

Do Governance Institutions Matter for Trade Flows between Sub-Saharan Africa and its Trading Partners?

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Abstract

This study analyses the role of governance institutions in trade involving Sub-Saharan Africa (SSA) and its trading partners. Specifically, the objectives of this study are to: investigate the effect of institutions on trade between SSA and its trading partners; and examine whether governance institutions matter more for trade in SSA resource-poor countries (or non-mineral products) than for trade in resource-rich countries (or mineral products). Based on a combination of strands of literature on the subject matter, we used a modified gravity model to analyse the objectives highlighted above. Using data spanning 1996 to 2014, empirical analysis involves estimating variants of gravity equations using the modified Poisson pseudo maximum likelihood estimation approaches. Empirical results show that not all governance variables matter for trade between SSA and its partners. Whether it matters or not depends on countries' resource endowment, the pattern of trade and the direction of trade. Trade between SSA and developed countries (especially imports) is driven significantly by governance institutions, particularly the bureaucratic quality and compliance with law and order. Such importance of governance institutions could not be established in trade between SSA and Asia, which are both developing economies. Furthermore, governance institutions matter more for trade in non-mineral products than for trade in mineral products. The interaction of tariff with governance variables produced some results which suggest that inadequate governance institutions reflected in poor implementation of tariff policy may increase trade costs, thus reinforcing the negative effect of tariff on trade. Some policy recommendations were articulated to improve governance institutions in SSA to promote trade with its trading partners.

Key words: Governance institutions; Trade flows; Sub-Saharan Africa; Regional trading partners; Panel data analysis

1. Introduction

Trade is an important vehicle for economic development. The degree of the effect of trade on economic development depends on the extent to which goods and services can flow. International trade literature has established that free trade is welfare-improving while restrictive trade is welfare-reducing (Krugman and Obsfeld, 2000; Markusen et al, 1995). As a result, reduction in tariffs, declining costs of transportation, and technological advances have considerably increased international trade but not to the expected level (De Groot et al, 2003). To this end, Rauch (2001) submits that physical and market distortions fail to explain why some countries with seemingly pro-trade policies have relatively small trade flow per GDP.

To promote trade, African countries have entered into various bilateral, regional and multilateral trade agreements. For example, at the bilateral level, African countries are part of the ACP (Africa, Caribbean and Pacific) countries that engaged in non-reciprocal trade agreement with the European Union (EU-ACP pact). The EU-ACP trade pact (spelt out in the Cotonou Agreement) aims to provide improved market access for ACP countries to EU markets, enhance trade in services, increase cooperation in trade-related areas such as competition and investment, enhance the political dimension (to explicitly address corruption: promote participatory approaches, and to refocus development policies on poverty reduction). However, Africa's trade performance has been low despite non-reciprocal trade preferences for products originating from African countries. Anecdotal evidence shows that the share of Africa in European Union's (EU) market fell from 6.7% in 1976 when trade between them was less free to 2.8% in 2004 when policy barriers were almost completely dismantled (EU Commission, 2005). Further, about 65% of total exports consist of raw materials and over 60% are concentrated on only 10 products. This suggests that preferential market access alone is not capable of capturing substantial gains from trade by the African continent.

One of the factors militating against satisfactory trade performance is lack of quality governance institutions.¹ Governance institution refers to humanly devised mechanisms that structure political, economic and social interactions. They exist to reduce uncertainties that arise from incomplete information concerning the behaviour of other individuals in the process of interaction (North, 1990; Busse et al, 2007). According to WTO (2004), if a country lowers its trade barriers, outsiders may be reluctant to trade with it if, for example, they do not believe contracts can be

enforced or are not sure whether payments will be made. Therefore, the quality of domestic institutions matters for international trade. In particular, a country or region may experience low trade if the governance situation is not encouraging, even though there are strong free trade policies. According to Wei (2000), if a country is naturally open (existence of low transaction cost and less market distortion), it will be optimal for such a country to devote more resources to building good governance institutions to attract more international traders.

Further analysis of the impact of governance on trade by scholars including Li and Samsell (2009) and Wu, Li and Samsell (2012), led to the conclusion that the direction of effect of governance on trade depends on the effectiveness of governance systems, be it rule-based, relation-based or family-based.² Trade among rule-based economies is easy and high because they share the same features, while in the case of relation-based economies, trade is less easy and low because they tend to have diverse commonalities.³ However, trade between rule-based and relations-based economies may be strong or weak. Therefore, the literature is unclear as to how diverse governance institutions among countries and regions tend to impact trade.

Governance institutions in Africa and particularly Sub-Saharan Africa (SSA) are essentially weak. The World Bank has argued that the major bane to Africa's development and particularly to Africa's poor trade is the governance crisis. Most of SSA countries are characterized by poor quality institutions, weak rule of law, absence of accountability, tight controls over information and high levels of corruption. Poor governance in SSA has been attributed to lack of strong indigenously rooted institutions that could tackle the development demands of modern states, economic crisis and unsustainable debt, civil wars, and political instability (Brautigam and Knack, 2004). However, the United Nations Economic Commission for Africa (UNECA) reports that Africa has made modest progress in improving governance specifically in the angles of declining levels of violent conflicts and civil wars, consolidation of peace and security, improved budgetary management and a business-friendly environment (UNECA, 2009). Nevertheless, institutional challenges in the growth path of the region are poor political democracy, lack of respect for the rule of law, insecurity and corruption. In fact, in most African countries, high levels of insecurity and political instability and internal conflict have resurfaced, and this could pose more threat to the continent's growth performance (UNECA, 2009).

A UNECA report suggests that Africa can exploit resource endowments and high international commodity prices to generate the required resources to improve the institutional environment in the continent. Also, since the global economic and geopolitical changes have shifted from the North to South through revolution in information and communication technology, remarkable cross-border capital flows and trade in intermediate goods present opportunities for Africa to reclaim its lost legacies (UNECA, 2013). However, the state and pattern of governance institutions of a country tends to predict its chances of benefiting from any opportunities provided by global dynamics (UNECA, 2013). Thus, what is the share of Africa, and particularly SSA (compared to Asia) in the recent surge in capital inflow and commodity trade of

developing region? Does weak governance attenuate the chances of Africa in taking greater opportunities provided by globalization?

In SSA, virtually all the countries appear to experience low levels of governance indicators. For example, based on data from the Political Risk Service (PRS) group, SSA is lagging in relevant business regulating governance indicators such as control of corruption, law and order, and bureaucracy quality, compared to Asia and Europe with higher ratings.⁴

The emerging issues and questions from the foregoing are: how and to what extent do governance institutions help to explain trade flows and directions? And do governance institutions matter more for trade in resource-poor countries or non-mineral products than for trade in resource-rich economies or mineral products? Specifically, the objectives of this study are to: investigate the impact of governance institutions on SSA's total trade, and trade with its trading partners; and examine whether governance institutions matter more for trade in SSA resource-poor countries (or non-mineral products) than for trade in SSA resource-rich economies (or mineral products).

The motivation for this study lies in the fact that although there exist some studies on the link between governance institutions and trade for developed countries, few studies are available for developing nations. Some of the cross country studies included only a part of Africa (high/middle income countries), which does not reflect heterogeneity of Africa's features in terms of commodities traded, diverse trading partners, governance qualities and resource endowment. Besides, to our knowledge, there is dearth of specific studies on the role of governance institutions in trade between SSA and its trading partners (SSA-EU, SSA-America or SSA-Asia). Therefore, none of the earlier studies specifically and comprehensively investigated the case of Africa, or even produced empirical evidence that recognized the differences (peculiarity) highlighted above. These are the gaps and main areas of value addition of this study. The study covers 1996 to 2014, for which the required data for classification of SSA trade into mineral and non-mineral products are available for analysis.

The rest of this report is organized as follows: Section II covers the stylized facts about trade and governance institutions in SSA and its trading partners, while section III is on literature review. Section IV discusses the theoretical framework and methodology of the study, while section V presents and discusses empirical results. Section VI summarizes and concludes the study with policy recommendations.

2. Trade and governance institutions in sub-Saharan Africa

Magnitude and structure of SSA's trade

Explanations on the structure and direction of trade in this section are based on real term; that is, all the values in Tables 1 to 3, except where otherwise specified, were deflated using world commodity price.⁵ The level of trade of SSA with the World was low in the 1990s compared to the 2000s (Table 1). Exports rose from over US\$ 128.19 billion in 1996 to over US\$ 304.10 billion in 2014 while imports increased from over US\$ 137.59 billion in 1996 to over US\$ 298.78 billion in 2014. Going by the data presented in Table 1, SSA began to record trade surplus from 2010 while there had been a trade deficit before that time.

At the regional level, the EU offers the largest market for SSA's exports. The value of SSA's exports to the EU rose from US\$ 48.73 billion in 1996 to US\$ 52.21 billion in 2005 and further to US\$ 86.05 billion in 2014. In the same period, the respective values of SSA exports to Asia were US\$ 21.42 billion, US\$32.23 and US\$ 106.17 billion while to America the values of exports were US\$ 26.04 billion, US\$ 18.67 billion and US\$ 32.37 billion, respectively. This implies that exports to the EU and Asia rose consecutively, but that of America fell between 2010 and 2014. This fall was preceded by a sudden jump from US\$ 18.67 billion in 2005 to US\$ 69.75 billion in 2010. This scenario may reflect the impact of the financial crisis that occurred during this period on exports of SSA. The second observation from Table 1 is that the EU ceased to be the highest market for SSA exports from 2010. In fact, other continents (Africa, Russia Federation, Middle East and Australia) put together imported more than the EU in 2010. Similarly, SSA imported more from the EU than from other regions in 1996 through 2000, but thereafter SSA imported more from Asia than any other continent while the least imports came from America.

Sub-Saharan Africa (SSA) is a small player in the world in terms of trade flows. This is because the shares of the continent's exports and imports in total world trade were around 1.0% between 1996 and 2005 (Table 1). The highest share was experienced in 2010, with exports accounting for 2.22% while the proportion of imports was 1.96%. This suggests that neither SSA's exports nor imports accounted for 2.5% of global trade over time. The SSA constitutes a small market in the world but also in the developed regions and the emerging markets. The share of SSA's exports to Asia was less than 1.0% in 1996 through 2005 but rose to 1.95% in 2010 and then fell slightly to 1.86% in 2014.

Table 1: Direction, share and structure of SSA's trade (US\$ billion)

Direction of Trade										
Year	Value of exports (constant US\$ billions)					Value of imports (constant US\$ billions)				
	World	Asia	EU	America	Others	World	Asia	EU	America	Others
1996	128.19	21.42	48.73	26.04	32.00	137.59	33.00	56.35	18.25	30.00
2000	190.96	34.90	62.61	47.80	45.64	158.05	44.01	57.41	16.79	39.84
2005	140.11	32.23	52.21	18.67	37.00	187.05	62.73	59.66	17.30	47.36
2010	298.05	90.99	64.67	69.75	72.64	276.90	105.80	72.62	34.62	63.86
2014	304.10	106.17	86.05	32.37	79.51	298.78	124.84	75.43	28.82	69.70
Share of SSA Trade in the World and Regions										
Year	Export Share (%)				Import Share (%)					
	World	Asia	EU	America	World	Asia	EU	America		
1996	1.35	0.90	1.23	1.30	1.38	1.24	1.47	0.76		
2000	1.42	0.93	1.11	1.57	1.08	1.20	1.00	0.39		
2005	1.02	0.77	0.89	0.75	1.27	1.56	1.00	0.47		
2010	2.22	1.95	1.29	3.08	1.96	2.31	1.41	1.11		
2014	1.99	1.86	1.58	1.28	1.86	2.18	1.40	0.81		
Magnitude and Structure of SSA's Trade (constant US\$ billions)										
Year	Exports (constant US\$ billions)				Imports (constant US\$ billions)					
	Mineral products	Non-mineral products	Total	Share of mineral products in total (%)	Mineral products	Non-mineral products	Total	Share of mineral products in total (%)		
1996	83.22	49.34	132.56	62.78	24.93	79.73	104.66	23.82		
2000	101.53	80.66	182.19	55.73	25.81	110.11	135.91	18.99		
2005	31.32	103.35	134.68	23.31	25.75	148.36	174.11	14.79		
2010	119.20	110.81	230.02	51.82	38.46	191.21	229.67	16.75		
2014	120.33	124.09	244.42	49.23	52.93	220.87	273.80	19.33		

Source: Computed using data from the World Trade Integrated Solution (WITS: UNCTAD) database. Note: In part A of the table, exports and imports consist of mineral and non-mineral products and services.

In contrast to exports, imports from Asia were over 1% in 1996 through 2005 but rose sharply to over 2% in 2010 and then fell to 2.18% in 2014. The situation is not different in the case of trade between SSA and the EU. SSA's exports accounted for around 1% of the EU's total exports but there was a slight improvement in 2014 where it posted 1.58%. Imports exhibited the same characteristics but there was no year that imports from the EU accounted for 2%. The share of SSA's exports in America's total world exports ranged from 1.3% to 1.57% from 1996 to 2000 but fell to 0.75% in 2005 and rose to 3.1% in 2010 before it fell again to 1.28% in 2014. In the case of imports, the share was less than 1% in 1996 through 2005, rose to 1.11% in 2010 and then fell slightly to 0.81% in 2014. Clearly, trade with America appears to be less stable compared to other regions. Also, the market share of SSA's products is higher in the EU than any of the regions under review until 2010 when the EU was overturned by Asia. The overall observation from the trade structure of SSA is that except in 1996, the continent exported more mineral products than non-mineral products, and therefore it imported more non-mineral products throughout the period under review (Table 1).

Analysis of the contribution of SSA's groups (mineral-rich and mineral-poor) to trade

To further analyse SSA's trade performance, the contributions of the resource-rich and resource-poor groups are examined. According to Collier and O'Connell (2008), there are 14 Sub-Saharan African countries that can be identified as mineral-rich while the rest are mineral-poor. Based on this classification, despite there being more mineral-scarce/poor countries than mineral-rich countries in SSA, the latter traded more than the former (Table 2). Specifically, the export of mineral-rich countries was more than US\$ 110.42 billion in 1996 while that of their mineral-scarce counterparts was just a little above US\$ 22.14 billion in real term. The real value of exports of mineral-rich countries rose to US\$ 189.86 billion in 2010 and to US\$ 195.27 billion in 2014 while that of the mineral-scarce increased to US\$ 40.16 billion in 2010 and then to US\$ 49.15 in 2014. In the case of imports, mineral-rich countries imported US\$ 70.51 billion in 1996 while the mineral-scarce countries imported US\$ 34.15 billion. The real values of import by the two groups rose drastically from US\$ 144.23 in 2010 to US\$ 168.31 in 2014 for mineral-rich countries and from US\$ 85.44 to US\$ 105.49 in the same period for mineral-poor countries.

The share of mineral-rich countries in total SSA's trade provides a clearer picture of the dominance of the group in SSA's trade. Over the study period, mineral-rich countries accounted for more than 70% of overall exports and over 59% of total imports. This trade pattern suggests that countries endowed with mineral resources accounted for a large percentage of SSA's trade with the world. An examination of the trade structure of the SSA's groups shows that, as expected, mineral-rich countries exported more of mineral products than non-mineral products (Table 2). Specifically, the share of mineral products in total exports of mineral-rich countries was more than 60% while that of mineral-scarce countries hovered around 20% for most of the period 1996-2014. Imports of mineral products by the mineral-rich countries was lower than that of the mineral-poor countries for the periods. As shown in Table 2, the share of mineral products in imports of the mineral-rich countries was 15-22% during the study period while that of the mineral-poor country was between 16% and 28%.

The trade position of each group reveals that mineral rich countries had trade surplus in mineral products and trade deficit in non-mineral products, and the overall trade balance was positive. The converse is the case when the trade balance of mineral scarce countries is considered. The group experienced trade deficit in both mineral and non-mineral products throughout the years, and this consequently resulted in overall trade deficit recorded by the group. Therefore, mineral-scarce SSA's countries are indebted to the world. It can also be said that this group contributed to the deteriorating traded balance of SSA.

Table 2: Magnitude and structure of trade of SSA groups

Description	Trade type	Export (constant US\$ billions)					Import (constant US\$ billions)					
		Share / Year	1996	2000	2005	2010	2014	1996	2000	2005	2010	2014
SSA Group	Mineral-Rich		110.42	148.07	195.34	189.86	195.27	70.51	85.47	103.26	144.23	168.31
	Mineral-Poor		22.14	34.12	39.34	40.16	49.15	34.15	50.44	70.85	85.44	105.49
	Total SSA Export		132.56	182.19	234.68	230.02	244.42	104.66	135.91	174.11	229.27	273.80
	Share of Mineral-Rich in SSA (%)		83.30	81.27	83.24	82.54	79.89	67.37	62.89	59.30	62.80	61.47
SSA Group		Mineral-Rich countries					Mineral-Poor countries					
Description	Trade Structure	1996	2000	2005	2010	2014	1996	2000	2005	2010	2014	
Exports (constant billion US\$)	Mineral Products	73.74	94.11	123.79	110.44	110.31	9.47	7.42	7.53	8.76	10.02	
	Non-mineral Products	36.68	53.95	71.55	79.42	84.97	12.66	26.70	31.80	31.39	39.13	
	Total	110.42	148.07	195.34	189.86	195.27	22.14	34.12	39.34	40.16	49.15	
	Share of Mineral in Total (%)	66.78	63.56	63.37	58.17	56.49	42.79	21.74	19.15	21.83	20.39	
Imports (constant billion US\$)	Mineral Products	15.43	15.11	15.45	22.10	33.08	9.50	10.70	10.30	16.36	19.85	
	Non-Mineral Products	55.08	70.37	87.80	122.13	135.23	24.65	39.74	60.55	69.08	85.64	
	Total	70.51	85.47	103.26	144.23	168.31	34.15	50.44	70.85	85.44	105.49	
	Share of Mineral in Total (%)	21.88	17.67	14.97	15.32	19.66	27.81	21.22	14.54	19.15	18.82	
Trade Balance (billion US\$)	Mineral Products	58.31	79.00	108.34	88.34	77.22	-0.02	-3.28	-2.77	-7.60	-9.83	
	Non-Mineral Products	-18.40	-16.41	-16.25	-42.71	-50.26	-11.99	-13.04	-28.75	-37.69	-46.52	
	Total	39.91	62.59	92.09	45.63	26.97	-12.01	-16.32	-31.52	-45.28	-56.34	

Source: Computed using data from WITS (UNCTAD). Note: Exports and imports exclude services

Sub-Saharan Africa trade with regional trading partners

Except in 2005, the major products exported by SSA to Asia were minerals (Table 3). In 1996, a total of US\$ 12.45 billion of mineral products were exported to Asia and the value rose significantly to US\$ 68.37 billion in 2010 and by 2014, it was US\$ 73.87 billion. However, there was a slight decline in mineral exports to Asia in 2005.

Non-mineral products exported to Asia were US\$ 9.85 billion in 1996, which rose to US\$ 22.62 billion in 2010 and by 2014, it had risen slightly to US\$ 23.73 billion. The structure of SSA's imports from Asia is relatively different as non-mineral products dominated. Specifically, non-mineral imports rose from US\$ 19.23 billion in 1996 to US\$ 85.43 billion in 2010 and then rose to US\$ 108.25 billion in 2014. Meanwhile, mineral imports were also rising, picking from US\$ 10.95 billion in 1996 to US\$ 20.37 billion in 2010 and then to US\$ 24.85 billion in 2014.

The share of minerals in total exports of SSA to Asia clearly reveals that except in 1996 and 2005, mineral products accounted for more than 60%, with the highest share experienced in 2010. However, the share of mineral imports was below 40% and in fact it reduced to 19% in 2010 and 2014. Thus, SSA exported more mineral products to Asia than non-mineral products and imported more non-mineral products than mineral products. As a result of this trade pattern, SSA experienced total trade deficit, informed by large trade deficit in non-mineral imports. However, the region experienced trade surplus in mineral products in most of the years. This suggests that exports of mineral products by SSA's countries tend to offset some of the deficit incurred from large inflow of imported manufactured products.

