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Tittle:	Rethinking China-Africa trade relations: The impact of a Sino-Africa FTA on trade balance	
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ABSTRACT

Amid COVID-19 and other global uncertainties particularly concerning for the present and future of international trade, this paper looks into Sub-Saharan Africa's trade relations with China, its biggest commercial partner. The chapter, a feasibility study, analyses whether a Free Trade Agreement could have an effective impact in decreasing Sub-Saharan African countries' trade deficit with China, and/or consequently boost other macroeconomic factors. Using the GTAP model, three assumptions are set forth referring to 30%, 50% and 100% reduction cuts in tariff-lines. The simulation results proved to reduce the trade deficit and outlined an improvement in GDP and social welfare gains. For an effective implementation, a phased-out application of the proposed agreement is recommended, along with five other considerations, crucial in laying down the foundation for a resilient and sustainable continent post crisis.

1. Introduction

The contemporaneous economic relationship between China and the African continent is well-known. In 2009 China surpassed the United States and the European Union and became Africa's main trade partner. At its peak in 2014, the total trade value between the two regions reached US$ 220 billion[1]. Nevertheless, as with most commercial partnerships, despite the cheering numbers, there is evident room for improvement. Last year, in 2019, China's total import and export volume with Africa reached US$ 208.7 billion.[2] China's imports fell by 3.8% in the mean period to US$ 95.5 billion, while exports rose 7.9% to US$ 113.2 billion. Africa's trade deficit with China run at US$ 17.7 billion. These figures were disappointing for African economies even though unsurprisingly expected.

Over the past decades, the Sino-African trade flow has been highly moved by China's interests in Africa's primary commodities which is in turn fuelled by Africa's own overdependency on the export of such natural resources. Therefore, while Africa's imports from China are diversified and a combination of its various sectors, from goods to services, Africa's exports to China are largely concentrated in minerals and other raw commodities. As a result, China's principal trade partners in the African continent are resource-rich nations, leading to a Sino-Africa pattern of trade that is geographically uneven. In addition, the current volatility in the commodities' market signifies that not always a raise in volumes of exports, leads to higher profits. Actually, a decline in commodity prices since 2014 has severely impacted the value of African exports to China, whereas the contrary, the value of China's exports to Africa, remains steady. This means that although SAA does not run a sustained trade deficit with China, because much of the trade direction and flow of their components depends on the commodities market, its exports' performance is unstable.

[1] National Bureau of Statistics of China

[2] Ibid

This is particularly concerning because after forty years of rapid growth, for the last decade China seems to be reaching the peak of industrial development. Although this stage was much anticipated by analysts, the effects of a deteriorating external environment, associated by a global slowdown, the US-China trade tensions and now the pandemic, aggravated the Chinese economic slowdown. Given China's importance in SSA's economy, particularly due to its vigorous demand for commodities, unless African economies diversify their export baskets to the Chinese market, any decrease in commodity demand at the moment, is likely to have far-reaching consequences for the region.[3]

Considering these loopholes, suggestions have been made, calling for China and African countries to consider launching sector-specific reciprocal Free Trade Agreements (FTAs) that would reduce tariffs on certain product lines.[4] But, these suggestions have not been without refutations. Those pushing for such deals argue that if China and African countries sign FTAs in sectors where African imports cover mainly industries not yet matured locally or perhaps in sectors where China's demand for African imports is higher, there is a great probability that the existing trade imbalance between the two regions could diminish.[5] On the other hand, those arguing against it, claim that by opening- up completely to Chinese producers, even if in sectors where Africa currently does not have booming industries, African countries may compromise the growth and rise of infant industries, leading them to be inevitable struck-down by the overwhelming presence of Chinese companies in the foresaid sectors.[6]

Be that as it may, fact is that the time to reconsider Sino-African trade relations has never been more appropriate. After all, the unveiling of current global events, with

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[3] Ana Nicolaci da Costa, 'China's economic slowdown: How bad is it?', BBC News, also available at: https://www.bbc.com/news/business-49791721

[4] Fu Jing, 'An FTA between China, African nations will boost global trade', China Daily. http://www.chinadaily.com.cn/a/201809/04/WS5b8dbd97a310add14f3895cd.html

[5] Garth Shelton, 'Trading with the dragon: Prospects for a China-South Africa FTA', South African Journal of International Affairs (2004)

[6] Ibid

particular focus to the emergence of COVID-19 as well as the ongoing US-China trade tension has put African governance, once again, to the test.

At the beginning of 2020, when COVID-19 reached the continent, Africa was on a continued path of economic expansion, with growth projected to rise from 2.9% in 2019 to 3.2% in 2020, and 3.5% in 2021.[7] Yet, as it stands today, more than halfway through 2020, the impact of this 'invisible virus' is expected to shrink global economy by an estimate of 5.2% this year alone. Emerging market and developing economies (EMDEs) are expected to shrink by 2.5% (World Bank, Global Economic Prospects). In Africa, the prolonged lack of investment in critical health systems and decades of economic growth unevenly distributed, make our chances to fight the economic impact of the virus, much harder. And, even if it may still be a little too early to measure the full impact of the pandemic in the African continent, the initial measures of containment, which included a confinement that put a halt on most economic activities, is expected to cause an economic and humanitarian fallout.

In addition, the ongoing US-China trade tensions could also have significant impact to Sino-Africa trade flows. Even if currently in limbo, on Phase One trade deal between the United States and China, signed in January 2019, China pledged to buy over US$ 50 billion of US energy supplies. To meet this target Beijing would need to renegotiate or outright cancel its standing long-term energy contracts with other suppliers. It is then that African countries like Angola, heavily dependent on oil exports to China, could take quite a hit.

It is therefore, under the umbrella of such episodes, that this paper examines China-Africa trade relations. Using the GTAP model, the chapter forecasts the impact of Sino-African FTAs in addressing trade imbalances between the two regions. Looking particularly into the sectors of manufactured goods and agriculture, this paper analyses whether the proposed FTA could have an effective impact decreasing African countries' trade deficit with China, and/or consequently boost other macroeconomic factors such

[7] World Economic Situation and Prospects 2020, United Nations Department of Economic and Social Affairs, May 13, 2020

as GDP and social welfare gains. In addition, taking into consideration the impact of current global uncertainties on the horizons of trade relations, the chapter provides policy recommendations outlining some of the continent's best chances to maximise opportunities brought forward for an inclusive and sustainable future.

2. Literature Review

One of the biggest triggers holding back trade liberalisation between China and Africa, is certainly the different stages of development undergoing each region. While over the last 40 years China has built its reputation in global trade as a highly industrialised nation, continuously pushing for growth in crucial sectors of product development such as manufacturing, the same cannot be said about Africa. The structure of industrial activity in SSA remains underdeveloped and dominated by the minimal processing of local natural resources and simple consumer goods (Oyejide and Wangwe, 2003). For this reason, fears regarding the implementation of an FTA between these two regions in totally different stages of economic development is indeed justifiable.

In response however, it has been argued before that different stages of development are not constraints for the creation of functional FTAs (U.K Department for International Development, 2015). Research analysing Mexico's experience with NAFTA concluded that FTAs signed between developing and industrialised nations did not support fears of slow economic development in emerging economies (Grace V. Chomo, 2002). One of the reasons could be that under the theory of comparative advantage, when a nation reduces barriers to a trading partner, national resources adjust through specialization towards areas of comparative advantage relative to the trading partner. Thus, in theory, African countries signing bilateral trade liberalisation deals with China, will inevitably specialize in their areas of comparative advantage. For instance, SSA countries Relative Unit Labour Costs (RULC) levels have been declining in comparison to China, as China's wages continue to rise faster than production (Ceglowski, 2015). Low RULC along with a stronger business climate may permit a situation where if a trade deal is

implemented, Africans may specialize their industries in certain manufacturing areas for purposes of attracting Chinese interest into their markets.

Touching base on the effects of FTAs on trade flows and stressing the role of regionalization, there is also extensive literature analysing the matter. Except, the evidence is mixed since most studies assume that the FTA formation (i.e. the choice of partner countries) is exogenous, whereas some papers highlight the potential endogeneity bias in estimating the effects of FTAs on trade volumes (Magee, 2003; Baier and Bergstrand, 2004). An FTA assumes a relative balance in the potential trade between the partner countries (Grossman and Helpman,1995).

Moreover, whilst addressing trade balance, it is also important to note and deflect a common misconception that seems to be getting more momentum in recent times. A trade deficit is not necessarily a sign of weak economy. Some economists argue that judging the effect of an FTA solely based on the impact of trade balances is highly misleading.[8] Usually other macroeconomic factors come into play once analysing if a bilaterateral or regional trade agreement leans in any degree more unfavorably to one side, meanwhile the other, 'gains in proportion to its declension from the exact equilibrium' (Smith, 1776). A recent study which used the Global Trade Analysis Project (GTAP) model on 57 tradable commodities and nine regions of the world to understand the likely impact of a possible BRICs FTA, is relevant in emphasizing the importance of FTAs for partner countries beyond balance of trade (Sharma and Kallummal, 2012). Non-BRICs members experienced an increase in GDP and all the components of the GDP from the base run. In terms of absolute value, a highest welfare gain was attained by most BRICs members, in comparison to Non-BRICs members that instead registered net welfare loss. But, all the BRICs members except Russia showed negative trade balance vis-à-vis Non-BRICs members. In sum, the impact of the proposed FTA, considering all macroeconomic factors would be positive for all members, despite the trade deficit.

