Can Increased Intra-Continental Trade Partnerships Diversify Export Baskets in Africa?

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The study investigates the potential of the African Continental Free Trade Area (AFCFTA) agreement in fostering diversified export baskets through increased intra-continental trade partnerships. It aims to evaluate how these trade partnership influence export diversification within Africa. Using network analysis, it develops three indices to measure the degree, closeness, and prestige of trading partners across 54 African countries from 2000 to 2020. These indices, along with traditional estimators, reveal two key findings. Firstly, the quality of trade partnerships, focusing on 'who' a country trades with, holds more significance than quantity. Secondly, there is a geographical imbalance, where the effect of trade partnerships turns negative for countries with higher product diversification. In conclusion, while intra-continental trade diversification shows promise, more advanced African nations may experience diminishing returns, suggesting a need for expanding trade networks beyond the continent for sustained export diversification.

Key Words: trade partner diversification, product diversification, AFCFTA agreement
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Introduction

Africa, with its vast and diverse resources, has long been viewed as a continent ripe with potential for economic growth and development. However, unlocking this potential has proven to be a complex challenge, particularly in the realm of international trade. The main problem addressed in this research revolves around the need to diversify export

baskets in Africa, thereby enhancing economic resilience and sustainability. By addressing this issue, this study aims to shed light on the potential of increased intra-continental trade partnerships as a means to address this challenge. Therefore, the primary objective of the study is to investigate the potential impact of increased intra-continental trade partnerships on the diversification of export baskets among African nations. Specifically, the paper aims to assess the influence of these trade partnerships on export diversification within the African context. This involves examining both the quantity and quality of trade relationships to understand their role in fostering diversified export portfolios among African countries.

Historically, one of the primary impediments faced by African countries is the reliance on a restricted set of trading partners. This historical dependence, often rooted in colonial legacies and post-colonial relationships, exposes African economies to external shocks and constrains their ability to explore diversified export destinations (United Nations Conference on Trade and Development 2019). Recognizing the vulnerability associated with such dependence, concerted efforts have been made to broaden the scope of trading relationships.

In the past, many developing nations pursued inward-looking import substitution policies to address economic challenges, but the oil shocks of the 1970s rendered these strategies unsustainable. This led to a shift towards more liberalized trade regimes, notably through programmes like the Structural Adjustment Programme. Export promotion gained traction in the 1980s, inspired by the success of the 'Asian Tigers', aiming to catalyse economic growth through international trade. However, the outcomes of export-oriented policies varied among developing countries, prompting nuanced examination. In Africa, low intra-African trade levels persist despite efforts at regional economic cooperation since the 1970s. Aid for Trade initiatives introduced by the World Trade Organization sought to enhance developing countries' participation in global trade, yet progress in diversifying economies through international commerce remains uneven. The African Continental Free Trade Area (AFCFTA), established in 2018, holds the potential to enhance intra-African trade and economic integration, offering opportunities to diversify export markets and goods produced across the continent.

The AFCFTA agreement is the largest FTA since the formation of the General Agreement on Tariffs and Trade (GATT) and is considered as a resurrection of previous attempts to economically unify Africa through

terms of trade (Leshoele 2020). At the core of the agreement is the agenda of increased intra-continental trade partnerships which is envisioned as necessary to decolonize the African trade system and subsequently overcome the lingering effects of slavery, colonialism and neo-colonialism (Obeng-Odoom 2020). Whilst several authors have used Computable General Equilibrium (CGE) and Partial Equilibrium (PE) models to document the potential economic gains from the zero-tariffs policy proposed by the agreement (Abrego et al. 2019; Fofack et al. 2021; Bayale et al. 2022), these studies do not offer insights into the economic impact of increasing the number and variety of trade partnerships.

The hypotheses driving this research are twofold: firstly, that fostering trade partnerships within Africa will lead to greater diversification of export baskets among its nations, and secondly, that such diversification will result in increased economic stability and growth for participating countries. These hypotheses are grounded in the belief that reducing reliance on a limited set of exports and broadening the range of traded goods can mitigate risks associated with market volatility and external shocks.

Our study seeks to investigate whether the AFCFTA's primary objective of improved intra-trade partnerships can stimulate diversification in trade products. In theory, the configuration of trade networks is fundamentally shaped by competitive dynamics and the drive for survival among heterogeneous firms, compelling them to adapt and seek heightened productivity by venturing into new markets (geographical trade margins) and expanding the array of products they offer (extensive trade margins) (Melitz 2003; Chaney 2008; Helpman et al. 2008). In practice, insights drawn from the 'Asian growth miracle' demonstrate the significance of cultivating more sophisticated export portfolios and forging new trade alliances, as these elements can enhance a nation's trade standing and fully harness the potential of trade activities (Stiglitz 1996).