The SSA's mineral exports to the EU outweighed non-mineral exports in 1996 and 2014 (Table 3). The value of mineral exports was US\$ 30.91 billion in 1996 while that of non-mineral exports was US\$ 21.15 billion. Mineral exports fell to US\$ 31.57 billion in 2010 while non-mineral exports rose to US\$ 33.10 billion in 2010. However, in 2014, mineral exports posted US\$ 48.79 billion while non-mineral exports recorded US\$ 35.78 billion. Overall, SSA's major exports to the EU markets are mineral products, accounting for at least 50%. The case is opposite for imports from the EU. The share of imports of mineral products was between 5% and 12% with the highest, which is 12%, occurring in 2014. Also, while imports of non-mineral products was increasing, that of mineral products was unstable. Further, the value of non-mineral imports more than offset the value of mineral exports, and this has implications for the trade balance of the region with the EU. SSA enjoyed trade surplus in mineral products but trade deficit in non-mineral products, with overall trade balance being surplus except in 2005 and 2010.

Mineral products dominated exports to America except in 2005 when non-mineral products surpassed mineral products. In 1996, mineral products exported to America were worth US\$ 26.28 billion and rose to US\$ 56.56 billion in 2010 after a major decline in 2005. In 2014, exports of mineral products to America fell to US\$ 20.04 billion. In the case of imports, non-mineral products also rose from US\$ 6.51 billion to US\$ 13.20 billion in 2010 but fell slightly to US\$ 11.48 billion in 2014. Unlike mineral exports that experienced decline in 2005, imports of non-mineral products were rising consistently from 1996 until 2010 when it fell. In fact, the continuous increase of non-mineral products caused it to account for more than 80% of total exports to America except in 2005 when it accounted for just 32% and in 2014 when it was 64% of total exports to the region.

Table 3: SSA trade with trading partners: Asia, EU and America

Description	Product Type	1996	2000	2005	2010	2014
Magnitude and Structure of SSA's Trade with Asia						
Exports (constant US\$ billions)	Mineral	12.45	23.11	11.60	68.37	73.87
	Non-mineral	9.85	12.51	21.64	22.62	27.73
	Total	22.30	35.61	33.25	90.99	101.60
	Share of mineral	56%	65%	35%	75%	73%
Imports (constant US\$ billions)	Mineral	10.95	13.53	14.10	20.37	24.85
	Non-mineral	19.23	29.42	52.52	85.43	108.25
	Total	30.17	42.95	66.62	105.80	133.10
	Share of mineral (%)	36%	32%	21%	19%	19%
Trade balance (constant US\$ billions)	Mineral	1.50	9.57	-2.50	48.01	49.02
	Non-mineral	-9.37	-16.91	-30.87	-62.82	-80.52
	Total	-7.87	-7.33	-33.38	-14.81	-31.50
Magnitude and Structure of SSA's Trade with EU						
Exports (constant US\$ billions)	Mineral	30.91	26.88	11.44	31.57	48.97
	Non-mineral	21.15	35.17	44.08	33.10	35.78
	Total	52.06	62.05	55.51	64.67	84.75
	Share of mineral	59%	43%	21%	49%	58%
Imports (constant US\$ billions)	Mineral	3.64	2.73	1.93	6.73	9.53
	Non-mineral	40.23	51.41	64.02	65.89	72.09
	Total	43.86	54.14	65.95	72.62	81.62
	Share of mineral	8%	5%	3%	9%	12%
Trade balance (constant US\$ billions)	Mineral	27.27	24.15	9.50	24.84	39.43
	Non-mineral	-19.08	-16.24	-19.94	-32.80	-36.31
	Total	8.20	7.91	-10.44	-7.95	3.12
Magnitude and Structure of SSA's Trade with America						
Exports (constant US\$ billions)	Mineral	26.28	40.63	6.12	56.56	20.04
	Non-mineral	6.51	9.28	13.28	13.20	11.48
	Total	32.79	49.90	19.39	69.75	31.52
	Share of mineral	80%	81%	32%	81%	64%
Imports (billion constant US\$)	Mineral	2.09	1.21	0.95	2.13	2.12
	Non-mineral	12.58	14.67	18.09	32.49	29.40
	Total	14.67	15.89	19.04	34.62	31.52
	Share of mineral	14%	8%	5%	6%	7%
Trade balance (constant US\$ billions)	Mineral	24.19	39.41	5.17	54.43	17.92
	Non-mineral	-6.07	-5.40	-4.82	-19.29	-17.92
	Total	18.12	34.02	0.35	35.13	0.00

Source: Computed using World Integrated Trade Solution (WITS). Note: The total export and import exclude services

The situation was slightly different in the case of imports because non-mineral products dominated throughout, even though they declined in 2014 when compared to 2010. Imports of mineral products declined from US\$ 2.09 billion in 1996 to US\$ 1.21

billion in 2000 and then to US\$ 0.95 billion in 2005. But the imports rose to US\$ 2.13 billion in 2010 and decreased slightly in 2014, posting US\$ 2.1 billion. This suggests that non-mineral imports to America were more stable than mineral imports. Like in the EU, SSA enjoyed trade surplus for mineral products and trade deficit for non-mineral products. Overall, America is indebted to SSA in terms of trade balance as the region (SSA)'s trade surplus in mineral products more than offset trade deficit of non-mineral products. Comparing the trade position of SSA in relation to all the regions, SSA is indebted to Asia, less indebted to the EU but not indebted to America.

This analysis of trade magnitude and structure of SSA indicates that there is divergent trade relations between SSA and other regions. Trade with the world and each of the regions is small, implying that SSA is a small country. But the structure of trade with each region suggests that the strength of SSA trade lies in its natural resources. Trade deficit occurred for non-mineral products because, apart from the high preference for imported manufactured final goods, the region needs intermediate goods to power its manufacturing sectors, and this type of inputs were not produced in the region. Given this situation, of what relevance are governance institutions in the trade position of SSA in the world in each region? Can governance institutions explain why exports of non-mineral products is small? Can it explain why trade with America is smaller than that of Europe and Asia? The basis of this work is to answer these and other related questions. Before turning attention to answering these questions, it is imperative to provide background information about governance institutions in SSA and compare this with the trading partners identified in the study.

Analysis of governance indicators

There are many governance indicators provided by different sources. However, in this study, governance indicators provided in the International Country Risk Guide (ICRG) published by the Political Risk Service (PRS)⁶ group are used for the reason that will be well articulated in subsequent sections. Alongside governance indicators are trade facilitation variables that are considered to complement information from the governance institution variables. Among the indicators provided in the ICRG,⁷ three of the political risk indicators were selected based on the emphasis placed on them in the theoretical literature. The three selected indicators are control of corruption, law and order and bureaucratic quality. According to ICRG, control of corruption indicator covers avoidance of requests for special payments and bribes while obtaining import and export licences, exchange controls, tax assessments, police protection, or loans, which can hinder effective business conduct and may even lead to the removal or cancellation of business activities. It also includes potential sources of corruption such as undue patronage, partiality, job reservations, reciprocal favoritism, underground party sponsoring, and an undisclosed link between politics and business. Similarly, the law and order indicator considers the strength and fairness of the legal system and adherence to the law by the people, including enforceability of contracts.

Bureaucratic quality indicator captures the institutional strength and quality of the bureaucracy (expertise) to govern. It also covers freedom of the bureaucracy from political interference, which could lead to undue radical policy changes or disruption in government services.

Table 4 shows the trend of governance indicators across regions during 1995 to 2014. Control of corruption was not encouraging in SSA as its rating ranges between 2.0 and 2.9, out of a maximum of 6.0 points, while a similar trend could be noticed in the case of Asia. Most of the regions had higher rating on law and order compared to ratings on control of corruption. Of course, this trend is not peculiar to SSA. For example, in America, control of corruption rating declined from 3.19 in 1995 to 2.52 in 2014. Europe's rating on control of corruption was higher than the other regions, but the rating fell from 3.75 in 1995 to 3.19 in 2005 and later picked up at 3.89 in 2014. Comparatively, the EU had the highest ratings on control of corruption followed by America and then Asia, while SSA had the least ratings on the indicator. The story is different when attention is focused on the ratings on law and order, as the ratings suggest that after EU, the next region with effective law and order was Asia, followed by America, while SSA takes the last position. However, America has experienced declining rating of law and order over time, while Asia recorded a marginal decline in 2010. With respect to bureaucratic quality, the ratings show that it was poor in the SSA compared to other regions. There was insignificant change in the ratings of bureaucratic quality for Asia while that of Europe improved over the period, and the ratings for America declined particularly after 2000. In summary, SSA is lagging the three selected indicators (Figure 1). Analysis by SSA groups suggests that mineral-poor countries had relatively more improved governance institutions than the mineral-rich countries and the SSA as a whole during the period under review (Figure 2).

Table 4: Trend of governance indicators across regions

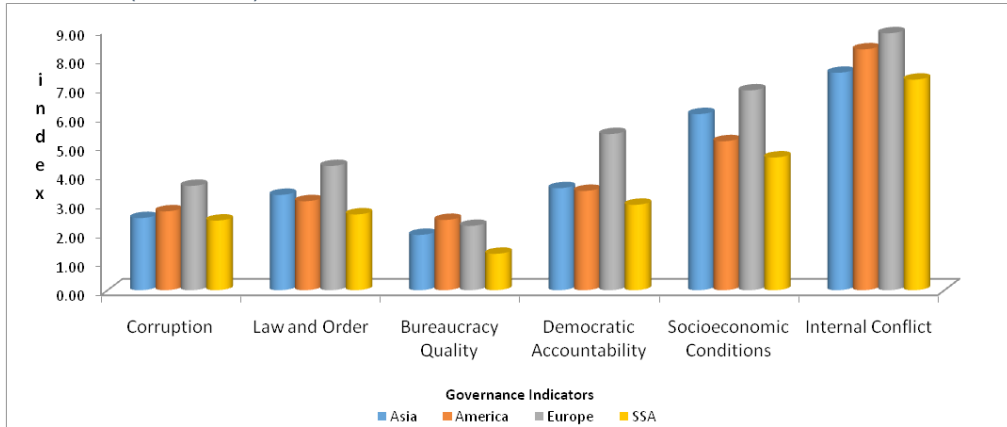
Governance Indicators	Continent	1995	2000	2005	2010	2014
Control of Corruption (6 points)	Asia	2.92	2.48	2.09	2.47	2.68
	America	3.19	3.22	2.45	2.54	2.52
	Europe	3.75	3.65	3.19	3.71	3.89
	SSA	2.9	2.33	2.05	2.34	2.43
Law and Order (6 points)	Asia	4.02	4.13	3.97	3.96	3.90
	America	3.84	3.54	3.1	2.69	2.58
	Europe	4.5	4.42	4.32	4.95	5.40
	SSA	3.18	3.13	2.98	3.06	3.14
Bureaucratic Quality (4 points)	Asia	2.04	2.15	2.10	2.18	2.28
	America	2.66	2.94	2.88	2.19	1.86
	Europe	1.92	2.15	2.19	3.25	3.79
	SSA	1.45	1.03	1.04	1.44	1.89

Source: Computed using International Country Risk Guide (ICRG) (<http://www.prsgroup.com/icrg.aspx>)

The number in the parenthesis indicates the maximum number that shows the highest improvement of the indicator. The closer the number in the table to the number in the parenthesis, the more improved the governance indicator.

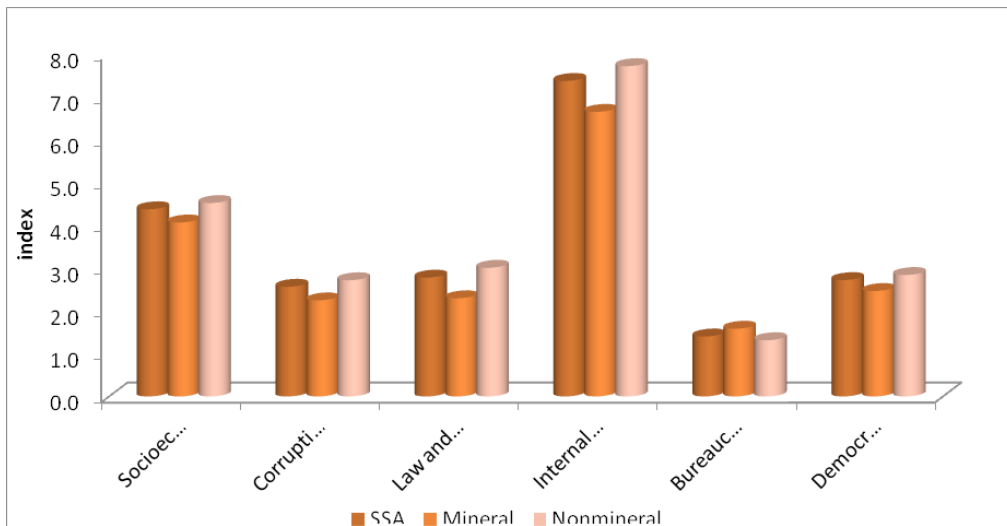
Analysis of the indicators measuring the efficiency of trade facilitation system shows that it takes longer days to set up a business, to import and to export in SSA than in the other regions (Figure 3). The foregoing analysis indicates that governance and trade facilitation institutions are less efficient in SSA compared with the other regions.

Figure 1: Governance indicators of SSA compared with regional trade partners (1995-2014)



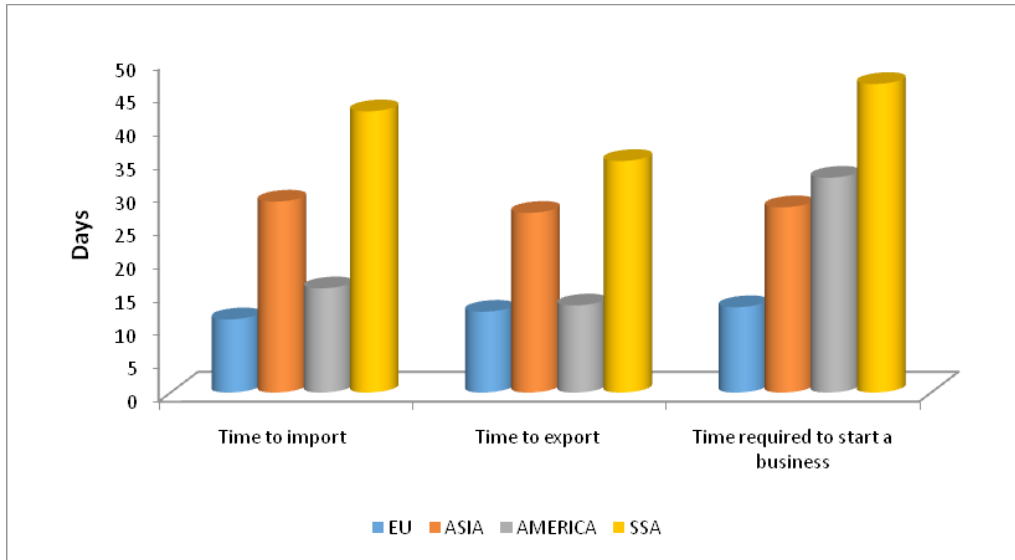
Source: Computed using International Country Risk Guide (ICRG) (<http://www.prsgroup.com/icrg.aspx>)

Figure 2: Governance institutions in SSA by country group (1995-2014)



Source: Computed using International Country Risk Guide (ICRG) (<http://www.prsgroup.com/icrg.aspx>)

Figure 3: Trade facilitation across country group and across trading partners (1995-2014)



Source: Computed using data from World Bank (2014), World Development Indicators

Preliminary analysis of the link between SSA's trade and governance indicators

The relationship between exports and imports of SSA and governance variables are analysed using some scattered plots presented in panels A in Appendix A. These relationships are also analysed for SSA's groups (mineral-rich and mineral-poor groups) as shown in panels B and C in Appendix A.

In Panel A, it seems that there is an inverse relationship between exports of SSA and ratings on control of corruption. This kind of relationship holds between imports of the region and the governance variable. This means that high levels of SSA's exports and imports are associated with low ratings on corruption control or high rate of corruption. However, SSA's exports and imports appear to have a direct positive link with high ratings on compliance with law and order, which suggests that high levels of exports and imports are related with high ratings on compliance with law and order. Moreover, as in the case of corruption control, it seems that there is a negative association between SSA's exports and imports and bureaucratic quality ratings. This means that upward trends in SSA's exports and imports are connected with low ratings on bureaucratic quality. This analysis suggests that high trade volumes in the SSA, which correlate with low bureaucratic quality and high rate of enforcement of compliance with law and order result in high rate of corruption. This is consistent with efficiency grease hypothesis since, in an attempt to circumvent law and red tape, traders may offer bribes to public officials who are expected to enforce compliance.

In Panel B, it seems that there is a negative relationship between exports of the mineral-rich SSA's group and control of corruption; this relationship also holds for imports. Similarly, an inverse link is shown between exports of the mineral-rich SSA and bureaucratic quality, which also holds for imports of the region. This analysis suggests that high levels of exports (and imports) of this group are associated with low ratings of control of corruption, and bureaucratic quality. As in the general case above, high levels of trade are connected with low bureaucratic quality and high level of corruption. However, the links between exports and imports of the mineral-rich SSA and compliance with law and order are not very clear.

In Panel C, it appears that there are inverse relationships between exports and imports of the mineral-poor SSA's group and each of the three governance indicators (control of corruption, law and order, and bureaucratic quality). Thus, trade of this group flourishes under low rate of corruption control (high rate of corruption), low rate of compliance with law and order, and low bureaucratic quality.

3. Literature review

Theoretical and methodological review

Among the studies that examine the theoretical link between trade and governance are Kaufman and Wei (1999); Anderson and Marcouiller (2002); Acemoglu and Johnson (2003); Koukhartchouk and Maurel (2003); De Groot et al (2004); Levchenko (2004 and 2007); Li, et al (2003); Ederington, Levinson and Minner (2005); Anderson and Young (2006); Li and Samsell (2009); and Wu, Li and Samsell (2012). The main theoretical arguments of each of these studies are discussed in what follows.

Kaufman and Wei (1999) used game theory (involving a rent-seeking government official and a representative firm) to develop an efficiency grease hypothesis, which shows that in a partial equilibrium analysis, weak governance in form of high level of corruption can facilitate trade. They argued that the size of bribes offered by different economic agents could reflect their different opportunity cost of transactions and, therefore, firms are willing to buy lower effective red tape that enhances their performance. Therefore, like an auction, a licence or contract awarded based on bribe size could achieve Pareto-optimal allocation. They submitted that in the context of exogenous poor bureaucratic quality, bribe payments may help firms reduce the effective burden and delay they face and increase trade. However, Anderson and Marcouiller (2000) opined that cross-country variation in the effectiveness of institutions and consequent variation in the prices of traded goods accounts for disproportionate trade between the North and the South. Furthermore, they argued that insecurity in form of corruption and defective contract enforcement act as a hidden tax or tariff, which must be incorporated in the gravity model of trade. According to them, if such an important governance indicator is missing, it could bias typical gravity model estimations. Anderson and Marcouiller (2002) used an import demand framework to explain that corruption and poor contract enforcement in a country increase the insecurity of selling to that country and, by implication, reduces foreign trade.

In another development, Acemoglu and Johnson (2003) stated that improved productivity facilitated by good governance institutions promotes trade. They argued that the contracting institution in the Ricardian world acts as a technology that boosts workers' productivity.⁸ Thus, an institution-dependent economy tends to experience increased production and, in the Ricardian idea, such economy may export more to

other economies, particularly those with weak institutions. The inflow of goods to the countries with weak institutions in turn reduces product prices and increases purchasing power. Thus, good governance tends to increase gains from trade between good governance and those with weak governance.

Some researchers have also used contract incompleteness model to examine the consequence of institution differential on trade among countries. Since trade ordinarily implies the exchange of goods or services against money, contract incompleteness occurs when the delivery of commodities and payment for them do not take place at the same moment in time. There may be increase in transactions if credit is involved because it will be possible to pay today for commodities that will be delivered in the future or to obtain commodities today and pay for them in the future. However, the challenge in this development is that the person giving the credit (either in the form of money or in the form of goods or services) needs to have some assurance that he or she will in the future get what was agreed upon when the deal was made. Levchenko (2004 and 2007) uses this framework to argue that contract incompleteness, absence of property right and weak shareholder protection are important factors constraining international trade. According to his model, a country exhibiting these characteristics will experience low comparative advantage in bilateral trade and, by implication, will record low trade volume despite any trade policy that fosters free trade.

Anderson and Young (2006) argued that contract incompleteness presumes that courts enforce contracts that contain verifiable actions, and that actions that cannot be verified are excluded. This means that all traders in the model will prefer a costless enforcement, which may not always be true. They, therefore, developed a model that translated contract incompleteness in their model to first show that partial enforcement of all actions that are not perfectly contractible results in inefficient trade. They went further to show that imperfect contract enforcement engenders inefficient trade because the victims of contract repudiation have alternative options including recourse to a spot market. Their model, therefore, reveals the implications of imperfect enforcement that are clearly different from that of incompleteness in the contracts to be enforced. According to them, imperfect enforcement fits into the "incomplete contracts" approach only in the sense that it reflects the impossibility of contracting on the performance of the "court". As in the case of the contract incompleteness model, they show that improvement in institutions can enlarge contractible activities without being necessarily supported by all agents.