[8] William D. Lastrapes: Why trade deficits aren't so bad, The Conversation. https://theconversation.com/why-trade-deficits-arent-so-bad-104358

Notwithstanding the aforementioned, even if agreed that in general terms trade deficits are not indicators of a weak economy, the African context is different. Due to the continent's participation in international trade by exporting its natural resources in raw form, and re-importing them after transformed into intermediary or finished products, SSA runs an aggregate trade deficit with the rest of the world that goes hand in hand with a deterioration in the current account.

3. Trade between China and Africa

3.1 An overview of the current Sino-African trade pattern

China has been Africa's largest trading partner since 2009. Promoting the high-quality development of Sino-African trade is not only an important way to enhance Africa's position in the global value chain, but also to promote its sustainable economic and social development. In 2018, the bilateral trade volume between China and SSA presented an obvious upward trend while the trade structure remained stable. Total exports to China reached US$ 90.56 billion, with a year on year (yoy) growth rate of 25.91%. Import volume from China reached US$ 76.38 billion, with a yoy growth rate of 8.3%. Graph 1 shows the bilateral trade pattern between China and SSA for the period between 2001-2018.

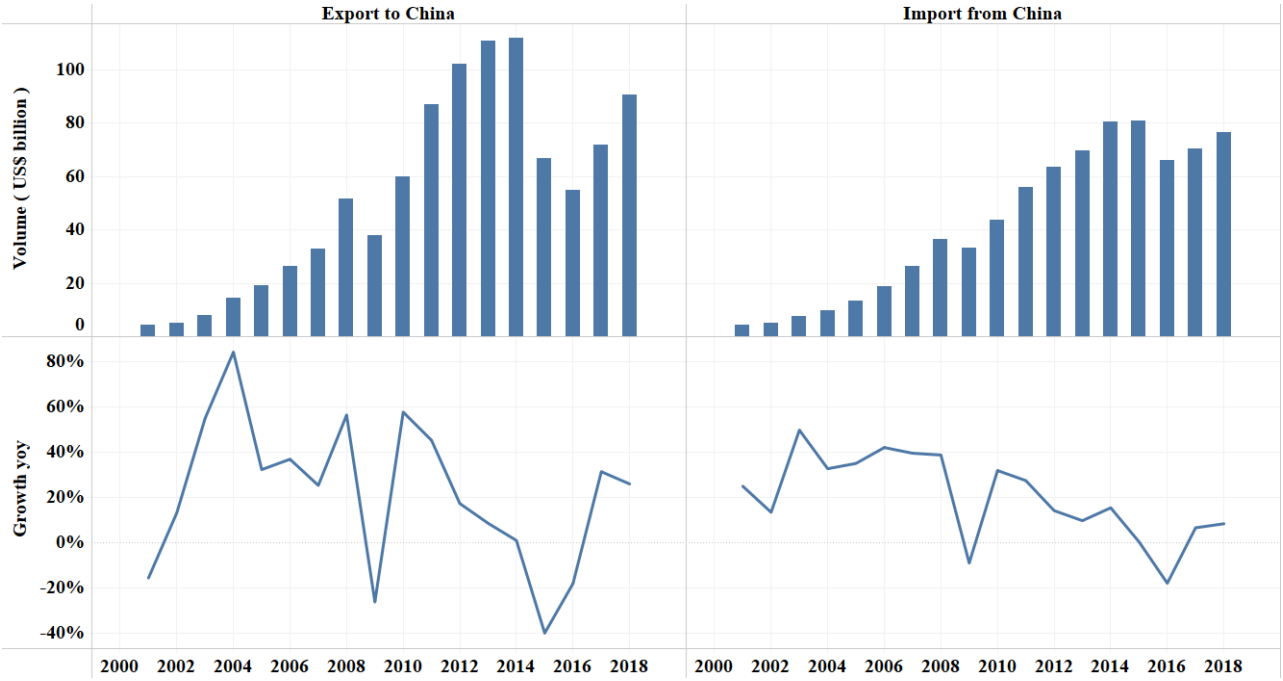

Figure 1. Bilateral Trade between China and Sub-Saharan Africa (US$ billion)

Source: National Bureau of Statistics of China

An overview of Sino-African trade relations cannot ignore its ignition in the early 2000's. After China joined the WTO in 2001, the dynamics of WTO membership opened up China's market to become more international inclusive. As result, trade with SSA has been revamped and characterized by differential systematic compositions between its imports and exports (Ceglowski, 2015).

Table 1 illustrates the composition of the SSA bilateral exports per factor intensity for the years 2001, 2008 and 2018 using the classification of Lall (2000). It reveals that SSA's bilateral exports to China from the moment that China joined the WTO and opened-up its economy, consist mainly of primary products. On the flipped side, SSA's imports from China consist largely of low and medium technology manufactures, with the share of low technology manufactures gradually decreasing and the share of medium technology manufactures gently increasing. Figure 2 depicts the share of SSA's bilateral exports and imports from China in its total trade volume, which have been growing from 2001, around 5%, to 2018, around 15%. Figure 2 also shows that Africa's reliance on China as a trade partner is growing, both as an export destination and as source of imports. In contrast, since the financial crisis, the portion of Africa's exports to the United States suffered a substantial fall, from around 27% at its peak in 2006 to around 5% in 2018. Similarly, the share of US imports in the African market – since the beginning of the decade has been relatively low–, declined even further from around 8% in 2008 to approximately 5% in 2018.

Onset figure 2 reveals that the 2008 global financial crisis proved to be an important turning point to both US-Africa and China-Africa trade relations. Although the overall impact of the crisis reduced global demand, lowering Africa's export volumes and depressing commodity prices, China, had adopted a variety of domestic containment measures which were able to limit the impact of the crisis at home (Fan Gang 2003, Xu Guangyao 2007). Due to these measures, China continued its ambitious reform plan

which triggered a spike in industrialization and an overwhelming need for commodities, which Africa had plenty. Hence Africa's exports as from the year of 2008 gained a momentum in the Chinese market in comparison to the US market (figure 2).

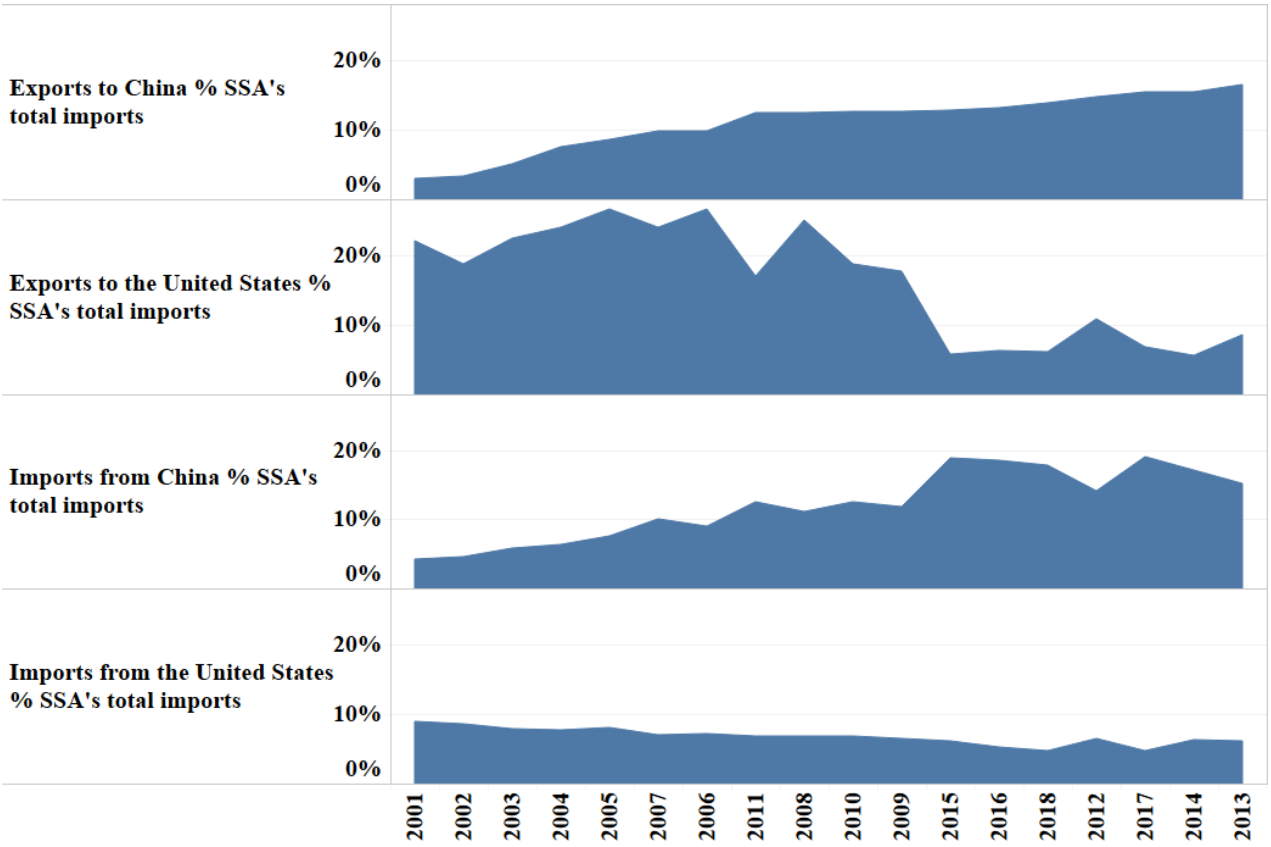

Figure 2. Share of Trade with China and the United States in SSA's Total Trade

Source: National Bureau of Statistics of China, UNCTAD.

