WFL Publisher
Science and Technology
Meri-Rastilantie 3 B, FI-00980
Helsinki, Finland
e-mail: info@world-food.net

Journal of Food, Agriculture & Environment Vol.6(2) : - . 2008 *www.world-food.net*

Impacts of free trade area (FTA) within Eastern and Southern Africa countries and unilateral tariff elimination by other regions

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Received 8 January 2008, accepted 25 March 2008.

Abstract

Free trade between countries and regions has become a common practice and yet there are imbalances in both trade flow and trade benefits. One such example is agriculture trade between developed and least developed nations. Developed nations subsidize their farmers and protect against poor farmers' commodities from entering their domestic market through various trade barriers. As a result, developing countries like sub-Saharan Africa are languishing in a balance of trade deficit. Moreover, the emergences of free trade areas have created new challenges to some individual countries through preferential erosion and special benefits to countries that joined the block through trade creation. In sub-Saharan Africa, there are regional trade blocks that actually are not working on well-established free trade specifications. Therefore, this study attempts to evaluate the impact of free trade within countries and unilateral or unreciprocated tariff elimination by others. It employs the standard multi-regional applied general equilibrium model developed by global trade analysis project (GTAP) and its version 6 database. Eight countries from Eastern and Southern Africa and four from the world's biggest economies were selected for the analysis along with three main sectors: agriculture, manufacturing and services. Eighty-seven countries including the above are aggregated into 16 trading blocks, and the sectors are disaggregated into 19 sub-sectors with greater emphasis on agriculture. The simulation results show that within the eight countries, owing to their trading system and economy of scale, welfare change significantly differs. Terms of trade gains from agricultural commodities, mainly the sugar sub-sector, contributes a significant amount to the welfare change. Among the eight countries, Mozambique has better welfare change with US$3.11 million in bilateral import tariff elimination than from unilateral tariff elimination of the biggest economies, and Botswana shows US$285.21 million from unilateral tariff elimination. South Africa, as the main trading partner for most southern African nations, registers a loss of US$3.91 million to the eight countries. In the unilateral tariff elimination, China and the European Union have better net welfare gains largely from allocative efficiency than the United States and Japan. Nevertheless, welfare gains and losses accrued to these biggest economies do not pose any impact on their GDP, household utilities and terms of trade change. This signals that unilateral tariff elimination by the biggest economies to the eight sub-Saharan countries would be a possible scenario and poor countries should push for such intervention to be taken by developed nations.

Key words: Aggregation, Eastern and Southern Africa, GTAP, free trade area, Sub-Saharan Africa, unilateral tariff elimination, welfare change.

Introduction

The ultimatum of economic integration between countries is largely a matter of easing restrictions on trade, apart from other pertinent issues, because easing the restrictions would enable trade to be free and become a driving force in an economic development [1-4]. In essence, there are three principal requirements that have to be fulfilled in order for free trade between countries to be operational: the principle of nondiscrimination, an international non-coercion principle and a principle of laisser-faire government [5, 6]. Proper functioning of these requirements yields insights into most import trade and environment cases where countries would be encouraged to specialize in producing commodities that have comparative advantage without violating the environment.

Therefore, the ultimate necessity of integration lies in measuring welfare gains and losses from free trade. The gains and losses may emerge from a number of sources such as specialization, economy of scale, changes in terms of trade and changes in efficiency owing to increased competition [7-9]. In sub-Saharan Africa, amid migration frustration from poor to relatively better economies and the social economic landscapes each country has, free trade principal merits fall short of serving as a practical guide in integrating the region's economy [10, 11]. Nonetheless, countries have been striving hard for the realization of regional trade integration.