Li and Samsell (2009) extended theoretical literature by arguing that past studies only focus on formal institutions such as government institutions (laws and regulations), while the effect of informal and social institutions such as information infrastructure (such as the free flow of information and the quality of information) and public trust, which also account for low international trade are ignored. Similarly, Wu, Li and Samsell (2012) consider the role of family-based mode of governance in trade apart from the well known rule-based and relation-based modes. They argue that some countries' mode of governance may lack both the public rule and private network, while family-based governance (or trade networks) tends to be important for trade.

Rule-based regions have similar laid down (most official) rules, while relation-based regions have varieties of relation-based governance mechanisms (official, unofficial and persuasive). Because of the homogeneity among relation-based countries, it is expected that trade among them will be relatively easier. Thus, trade between relation-based countries is expected to be positively affected by the governance environment, but such trade will be less compared to trade between rule-based and relation-based economies.

It is also important to note that there are arguments concerning the moderating effect of resource endowment on the link between governance quality and trade. Given that SSA countries can be categorized by their resource endowment as mineral-rich and mineral-poor, the diverse arguments in the literature concerning the link between resource endowment and governance can be analysed. It is argued in the literature that boom in the natural resources exports is the cause of poor governance (corruption) in most of the resource-rich economies (Ross, 2012; and Arndt and Tsui, 2011). However, it is also submitted that the source of resources required to build effective governance institutions (quality) is trade (Wei, 2000; Alonso and Garcimartin, 2009; and Torres, Afonso and Soares, 2013). This implies that a boom in resource exports could help the resource-rich economies to generate the resources needed to build effective governance institutions.

On methodological approach, the gravity model has found increased application following the pioneering work of Tinbergen (1962). The earlier studies that used the gravity model were based on time series and cross-section regression equations. Subsequent studies show that the model was estimated at first difference to correct for possible autocorrelation and simultaneity problems. The focus of further refinement of the gravity model for empirical analysis of bilateral trade flows is on the adequacy of the linear estimation techniques used. The use of least squares has been criticized by researchers such as Santos and Tenreyro (2006) who observed that the appropriateness of estimating log-linearized form of gravity equation rests heavily on the assumption that the error term/factor and its log are statistically independent of the regressors (i.e. homoskedastic). But there is sufficient evidence that the error terms/factors in the normal log-linear form of the gravity equation are heteroskedastic (Santos and Tenreyro, 2006). Thus, with heteroskedasticity, the estimates of elasticities derived from the least squares method are inefficient and inconsistent. Also, the parameters from the log-linearized gravity model estimated with the least squares and interpreted as elasticities will be invalid in the presence of heteroskedasticity (Santos and Tenreyro, 2006).

Another recent observation is that the initial theory upon which the gravity model of trade was based permits gravitational force to be very small but not zero. However, the reality is that there are frequent occurrences of zero bilateral trade flows due to a number of reasons, including lack of trade between some pairs of countries, rounding up and measurement errors, and unreported trade flows (Frankel, 1997). All these pose both theoretical and methodological challenges particularly with excessive presence of the zero values in the bilateral trade data. The initial approach used in

the empirical literature to handle this problem was to exclude the pairs of countries with zero trade flows from the dataset and still use least squares method. However, Linders and De Groot (2006) posit that by excluding the zero trade flows, there is a loss of information on the reason for the occurrence of such low trade levels between certain countries, which will bias the empirical results particularly in the absence of random distribution of the zero trade flows. Also, exclusion of countries with zero trade flows in the analysis will place more weight both in terms of magnitude and statistical significance on the remaining observations and their corresponding coefficient estimates. Another alternative in the literature is the substitution of the zeros with a small positive constant. This approach has been criticized based on the arbitrary choice of the small positive constant and, therefore, lack of theoretical or empirical justification for the choice (Linders and De Groot, 2006; and Turkson, 2011).

The latest development in the approach to handling zero trade flow is the adoption of alternative regression techniques that appeared to be more appropriate to estimate the gravity model than the earlier approaches. Several extensions of Tobit estimation, truncated regression, probit regressions, Poisson and modified Poisson models have been used to deal with the problems discussed above. However, the appropriateness of using the Tobit model has been challenged by Linders and De Groot (2006) and the alternative methods adopted are the Poisson and modified Poisson specifications of the gravity model. The rationale for the adoption of these specifications is that, given its multiplicative form, the fixed effects Poisson pseudo maximum likelihood (PPML) method provides a genuine method of handling the issue. This is because zero- trade flows PPML works through the maximum likelihood method, which guarantees that the estimates produced are adapted to the actual data, implying that the sum of the predicted values are almost identical to the sum of the original values (Santos and Tenreyro, 2006; and Turkson, 2011). However, a major defect of this approach is the over-dispersion in the dependent variable (trade flows) due to the presence of unobserved heterogeneity from omitted variables usually not accounted for in the conditional mean. This problem has been addressed by some researchers using modified Poisson models in the form of either negative binomial pseudo maximum likelihood (NBPML) or zero-inflated pseudo maximum likelihood models. The selection between these models depends on presence of excessive zero-valued trade flows in the sample. Thus, Burger et al (2009) stated that in cases where the number of observed zero trade flows exceeds the number of zeros predicted by the model, the NBPML model is not appropriate.

Review of empirical studies

Wei (2000) used bureaucratic corruption (output indicators of public governance) and relative wage (input indicator of public governance) to develop a minimalist model in which bad governance was demonstrated to reduce trade. Also, the model shows that countries tend to invest on building good governance to attract foreign trade.

With the aid of gravity equation, the study found evidence supporting the fact that after controlling for the level of development and other possible determinants of corruption, a naturally more open economy tends to display a lower level of corruption. The paper concluded that trade liberalization increases the level of natural openness, which in turn enhances a country's capacity to build good governance.

De Groot et al (2003) adopted the gravity model of trade to examine the effect of institutions on trade flows. They extended the gravity equation by including proxies for institutional quality and institutional homogeneity between trade partners. Using governance indicators developed by Kaufmann et al (2002), they found that having a similar law or regulatory framework (that is country with similar governance – be it rule-based or relation-based) promotes bilateral trade by 12% to 18%.⁹ They also found that rule-based governance economies report higher trade among themselves. An increase in regulatory quality of 1.0% deviation from the mean leads to an estimated increase of 20% to 24% in bilateral trade. Also, lower corruption accounts for 17.0% to 27.0% extra trade.

Kaufmann and Wei (1998) showed that in an environment with exogenous bureaucratic burden and delay, weak institutions tend to promote trade while if such bureaucratic quality is endogenous, then weak institutions seem to hinder trade. Using three different worldwide firm-level surveys, the authors found that the "efficient grease hypothesis" does not work. In fact, it is the case that weak governance is costly and, therefore, reduces international trade.

Li and Samsell (2009) focused on how governance affects world trade using 44 countries for which data on bilateral trade and governance indicators are available. They adopted the governance environment index (GEI), which are: political rights, rule of law, quality of accounting standards, free flow of information and public trust. They used a gravity model estimated with both OLS with fixed effect and OLS country-specific fixed effect. They found that the governance environment matters for bilateral trade flows. Countries with more highly rule-based governance systems tend to trade more than countries with more highly relation-based governance systems. They also found that countries with a large difference in governance environments tend to trade less with each other, which does not necessarily lead to the conclusion that countries having a similar governance environment seem to trade more, as previous studies have reported.

Wu et al (2012) investigated the reason why some countries trade more, some trade less and some trade almost nothing. They used an updated classification of governance framework for 44 countries that accounted for 89% of world trade. The authors included family-based mode of governance apart from the well-known rule-based and relation-based mode of governance. Their argument for the inclusion of family-governance mode was that some countries' mode of governance may lack both public rule and private network. Their results suggested that rule-based countries trade more than relation-based or family-based countries. Further, favourable and large trade flows among highly rule-based economies was observed, which also occurred among relation-based economies. Trade flows with and among family-based

countries was negligible, an indication that the absence of well defined governance institutions is detrimental to trade among the affected countries.

The brief empirical evidence presented above appears to agree that governance matters for trade. Meanwhile, none of the studies discussed above focuses on Sub-Saharan Africa. For example, in Li and Samsell (2009), only South Africa, Egypt and Morocco appear as African countries, which implies that only South Africa represents Sub-Saharan Africa. For other studies that included SSA, analysis did not reflect the heterogeneity of the region in terms of differences in trading partners, quality of governance institutions and commodities traded. This is an empirical gap in the bilateral trade literature, which this study attempts to fill.

4. Theoretical framework and methodology

Theoretical framework

There seems to be two main arguments in the theoretical literature: (a) different governance institutions (high or low) may produce positive or negative effect on trade (Anderson and Marcouiller, 2000, 2002; Koukhartchouk and Maurel, 2003; Ederington, Levinson and Minner, 2005; Acemoglu and Johnson, 2003; and Levchenko, 2004 and 2007); and (b) economies are dichotomized by effectiveness of governance institutions and trade patterns (Li et al, 2003; De Groot, et al, 2004; and Li and Samsell, 2009).

This study follows a combination of the above two strands of literature and, as stated earlier in the concluding part of the previous section, the gravity model is used to operationalize them. The gravity model of bilateral trade is inspired by Newton's gravity equation in physics, which relates the gravity force (with which two bodies attract each other) proportionately to the product of their masses, and inversely to the square of their distance. Specifically, gravity modelling in economics involves the application of Newton's Law of Gravity to provide an empirically tractable framework to demonstrate a linear relationship between trade volumes, trading distances and the importing and exporting countries' GDP. We begin with the basic gravity model formulation, and then modify to reflect recent theoretical refinement.

The traditional specification of gravity model is expressed in equation 1

$$M_{ij} = K \frac{Y_i Y_j}{DIST_{ij}^2} \quad (1)$$

Where M_{ij} implies trade value between countries i and j , Y_i and Y_j are the GDPs of country (or regions) i and country j , respectively, and $DIST_{ij}^2$ is the square of distance between them. Equation 1 shows that the gravity attraction force between two bodies i and j (trade flow between two countries, ij : M_{ij}) is proportionately linked with the product of thier masses (incomes of the trading partners i and j), and inversely to the square (nonlinearity) of their distance ($DIST_{ij}^2$).

According to Frankel and Wei (1993), the levels of development of the partner economies (captured by GDP per capita) determine the degree of their specialization and trade. Thus, they argued that at a particular size, countries appear to specialize and

trade more as they become more developed. Subsequent theoretical advancement in gravity modeling also led to an important contribution by McCallum (1995) following the estimation of the traditional gravity equation for bilateral trade among United States and Canada. After taking account of distance and size, McCallum (1995) revealed that trade between provinces was 22 times greater than trade between states and provinces, which implies that substantial trade costs were incurred in cross-border trade between the United States and Canada. Several ways of augmenting the gravity equation have been suggested, including the use of common border or contiguity dummy variables, and exporter and importer fixed effects resulting in the stochastic theory-based gravity equation (McCallum, 1995; Anderson and van Wincoop, 2003; Feenstra, 2004; Baier and Bergstrand, 2007; and Brun et al, 2005). Another significant contribution to the literature on the analysis of drivers of trade flows between nations using gravity equation was in terms of the augmentation of the equation with other factors that are considered significant drivers of trade costs and volumes. These drivers include various measures of country characteristics such as language, logistics and governance institutions quality (Anderson and Marcouiller, 2000; Wu et al, 2012).

Incorporating other trade drivers including governance institution variables of both partners in Equation 1 produces the following:

$$M_{ij} = K \frac{Y_i Y_j}{DIST_{ij}^2} * Ypc_i * Ypc_j * OCC_i * OCC_j * INST_i * INST_j \quad (2)$$

Where $INST_i$ and $INST_j$ stand for governance institutions in countries i and j , respectively, measured by governance quality indicators. OCC_i and OCC_j represent other macroeconomic factors and characteristics of countries i and j such as real exchange rate, tariff rate, bilateral trade treaties, contiguity and language. Following Behar and Manners (2008), Hoekman and Nicita (2008) and Turkson (2011), we specify the standard multiplicative form of the modified gravity model as follows:

$$M_{ij} = \alpha Y_i * Y_j * DIST_{ij}^2 * Ypc_i * Ypc_j * OCC_i * OCC_j * INST_i * INST_j \quad (3)$$

Methodology

Empirical model specification

Following the above theoretical framewok, the empirical model estimated in this study is as follows:

$$M_{ij} = \alpha Y_i * Y_j * DIST_{ij}^2 * Ypc_i * Ypc_j * OCC_i * OCC_j * INST_i * INST_j * e_{ij} \quad (4)$$

Where:

M_{ij} means mineral (MINEXP) or non-mineral (NONMINEXP) export from country i to country j ; or mineral (MINIMP) or non-mineral (NONMINIMP) import of country i from country j ;

Y_i and Y_j indicate GDP of countries i and j .

Y_{pc_i} and Y_{pc_j} connote GDP per capita of countries i and j .

$INST_i$ and $INST_j$ are control of corruption, compliance with law and order, and bureaucratic quality in countries i and j . $DIST_{ij}$ represents distance between countries i and j ;

OCC (for countries i and j) means other determinants such as real effective exchange rate (REER), tariff and country characteristics including dummy variables for contiguity and common language, and number of bilateral trade treaties signed between countries i and j .

All variables are as earlier defined, while e_{ij} is the error terms, which captures all other variables omitted in the model. Export and import variables were converted to real variables by deflating using energy and non-energy price indices (at 2010 constant price) obtained from the World Bank Commodity price indices database available online. Similarly, the GDP and GDP per capita variables are measured in US dollars 2010 constant price. All the variables in equation 4 are explicitly defined in Table 5.

This study covers 1996 to 2014 because of data availability for variables used. In accordance with the objectives of the study, we estimated versions of Equation 4 to show the importance of governance institutions as drivers of SSA trade. To handle some of the methodological challenges discussed in the previous section, this study adopts the count data model (modified Poisson models such as negative binomial pseudo maximum likelihood-NBPML and zero-inflated models). These estimation approaches capture the source of the zero counts by separating country pairs possessing strictly zero trade flows from those that have non-zero probability of having non-zero-valued trade flows. This estimation process is similar to the Heckman selection model extended by Helpman et al (2008) and Linders and De Groot (2006) to control for firm heterogeneity. It is a two-step method which contains a logit or Probit regression of the probability of no bilateral trade, and a Poisson regression of the probability of each zero count for the country pairs that have non-zero probability or interaction intensity other than zero. It is better than the Heckman selection model because it is less restrictive and does not require an instrument for the second stage of the regression. Further, the bias that results from the logarithmic transformation in the second part of the Heckman selection model is avoided because of the multiplicative nature of the equations used.

Table 5: Definition of variables and sources of data

	Variables	Definition	Sources
1	EXPORTS	Total export in real term using commodity price index of 2010 as base (all SITC revision 1 CODE 1-9)	Computed using data from WITS (COMTRADE) and commodity price published by the World Bank
2	IMPORTS	Total import measured same as above (all SITC revision 1 CODES 1 to 9)	Same as for EXPORT
3	MINEXP _{ij}	Mineral exports (SITC revision 1 CODES 2 and 3) from the reporting countries (i) in SSA to the partner countries (j) measured in US\$	Computed using data from WITS (COMTRADE)
4	MINIMP _{ji}	Mineral imports (SITC revision 1 CODES 2 and 3) measured in US\$	Computed using data from WITS (COMTRADE)
5	NONMINEXP _{ij}	Non-mineral exports (SITC revision 1 CODES 1 to 9 excluding 2 and 3) measured in US\$	Computed using data from WITS (COMTRADE)
6	NONMINIMP _{ji}	Non-mineral imports (SITC revision 1 CODES 1 to 9 excluding 2 and 3) measured in US\$	Computed using data from WITS (COMTRADE)
7	COMMON_LANG	Dummy variable for common language	CEPII gravity dataset
8	DISTANCE	Distance between the capital cities of the reporting and partner countries	CEPII gravity dataset
9	CONTIGUITY	Variable capturing sharing of borders by the pair countries	CEPII gravity dataset
10	LOG_GDP _i	Gross Domestic Product of countries i (reporting countries)	World Development Indicators (2014)
11	LOG_GDP _j	Gross Domestic Product of countries j (Partner countries)	World Development Indicators (2014)
12	LOG_GDPCAP _i	Per Capita Income of countries i (reporting countries)	World Development Indicators (2014)
13	LOG_GDPCAP _j	Per capita income countries j (partner countries)	World Development Indicators (2014)
14	LOG_REER _i	Real Effective Exchange Rate of countries i (reporting countries)	World Development Indicators (2014)
15	LOG_REER _j	Real Effective Exchange Rate of countries j (partner countries)	World Development Indicators (2014)
16	LANDLOCKED	Dummy variable for if a country is landlocked	CEPII
17	BTA _{ij}	Number of bilateral trade agreements signed between the partner countries i and j	WTO data set/CEPII
18	CONTROL_CORR _i	Control of corruption rating for countries i (reporting countries)	ICRG (PRS)
19	LAW_ORDER _i	Law and order rating for countries i (reporting countries)	ICRG (PRS)
20	BUREAUC _i	Bureaucracy quality rating for countries i (reporting countries)	ICRG (PRS)
21	LAW_ORDER _j	Law and order rating for countries j (partner countries)	ICRG (PRS)
22	CONTROL_CORR _j	Control of corruption rating for countries j (partner countries)	ICRG (PRS)
23	BUREAUC _j	Bureaucracy quality rating for countries j (partner countries)	ICRG (PRS)

Scope of the study, methods of analysis and sources of data

To analyse the moderating role of mineral endowment in the link between trade and governance institutions, there is a need to categorize SSA economies into resource-rich and resource-poor. In the literature, there are alternative approaches to such classification of economies. For example, Wood (2003) used area of land per inhabitant to categorize countries into resource (land) abundant and resource-scarce. This approach was criticised by Collier and O'Connell (2008) in the sense that a country with a large landlocked acreage, which is in a resource-scarce desert will be classified as resource-rich at the expense of another country characterized as small island full of oil. Also, Collier and O'Connell (2008) adopted the concept of resource value and used three conditions that will impose stability on the data such that a country classification will not change so frequently. The conditions are: (a) present rents from energy, mineral and forest should be greater than 5% of gross national income (GNI); (b) a forward moving average of the rents should exceed 10% of GNI; and (c) the proportion of primary commodities in export should be higher than 20% for at least a five-year period following the initial year. According to them, these conditions will single-out countries where natural resource wealth is sufficiently large to play a major role in economic management and international markets. Based on these approach, 14 SSA countries were categorized as resource-rich, while others were categorized as resource-scarce.

Another approach was used by Sala-i-Martin and Pinkkovskiy (2010) to construct an index of mineral richness and identified 19 countries as mineral-rich. Sala-i-Martin and Pinkkovskiy (2010) argue that a country is mineral-rich if the sum of fuel and mineral exports exceed other exports (totality of manufacturing, agriculture and food exports). The drawback of this approach includes the idea that prices of primary commodities are unstable, which also leads to instability in the export receipts, hence frequent changes in the classification of countries from year-to-year. Yet another approach is to categorize exports of SSA into mineral and non-mineral products.

In this study, two approaches were adopted to conduct analysis on the role of resource endowment. First, the approach developed by Collier and O'Connell (2008) was adopted not only because the number of countries categorized as mineral-rich is not significantly different from those identified by Sala-i-Martin and Pinkkovskiy (2010), but also because it overcomes the shortcomings of the other two approaches. Thus, a table showing the classification of SSA countries into resource-rich and resource-scarce is placed in Appendix B (1b). Second, to avoid the problem of inconsistency in the classification of countries by mineral endowment, the structure of SSA trade has been dichotomized into mineral and non-mineral products based on the available data obtained from World Intergrated Trade Solution - WITS (developed by the UNCTAD) so as to see the effect of governance on each type of trade.