In alignment with these theoretical underpinnings and practical insights, our study scrutinizes whether the prospect of augmenting Africa's intra-continental geographical trade margins will increase the extensive trade margins of its products and produce a more diversified export portfolio.

The main element of complexity in our research lies in formulating a measure for trade partnerships. While existing literature suggests metrics such as the actual number of trading partners (Shepard 2010) or the trade partner concentration index formulated by Babones et al. (2011), and Babones and Farabee-Siers (2012), which gauges the proportion of

a country's exports routed to its foremost trading partners, we adopt the network coding system devised by Önder and Yilmazkuday (2016). This network system produces three indices of trade partner diversification (TPD) encompassing (i) the degree or number of export partners), (ii) the proximity of these export partners, and (iii) the prestige of trading partners, which delineates the interconnectedness of a country's trading associates. Notably, these indices encapsulate pivotal dimensions of trade within the partnership network, encompassing facets such as intermediate-input trade, participation in global value chains, and considerations related to transportation costs (Önder and Yilmazkuday 2016).

We compile a comprehensive TPD dataset spanning 54 African countries over the period from 2000 to 2020. Subsequently, we employ this dataset to scrutinize the relationship between geographical trade margins and trade product diversification across the African continent using traditional POLS and more advanced panel quantile regressions which can capture location asymmetries in trade relationships (Ngondo and Phiri 2024). Our findings unveil a 'semi-hump-shaped' association between partner diversification and export diversification, signifying that the AFCFTA's pursuit of augmented intra-trade partnerships can catalyse the development of novel products for new markets, albeit up to a certain threshold limit.

The study overcomes the constrictions of relying on a few trading partners, enabling policymakers and businesses to develop strategies for diversification and reducing dependence. Despite its significance, this research is not without limitations. One such limitation is that the study may face challenges in accounting for the diverse economic, political, and social contexts across different African countries, which could impact the generalizability of its findings. Furthermore, the complex nature of trade dynamics entails that the outcomes of increased intra-continental trade partnerships may vary depending on a range of contextual factors.

The rest of the paper is structured as follows: the second section presents a literature review, the third section outlines the measures of trade partner diversification, the fourth section presents the empirical framework, the fifth section presents the results and the sixth section concludes the study.

Literature Review

Our study relates to a strand of research which examines the influence of a country's trade partners on economic growth, employing various

proxies to measure trade partnerships. Arora and Vamvakidis (2005) were among the pioneers in investigating the impact of a country's trading partners on domestic economic growth. Analysing a sample of 101 countries from 1960 to 1999, they found that the growth and income levels of trading partners significantly affect a country's growth rates, suggesting that developing countries can benefit from industrialized economies, while industrialized countries can benefit from rapidly growing emerging economies.

Brenton and Newfarmer (2007), along with Amurgo-Pacheco and Pierola (2008), introduced a formal measure of the geographic extensive margin, emphasizing the importance of exporting to new geographical destinations for developing countries. Rondeau and Roudaut (2014) and Didier (2017) extended these concepts, developing similar measures of trade geographic diversification for samples of 64 developing countries and BRICS countries, respectively. Rondeau and Roudaut (2014) found that partner diversification can benefit poorer countries more than richer ones, while Didier (2017) highlighted the role of bilateral trade between Sub-Saharan Africa (SSA) and BRIC (Brazil, Russia, India and China) countries in diversifying export destinations within intra-Africa trade.

Shepard (2010) presented a simpler measure of trade partner diversification for 117 developing countries, counting the number of countries to which the exporting country has strictly positive export flows. The study used POLS and GMM estimators to identify factors influencing export partner diversification, finding that reductions in export costs, tariffs, and international transport costs positively impact geographical export diversification.

Babones et al. (2011), and Babones and Farabee-Siers (2012), created trade partner concentration indices for a sample of 128 countries from 1981 to 2006, measuring the percentage of a country's exports allocated to its top trading partners. They found that while the patterns of export trade concentration shifted over decades, Latin America and Africa maintained historically high levels of trade partner concentration.

In a study closely related to ours, Önder and Yilmazkuday (2016) created a panel dataset of export partner diversification for 83 countries, considering the degree, closeness, and prestige of export partners. Their growth regressions revealed that trade partnership is a significant growth determinant for countries characterized by low financial depth, high inflation, and low levels of human capital.

Our study extends Önder and Yilmazkuday's work by creating a trade partner diversification dataset exclusively for a network of African countries, using a more recent time span (2000 - 2020). Moreover, we deviate from the conventional focus on economic growth and investigate the trade partnership-export diversification relationship. This departure is motivated by recent literature questioning the utility of economic growth as a welfare measure, emphasizing the importance of diversified export portfolios in reflecting a more diversified industrial structure, which, in turn, is directly linked to improvements in standards of living (Siswana and Phiri 2021).

