The potential Trade effects of Democratic Republic of Congo Joining the East African Community bloc

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Abstract

DRC has expressed interest in joining the EAC regional bloc to tap into the benefits of the regional trade and expanded markets. Using trend analysis of trade flows and SMART-WITS Partial Equilibrium model, this study examines the likely impact of DRC's membership in the EAC, to establish trade effects of liberalising trade between EAC and DRC. The emerging results reveal that trade effects are positive among the EAC partner states, more so for Rwanda and Uganda given that there are the leading EAC exporters to DRC. The analysis also identifies the EAC main economic sectors poised to benefit a result of this trade liberalisation. At a sectoral level, the largest trade effects will be experienced in agro-processing, metal products and mineral ores industries. These findings point to the need for EAC members to pursue develop these sectors while pursuing industrialization agenda to replace DRC's imports from the rest of the world.

Keywords: trade effects, trade liberalization, Industrialization
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1. Introduction

In the recent past, African economies have increasingly pursued the idea of regional integration to promote free trade among themselves (UNECA, 2017). Notably, membership to RTAs is associated with economic growth through increased market size, exploitation of economies of scale, increased competition, and learning by doing, and increased investment (*ibid)*. In pursuit of these benefits, the Democratic Republic of Congo (DRC) has applied for membership to the East African Community (EAC). According to the letter of interest submitted to the EAC secretariat, DRC seeks to tap into the bloc's benefits of the regional trade, expanded markets as well as attraction of Foreign Direct Investment (FDI) in the EAC bloc (Tabaro, 2019).

Many observers consider DRC's interest in EAC as a game changer to the bloc's trade performance given its natural resources base and a huge consumer market of 81 million people (almost a half the population of the EAC). Noteworthy, DRC is the world's biggest producer of cobalt, a major component in the manufacture of rechargeable batteries for electric vehicles, and Africa's main copper producer. It is also a major producer of gold, diamonds, uranium, coltan, oil and other precious metals, making it one of the most resource-rich countries in the world. These resources coupled with appropriate transport infrastructure can boost the EAC's industrialization agenda through reduced transactional costs for labour from lower- to higher-productivity activities (Cilliers, 2018). Hence, this would lead to economic transformation in the East African economies, key to achieving economy-wide productivity improvements, job creation and sustained progress in growth and poverty reduction (WTO, 2018). Moreover, not only does DRC share borders with four of the six countries, it also shares EAC's official language, Kiswahili, with about 50% of the population fluent in the language (Kamabale, 2004).

Despite the low EAC intra-regional trade accounting to 20 percent of its total trade, the bloc is considered the most successful among all the Regional Economic Communities (RECs) in Africa; with the highest Regional Integration Index and intra-regional trade (African Union , 2020). According to African Development Bank report (2019), the EAC is approaching the highest stage of integration having ratified the protocol for a monetary union as compared to other RECs such as IGAD, COMESA and SADC. Additionally, EAC partner states had relatively good economic growth performance over the last two decades in comparison with the world and sub-Saharan Africa (SSA). On average, the EAC region grew by around 5.6 per cent between 2000 and 2016 (UNCTAD, 2018). Relatedly, real GDP per capita in the region grew faster (2.6 per cent) than the SSA average (2 per cent) during the same period. Arguably, these advantages provide a motivation for DRC's interest into the EAC trade bloc (ibid).

Though a previous study by Gaalya (2015), examined the impact of trade liberalization between DRC, Sudan and the EAC on Uganda's revenue and total trade effects, this current study focuses on trade effects of DRC-EAC trade bloc membership on for EAC member states using an Excel-based SMART-WITS Simulation. The model utilizes specific commodity tariffs (MFN) to provide a more realistic ex ante analysis. Moreover, this study comes at an opportune time after the DRC has actually applied to join the bloc. Further, this study is premised on the most recent data (2018) data that points to a relative improvement in the trade balances between DRC and the EAC bloc, with consideration for different sectors and trade related aspects between the two parties.

This study therefore examines the trade effects of DRC's membership in the EAC trade bloc. Specifically, the paper analyses the likely trade creation and diversion accrued to the EAC partner states as well the sectors poised to benefit as a result of this trade liberalization. As contribution to existent literature on trade policy, the study addresses pertinent questions on the dynamics of economic integration for the EAC partner states in regard to the potential impact of DRC membership in the bloc. The paper further provides an in-depth analysis of economic sectors that are likely to gain at the expense of others and potentially result into structural changes in the EAC economies.

The rest of the paper is structured as follows: Section 2 reviews the past literature while section 3 presents the methodology adopted by the study. Section 4 explains the results and Section 5 offers the conclusion and policy recommendations.

2. Literature Review

Economic theory on free trade has substantially evolved overtime. It dates back to the times of Smith (1776), "*The Wealth of Nations"*, and Ricardo's law of comparative advantage (1817), complemented by Heckscher and Ohlin (1919) theory on factor endowment; on which subsequent economic approaches are premised. Notably, the custom union theory by Viner (1950) introduced welfare enhancing aspects 'trade creation' and 'trade diversion' which became essential concepts for the analysis of the effects of economic integration. He defined trade creation as the shift in the trade flows from less efficient domestic producers to efficient ones; while trade diversion is when a customs union shifts trade from producers that are efficient to less efficient ones. According to the custom theory, trade creation is welfare enhancing while trade diversion reduces welfare.

While Viner's theory focused on the production effects of Customs Unions, the seminal contributions of Meade (1955) and Lipsey (1957) added the consumption aspect to customs unions' theory. Allowing for the consideration of non-zero elasticity demand curves, Meade (1955) introduced the concept of trade expansion as a factor potentially improving economic welfare. This aspect of customs union theory, known as the inter-commodity substitution effect, is also explored by Lipsey (1957) who shows how a trade diversion may be welfare improving because of consumption considerations. Apart from production and consumption aspects, the custom union theory entails other related aspects such as selection of partners states, the role of administrative costs, terms of trade, the role of economies of scale, and the effects of CUs on firms and industry efficiency among others.

