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Abstract

The European Union (EU) market is critical for Kenya in achieving the goals of the Kenya National Export Development and Promotion Strategy, especially realization of an export-led growth. Despite the EU market accounting for over 51.3 per cent of Kenya's untapped export potential, few studies have examined the competitiveness implications of key market access factors such as tariff barriers, technical regulations, and standards on Kenyan firms exporting to the market. Using panel data spanning 2007-2020, the results demonstrate that higher preferential margins emanating from trade agreements are associated with an increase in export competitiveness and the number of products per exporter, but a decline in the number of exporters per product as firms embrace specialization. Larger preferential margins are associated with a rise in number of technical regulations and standards that must be complied with to access the EU market. Higher technical regulations are associated with an increase in export competitiveness, the number of products per exporter, and the number of exporters per product. Since regulations promote fair trade practices and are legally binding, they enhance export competitiveness. Higher number of standards is associated with an increase in export competitiveness, but a decline in the number of products per exporter and the number of exporters per product as firms differentiate and specialize in a few products. On export competitiveness, the results point to a need to strengthen domestic capacity especially among MSMEs to comply with existing technical regulations and standards for enhanced competitiveness. In terms of the number of products per exporter, the findings point to a need for enhanced cooperation in quality management and assurance through capacity building. Regarding the number of exporters per product, the findings indicate that there is a need to build functional ties between institutions from developing countries and those from the EU for enhanced access to information and improved compliance.

Abbreviations and Acronyms

EAC	East African Community
EU	European Union
GSP	Generalized System of Preference
ACP	African, Caribbean, and Pacific
EPA	Economic Partnership Agreement
ROO	Rules of origin
MSMEs	Micro, Small, and Medium Enterprises
HHI	Herfindahl-Hirschman Index
IO	Industrial organization

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1.   Introduction

Over the last few decades, trade agreements have greatly facilitated the exchange of commodities between countries (Huang, 2010). Trade liberalization has been primarily viewed as a strategy for promoting market integration and economic progress. Parallel to this, countries have established a plethora of safety and quality standards to address various hazards related to the safety and quality of traded commodities (Tallontire et al., 2011). Accordingly, standards and technical regulations have been identified as some of the enablers of the economies and key facilitators for accessing target export markets.

The Kenya's Integrated National Export Development and Promotion Strategy aims at realizing 25 per cent annual growth in exports. To achieve an export-led growth, there is need to enhance export competitiveness in markets where the country has the largest untapped export potential. The EU market takes up over 22.4 per cent of total Kenyan exports and comprises of over 51.3 per cent of Kenya's untapped export potential (Table A1). Because of the untapped market potential, EU is an extremely important market for Kenya in achieving the country's export development and promotion goals and improving on its export competitiveness.

Currently, Kenyan exports enjoy duty reductions and quota-free access to the European Union (EU) market under the interim Economic Partnership Agreement (EPA) between the EU and the East African Community (EAC),[1] which has been in force since 2008, and the EU's Generalized Systems of Preference (GSP) that has been in force since 1971. In addition, the trade arrangement is expected to provide preferential margins for Kenyan exports by lowering market entry barriers that may limit Kenyan exporters' access to the European Union market.

However, despite Kenyan exports enjoying duty-reductions and quota-free access to the European Union (EU) market and the trade arrangement encouraging cooperation in the field of standardization, certification, and quality assurance to eradicate unnecessary technical barriers, Kenyan exporters still encounter difficulties in complying with labelling requirements, rules of origin, and phytosanitary controls while accessing the EU market (Carbone, 2018; Kareem et al., 2016). As a result, the study aims to establish the effect of trade agreements, technical regulations, and standards on competitiveness of Kenyan firms exporting to the EU and proffer policy recommendations that will enhance Kenya's export competitiveness to EU markets.

An important stylized fact is that EU countries offering the largest preferential margin to Kenyan exporting firms through provision of the largest reduction of tariff barriers to market access are the very same countries with the largest number of technical measures regulating entry of Kenyan exporters to their markets. The implication is that despite the existence of a trade agreement, which significantly reduces tariff barriers to market entry, exporting firms find it hard to access the EU market due to introduction of technical regulations on exports.

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[1] The EAC-EU Economic Partnership Agreement meant to operationalize the African, Caribbean, and Pacific (ACP)/Cotonou Agreement with EU within the eastern bloc of the African continent.