Figure 3 depicts the volume of trade as per specific countries' distribution, evidencing that for some African economies such as Angola, South Sudan, Eritrea and Gambia, China makes up to around 90% of their exports market. Figure 3 also points out that some of China's main trade partners in the continent, are indeed resource-rich countries. Overall, as many observers argue, the type of goods traded between the two regions, i.e. raw materials vs. manufactured consumer products and capital equipment, are certainly determinant factors in the existing pattern of China's trade with African countries (Table 1).

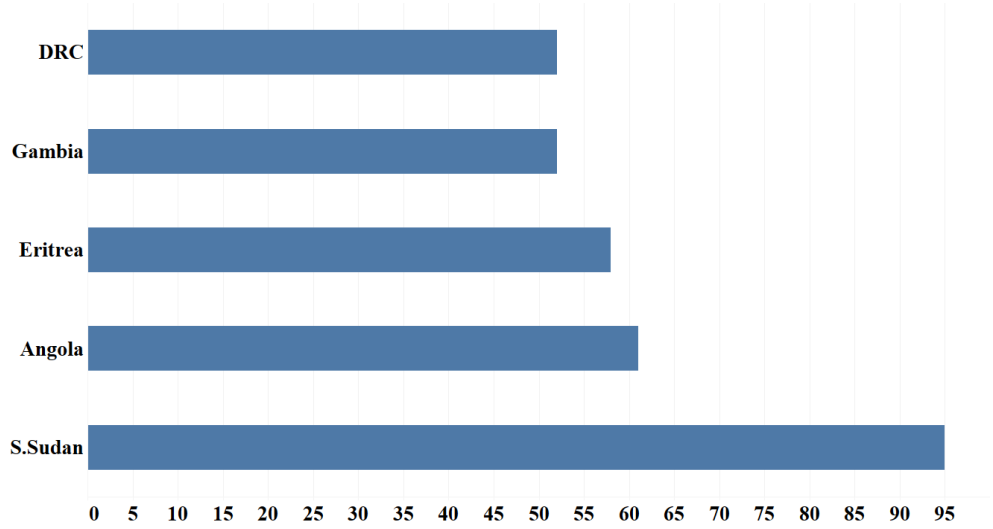

Figure 3 Africa's resource rich countries% 2017 exports to China

Source: UN Comtrade data

Table 1 Sub-Saharan Bilateral Trade with China by Sector

Sector	Exports % of total exports with China			Imports % of total imports with China		
	2001	2008	2018	2001	2008	2018
Primary products	65.47	80.96	70.57	6.10	3.00	2.95
Resource-based manufactures	26.95	16.39	25.77	11.05	10.34	10.70
Low technology manufactures	2.30	0.71	0.79	37.58	28.81	26.08
Medium technology manufactures	4.89	1.59	2.51	28.97	34.45	38.23
High technology manufactures	0.19	0.23	0.26	15.37	22.91	21.30

Source: National Bureau of Statistics of China

3.2 The impact of the global pandemic

The first semester of 2020 posed a different type of challenge to Sino-African trade relations. Due to the threat posed by the global health crisis, measures taken by countries around the world to contend the COVID-19 pandemic triggered the suspension of most activity, which almost immediately impacted the world's

commodity markets – the crude market being among the most affected. Undermined energy demand worldwide, but specially in China, currently the number one importer of crude in the world, signifies a decline in demand. This severely impacted African countries (Angola, South Sudan, Congo) that have China as their primary crude export market.

Likewise, the shutdown of economic activities should lead to a sharp decline in productivity, jobs and revenue, and, with less buying power, African countries will inevitably import less from China. Figure 4 illustrates how the trade pattern between China and SAA reacted to the pandemic during the first half of 2020.

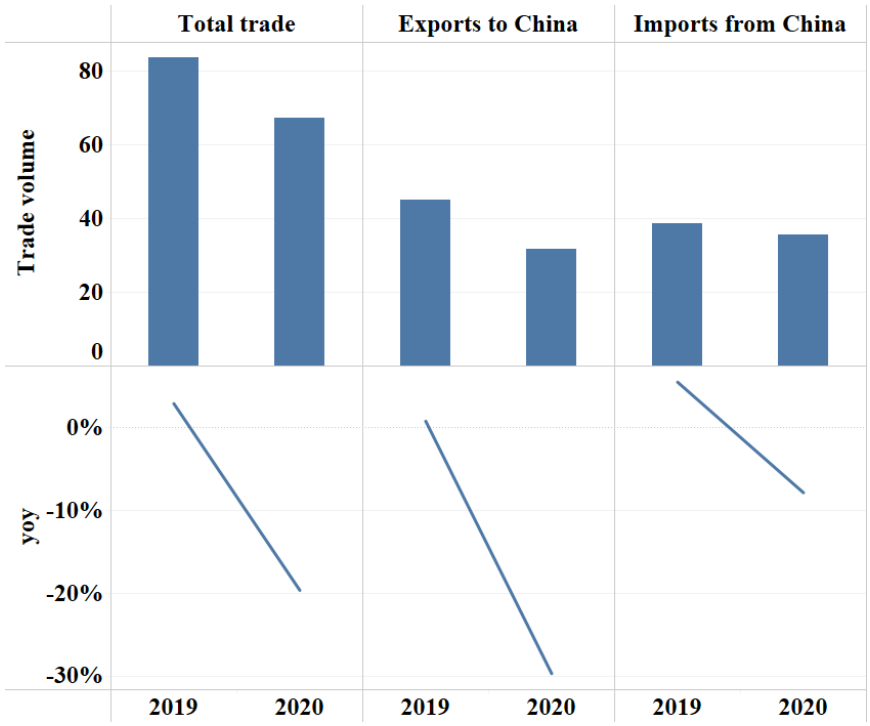

Figure 4 Trade between China and SSA from January to June 2020 (US$ billion)

Source: National Bureau of Statistics of China

3.3 A proposed Free Trade Agreement between China and Africa

Focusing on the specific African countries pertinent for this research analysis, in order to understand how FTAs may influence their economies we first need to understand the manner in which these economies operate from a bigger African spectrum, that is, their division through economic and trade blocks.

The African Union (AU), as an economic bloc, corresponds to 54 member States and recognizes eight regional economic communities (RECs) and five subgroups which consists primarily of trade blocs (AU, 2015b; UNCTAD, 2015b). All the eight communities form the pillars of the African Economic Community (AEC), which are divided as follows: Economic Community of West African States (ECOWAS), Economic Community of Central African States (ECCAS), Arab Maghreb Union (UMA), Southern African Development Community (SADC), Common Market for Eastern and Southern Africa (COMESA), Intergovernmental Authority on Development (IGAD), Community of Sahel-Saharan States (CEN-SAD) and East African Community (EAC).

For purposes of studying the effect of Sino-African FTAs, from this point onwards the chapter shall focus on two economic blocs, namely: SADC,[9] and EAC.[10] In 2018, SADC corresponded to 26.5 percent of Africa's population, about 344, 102,897 million people, from which 56.9 percent living in urban areas. Its GDP corresponds to US$ 725,694 billion or US$ 2,109 per capita.[11] In 2017, the EAC corresponded to 13.7 percent of Africa's population, about 172 million people, from which 21.7 percent living in urban areas. Its GDP corresponds to US$ 172.7 billion or US$ 662.1 per capita[12]. For purposes of this chapter, going forward the objective is to scrutinize the current trade relationship of these regions with China and use GTAP to predict the impact of a reciprocal agreement reducing tariff lines on two specific sectors: agriculture and manufacturing. Both regions were chosen, taking into consideration, as per statistics, the fact that both these two regions have strong commercial bonds with China. Table 2 and 3 allude to this representation. It demonstrates, the volume of

[9] The Southern African Development Community (SADC) is a regional economic community of fifteen southern African states: Angola, Botswana, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.