Empirical evidence on the potential trade outcomes of free trade has increasingly contributed to trade policy debate. Several empirical studies have used a number of models at various levels, ranging from industry/sectoral, single and multi-country studies used in both the partial and general equilibrium frameworks. The commonly used methodology for the partial equilibrium framework is the World Integrated Trade Solution (WITS) Single Market Partial Equilibrium Simulation Tool (SMART) whereas most studies using the general equilibrium framework are based on the Global Trade and Analysis Project (GTAP) models. On the other hand, other studies have also used other econometric approaches such as the gravity model approach among others.

For instance, using the single country partial equilibrium framework based on the WITS- SMART approach, Gaalya (2015) examined the potential total trade effects arising from FTAs between Uganda and DRC and Sudan under tariff scenarios of zero rate and 25 percent tariff rate between and Zambia and South Africa respectively. Results revealed a positive trade effect with a larger trade creation than trade diversion under the zero rate tariff scenario compared to when the applied

rate is applied. The results are consistent with simulations by Punt & sundry (2016) in their SMART model analysis of trade effects of FTA between Zambia and South Africa under the same scenarios.

Furthermore, sectoral level studies by Poczta and Sapa (2017) and Hoang *et al* (2019) use the WITS-SMART approach to estimate the trade effect of (Free Trade Agreements) FTAs on the apparel and textile industries and agri-food sectors in Vietnam and the EU markets respectively. Whereas both studies reveal a positive trade effect estimated at 42% and 8.5% export growth respectively, there are mixed findings on the total trade effect simulations. The composition of trade creation vis-à-vis trade diversion of the net trade effect varies in both studies. Notably, Poczta and Sapa (2017) found that the EU's trade effect is largely marked by trade creation concentrated in a few product groups. On the contrary, Hoang *et al.* (2019) found that trade diversion from the Vietnam-EU FTA dominates trade creation as Vietnam's apparels are poised to benefit than non –FTA members.

Using the multi country SMART-WITS model, Pasara and Dunga (2019) estimated the potential trade effects of a tripartite agreement between COMESA, the EAC and SADC members. Their findings reveal mixed results of both positive and negative net trade effects for the member countries, owing to the level of protection policies pursued by countries before the FTA, level of trade flows and capacity to leverage the economies of scale. Notably, whereas countries with high pre-FTA tariffs such as Mozambique and DRC were poised to increase trade by USD 166 million and USD 146 million respectively, negative trade effects were estimated for Madagascar (USD 0.5 million) and Mauritius (USD - 0.31 million) mainly due to limited trade flows before the FTA. On the contrary, Remi (2006) assessed ECOWAS-EU Economic Partnership Agreement using the SMART model. The simulation results found that agreement would boost EU exports by USD 1.8 billion mainly driven by trade creation worth 81% of the total trade effects compared to USD 0.36 billion worth of trade diversion.

Lisandro *et al*. (2019) used a multi-country, multi-sectoral General Equilibrium model to estimate the welfare effects of the AfCTA for 45 countries in Africa. The study was based on simulation including full employment of import tariffs and partial but substantial reduction in the Non-Tariff Barriers (NTBs). Results of the study revealed significant potential welfare gains from trade liberalization in Africa. The results further showed that because of the already low intraregional import tariffs, most of the gains result from lowering the NTBs as opposed to the tariffs per se.

The reviewed studies indicate that a number of empirical methodologies have been used to study the effects of regional blocs on member and non-member countries. These include the Computable General Equilibrium model, Partial Equilibrium model (WITS-SMART) and the Excel Based simulation. Although a study has been conducted on the impact of the trade liberalization between the DRC and EAC partner states, this study analyses the potential trade impact of DRC's membership on the EAC member states, using more current data, in light of DRC's desire to join the bloc. It also goes further to provide an analysis on the effects of NTBs therein, foreseeable challenges and opportunities that could arise in terms of policy. Importantly, most studies apart from Punt and Sundrey (2016) do not utilize specific commodity tariff rates.

3. Methodology

This section presents the analytical framework and methods used in the study. Notably, the study adopts a structure and trend analysis of the trade flows between EAC partner states and DRC, and each of the two parties with the rest of the world (ROW) for the period 2010-2018. This analysis seeks to understand the competitiveness of EAC's exports to replace DRC's imports from the ROW

Secondly, to estimate the trade effects arising from DRC's membership, the paper adopts the SMART model using the most current data available of 2018. SMART is a partial equilibrium model developed by the United Nations Conference for Trade and Development (UNCTAD) and the World Bank, mainly to assess the impact of General Agreement on Trade and Tariffs (GATTs) rounds. The SMART model relies on the Armington assumption to model the behaviour of the consumers based on the assumption of imperfect substitution between different import sources (WITS, 2011).

The model is an efficient analytical tool in simulating likely economic effects of the various trade policy alternatives. First, it can be used to analyse the impact of a domestic trade reform as it provides insights into the distribution of the potential gains and losses from any contemplated policy changes. Thus, the model can be useful in predicting any adjustment costs associated with reform implementation. Second, it also provides an analytical framework of the impact of foreign trade liberalisation. For example, when preparing for trade negotiations, market access analysis helps identify the sensitive sectors where negotiation efforts should be focused (ibid). The SMART model also simulates the possible impact of a given trade policy intervention or reforms (tariff changes) for a single market on key variables including: trade flows, tariff revenue variations, economic welfare effects and other measures (Othieno & Shinyekwa, 2011).

Worth noting is that SMART being a Partial Equilibrium model has a number of advantages and disadvantages that have to be considered while doing trade and tariff analysis. One of the benefits of the SMART model is that it allows analysis at the most disaggregated level of trade data. Hence it provides the basis for tariff negotiations unlike the General Equilibrium model. Additionally, it analyses the impact of the FTA on all countries that export to a particular country, not only to partner countries (Punt & Sundry, 2016).

However Partial Equilibrium models, SMART model inclusive provide results limited to direct effects of a trade policy change in only one market thus it ignores indirect effects of trade policies. The model only allows consistent cuts in the tariffs across all the products selected in the product groups. Notwithstanding such weaknesses in the model, it is the best for analysing detailed effects of any tariff policy. In order to allow flexibility in running product specific tariff reduction and sensitivity analysis, the study adopted an Excel based simulation but based on the SMART model.