Although existing studies have demonstrated that trade agreements, regulations, and standards influence export competitiveness (Catherine and Ekaterina, 2015; Sun and Reed, 2010; Volpe et al., 2011; Rose, 2007; Gil et al., 2008), few have examined the implications of the three on competitiveness of Kenyan firms exporting to the European Union. Additionally, even though trade agreements increase developing countries' access to markets, some studies indicate large variations in tariff equivalents (Nimenya et al., 2012), which mostly take the form of technical regulations and standards implemented by the EU importing countries for products enjoying large preferential margins. Other studies that have examined trade agreements, the focus has been from the prism of volume and direction of exported goods, foreign direct investment (FDI) and geopolitical dimensions (Egger and Larch, 2011; Capling, 2008), with little focus on competitiveness. Even studies that have come close to examining the link between trade agreements and competitiveness (Arnold, 2006), the focus has mainly been on labour and the development process.

Results from this study add to the existing literature on the competitiveness implications of trade agreements, regulations, and standards on Kenyan firms exporting to the European Union. First, the results indicate that higher preferential margins emanating from trade agreements are associated with increase in market power and the number of products per exporter, but a decline in the number of exporters per product. Second, the findings indicate that the higher number of technical regulations is associated with improvement in market competitiveness, the number of products per exporter, and the number of exporters per product (extensive margin). Third, a rise in the number of standards that exporting firms should satisfy is associated with a rise in market power, but a decline in the number of products per exporter and the number of exporters per product. The policy implications of these findings are not limited to Kenyan firms exporting to the European Union; they extend to firms from other developing countries exporting to the market.

2.   Trade Agreements, Technical Regulations, and Standards

2.1   Trade Agreements

Trade agreements liberalize custom tariffs and thus reduce market access barriers related to tariffs. In absence of a trade agreement, the Most Favoured Nation (MFN) tariff would prevail. The effectively applied tariff rate in the presence of a trade agreement is therefore lower than the MFN tariff. The difference between the MFN tariff that would prevail in absence of a trade agreement and the effectively applied tariff rate that exists in presence of a trade agreement is the preferential margin and it measures the amount of tariff barriers eliminated by tariff liberalization.

Kenya has been trading with the EU under the interim EAC-EU Economic Partnership Agreement (EPA) that has been in force since 2008. The agreement has seen majority of the European Union countries significantly reduce tariff barriers to Kenyan exports to the bloc below the Most Favoured Nation (MFN) tariffs that would exist in absence of an agreement. Under the agreement, the trade and economic cooperation between individual EAC members and EU members would foster smooth and gradual integration of the African, Caribbean, and Pacific (ACP) countries into the world economy while considering priorities for development and levels of development of individual partner countries. The EPA is consistent with principles and objectives of the Cotonou Agreement, especially provisions of Part 3 Title II on economic and Trade Cooperation. Under the agreement, EAC member countries would experience sustained growth, increased production, investment, technology, employment, and diversification. This would improve competitiveness of the exporters, especially Kenyan firms exporting to the EU market.

Further review on EU market indicates that despite the EU having made huge progress towards harmonization of tariff and non-tariff measures (technical regulations and standards),[2] there exists noticeable variations in effectively applied tariff rates and enforced non-tariff measures across individual member countries and across specific products (see Table Appendix Table A2 and A3). The EAC-EU EPA anticipates variations in effectively applied tariff rates by providing that "The basic customs duty to which the successive reductions are to be applied shall be that specified in each party's tariff schedule for each product" (Article 6 on customs duty). Existing literature corroborates this observation by noting that the EU cannot be considered a single unit pertaining non-tariff measures (Tudela-Marco et al., 2016) and that there are variations in effectively applied tariffs across specific products and among individual EU members (Daly and Kuwahara, 1998). The implication for Kenya and other developing countries is that these variations are likely to make specific EU countries attractive export destinations for specific products and specific type of firms.

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[1] Standards become technical regulations if they are legally binding.

The review of the Kenya-EU market shows that countries offering the largest average preferential margin to Kenyan exports in the Union include Bulgaria (8.75%), Slovenia (8.49%), Luxembourg (7.20%), Romania (6.96%), Poland (6.62%), Slovakia (6.53%), Latvia (6.32%), Lithuania (6.31%), Netherlands (6.23%), Ireland (6.16%), Cyprus (6.10%), and Estonia (6.07%) (Appendix Table A2). Although these countries would conventionally be considered more attractive to Kenyan exports because they offer the largest reduction of tariff barriers, they have the largest number of non-tariff barriers (technical regulations and standards). Given that non-tariff measures are highly opaque and more trade-prohibiting compared to tariff measures, which are more transparent and quantifiable, it would mean these markets are attractive to large firms that enjoy competitive edge emanating from technology and economies of scale, but unattractive to Micro, Small, and Medium Enterprises (MSMEs). The Czech Republic (4.10%), Finland (4.61%), and United Kingdom[2] (4.89%) had the lowest preferential margin to Kenyan exporters. Although these markets have retained tariff measures relatively high, they could possibly be attractive to both MSMEs and large firms because they have relatively lower number of non-tariff measures.