Despite integration problems, most countries in the region could not penetrate the international market and take advantage of it due to trade barriers. Exports in the region are largely agricultural commodities, and agriculture is the most protected and subsidized sector in the western developed nations. Numerous negotiations on agricultural trade have often been stalled due to the inflexible position of those countries, and future breakthroughs are left uncertain. However, there are a few initiatives from the west to make their markets accessible for Africa's agricultural commodities free of import tariffs. The initiatives are not inclusive of all agricultural commodities but applied only to a few predefined commodities.

Thus, in this research we introduced the concept of unilateral or unreciprocated tariff elimination by developed economies to all exports from eight selected subs-Saharan countries (Botswana, Madagascar, Malawi, Mozambique, Tanzania, Uganda, Zambia, and Zimbabwe, hereafter AF8) and free trade within those countries to determine welfare changes.

Conceptual Framework and Aggregation Description

Conceptual framework: The concept of free trade has been well-debated over decades, though, as yet, there are no indisputable agreements. Abolishing uncompetitive practices such as production subsidies, dumping and removing market-access restrictions harmful to producers in poor countries are the core tenets of free trade between countries or regions. Removal of these barriers would especially improve agricultural trade competitiveness, and producers in developing countries would get incentives to produce more as prices increase. Nevertheless, market-distorting trade policies continue to be widespread and adversely affect global agricultural markets as negotiations on agricultural trade continue to be unsure of defeating the trade barriers in this longstanding battle.

Thus, in the face of such distortions, it is quite hard for poor sub-Saharan countries, where more than two-thirds of their exports are primary products, to compete and succeed in the global markets[12, 13]. On the contrary, developed nations, instead of addressing the salient features of agricultural trade fairly and squarely and deep liberalization in their own backyards, simply demand deep liberalization in developing countries through trade policy reform that has been a central plank of donor-supported structural adjustment programs in developing countries for the past twenty years. On the other hand, developing nations sought to have a fair market access for their products.

In the face of tariff-reduction refusal, it would be hard to conceive of complete and unreciprocated tariff removal, which is contrary to the consent of developed nations. However, under the agreement of special initiatives galvanized by the developed west to open up their domestic markets for limited agricultural products from poor countries, it is vital to further extend the idea to all agricultural products and evaluate the effect. This is the basic assumption set behind the unilateral tariff elimination, and such tariff elimination is not a common trend except for very few agricultural commodities under special conditions.

The standard multi-regional applied general equilibrium model GTAP [14-16] and its version 6 database were used in the analysis. The model deals with static equilibrium and it employs equivalent variation (EV) as a monetary measure of gains and losses to trade due to trade policy reform. EV uses the money metric utility function where by regional household consumers face a price before introduction of policy reform, and a new utility after policy change under that initial price [8, 17, 18]. Then, EV change is simply defined as the difference between the expenditure required to obtain the new level of utility at initial prices and the initial expenditure. The welfare effects of such variation changes are mainly decomposed into allocative efficiency, terms of trade and insurances and savings [19]. Even though, EV is used in this study, compensation variation (CV) and compensation surplus (CS) can be used to measure welfare changes as well. The three are equal only under quasi-linear preferences. Otherwise, the relationship among the three remains in order of EV<change in CS<CV [20].

Region aggregation: In an attempt to comprehend the effect of free trade and unilateral tariff elimination on welfare change, regional aggregation is necessary. The aggregation was basically carried out with the premise of the impact that the aggregation would bring to each aggregated region and country with respect to the two concepts. That is, selection for aggregation was anchored in the role each free trade region or country would induce on the welfare change of the AF8. In the aggregation, we took into account that European countries as traditional trading partners of most African countries, United States and Japan as good trading partners and world biggest economies, China and India as emerging economies and South Africa as a regional economic player in sub-Saharan Africa. This aggregation doesn't mean that other countries have no established trading system with the eight African countries. The authors are interested in testing the unilateral tariff elimination with the biggest economies, which is more likely to be practical than with other developing countries.