3.1 Application of the SMART WITS model and Excel simulation

The model considers elasticities that relate to the quantity changes as a result of price changes of imports. It is assumed that tariff changes are the only effects on the prices (Punt and Sunder, 2016). Hence the model assumes three elasticities namely; supply elasticity, import substitution and import demand elasticities.

The Supply elasticities: The model assumes that an increase in demand for a given product due to tariff liberalization will always be matched by the producers and exporters of that good, without any impact on the price of the good. This assumption is however unrealistic in this case given that reduction in DRC's commodity tariffs many not necessarily be accompanied by increased supply and therefore exports by the EAC countries. Accordingly, the export supply elasticity ($\mu_{i,k}$) of 10 for all products is assumed for the simulation. This implies that for every 1 percentage increase in the export price of a product, the quantity of exports of the product by a particular country will increase by 10%. This tariff is more realistic than the one proposed by Laird and Yeats (1986) and WITS (2011) of infinitely elastic elasticity. This elasticity (equal to 10) is used in the calculations of trade diversion and the trade creation under the assumption of elastic export supply. The study instead uses supply elasticities that recognize production and supply side constraints in order to be more exact. This implies that lowering and removing tariffs may not automatically lead to increased supply which is a more realistic assumption.

Import substitution elasticities define the degree of substitution between two goods from different countries. This is derived from the Armington assumption which indicates that similar goods from different countries are imperfectly substitutable. In SMART, the import substitution elasticity is considered to be 1.5 for each good. This assumption is close to the real world and therefore it was used in the study without alteration.

The Import demand elasticities measure the demand response to a shift in import price. In SMART, the import demand elasticity varies at the HS-6 level and is based on the study on the price elasticities by Stern (1976). The import demand elasticity ($\varepsilon_{i,k}$) of –1.5 for all products is assumed for the simulation. This implies that for every 1 percentage decrease in the tariff on the import price relative to the domestic (DRC) price of a product, the quantity of the product's imports from EAC partners will increase by 1.5%. The elasticity is used in the calculation of trade creation. Another important assumption made by the model is that of perfect competition, which means that tariff cuts are fully reflected in the prices paid by consumers.

Theoretically, once DRC joins the EAC trade bloc, the tariff on its commodities are reduced or eliminated altogether, then the price of these commodities will reduce by the same amount of the tariffs. Depending on EAC partner states export supply elasticity, they will increase production of commodities to trade with DRC. This is considered as trade creation as indicated where by more EAC products are demanded due to elimination of the tariffs on the exports. Trade creation is calculated in SMART as the direct increase in exports by DRC attributable to a tariff reduction. According to Jammes and Olarreaga (2005), trade creation is described by the following equation

$$TC_{i,k} = \varepsilon_{i,k} * m_{i,k} * \frac{dt_{i,k}}{(1+t_{i,k})} * \frac{1}{(1-\varepsilon_{i,k}/\mu_{i,k})} \quad (1)$$

Where $TC_{i,k}$ is the trade created from product (i) which is the value of new imports of product (i) imported by DRC from EAC partner states (k) and $\varepsilon_{i,k}$ is the elasticity of import demand with respect to domestic (DRC) price. In addition, this very tariff reduction will result into substitution of imports (since the assumption is that products are differentiated according to their country of origin), between those from EAC and ROW, hence induce demand away from other exporters.

This is referred to as a trade diversion. This trade diversion is calculated in SMART using the elasticity of substitution. Following Jammes and Olarreaga (2005), trade diversion under the assumption of elastic supply can be expressed as:

$$TD_{i,k} = \frac{m_{i,\neq k} * m_{i,k} * \frac{dt_{i,k}}{(1+t_{i,k})} * \sigma_{i,k,\neq k}\left[\frac{(m_{i,k}+m_{i,\neq k})\mu_{i,k}}{(m_{i,k}+m_{i,\neq k})\mu_{i,k}-m_{i,\neq k}}\right]}{m_{i,\neq k}+m_{i,k}+m_{i,\neq k} * \frac{dt_{i,k}}{(1+t_{i,k})} * \sigma_{i,k,\neq k}\left[\frac{(m_{i,k}+m_{i,\neq k})\mu_{i,k}}{(m_{i,k}+m_{i,\neq k})\mu_{i,k}-m_{i,\neq k}}\right]} \quad (2)$$

The price effect reflects a rise in the world price for the product whose demand increases following the tariff reduction (also known as the terms of trade effect). In other words, it is the additional import value of imports by DRC from EAC partner states because of the increased world price. In line with Punt and Sandrey (2016), under the assumption of elastic export supply, the change in world price can be expressed as:

$$dp^{w}_{i,k} = \frac{TC_{i,k}+TD_{i,k}}{\mu_{i,k}} \quad (3)$$

The total trade effect is calculated as the sum of three effects; trade creation, trade diversion and the price effect as shown below

$$TT_{i,k} = TC_{i,k}+TD_{i,k}+dp^{w}_{i,k} \quad (4)$$

Where $dp^{w}_{i,k}$ is the change in world price (price received by exporter) of product (*i*) exported by EAC partner states (*k*). The Excel spreadsheet simulation only reports the price effect for the partner country.

3.2 Data used

The study utilized trade data obtained from Trade Map from the International Trade Centre (ITC). To understand the patterns of trade between EAC and DRC, import and export data for the period 2010-2018 was selected at 2 digit HS level. Furthermore, the most recent data (2018) for each EAC partner state was used at the highest level of disaggregation available (6 digit HS level) for trade effects analysis. Noteworthy, South Sudan was not considered in this analysis on the account that it had just joined the EAC hence her trade data was not available in the ITC data base.