[10] The East African Community is a regional economic community of five member states: Burundi, Kenya, Rwanda, Tanzania and Uganda.

[11] African Development Bank, 2018

[12] EAC, AU, 2017

exports of each member of SADC and EAC with China, as well as the trade balance for the same time-period. Henceforth, due to the version of GTAP, Africa in this paper refers to SADC, EAC and part of Eastern Africa (Comoros, Djibouti, Eritrea, Mayotte, Seychelles, Somalia, Sudan.).[13]

Table 2. China's exports to and trade balance with SADC Members (US$ million)

Country	2001		2008		2018	
	Exports	Balance	Exports	Balance	Exports	Balance
Angola	45.72	-676.11	2942.47	-19440.05	2253.14	-23573.37
Botswana	14.23	-	169.15	-14.76	281.6	267.37
Madagascar	72.86	64.02	602.59	537.42	1010.08	810.02
Malawi	4.49	4.09	81.05	72.94	221.6	194.24
Mauritius	87.18	78.23	320.09	314.38	804.18	766.74
Mozambique	22.04	10.85	295.99	170.11	1861.78	1228.25
Namibia	21.22	9.96	243.17	-39.01	323.71	-179.21
Seychelles	1.12	1.07	14.13	10.45	61.33	61.3
South Africa	1049.12	-123.99	8617.62	-617.35	16248.38	-11039.11
Tanzania	90.15	86.86	950.44	818.85	3583.14	3191.88
Congo, Dem.Rep	13.13	5.44	234.58	-1349.28	1773.25	-3882.29
Zambia	38.84	3.16	264.35	-258.15	969.49	-3113.36
Zimbabwe	33.27	-81.62	133.1	-15.11	445.68	-443.95
Lesotho	16.76	15.63	79.64	77.94	64.14	34.05
Swaziland	2.99	-4.02	20.6	9.32	36.4	8.94

Source: National Bureau of Statistics of China

Table 3. China's exports to and trade balance with EAC members (US$ million)

Country	2001		2008		2018	
	Exports	Balance	Exports	Balance	Exports	Balance
Burundi	1.16	-	17.68	17.56	37.32	25.39
Kenya	138.93	133.05	1249.33	1214.61	5197.2	5023.44
Rwanda	2.89	-3.48	59.37	29.79	165.59	126.26
Tanzania	90.15	86.86	950.44	818.85	3583.14	3191.88
Uganda	16.24	15	230.1	213.04	706.4	660.18

[13] This third grouping is a result of the version of GTAP and its representation of the African map due to the software.

Source: National Bureau of Statistics of China

Table 4. China's exports to and trade balance with rest of eastern Africa (US$ million)

Country	2001		2008		2018	
	Exports	Balance	Exports	Balance	Exports	Balance
Comoros	0.46	0.42	25.44	25.43	79.2	79.17
Dijibouti	47.32	47	252.27	252.09	1863.78	1863.58
Eritrea	2.84	2.83	28.98	28.11	42.85	-268.01
Somalia	1.12	0.6	40.34	34.54	635.45	618.9
Sudan	219.89	-718.24	1874.33	-7667.22	1880.4	1215.23

Source: National Bureau of Statistics of China

4. GTAP model empirical simulation and results analysis

4.1 Model Assumptions

Trade agreements such as Free Trade Agreements or Preferential Free Trade Agreements, like the Sino-Africa Free Trade Agreement, require a methodology which can account for changes in tariffs across a broad spectrum of products, for both imports and exports. Changes in product prices or output in any product can have impact on employment, wages and output in other industries, government revenue and expenditures, underscoring the importance of capturing significant linkages between products and markets. For this reason, the GTAP model is the most suitable for this structure. GTAP is a general equilibrium model designed according to the neoclassical economic theory, which has been widely used in trade policy analysis. This paper uses GTAP 9th Edition database released in 2015, which is updated on the basis of GTAP 8th Edition database, covering 140 countries and 57 sectors. In order to fully investigate the economic effects of a Sino-Africa FTA, we divide the world into eighteen parts: China, South Central Africa[14], Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, rest of Eastern Africa[15], Botswana,

[14] South Central Africa in GTAP 9 refers to Angola and Congo, Dem. Rep.

[15] Rest of Eastern Africa in GTAP 9 refers to Burundi, Comoros, Djibouti, Eritrea, Mayotte, Seychelles, Somalia, Sudan.

Namibia, South Africa, Southern Africa [16], rest of the World. The three assumptions set forth refer to 30%, 50% and 100% reduction of bilateral tariffs between China and Africa. The base year is 2004. In order to clearly show the impact of signing the FTA, we also re-verified the African part as a whole, and use "Africa" at the end of each table to refer to these results.

4.2 Overall Impact on Economies

Table 5, table 6 and table 7 illustrate the changes of main economic indicators of the eighteen economies under the three assumptions respectively. In terms of economic growth, due to the large scale, the increase in China's GDP is relatively small (0.05%, 0.1%, 0.23%), while the effect of the FTA on Africa's side is universally negative. Under the three circumstances, only Zambia remains a positive growth in value of GDP (0.05%, 0.06%, 0.02%). The GDP of Malawi also reflects a small growth with 30% cut (0.02%). When bilateral tariffs are reduced by a 50% cut, the impact of the Sino-Africa FTA on GDP is more significant than in the first assumption. Furthermore, the FTA influence is stronger when China and Africa reduce all tariffs of the industries involved under the third assumption. In terms of the SSA as a whole, the empirical results also show that the signing of FTA will further expand the trade deficit in Africa, but the improvement of social welfare is also worthy of attention.

Table 5 Changes in major economic indicators, 30% cut (US$ million, %)

	Change in value of GDP	Change in trade balance	value of merchandise imports	value of merchandise exports	terms of trade	Social welfare
China	0.05	-302.26	0.10	0.07	0.04	1001.25
South Central Africa	-0.11	-62.65	0.22	0.03	0.00	54.52
Kenya	-0.37	12.24	0.28	0.64	-0.28	-15.50
Madagascar	-0.13	-10.86	0.77	0.48	-0.11	-1.52
Malawi	0.02	-6.61	0.27	-0.02	0.09	3.54
Mauritius	-0.25	6.91	-0.25	-0.21	-0.16	-11.37
Mozambique	-0.12	-3.50	0.22	0.22	0.00	0.10
Rwanda	-0.11	-0.09	0.13	0.14	0.01	1.37
Tanzania	-0.37	-20.42	0.40	0.35	-0.09	-15.96
Uganda	-0.21	-1.64	0.18	0.16	-0.05	-0.85

[16] Southern Africa in GTAP 9 includes Lesotho and Swaziland.

Zambia	0.05	-12.22	0.22	0.06	0.04	11.79
Zimbabwe	-0.27	10.04	0.54	1.53	0.04	-4.23
Rest of Eastern Africa	-0.38	-2.44	0.68	0.74	-0.11	32.20
Botswana	-0.03	-11.63	0.41	0.05	0.02	7.77
Namibia	-0.13	-3.54	061	0.37	-0.04	5.63
South Africa	-0.20	-128.96	0.77	0.71	-0.14	100.81
Southern Africa	-0.11	-2.20	0.33	0.15	-0.03	1.67
Rest of World	-0.01	539.84	-0.01	0.00	0.00	-702.98
Africa	-0.19	-299.58	0.11	0.07	0.04	1019.01

Source: GTAP 9 simulation results.

Upon the conclusion of the proposed Sino-Africa FTA, there is an obvious positive effect on the import and export volumes of both sides. In terms of trade balance changes, due to the great reduction of bilateral tariffs, the import growth on both sides is higher than that of exports. Under the first assumption, there are only slight changes in both imports and exports. Under the second assumption, all parties except Mauritius experience an increase in both imports and exports. Under the third assumption, China's imports increased by 0.44% and exports increased by 0.30%. The most significant change in Africa occurs in South Africa, with import growth of 3.91% and export growth of 3.64%. However, the impact on the import volumes of China and Africa is more significant than that on exports, so it has a negative impact on trade balance. Only Kenya, Mauritius and Zimbabwe have trade surplus growth under the three experiments.