Measures of Trade Partner Diversification

We now detail the steps taken to create the time series indices of trade partner diversification for 54 African countries. We use information from the World Integrated Trade Solution (WITS) database to identify the export trading partners of each African country in the network and follow the three-stage procedure, described in Önder and Yilmazkuday (2016), to construct the indices.

Firstly, we create an Adjacency matrix A(t) of binary digits describing the bilateral trade links between African countries, with the trade elements (i.e. TRD (t):

$$A(t)_{ij=}\begin{cases}1, & \textit{if country } i \text{ exp}\textit{orts to contry } j\\ 0, & \textit{otherwise}\end{cases}. \tag{1}$$

From matrix A(t), trade partner degree (TPD) is measured as the number of trade links a country has relative to the total number of possible links in the binary network.

$$TPD(t)_i = \frac{\sum_j \exp(t)_{ij}}{N-1}, \tag{2}$$

where 0 < TPD(t)i < 1, such that when TPD = 1, then country i trades with every African country in the network, whereas if TPD = 0, then country i does not export to any country.

Secondly, we extend the binary A(t) matrix into a non-binary D(t) matrix whose non-diagonal elements measure the geodesic distance between two countries, that is, the shortest path between two nodes in the network (Han et al. 2022). For cases in which the countries in the network are not connected and their geodesic distance is assumed to be

infinity, we follow Önder and Yilmazkuda (2016) and assign the value 10 in the corresponding elements of the distance matrix D(t). All in all, the closeness centrality shows how far or close a country is to its trade partners or how directly accessible a country is by other countries, and thus reflects dimensions of intermediate-input trade and global value chains as well as transportation costs within the network (Önder and Yilmazkuday 2016). The elements 'TPC(t)ij' within the D(t) matrix are computed as:

$$TPC(t)_i = \frac{N - 1}{\sum_j d\exp(t)_{ij}}, \tag{3}$$

wher 0 < TPC(t)i < 1, such that values close to 0 indicate that a given country is 'far' from other countries (trade partners) in the network, whereas a value close to 1 indicates that a given country is 'close' to its trade partners. In other words, in the trade network, the higher the closeness centrality of a country, the closer its trade connection with other countries in the trade network.

Lastly, we create an index of a country's trade prestige by computing the eigenvectors for each country in the international trade network which measures how crucial, influential, and clustered a country's trading partners are. The eigenvector centrality is computed using the Power-Iteration Method in which we (i) initialize all the centralities to one, (ii) normalize the vector, and (iii) repeat the multiplication-normalization steps until convergence is reached (Abdi and Shakeri 2019). The trade partner eigenvalue - TE(t) - values range from a hypothetical 0 (a country does not have trading partners) to 1 (all of a country's trading partners trade with all other partners in the network) and countries with higher (lower) eigenvectors are more (less) connected to countries which are well connected to other countries in the network.

We now provide insight to some stylized facts on the trade partner diversification dataset by summarizing the rankings of the countries based on degree, closeness, and prestige, and further evaluate the evolution of time series plots for the individual countries. To keep the discussion concise, we focus on countries in the top five and bottom five of the rankings.

From the summary of the rankings in table 1, we observe that higher income countries such as South Africa, Egypt, and Morocco occupy the top rankings of all partnership indices (panel A), whilst poorer con-

TABLE 1 Summary of Top 5 and Bottom 5 Trade Diversification Ranking

Rank	Export Degree (ED)	Export Concentration (EC)	Export Prestige (EE)
Panel A: top-ranked countries			
1	South Africa (0.94)	South Africa (0.95)	South Africa (0.20)
2	Egypt (0.91)	Egypt (0.92)	Egypt (0.20)
3	Kenya (0.91)	Kenya (0.92)	Kenya (0.19)
4	Côte d'Ivoire (0.87)	Morocco (0.89)	Côte d'Ivoire (0.19)
5	Morocco (0.87)	Côte d'Ivoire (0.88)	Morocco (0.19)
Panel B: bottom-ranked countries			
1	Guinea-Bissau (0.26)	Guinea-Bissau (0.57)	Guinea-Bissau (0.06)
2	Comoros (0.230	Comoros (0.57)	Comoros (0.06)
3	Cabo Verde (0.19)	Cabo Verde (0.55)	Cabo Verde (0.04)
4	Sao Tome and Principe (0.14)	Sao Tome and Principe (0.54)	Sao Tome and Principe (0.03)
5	South Sudan (0.03)	South Sudan (0.38)	South Sudan (0.01)

NOTE Index values reported in parentheses ().

flict-prone economies and islands such as South Sudan, Somalia, Guinea-Bissau, and Eretria are at the bottom of these rankings (panel B).

The time series plots of the trade partner indices are presented in figure 1 for the top 5 (South Africa, Egypt, Kenya, Côte d'Ivoire, Morocco) and bottom 5 (Guinea-Bissau, Comoros, Cabo Verde, Sao Tome and Principe, South Sudan) ranked countries.