Bilateral trade data were extracted from the WITS, which is an offshoot of COMRADE database provided by UNCTAD and World Bank over 1996 to 2014. Data for incomes and other variables were extracted from World Development Indicators (WDI-online) and database of Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). A number of aggregate governance indicators have been produced by Political

Risk Services (PRS) group within the framework of the International Country Risk Guide (ICRG: available at <http://www.prsgroup.com/icrg.aspx>) and the Worldwide Governance Indicators ("WGI") produced by the World Bank. In this study, the ICRG governance indicators were used because they take positive values (which could be easily analysed and interpreted) rather than mixed values (negative and positive) assumed in the WGI. Besides, ICRG presents a private independent assessment of political, financial and economic risks situation. It is a good source of comparative indicators of governance with those produced by the World Bank that have received much criticism in recent times (Thomas, 2010; Kaufmann, Kraay and Mastruzzi, 2007).

5. Empirical results and discussions

Preliminary Analysis

Descriptive statistics of major variables in respect of SSA and its trading partners are presented in the upper part of Table 6 while pair-wise correlation results of governance variables are presented in the lower part. It can be observed from the pair-wise correlation results for full SSA sample, mineral or resource-rich and resource-poor SSA groups that the governance variables are highly associated among themselves. The implication of these results is that the inclusion of all these variables in a single regression model will lead to imprecise results. Thus, each of these governance variables will be treated separately in the gravity regression models to analyse its impact on SSA bilateral trade flows.

Table 6: Descriptive statistics for SSA and pair-wise correlation of the selected governance variables

Variable	Obs	Mean	Std. Deviation	Minimum	Maximum
LOG_EXPORTS	25730	7.07	3.54	4.78	18.01
LOG_IMPORTS	32827	7.35	3.53	7.08	18.13
LOG_GDP _i	58293	22.77	1.34	18.89	26.71
LOG_GDPCAPI _i	58293	6.29	0.95	4.28	9.37
LOG_REER _i	27814	4.71	0.31	4.24	6.93
BTA _i	56134	0.68	0.50	0.00	1.79
LOG_GDP _j	55431	24.40	2.15	18.89	30.40
LOG_GDPCAP _j	55431	8.20	1.65	4.28	11.63
LOG_REER _j	31158	4.63	0.19	4.03	6.93
LOG_DIST _{i,j}	58293	8.65	0.72	2.35	9.90
TARIFF _i	24001	16.98	14.95	4.10	126.70
TARIFF _j	25856	14.99	12.56	0.00	125.89
BTA _j	56134	2.23	1.19	1.00	6.00
BURU_QUAL _j	58293	2.21	0.64	1.00	3.35
CONTR_CORR _i	58166	2.53	1.09	0.50	5.33
LAW_ORDER _j	58293	2.69	1.02	1.00	5.00
BURU_QUAL _i	52083	2.31	2.11	0.90	3.91
CONTR_CORR _j	53433	3.15	1.36	1.00	6.00
LAW_ORDER _i	53703	3.63	1.53	1.00	6.00

continued next page

Table 6 Continued

Pair-wise correlation of selected governance variables						
	BUREAUC _i	CORR _i	LOD _i	BUREAUC _i	CORR _i	LOD _i
FULL SAMPLE						
BUREAUC _i	1.0000					
CONTROL_CORR _i	0.9478*	1.0000				
LAW_ORDER _i	0.9302*	0.9136*	1.0000			
BUREAUC _j	0.8561*	0.8424*	-0.9191*	1.0000		
CONTROL_CORR _j	0.8963*	0.8786*	-0.8164*	0.8833*	1.0000	
LAW_ORDER _j	-0.9480*	-0.8390*	0.8994*	0.8167*	0.8108*	1.0000
MINERAL/RESOURCE-RICH						
BUREAUC _i	1.0000					
CONTROL_CORR _i	0.5467*	1.0000				
LAW_ORDER _i	0.5720*	0.5459*	1.0000			
BUREAUC _j	0.7704*	0.5394*	-0.5098	1.0000		
CONTROL_CORR _j	0.6158*	0.7592*	-0.7023	0.6836*	1.0000	
LAW_ORDER _j	-0.5268*	-0.5498*	0.6836*	0.6332*	0.5984*	1.0000
MINERAL/RESOURCE-POOR						
BUREAUC _i	1.0000					
CONTROL_CORR _i	0.8990*	1.0000				
LAW_ORDER _i	0.8880*	0.8742*	1.0000			
BUREAUC _j	0.8991*	0.8493*	-0.9244*	1.0000		
CONTROL_CORR _j	0.8721*	0.8042*	-0.9238*	0.84871*	1.0000	
LAW_ORDER _j	-0.8322*	-0.8330*	0.8108*	0.8718*	0.8085*	1.0000

Source: Computed; Note: i represents SSA countries, while j connotes SSA's partner countries

Regression results and discussions

Four models were estimated to analyse the impact of governance on exports of SSA. The first model contains the basic variables of the gravity model and some related control variables. The remaining three models were estimated to capture the effect of each of the governance variables. Thus, the second model was estimated to analyse the effect of bureaucratic quality in SSA and its interaction with trade cost; that is, tariff. The third and fourth models were estimated to examine the effect of control of corruption, and compliance with law and order alongside their interaction with each of the respective governance variables. This approach was also used to analyse the impact of governance on import of SSA. Analysis was conducted for aggregate exports and imports of SSA; for SSA groups (mineral or resource-rich and resource-poor); for categories of products traded by SSA (mineral and non-mineral products); and by SSA trading partners (America, Asia and Europe).

Both the Negative Binomial Pseudo Maximum Likelihood (NBPML) and Zero-Inflated Pseudo Maximum Likelihood (ZIPML) regression estimates were obtained. However, since the log of the dispersion parameter (lnalpha) in the NBPML regression is statistically significant at 1% in all the models, which confirms over-dispersion in the data due to unobserved heterogeneity (Turkson, 2011), these models are preferred to the ZIPML.

Impact of governance on SSA's trade (aggregate analysis)

Regression results showing the impact of the various explanatory variables including governance on total exports and imports of SSA are presented in Table 7. It can be observed from the four versions of the NBPML regression estimates for exports and imports that the explanatory power (R-squared) of the models improves when moving from the basic gravity result to incorporating governance variables. This suggests that governance variables contribute to the explanatory power of the model. All the gravity variables significantly influence exports of SSA. The GDP of SSA and partners, the GDP per capita of partner, contiguity, official common language and distance have the expected signs. These means that the productive capacity of SSA (GDP) and market size of its trading partners (GDP) and their level of development (per capita GDP) promote exports of SSA. It also means that contiguity and common language foster SSA's exports, while short distances between the trading partner increases exports. The GDP per capita of SSA produces significant negative impact on SSA exports. This suggests that the low level of development of SSA countries, which is reflected in production of primary products, hinders their exports. It also implies that there are export supply response constraints in these countries. It may also mean that as per capita income rises, there is increase in the domestic consumption of locally made products at the expense of exports. Real effective exchange rate (REER) of SSA showed insignificant negative effect. The negative sign of the BTAs variable may be a reflection of trade diversion following preferential market access granted to SSA by the EU and US under the non-reciprocal market access conditions of the Lome Convention (and Cotonou Partnership Agreement) and the African Growth and Opportunity Act (AGOA), respectively. In the case of imports of SSA, almost all the basic gravity variables are significant drivers. Thus, GDP and per capita GDP of SSA and its trading partners, and contiguity, common language and distance promote exports of SSA.

Analysis of the impact of the governance variables reveals that although bureaucratic quality of SSA's trading partners has insignificant impact on exports of SSA, its interaction with tariff produce significant positive effects. This suggests that efficiency and effectiveness of the bureaucratic machinery of the SSA's trading partners in the implementation of tariff policy enhances exports of SSA. The results also show that bureaucratic quality of SSA's trading partners fosters imports of SSA. This result is consistent with the theoretical argument by Kaufman and Wei (1999) that low effective red tape (which implies high bureaucratic quality) promotes trade. This result is also supported by the data presented in the background which shows that time to import in the SSA partner countries particularly the developed regions is far lower than what obtains in the SSA. However, neither bureaucratic quality in SSA nor its interaction with SSA tariff had any significant effect on exports. On the impact of corruption, the result reveals that this governance variable for both SSA and trading partners matters significantly for exports of SSA. Thus, improvement

in the control of corruption in the SSA encourages exports by reducing trade cost, while low level of corruption in the partner countries provides confidence and security for exports to thrive. This result also confirms the finding of Kaufmann and Wei (1998) and De Groot et al (2003) who showed that low corruption levels (high rating of index for control of corruption) induce trade. The result is also in line with the argument of Anderson and Marcouiller (2002) who argued that a high level of corruption in a country increases the insecurity of selling to that country, and therefore reduces foreign trade. This means that low corruption level in the destination country reduces insecurity of selling to that nation and thus promotes trade. In the case of imports, control of corruption in the SSA significantly induced more imports from abroad. In the same vein, the interaction of tariff with control of corruption in SSA shows significant impact on SSA imports. This suggests that control of corruption particularly in the implementation of tariff policy in the SSA countries encourages inflow of imports.

In the case of compliance with law and order in the SSA, the results reveal that both exports and imports were hindered by this governance variable. This result contrasts the findings of Anderson and Marcouiller (2002) who argued that the ease of contract enforcement in a country improves security of selling to that country, and thereby increases trade. Similarly, Levchenko (2004 and 2007) pointed out that contract incompleteness, absence of property rights and weak shareholder protection are critical factors hindering foreign trade. If traders find it difficult to enforce contract in a timely manner, then they resort to underground/informal trade at the expense of formal trade. Also, if most exporters find law and order too costly to comply with, they tend to either forgo trade or find alternative means which hinder formal trade.

Estimates of the marginal effects presented in the lower part of Table 7 show that SSA bureaucratic quality and partners' enforcement of law and order did not significantly affect SSA exports. Specifically, a 1.0% increase in partners' bureaucratic quality increases exports of SSA by 0.49%. In the same vein, a 1% improvement in the control of corruption in SSA and trading partners will increase its exports by 0.58% and 0.52%, respectively, while a 1% rise in the enforcement of law and order in SSA will reduce exports by 1.24%. With respect to imports, improvement in control of corruption in SSA will increase imports by 1.04% while a 1.0% increase in the effectiveness of law and order in SSA will reduce imports by 0.60%. A close look at the results reveals that governance institutions in both SSA and its trading partners contribute to exports of SSA, while these institutions in both trading partners play a minimal role in imports. Besides, the magnitude of effects of these variables differs considerably.

Table 7: NBPML regression results on the impact of governance on SSA trade

	Exports	Exports	Exports	Exports	Exports	Imports	Imports	Imports	Imports	Imports	Imports
LOG_GDP_i	0.686*** (20.11)	0.766*** (15.36)	0.698*** (14.03)	0.744*** (16.15)	0.988*** (34.12)	0.868*** (21.32)	0.771*** (20.33)	0.844*** (21.08)			
LOG_GDPCAPI_i	-0.119* (-2.15)	-0.303*** (-4.00)	-0.239** (-3.80)	-0.0223 (-0.24)	-0.200*** (-4.33)	-0.364*** (-5.35)	-0.275*** (-5.04)	-0.291*** (-3.93)			
LOG_REER_i	0.346 (1.71)	-0.347 (-1.09)	-0.606 (-1.79)	-0.920* (-2.56)	0.848*** (4.13)	1.853*** (6.45)	-0.0726 (-0.21)	1.470*** (4.77)			
LOG_GDP_j	0.257*** (12.37)	0.694*** (24.08)	0.700*** (27.21)	0.694*** (24.12)	0.492*** (34.24)	0.824*** (35.04)	0.891*** (37.84)	0.830*** (36.03)			
LOG_GDPCAP_j	0.114** (2.73)	-0.109* (-2.13)	-0.103* (-1.97)	-0.131* (-2.33)	-0.0426 (-1.72)	-0.122* (-3.23)	-0.106** (-2.77)	-0.0631 (-1.39)			
LOG_REER_j	-0.274 (-1.38)	0.152 (0.61)	0.443 (1.59)	0.250 (0.92)	0.262 (1.87)	-0.455* (-2.27)	0.0707 (0.31)	-0.530** (-2.63)			
TARIFF_j	-0.00889* (-3.01)	-0.0111 (-1.09)	-0.0221 (-1.43)	-0.00313 (-0.22)		0.0118 (1.44)	0.00493 (0.52)	0.00231 (0.25)			
CONTIGUITY	1.122*** (3.91)	0.850* (2.22)	0.988** (2.64)	0.814* (2.15)	1.040** (3.99)	0.282 (0.82)	0.146 (0.43)	0.313 (0.91)			
COMMON_LANG	0.694*** (7.73)	0.333** (3.20)	0.267** (2.60)	0.270* (2.55)	0.840*** (12.58)	0.390*** (4.48)	0.481*** (5.66)	0.370*** (4.30)			
LOG_DISTi,j	-0.345*** (-5.88)	-1.245*** (-14.04)	-1.302*** (-15.20)	-1.282*** (-15.01)	-0.415*** (-9.48)	-0.965*** (-14.24)	-1.032*** (-16.16)	-0.967*** (-14.61)			
LANDLOCKED_i	-0.224 (-1.87)	-0.835*** (-5.31)	-0.965*** (-6.83)	-0.333 (-1.93)	0.786** (8.87)	0.864*** (6.35)	0.879*** (7.09)	1.089*** (7.54)			
BTA_i	-0.426*** (-7.44)	-0.504*** (-6.60)	-0.441*** (-6.73)	-0.329*** (-4.31)	-0.572*** (-14.31)	-0.677*** (-10.82)	-0.575*** (-10.67)	-0.667*** (-11.99)			
TARIFF_i		-0.00269 (-0.29)	-0.00661* (-2.54)	-0.0498 (-1.83)	-0.0174*** (-11.27)	-0.0180* (-2.42)	-0.0155*** (-7.26)	-0.0218 (-1.12)			
BURU_QUAL_i		-0.00579 (-0.09)				0.0387 (0.71)					

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Table 7 Continued

	Exports	Exports	Exports	Exports	Exports	Imports	Imports	Imports	Imports
BURU_QUAL_j		0.0474 (1.16)					0.0839* (2.50)		
TARIFFI*BUQUALI		0.000626 (0.21)					-0.000884 (-0.37)		
TARIFFJ*BURQUALJ		0.00394** (2.80)					-0.00212 (-1.81)		
CONTR-CORR_i			0.159** (2.93)					0.252** (5.43)	
CONTR_CORR_j			0.168* (2.40)					0.0233 (0.46)	
TARIFFI*CONTRL_CORRi			0.00000391 (1.53)					0.0000136*** (6.07)	
TARIFFJ*CONTROL_CORRj j			-0.00103 (-0.29)					0.00129 (0.51)	
LAW_ORDER_i						-0.275** (-2.58)			-0.204* (-2.36)
LAW_ORDER_j						0.102 (1.54)			-0.0212 (-0.37)
TARIFFI*LAW_ORDERi						-0.0115 (-1.65)			0.000468 (0.09)
TARIFFJ*LAW_ORDERj						0.00312 (1.08)			-0.00109 (-0.51)
Constant	-8.421*** (-5.12)	-9.654*** (-4.02)	-9.512*** (-3.90)	-23.58** (-17.23)	-8.551*** (-3.36)	-24.64*** (-11.77)	-18.38*** (-8.69)		-21.81*** (-10.21)
Lnalpha									
Constant	1.526*** (83.76)	1.355*** (52.48)	1.346*** (52.46)	1.345*** (52.13)	1.299*** (82.51)	1.116*** (46.18)	1.092*** (45.46)		1.114*** (46.28)
R-SQUARED	0.21	0.21	0.39	0.35	0.37	0.41	0.44		0.44

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Table 7 Continued

	Exports	Exports	Exports	Exports	Exports	Exports	Imports	Imports	Imports	Imports	Imports
PSEUDO-R-SQUARED	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04
CHI-SQUARED	1557.58	1339.97	1388.56	1376.19	1376.19	3149.42	1847.91	1992.53	1895.00	1895.00	1895.00
LOG_LIKELIHOOD	-38835.55	-19849.81	-20085.91	-19884.12	-19884.12	-54027.83	-23343.16	-23583.96	-23434.29	-23434.29	-23434.29
OBSERVATION	3699	1903	1930	1909	1909	5006	2195	2231	2212	2212	2212
Marginal effect of governance variables on SSA trade											
Trade						Imports					
Method											
Delta-method											
Variables	ey/ex	Std. Err.	Z	P> z	ey/ex	Std. Err.	z	P> z			
BUREAUC_i	-0.081	0.164	-0.500	0.617	0.021	0.146	0.150	0.883			
CONTROL_CORR_j	0.585	0.126	4.640	0.000	1.039	0.108	9.580	0.000			
LAW_ORDER_j	-1.236	0.211	-5.870	0.000	-0.600	0.172	-3.490	0.000			
BUREAUC_j	0.499	0.214	2.330	0.020	0.279	0.171	1.630	0.103			
CONTROL_CORR_j	0.520	0.187	2.780	0.005	-0.097	0.134	-0.730	0.466			
LAW_ORDER_j	0.023	0.261	0.090	0.928	-0.226	0.213	-1.060	0.288			

Source: Computed by the Authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

To examine the moderating role of mineral endowment in the link between SSA trade and governance, it is imperative to decompose the region into mineral-rich and mineral-poor groups. As stated earlier, to avoid the divergence in classification of countries by mineral endowment, SSA trade has been grouped into mineral and non-mineral product exports and imports based on the data available on the database of the United Nations Conference on Trade and Development (UNCTAD).

Impact of governance on trade of SSA groups (mineral or resource-rich and resource-poor)

The regression results on the effect of governance on exports and imports of resource or mineral-rich and mineral-poor groups of SSA are presented in Tables 8a and 8b. The results of the four versions of the NBPML regression estimates for exports and imports indicate that the explanatory power (R-squared) of the models moderately increases when governance variables were included. This suggests that governance variables add to the explanatory power of the model and, therefore, the variables constitute major determinants of exports and imports of the two groups of SSA countries.

Beginning from the analysis of mineral-rich SSA countries, results in Table 8a show that (in most of the equations) the basic gravity variables are significant determinants of exports of the SSA's group. Moreover, significant drivers of exports of the resource-rich SSA countries also include partner countries' tariff, distance and real effective exchange rate (REER) of both trading partners. However, contiguity and landlocked could not explain exports of resource-rich SSA countries. Meanwhile, imports of the resource-rich SSA countries are influenced by GDP and per capita GDP of both the resource-rich SSA countries and their trading partners. Other variables that are major drivers of imports of the resource-rich SSA countries are REER of SSA, distance, bilateral trade agreements (BTA) and tariff of SSA's partners.

Columns 3 to 5 and 7 to 9 show the behaviour of exports and imports when governance variables are included in the models. Column 3 reveals that there is no significant impact of either the bureaucratic quality in the resource-rich SSA or that of the trading partners on exports and imports of the SSA's group. Even when bureaucratic quality was interacted with tariffs, there was no change in the result in terms of significance. The same outcome was observed for control of corruption and compliance with law and order in both the resource-rich SSA and the trading partners. However, interacting control of corruption with tariff in the resource-rich SSA shows a significant positive impact, suggesting that control of corruption in the execution of tariff policy produces positive effects on exports and imports of resource-rich SSA countries (control of corruption moderate the effect of tariff). Similarly, the interaction of tariff with compliance with law and order produce a negative impact on exports. This result is not surprising since the composition of exports is skewed towards mineral products, which may not be

influenced by governance institutions. Therefore, as far as exports of resource-rich SSA are concerned, governance institutions play a mild role. Given that some crude mineral resources serve as critical inputs in the production activities and trade in the developed, industrialized and mineral-scarce countries, governance institutions may not matter much for trade between mineral-rich countries and their trading partners. For example, to ensure steady supply of raw materials (critical inputs), some countries in need of these kinds of resources engage in trade facilitation through various means including signing of bilateral trade agreements (BTAs), while to stabilize demand or price, mineral-rich countries form cartels. All these may suppress the role of effective governance in trade.

Estimates of the marginal effects show that governance variables had mixed effects on trade. For example, a 1.0% improvement in the control of corruption in the mineral-rich SSA increased exports by 1.81% but increased imports by 2.02%. But increase in foreign bureaucratic quality by 1.0% will raise exports from the resource-rich SSA by 0.86%. Improvement in control of corruption in the partner country had no statistical significant effect on resource-rich SSA's exports and imports. This is clear evidence that resource-rich exports do not depend mainly on governance institutions. The major drivers are the size of the economy and other basic gravity variables.