Table 6 Changes in major economic indicators, '50% cut' (US$ million, %)

	Change in value of GDP	Change in trade balance	value of merchandise imports	value of merchandise exports	terms of trade	Social welfare
China	0.10	-544.06	0.18	0.13	0.08	1783.59
South Central Africa	-0.20	-111.24	0.39	0.07	0.00	86.60
Kenya	-0.77	30.56	0.54	1.32	-0.55	-50.21
Madagascar	-0.24	-18.98	1.38	0.87	-0.19	-4.04
Malawi	-0.02	-10.13	0.47	0.04	0.14	4.97
Mauritius	-0.42	11.27	-0.40	-0.34	-0.27	-18.93
Mozambique	-0.24	-6.39	0.41	0.41	0.00	-2.00
Rwanda	-0.22	-0.22	0.25	0.27	0.02	1.95
Tanzania	-0.71	-36.67	0.74	0.67	-0.18	-37.37

Uganda	-0.41	-3.11	0.37	0.33	-0.09	-4.49
Zambia	0.06	-22.52	0.42	012	0.08	18.49
Zimbabwe	-0.70	23.21	1.00	3.01	-0.01	-19.48
Rest of Eastern Africa	-0.78	-5.79	1.30	1.42	-0.22	21.08
Botswana	-0.06	-20.62	0.75	0.11	0.04	11.65
Namibia	-0.25	-6.61	1.10	0.66	-0.07	8.25
South Africa	-0.40	-232.81	1.45	1.33	-0.26	75.70
Southern Africa	-0.21	-3.96	0.62	0.29	-0.05	2.10
Rest of World	-0.01	958.08	-0.01	-0.01	-0.01	-1215.96
Africa	-0.38	-532.21	1.12	0.9	-0.17	211.27

Source: GTAP 9 simulation results.

In terms of social welfare, under the three assumptions, the proposed FTA between China and Africa promotes the growth of welfare for most of the parties. Due to its large economic scale, China's social welfare is significantly improved by US$ 1001.25 million, US$ 1783.59 million and US$ 4189.31 million, in each experiment, respectively. However, changes on social welfare for African members are not very optimistic. Only half of the African countries are able to materialize social welfare growth under the three assumptions. The largest increase of social welfare occurs in south central Africa (Angola and Congo, Dem. Rep), with social welfare increasing of US$ 54.52 million, US$ 86.6 million and US$ 142.89 million under the three experiments. As for the terms of trade, while China's changes for terms of trade are positive in all three experiments, the terms of trade for most African countries have declined after the conclusion of the FTA. As far as the SSA as a whole is concerned, the trade surplus drops sharply in this case and the social welfare deteriorates at the same time.

Table 7 Changes in major economic indicators, 100% cut (US$ million, %)

	Change in value of GDP	Change in trade balance	value of merchandise imports	value of merchandise exports	terms of trade	Social welfare
China	0.23	-1344.19	0.44	0.30	0.18	4189.31
South Central Africa	-0.53	-261.54	0.97	0.18	0.00	142.89
Kenya	-2.45	120.26	1.57	4.17	-1.56	-252.40
Madagascar	-0.62	-43.29	3.37	2.24	-0.42	-16.93

Malawi	-0.49	-12.24	1.09	0.68	0.17	1.89
Mauritius	-0.81	19.91	-0.69	-0.56	-0.50	-36.25
Mozambique	-0.71	-15.97	1.06	1.04	-0.02	-17.95
Rwanda	-0.65	-0.89	0.75	0.77	0.05	1.36
Tanzania	-1.93	-88.44	1.95	1.88	-0.49	-136.97
Uganda	-1.22	-8.77	1.16	1.09	-0.28	-30.45
Zambia	0.02	-58.15	1.22	0.41	0.17	27.28
Zimbabwe	-3.51	99.92	2.79	9.59	-0.64	-155.00
Rest of Eastern Africa	-2.47	-24.06	3.68	3.95	-0.63	-190.91
Botswana	-0.21	-47.27	1.87	0.34	0.09	16.96
Namibia	-0.68	-17.52	2.70	1.60	-0.18	9.06
South Africa	-1.20	-586.75	3.91	364	-0.67	-496.18
Southern Africa	-0.61	-9.79	1.72	0.83	-0.13	-0.34
Rest of World	-0.02	2278.80	-0.03	-0.02	-0.01	-2640.76
Africa	-1.11	-1323.8	2.97	2.41	-0.43	-642.77

Source: GTAP 9 simulation results.

From the perspective of an Optimal Situation, for China, Africa and the rest of the world, the level of tariff reduction applicable to the Optimal case is also different.

Table 8 Optimal situation for major economic indicators

	Change in value of GDP	Change in trade balance	value of merchandise imports	value of merchandise exports	terms of trade	Social welfare
China	0.23	-302.26	0.10	0.30	0.18	4189.31
	100% cut	30% cut	30% cut	100% cut	100% cut	100% cut
Rest of world	-0.01	2278.80	-0.01	0.00	0.00	-702.98
	30/50% cut	100% cut	30/50% cut	30% cut	30% cut	30% cut
Africa	-0.19	-299.58	2.97	2.41	0.04	1019.01
	30% cut	30% cut	100% cut	100% cut	30% cut	30% cut

4.3 Impact on Industrial Sectors

Table 9, table 10 and table 11 illustrate the changes of output in different industrial sectors under the respective three assumptions.

For China, among all the sectors, growth in the textile and clothing industry remain the most significant, with an increase in output worth US$ 1298.38, 2318.88 and 5406 million, under the three assumptions. The output volume changes for industries involved in the FTA under the first assumption, namely, grains and crops, livestock and meat products, processed food, textiles and clothing, light manufacturing and heavy

manufacturing, are US$ -56.56, -42.03, -55.44, 1298.38, 956.75 and -2082.50 million, revealing China's huge competitiveness in light manufacturing. The above trend has been further strengthened with the further decline of bilateral tariffs.

Meanwhile for Africa, the output edges up in agricultural sectors. Only four members are experiencing a decline in output for grains and crops. As for heavy industry, most members participating in the FTA have decreases in output, with only five African members having slightly increased under the first assumption. The competitiveness of African countries varies in different industries which means that not all African countries benefit from the FTA. Kenya, Zimbabwe, rest of Eastern Africa customs[17] and South Africa run top in growth of grains and crops under all assumptions. Most of African countries gain positive growth in food processing industry, among which South Africa ranks first with output growth of US$ 63.54 million, US$ 330.09 million and US$ 1067.06 million under the three assumptions. South Africa also rates number one in livestock and meat products, followed by rest of Eastern Africa. African countries' output in the light industry has declined to varying degrees. The output of six countries in the field of heavy industry has increased, but only notable in South Africa, which has increased by US$ 499.75, 966.56, 2689.197 million, in the three experiments respectively. As for heavy manufacturing, remarkable increase occurs in South Africa and Namibia under the three assumptions. When bilateral tariff concessions rise to 100%, heavy manufacturing output growth in Zimbabwe, Tanzania and Mozambique are also worth noting. Under the three assumptions, Botswana has positive gains in both textiles, clothing and light manufacturing. From the perspective of SSA as a whole, the output of agriculture and heavy industry in Africa increased to varying degrees except for light industry, which become more obvious with the further decline of tariff levels.

Table 9 Changes in output by sector, 30% cut (US$ million)

	Grains and Crops	Livestock and Meat Products	Processed Food	Textiles and Clothing	Light Manufacturing	Heavy Manufacturing
China	-56.56	-42.03	-55.44	1298.38	956.75	-2082.50

[17] Rest of Eastern Africa refers to Burundi, Comoros, Djibouti, Eritrea, Mayotte, Seychelles, Somalia, Sudan.

South Central Africa	-1.37	3.44	1.86	-20.57	-57.75	-47.59
Kenya	30.05	0.13	2.73	-57.07	-49.61	-19.82
Madagascar	-0.48	-0.31	-0.81	7.97	-7.53	-4.08
Malawi	1.19	0.93	0.86	-2.97	-4.65	-1.33
Mauritius	2.14	0.61	6.22	-34.63	0.09	3.94
Mozambique	2.08	-0.28	-0.47	-3.51	-10.20	5.60
Rwanda	0.69	-0.04	0.12	-1.84	-1.08	-1.06
Tanzania	5.08	-1.15	-0.02	-18.78	-13.94	9.53
Uganda	3.48	0.42	1.44	-9.68	-10.61	-2.96
Zambia	5.26	-0.06	-1.14	-2.74	-16.27	-5.83
Zimbabwe	26.11	-1.09	0.33	-27.69	-15.13	4.60
Rest of Eastern Africa	29.30	23.73	21.83	-40.03	-99.23	-82.49
Botswana	-0.01	-0.14	0.50	3.34	1.31	-5.94
Namibia	-0.05	1.04	0.04	-17.18	-8.35	22.15
South Africa	22.22	167.42	63.54	-795.03	-137.91	499.75
Southern Africa	0.11	0.06	0.34	-2.52	-0.77	-1.62
Rest of World	-36.25	-93.38	-38.00	-91.63	-580.00	1624.00
Africa	140.64	178.61	104.77	-1104.4	-562.75	414.84

Source: GTAP 9 simulation results.

