net trade-to-GDP benefits through a comparison of trade openness figures for African landlocked but not-at-war countries and coastal and peaceful African members using data obtained from World Development Indicators (WDI) from 2015 to 2020 (ex-ante) and 2021- 2023 (ex-post). The study attempted to unpack the veracity of repeated pessimist claims that South-South trade will fail. The study found that for landlocked countries ex-ante trade was steady but yielding negative net trade outcomes but worsened post-2021 (ex-post) which supports the qualitative findings that South-North trade outcomes yield negative trade outcomes for African countries.

However, the situation is different when you consider coastal and peaceful African countries. Positive net trade outcomes were registered for petroleum exporting countries with a coastline except for an economically diversified economy like South Africa which stands to reap the benefits from inter-Africa trade. This study offers insights and contributes to the academic scholarship on inter-Africa trade and clears some research questions using tools of probability and stylized economic facts from secondary available data on net trade to GDP a proxy in tandem with supporters of the net export-led growth basis that binds inter-African trade within the scope of Africa Agenda 2063 framework. In the future, there is a need to ventilate using econometric dynamic models' participant African nation's trade outcomes by considering inter-regional trade gains using dynamic panel data modeling to gauge if intra-African trade is beneficial for AfCFTA members at war or peace which are further distinguished on geographic variables of being landlocked or having a coastline.

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