Most AF8 countries, with the exception of Botswana better economy, rely on agriculture as their source of livelihood for their larger rural communities. Then, unilateral tariff elimination for these countries agricultural commodities would initialize the momentum of replication to other countries if our results are robust. In addition to the above aggregation, Southern African development community and Southern Africa customs union member countries were aggregated as the rest of sub-Saharan Africa. The aggregation was done as follows: 1) United States, Canada and Mexico (NAFTA); 2) European Union (EU_{15}); 3) Japan (JPN); 4) China (CHN); 5) India (IND); 6) Malawi (MWI); 7) Botswana (BWA); 8) Zambia (ZMB); 9) Zimbabwe (ZWE); 10) Mozambique (MOZ); 11) Tanzania (TZA); 12) Madagascar (MDG); 13) Uganda (UGA); 14) Rest of Sub-Saharan Africa (R_SSA); 15) South Africa (ZAF); 16) Rest of World (ROW).

Sector aggregation: Tradable commodities in the database are aggregated into three main sectors: Food (Agriculture), Manufacture and Service. To fit the purpose of the analysis, the main sectors were further disaggregated into sub-sectors. Carrying out such processes enable one to discern the contribution of commodities individually and collectively. With respect to commodity export in most sub-Saharan Africa, agriculture comes first as an important sector. Then, the agriculture sector was disaggregated into nine sub-sectors, and the aggregations were set to be limited to manageable size as follows: 1) Cereal grains not elsewhere classified (GRO); 2) Wheat (Wht); 3) Vegetables, fruit, nuts (V_F); 4) Crops not elsewhere classified (OCR); 5) Animal products not elsewhere classified (OAP); 6) Oil seed (OSD); 7) Sugar (SGR); 8) Plant-based fibers (PBF); 9)Rest of food (R_Food); 10)Textile (TEX); 11)Petroleum, coal products (P_C); 12) Chemical, rubber, plastic products (CRP); 13) Motor vehicle and parts (MVH); 14) Transport equipment not elsewhere classified (OTN); 15) Manufacturing not elsewhere classified (OME); 16)Communication (CMN); 17) Public admin., defense, education, health (OSG); 18) Shoe and other manufactures (R-Mnfcs); 19)Rest of service and activities not elsewhere classified (R_ Svces).

Experimental design: Six simulation experiments were carried out: five experiments based on unilateral tariff elimination and one experiment based on bilateral tariff elimination. In the experiments, unlike China that has recently speeded up its commodities flows

with Africa, India was excluded, taking into account the insignificant agricultural export-import commodities flow from AF8 to India vis-à-vis India. South Africa was treated with the rest of sub-Saharan Africa because some of the AF8 countries do not export more than they import. The experiments are synonymously called scenarios in the results and discussion section. Accordingly, the experiments were: a)AF8 with EU_{15} [EU]; b) AF8 with Japan [JAPAN]; c) AF8 with NAFTA [NAFTA]; d) AF8 with China [CHINA]; e) AF with R_SSA [R_SSA]; f) AF8 with AF8 [AF8].

Results and Discussion

The welfare measures of impact of a policy change are the focus of applied equilibrium models and such impact is often measured by using the equivalent variation [9]. The ratio of the equivalent variation to the expenditure function valued at the benchmark prices and income provides the same information as the equivalent variation because both are positive if household welfare increases[8]. In the GTAP model, economic welfare is represented as being derived from the allocation of national income between private consumption, government consumption and savings [14], and how much better off a policy change actually makes a country or region depends on what the change does to its national income[16]. The impact does not essentially lead countries or regions to have equi-proportional increases in economic wellbeing.

The results in Table 1 show that both bilateral and unilateral tariff eliminations in each scenario have different impacts. Each country's economy of scale contributes to such differences. For instance, Botswana, a country with a sound economy in the region, has larger EV changes in contrast to others with a weak economy. All simulation results, except Zambia, in the Japan scenario, are positive, hinting that the impact of policy reform is in favor of the eight countries.