Two striking features are observed from the evolution of the time series. Firstly, the indices appear to be correlated with business cycle fluctuations. For instance, during the commodity boom of 2003-2005, we observe an increasing trend in most trade partnership indexes, whereas around the 2008-09 financial crisis and the resulting global recession period of 2009-2010, as well as the more recent COVID-19 pandemic, the indexes experience slumps. Secondly, in the post-2010 recession period the closeness and prestige indexes have slumped for most lower-ranked

countries, whereas a general upward trend is observed for the higher ranked counterparts.

Empirical Framework

To examine the impact of trade partner diversification (TPD) on export product diversification, we estimate the following panel regression model using data spanning from 2000 to 2020:

$$DX_{i,t} = \alpha + \beta_1 TPD_{i,t} + \beta_2 TPD_{i,t}^2 + \gamma Z_{i,t} + \delta_i + \delta_t + e_{i,t}, \quad (4)$$

where the dependent variable DXt is the modified Finger-Kreinin (1979) index used to capture export diversification computed as:

$$DX_j = \frac{\sum h_{ij} - x_j}{2}, \quad (5)$$

where is the share of commodity i in the total exports of country j and is the share of the commodity in world exports. The vector Zt is the set of conditioning variables inclusive of GDP growth (GDP), human capital (HC), domestic investment (INV), and quality of political institutions (POLITY), whilst δi and δt account for fixed effects.

We also estimate regressions (4) using the quantile regression estimators of Koenker and Bassett (1978), which we use to examine how trade partner diversification and other growth covariates influence the shape, scale and location at different points of the response distribution to export diversification. This involves estimating the dependent variable (Yit) at different quantiles of conditional distribution of the independent variables, Xit, where the conditional quantile for Yit given Xit i is compactly represented as:

$$Q_{y_{it}}(\tau ? X_{it}) = X_{it}^{\tau} \beta_{\tau}. \quad (6)$$

The coefficient estimates obtained from the traditional OLS estimator is based on the following minimization mean function of the form,], the quantile estimator of the conditional mean function of Y on its set of conditioning covariates (X):

$$\min_{\beta} [\theta \sum |Y_t - X_t \beta| + (1 + \theta) \sum |Y_t - X_t \beta|] \{t: FS_t \geq X_t \beta\} \{t: FS_t < X_t \beta\}, \quad (7)$$