The pre-liberalisation, MFN rate data for DRC as an importer was used obtained from Market Access Map at 6 digit of HS level disaggregation. The post-FTA MFN rates were set at zero representing a total trade liberalisation. Worth noting is that DRC liberalized its tariff structure in 2011, into four bands of 0%, 5%, 10% and 20% to reduce duties on raw materials and other inputs with a view to stimulating economic growth **(Table 1)**. The zero rate is applicable to a few commodities that include postage stamps, stamped paper and coins. The 5% rate applies to capital goods, raw materials, agricultural and livestock inputs, pharmaceutical inputs, milk and other infant food preparations. The 10% rate applies to parts, components, accessories and sub-assemblies intended for assembly under Medium Knocked Down (MKD), staple food stuffs, spare parts and industrial inputs whereas the 20% rate applies on other finished products. With DRC's membership in the EAC trade bloc, it is assumed that all imports from the other partner states will be exempted from tariffs and the country will adopt a common external tariff on imports from non-member countries outside the bloc

Table 1: Distribution of MFN tariff duties for DRC

Pre-TFA tariff	Number of tariff lines	Proposed tariffs	Proportion
0%	23	0%	0.4
5%	1,963	0%	33.6
10%	2,121	0%	36.3
20%	1,718	0%	29.4

Source: WTO (2016)

4. Results

4.1 EAC Export trade with DRC (2010-2018)

Table 2 presents the available official data on merchandise export trade between the EAC countries and DRC from 2010 to 2018. Generally, all EAC member states are net exporters to DRC with Rwanda and Uganda being the largest trade partners while Burundi has the lowest export values. Notably, EAC's exports have more than doubled from USD 419 million to USD 855 million between 2010 and 2018. Relatedly, imports from DRC in the same period equally increased albeit by a lesser 28 percent.

The data reveals that in 2010, Uganda and Tanzania were the leading EAC exporters to DRC valued at USD 183 million and USD 156 million respectively. The two have been surpassed by Rwanda whose trade has drastically grown by 120 percent to USD 337 million in 2018. Notably, the DRC currently stands as the main export destination for Rwanda and accounts for 75 percent of the country's exports. On the other hand, Burundi's export trade to DRC has increasingly dwindled compared to other EAC partner states mainly owing to an underdeveloped manufacturing sector coupled with the aftermath of civil unrest in the country in 2015 that could hindered trade and production. Hence, trends in export data suggest that DRC's membership is likely to witness growth in export trade flows to the EAC bloc. More succinctly, trade effects and export trade accrued to Rwanda and Uganda to DRC are poised to be largest compared to other EAC members.

Table 2: Formal trade between EAC and DRC for the period 2010-2018 ('000' USD)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018
Panel A: Exports									
Uganda	183,992	182,441	240,881	268,175	181,680	152,561	176,921	189,606	204,309
Kenya	61,352	198,443	218,294	214,063	239,380	211,063	197,480	182,612	149,800
Tanzania	156,081	128,102	187,353	237,559	281,493	198,290	157,428	114,323	144,926
Burundi	269	10,434	141	12,079	28,400	28,272	27,471	26,648	18,904
Rwanda	18,137	44,620	109,300	114,991	153,607	193,631	202,979	280,789	337,443
Total	**419,831**	**564,040**	**755,969**	**846,867**	**884,560**	**783,817**	**762,279**	**793,978**	**855,382**
Panel B: Imports									
Uganda	7,278	6,354	12,223	6,751	5,917	3,641	2,532	4,870	34,492
Kenya	6,770	28,958	10,470	6,521	2,954	1,304	2,053	4,881	12,723
Tanzania	134	403	906	110	825	628	338	967	559
Burundi	5,330	6,342	3,854	3,712	50	3,849	987	3,923	2,785
Rwanda	30,918	16,675	10,414	9,300	10,722	11,010	9,105	12,716	14,290
Total	**50,430**	**58,732**	**37,867**	**26,394**	**20,468**	**20,432**	**15,015**	**27,357**	**64,849**

Source: Trade Map (2019)

To better understand the sectoral composition of EAC-DRC exports, Table 3 summarizes the average export trade for the top 25 commodities. The products represent 81.1 percent of the total EAC exports to DRC, implying that they account for the largest share of total export trade. Analysis of EAC export trade with DRC reveals that exports are predominantly primary products that include and ores and metals, mineral fuels, agricultural commodities and food and beverages. For instance, the top 6 exports which account for 44.5 percent of the total exports are all primary products. These are mineral fuels (USD 73 million), Iron and steel (USD 59 million), Cereals (USD 52 million) cement (USD 46 million) Vegetable/animal Oil (USD 49 million) and, minerals and ores (USD 49 million). The structure of exports is mainly explained by limited value addition and manufacturing sector in the EAC partner states. Hence, from a sectoral perspective, membership of DRC is likely to increase EAC's export trade skewed towards primary commodities compared to manufactured/processed goods.

Table 3: Average EAC's export trade to DRC between 2010-2018 in '000' USD

HS CODE	Total exports	749,598	100%
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	73,920	9.9
72	Iron and steel	59,342	7.9
11	Products of the milling industry; malt; starches; inulin; wheat gluten	55,034	7.3
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal ...	49,284	6.6
25	Salt; sulphur; earths and stone; plastering materials, lime and cement	49,246	6.6
24	Tobacco and manufactured tobacco substitutes	46,192	6.2
39	Plastics and articles thereof	38,245	5.1
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial ...	33,129	4.4
22	Beverages, spirits and vinegar	31,328	4.2
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	26,040	3.5
73	Articles of iron or steel	24,120	3.2
17	Sugars and sugar confectionery	22,698	3.0
63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	14,720	2.0
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; ...	14,689	2.0
64	Footwear, gaiters and the like; parts of such articles	13,916	1.9
48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	11,687	1.6
84	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	11,037	1.5
21	Miscellaneous edible preparations	10,428	1.4
20	Preparations of vegetables, fruit, nuts or other parts of plants	9,410	1.3
76	Aluminium and articles thereof	6,397	0.9
68	Articles of stone, plaster, cement, asbestos, mica or similar materials	3,645	0.5
30	Pharmaceutical products	3,551	0.5
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring ...	3,519	0.5
67	Prepared feathers and down and articles made of feathers or of down; artificial flowers	1,179	0.2

Authors' computations based on Trade map trade data (2019)

4.2 DRC's import trends with EAC and the ROW, 2010-2018

Table 4 presents the average import trade for DRC's top 22 imports from the ROW for the period 2010-2018. Noteworthy, these imports represent 78 percent of the total imports implying that they comprise the largest proportion of DRC's import bill. A critical analysis of these commodities reveals that DRC mainly imports high value commodities that include machinery, electronics, motor vehicles and pharmaceutical products which EAC cannot competitively produce.