In five of the scenarios, Botswana has greater gains than the rest, but in the China scenario, the changes are lower than that of Zimbabwe by half. This particular result reflects an interesting situation concernig Zimbabwe's trade partnership. The gain from the China scenario is four times bigger than the gains from NAFTA, and almost equal to that from the EU. Similar results in Zambia demonstrate the countries tendency of leaning towards the east rather than to the west, their traditional partner. China is the newly emerged economic partner to some sub-Saharan countries and substantial debates are underway in different international and regional forums about whether such a relationship has mutual benefit and understanding, or unanticipated consequences because China's imports from sub-Saharan Africa are more of the raw materials. For instance in 2002, bilateral trade between Zimbabwe and China was US$191 million, of which US$159 million was China's imports.

In the R_SSA scenario, where the aggregated countries in this group are from southern Africa, it is Tanzania and Uganda from eastern Africa that have better gains unlike the southern Africa countries with weak economies. These two countries together with Kenya have enhanced trade flows across their borders more than with other countries in sub-Saharan Africa in an attempt to step up the establishment of the east African community common market. Nonetheless, the results show free trade deals with the other six countries would be to their advantage. In this scenario, Madagascar shows the least because she has free trade deals with most of these countries. For the same reason, Madagascar has the least gain from the AF8 scenario as well, while Mozambique has uniquely greater gain, than in the remaining five scenarios because it has no free trade deal with most of these countries. Mozambique depends heavily for its imports on South Africa, and South Africa as the main trading partner to most southern Africa countries has losses greater than in R_SSA scenario.

The welfare gains from policy reform are mainly decomposed into component gains as allocative efficiency, terms of trade and investment and savings. Table 2 shows that most welfare gains for the eight sub-Saharan countries are from terms of trade and this reveals how much better it would be if these countries got fair market access for their agricultural commodities dominated exports. From the biggest economies, unreciprocated tariff elimination cases, the EU and China in their respective scenarios show a positive allocative efficiency change. This shows that whenever countries avoid their pre-existing trade distortion through policy reform they would be better off than with distortions and inefficient allocation of resources [21]. In policy reforms, with regard to farm subsidy and tariff reduction for agricultural commodities, countries

Table 1. Equivalent variation change (US$ Million) indeveloped and developing nations.

a) Developed nations

FTA/Country	EU	JPN	NAFTA
NAFTA	-12.01	-1.8	-44.62
EU	145.42	-4.38	-52.49
JPN	-6.19	-1.35	-7.13
CHN	-1.36	-0.8	-7.51
IND	-2.44	-0.23	-4.39
MWI	12.33	0.1	21.84
BWA	117.36	6.62	146.72
ZMB	1.29	-0.08	0.02
ZWE	29.26	5.23	7.66
MOZ	0.44	0.32	1.38
TAN	4.81	0.19	2.06
MDG	1.01	0.21	37.52
UGA	0.43	0.04	0.3
R_SSA	-5.01	0.15	1.39
ZAF	0.1	0.07	0.39
ROW	-11.39	-2.88	-21.41

b)Developing nations

FTA/Country	CHN	R_SSA	AF8
NAFTA	-2.69	-2.61	-2.62
EU	-11.67	-11.23	-9.26
JPN	-0.55	-2.73	-1.35
CHN	26.2	-2.29	-0.8
IND	-0.51	-2.3	-0.85
MWI	0.21	-0.22	2.86
BWA	14.51	12.29	24.3
ZMB	1.35	5.14	0.6
ZWE	28.59	6.87	6.55
MOZ	0.44	0.77	3.11
TAN	1.17	15.91	4.82
MDG	0.58	0.16	0.02
UGA	0.39	11.77	1.67
R_SSA	0.29	-1.04	-0.73
ZAF	-0.28	-2.22	-3.91
ROW	-17.67	-5.37	-4.73