with $\{Y, t = 1, 2\ldots, T\}$ being a random sample on the regression

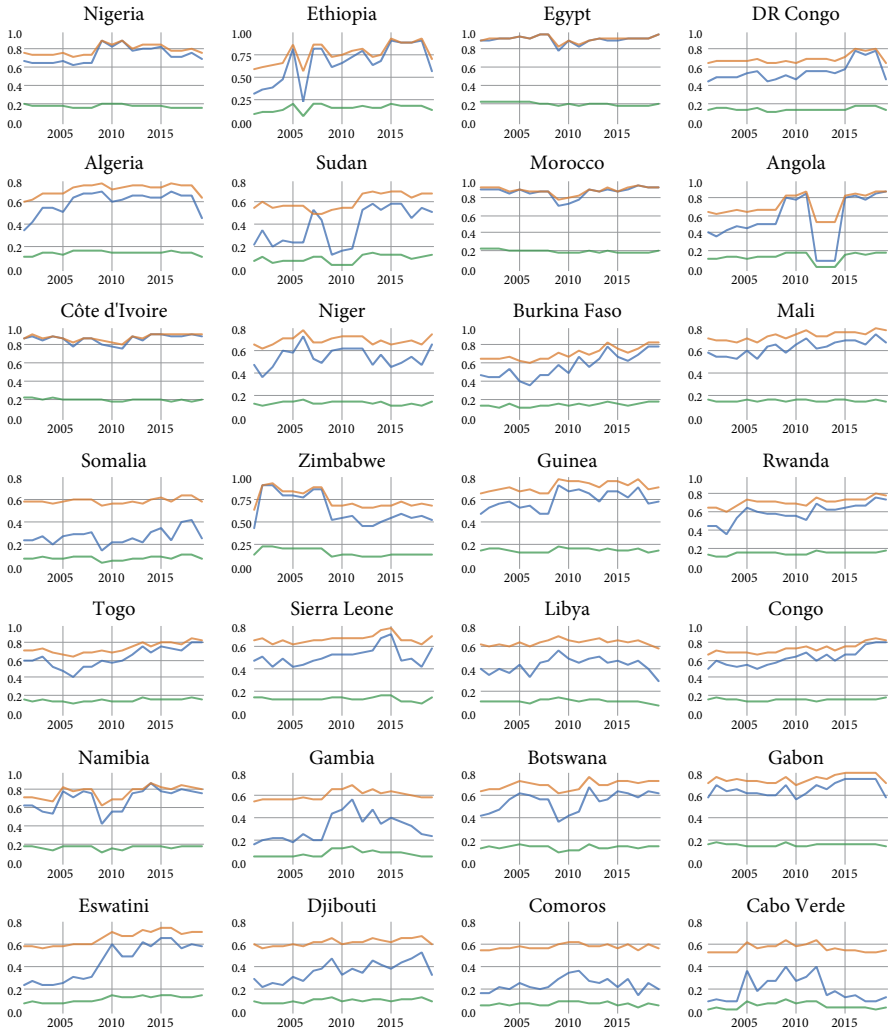

FIGURE 1 Time Series Plots of Trade Partner Diversification Indices

process $Y = {}_t + X_t\beta$, and the conditional distribution function of $F_{Y/X}(y) = F(Y_t \leq GDP) = F(Y_t - X_t\beta)$, and $\{X_t, t = 1,2\ldots, T\}$ being the sequences of (row) k-vectors of a known design matrix. The θ^{th} regression quantile, $Q_{Y/X}(\theta)$, $0 < \theta < 1$, is any solution to minimize problems, denotes the solution from which the θ^{th} onditional quantile $Q_{Y/X}(\theta) = x\beta_\theta$. Our study uses 3 'quantiles' within the regression which are designated at the 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th and 90th quantiles of conditional distribution.

Data Description and Results

The following sub-sections present the empirical findings from our analysis.

SUMMARY STATISTICS, CORRELATION MATRIX AND UNIT ROOT TESTS

In this section of the paper, we present the summary statistics, unit root tests, and correlation matrices of the panel series, as reported in tables 2,

TABLE 2 Summary Statistics and Unit Root Tests

	DX	EC	ED	EE	INV	HC	GDP	POLITY
MEAN	0.759	0.705	0.548	0.126	-1.88	0.185	4.074	0.351
MEDIUM	0.782	0.697	0.566	0.133	-2.379	0.195	4.337	0.00
MAXIMUM	0.937	1.00	1.00	0.224	0.00	0.468	6.083	1.00
MINIMUM	0.453	0.00	0.00	0.00	-5.231	0.00	0.00	0.00
STD. DEV.	0.089	0.127	0.238	0.049	1.506	0.137	1.333	0.399
SKEWNESS	-1.15	-0.489	-0.211	-0.475	0.187	0.039	-1.902	0.378
KURTOSIS	4.04	6.27	2.19	2.54	1.52	1.84	6.77	1.31
JARQUE-BERA	273.47	499.70	35.66	47.76	99.37	57.13	1228.08	145.51
P-VALUE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES DX – export diversification; EC – Export closeness, ED – Export degree; EE – Export prestige, INV – investment; HC – human capital; GDP – gross domestic product growth; POLITY – political institutions.

3, and 4, respectively. It is essential to note that all time series variables have been logged for empirical purposes.

From table 2, we observe high (low) average values on the export diversification and trade partner concentration indices (trade partner diversification and prestige), implying that while African countries have a high number of trading partners, these countries also have relatively low-quality trading partners. Skewness and kurtosis statistics reveal that the trade partnership indices are slightly negatively skewed with fat tails, indicating a non-normal distribution of the series. This justifies the use of quantile regression, which can capture the relationship between a set of time series at different levels of conditional distribution, including tail-end co-movements.

In table 3, the reported correlation coefficients demonstrate the expected positive correlation between all measures of trade partner diversification and export diversification, as indicated by previous studies (Brenton and Newfarmer 2007; Amurgo-Pacheco and Pierola 2008; Shepard 2010; Babones et al. 2011; Babones and Farabee-Siers 2012; Didier 2017). Based on these preliminary findings, we formulate the hypothesis of a positive trade partner–export diversification relationship for all partnership indices, which we subsequently evaluate in our main empirical analysis. Moreover, none of the reported correlation coefficients exceeds 0.8, a result that safeguards against possible multicollinearity among the variables.

Finally, the LLC and IPS unit root test results in table 4 reject the unit root null hypothesis for at least one of the performed tests for each of

TABLE 3 Correlation Matrix

	DX	EC	ED	EE	INV	HC	GDP	POLITY
DX	1.00							
EC	0.04	1.00						
ED	0.07	0.96	1.00					
EE	0.06	0.92	0.97	1.00				
INV	0.05	−0.06	−0.05	−0.05	1.00			
HC	0.09	0.60	0.63	0.62	−0.10	1.00		
GDP	0.08	0.63	0.64	0.63	−0.20	0.58	1.00	
POLITY	0.05	0.16	0.15	0.15	−0.12	0.23	0.16	1.00

NOTES DX – export diversification; EC – Export closeness, ED – Export degree; EE – Export prestige, INV – investment; HC – human capital; GDP – gross domestic product growth; POLITY – political institutions.

the panel time series. This implies that all variables are mutually I(0) stationary processes and are thus suitable for estimation using POLS and quantile estimators.