Overall, the EAC member countries have 13.1 percent market share of DRC's total imports, however the share is much lower at 5.5 percent for the top 5 high value products that account for 40 percent of the total import products. More succinctly, the EAC region possess a low market share in most of these high value imports such as machinery (1.4%), electrical machinery (8.3%), vehicles (6.5%), and pharmaceuticals (1.2%). This is largely attributed to limited capacity or technological advancement to produce these high technology products. Even for the goods that are produced in the EAC countries, the region commands a smaller market share averaging 20.9 percent which presents an opportunity to scale up production to supply this market. For instance, EAC's market share for plastics stands at 16.7%, mineral fuels (17.2%), iron and steel (36.3%), soap and its articles (37.2%). This is explained by limited production in EAC countries characterized by an underdeveloped manufacturing sector. Conclusively, these results suggest that building capacity in production of high value technology products such as machinery, vehicles and electrical appliances, while scaling production in light manufactured goods like soap and salt is vital to tap into a huge DRC export market.

Table 4: DRC's top imports from the World (2010-2018) in USD 000s

HS CODE	Products	Imports from the world	% world imports	% EAC market share
	Total imports	6,098,728	100	13.1
84	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	798,240	13.1	1.4
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers,	506,527	8.3	1.2
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances...	429,367	7.0	17.2
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	394,703	6.5	6.6
30	Pharmaceutical products	295,871	4.9	1.2
73	Articles of iron or steel	283,292	4.6	8.5
39	Plastics and articles thereof	228,793	3.8	16.7
25	Salt; sulphur; earths and stone; plastering materials, lime and cement	223,569	3.7	22.0
28	Inorganic chemicals; organic or inorganic compounds of precious metals, , ...	191,840	3.1	2.3
72	Iron and steel	163,597	2.7	36.3
02	Meat and edible meat offal	141,484	2.3	1.0
11	Products of the milling industry; malt; starches; inulin; wheat gluten	128,536	2.1	42.8
17	Sugars and sugar confectionery	125,478	2.1	18.1
3	Fish and crustaceans, molluscs and other aquatic invertebrates	120,708	2.0	4.9
10	Cereals	115,766	1.9	29.1
15	Animal or vegetable fats and oils and their cleavage products; prepared edible	103,504	1.7	47.6
22	Beverages, spirits and vinegar	96,543	1.6	32.4
63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	91,258	1.5	16.1
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial	89,101	1.5	37.2
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; ...	81,093	1.3	18.1
40	Rubber and articles thereof	72,571	1.2	2.6
64	Footwear, gaiters and the like; parts of such articles	69,175	1.1	20.1
	The total proportion for the top 22 products imported by DRC		**77.9**	

Source: Authors computation based on Trade map data (2019)

To further illustrate dominance of DRC's imports by manufactured products, analysis of the 20 top exporters of the DRC (2010-2018) include China, South Africa, Zambia, Belgium, USA, and France among others (Figure 5). These are countries with advanced manufacturing sectors that account for the lion's share of DRC's imports from the world. Noteworthy, China, South Africa, Belgium and France are big producers of machinery, pharmaceuticals and other manufactured products. For instance between 2010 and 2018, China's share in DRC imports more than doubled from 11 percent to 23.9 percent mainly due to growth of imports in machinery, electronics and pharmaceuticals. On the other hand, Kenya is the only EAC country that can compete favourably with these exporters, mainly due to a more developed manufacturing sector, however its share in DRC's imports is declining.

Table 5: Top sources of DRC's imports by percentage share (2010-2018)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
China	11.0	14.1	13.0	13.5	19.7	22.0	19.7	18.2	23.9
South Africa	19.6	18.7	23.0	19.3	17.9	16.0	15.5	16.5	17.4
Zambia	7.5	9.9	12.5	16.9	11.6	8.4	8.0	9.9	11.7
Belgium	8.3	7.5	7.0	6.9	6.1	7.4	7.6	8.3	5.5
France	5.3	4.2	4.3	4.2	3.0	4.2	5.1	2.7	1.7
Netherlands	2.9	2.6	2.2	2.2	2.2	1.6	1.7	3.3	4.0
India	0.3	0.1	1.9	2.1	3.2	5.0	4.6	3.9	3.8
Kenya	**3.7**	**3.4**	**3.4**	**3.0**	**3.5**	**3.3**	**3.9**	**3.4**	**2.0**
Germany	2.9	2.7	2.6	3.0	2.5	2.5	1.8	1.5	1.4
USA	2.2	2.8	3.1	2.4	2.6	2.1	1.6	1.4	1.1
Percent of total imports	**73.8**	**73.2**	**83.1**	**84.1**	**83.5**	**82.6**	**83.2**	**83.1**	**83.6**

Source: Authors' computations based on Trade map data 2019

4.3 Trade effects of the trade liberalization between EAC and DRC

The trade effects arising from the trade liberalization are derived from the sum of the trade creation, price changes and diversion effects. While trade creation and trade diversion effects depict the impact of free trade on quantity, price effect represents the additional export value from increased world price. Table 6 summarizes these effects and suggests a positive net trade effect across all the EAC partner states. Notably, Rwanda and Uganda will be the biggest beneficiaries of the trade effect from DRC's membership in the EAC, with export trade expected to increase by USD 81.2 million and USD 60.4 million respectively. This could be explained by the fact that the two countries enjoy the geographical advantage over Kenya and Tanzania which reduces the transactional cost to trade with DRC. In addition, it is noted in Cuts international (2015) that trade between Rwanda and DRC is facilitated by strong traders' associations that enjoy the economies of scale unlike other EAC countries.