Table 2. Decomposition of the welfare effect in US$ million (AE allocative efficiency, TOT terms of trade, and IS insurance and savings).

a) EU

FTA/Country	AE	TOT	IS	Total
NAFTA	-3.7	-6.5	-1.8	-12.0
EU	248.0	-104.0	1.6	145.4
JPN	-1.2	-6.1	1.1	-6.2
CHN	-1.2	-1.3	1.1	-1.4
IND	-0.3	-2.2	0.1	-2.4
MWI	3.7	8.9	-0.3	12.3
BWA	32.4	85.5	-0.6	117.4
ZMB	-0.3	1.8	-0.2	1.3
ZWE	2.2	30.3	-3.2	29.3
MOZ	0.1	0.2	0.1	0.4
TAN	0.8	2.9	1.1	4.8
MDG	0.0	0.8	0.2	1.0
UGA	0.0	0.3	0.2	0.4
R_SSA	-0.6	-4.0	-0.4	-5.0
ZAF	-0.8	2.0	-1.1	0.1
ROW	-4.6	-8.9	2.1	-11.4
Total	274.0	0.0	0.0	274.0

b) JAPAN

FTA	AE	TOT	IS	Total
NAFTA	-0.3	-0.9	-1.0	-1.8
EU	-1.3	-3.2	0.1	-4.4
JPN	0.8	-2.5	0.3	-1.4
CHN	-0.2	-1.1	0.4	-0.8
IND	-0.1	-0.2	0.0	-0.2
MWI	0.0	0.1	0.0	0.1
BWA	2.1	4.6	0.0	6.6
ZMB	0.1	-0.1	0.0	-0.1
ZWE	1.0	4.8	-1.0	5.2
MOZ	0.1	0.2	0.0	0.3
TAN	0.0	0.1	0.0	0.2
MDG	0.0	0.2	0.0	0.2
UGA	0.0	0.0	0.0	0.0
R_SSA	0.0	0.1	0.0	0.2
ZAF	0.0	0.2	0.0	0.1
ROW	-0.8	-2.4	0.3	-2.9
Total	1.4	0.0	0.0	1.4

c) NAFTA

FTA	AE	TOT	IS	Total
NAFTA	37.9	-62.5	-20.1	-44.6
EU	-11.0	-43.2	1.6	-52.5
JPN	-0.5	-9.9	3.2	-7.1
CHN	-3.6	-8.4	4.5	-7.5
IND	-1.1	-3.4	0.2	-4.4
MWI	4.6	17.6	-0.4	21.8
BWA	48.4	98.9	-0.6	146.7
ZMB	0.1	-0.1	0.0	0.0
ZWE	1.0	7.4	-0.7	7.7
MOZ	0.4	0.9	0.1	1.4
TAN	0.4	1.3	0.4	2.1
MDG	6.7	23.1	7.7	37.5
UGA	0.0	0.2	0.1	0.3
R_SSA	1.3	-0.1	0.1	1.4
ZAF	-1.0	2.2	-0.9	0.4
ROW	-2.1	-23.7	4.5	-21.4
Total	81.4	0.0	0.0	81.4

d) R_SSA

FTA	AE	TOT	IS	Total
NAFTA	-0.5	0.4	-2.5	-2.6
EU	1.2	-12.0	-0.9	-11.2
JPN	-0.3	-1.9	-0.5	-2.7
CHN	-0.6	-1.7	0.0	-2.3
IND	-0.8	-1.4	-0.1	-2.3
MWI	0.0	-0.2	0.0	-0.2
BWA	4.3	8.1	-0.1	12.3
ZMB	-0.2	5.6	-0.3	5.1
ZWE	0.5	7.1	-0.7	6.9
MOZ	0.1	0.6	0.0	0.8
TAN	3.1	9.7	3.1	15.9
MDG	0.0	0.1	0.0	0.2
UGA	1.0	6.6	4.1	11.8
R_SSA	16.9	-16.0	-1.7	-1.0
ZAF	-0.6	-1.8	0.1	-2.2
ROW	-1.1	-3.7	-0.6	-5.4
Total	22.9	0.0	0.0	22.9

