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Industrial similarity, diversification and the promotion of intra-African trade

Abstract

Recent research indicates that the level of intra-African trade is low relative to what is observed in other continents and relative to the potential of African economies. The continent's weak regional trade performance has been ascribed to factors ranging from limited supply capacities and multiple non-convertible national currencies to high trade barriers and infrastructural bottlenecks. While the impacts of these factors have been studied in the literature, the roles of product concentration and similarities in industrial structures across countries in explaining intra-African trade have not been addressed using a suitable econometric methodology. The present paper fills this gap. It finds that product concentration impedes intra-African trade while similarities in industrial structures between country pairs enhance it.

Key words: *Intra-African trade; industrial similarity; diversification; product concentration*



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1. Introduction

Regional integration has been a prominent and noteworthy feature of Africa's economic development over the past decades as evidenced by the relatively high number of regional economic groups, trade agreements and other initiatives launched by the continent (UNECA 2010; WTO 2018). Since independence, integration arrangements in Africa have underscored the need to boost intra-African trade to foster sustained growth and development and facilitate integration of the continent into the global economy.¹ The small size of African economies both in terms of population and income makes integration appealing because it provides access to a larger export market and permits exploitation of economies of scale in production. Regional cooperation in trade also diminishes exposure to global shocks and reduces trade costs, particularly for the 16 landlocked countries on the continent. Furthermore, regional cooperation contributes to the goal of export diversification of African economies because the composition of intra-African trade is skewed toward manufactured goods compared to Africa's trade with the rest of the world, which is dominated by primary commodities.

Notwithstanding the high potential benefits of intra-African trade, and the vital role of regional integration in the achievement of Africa's development goals, very modest trade takes place among African countries. In 2017, intra-African exports accounted for about 17 percent of Africa's total trade and intra-African imports accounted for about 13 percent. These numbers are small relative to what is observed in regional groups in other parts of the world. They are also small relative to the potential of African economies. Africa's weak regional trade performance has been ascribed to factors ranging from the low level of diversification and lack of productive capacities to high trade barriers, infrastructural bottlenecks, and existence of multiple national currencies that lack convertibility (UNECA 2010). UNCTAD (2013) suggests that the level of intra-African trade is far below potential, notably because the African regional integration agenda is focused more on the elimination of trade barriers rather than on the development of supply capacities for trade. In the same vein, Geda and Seid (2015), and Seid (2015) note that the realization of the large potential for intra-African trade is hampered by lack of diversification, which reflects the fact that most African countries export a small number of primary commodities while their imports are predominantly manufactured goods (UNCTAD, 2007; Limão and Venables, 2001).

This paper examines the role of product concentration and similarities in the sectoral structure of production across African countries in understanding intra-African trade. Traditional trade theories, such as the Ricardian and Heckscher-Ohlin models, suggest that similarities in the sectoral structure of production between two countries should lead to less bilateral trade. However, the more recent trade theories suggest that such similarities in production structure should lead to more bilateral trade (Baxter and Kouparitsas, 2006; Helpman and Krugman, 1989). The main message from these models is that there is a fundamental difference in predictions of trade theories regarding the relationship between economic similarities between country pairs and bilateral trade. A widespread view in the discourse on intra-African trade is that African countries trade less among themselves because they have similar production patterns. Yet we are not aware of any studies that have addressed this issue using a suitable econometric methodology applied to African data. To fill this gap, we use gravity-type models to examine the roles of product concentration and similarities in the production structures of African economies in explaining intra-African trade performance.

In a related paper Longo and Sekkat (2004) examined, among other factors, the role of similarities in living standards (or levels of development) between countries in explaining intra-African trade. However, the measure of economic similarity used in their paper was similarity in income per capita rather than similarity in production or industrial structures. Oramah and Abou-Lehaf (1998) also examined the extent to which the export structures of African countries match their import patterns and found that the potential for intra-African trade is modest. While Oramah and Abou-Lehaf (1998) focused on the correspondence of exports and imports of African countries our paper focuses on the effects of product concentration and similarities in the sectoral

¹ There are many regional trade arrangements in Africa, ranging from the Lagos Plan of Action and the Abuja Treaty to the African Union's Agenda 2063 and the African Continental Free Trade Area (AfCFTA) agreement signed by African Heads of State and Government in Kigali in March 2018.

patterns of production on intra-African trade. Furthermore, Oramah and Abou-Lehaf (1998) estimated their gravity equations by ordinary least squares (OLS), which yields biased and inconsistent estimates in the presence of zero observations and heteroscedasticity. To circumvent these problems the present paper adopts the Pseudo Poisson Maximum Likelihood (PPML) estimation technique, which accounts for zero observations and heteroscedasticity.