In addition, Tanzania exports will grow by USD 50.2 million, Kenya by USD 42.5 million and Burundi by USD 6.2 million. In terms of trade creation, Rwanda's trade to DRC will increase by a total of USD 42.6 million, equivalent to a 13 percent share of the current export trade while Uganda's trade creation amounts to USD 28.8 million equivalent to a 14% increase in exports to DRC. Noteworthy, more trade across all EAC partner states will be created than diverted from the

ROW economies on account of the increased market access into previously restricted DRC market. Similarly, the two countries will have the greatest trade diversion effect arising from diversion of trade from non-EAC partner states. A total of USD 31.1 million worth of export trade will be diverted to Rwanda while USD 26.0 million worth trade will be diverted to Uganda. Worth noting is that EAC will experience a positive trade effect of USD 240.7 million equivalent to a 28 percent growth of EAC export trade with DRC. Overall, the magnitude of the trade effects from trade liberalization are explained by the GDP structure, trade flows of specific member countries and the level of pre-FTA trade tariffs between EAC countries and DRC.

Table 6: The trade effects of the EAC countries in thousand Dollars

	Uganda	Rwanda	Tanzania	Kenya	Burundi	Total EAC
Trade creation from DRC	28,886	42,651	24,780	21,763	2,808	120,888
Trade creation as % of initial exports to DRC	14	13	17	15	15	14
Trade diversion from Rest of World	26,049	31,153	20,866	16,963	2,861	97,892
Trade diversion as % of initial exports to DRC	13	9	14	11	15	11
Price effect from trade with DRC	5,494	7,380	4,565	3,873	567	21,879
Price effect as % of initial exports to DRC	3	2	3	3	3	3
Total trade effect for EAC Partners states trade to DRC	60,429	81,185	50,210	42,598	6,236	240,658
Total trade effect as % of initial exports to DRC	30	24	34	29	33	28

Source: Authors' computations based on the SMART-WITS simulation

4.4 Sectoral distribution of trade effects

A detailed sectoral analysis of net trade effect by product classification (HS) reveals that EAC's greatest trade gains lie in processed food stuff and beverages, mineral products, agriculture and metal products which account for 27.8%, 18.0%, 15.6% and 10.0% of the total trade effect respectively (Table 7). Worth noting also is that even with FTA in place, there will be limited trade in high value manufactured products such as machinery and electrical equipment products.

At a country level, Uganda possess a competitive edge in the export of food stuffs and beverage products mainly because of the country's agricultural production potential and its recent pursuit for the agro-industrialization strategy and value addition. Rwanda and Tanzania will gain the greatest in the trade of raw agricultural products. It is important to note that Rwanda's greatest trade gain estimated at USD 4.5 million is attributed to the recent growth of the industry and the total ban on the second hand clothes that has attracted domestic textile industries to grow and more export textile products

Further, Kenya and Uganda will be the main EAC contenders for the export market in metal products in the DRC. Tables A(I-IV) (Appendix) show that the main processed food stuffs with the greatest trade gains include palm oil and its fractions, sugar, beer from malt and broken rice and mineral products including Portland cement, petroleum products and electricity**.** In addition, metals include iron and steel and articles of steel. The main agricultural products with the highest trade gains include wheat or meslin flour, maize flour, broken rice and food preparations.

Noteworthy, Agriculture and agro-processing are key sectors poised to benefit as a result of EAC trade liberalization with DRC. As such, the nature of their industrial linkage presents a great opportunity for EAC countries to increase trade with DRC through pursuing an agro-industrialization strategy. Similarly, the anticipated high trade gains in metal and mineral products calls for EAC partners to strengthen and develop their manufacturing sectors.

Table 7: EAC's net trade effect by HS product classification (USD 000s)

HS CODE	Sector	Uganda	Kenya	Rwanda	Tanzania	Burundi	EAC share
0-15	Agriculture	699	3,241	28,230	3,589	2,410	15.6
16-24	Foodstuffs & Beverages	29,737	15,075	9,305	10,948	2,688	27.8
25-27	Mineral Products	8,339	2,404	23,593	9,142	494	18.0
28-38	Chemicals/Allied Industries	2,263	6,367	4,928	7,732	38	8.7
39-40	Plastics / Rubbers	3,211	2,519	1,232	2,689	30	4.0
41-43	Hides, Skins, Leather,	17	3	174	250	2	0.2
44-49	Wood & Wood Products	1,017	467	1,084	780	2	1.4
50-63	Textiles	2,457	1,375	4,556	230	76	3.6
64-67	Footwear / Headgear	492	2,717	1,758	1,193	1	2.5
68-71	Stone / Glass	56	1,231	1,232	1,387	11	1.6
72-83	Metals	8,987	10,145	2,923	2,847	177	10.3
84-85	Machinery / Electronics	604	859	2,063	195.9	164	1.6
86-89	Transportation	3,634	459	1,347	109	298	2.4
90-97	Miscellaneous	956	1,545	2,057	1,191	37	2.4

Source: Authors' computations based on the SMART-WITS simulation

To delve into the details of the particular products that yield the largest trade margins in the sectors highlighted above, Table 8 presents the top 5 products with the highest trade effects in each of the EAC partner states. Burundi will derive the highest trade effects from the export of wheat, beer, petroleum products while Uganda's lie in palm oils, iron and steel products, Portland cement and cereals. Kenya's trade gains lie in cigarettes, iron and steel products and palm oil while Tanzania's will be in export of cigarettes, cement, soap and its fractions and iron and steel products. Noteworthy iron and steel, palm oil petroleum products, cement and sugar are the common products that yield highest trade gains to the EAC partner states thus calling for increased production to tap into the DRC market.