Table 8a: NBPML regression results on the impact of governance on trade of mineral-rich SSA

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EXPORTS	EXPORTS	EXPORTS	EXPORTS	IMPORTS	IMPORTS	IMPORTS	IMPORTS
LOG_GDP_i	1.626*** (19.41)	0.481*** (4.23)	0.388*** (3.53)	0.407*** (3.59)	1.212*** (19.65)	0.771*** (8.99)	0.615*** (6.92)	0.724*** (8.23)
LOG_GDPCAPI_i	1.010*** (8.90)	-0.566* (-2.37)	-0.122 (-0.57)	-0.849*** (-3.33)	-0.0160** (-0.14)	-0.877*** (-4.76)	-0.476** (-2.88)	-1.083*** (-5.34)
LOG_REER_j	-4.435*** (-9.94)	-2.916*** (-3.62)	-1.126 (-1.35)	-2.918*** (-3.47)	-2.851*** (-7.45)	-2.945*** (-4.69)	-1.466** (-2.62)	-3.954*** (-6.45)
LOG_GDP_j	0.697*** (18.81)	0.822*** (16.77)	0.833*** (19.09)	0.833*** (17.23)	0.668*** (25.60)	0.977*** (26.86)	1.061*** (30.02)	0.988*** (27.18)
LOG_GDPCAP_j	-0.137* (-2.06)	-0.235* (-2.52)	-0.0761 (-0.95)	-0.189 (-1.89)	-0.00646 (-0.16)	-0.174** (-2.95)	-0.108 (-1.91)	-0.161* (-2.10)
LOG_REER_j	1.285* (2.35)	0.190 (0.41)	0.171 (0.40)	0.167 (0.34)	-0.983*** (-3.56)	-0.358 (-1.10)	-0.155 (-0.50)	-0.426 (-1.29)
TARIFF_j	0.0402*** (7.13)	0.0616 (1.56)	0.0398 (1.15)	0.0700 (1.91)	-	0.0210 (0.69)	-0.0268 (-1.23)	-0.000237 (-0.01)
CONTIGUITY	-0.564 (-0.95)	-0.861 (-1.06)	-1.270 (-1.55)	-1.025 (-1.24)	0.0925 (0.22)	0.997 (1.56)	0.0226 (0.04)	0.923 (1.45)
COMMON_LANG	-0.873*** (-5.56)	-0.0491 (-0.26)	-0.172 (-0.91)	-0.0521 (-0.27)	1.369*** (9.90)	0.206 (1.35)	0.271 (1.81)	0.192 (1.30)
LOG_DISTij	-1.329*** (-12.07)	-1.491*** (-10.33)	-1.734*** (-12.03)	-1.524*** (-10.26)	-0.649*** (-9.22)	-1.065*** (-9.82)	-1.387*** (-13.50)	-1.092*** (-10.15)
LANDLOCKED_i	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
BTA_i	0.486*** (4.12)	-0.972** (-2.71)	-1.375*** (-4.58)	-1.487*** (-5.28)	-0.698*** (-5.19)	-0.922*** (-3.54)	-1.382*** (-6.00)	-1.520*** (-7.12)
TARIFF_i		-0.0486 (-0.65)	-0.237** (-3.09)	-0.111 (-1.85)	-0.0435*** (-3.35)	-0.181** (-2.81)	-0.204*** (-3.33)	-0.0920 (-1.94)

continued next page

Table 8a Continued

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EXPORTS	EXPORTS	EXPORTS	EXPORTS	IMPORTS	IMPORTS	IMPORTS	IMPORTS
BURU_QUAL_i		0.246 (1.36)				0.173 (1.08)		
BURU_QUAL_j		0.171 (1.60)				0.0213 (0.26)		
TARIFF*BUQUALI		-0.00663 (-0.51)				0.0108 (0.96)		
TARIFF*BURQUALJ		-0.00925 (-1.62)				-0.00419 (-0.97)		
CONTR-CORR_i			-0.548 (-1.60)				-0.231 (-0.84)	
CONTR_CORR_j			0.0486 (0.34)				-0.0553 (-0.56)	
TARIFF*CONTRL_CORRi			0.109** (3.47)				0.0912** (3.56)	
TARIFF*CONTROL_CORRjLj			-0.00935 (-1.08)				0.00567 (1.09)	
LAW_ORDER_i				0.0604 (0.19)				0.0363 (0.15)
LAW_ORDER_j				0.188 (1.32)				-0.0598 (-0.47)
TARIFF*LAW_ORDERi				0.00499 (0.26)				-0.00926 (-0.62)
TARIFF*LAW_ORDERj				-0.0159* (-2.11)				-0.00164 (-0.28)
Constant	-26.86*** (-6.25)	11.20 (1.39)	5.267 (0.66)	17.32* (2.43)	-10.01** (-2.85)	2.412 (0.41)	-3.840 (-0.66)	12.00* (2.26)

continued next page

Table 8a Continued

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EXPORTS	EXPORTS	EXPORTS	EXPORTS	IMPORTS	IMPORTS	IMPORTS	IMPORTS
Lalpha								
Constant	2.682*** (104.56)	2.133*** (62.05)	2.131*** (62.24)	2.146*** (62.47)	1.984*** (93.01)	1.674*** (50.50)	1.659*** (50.15)	1.686*** (51.06)
R-SQUARED	0.3	0.3	0.31	0.33	0.35	0.35	0.40	0.41
PSEUDO_R-SQUARED	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
CHI-SQUARED	1095.60	447.02	506.25	463.14	1447.40	850.98	956.30	866.36
LOG_LIKELIHOOD	-23083.28	-12715.31	-12831.96	-12739.40	-32320.64	-13753.03	-13853.01	-13814.57
OBSERVATION	3577	1410	1446	1427	3468	1410	1446	1427
Marginal effect of governance on trade of resource-rich SSA group								
Trade	Exports				Imports			
Method	Delta-method				Delta-method			
Variables	ey/ex	Std. Err.	Z	P> z	ey/ex	Std. Err.	Z	P> z
BUREAUC_i	-1.085	0.546	-1.990	0.047	-0.258	0.391	-0.660	0.509
CONTROL_CORR_j	1.811	0.301	6.020	0.000	2.018	0.230	8.770	0.000
LAW_ORDER_j	-0.074	0.417	-0.180	0.859	-0.484	0.346	-1.400	0.161
BUREAUC_j	0.858	0.406	2.110	0.035	-0.054	0.267	-0.200	0.838
CONTROL_CORR_j	-0.279	0.308	-0.910	0.365	0.354	0.225	1.570	0.116
LAW_ORDER_j	-0.221	0.407	-0.540	0.587	-0.508	0.343	-1.480	0.138

Source: Computed by the Authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

The results on the impact of governance on exports and imports of the resource-poor SSA are presented in Table 7b. The results show that apart from economic or market size, productive capacity and level of development (GDP and per capita GDP) of the resource-poor SSA and its trading partners, other determinants of exports are contiguity, common language, landlocked, BTA and distance. However, imports of the resource-poor SSA are influenced by GDP, per capita GDP and REER of the SSA group, GDP of trading partners, common language, distance, landlocked and BTA.

The results in Table 8b reveal that bureaucratic quality in the resource-poor SSA produced significant and negative impacts on exports and imports of the SSA's group. This governance indicator of the partner countries had insignificant positive impact on the exports of mineral-poor SSA while it shows significant positive impact on imports of the SSA's group. The interaction of the partners' bureaucratic quality with tariff exerts significant positive effects on the exports of resource-poor SSA. This suggests that improvement in the bureaucratic quality of the tariff policy executors in the trading partners is very important for exports of the resource-poor countries. Control of corruption in the resource-poor SSA had insignificant negative impact while that of the partner countries had significant positive impact on exports of the resource-poor SSA. The interaction of tariff with control of corruption in both resource-poor SSA and its partners had significant impact. The results suggest that, in the resource-poor SSA, improvement in the control of corruption in the implementation of tariff policy promotes exports while a similar development in the partner countries hinders exports.

Although control of corruption in both resource-poor SSA's group and its trading partners had insignificant effect on imports of the SSA's group, its interaction with tariff produced significant positive impact. Compliance with law and order in the resource-poor SSA countries had insignificant effect on its exports and imports while that of the partner countries had significant (negative) effect only on imports. Further, the interaction of compliance with law and order with tariff in the resource-poor SSA countries generated significant negative effects on exports while that of the partner countries produced significant positive impacts. However, such interactions do not have a significant effect on imports of the resource-poor SSA's group.

In terms of the marginal effects of governance on trade of mineral-poor SSA, a 1.0% improvement in the control of corruption in the SSA's group will harm exports by 1.16% but with insignificant effect on imports. A 1% rise in control of corruption in the SSA's partner countries will raise exports by 1.54%. An improvement in the compliance with law and order in the mineral-poor SSA by 1% will reduce exports by 1.73% and raise imports by 0.70%. If this indicator improved in the SSA's partner countries by the same percentage, it would have insignificant effect on exports, while imports would reduce by 0.72%.

In summary, the results portray the importance of governance institutions in the SSA partner countries for exports of the mineral-rich and mineral-poor groups of SSA, while governance institutions of both SSA groups are very crucial for their imports.

Table 8b: NBPML regression results on the impact of governance on trade of mineral-poor SSA

VARIABLES	1	2	3	4	5	6	7	8
	EXPORTS			IMPORTS				
LOG_GDP_i	2.432*** (15.02)	1.405*** (5.07)	1.863*** (6.46)	0.521* (3.62)	1.625*** (15.37)	1.824*** (10.42)	1.908*** (10.90)	1.830*** (7.89)
LOG_GDPCAPI_i	-3.263*** (-10.74)	-2.733*** (-5.56)	-3.223*** (-5.95)	-0.527* (-4.00)	-2.417*** (-12.67)	-2.961*** (-8.58)	-2.922*** (-8.23)	-2.753*** (-6.31)
LOG_REER_i	1.026** (3.09)	-0.998 (-1.68)	0.214 (0.29)	-2.584** (-3.00)	1.414*** (4.25)	2.693*** (4.83)	3.751*** (5.17)	1.342* (2.26)
LOG_GDP_j	0.433*** (11.28)	0.983*** (17.71)	1.062*** (18.81)	0.952*** (16.45)	0.725*** (26.99)	0.871*** (18.64)	0.905*** (18.69)	0.866*** (18.85)
LOG_GDPCAP_j	0.0383 (0.63)	-0.250** (-2.72)	-0.522*** (-5.20)	-0.168* (-3.71)	0.0546 (1.40)	-0.0416 (-0.57)	-0.0528 (-0.68)	-0.225** (2.83)
LOG_REER_j	-0.0597 (-0.17)	-0.346 (-0.97)	0.142 (0.32)	-0.00840 (-0.02)	0.594* (2.57)	-1.106* (-2.07)	-0.128 (-0.25)	-0.953 (-1.71)
TARIFF_j	0.0103** (2.92)	-0.0154 (-1.35)	-0.0300* (-2.13)	-0.0113 (-0.73)		-0.00634 (-0.41)	-0.0445*** (-3.57)	-0.0216 (-1.34)
CONTIGUITY	1.859** (3.08)	3.465*** (4.38)	3.388*** (4.26)	2.892*** (3.64)	1.529*** (3.47)	1.010 (1.42)	1.717* (2.29)	1.075 (1.47)
COMMON_LANG	0.766*** (4.62)	0.837*** (4.04)	0.897*** (4.61)	0.574** (2.79)	0.437*** (4.01)	0.722*** (4.27)	0.844*** (5.13)	0.671*** (4.03)
LOG_DISTi_j	-0.304*** (-3.81)	-0.710*** (-5.66)	-0.694*** (-5.72)	-0.736*** (-5.92)	-0.876*** (-11.63)	-0.898*** (-8.00)	-0.856*** (-7.38)	-0.931*** (-8.20)
LANDLOCKED_i	0.916*** (5.20)	0.460 (1.63)	1.668*** (5.52)	1.995*** (4.91)	0.903*** (5.95)	0.718** (2.94)	1.183*** (3.93)	0.638* (4.88)
BTA_i	-1.851*** (-12.17)	-0.972*** (-5.18)	-1.776*** (-7.03)	-0.454* (-2.12)	-1.048*** (-11.70)	-1.200*** (-8.72)	-1.465*** (-8.83)	-1.189*** (-7.57)
TARIFF_i		0.0130 (0.59)	0.118* (2.16)	0.350** (2.77)	-0.00422 (-1.69)	-0.0594*** (-3.53)	-0.0303 (-0.67)	-0.0257 (-0.74)
BURU_QUAL_i		-0.364* (-2.15)				-0.571*** (-4.18)		

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Table 8b Continued

VARIABLES	1	2	3	4	5	6	7	8
	EXPORTS				IMPORTS			
BURU_QUAL_j		0.112 (1.67)				0.164** (2.74)		
TARIFF*BUQUALI		-0.000889 (-0.11)				0.0190** (2.99)		
TARIFF*BURQUALJ		0.00442** (2.74)				0.000326 (0.15)		
CONTR-CORR_i			-0.305 (-0.76)				-0.488 (-1.31)	
CONTR_CORR_j			0.320** (3.07)				0.0328 (0.42)	
TARIFF*CONTRL_CORRi			-0.0540* (-2.01)				0.00901 (0.40)	
TARIFF*CONTROL_CORRjLj			0.0115** (3.21)				0.00981** (3.05)	
LAW_ORDER_i				0.388 (0.99)				
LAW_ORDER_j				-0.0500 (-0.51)				-0.300** (-3.10)
TARIFF*LAW_ORDERi				-0.0844** (-2.67)				0.00462 (0.52)
TARIFF*LAW_ORDERj				0.00674* (2.02)				0.00388 (1.06)
Constant	-35.22*** (-9.70)	-14.65** (-2.87)	-29.32*** (-4.95)	-7.340 (-1.18)	-30.95*** (-12.14)	-31.54*** (-6.36)	-43.74*** (-8.39)	-30.29 (-1.64)

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Table 8b Continued

VARIABLES	1	2	3	4	5	6	7	8
Llnalpha								
Constant	2.388*** (96.57)	2.135*** (58.19)	2.147*** (58.81)	2.147*** (58.51)	1.882*** (83.80)	1.724*** (51.40)	1.758*** (52.88)	1.752*** (52.34)
R-SQUARED	0.41	0.41	0.42	0.42	0.33	0.33	0.36	0.39
PSEUDO_R-SQUARED	0.02	0.03	0.03	0.03	0.02	0.03	0.02	0.03
CHI-SQUARED	635.75	501.75	519.17	529.69	961.35	573.35	576.37	590.87
LOG_LIKELIHOOD	-19546.63	-8772.44	-8856.80	-8792.38	-24607.45	-11149.26	-11309.35	-11194.10
OBSERVATION	3082	1349	1379	1375	3058	1349	1379	1375
MARGINAL EFFECT OF GOVERNANCE ON TRADE OF RESOURCE-POOR SSA GROUP								
Trade	Exports				Imports			
Method	Delta-method							
Variables	ey/ex	Std. Err.	z	P> z	ey/ex	Std. Err.	z	P> z
BUREAUC_i	-0.261	0.550	-0.470	0.635	-1.146	0.465	-2.460	0.014
CONTROL_CORR_i	-1.160	0.601	-1.930	0.054	-0.550	0.499	-1.100	0.270
LAW_ORDER_i	-1.728	0.473	-3.650	0.000	0.703	0.312	2.260	0.024
BUREAUC_j	0.866	0.374	2.310	0.021	1.285	0.299	4.290	0.000
CONTROL_CORR_j	1.540	0.397	3.880	0.000	0.851	0.270	3.150	0.002
LAW_ORDER_j	-0.599	0.426	-1.400	0.160	-0.716	0.408	-1.750	0.079

Source: Computed by the Authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

Impact of governance on SSA trade structure (mineral and non-mineral products)

Further analysis of the moderating role of mineral endowment in the determination of the impact of governance on SSA trade leads to categorization of exports and imports into mineral and non-mineral products. Regression results shown in Table 9a indicate that SSA's GDP and GDP per capita, common language, and distance are the variables that had significant impact on SSA's mineral product exports, while the effects of other variables are insignificant. Thus, the productive capacity (GDP) and level of development (GDP per capita) of SSA countries coupled with common language and distance between these countries and their trading partners drive mineral exports. However, while GDP and common language promote mineral exports, GDP per capita and distance hinder it. The result in respect of GDP per capita suggests that the low level of development of the SSA countries (which support production of primary products) hinders exports. The regression results also reveal that only partners' GDP, GDP per capita and tariff are the significant determinants of mineral product imports of SSA. It must be noted that all the variables carry the expected sign. Therefore, while SSA's partners' GDP per capita fosters imports, their tariffs and GDP harm imports. The result in respect of partners' GDP suggests that SSA's exports become an inferior product as partners' GDP expands.

With respect to the effect of governance on mineral product exports, Table 9a shows that only interaction of bureaucratic quality in the SSA with tariff had significant negative impact on its mineral product exports. Thus, other governance variables have insignificant impact. This outcome further strengthens the claim that mineral-based exports appear not to be influenced by governance institutions. However, while control of corruption in the SSA's partner countries engendered increased mineral imports, compliance with law and order in the SSA's countries (which is low) hinders such imports. The results are in line with the position of Acemoglu and Johnson (2003) who argued that institution-dependent economies (such as the developed SSA's partners) seem to record more output and therefore increased exports to economies with weak governance institutions (such as most SSA countries).

Based on the results of the marginal effects, a 1% improvement in control of bureaucratic quality in SSA will lead to -0.296% reduction in mineral product exports. Also, a similar improvement in corruption in the SSA's partner countries raises mineral imports by 3.3%, while law and order in SSA reduces imports of such products by 1.04%. Other governance variables show no significant effect.

Table 9b presents the regression results on the drivers of non-mineral product exports and imports of SSA, including the governance variables. The regression results show that GDP and GDP per capita of SSA countries and their partners, and contiguity, common language and distance are major determinants of SSA's exports of non-mineral products. The GDP of both SSA countries and their partners stimulate non-mineral product exports, which means that productive capacity (or resource endowment) of SSA countries and the market size of their partners promote exports of non-mineral products.