The paper is organized as follows. Section 2 discusses Africa's trade performance and structure while section 3 describes the estimation methodology and the data used in the study. Section 4 presents and discusses the regression results. Section 5 concludes the paper.

2. Africa's trade performance and structure

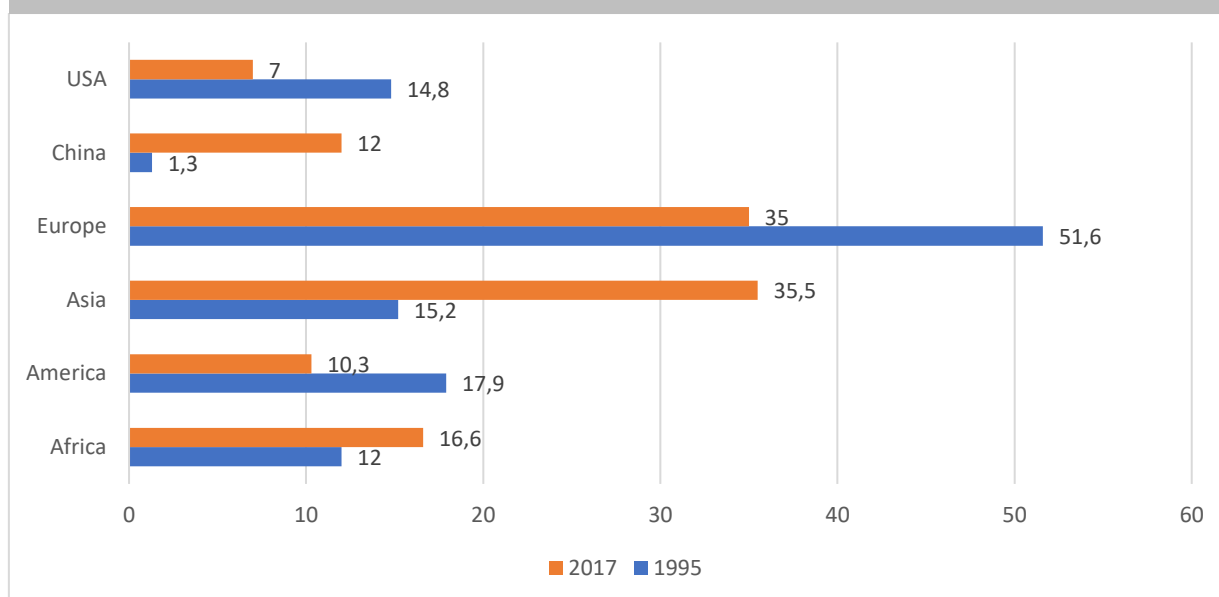
African countries are heavily reliant on trade for development as evidenced by the fact that they have high trade ratios.² Over the past few decades there has been a significant increase in the value of Africa's global trade. For instance, the value of the continent's global exports increased from \$16.1 billion in 1970 to \$413.8 billion in 2017 and the value of its global imports increased from \$14.5 billion to \$534.3 billion over the same period. Interestingly, this increase in the value of the continent's trade has gone hand in hand with a decrease in its share of global trade from 4.4 percent in 1970 to 3 percent in 2017 (table 1). There has also been a significant change in the destination of Africa's exports. In 1995 Europe was Africa's main trading partner, accounting for about 52 percent of the continent's total trade, followed by America with 18 percent, and Asia with 15 percent (figure 1). Unlike the situation some decades ago, Asia is now Africa's most important trading partner, accounting for 35.5 percent of the continent's total trade, followed by Europe with 35 percent and Africa with 17 percent. The increase in Asia's role in Africa's trade is largely due to the rapid increase in China's engagement with Africa which has seen its share of Africa's total trade rise from 1.3 percent in 1995 to 12 percent in 2017.