e) CHINA

FTA	AE	TOT	IS	Total
NAFTA	0.0	-1.9	-0.9	-2.7
EU	-2.0	-10.2	0.5	-11.7
JPN	0.1	-1.5	0.9	-0.5
CHN	33.7	-7.2	-0.2	26.2
IND	0.1	-0.7	0.1	-0.5
MWI	0.2	0.0	0.0	0.2
BWA	5.4	9.2	-0.1	14.5
ZMB	0.4	1.0	-0.1	1.3
ZWE	2.1	28.4	-1.9	28.6
MOZ	0.1	0.3	0.0	0.4
TAN	0.3	0.7	0.2	1.2
MDG	0.0	0.4	0.1	0.6
UGA	0.0	0.2	0.2	0.4
R_SSA	0.0	0.2	0.1	0.3
ZAF	-0.1	0.3	-0.5	-0.3
ROW	-0.1	-19.1	1.6	-17.7
Total	40.3	0.0	0.0	40.3

f) AF8

FTA	AE	TOT	IS	Total
NAFTA	-0.2	-1.3	-1.1	-2.6
EU	-1.0	-8.1	-0.2	-9.3
JPN	-0.2	-1.2	0.1	-1.3
CHN	-0.2	-0.8	0.2	-0.8
IND	-0.1	-0.7	0.0	-0.8
MWI	2.7	0.1	0.0	2.9
BWA	14.1	10.2	-0.1	24.3
ZMB	0.7	-0.1	0.0	0.6
ZWE	2.0	5.1	-0.5	6.6
MOZ	0.5	2.4	0.1	3.1
TAN	2.9	1.7	0.3	4.8
MDG	0.0	0.0	0.0	0.0
UGA	0.4	0.8	0.5	1.7
R_SSA	-0.3	-0.4	-0.1	-0.7
ZAF	-0.8	-3.6	0.5	-3.9
ROW	-0.8	-4.2	0.2	-4.7
Total	19.7	0.0	0.0	19.7

and regions with strong an economy refuse to accept such deals, and poor countries who rely on agricultural commodities export suffer a lot. The simulation results in the EU and NAFTA scenarios clearly show this phenomena, from where gains and losses as a result of trade policy reforms come from.

Policy-induced welfare gains can have different impact on different households within a country since the composition of expenditure may differ with income levels, and composition of income may vary by household type [16]. Welfare decomposition for a representative household is used assuming that all households are identical. Then, welfare gains and losses from policy reform have diverse effects depending on each country's economy of scale and the role of agriculture in the economy (Table 3). In Malawi and Tanzania, where the share of agriculture to GDP remains respectively as high as 36 and 43%, then, the small welfare changes, as a result of bilateral and unilateral tariff elimination, have a greater contribution as compared to Botswana. In all of the six scenarios, Botswana gains a larger proportion than the other seven countries, but the contribution to GDP is minimal because agriculture's contribution to GDP is close to 2.4%. Similar implications hold for household utility and terms of trade changes. Specifically, these results clearly justify the reason why poor countries are insisting on tariff reduction for agricultural commodities. The small change in trade gains because of the policy reform has relatively greater impact especially for countries whose population lives on less than a dollar a day.