BASELINE ESTIMATORS

Table 5 presents the baseline regression outcomes from the POLS, fixed effects, and random effects estimators. Notably, all three trade partner diversification indices yield positive and statistically significant estimates, indicating the importance of the degree, closeness, and prestige of trading partners in trade product diversification. It is noteworthy that both prestige and closeness indices result in higher coefficient estimates

TABLE 4 Unit Root Tests

	Levin, Lin, and Chu (LLC)		Im, Pesaran, and Shin (IPS)	
	levels	First differences	Levels	First differences
DX				
ED	−2.04**	−9.48***	−1.84**	−13.68***
EC	−1.46*	−9.98***	−1.37*	−13.74***
EE	−3.77***	−8.88***	−4.59***	−13.99***
INV	−5.59***	−5.63***	−1.23	−5.27***
HC	−0.21	−3.95***	−1.51*	−3.59**
GDP	−7.57***	−17.57***	−7.63***	−22.79***
POLITY	45.77***	−37.42***	−14.61***	−12.28***

NOTES '***', '**', '*' denote 1%, 5%, 10% significance levels, respectively. DX – export diversification; EC – Export closeness, ED – Export degree; EE – Export prestige, INV – investment; HC – human capital; GDP – gross domestic product growth; POLITY – political institutions.

compared to the degree of trading partners. This aligns with the findings of Brenton and Newfarmer (2007), Amurgo-Pacheco and Pierola (2008), and Önder and Yilmazkuday (2016), underscoring that the type of trading partner holds more significance than the sheer number of trading partners. For instance, countries with an equal number of trading partners may exhibit different levels of development based on the nature of their trade partnerships (Babones et al. 2011; Babones and Farabee-Siers 2012). Moreover, from an economic standpoint, establishing international trade connections with a larger and/or better-connected array of countries is positively and significantly associated with higher levels of export diversification, all else being equal. This implies that fostering such connections should be considered crucial for achieving greater export diversification, thereby potentially leading to higher levels of economic growth and development. Policymakers should therefore prioritize initiatives aimed at fostering diverse and robust trade partnerships, both regionally and internationally. While efforts to increase the number of trading partners are important, policymakers should also focus on strengthening ties with economically advanced and geographically proximate countries. This balanced approach to diversifying trade partnerships can amplify efforts towards export diversification and contribute positively to overall economic development.

Furthermore, most control variables (investment, human capital, and GDP growth) consistently yield positive and statistically significant estimates, consistent with prior studies by Agosin et al. (2012), Fonchamnyo and Akame (2017), Swathi and Sridharan (2022), and Zarach and Parteka (2023). These variables are recognized as plausible determinants of export diversification. An exception is the political institution (POLITY) variable, which predominantly produces negative and significant estimates. This could occur when political institutions fail to create an environment conducive to fostering diversification of productive capabilities, particularly in resource-intensive countries, i.e. the resource curse (Omgba 2014; Olander 2019).

QUANTILE ESTIMATORS

Table 6 presents the coefficient estimates from quantile regression across 10 distributional quantiles. For the trade partner degree and closeness measures, positive and statistically significant estimates are evident between the 20th and 80th quantiles. Conversely, the coefficient estimates for the prestige measure are significantly positive across all quantiles.

TABLE 5 Baseline Estimators

	POLS			Fixed effects			Random effects		
ED	0.05			0.04			0.03		
	(0.00)***			(0.00)***			(0.00)***		
EC		0.16			0.16			0.14	
		(0.00)***			(0.09)*			(0.06)*	
EE			0.18			0.17			0.17
			(0.01)**			(0.01)**			(0.01)**
INV	0.005	0.005	0.005	0.004	0.004	0.04	0.008	0.007	0.007
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
HC	0.07	0.09	0.04	0.11	0.10	0.08	0.06	0.04	0.03
	(0.00)***	(0.00)***	(0.09)*	(0.09)*	(0.14)	(0.24)	(0.30)	(0.34)	(0.25)
GDP	0.01	0.01	0.005	0.02	0.03	0.03	0.003	0.005	0.005
	(0.00)***	(0.00)***	(0.06)*	(0.07)*	(0.02)**	(0.02)**	(0.69)	(0.46	(0.52)
POLITY	0.009	0.01	0.009	−0.02	−0.015	−0.01	−0.01	−0.015	−0.015
	(0.18)	(0.15)	(0.20)	(0.01)**	(0.02)**	(0.02)**	(0.01)**	(0.00)***	(0.00)***

NOTES '***', '**', '*' denote 1%, 5%, 10% significance levels, respectively. DX – export diversification; EC – Export closeness, ED – Export degree; EE – Export prestige, INV – investment; HC – human capital; GDP – gross domestic product growth; POLITY – political institutions.