Table 10 Changes in output by sector, 50% cut (US$ million)

	Grains and Crops	Livestock and Meat Products	Processed Food	Textiles and Clothing	Light Manufacturing	Heavy Manufacturing
China	-99.00	-85.59	-101.63	2318.88	1793.75	-3788.00
South Central Africa	-2.67	6.01	2.66	-36.43	-100.77	-82.44
Kenya	54.77	-0.68	2.30	-97.51	-87.07	-29.86
Madagascar	-1.00	-0.77	-1.76	15.10	-13.23	-6.62
Malawi	2.83	1.43	1.31	-5.33	-8.35	-1.91
Mauritius	3.50	1.03	10.25	-56.29	-0.13	6.11
Mozambique	3.46	-0.54	-0.99	-6.23	-17.96	10.97
Rwanda	1.18	-0.09	0.17	-3.33	-1.92	-1.80
Tanzania	8.75	-2.58	-0.64	-32.08	-24.51	18.44
Uganda	6.44	0.75	2.37	-17.09	-19.27	-4.52
Zambia	8.61	-0.23	-2.40	-5.18	-29.30	-6.87
Zimbabwe	46.75	-1.86	1.51	-52.48	-27.82	13.53
Rest of Eastern Africa	54.11	43.07	40.61	-71.23	-179.30	-136.34
Botswana	-0.03	-0.39	0.74	6.74	2.56	-10.26
Namibia	-0.08	1.89	-0.09	-30.28	-14.36	39.61

South Africa	40.42	330.09	114.75	-1435.74	-241.41	966.56
Southern Africa	0.16	0.08	0.53	-4.21	-1.38	-2.65
Rest of World	-79.25	-185.63	-77.00	-62.25	-1061.00	2906.00
Africa	248.68	344.52	182.73	-1973.31	-1004.02	841.02

Source: GTAP 9 simulation results.

Table 11 Changes in output by sector, 100% cut (US$ million)

	Grains and Crops	Livestock and Meat Products	Processed Food	Textiles and Clothing	Light Manufacturing	Heavy Manufacturing
China	-226.81	-298.56	-257.81	5406.00	4848.50	-9322.50
South Central Africa	-7.68	13.51	2.33	-84.84	-226.21	-180.99
Kenya	134.44	-7.01	-10.52	-195.01	-198.93	-40.50
Madagascar	-3.36	-2.98	-6.09	42.20	-30.21	-11.63
Malawi	11.83	1.68	1.42	-12.80	-20.28	-1.30
Mauritius	6.27	2.05	18.99	-98.49	-2.21	8.52
Mozambique	6.75	-1.46	-3.44	-14.40	-41.17	32.20
Rwanda	2.48	-0.28	0.08	-8.08	-4.54	-3.69
Tanzania	18.74	-9.03	-5.23	-66.00	-55.83	50.70
Uganda	16.65	1.77	4.31	-38.52	-47.76	-5.81
Zambia	15.64	-1.32	-8.29	-14.21	-71.41	6.66
Zimbabwe	116.52	-4.25	10.37	-145.78	-75.18	78.06
Rest of Eastern Africa	139.99	107.68	106.60	-160.71	-439.77	-255.71
Botswana	-0.18	-1.77	0.64	21.90	6.80	-22.83
Namibia	-0.20	4.77	-1.57	-68.45	-31.26	94.01
South Africa	94.43	1067.06	285.52	-3431.13	-590.34	2689.19
Southern Africa	0.15	0.03	0.68	-7.87	-3.41	-4.81
Rest of World	-280.25	-591.50	-243.00	466.75	-2625.00	6938.00
Africa	567.27	1053.96	404.00	-4581.54	-2428.29	2529.06

Source: GTAP 9 simulation results.

Table 12 shows changes on imports for the different sectors. Imports from all sectors included in the FTA are growing positively for China. The most significant change for China's imports occurs in livestock and meat products, with growth rate of 0.61%, 1.21% and 3.96% under the three assumptions, reflecting the complementary advantages of China and Africa in the field of Agriculture. The growth of textiles and clothing is closely followed, with growth rate of 0.31%, 0.57% and 1.39%. Meanwhile for Africa, the biggest change appears in textiles and clothing. All African members participating

in the FTA except Mauritius import more under the three assumptions. South Africa ranks top on the import of textiles and clothing, with growth rate of 12.42%, 23.85% and 66.06% under the three assumptions, followed by Namibia, with growth rate of 9.64%, 17.84% and 45.37% under the three assumptions. For the whole SSA, manufacturing imports increased to varying degrees, while agricultural imports decreased slightly.

Table 12 Changes in imports by sector (%)

	Grains and Crops			**Livestock and Meat Products**			**Processed Food**			**Textiles and Clothing**			**Light Manufacturing**			**Heavy Manufacturing**		
Cut	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**	**30%**	**50%**	**100**	**30%**	**50%**	**100 %**
China	0.21	0.37	0.86	0.61	1.21	3.96	0.11	0.19	0.46	0.31	0.57	1.39	0.17	0.31	0.73	0.11	0.20	0.48
South Central Africa	-0.06	-0.12	-0.31	-0.20	-0.36	-0.92	0.02	0.02	0.02	4.04	7.29	17.75	0.38	0.70	1.81	0.48	0.87	2.15
Kenya	-0.23	-0.47	-1.23	-0.61	-1.23	-3.61	-0.29	-0.62	-2.02	5.80	10.89	28.33	0.56	1.16	3.84	-0.03	-0.05	-0.14
Madagascar	0.01	-0.01	-0.16	0.01	-0.02	-0.22	0.04	0.06	0.10	1.89	3.39	8.17	2.46	4.49	11.34	0.54	0.96	2.31
Malawi	-0.03	-0.12	-0.78	0.41	0.60	0.57	0.19	0.25	0.06	2.19	4.30	13.18	1.07	1.98	5.28	0.04	0.05	-0.09
Mauritius	-0.43	-0.70	-1.24	-0.41	-0.67	-1.22	-0.18	-0.31	-0.59	-1.71	-2.78	-4.86	0.06	0.13	0.48	-0.14	-0.23	-0.39
Mozambique	0.03	0.03	-0.05	0.02	-0.01	-0.29	-0.02	-0.06	-0.26	1.45	2.75	7.51	0.69	1.29	3.36	0.14	0.25	0.64
Rwanda	-0.13	-0.25	-0.76	-0.15	-0.29	-0.77	-0.05	-0.10	-0.28	3.41	6.52	18.03	0.30	0.61	1.98	0.03	0.06	0.18
Tanzania	-0.14	-0.32	-1.08	0.29	0.50	1.11	-0.06	-0.14	-0.51	3.86	7.06	17.10	0.67	1.34	4.01	0.23	0.42	1.13
Uganda	-0.13	-0.27	-0.88	0.15	0.26	0.60	-0.06	-0.11	-0.34	4.44	8.54	23.52	0.73	1.52	5.17	-0.05	-0.01	-0.30
Zambia	0.25	0.43	0.86	0.54	0.96	2.34	0.34	0.61	1.42	1.83	3.55	10.65	1.00	1.90	5.27	0.15	0.28	0.78
Zimbabwe	-0.08	-0.33	-2.28	0.33	0.26	-2.03	-0.12	-0.44	-2.89	9.70	19.86	54.06	0.85	1.80	7.26	0.33	0.56	1.00
Rest of Eastern Africa	-0.24	-0.50	-1.60	-0.75	-1.51	-4.65	-0.24	-0.51	-1.70	1.93	4.07	12.76	1.85	3.66	11.18	1.08	2.02	5.44
Botswana	0.15	0.25	0.55	0.33	0.57	1.28	0.06	0.12	0.37	1.48	3.76	14.07	1.27	2.20	4.82	0.26	0.44	0.98
Namibia	-0.23	-0.42	-1.02	-0.26	-0.47	-1.12	0.82	1.53	4.08	9.64	17.84	45.37	1.12	1.97	4.53	0.17	0.30	0.67
South Africa	0.20	0.37	1.12	-0.11	-0.21	-0.43	0.01	-0.01	-0.21	12.42	23.85	66.06	1.19	2.28	6.56	0.18	0.27	0.41
Southern Africa	-0.27	-0.47	-0.97	-0.03	-0.07	-0.27	0.06	0.12	0.32	2.63	5.09	14.33	0.25	0.46	1.24	0.09	0.16	0.31
Rest of World	-0.01	-0.01	-0.03	-0.01	-0.01	-0.03	-0.01	-0.01	-0.03	-0.02	-0.04	-0.07	-0.01	-0.02	-0.05	-0.01	-0.01	-0.03
Africa	-0.02	-0.05	-0.12	-.03	-0.58	-1.5	-0.06	-0.13	-0.45	7.95	15.24	41.91	1.15	2.19	6.14	0.34	0.58	1.24

Source: GTAP 9 simulation results.

Table 13 illustrates the changes in exports by sectors. After signing the FTA, the biggest drop for China occurs in the sector of livestock and meat products, with an export decline of 0.26%, 0.46% and 1.08% under the three assumptions. The biggest growth occurs in textiles and clothing, with growth rate of 0.36%, 0.64% and 1.5% under the three assumptions. In the meantime, all the sectors included in the FTA show positive growth for Madagascar and rest of Eastern Africa. Only Botswana has a decrease in exports of grains and crops, which reveals its lack of competitiveness in the sector. Exports in livestock and meat products increased for most African members especially when bilateral tariffs are reduced to zero.