However, despite the fact that the gains are positive, in both assumptions for the eight countries, they are far less than anticipated, especially in the AF8 scenario. Such small changes reveal two things: 1) the volume of exports within the eight countries is small because of the similarity in export commodities, or 2) import tariffs are high and tariff elimination might reduce the revenue. Potential revenue losses from intra-common market for eastern and southern Africa (COMESA), of which five of the eight

Table 3. Effect of welfare change (results are rounded off to the nearest two decimal places).

a) Real gross domestic products change (present)

FTA	EU	JPN	NAFTA	CHN	R_SSA	AF8
NAFTA	0	0	0	0	0	0
EU	0	0	0	0	0	0
JPN	0	0	0	0	0	0
CHN	0	0	0	0	0	0
IND	0	0	0	0	0	0
MWI	0.21	0	0.26	0.01	0	0.16
BWA	0.02	0	0.03	0	0	0.01
ZMB	-0.01	0	0	0.01	-0.01	0.02
ZWE	0.02	0.01	0.01	0.02	0.01	0.02
MOZ	0	0	0.01	0	0	0.01
TZA	0.01	0	0	0	0.03	0.03
MDG	0	0	0.15	0	0	0
UGA	0	0	0	0	0.02	0.01
R_SSA	0	0	0	0	0	0
ZAF	0	0	0	0	0	0
ROW	0	0	0	0	0	0

b) Household untility change (percent)

Country	EU	JPN	NAFTA	CHN	R_SSA	AF8
NAFTA	0	0	0	0	0	0
EU	0	0	0	0	0	0
JPN	0	0	0	0	0	0
CHN	0	0	0	0	0	0
IND	0	0	0	0	0	0
MWI	0.79	0.01	1.4	0.01	-0.01	0.18
BWA	0.07	0	0.09	0.01	0.01	0.01
ZMB	0.04	0	0	0.04	0.16	0.02
ZWE	0.37	0.07	0.1	0.36	0.09	0.08
MOZ	0.01	0.01	0.04	0.01	0.02	0.09
TZA	0.05	0	0.02	0.01	0.18	0.05
MDG	0.02	0.01	0.89	0.01	0	0
UGA	0.01	0	0.01	0.01	0.22	0.03
R_SSA	0	0	0	0	0	0
ZAF	0	0	0	0	0	0
ROW	0	0	0	0	0	0

c) Terms of trade change (percent)

FTA	EU	JPN	NAFTA	CHN	R_SSA	AF8
NAFTA	0	0	-0.01	0	0	0
EU	0	0	0	0	0	0
JPN	0	0	0	0	0	0
CHN	0	0	0	0	0	0
IND	0	0	-0.01	0	0	0
MWI	1.31	0.01	2.59	0	-0.03	0.02
BWA	0.2	0.01	0.23	0.02	0.02	0.02
ZMB	0.1	-0.01	-0.01	0.06	0.36	-0.01
ZWE	1.31	0.21	0.32	1.24	0.31	0.22
MOZ	0.02	0.02	0.07	0.03	0.04	0.19
TZA	0.2	0.01	0.09	0.05	0.65	0.11
MDG	0.07	0.02	2.27	0.04	0.01	0
UGA	0.04	0	0.02	0.03	0.85	0.1
R_SSA	-0.01	0	0	0	-0.03	0
ZAF	0	0	0	0	-0.01	-0.01
ROW	0	0	0	0	0	0

countries are members, are low owing to the low level of intra-regional trade flows [11]. That is, there could be bigger losses if the trade flow were large enough. Kenya is mentioned as a case in the study where government revenue from EU imports constitutes 10% of its total revenue. In the eastern Africa region, Kenya is considered as a more liberalized country, as compared to the others, and revenue losses for less liberalized countries could be large. Nevertheless, COMESA is better off with free trade [22] and countries that prefer to enter into free trade must adjust their revenue losses before they join free trade. Free trade by its nature is based on the comparative advantage a country has while trading with others and a country should make sure of these advantages during the process of opening up its domestic market to foreign commodities. In some respects, short-run difficulties could challenge the continuity of the free movement of goods and services across borders and anticipated benefits, as well. If the short-run difficulties induce unprecedented impacts, member countries will be forced to quit their membership (e.g., Tanzania from COMESA in 2002).