Table 9a: NBPML regression results on the impact of governance on mineral product trade

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	REALEXPORT	REALEXPORT	REALEXPORT	REALEXPORT	REALIMPORT	REALIMPORT	REALIMPORT	REALIMPORT
LOG_GDP_i	1.700** (9.68)	2.194* (2.38)	1.004 (1.34)	0.840 (1.15)	-0.161 (-0.20)	-0.520 (-0.27)	-1.976 (-1.83)	1.435 (1.15)
LOG_GDPCAPI_i	-2.083** (-9.21)	-2.473* (-2.20)	-1.055 (-1.12)	-0.876 (-0.98)	0.0361 (0.04)	0.0249 (0.01)	1.928 (1.45)	-2.068 (-1.35)
LOG_REER_i	0.548 (1.20)	2.728** (2.72)	2.597* (2.43)	1.403 (1.30)	1.487 (1.74)	0.312 (0.15)	1.252 (0.96)	-0.168 (-0.12)
LOG_GDP_j	0.0462 (0.82)	-0.155 (-1.47)	-0.0538 (-0.52)	-0.0928 (-0.89)	-0.194* (-2.16)	-0.352 (-1.67)	-0.414** (-3.25)	-0.113 (-0.72)
LOG_GDPCAP_j	0.148 (1.91)	0.143 (0.92)	0.119 (0.77)	0.348 (1.96)	0.799** (5.26)	1.017*** (3.48)	0.558*** (3.37)	0.979*** (4.00)
LOG_REER_j	-0.0762 (-0.17)	-2.575* (-2.34)	-0.751 (-0.88)	-2.222* (-2.05)	-0.642 (-0.92)	-1.558 (-1.00)	0.847 (0.66)	-0.768 (-0.53)
TARIFF_j	-0.0163* (-2.14)	-0.0987 (-1.59)	-0.0283 (-0.66)	-0.0446 (-0.91)	-	0.0691 (0.87)	0.0713 (1.50)	0.0217 (0.40)
CONTIGUITY	0.241 (0.29)	-3.384 (-1.76)	-3.737 (-1.91)	-3.437 (-1.80)	0.678 (0.273)	0.727 (0.467)	0.869 (0.345)	0.795 (0.251)
COMMON_LANG	0.733*** (3.88)	0.447 (1.23)	0.690 (1.94)	0.541 (1.50)	-0.208 (-0.55)	0.427 (0.57)	-0.710 (-1.42)	-0.137 (-0.25)
LOG_DISTi_j	-0.439** (-2.76)	-0.239 (-0.84)	-0.427 (-1.49)	-0.323 (-1.13)	-0.115 (-0.51)	-0.479 (-1.02)	-0.952** (-2.58)	-1.313** (-2.74)
LANDLOCKED_i	0.247 (1.31)	0.770* (2.15)	1.083** (2.70)	0.691* (1.98)	0.248 (0.99)	0.487 (1.10)	0.564 (1.34)	1.049* (2.24)
BTA_i	-0.0421 (-0.60)	-0.241 (-1.27)	-0.333 (-1.77)	-0.261 (-1.39)	-0.0351 (-0.21)	-0.247 (-0.98)	0.160 (0.79)	-0.173 (-0.77)
TARIFF_i		0.0371 (1.82)	0.00212 (0.18)	-0.0358* (-2.29)	-0.0156*** (-3.96)	0.00137 (0.05)	-0.0163 (-0.95)	-0.0386* (-2.57)

continued next page

Table 9a Continued

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	REALEXPOR	REALEXPOR	REALEXPOR	REALEXPOR	REALIMPORT	REALIMPORT	REALIMPORT	REALIMPORT
BURU_QUAL_i		0.328 (1.88)				0.316 (1.42)		
BURU_QUAL_j		-0.117 (-0.64)				0.568 (1.77)		
TARIFF*BUQUALI		-0.00840* (-2.41)				-0.00344 (-0.71)		
TARIFF*BURQUALJ		0.0153 (1.45)				-0.0169 (-1.47)		
CONTR-CORR_i			0.299 (1.05)				0.502 (1.74)	
CONTR_CORR_j			0.114 (0.51)				1.167*** (5.69)	
TARIFF*CONTRL_CORRi			-0.00468 (-1.48)				-0.00185 (-0.41)	
TARIFF*CONTROL_CORRj			0.00812 (0.69)				-0.0187 (-1.72)	
LAW_ORDER_i				-0.225 (-1.29)				-1.118*** (-4.49)
LAW_ORDER_j				-0.348 (-1.59)				0.260 (1.03)
TARIFF*LAW_ORDERi				0.00798 (1.74)				0.00987 (1.92)
TARIFF*LAW_ORDERj				0.0120 (0.98)				-0.0103 (-0.98)
Constant	-16.97*** (-3.93)	-22.45 (-1.26)	-12.04 (-0.77)	4.363 (0.29)	8.854 (0.57)	27.61 (0.68)	41.92 (1.90)	1.288 (0.06)

continued next page

Table 9a Continued

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	REALEXPOR	REALEXPOR	REALEXPOR	REALEXPOR	REALIMPORT	REALIMPORT	REALIMPORT	REALIMPORT
Lalpha								
Constant	1.354*** (32.24)	1.123*** (13.91)	1.138*** (14.40)	1.131*** (14.12)	1.598*** (30.70)	1.554*** (18.92)	1.404*** (17.22)	1.467*** (17.78)
R-SQUARED	0.45	0.45	0.48	0.47	0.40	0.40	0.43	0.43
PSEUDO_R-SQUARED	0.01	0.01	0.01	0.01	0.02	0.03	0.04	0.04
CHI-SQUARED	92.69	36.40	34.59	32.98	134.83	96.34	137.73	121.42
LOG_LIKELIHOOD	-6994.54	-2074.50	-2178.84	-2107.74	-4004.54	-1543.70	-1600.84	-1543.25
OBSERVATION	697	195	203	198	449	179	186	180
Marginal effect of governance on mineral product trade								
Trade								
Exports								
Imports								
Delta-method								
Method	Exports				Imports			
Variables	ey/ex	Std. Err.	z	P> z	ey/ex	Std. Err.	z	P> z
BUREAUC_i	-0.296	0.918	-0.320	0.104	0.168	1.344	0.120	0.901
CONTROL_CORR_i	0.064	0.922	0.070	0.945	0.960	1.210	0.790	0.427
LAW_ORDER_i	0.211	0.406	0.520	0.604	-1.039	0.493	-2.110	0.035
BUREAUC_j	0.124	0.670	0.180	0.853	0.146	0.763	0.190	0.848
CONTROL_CORR_j	2.113	0.509	4.150	0.200	3.321	0.692	4.800	0.000
LAW_ORDER_j	-2.113	0.634	-3.330	0.301	-2.075	0.877	-2.370	0.118

Source: Computed by the Authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

However, the GDP per capita of both SSA countries and their partners discourage non-mineral product exports, which suggests that the levels of development of the SSA countries (which is low) and their partners (which is high) hinder exports. While the negative effect of GDP per capita of SSA countries is a reflection of exports supply response capacity constraint, that of their trading partners portrays low or declining patronage of such exports as income increases (signifying inferior products).

The results also reveal that while contiguity and common language enhance non-mineral exports, distance hinders it. In the case of non-mineral imports, results show that GDP of both SSA countries and their partners, and GDP per capita are significant drivers of such imports of SSA countries. Other major drivers of non-mineral imports of SSA countries are REER of SSA's partners, contiguity, common language, distance, landlocked, BTA and tariff. While distance, landlocked, REER and GDP per capita of SSA's partners harm non-mineral import of SSA countries, other factors promote it.

Results indicate that, out of the three governance variables considered, control of corruption in both the SSA countries and their partner countries, and compliance with law and order (interaction with tariff) are very important for non-mineral exports of SSA countries. However, the results suggest that low level of compliance with law and order in SSA countries particularly in the execution of tariff policy (law and order interact with tariff) impacts negatively on exports. An assessment of the impacts of governance variables on non-mineral import of SSA shows that bureaucratic quality of SSA and their trading partners produce a significant positive effect. Meanwhile, when the variables are interacted with respective tariffs, the positive effect of bureaucratic quality of the SSA countries was turned negative by tariffs. Thus, the negative effect of tariff overweighs the positive effect of bureaucratic quality on imports of non-mineral products. Furthermore, improvement in control of corruption of the SSA' trading partners impacted positively on non-mineral imports while that of the SSA countries had insignificant impact. In the same vein, while compliance with law and order in the SSA's trading partners engendered positive influence on non-mineral imports of SSA countries, that of SSA countries (with interaction with tariff) generated negative effects. This also means that the negative effect of tariff overweighs the positive effect of bureaucratic quality on imports of non-mineral products.

The results from the marginal effects obtained indicate that a 1.0% rise in the control of corruption in the SSA's countries and their partner countries raised exports by 2.39% and 1.00%, respectively. The same percentage increase in SSA's partners' compliance with law and order increased non-mineral exports by 0.11%. However, a 1.0% improvement in bureaucratic quality in the SSA countries and their partners produced insignificant effects. In the same vein, a 1.0% progress in bureaucratic quality in the SSA countries and their partner countries will raise non-mineral imports by 0.42% and 0.95%, respectively. Further, a 1.0% increase in control of corruption, and compliance with law and order in the SSA's partner countries, will increase non-mineral imports of SSA countries by 1.54% and 0.22%, respectively. These results, therefore, suggest that while non-mineral trade ~~were~~was responsive to governance in both source and destination countries, exports are less responsive to such governance.

Table 9b: NBPML regression results on the impact of governance on trade in non-mineral products

VARIABLES	1	2	3	4	5	6	7	8
LOG_GDP_i	1.311** (28.66)	1.188** (14.36)	1.149** (17.83)	1.155** (13.72)	0.900** (42.01)	0.951** (29.90)	0.981** (29.24)	0.889** (26.49)
LOG_GDPCAPI_i	-0.612** (-9.34)	-0.475** (-3.68)	-0.336** (-3.21)	-0.401** (-3.17)	0.0737 (1.55)	-0.0824 (-1.30)	0.0822 (1.08)	-0.0682 (-1.09)
LOG_REER_i	-0.379* (-2.19)	-0.476 (-1.23)	-0.319 (-0.85)	-0.168 (-0.45)	0.831** (5.57)	0.415 (1.86)	0.522* (2.23)	0.418 (1.89)
LOG_GDP_j	0.663** (26.87)	0.675** (14.82)	0.536** (15.26)	0.669** (15.27)	0.699** (47.30)	0.928** (33.45)	0.742** (32.29)	0.905** (36.46)
LOG_GDPCAP_j	0.116** (3.59)	-0.130 (-1.83)	-0.0616 (-0.85)	-0.196* (-2.41)	0.0502* (2.26)	-0.231** (-5.59)	-0.157** (-3.85)	-0.268** (-5.71)
LOG_REER_j	0.664** (3.34)	-0.110 (-0.29)	0.142 (0.40)	-0.156 (-0.41)	-1.292** (-10.01)	-1.077** (-5.36)	-1.112** (-4.78)	-0.909** (-3.91)
TARIFF_j	-0.00282 (-1.01)	0.00469 (0.26)	0.00663 (0.44)	0.00667 (0.36)		-0.0143 (-1.76)	0.00154 (0.18)	-0.00305 (-0.32)
CONTIGUITY	2.001** (7.97)	1.975** (4.07)	2.542** (5.64)	2.112** (4.32)	1.624** (6.42)	1.275** (3.62)	1.621** (4.39)	1.127** (3.12)
COMMON_LANG	0.561** (7.21)	0.727** (5.34)	0.848** (6.38)	0.758** (5.64)	1.096** (15.99)	0.678** (7.08)	1.090** (10.42)	0.809** (8.58)
LOG_DISTij	-1.041** (-15.44)	-0.699** (-6.29)	-0.820** (-8.13)	-0.658** (-5.89)	-0.523** (-11.68)	-0.656** (-10.39)	-0.479** (-7.34)	-0.661** (-10.23)
LANDLOCKED_i	-0.177* (-2.04)	-0.0196 (-0.12)	-0.108 (-0.68)	-0.0158 (-0.10)	-0.247** (-3.36)	-0.317** (-3.11)	-0.253* (-2.30)	-0.266* (-2.56)
BTA_i	-0.0394 (-1.21)	-0.0726 (-1.06)	-0.0655 (-1.03)	-0.0729 (-1.07)	0.0773** (2.69)	0.215** (4.72)	0.161** (3.39)	0.216** (4.68)
TARIFF_i		0.00200 (0.16)	0.00302 (0.34)	0.0189 (2.15)	0.00283 (1.78)	-0.0260** (-2.90)	-0.00298 (-0.52)	-0.0370** (-4.93)

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Table 9b Continued

VARIABLES	1	2	3	4	5	6	7	8
	EXPORTS		IMPORTS					
BURU_QUAL_j		0.113 (1.83)				0.150*** (3.65)		
BURU_QUAL_j		0.0722 (1.25)				0.119** (3.20)		
TARIFF*BUQUALI		0.0000455 (0.02)				-0.00366* (-2.24)		
TARIFF*BURQUALJ		-0.00214 (-0.79)				0.00208 (1.55)		
CONTR-CORR_j			0.635*** (7.35)				-0.101 (-1.72)	
CONTR_CORR_j			0.215** (2.87)				0.331*** (6.60)	
TARIFF*CONTRL_CORRi			-0.00143 (-0.57)				0.00153 (0.90)	
TARIFF*CONTROL_CORRj j			-0.00537 (-1.49)				-0.00160 (-0.71)	
LAW_ORDER_i				0.0398 (0.45)				0.126 (1.88)
LAW_ORDER_j				0.168* (1.98)				0.212*** (3.94)
TARIFF*LAW_ORDERi				-0.00657* (-2.38)				-0.0118*** (-4.75)
TARIFF*LAW_ORDERj				-0.00318 (-0.83)				0.000595 (0.26)
Constant	-27.10*** (-16.24)	-23.48*** (-7.59)	-24.08*** (-8.68)	-23.90*** (-7.64)	-23.67*** (-19.96)	-27.03*** (-15.29)	-25.77*** (-14.32)	-25.29*** (-13.67)

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Table 9b Continued

VARIABLES	EXPORTS			IMPORTS			7	8
	1	2	3	4	5	6		
Lalpha								
Constant	1.363*** (69.15)	1.320*** (38.63)	1.267*** (37.05)	1.318*** (38.63)	1.067*** (55.60)	0.941*** (31.54)	1.016*** (34.55)	0.946*** (31.84)
R-SQUARED	0.39	0.51	0.51	0.50	0.40	0.51	0.54	0.54
PSEUDO R-SQUARED	0.03	0.04	0.04	0.04	0.05	0.06	0.05	0.06
CHI-SQUARED	2253.00	849.88	952.94	857.56	3728.78	1820.77	1692.74	1831.44
LOG_LIKELIHOOD	-31306.15	-10400.81	-10419.96	-10428.04	-34545.85	-14628.06	-14883.16	-14694.28
OBSERVATION	3270	1125	1134	1129	3513	1483	1505	1493
Marginal effect of governance on trade in non-mineral products								
Trade	Exports				Imports			
Method	Delta-method				Delta-method			
	ey/ex	Std. Err.	z	P> z	ey/ex	Std. Err.	Z	P> z
BUREAUC_i	-0.732	0.220	-3.330	0.000	0.416	0.148	2.820	0.005
CONTROL_CORR_i	2.398	0.203	11.820	0.000	0.020	0.142	0.140	0.890
LAW_ORDER_i	-0.453	0.208	-2.180	0.033	0.204	0.152	1.340	0.180
BUREAUC_j	0.099	0.245	0.404	0.686	0.959	0.192	4.990	0.000
CONTROL_CORR_j	1.001	0.256	3.910	0.000	1.537	0.146	10.490	0.000
LAW_ORDER_j	0.108	0.319	0.340	0.734	0.201	0.197	1.020	0.094

Source: Computed by the Authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

Impact of governance on trade between SSA and its trading partners

The role of governance in trade between SSA countries and their trading partners in different regions is also analysed. Starting with the United States of America, Table 10 indicates that the major determinants of export flows from SSA countries to the region are SSA's GDP and GDP per capita, and tariff, partner countries' GDP and GDP per capita, and landlocked. While GDP of SSA countries and their partners had significant positive effect on exports, their GDP per capita, landlocked and tariff generated negative impacts on the same. Other variables (SSA's REER, partner countries REER and tariff, common language, distance and contiguity) produced insignificant effects on export flows from SSA to America. The significant factors influencing SSA's imports from America are SSA's GDP and GDP per capita, tariff and REER, SSA's partners' GDP and SSA tariff, landlocked and BTAs. Although GDP of SSA and their partners promote imports of SSA from America, BTA's and SSA's GDP per capita hinders it. The impact of other variables such as contiguity and common official language on import flows is not significant.

An assessment of the impact of governance on export flows from SSA to America reveals that the bureaucratic quality in the SSA had significant positive impact on both exports and imports between SSA and America while the bureaucratic quality in America produced insignificant impact on them. However, the interaction of SSA's bureaucratic quality with tariff produced significant negative impacts, suggesting that poor bureaucratic quality in the SSA can reinforce the negative effect of tariff on trade. Control of corruption (and its interaction with tariff) had insignificant impact on exports and imports between SSA and America. However, compliance with law and order (and its interaction with tariff) shows positive (negative) impact. This also suggests that enforcement of compliance with law and order can reinforce the negative impact of tariff on exports and imports between SSA and America.

The results of the marginal effects show that 1.0% rise in the bureaucratic quality in the SSA will raise its exports to America by 1.48%. The same percentage rise in compliance with law and order in America will raise exports to the continent by 4.34% and imports from the region by 1.87%.

Table 10: NBPML regression results on the impact of governance on trade between SSA and America

VARIABLES	EXPORTS			IMPORTS			(8)	
	(1)	(2)	(3)	(4)	(5)	(6)		(7)
LOG_GDP_i	0.635*** (5.10)	0.882** (3.94)	1.160*** (4.55)	0.941*** (5.92)	1.194*** (13.71)	0.957*** (6.57)	1.084*** (7.33)	1.150*** (9.37)
LOG_GDPCAPI_i	0.489** (2.98)	-0.134 (-0.54)	-0.488* (-2.11)	-0.673* (-2.57)	-0.644*** (-4.37)	-0.368 (-1.84)	-0.370* (-4.92)	-0.425* (-2.13)
LOG_REER_i	0.480 (0.66)	4.056*** (3.88)	2.568* (2.19)	-2.039 (-1.48)	3.149*** (4.58)	4.516*** (5.85)	3.952*** (3.95)	3.612*** (4.07)
LOG_GDP_j	0.717*** (8.49)	0.604*** (4.96)	0.539*** (4.89)	0.663*** (6.81)	0.493*** (10.51)	0.431*** (5.83)	0.567*** (7.73)	0.465*** (6.30)
LOG_GDPCAP_j	-0.905*** (-3.43)	-0.307 (-0.81)	-0.204* (-7.67)	-1.009*** (-3.48)	0.154 (1.09)	0.438* (2.23)	0.101 (0.58)	0.0664 (0.34)
LOG_REER_j	-0.330 (-0.25)	-0.557 (-0.33)	-1.363 (-0.79)	-1.555 (-1.06)	1.143 (1.63)	1.135 (1.08)	0.819 (0.74)	0.444 (0.41)
TARIFF_j	0.0987*** (5.32)	-0.201* (-2.09)	-0.0552 (-0.93)	-0.112* (-1.97)		-0.114* (-2.22)	-0.0398 (-1.28)	-0.0493 (-1.87)
CONTIGUITY	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
COMMON_LANG	1.923*** (4.29)	-0.439 (-0.78)	0.0264 (0.05)	-0.286 (-0.51)	0.379 (1.20)	-0.186 (-0.53)	0.394 (1.09)	0.0476 (0.13)
LOG_DISTi,j	-0.180 (-0.16)	-1.543 (-1.22)	-0.184 (-0.15)	-0.462 (-0.40)	-0.768 (-1.32)	-0.0575 (-0.06)	-0.373 (-0.40)	-0.0431 (-0.05)
LANDLOCKED_i	-2.854*** (-4.88)	-2.010* (-2.33)	-2.334** (-2.70)	0.418 (0.50)	2.162*** (6.32)	1.673** (2.82)	1.862** (2.82)	2.077** (3.01)
BTA_i	0.815*** (4.29)	-0.204 (-0.72)	-0.163 (-0.59)	0.407 (1.59)	-0.871*** (-7.81)	-0.699*** (-3.91)	-0.672*** (-3.45)	-0.746*** (-4.29)
TARIFF_i		0.429*** (5.70)	0.0508 (0.73)	0.364*** (4.56)	-0.0409*** (-9.07)	0.200*** (3.80)	-0.0781 (-1.38)	0.0136 (0.26)
BURU_QUAL_i		1.799*** (4.38)				1.213*** (4.37)		

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Table 10 Continued

VARIABLES	(1)	EXPORTS (2)	(3)	(4)	IMPORTS (5)	(6)	(7)	(8)
BURU_QUAL_j		0.306 (0.89)				0.188 (1.06)		
TARIFF*BUQUALI		-0.118*** (-5.97)				-0.0627*** (-4.67)		
TARIFF*BURQUALJ		0.0465 (1.94)				0.0245 (1.95)		
CONTR-CORR_j			-0.234 (-0.60)				-0.0881 (-0.29)	
CONTR_CORR_j			0.505 (1.56)				0.211 (0.99)	
TARIFF*CONTRL_CORRi			-0.0368 (-1.10)				0.0195 (0.72)	
TARIFF*CONTROL_CORRj j			0.0123 (0.65)				0.00718 (0.72)	
LAW_ORDER_j				0.119 (0.41)				0.0214 (0.09)
LAW_ORDER_j				0.878** (3.15)				0.444** (2.64)
TARIFF*LAW_ORDERi				-0.0994*** (-4.78)				-0.0136 (-1.00)
TARIFF*LAW_ORDERj				0.0187 (1.34)				0.00824 (1.20)
Constant	-22.93 (-1.63)	-32.01* (-2.09)	-32.23 (-1.77)	-9.299 (-0.62)	-38.54*** (-5.50)	-54.72*** (-4.51)	-46.42*** (-3.66)	-45.70*** (-3.47)

continued next page

Table 10 Continued

VARIABLES	EXPORTS		IMPORTS		(8)			
	(1)	(2)	(3)	(4)		(5)	(6)	(7)
Llnalpha								
Constant	1.600*** (30.23)	1.341*** (17.42)	1.396*** (18.80)	1.253*** (16.22)	1.444*** (36.85)	1.094*** (17.30)	1.177*** (19.13)	1.135*** (18.14)
R-SQUARED	0.51	0.54	0.54	0.54	0.49	0.58	0.57	0.58
PSEUDO_R-SQUARED	0.03	0.05	0.05	0.06	0.04	0.06	0.05	0.05
CHI-SQUARED	272.30	237.47	230.15	268.91	642.43	368.63	352.27	354.96
LOG_LIKELIHOOD	-4427.66	-2207.68	-2342.04	-2213.05	-7574.16	-3133.11	-3242.28	-3183.18
OBSERV	433	216	229	218	798	325	339	330
Marginal effect of governance on trade between SSA and America								
Trade								
Exports								
Imports								
Delta-method								
Method	Exports				Imports			
Variables	ey/ex	Std. Err.	z	P> z	ey/ex	Std. Err.	z	P> z
BUREAUC_j	1.476	0.808	1.830	0.068	-0.184	0.545	-0.340	0.073
CONTROL_CORR_j	-1.085	0.590	-1.840	0.166	0.923	0.412	2.240	0.225
LAW_ORDER_j	-3.009	0.749	-4.020	0.200	-0.502	0.516	-0.970	0.331
BUREAUC_j	2.183	0.972	2.250	0.225	1.875	0.692	2.710	0.1307
CONTROL_CORR_j	0.500	0.667	0.750	0.453	-0.367	0.624	-0.590	0.556
LAW_ORDER_j	4.342	0.874	4.970	0.000	1.869	0.623	3.000	0.003

Source: Computed by the Authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

The results presented in Table 11 show that most variables are not significant drivers of exports flows from SSA to Asia. Specifically, only SSA's GDP and GDP per capita and Asia's GDP showed significant positive impacts, while distance indicates significant negative effect. Other variables such as GDP per capita of Asia, common official language, landlocked, contiguity REER and tariff produced insignificant effects on SSA's exports. The results indicate that GDP of SSA and Asia had significant positive effects on SSA's imports from Asia while per capital GDP of both engendered negative impacts. Other variables such as language, distance, BTA and tariff hindered imports of SSA from Asia.