Table 8: Top five products with the highest trade effects in EAC partner states[1]

Uganda	**Trade effect (USD 000s)**
Palm oil and its fractions	8,219
Iron and steel products	7,329
Portland cement	6,816
Cane or beet sugar	6,483
Cereals	4,152
Burundi	
Beer	2,203
Petroleum products	625
Motor vehicles	225
Iron and steel products	162
Rwanda	
Petroleum products	21,276
Cereals	13,968
Palm oil and its fractions	10,949
Worn clothes	3,529
Cane or beet sugar	1,853
Tanzania	
Cigarettes	8,072
Quick lime and cement	6,443
Soap and its fractions	3,958
Wheat and mensulin	2,508
Iron and steel products	1,537
Kenya	
Cigarettes	7,063
Iron and steel products	6,558
Food preparations	3,066
Soap and its fractions	2,895
Palm oil and its fractions	1,962

Source: Authors' computations based on the SMART-WITS simulation

[1] The detailed breakdown of the top 20 products with highest trade effects is in the Appendix section

5. Conclusion and policy implications

The paper seeks to examine the likely trade effects of DRC's membership in the EAC. More succinctly, to establish trade effects of liberalising trade between EAC partner states and consequently reveal the main sectors that will benefit as a result of this trade liberalisation. Analysis of the trade flows between 2010 and 2018 reveals that EAC bloc possesses a positive trade balance with DRC estimated at 790 million USD in 2018. With tariff liberalisation under FTA, this positive trade balance is likely to translate into increased export volumes from EAC states mainly driven by Rwanda and Uganda, the leading sources of DRC's imports in the bloc. Notwithstanding this anticipated growth in exports, the EAC bloc still accounts for a smaller 11 percent of her imports; and only 5 percent of the DRC's top 4 imports from the world that include machinery, electrical equipment, vehicles and articles of iron and steel. Thus, in the short run, the EAC bloc will not satisfactorily supply these goods to DRC owing to limited technological capacity to produce these products. On the other hand, EAC imports primary products (agriculture and mineral ores) from DRC but still in smaller quantities given that EAC equally produces the same products. Hence, even with trade liberalisation, EAC imports are not likely to increase significantly as these same primary products are available on the EAC domestic market.

Simulations for the trade effects suggest a positive effect among the EAC partner states, with Rwanda and Uganda reaping the highest trade gains. More succinctly, DRC's membership in the EAC is poised to increase Rwanda's exports by USD 81 million; Uganda, USD 60 million; Tanzania, USD 50 million; Kenya, USD 42 million and Burundi, USD 6 million. In terms of the percentage share, the trade liberalization will increase current trade with Uganda by 30 percent, 28 percent for Rwanda, 34 percent for Tanzania, 29 percent for Kenya and 33 percent for Burundi. Notably, majority of increase in this trade is attributed to trade creation (as a result of new exports from EAC to DRC initially sourced from non EAC countries). A critical analysis of the key sectors that are likely to boost export trade with DRC shows that the bloc harvests largest gains from agriculture, agro processing (food and beverages), mineral products and metal industries. Specifically, Tanzania and Rwanda's largest gains are in the export of agricultural products; Uganda and Tanzania will reap the largest trade benefits from agro processing; while Kenya and Uganda experience the highest trade gains in metal products (iron and steel),.

Overall, DRC's membership is likely to have a positive effect on the bloc's exports mainly driven by trade creation as EAC is poised to be a cheaper source for DRC's imports compared to ROW. Nonetheless, these exports are largely dominated by primary goods rather than high value manufactured products. In light of these findings, EAC Partners states should adopt a long term strategy of building their capacity in the production of high technology products such as machinery, electrical equipment and motor vehicles which are DRC's leading imports to overcome supply constraints. In short run, the EAC members can establish themselves as re-export/ assembling hubs to supply high value manufactured products such as electronics and machinery, with a strategy to manufacture these products themselves.

To tap into the vast market for food stuffs, there is need to develop agro-processing industries (food) to add value to raw agricultural products especially sugar and palm oil and cereals alongside investing in commercial agricultural production to supply inputs to the agro-food industries. To increase the exports of iron and steel products, the government should promote the growth of the

iron and steel industry production and attract private investment to overcome the supply constraints.

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APPENDICES

Table AI: Kenya's top 20 commodities with highest Trade effect

HSCODE	Products	Trade effect
240220	Cigarettes, containing tobacco	6,083
210690	Food preparations, n.e.s.	3,066
721061	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, hot-rolled or cold-rolled ...	2,943
340220	Surface-active preparations, washing preparations, auxiliary washing preparations and cleaning ...	2,403
151190	Palm oil and its fractions, whether or not refined (excluding chemically modified and crude)	1,962
721070	Flat products of iron or non-alloy steel, of a width of >= 600 mm, hot-rolled or cold-rolled ...	1,912
300490	Medicaments consisting of mixed or unmixed products for therapeutic or prophylactic purposes, ...	1,746
721041	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, hot-rolled or cold-rolled ...	1,703
271019	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, ...	1,342
640192	Waterproof footwear covering the ankle, but not the knee, with outer soles and uppers of rubber ...	1,154
170490	Sugar confectionery not containing cocoa, incl. white chocolate (excluding chewing gum)	1,081
681181	Corrugated sheets of cellulose fibre-cement or the like, not containing asbestos	1,078
240290	Cigars, cheroots, cigarillos and cigarettes consisting wholly of tobacco substitutes	980
170410	Chewing gum, whether or not sugar-coated	663
252329	Portland cement (excluding white, whether or not artificially coloured)	655
940370	Furniture of plastics (excluding medical, dental, surgical or veterinary, and seats)	582
220830	Whiskies	560
940421	Mattresses of cellular rubber or plastics, whether or not covered	527
392410	Tableware and kitchenware, of plastics	499
340111	Soap and organic surface-active products and preparations, in the form of bars, cakes, moulded ...	492