Table 1. Value and global share of Africa's merchandise trade

YEAR		1970	1980	1990	2000	2010	2013	2014	2015	2016	2017
Measure	Flow										
US Dollars at current prices (in millions)	Exports	16129	121378	104877	147905	521435	602322	553130	389783	355425	413836
	Imports	14538	96490	94444	129914	479324	640538	644698	555143	496311	534262
Percentage of total world	Exports	5.1	5.9	3.0	2.3	3.4	3.2	2.9	2.4	2.2	2.3
	Imports	4.4	4.6	2.6	2.0	3.1	3.4	3.4	3.3	3.1	3.0

Source: UNCTADstat Database.

² For instance, in the period 2013-2017, the average ratio of merchandise trade to GDP in sub-Saharan Africa was about 55 percent.

Figure 1. Destination of Africa's exports, 1995 and 2017, (percentage)

Source: compiled using data from UNCTADstat Database.

Another interesting feature of Africa's global trade is the fact that its exports are highly concentrated on a few products, particularly when compared to the exports of other developing regions. Table 2 presents the product concentration and diversification indices of Africa's merchandise exports. Both indices lie between 0 and 1 and are constructed in such a way that values closer to 1 imply more product concentration and high deviation of a country's exports from the global pattern. The table shows that the product concentration index for Africa in 2017 was 0.24 compared to 0.09 for developing economies in America and 0.10 for developing economies in Asia. It is also interesting to note that the value of this index for Africa in 2017 was about the same as it was in 1995, indicating there has not been any significant progress made in reducing the product concentration of the continent's exports. A look at the export diversification index also shows that Africa's export structure differs significantly from the world pattern, which reflects the fact that African countries have very low levels of diversification.

Table 2. Product concentration and diversification indices of Africa's merchandise exports

ECONOMY		Developing Africa	Developing America	Developing Asia	Africa excluding South Africa	Northern Africa	Sub-Saharan Africa
YEAR	MEASURE						
1995	Concentration Index	0.25	0.09	0.09	0.34	0.36	0.21
	Diversification Index	0.59	0.36	0.32	0.68	0.71	0.59
2005	Concentration Index	0.43	0.12	0.12	0.52	0.47	0.42
	Diversification Index	0.60	0.33	0.27	0.66	0.69	0.60
2013	Concentration Index	0.41	0.13	0.12	0.49	0.41	0.42
	Diversification Index	0.54	0.34	0.23	0.60	0.61	0.58
2014	Concentration Index	0.36	0.12	0.11	0.44	0.31	0.39
	Diversification Index	0.54	0.34	0.23	0.60	0.58	0.58

2015	Concentration Index	0.26	0.09	0.10	0.33	0.23	0.28
	Diversification Index	0.53	0.34	0.24	0.61	0.57	0.58
2016	Concentration Index	0.22	0.08	0.10	0.29	0.21	0.24
	Diversification Index	0.54	0.34	0.24	0.61	0.57	0.58
2017	Concentration Index	0.24	0.09	0.10	0.31	0.23	0.26
	Diversification Index	0.54	0.35	0.23	0.61	0.57	0.59

Notes: The product concentration index lies between 0 and 1, with higher values indicating a higher degree of export concentration. The diversification index measures the absolute deviation of a country's trade structure from the world pattern. It also lies between 0 and 1 and higher values indicate more deviation of a country's export structure from the global pattern.

Source: UNCTADstat Database.

Regarding intra-African trade, available data indicate that there has been an increase in its share of Africa's global exports from 12 percent in 1995 to about 17 percent in 2017. Nevertheless, intra-Africa trade is still quite low relative to the intra-group trade of other continents. For example, in 2017, the share of intra-group exports in total exports (of the group considered) was 66.7 percent in Europe, 53.1 percent in developing Asia and 30.6 percent in developing countries in America (Table 3). The aggregate figures for Africa masks wide variations across the regional trade blocs on the continent. Among the eight regional economic communities recognised by the African Union, the Southern African Development Community (SADC) and the East African Community (EAC) had the highest percentage of intra-group trade in 2017, with about 20 percent and 19 percent respectively. The Arab Maghreb Union (AMU) is the regional economic community with the lowest intra-group trade in 2017 (about 3.5 percent). An examination of intra-group imports also leads to the same conclusion that African countries trade less among themselves relative to the rest of the world. In 2017 intra-group imports in Africa was about 13 percent compared to 63 percent in Europe, 55 percent in developing countries in Asia and 19 percent in developed countries in America (table 4). Another approach to assessing the performance of African countries in regional trade is to compare the actual trade among African countries to potential trade derived from estimation of bilateral trade equations. By this measure, the extant literature also suggests that intra-African trade is low relative to potential (Geda and Seid, 2015; UNCTAD 2013; and Longo and Sekkat, 2004).