Table 13 Changes in exports by sector (%)

	Grains and Crops			**Livestock and Meat Products**			**Processed Food**			**Textiles and Clothing**			**Light Manufacturing**			**Heavy Manufacturing**		
Cut	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**	**30%**	**50%**	**100 %**
China	0.06	0.12	0.41	-0.26	-0.46	-1.08	-0.01	-0.01	-0.03	0.36	0.64	1.50	0.27	0.50	1.31	-0.03	-0.07	-0.20
South Central Africa	0.40	0.73	1.84	1.52	2.75	6.76	0.07	0.14	0.37	1.13	2.10	5.53	-1.61	-2.80	-6.22	0.66	1.19	2.91
Kenya	0.90	1.78	5.17	1.23	2.50	7.74	0.67	1.34	3.98	4.26	8.26	24.27	-1.50	-2.49	-4.73	-0.20	-0.22	0.23
Madagascar	0.01	0.04	0.17	0.04	0.10	0.31	0.08	0.14	0.33	1.98	3.65	9.50	1.65	2.94	6.92	2.41	4.43	11.53
Malawi	0.22	0.47	1.76	-0.21	-0.14	1.27	-0.26	-0.41	-0.55	-1.53	-2.33	-2.86	-3.09	-5.32	-11.39	-0.18	-0.14	0.90
Mauritius	0.21	0.30	0.23	1.39	2.38	5.01	0.48	0.79	2.46	-3.10	-5.03	-8.81	0.63	1.00	1.67	0.49	0.74	0.90
Mozambique	0.62	1.09	2.52	0.25	0.50	1.53	0.03	0.04	-0.06	-1.23	-1.56	0.66	-0.39	-0.67	-1.45	0.41	0.76	2.02
Rwanda	0.22	0.44	1.33	-0.32	-0.61	-1.56	0.22	0.42	1.17	-2.90	-4.79	-8.58	0.57	1.09	3.05	-0.14	-0.19	-0.07
Tanzania	0.80	1.45	3.52	0.32	0.70	2.28	0.27	0.51	1.31	-2.58	-4.22	-7.38	-0.48	-0.83	-1.74	0.86	1.58	3.99
Uganda	0.35	0.66	1.77	0.38	0.77	2.45	0.29	0.53	1.41	-3.42	-5.32	-7.44	0.86	1.63	4.84	-0.87	-1.49	-3.11
Zambia	1.17	1.97	3.96	-0.71	-1.24	-2.75	-0.27	-0.49	-1.27	-0.23	-0.34	-0.18	-1.14	-2.11	-5.51	0.03	0.08	0.36
Zimbabwe	4.32	7.74	19.06	-0.84	-0.99	1.69	0.31	0.91	5.08	-6.78	-10.21	-11.76	-1.10	-1.37	1.78	0.90	2.08	9.20
Rest of Eastern Africa	3.04	5.56	14.35	1.80	3.56	10.83	1.04	2.02	5.88	8.74	16.92	51.00	4.02	7.69	22.22	2.57	4.93	14.10
Botswana	-0.21	-0.37	-0.92	-0.38	-0.76	-2.45	-0.14	-0.37	-1.90	13.99	26.09	69.77	1.07	1.89	4.33	-0.72	-1.26	-2.89
Namibia	0.15	0.27	0.63	0.29	0.54	1.39	0.17	0.30	0.64	-1.34	-2.15	-3.62	-0.75	-1.28	-2.77	1.09	1.94	4.54
South Africa	0.37	0.66	1.47	14.89	29.54	96.33	0.55	0.97	2.21	1.58	3.64	14.47	0.93	1.74	4.56	0.74	1.39	3.59
Southern Africa	0.16	0.30	0.81	0.37	0.69	1.79	0.09	0.17	0.43	0.97	1.82	4.86	-0.52	-0.90	-1.94	-0.37	-0.61	-1.20
Rest of World	-0.01	-0.02	-0.07	-0.04	-0.08	-0.27	-0.01	-0.02	-0.04	-0.06	-0.10	-0.11	-0.03	-0.06	-0.13	0.01	0.01	0.03
Africa	1.02	1.82	4.32	6.06	11.94	38.13	0.46	0.85	2.14	0.01	0.65	5.86	0.54	1.02	2.75	0.85	1.57	3.98

Source: GTAP 9 simulation results.

Table 14, table 15 and table 16 show the changes in trade balance after signing the FTA. In the first simulation, the bilateral tariffs between China and Africa were reduced by a 30% cut, China's trade balance in grains and crops, livestock and meat products, processed food, textile and clothing, light manufacturing and heavy manufacturing are US$ -111.45, -85.28, -39.88, 797.61, 785.15, -1306.14 million respectively. China's competitive advantage in the manufacturing sector is significantly higher than that in the agricultural and food processing industries. On African members side, only Mauritius denotes a trade surplus in manufacturing industries. In terms of the whole SSA, the increase of trade surplus is mainly concentrated in agriculture and heavy industry, while the increase of trade deficit is mainly in light industry.

In this case, manufacturing in Africa lacks competitive advantage comparing to China's strong production capacity. Nonetheless, considering that Africa reveals strong advantages in agriculture, food processing industries and China possesses great capacity in manufacturing, China and Africa should strengthen cooperation based on their respective advantages.

Table 14 Changes in the trade balance by sector, 30% cut (US$ million)

	Grains and Crops	**Livestock and Meat Products**	**Processed Food**	**Textiles and Clothing**	**Light Manufacturing**	**Heavy Manufacturing**
China	-111.45	-85.28	-39.88	797.61	785.15	-1306.14
South Central Africa	0.40	2.32	-0.5	-19.92	-55.98	-51.89
Kenya	24.82	1.11	7.83	-29.18	-24.96	-0.51
Madagascar	0.01	0.00	0.03	1.48	-8.3	-4.80
Malawi	1.77	-0.01	-0.53	-2.47	-4.61	-0.84
Mauritius	1.12	0.95	4.98	-22.5	1.28	6.11
Mozambique	2.97	0.00	0.24	-3.17	-9.04	2.94
Rwanda	0.35	-0.04	0.16	-1.38	-0.53	-0.27
Tanzania	9.87	0.29	1.78	-26.42	-13.5	-0.57
Uganda	3.05	0.06	1.12	-6.57	-5.37	-1.32
Zambia	5.76	-0.19	-1.74	-2.3	-11.78	-2.68
Zimbabwe	37.57	-0.42	1.64	-19.7	-12.54	-4.96
Rest of Eastern Africa	19.03	14.76	11.87	-16.75	-54.9	-61.26

Botswana	-0.08	-0.22	-0.12	3.40	-0.78	-7.83
Namibia	0.20	0.97	-0.36	-13.65	-8.95	17.18
South Africa	9.67	122.88	21.85	-525.81	-138.63	297.04
Southern Africa	-111.45	-85.28	-39.88	797.61	785.15	-1306.14
Rest of World	-14.07	-59.71	-7.47	-139.23	-476.74	1098.38
Africa	123.22	139.06	51.43	-741.02	-435.54	258.96

Source: GTAP 9 simulation results.

Table 15 Changes in the trade balance by sector, 50% cut (US$ million)

	Grains and Crops	**Livestock and Meat Products**	**Processed Food**	**Textiles and Clothing**	**Light Manufacturing**	**Heavy Manufacturing**
China	-196.73	-165.77	-71.65	1423.43	1465.73	-2393.42
South Central Africa	0.75	4.26	-0.68	-35.92	-100.26	-94.3
Kenya	49.02	2.25	16.08	-53.53	-48.61	1.33
Madagascar	0.11	0.01	0.11	3.08	-15.26	-8.47
Malawi	3.96	-0.02	-0.78	-4.61	-8.41	-0.84
Mauritius	1.81	1.61	8.24	-36.57	1.72	966
Mozambique	5.33	0.02	0.52	-5.92	-16.73	5.61
Rwanda	0.7	-0.07	0.31	-2.62	-1.09	-0.51
Tanzania	18.14	0.67	3.62	-47.02	-26.73	-1.35
Uganda	5.77	0.12	2.1	-12.08	-11.36	-1.92
Zambia	9.69	-0.34	-3.13	-4.42	-22.3	-2.75
Zimbabwe	67.96	-0.44	5.34	-38.56	-25.49	-5.09
Rest of Eastern Africa	36.34	29.29	24.13	-36.06	-109.22	-112.69
Botswana	-0.13	-0.42	-0.28	4.89	-1.12	-13.6
Namibia	0.36	1.78	-0.81	-25.13	-15.58	30.68
South Africa	16.97	243.65	40.39	-1004.04	-270.7	583.43
Southern Africa	0.29	0.08	0.35	-4.01	-1.72	3.49
Rest of World	-36.62	-121.8	-21.57	-178.2	-872.38	1966.59
Africa	221.72	273.54	98.69	-1396.5	-828.09	523.98

Source: GTAP 9 simulation results.