Table AII: Tanzania's top 20 commodities with the highest trade effect

240220	Cigarettes, containing tobacco	8,072
340119	Soap and organic surface-active products and preparations, in the form of bars, cakes, moulded ...	1,513
252210	Quicklime	3,070
110100	Wheat or meslin flour	3,958
252329	Portland cement (excluding white, whether or not artificially coloured)	2,508
252230	Hydraulic lime (excluding pure calcium oxide and calcium hydroxide)	1,218
310230	Ammonium nitrate, whether or not in aqueous solution (excluding that in pellet or similar forms, ...	1,566
251990	Fused magnesia; dead-burned "sintered" magnesia, whether or not containing small quantities ...	1,807
392490	Household articles and toilet articles, of plastics (excluding tableware, kitchenware, baths, ...	1,033
701090	Carboys, bottles, flasks, jars, pots, phials and other containers, of glass, of a kind used ...	1,210
220210	Waters, incl. mineral and aerated, with added sugar, sweetener or flavour, for direct consumption ...	780
271019	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, ...	702
720854	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, not in coils, simply ...	589
220290	Non-alcoholic beverages (excluding water, fruit or vegetable juices and milk)	560
960500	Travel sets for personal toilet, sewing or shoe or clothes cleaning (excluding manicure sets)	989
330499	Beauty or make-up preparations and preparations for the care of the skin (other than medicaments), ...	500
730661	Tubes and pipes and hollow profiles, welded, of square or rectangular cross-section, of iron ...	660
721041	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, hot-rolled or cold-rolled ...	700
220710	Undenatured ethyl alcohol, of actual alcoholic strength of >= 80%	548
340213	Non-ionic organic surface-active agents, whether or not put up for retail sale (excluding soap)	325

Table AIII: Burundi's top 20 commodities with highest Trade effect

110100	Wheat or meslin flour	2,396
220300	Beer made from malt	2,203
271019	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, ...	210
271012	Light oils and preparations, of petroleum or bituminous minerals which >= 90% by volume "incl. ...	226
240220	Cigarettes, containing tobacco	400
870333	Motor cars and other motor vehicles principally designed for the transport of persons, incl. ...	154
721041	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, hot-rolled or cold-rolled ...	150
630900	Worn clothing and clothing accessories, blankets and travelling rugs, household linen and articles ...	61
252329	Portland cement (excluding white, whether or not artificially coloured)	54
841830	Freezers of the chest type, of a capacity <= 800 l	59
843049	Boring or sinking machinery for boring earth or extracting minerals or ores, not self-propelled ...	17
870899	Parts and accessories, for tractors, motor vehicles for the transport of ten or more persons, ...	25
870332	Motor cars and other motor vehicles principally designed for the transport of persons, incl. ...	37
870323	Motor cars and other motor vehicles principally designed for the transport of persons, incl. ...	34
521215	Woven fabrics of cotton, containing predominantly, but < 85% cotton by weight, other than those ...	9
852859	Monitors, not incorporating television reception apparatus (excluding with cathode ray tube ...	28
870590	Special purpose motor vehicles (other than those principally designed for the transport of ...	8
220429	Wine of fresh grapes, incl. fortified wines, and grape must whose fermentation has been arrested ...	27
721499	Bars and rods, of iron or non-alloy steel, only hot-rolled, only hot-drawn or only hot-extruded ...	13
870423	Motor vehicles for the transport of goods, with compression-ignition internal combustion piston ...	6

Table AIV: Rwanda's top 20 commodities with the highest trade effect

271012	Light oils and preparations, of petroleum or bituminous minerals which >= 90% by volume "incl. ...	12,579
271019	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, ...	8,697
151190	Palm oil and its fractions, whether or not refined (excluding chemically modified and crude)	7,483
100630	Semi-milled or wholly milled rice, whether or not polished or glazed	6,480
110100	Wheat or meslin flour	5,899
630900	Worn clothing and clothing accessories, blankets and travelling rugs, household linen and articles ...	3,529
252329	Portland cement (excluding white, whether or not artificially coloured)	2,133
170199	Cane or beet sugar and chemically pure sucrose, in solid form (excluding cane and beet sugar ...	1,853
190531	Sweet biscuits	1,802
151620	Vegetable fats and oils and their fractions, partly or wholly hydrogenated, inter-esterified, ...	1,801
151219	Sunflower-seed or safflower oil and their fractions, whether or not refined, but not chemically ...	1,665
220290	Non-alcoholic beverages (excluding water, fruit or vegetable juices and milk)	1,594
340119	Soap and organic surface-active products and preparations, in the form of bars, cakes, moulded ...	1,593
110220	Maize "corn" flour	1,590
340220	Surface-active preparations, washing preparations, auxiliary washing preparations and cleaning ...	1,448
640220	Footwear with outer soles and uppers of rubber or plastics, with upper straps or thongs assembled ...	1,398
721430	Bars and rods, of non-alloy free-cutting steel, not further worked than hot-rolled, hot-drawn ...	901
100640	Broken rice	727
870333	Motor cars and other motor vehicles principally designed for the transport of persons, incl. ...	720
10290	Live bovine animals (excluding cattle and buffalo)	699

Table AV: Uganda's top 20 commodities with highest trade effect

151190	Palm oil and its fractions, whether or not refined (excluding chemically modified and crude)	8,219
252329	Portland cement (excluding white, whether or not artificially coloured)	6,816
170199	Cane or beet sugar and chemically pure sucrose, in solid form (excluding cane and beet sugar ...	6,483
220300	Beer made from malt	2,743
100640	Broken rice	2,653
190531	Sweet biscuits	2,396
721049	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, hot-rolled or cold-rolled ...	2,368
110100	Wheat or meslin flour	1,499
730690	Tubes, pipes and hollow profiles "e.g., open seam, riveted or similarly closed", of iron or ...	1,479
271019	Medium oils and preparations, of petroleum or bituminous minerals, not containing biodiesel, ...	1,402
870323	Motor cars and other motor vehicles principally designed for the transport of persons, incl. ...	1,396
731700	Nails, tacks, drawing pins, corrugated nails, staples and similar articles of iron or steel, ...	1,284
721420	Bars and rods, of iron or non-alloy steel, with indentations, ribs, groves or other deformations ...	1,205
871120	Motorcycles, incl. mopeds, with reciprocating internal combustion piston engine of a cylinder ...	1,036
721041	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, hot-rolled or cold-rolled ...	993
940421	Mattresses of cellular rubber or plastics, whether or not covered	876
391723	Rigid tubes, pipes and hoses, of polymers of vinyl chloride	709
200290	Tomatoes, prepared or preserved otherwise than by vinegar or acetic acid (excluding whole or ...	688
220860	Vodka	675
392190	Plates, sheets, film, foil and strip, of plastics, reinforced, laminated, supported or similarly ...	655