Table 3. Intra-group exports (percentage of total group exports)

	1995	2005	2010	2013	2014	2015	2016	2017
Developing Africa	12.01	9.51	13.88	14.51	15.47	17.81	17.60	16.65
Developing America	20.50	18.66	19.98	19.61	18.31	17.20	16.25	16.59
Developing Asia	42.22	46.59	51.41	54.68	54.14	53.60	52.99	53.07
America (developed economies)	35.87	40.78	32.39	31.82	32.36	31.13	30.66	30.61
Europe	66.34	71.76	69.03	65.52	66.37	66.06	66.82	66.69
AMU (Arab Maghreb Union)	3.90	1.97	2.39	3.55	4.11	4.11	4.10	3.45
CEN-SAD (Community of Sahel-Saharan States)	7.44	6.32	6.03	7.18	7.03	8.22	8.73	8.26
COMESA (Common Market for Eastern and Southern Africa)	5.70	5.30	7.15	9.09	9.93	11.47	9.74	11.50
EAC (East African Community)	17.50	18.98	18.69	19.55	21.17	22.52	19.76	19.35
ECCAS (Economic Community of Central African States)	1.39	1.17	2.03	1.67	1.51	2.08	1.92	2.24
ECOWAS (Economic Community of West African States)	9.43	9.63	7.69	9.18	8.29	9.97	11.23	10.18
IGAD (Intergovernmental Authority on Development)	11.81	10.47	9.07	13.31	14.50	16.31	16.01	16.01

SADC (Southern African Development Community)	14.66	10.73	18.04	18.67	19.27	21.71	20.83	19.83
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Source: UNCTADstat Database.

Table 4. Intra-group imports (percentage of total group imports)

	1995	2005	2010	2013	2014	2015	2016	2017
Developing Africa	10.76	13.66	14.66	14.38	13.68	13.40	12.95	12.93
Developing America	18.99	21.17	20.04	19.05	17.68	16.07	15.67	16.05
Developing Asia	37.92	51.43	52.74	53.55	54.27	54.94	52.49	55.18
America (developed economies)	27.60	23.18	20.41	20.84	21.20	19.34	18.72	18.70
Europe	64.88	66.23	62.82	62.92	63.16	63.13	63.29	62.84
AMU	3.62	2.99	2.86	3.45	3.27	2.65	2.51	2.33
CEN-SAD	5.59	6.91	5.98	6.65	5.87	5.62	5.44	5.47
COMESA	4.16	6.15	6.49	6.60	6.12	5.91	5.40	6.31
EAC	10.54	10.43	8.29	7.43	7.40	6.75	6.97	6.94
ECCAS	2.61	3.38	5.05	5.47	2.68	4.45	4.59	5.63
ECOWAS	8.40	12.50	9.41	11.30	9.73	9.11	8.88	8.68
IGAD	7.01	5.53	4.86	4.09	3.71	3.54	3.18	3.77
SADC	14.99	17.20	20.22	19.67	19.42	20.41	21.33	20.99

Source: UNCTADstat Database.

UNCTAD (2013) underscores the importance of low supply capacities in explaining observed levels of intra-African trade. But Africa's low level of regional trade is also a consequence of the prevalence of high tariff and non-tariff barriers that impede trade. African exporters generally face higher levels of restrictions when trading within the continent than when trading with the rest of the world. In 2017, the average tariffs facing an African exporter in sub-Saharan African countries was 3.1 percent compared with 0.4 percent for those exporting to developed countries, 1.7 percent for those exporting to East Asia, 1.9 percent for those exporting to Latin America, and 2.6 percent for those exporting to West Asia and North Africa (Table 5).

Table 5. Matrix of tariffs imposed on trade flows between regions in 2017 (%)

Importing Region	Developed Countries	East Asia	Latin America	South Asia	Sub-Saharan Africa	Transition Economies	W.Asia & N.Africa
Developed Countries	1.6	2.6	1.2	2.1	0.4	1.7	0.6

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