Similar to the traditional estimators, the trade partnership closeness and prestige variables yield larger regression coefficients compared to the partnership degree across all quantiles. This aligns with prior literature, emphasizing that the quality of trading partners holds more significance than the sheer quantity (Brenton and Newfarmer 2007; Amurgo-Pacheco and Pierola 2008; Önder and Yilmazkuday 2016). Therefore, trade policies should focus on nurturing relationships with partners characterized by high prestige and closeness, as they are likely to yield larger benefits in terms of export diversification for more developed AFCFTA member countries.

Upon closer examination, the coefficient estimates for all three measures of Trade Partner Diversification (TPD) increase in magnitude until the 50th median quantile, after which the magnitude decreases at higher quantiles. This suggests a semi-humped-shaped relationship between partnership and export diversification, indicating that the marginal benefits of increasing trade partnerships exist primarily for countries with low to medium levels of product diversification. Conversely, diminishing returns are observed for countries with more developed trade industries at higher quantiles.

The control variables generate positive and statistically significant estimates at various quantiles. For the investment, human capital, and GDP

TABLE 6 Quantile Regression Estimators

		Export Degree		Export Closeness		Export Prestige	
	τ	estimate	p-value	estimate	p-value	estimate	p-value
TPD	0.1	0.02	0.93	0.29	0.66	0.05	0.00***
	0.2	0.08	0.06*	0.13	0.00***	0.09	0.75
	0.3	0.07	0.00***	0.14	0.00***	0.11	0.29
	0.4	0.06	0.00***	0.14	0.00***	0.14	0.04*
	0.5	0.06	0.00***	0.16	0.00***	0.18	0.03*
	0.6	0.05	0.00***	0.14	0.00***	0.19	0.02**
	0.7	0.05	0.00***	0.13	0.00***	0.17	0.04*
	0.8	0.04	0.01**	0.12	0.00***	0.15	0.09*
	0.9	0.01	0.54	0.06	0.14	0.003	0.07*
INV	0.1	0.009	0.13	0.009	0.04*	0.003	0.45
	0.2	0.01	0.00***	0.008	0.12	0.006	0.03*
	0.3	0.007	0.00***	0.007	0.00***	0.006	0.00***
	0.4	0.006	0.00***	0.007	0.00***	0.008	0.00***
	0.5	0.005	0.00***	0.005	0.00***	0.007	0.00***
	0.6	0.004	0.00***	0.005	0.00***	0.005	0.00***
	0.7	0.003	0.03*	0.003	0.01**	0.003	0.04*
	0.8	0.003	0.09*	0.004	0.04*	0.003	0.07*
	0.9	0.004	0.07*	0.005	0.00***	0.004	0.05*
HC	0.1	−0.44	0.15	−0.18	0.78	−0.56	0.00***
	0.2	0.153	0.14	0.20	0.04*	0.003	0.98
	0.3	0.136	0.00***	0.18	0.00***	0.08	0.09*
	0.4	0.146	0.00***	0.16	0.00***	0.133	0.00***
	0.5	0.161	0.00***	0.17	0.00***	0.137	0.00***
	0.6	0.123	0.00***	0.12	0.00***	0.111	0.00***
	0.7	0.076	0.00***	0.08	0.00***	0.075	0.00***
	0.8	0.078	0.00***	0.09	0.00***	0.061	0.00***
	0.9	0.075	0.00***	0.09	0.00***	0.072	0.00***
GDP	0.1	0.03	0.12	0.05	0.00***	0.01	0.09*
	0.2	0.012	0.14	0.02	0.42	0.01	0.26
	0.3	0.014	0.00***	0.01	0.00***	0.01	0.01**
	0.4	0.012	0.00***	0.01	0.00***	0.008	0.06*
	0.5	0.005	0.23	0.008	0.09*	0.002	0.44
	0.6	0.002	0.21	0.003	0.08*	0.001	0.43
	0.7	0.004	0.03*	0.004	0.00***	0.003	0.06*
	0.8	0.005	0.00***	0.005	0.00***	0.004	0.01**
	0.9	0.005	0.00***	0.006	0.00***	0.005	0.00***

Continued on the next page

TABLE 6 *Continued from the previous page*

		Export Degree		Export Closeness		Export Prestige	
	τ	estimate	p-value	estimate	p-value	estimate	p-value
POLITY	0.1	0.0002	0.99	−0.0002	0.99	0.017	0.33
	0.2	0.0004	0.97	0.002	0.90	0.004	0.80
	0.3	−0.004	0.63	−0.002	0.82	−0.004	0.63
	0.4	−0.001	0.81	−0.001	0.82	−0.002	0.70
	0.5	−0.002	0.75	−0.001	0.80	−0.003	0.62
	0.6	0.002	0.74	0.005	0.43	0.0009	0.98
	0.7	0.014	0.03*	0.017	0.00***	0.009	0.18
	0.8	0.007	0.29	0.007	0.28	0.01	0.11
	0.9	0.14	0.04*	0.012	0.06*	0.02	0.02**

NOTES '***', '**', '*' denote 1%, 5%, 10% significance levels, respectively. DX – export diversification; EC – Export closeness, ED – Export degree; EE – Export prestige, INV – investment; HC – human capital; GDP – gross domestic product growth; POLITY – political institutions.

variables, the coefficients are significant across the 20th to 90th quantiles. Meanwhile, the political institution (POLITY) variable produces significant estimates at the 70th and 90th quantiles.