All governance indicators of both SSA and Asia (even with their interaction with tariff) had insignificant impact on export flows from SSA to Asia. In contrast, bureaucratic quality and compliance with law and order are important governance variables driving imports of SSA from Asia. Compliance with law and order in SSA and Asia alongside their respective interaction with tariff produced significant impacts on SSA's imports from Asia. This implies that while governance variables do not matter for exports from SSA to Asia, they do matter for imports from Asia. These results remain valid even when tariff was introduced to moderate the influence of these variables on trade with Asia. It is of interest that corruption in either of the trading partners does not influence trade between SSA and Asia. The result follows Li et al (2003) where they argue that trade between two relation-based economies may not be driven importantly by governance institutions. The reason why governance may matter less for exports from SSA to Asia is the dominance of mineral products which are needed as raw materials for industrialization.

The results of the marginal effect indicate that a 1.0% enhancement of compliance with law and order in the SSA will reduce its exports to Asia by 1.2% while similar improvement in Asia's compliance with law and order will raise export by 1.63%. Also, a 1% rise in the bureaucratic quality in Asia will increase imports by 0.49%.

Table 11: NBPML regression results on the impact of governance on trade between SSA and Asia

VARIABLES	1	EXPORTS		3	4	5	IMPORTS		7	8
LOG_GDP_i	1.055*** (11.92)	0.798** (7.06)	0.698** (5.84)	0.868** (7.20)	1.213*** (19.76)	1.119** (15.70)	1.045*** (13.47)	1.072*** (12.82)		
LOG_GDPCAPI_i	0.151 (1.16)	0.227 (1.41)	0.347* (2.03)	0.552** (2.84)	-0.287** (-2.65)	-0.633*** (-4.68)	-0.561*** (-4.84)	-0.370* (-2.46)		
LOG_REER_i	-0.343 (-0.69)	-0.930 (-1.26)	-0.952 (-1.19)	-1.757 (-1.95)	-0.233 (-0.48)	-1.313* (-2.30)	-1.044 (-1.92)	-0.492 (-0.76)		
LOG_GDP_j	0.0918 (1.71)	0.469** (4.57)	0.484*** (5.11)	0.150 (1.87)	0.161*** (5.23)	0.464*** (8.23)	0.465*** (8.27)	0.269*** (5.31)		
LOG_GDPCAP_j	0.0259 (0.41)	-0.141 (-1.62)	-0.171 (-1.60)	-0.109 (-1.02)	0.155*** (3.36)	0.0420 (0.66)	0.232*** (3.59)	-0.125 (-1.58)		
LOG_REER_j	0.876 (1.45)	0.492 (0.48)	-0.659 (-0.57)	0.689 (0.60)	0.979 (1.62)	0.0224 (0.03)	0.301 (0.37)	-0.0897 (-0.10)		
TARIFF_j	-0.0105 (-1.48)	-0.0457 (-1.09)	-0.0307 (-1.24)	-0.0255 (-0.73)		0.0113 (0.40)	0.00658 (0.34)	0.0230 (0.92)		
CONTIGUITY	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)		
COMMON_LANG	0.0442 (0.16)	0.754* (2.22)	0.981** (2.96)	0.437 (1.17)	-0.941*** (-6.03)	-0.405* (-2.08)	-0.478* (-2.54)	0.121 (0.57)		
LOG_DISTi_j	2.006*** (7.24)	1.026* (2.37)	1.440*** (3.44)	1.720*** (4.09)	1.409** (7.36)	1.024** (3.22)	1.153*** (3.82)	1.905*** (6.86)		
LANDLOCKED_i	0.636* (2.51)	-0.193 (-0.52)	-0.129 (-0.35)	0.761 (1.89)	1.183*** (5.91)	0.866*** (3.38)	0.749** (3.09)	1.305*** (5.01)		
BTA_i	-0.104 (-0.82)	-0.119 (-0.71)	-0.145 (-0.92)	0.0294 (0.17)	-0.316*** (-3.34)	-0.449*** (-3.77)	-0.330** (-3.20)	-0.509*** (-4.37)		
TARIFF_i		-0.0575** (-2.64)	-0.0575 (-1.08)	0.0201 (0.29)	-0.0162*** (-4.79)	-0.000000426 (-0.00)	-0.0197 (-0.46)	-0.166*** (-3.70)		

continued next page

Table 11 Continued

VARIABLES	1	2	3	4	5	6	7	8
		EXPORTS				IMPORTS		
BURU_QUAL_i		-0.0462 (-0.34)				0.159 (1.41)		
BURU_QUAL_j		0.221 (1.74)				0.220* (2.46)		
TARIFF*BUQUALI		0.00924 (1.29)				-0.00885 (-1.70)		
TARIFF*BURQUALJ		0.00458 (0.71)				-0.00195 (-0.44)		
CONTR-CORR_i			-0.147 (-0.49)				0.410 (1.66)	
CONTR_CORR_j			0.332 (1.88)				-0.117 (-0.94)	
TARIFF*CONTRL_CORRi			0.0145 (0.56)				0.000962 (0.05)	
TARIFF*CONTROL_CORRj			0.00392 (0.59)				-0.00233 (-0.47)	
LAW_ORDER_i				-0.527 (-1.87)				-0.878** (-4.06)
LAW_ORDER_j				0.230 (1.58)				0.561*** (4.79)
TARIFF*LAW_ORDERi				-0.0114 (-0.65)				0.0366** (3.15)
TARIFF*LAW_ORDERj				0.00184 (0.28)				-0.00498 (-1.06)
Constant	-38.54*** (-8.43)	-29.30*** (-3.87)	-25.62** (-3.22)	-27.09*** (-3.32)	-36.32*** (-9.83)	-27.71*** (-5.33)	-31.03*** (-5.86)	-30.61*** (-4.96)

continued next page

Table 11 Continued

VARIABLES	1	2	3	4	5	6	7	8
Llnalpha								
Constant	1.329*** (28.00)	1.161*** (17.88)	1.171*** (18.04)	1.238*** (19.35)	1.075*** (27.22)	0.682*** (11.20)	0.660*** (10.81)	0.871*** (14.76)
R-SQUARED	0.44	0.44	0.46	0.49	0.41	0.50	0.52	0.52
PSEUDO_R-SQUARED	0.04	0.04	0.04	0.05	0.04	0.05	0.05	0.05
CHI-SQUARED	505.67	291.11	286.52	346.46	760.16	460.13	471.93	484.43
LOG_LIKELIHOOD	-5944.36	-3228.22	-3230.51	-3288.23	-9414.61	-4214.63	-4208.73	-4342.29
OBSERV	580	315	315	320	825	372	372	384
Marginal effect of governance on trade between SSA and Asia								
Trade								
Exports								
Imports								
Delta-method								
Method	Exports				Imports			
Variables	ey/ex	Std. Err.	z	P> z	ey/ex	Std. Err.	Z	P> z
BUREAUC_i	0.563	0.350	1.610	0.108	0.330	0.303	1.090	0.275
CONTROL_CORR_j	0.297	0.321	0.930	0.354	1.478	0.238	6.210	0.230
LAW_ORDER_j	-0.987	0.485	-2.030	0.142	-1.225	0.283	-4.320	0.000
BUREAUC_j	0.312	0.652	0.480	0.632	0.494	0.481	-1.030	0.030
CONTROL_CORR_j	0.246	0.490	0.500	0.616	0.476	0.361	-1.320	0.188
LAW_ORDER_j	-1.010	0.593	-1.700	0.188	1.627	0.435	3.740	0.000

Source: Computed by the Authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

In the case of Europe, the results in Table 12 show that the main determinants of SSA's exports to the region are SSA's GDP, partners' (Europe) GDP and GDP per capita, REER, and BTAs. While SSA's GDP, and partners' (Europe) GDP and GDP per capita had significant positive effects on exports, Europe's REER and BTAs produced significant negative impact. Other variables, namely SSA's GDP per capita and REER, tariffs, landlocked, contiguity, common language and distance were not able to impact on exports from SSA to Europe. Imports from SSA to Europe are encouraged by GDP of SSA and Europe and discouraged by their GDP per capita. Other major determinants of SSA's imports from Europe are tariffs of both partners, language, distance, and BTAs.

The results of the impact of governance on SSA's exports to Europe are also analysed. Unlike in other regions (America and Asia), bureaucratic quality of SSA (and its interaction with tariff) impacted negatively (positively) on SSA exports to the region. Also, control of corruption in Europe (and its interaction with tariff) had significant positive (negative) impact on SSA exports to Europe. However, compliance with law and order in Europe enhanced SSA's exports to the region. Virtually all governance indicators significantly influenced imports from Europe. Results confirm that both bureaucratic quality and control of corruption in the SSA produced adverse effects on the region's imports from Europe, while control of corruption in Europe encouraged it. In the same vein, compliance with law and order in both SSA and Europe contributed significantly and positively to SSA's imports from Europe. Assessing the marginal effect of governance indicators on trade with Europe, it was found that 1.0% improvement in the bureaucratic quality in SSA will reduce SSA's exports to the region by 1.02% while the same percentage rise in the control of corruption and compliance with law and order in Europe will facilitate SSA exports by 1.51% and 1.05%, respectively. Moreover, while a 1.0% rise in the bureaucratic quality and control of corruption will harm SSA's imports by 0.42% and 0.20%, respectively, the same percentage rise in compliance with law and order will foster imports by 0.69%. Also, a 1% improvement in the control of corruption and compliance with law and order in Europe will promote SSA's imports from the region by 0.33% and 2.81%, respectively.

Table 12: NBPML regression results on the impact of governance on trade between SSA and the EU

	EXPORTS			IMPORTS				
	1	2	3	4	5	6	7	8
LOG_GDP_i	0.977*** (17.58)	0.941*** (10.77)	0.976** (11.04)	0.944*** (11.53)	0.735*** (19.10)	0.796** (13.27)	0.918*** (13.86)	0.765*** (13.00)
LOG_GDPCAPI_i	-0.328*** (-3.54)	-0.324* (-2.44)	-0.167 (-1.12)	-0.0801 (-0.52)	-0.382*** (-6.87)	-0.370*** (-3.71)	-0.388*** (-3.41)	-0.228* (-2.22)
LOG_REER_i	0.0799 (0.24)	1.010 (1.68)	0.594 (1.03)	-0.127 (-0.18)	0.752* (2.57)	0.611 (1.09)	0.297 (0.56)	0.241 (0.43)
LOG_GDP_j	0.993*** (23.60)	0.868*** (13.10)	0.894*** (14.90)	0.913*** (14.58)	0.930*** (29.76)	0.891*** (16.91)	0.953*** (19.50)	0.956*** (19.63)
LOG_GDPCAP_j	0.183 (1.80)	0.630*** (3.33)	0.358* (2.39)	0.385* (2.43)	-0.313*** (-4.77)	-0.203 (-1.43)	-0.627*** (-5.22)	-0.478*** (-4.10)
LOG_REER_j	-4.884*** (-5.10)	-6.850*** (-5.13)	-3.959** (-2.99)	-4.524*** (-3.50)	-1.206** (-2.88)	-0.316 (-0.34)	0.822 (0.81)	1.305 (1.33)
TARIFF_j	-0.00458 (-1.19)	0.0216 (1.08)	0.0888* (2.04)	0.0766 (1.44)		0.0466** (2.97)	0.00157 (0.06)	0.0816* (2.48)
CONTIGUITY	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
COMMON_LANG	0.277 (1.84)	0.00535 (0.02)	0.285 (1.19)	-0.100 (-0.44)	1.290*** (10.46)	1.652*** (8.24)	1.867*** (8.95)	1.556*** (8.34)
LOG_DISTi,j	0.533 (1.65)	1.143* (2.14)	-0.789 (-1.20)	-0.0677 (-0.13)	1.119*** (4.60)	2.492*** (6.14)	1.583** (3.19)	1.440*** (3.59)
LANDLOCKED_i	-0.436 (-1.81)	-0.803* (-2.18)	-0.303 (-0.75)	0.0120 (0.03)	0.121 (0.71)	-0.00475 (-0.02)	0.324 (1.13)	0.631* (2.19)
BTA_i	-0.182 (-1.69)	-0.536*** (-3.40)	-0.660*** (-4.46)	-0.299* (-5.96)	-0.670*** (-10.72)	-0.871*** (-8.01)	-0.983*** (-9.83)	-0.820*** (-8.38)
TARIFF_i		-0.0621** (-3.24)	-0.0659 (-1.61)	0.0976 (1.72)	-0.0126*** (-5.11)	-0.110*** (-8.45)	-0.115*** (-3.49)	0.211*** (6.42)

continued next page

Table 12 Continued

	1	2	3	4	5	6	7	8
	EXPORTS		IMPORTS					
BURU_QUAL_i		-0.474** (-3.59)				-0.653*** (-6.88)		
BURU_QUAL_j		0.0112 (0.13)				0.0575 (0.82)		
TARIFF*BUQUALI		0.0172** (2.59)				0.0347*** (7.64)		
TARIFF*BURQUALJ		-0.00311 (-1.18)				-0.00596*** (-3.36)		
CONTR-CORR_i			-0.233 (-0.93)				-0.818** (-4.01)	
CONTR_CORR_j			0.691*** (4.07)				0.401*** (3.57)	
TARIFF*CONTRL_CORRi			0.0279 (1.38)				0.0487** (3.03)	
TARIFF*CONTROL_CORRj j			-0.0186* (-2.12)				-0.000498 (-0.09)	
LAW_ORDER_i				-0.0451 (-0.19)				0.676*** (4.30)
LAW_ORDER_j				0.516** (2.79)				0.663*** (5.63)
TARIFF*LAW_ORDERi				-0.0271 (-1.89)				-0.0572** (-6.80)
TARIFF*LAW_ORDERj				-0.0151 (-1.63)				-0.0150** (-2.63)
Constant	-19.96*** (-3.69)	-18.26* (-2.21)	-17.21* (-2.24)	-19.06* (-2.31)	-31.37*** (-9.50)	-46.40*** (-7.39)	-43.78*** (-6.97)	-50.40*** (-7.97)

continued next page

Table 12 Continued

	1	2	3	4	5	6	7	8
L α								
Constant	1.193*** (35.62)	1.221*** (26.14)	1.211*** (25.91)	1.211*** (25.93)	0.837*** (28.30)	0.888** (20.12)	0.915*** (20.78)	0.887*** (20.09)
R-SQUARED	0.56	0.58	0.58	0.58	0.48	0.44	0.44	0.50
PSEUDO R-SQUARED	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05
CHI-SQUARED	1093.52	559.41	568.48	567.77	1723.66	836.27	808.96	837.61
LOG_LIKELIHOOD	-12356.13	-6376.48	-6371.94	-6372.29	-17545.06	-7564.20	-7577.86	-7563.54
OBSERVATION	1143	589	589	589	1531	682	682	682
Marginal effects of governance on trade between SSA and the EU								
Trade	Exports				Imports			
Method	Delta-method				Delta-method			
Variables	ey/ex	Std. Err.	z	P> z	ey/ex	Std. Err.	Z	P> z
BUREAUC_i	-1.023	0.330	-3.100	0.002	-0.423	0.297	-1.420	0.096
CONTROL_CORR_i	0.475	0.295	1.610	0.108	-0.198	0.253	-0.780	0.043
LAW_ORDER_i	-1.543	0.427	-3.610	0.119	0.692	0.362	1.910	0.056
BUREAUC_j	0.141	0.494	0.290	0.774	-0.739	0.444	-1.660	0.155
CONTROL_CORR_j	1.506	0.422	3.570	0.000	0.334	0.396	0.840	0.039
LAW_ORDER_j	1.051	0.673	1.560	0.000	2.815	0.581	4.850	0.000

Source: Computed by the authors; t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001

6. Conclusion

This study examined the impact of governance institutions on trade between SSA and its trading partners. Thus, the impact of governance on SSA's trade at aggregate and regional levels was analysed. The study also investigated whether governance institutions matter more for trade in the resource-rich (mineral-based) economies than in the resource-poor (non-mineral based) countries. This study, which covers 1996 to 2014, used the modified Poisson pseudo maximum likelihood (Negative Binomial Pseudo Maximum Likelihood and Zero-Inflated Pseudo Maximum Likelihood) for analysis due to the presence of some zero or unreported trade flows among the trading partners. Thus, both the Negative Binomial Pseudo Maximum Likelihood (NBPML) and Zero-Inflated Pseudo Maximum Likelihood (ZIPML) regression estimates were obtained. However, since the log of the dispersion parameter ($L\alpha$) in the NBPML regression is statistically significant at 1% in all the models, which confirms over-dispersion in the data due to unobserved heterogeneity, these models are preferred for analysis over the ZIPML.

The productive capacity of SSA (GDP) and market size of its trading partners (GDP) and their level of development (per capita GDP) promote aggregate exports of SSA. It also means that contiguity and common language foster SSA's exports while short distances between the trading partners increase exports. Analysis of the impact of the governance variables reveals that although bureaucratic quality of SSA's trading partners has insignificant impact on exports of SSA, its interaction with tariffs produces significant positive effects. The results also show that bureaucratic quality of SSA's trading partners fosters imports of SSA. However, neither bureaucratic quality in SSA nor its interaction with SSA tariff had any significant effect on exports. Coming to the impact of corruption, the result reveals that this governance variable for both SSA and trading partners matters significantly for exports of SSA. In the case of compliance with law and order in the SSA, the results reveal that both exports and imports were hindered by this governance variable.

Results show that the basic gravity variables (GDP and GDP per capita) are significant determinants of exports of the mineral-rich SSA. Moreover, significant drivers of exports of the resource-rich SSA also include partner countries' tariff, distance and real effective exchange rate (REER) of both trading partners. However, contiguity and landlocked could not explain exports of resource-rich SSA countries. Meanwhile, imports of the resource-rich SSA countries are influenced by GDP and per capita GDP of both the resource-rich SSA and their trading partners. Other variables

that are major drivers of imports of the resource-rich SSA countries are REER of SSA, distance, bilateral trade agreements (BTA) and tariff of SSA's partners. There is no significant impact of either the bureaucratic quality in the resource-rich SSA or that of the trading partners on exports and imports of the SSA's group. The same outcome was observed for control of corruption and compliance with law and order in both the resource-rich SSA and the trading partners. Therefore, as far as exports of resource-rich SSA are concerned, governance institutions play a very little role.

The results show that apart from economic or market size, productive capacity and level of development (GDP and per capita GDP) of the resource-poor SSA and its trading partners, other determinants of exports are contiguity, common language, landlocked, BTA and distance. However, imports of the resource-poor SSA are influenced by GDP, per capita GDP and REER of the SSA group, GDP of trading partners, common language, distance, landlocked and BTA. Bureaucracy quality in the resource-poor SSA produced significant negative impact on its exports and imports. This governance indicator of the partner countries had insignificant positive impact on exports of mineral-poor SSA while it shows significant positive impact on imports of the SSA's group. Control of corruption in the resource-poor SSA had insignificant negative impacts while that of the partner countries had significant positive impacts on exports of the resource-poor SSA. Although control of corruption in both resource-poor SSA's group and its trading partners had insignificant effect on imports of the SSA's group, its interaction with tariff produced significant positive impacts. Compliance with law and order in the resource-poor SSA countries had insignificant effect on its exports and imports, while that of the partner countries had significant (negative) effect only on imports. In summary, the results portray the importance of governance institutions in the exports and imports of mineral-poor SSA group than mineral-rich SSA groups. Also, governance institutions in SSA's partners are more important than that of its own.