Table 16 Changes in the trade balance by sector, 100% cut (US$ million)

	Grains and Crops	**Livestock and Meat Products**	**Processed Food**	**Textiles and Clothing**	**Light Manufacturing**	**Heavy Manufacturing**
China	-445.74	-518.57	-168.98	3310.68	3915.48	-6024.29

South Central Africa	1.98	10.83	-0.56	-87.44	-240.87	-233.94
Kenya	141.27	6.93	49.27	-126.86	-144.07	14.37
Madagascar	0.63	0.06	0.41	10.70	-39.27	-19.37
Malawi	15.41	0.00	-0.68	-12.57	-21.56	2.67
Mauritius	3.13	3.20	15.46	-64.08	0.60	14.88
Mozambique	12.91	0.19	1.59	-15.56	-43.35	15.85
Rwanda	2.13	-0.17	0.88	-7.13	-3.66	-1.37
Tanzania	45.35	2.32	10.52	-106.48	-78.60	-6.78
Uganda	15.79	0.39	5.66	-30.15	-39.33	-1.64
Zambia	19.44	-0.80	-7.77	-12.98	-6148	7.18
Zimbabwe	173.05	1.44	33.09	-115.69	-95.41	1997
Rest of Eastern Africa	100.22	89.25	76.01	-113.79	-337.57	-291.25
Botswana	-0.30	-1.21	-1.16	7.40	-1.40	-3043
Namibia	0.86	4.53	-3.29	-63.14	-34.90	72.58
South Africa	30.99	791.93	98.79	-2739.49	-845.94	1665.79
Southern Africa	0.67	0.24	0.87	-12.52	-4.30	-6.84
Rest of World	-158.66	-409.00	-102.23	7.53	-2156.32	4707.92
Africa	526.43	864.26	269.02	-3680.73	-2349.81	1568.31

Source: GTAP 9 simulation results.

5. Conclusion

This paper analyses the impact of a proposed Sino-Africa Free Trade Agreement on trade balance and other major macroeconomic factors. The overall simulation results from the GTAP model show that: (1) the full implementation of zero tariff-lines between China and Africa (i) boots China-Africa imports and exports but, variations of the impact in different industrial sectors should be taken into consideration, and; (ii) the reduction of tariff-lines should be phased-out. (2) Following implementation, all the members of the proposed Sino-Africa FTA, would experience an increase in major macroeconomic indicators such as: trade balance, social welfare and GDP. Finally, also worth noting is that on the three assumptions, while China experiences an overall deficit in trade balance against SSA, the Rest of the World (ROW) experiences a surplus. This could potentially mean that SSA's deficit shifts around between China and ROW. Therefore, it is recommended that policymakers focus not only on improving the trade

balance but also on improving production, employment and social welfare. To that end further efforts in the following areas should be considered:

5.1 Enhance industrial complementarity

Strengthening the connectivity of competitive goods and complementary industries, might be the future focus for the trade policy front. According to the current status and GTAP simulation results, China and Africa have strong complementary characteristics in the field of agriculture and manufacturing. Bilateral trade should also be further encouraged by giving full play to the capabilities of advantageous areas. In addition to reducing tariff barriers, the process of trade facilitation should be promoted. Endorsing measures such as, single window for customs clearance, for instance, should further reduce bilateral non-trade barriers. Step by step, the simple bilateral trade relation of goods should upgrade into a comprehensive partnership base incorporating services and investment.

5.2 Outline an FTA implementation strategy

Although the overall GTAP results for the proposed FTA are particularly encouraging for African members for the sectors of agriculture and food processing, the impact is not homogenous; the output varies for different countries across different sectors. For example: most African members experience positive growth in processed food output, whereas SADC members, namely Angola, DRC, Malawi, Zambia, Namibia Lesotho and Swaziland, display a negative change. Likewise, almost all African members denote a trade deficit in manufacturing demonstrating China's strong competitive advantage, whereas Mauritius becomes the only African member with a trade surplus in this very sector. The disparity could be a result of different macroeconomic factors that affect the development criteria of African economies. To maximize the benefits from the proposed FTA, African members, as per their development levels, should opt to phase out the elimination of tariff-lines within a timeline of five to ten years. On sensitive items, i.e. sectors where China holds an overwhelming comparative advantage such as, manufacturing, the Agreement should phase out tariffs for over a period of fifteen years. To determine which rates of duty, apply, members should be advised to establish comprehensive provisions relating to rules of origin. In this context, taking

into account the need to boost Africa's participation on the value chain development, members should also negotiate special tariff-quotas for goods that although non-originating from members' territories, meet specific conditions of aggregated value rendering it eligible for preferential treatment under the FTA.

5.3 Maximise benefits from the Belt and Road Initiative

China's Belt and Road Initiative could be an opportunity for both China and Africa to increase bilateral trade and cooperation of economic development post COVID. Despite negotiating Free Trade Agreements, through the Belt and Road Initiative, trade and economic growth are able to be accelerated through other options, such as: cross-border economic cooperation zone and overseas economic and trade cooperation zone. Furthermore, by joining the Belt and Road free trade area network, African members are given an opportunity to enhance its participation in international trade and promote its economic development to a greater extent.

5.4 Economic and structural reforms focusing on diversification

African governments should identify potential and productive industries and develop a plan to stimulate their growth focusing on revealed and latent comparative advantage. For example: Coffee is a major contributor to the economies of EAC members. However, export of the crop oscillates often due to internal and external forces of supply and demand. A proactive plan should neutralize the negative effects of these forces and instead formulate a strategy around EAC members with a comparative advantage in coffee. This should be replicated across Sub-Saharan Africa. Such national strategies should look at not only existing trade flows, but also nascent opportunities. The goal should be for policy makers to redirect their focus from commodity production and instead upscale their participation for diversification and value chain development.

5.5 Trade promotion strategies amid COVID-19 and other global uncertainties

Before engaging into further trade openness, it is crucial that SSA countries confront the reasons why past trials, accompanied by additional factors such as, stronger growth rates in GDP, and financial flows, have yet to reach their ideal results. The GTAP simulation reveals that out of all members included on the study, with South Africa being the exception, SSA's competitive advantage in agriculture and food processing

is still mild compared to its potential. Furthermore, according to the results, reducing tariffs in manufacturing, i.e. in subsectors such as textile, light manufacturing and heavy manufacturing, would prove to be highly disadvantageous for African members. It is therefore advisable that prior to entering into new trade deals, African governments: (i) examine existing trade agreements/provisions, such as the Chinese Duty Free Quota Free market access program for LDCs and utilize them as a trampoline to advance their comparative advantage on competitive sectors; (ii) boost intra-African trade partnership; and, (iii) up-scale value chain development by allowing regional partners to collaborate on the manufacturing of high-end goods with the ultimate goal of reaching external markets.

References

Baier, S. L. & Bergstrand, J. H. (2004). Trade agreements and trade flows: Estimating the effect of free trade agreements on trade flows with an application to the European Union, *European Economy-Economic Papers 2008-2015 214*, Directorate General Economic and Financial Affairs (DG ECFIN), European Commission.

Chomo, G. V. (2002). Free Trade Agreements Between Developing and Industrialized Countries: Comparing the U.S.-Jordan FTA with Mexico's Experience Under NAFTA, Working Papers 15868, United States International Trade Commission, Office of Economics.

Eisenman, J. (2012). China–Africa Trade Patterns: causes and consequences, *Journal of Contemporary China*, 21(77), 793-810.

Fan, G. (2003). China's Nonperforming Loans and National Comprehensive Liability, *Asian Economic Papers*, 2(1), 145-152.

Garth, S. (2004). Trading with the dragon: Prospects for a China - South Africa FTA. *South African Journal of International Affairs*. 11(2), 59-71.

Golub, S. S., Ceglowski, J., Mbaye, A. A., & Prasad, V. (2015). Can Africa Compete with China in Manufacturing? The Role of Relative Unit Labor Costs, Working Papers 201504, University of Cape Town, Development Policy Research Unit.

Magee, C. S. (2003). Endogenous Preferential Trade Agreements: An Empirical Analysis, *Contributions in Economic Analysis & Policy*, 2(1), 1-19.

Samaro, Z. (2009). Tried and Tested: Infant Industry Theory and its Relevance for Africa, Social Science Electronic Publishing. https://ssrn.com/abstract=1489397

Sharma, S. K. & Kallummal, M. (2012). A GTAP Analysis of the Proposed BRICS, 15th Annual Conference on Global Economic Analysis-New Challenges for Global Trade and Sustainable Development.

Stevens, C., Irfan, I., Massa, I. & Kennan, J. (2015) The Impact of Free Trade Agreements between Developed and Developing Countries on Economic

Development in Developing Countries: A Rapid Evidence Assessment, Overseas Development Institute, London.

Xu, G. Y. (2007). Import Trade Structure and Economic Growth Correlation Analysis of China, *Journal of International Trade*, 02, 5-9.