Conclusions

We examine whether the increased intra-continental trade partnerships resulting from the recent AFCFTA agreement can contribute to diversifying export baskets. To this end, we employ network analysis to construct three novel indices measuring the degree, closeness, and prestige of a country's trading partners for 54 African countries from 2000 to 2020. This dataset enables us to explore the impact of trade partnerships on export diversification using both traditional and quantile estimators.

Despite the potential benefits of AFCFTA and increased intra-continental trade, there is a gap in the literature regarding its specific impact on export diversification within the African context. While some studies have explored the determinants of export diversification at the country level, few have examined the role of trade partnerships in shaping export portfolios across the continent. Our contribution to the literature therefore lies in demonstrating that a country's position within the international trade network significantly and positively influences the level of export diversification regressions, even when considering other standard control variables. Traditional estimators indicate that all trade indices are positively associated with product diversification. Notably, the closeness

and prestige of trading partners exhibit more significant effects compared to the sheer number of trading partners. However, quantile regressions reveal a semi-humped-shaped partnership-export diversification schedule, suggesting that the marginal effects of enhanced intra-continental trade partnerships turn negative at higher quantiles of distribution.

Our findings yield two key policy implications. Firstly, the 'type' of a country's trading partners holds greater significance than the sheer quantity. Countries with the same number of trading partners may differ in industry structure and development based on the quality of their trading partners. Secondly, African countries with high (low) levels of product diversification will benefit less (more) from increased intra-continental trade partners. Hence, for the success of the AFCFTA agreement, policymakers should not only emphasize strengthening intra-continental ties but also consider boosting international trade connections, especially for more developed African countries unable to diversify trade baskets with less 'sophisticated' trading partners.

Based on the findings, the paper suggests that fostering intra-continental trade partnerships through initiatives like the AFCFTA can indeed contribute to diversifying export portfolios. Policymakers can leverage this insight to prioritize efforts aimed at strengthening regional trade integration. Therefore, a prudent trade policy for these countries would entail fostering strategic alliances with prestigious and economically robust trading partners, as emphasized in prior literature. By doing so, they can optimize their export diversification efforts and enhance their competitiveness within the AFCFTA framework.

African countries vary significantly in terms of geographical, economic, and institutional characteristics, which could affect the generalizability of the findings. To account for this heterogeneity, the study could have conducted subgroup analyses or sensitivity tests to assess the robustness of the results across different country groupings or economic classifications.

While the current study provides valuable insights into the relationship between intra-continental trade partnerships and export diversification in Africa, there are several avenues for further research that could expand upon the findings. Conducting comparative studies with other regions or countries outside of Africa could provide valuable insights into the unique challenges and opportunities faced by African nations in diversifying their export portfolios. By benchmarking against global trends and best practices, researchers can identify lessons learned and

potential policy recommendations for enhancing export diversification efforts.

Given the novelty of our dataset, we encourage researchers to utilize it (available upon request) for further empirical research on intra-continental partnerships under the AFCFTA agreement. The time series format of the data facilitates country-specific or regional analyses for researchers and policymakers. Future studies can use the dataset to explore issues related to regional-value-chains, small business and tourism development, female participation and environmental sustainability.

In essence, our findings highlight the potential of intra-continental trade partnerships under the AFCFTA agreement to foster export diversification in Africa, offering a pathway towards sustainable economic growth and development.

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Appendix

List of Countries

Countries			
1	Algeria	28	Madagascar
2	Angola	29	Malawi
3	Benin	30	Mali
4	Botswana	31	Mauritania
5	Burkina Faso	32	Mauritius
6	Burundi	33	Morocco
7	Cameroon	34	Mozambique
8	Cape Verde	35	Namibia
9	Central African Republic	36	Niger
10	Chad	37	Nigeria
11	Comoros	38	Republic of the Congo
12	DR of the Congo	39	Rwanda
13	Djibouti	40	Sao Tome and Principe
14	Egypt	41	Senegal
15	Equatorial Guinea	42	Seychelles
16	Eritrea	43	Sierra Leone
17	Eswatini	44	Somalia
18	Ethiopia	45	South Africa
19	Gabon	46	South Sudan
20	Ghana	47	Sudan
21	Guinea	48	Tanzania
22	Guinea-Bissau	49	The Gambia
23	Côte d'Ivoire	50	Togo
24	Kenya	51	Tunisia
25	Lesotho	52	Uganda
26	Liberia	53	Zambia
27	Libya	54	Zimbabwe