The results point out that governance institutions are not all that important for exports of mineral products compared to non-mineral products. This may be so because most SSA countries (such as Nigeria) are well endowed with high quality (sought after) crude mineral products coupled with existence of cartels in the world market, leaving governance institutions to play passive roles. Similarly, most SSA countries rely on imports of refined mineral products from their trading partners, having better trade-related governance to facilitate such imports. These results suggest that quality of resources endowment and growing demand for such resources may substitute for existence of better governance or may not necessitate provision of better governance for trade to occur. Unlike the case of trade in mineral products, these results indicate that governance institutions in both SSA and partner countries matter for SSA's trade in non-mineral products. This main finding may reflect the high degree of competition in the international markets for non-mineral products, where countries have to ensure effectiveness of trade-related governance institutions to promote free flow of commodities to maximize gains from trade. A comparative analysis reveals the following findings. The results portray the importance of governance institutions in the SSA partner countries for exports of the mineral-rich and mineral-poor groups of SSA while governance institutions in the two groups of SSA are very crucial for their

imports. In contrast, the results point out that governance institutions in both SSA and partner countries matter for SSA's exports and imports of non-mineral products.

The results reveal that only bureaucratic quality and compliance with law and order in SSA matters for exports of SSA to America. None of the governance variables either in SSA or Asia matter for exports from SSA to Asia. However, governance institutions in both SSA and Europe matter importantly for exports from SSA to Europe. In the case of imports, bureaucratic quality and compliance with law and order in SSA drive imports from America while bureaucratic quality in Asia and compliance with law and order in both partners are the major governance variables driving imports from Asia. It can be observed from the results that governance variables in the SSA are not significant. Virtually all governance variables in SSA and Europe are important drivers of imports from the region while bureaucratic quality of both trading partners, control of corruption in Europe and compliance with law and order in Europe are the major governance variables determining exports to Europe.

Following this result, it can therefore be concluded that not all governance variables matter for trade between SSA and its partners. Whether it matters or not depends on countries' resource endowment, the pattern of trade and the direction of trade. Trade between SSA and developed countries is driven significantly by governance institutions and it is the bureaucratic quality and compliance with law and order that are more important. Such importance of governance institutions could not be established between SSA and Asia, where the countries are classified as developing economies. Furthermore, governance institutions matter more for trade in non-mineral products but matter less for trade of mineral products. It was noticed that interaction of tariff with governance variables produced some results. Some of these results suggest that inadequate governance institutions reflected in poor implementation of tariff policy may increase trade costs, which reinforces negative effects of tariff on trade.

Based on these results, the following recommendations are made to improve the volume of trade between Sub-Saharan African (SSA) countries and their trading partners. The governance institutions in the SSA should be strengthened to promote exports and imports of non-mineral products and imports of refined mineral products. In particular, there is a need to adopt a participatory approach to eliminate corruption and bureaucratic red-tape at country level. People at all levels must be mobilized and informed about the adverse effects of these governance variables on individual and general welfare. Through participatory approach, there would be more effective compliance with law and order and timely delivery of judgement on trade-related offences. This will promote security and completeness of trade contracts. Efforts at both the regional and sub-regional levels towards promoting good governance should be intensified. The pre-requisite for good governance is good leadership and peaceful reconciliation of conflicts, which are required in African countries.

It should be mentioned that we acknowledge the limitation of the empirical analysis conducted in this study due to the fact that it reveals the level of impact of governance rather than the impact of change in governance. Besides, cross section correlations may not necessarily reflect causal links. However, the findings of this study are still robust to elicit recommendations that are useful for policy.

Notes

1. For comprehensive review on factors affecting trade in Africa, see Agbodji (2008), Kuroiwa and Ozeki (2010), and Roberto and Sekkat (2004).
2. Rule-based governance is characterized by sound checks and balances operating among the legislature, judiciary and the executive, a well-developed information infrastructure, a completely independent and transparent judicial system, and a reliance on public rules to settle disputes. Relation-based systems are characterized by lack of checks and balances among the arms of government, unfair and un-transparent public rules, political influence of judiciary, porous public information infrastructure and lack of confidence in public rules (Li and Samsell, 2009; wu, Li and Samsell, 2012).
3. The commonalities that are similar among them are corruption and lack of transparency.
4. PRS and International Country Risk Guide (ICRG); <http://www.prsgroup.com/icrg.aspx>.
5. <http://www.worldbank.org/en/research/commodity-markets>
6. <http://www.prsgroup.com.icrg.aspx>
7. These are governance stability, socio-economic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality.
8. An arrangement that governs relationship between private economic parties rather than between private and government.
9. These governance indicators are voice and accountability, political stability, governance effectiveness, regulatory quality, rule of law and control of corruption (wage of public workers to private workers).

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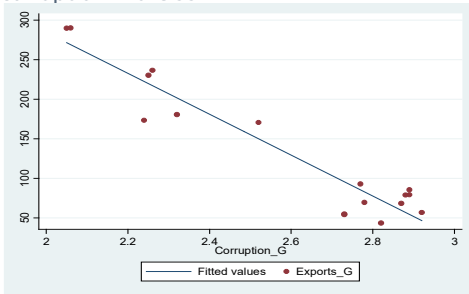
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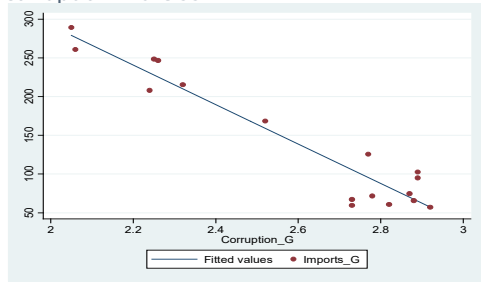
Appendix A

Panel A: The link between exports and imports of SSA with governance variables

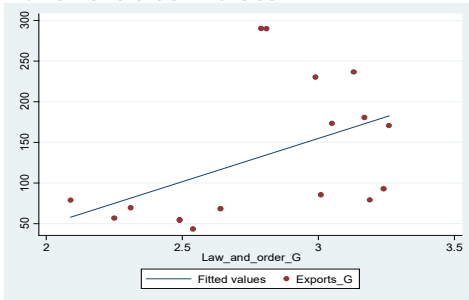
The link between exports and control of corruption in the SSA



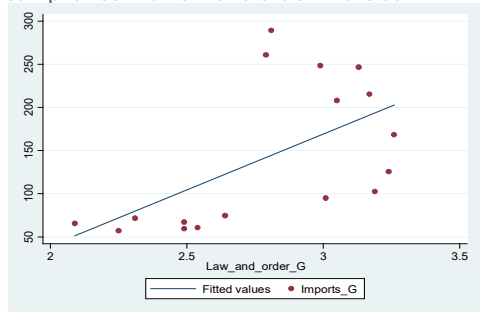
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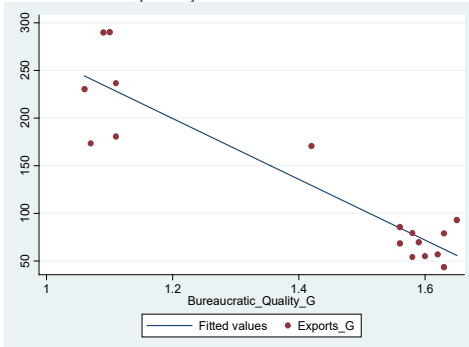
The link between exports and compliance with law and order in the SSA



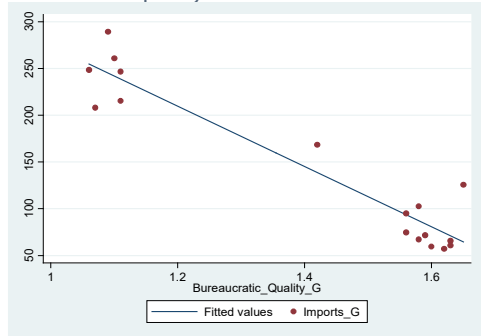
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The link between exports and bureaucratic quality in the SSA

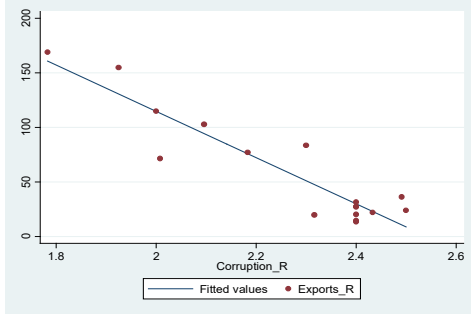


The link between imports and bureaucratic quality in the SSA

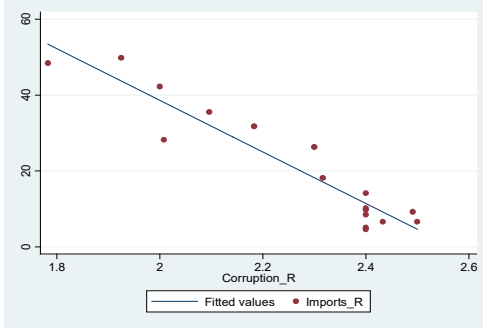


Panel B: The link between trade and governance for mineral-rich SSA group

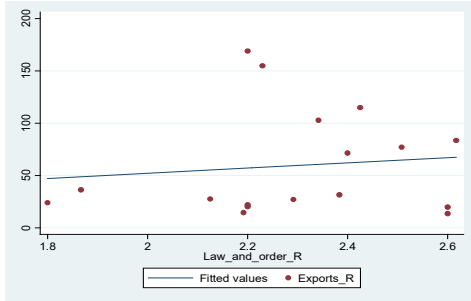
The link between exports and control of corruption in the mineral-rich SSA



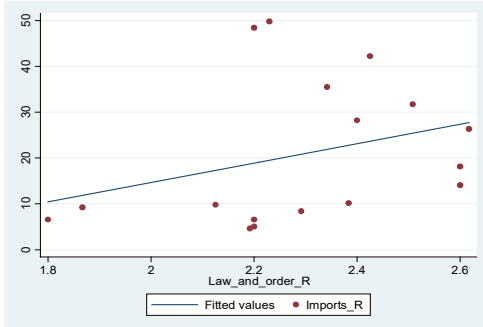
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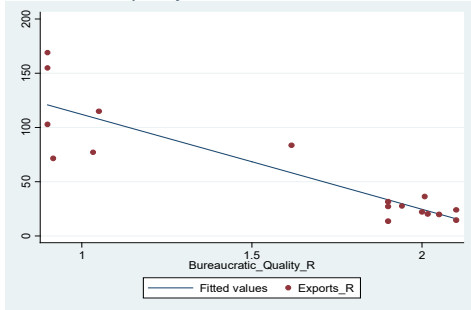
The link between exports and law and order in the M-rich SSA



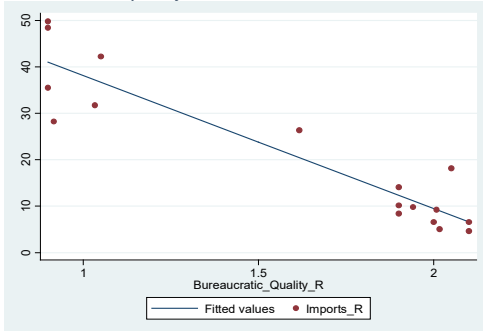
The link between imports and law and order in the M-rich SSA



The link between exports and bureaucratic quality in the mineral-rich SSA

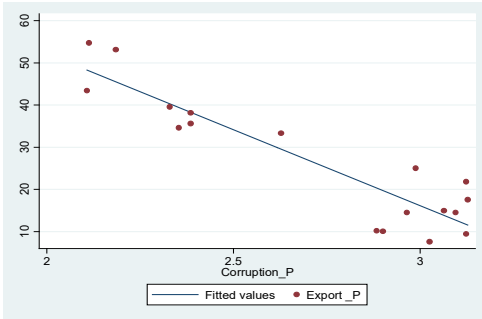


The link between imports and bureaucratic quality in the mineral-rich SSA

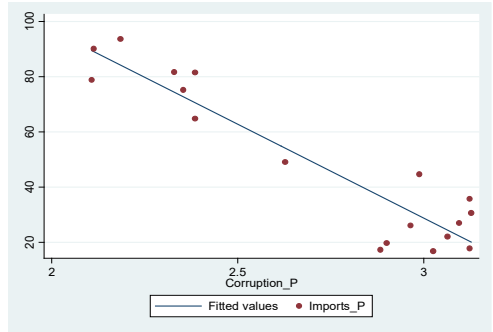


Panel C: The link between trade and governance for mineral-poor SSA group

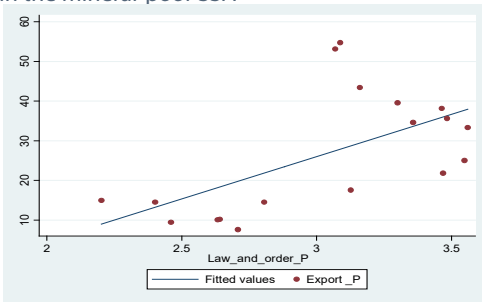
The link between exports and control of corruption in the mineral-poor SSA



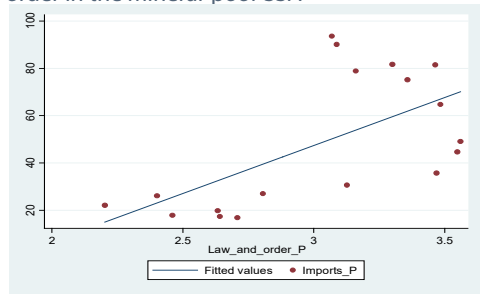
The link between exports and control of corruption in the mineral-poor SSA



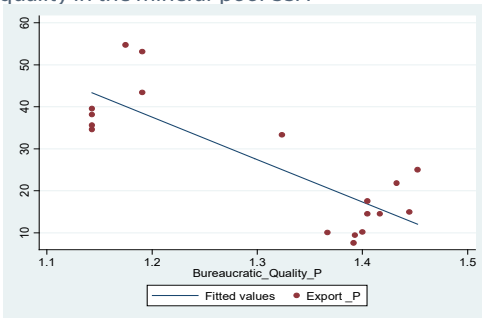
The link between exports and law and order in the mineral-poor SSA



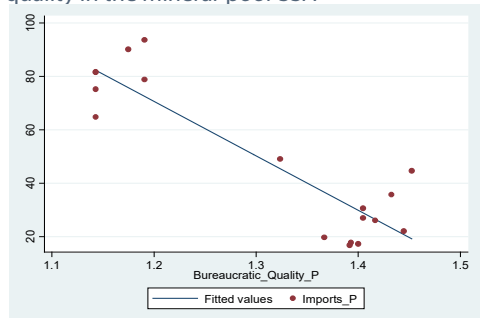
The link between imports and law and order in the mineral-poor SSA



The link between exports and bureaucratic quality in the mineral-poor SSA



The link between exports and bureaucratic quality in the mineral-poor SSA



Appendix B: Method used to extract data from WITS based on gravity

WITS has a utility where it is possible to customize countries and products required for download. We selected mineral and non-mineral countries using what obtains in the O'Connell (2008) AERC Growth project and customized each under non-mineral and mineral group, respectively. The product classification was based on the SITC Revision 1 in the WITS product window option. The mineral products appear in the SITC Revision 1 Categories 2 and 3

2 = crude materials, inedible except fuel; 3 = Mineral fuel, lubricants and related materials

Non-mineral products are in SITC Revision 1: 0-1, 4-9.

Table B1: Classification of SSA into mineral-rich and mineral-scarce economies

Resource or mineral-scarce countries in SSA			Resource or mineral-rich countries in SSA	
Burundi	Congo, Dem. Rep.	Seychelles	Angola	Swaziland
Benin	Lesotho	Togo	Cameroon	
Burkina Faso	Madagascar	Tanzania	Botswana	
Chad	Mali	Uganda	Liberia	
Central African Republic	Mozambique	Zimbabwe	Congo, Rep.	
Comoros	Ivory Coast	Sudan	Guinea	
Cape Verde	Malawi		Equatorial Guinea	
Eritrea	Mayotte		Gabon	
Ethiopia	South Africa		Mauritania	
Ghana	Niger		Nigeria	
Cote d'Ivoire	Rwanda		Sierra Leone	
Gambia, The	Senegal		Namibia	
Kenya	Sao Tome and Principe		Zambia	

Source: Collier and O'Connell (2008:127): AERC Growth Project

Generation of data for Estimating the Gravity Model

The method used is country-pair. The breakdown is as follows:

Product level model:

We collected data on country-pair with each SSA country being the reporter and each of ALL the countries listed in Table 1 below being the partner. Therefore, the export/import product level data; that is, mineral products and non-mineral products, were collected based on country-pair.

Country group level:

We collected data on country-pair with each of the mineral-rich SSA countries being the reporter (for all products) and each of ALL the countries listed in Table 1 being the partner. Therefore, the total export/imports were collected based on country-pair but using each of mineral country-pair with ALL the trading partners as listed in Table 1.

The same procedure was used for the mineral-poor countries.

We have 46 by 100 country-pair for the product level gravity equation

We have 32 by 100 country-pair for the mineral-poor countries gravity equation

We have 14 by 100 country-pair for the mineral-rich countries gravity equation

Table B2: List of SSA's trading partners used in the generation of data for estimating the gravity equations

1	ALB	Albania	35	GUY	Guyana	69	OMN	Oman
2	ARE	United Arab Emirates	36	HKG	Hong Kong SAR, China	70	PAK	Pakistan
3	ARG	Argentina	37	HND	Honduras	71	PAN	Panama
4	ATG	Antigua and Babuda	38	HTI	Haiti	72	PER	Peru
5	AUS	Australia	39	HUN	Hungary	73	PHL	Philippines
6	AZE	Azerbaijan	40	IDN	Indonesia	74	PNG	Papua New Guinea
7	BGD	Bangladesh	41	IND	India	75	POL	Poland
8	BGR	Bulgaria	42	IRL	Ireland	76	PRK	Korea, Dem. Rep.
9	BHR	Bahrain	43	IRN	Iran, Islamic Rep.	77	PRT	Portugal
10	BHS	Bahamas	44	IRQ	Iraq	78	PRY	Paraguay
11	BIH	Bosnia and Herzegovina	45	ISL	Iceland	79	QAT	Qatar
12	BRA	Brazil	46	ISR	Israel	80	ROM	Romania
13	BRB	Barbados	47	ITA	Italy	81	RUS	Russian Federation
14	BTN	Bhutan	48	JAM	Jamaica	82	SAU	Saudi Arabia
15	CHE	Switzerland	49	JOR	Jordan	83	SGP	Singapore
16	CHL	Chile	50	JPN	Japan	84	SLV	El Salvador
17	CHN	China	51	KAZ	Kazakhstan	85	SUR	Suriname
18	COL	Colombia	52	KOR	Korea, Rep.	86	SVK	Slovak Republic
19	CUB	Cuba	53	KWT	Kuwait	87	SWE	Sweden
20	CYM	Cayman Islands	54	LBN	Lebanon	88	SYR	Syrian Arab Republic
21	CZE	Czech Republic	55	LBY	Libya	89	THA	Thailand
22	DEU	Germany	56	LKA	Sri Lanka	90	TKM	Turkmenistan
23	DNK	Denmark	57	LTU	Lithuania	91	TTO	Trinidad and Tobago
24	DOM	Dominican Republic	58	LUX	Luxemburg	92	TUN	Tunisia
25	DZA	Algeria	59	MAR	Morocco	93	TUR	Turkey
26	ECU	Ecuador	60	MEX	Mexico	94	TWN	Taiwan
27	EGY	Egypt, Arab Rep.	61	MLT	Malta	95	URY	Uruguay
28	ESP	Spain	62	MMR	Myanmar	96	USA	United States
29	FIN	Finland	63	MNG	Mongolia	97	VEN	Venezuela, RB
30	FRA	France	64	MYS	Malaysia	98	VGB	British Virgin Islands
31	FRO	Faeroe Islands	65	NIC	Nicaragua	99	WSM	Samoa
32	GBR	United Kingdom	66	NLD	Netherlands	100	YEM	Yemen, Rep.
33	GRC	Greece	67	NOR	Norway			
34	GTM	Guatemala	68	NZL	New Zealand			

Note: The selection of countries was based on availability of governance data. Data were obtained from WITS



Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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