Apart from gains to trade, trade liberalization would reinforce peace and stability between countries. Because peace and stability have been a major setback in the sub-Saharan countries, integrating them under the umbrella of a free trade area would ensure the strength in promoting and nurturing peace and stability along with trade flows. Moreover, it tends to boost economic growth and contribute towards poverty reduction on the average in the long-run [23, 24] whilst short-run losses from free trade could occur because of preferential erosion, institutional restructuring and other trade related adjustment costs [25].

In this study, the agriculture sector in both assumptions has contributed a bigger portion for the welfare gain in the sub-Saharan Africa countries case. This is, a further evidence of their agricultural commodity dominated exports. In the global market competition, poor countries have often failed to gain market access in the presence of highly subsidized and low priced products from developed countries. Because developed nations, like the EU countries, provide relatively high import protection for their own declining agriculture sector and low protection for manufacturing[26]. The sugar sub-sector is a sensitive commodity in both developed and poor countries. For instance, the EU produces sugar at two to three times the world price and keeps imports from developing countries out by levying high tariffs. This depicts that EU producers couldn't compete with poor country producers that produce sugar at a much lower cost.

Therefore, subsidies and tariffs would continue to be an instrument of protection rather than allowing free and fair trade competition among producers. In sub-Saharan Africa, sugar is a labor-intensive sub-sector that employs many poor people and in our simulation analysis, it contributes the lion-share to welfare gain for countries where sugar is among the top five export commodities. According to the data used for our analysis, the tax levied on sugar imports from the eight countries by EU is: Zimbabwe (116%), Zambia (97.8%), Malawi (96.2%), Tanzania (96%), Madagascar (94%), Mozambique (21.4%), Botswana (6%), Uganda (0%), and by NAFTA respectively: 28.6, 0, 24.2, 0, 0, 24.2, 1.7 and 0%. The EU levied much less tax on Botswana's sugar and no tax on Uganda's sugar because Botswana and Uganda aren't sugar exporters, but importers. On the other hand, the EU levied 42% import tax on Botswana's meat and veal, and 70.6% import tax on Zimbabwean commodities aggregated as Rest of Food (R_Food) because these two are the most exported commodities by Botswana and Zimbabwe.

From the other disaggregated sub-sectors, textile contributes to the welfare gain of Botswana and Madagascar. However, the other non-agriculture sectors have no contribution to welfare gains or losses at all in both assumptions. It is true that the AF8 countries have no manufacturing and service sectors that would be exported to developed countries. Even among themselves, no such trading exists. Rather, each country barely depends on the developed nations manufacturing products and services. That is why poor countries are asking developed ones to cut their farm support systems and eliminate their import tariffs on poor countries' agricultural products.

Conclusions

Agriculture sector is the livelihood of most sub-Saharan Africa countries, and policy change would help countries to embrace agriculture driven development. The study highlights welfare gains to be made from such policy changes in both the developed and developing countries. Especially, the unilateral tariff elimination addresses the impact to be borne in the developed and developing nations' economies. The total welfare losses to developed nations have no significant effect on their economy, but the gains matter a great deal to the poor countries economy.

A similar phenomenon is observed in bilateral tariff elimination among the eight countries. Even though, the volume of trade flow and the limited diversity of export commodities restrict the gains, the results truly indicate that regional free trade would have added advantages to each country. Among the eight countries, some of them have already experienced the benefit of low import tariff rates because they have a common market or customs union, but there is no common market or customs union inclusive of all the eight countries.

The results validate our assumption that developed countries should extend further from the free import of a few agricultural commodities to all agricultural commodities. If the poor countries get such an opportunity, it would initiate an incentive and competition among producers for better prices and ultimately achieve their food-security. Therefore, developed countries should make broad policy reforms that would allow poor countries to export their agricultural products free of import tariffs and, on the other hand, poor countries must reform their agricultural policy to comply with product efficiency rules and quality standards in order to consistently satisfy developed nation domestic market demands.

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