Furthermore, larger preferential margins indicate larger export incentives to exporting firms. The incentives are realized through lower market entry barriers. The preferential margins arise from variations in the effectively applied tariff rates among individual EU countries and across specific product lines. Moreover, the variation in the observed preferential margin is large across specific products compared to among individual EU countries. Within the scope of this study, the implication is that observed variations emanate not only from slight differences[3] in the effectively applied tariff rates and the accompanying technical regulations and standards among EU members, but also from larger variations[4] across specific products.

Notably, fourteen (14) products benefiting the most from the trade agreement with the European Union in terms of higher preferential margin include sugars and sugar confectionary (32.28%), dairy produce, birds' eggs, natural honey, and edible products of animal origin (30.89%), preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates (28.41), meat and edible meat offal (28.36%), tobacco and manufactured tobacco substitutes (28.03%), preparations of vegetables, fruit, nuts, or other parts of plants (23.19%), products of the milling industry, malt, starches, inulin, and wheat gluten (20.38%), live animals (15.39%), edible vegetables and certain roots and tubers (15.08%), cereals (13.74%), articles of apparel and clothing accessories, knitted or crocheted (11.79%), footwear and gaiters (10.69%), other made-up textile articles, sets, worn clothing and worn textile articles, and rags (10.38%), edible fruit and nuts, peel

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[2] The United Kingdom emerges as the only country with almost no technical regulations on Kenyan exports.

[3]. The differences in the effectively applied tariff rates among individual EU countries are small, indicating a move towards convergence in the common external tariff for EU. The small differences are, however, adequate to drive variations in export attractiveness of individual EU countries for Kenyan exporters.

[4]. These sectoral variations make certain products exported by Kenyan firms competitive in certain EU countries and drive specialization.

of citrus fruits or melons (10.23%), and fish and crustaceans, molluscs and other aquatic invertebrates (10.17%).[5]

In addition, products benefiting the least from the trade agreement in terms of having the lowest preferential margin include vegetable plaiting materials and vegetable products not elsewhere specified (0.00%), ores, slag and ash (0.00%), pharmaceutical products (0.00%), explosives, pyrotechnic products, matches, pyrophoric alloys, certain combustible preparations (0.00%), pulp of wood or of other fibrous cellulosic material, recovered waste and scrap paper or paperboard (0.00%), paper and paperboard and articles of paper pulp (0.00%), printed books, newspapers, pictures and other products of the printing industry, manuscripts, typescripts and plans (0.00%), tin and articles thereof (0.00%), arms and ammunition, parts and accessories thereof (0.00%), and works of art, collectors' pieces and antiques (0.00%). Some products such as printed books, newspapers, pictures, and other products of the printing industry, manuscripts, typescripts, and plans (HS code 49) and works of art, collector's pieces, and antiques (HS code 97) that face higher tariff barriers to access the EU market, are strategic products in not only unlocking the potential of the creative economy sector in Kenya, but also among other developing countries.[6] Products with zero preferential margin face the Most Favoured Nation (MFN) tariff rate that would exist even in absence of a trade agreement. These are highly protected products within the EU.

2.2   Technical Regulations

Technical regulations are also known as technical requirements and are established by a regulatory entity as mandatory requirements for product, service, process, or system. They focus on national security, protection of human, animal or plant life, or health, protection of the environment, and fair-trade practices.

Although the agreement eradicated tariff barriers, other impediments to market access, including technical regulations and standards persist. The technical regulations mainly exist in the form of rules of origin and anti-dumping and countervailing measures. Rules of origin are non-preferential and parties to the agreement have discretion to review them from time to time. The regulations also exist in the form of safeguard measures aimed at protecting domestic industry and health and safety of consumers.

Rules of origin stipulate the conditions that products must meet for them to access the European market. The more the number of rules that must be satisfied, the more stringent accessing the market becomes and the higher the cost of complying with the requirement. The high cost could discourage exports or even make exports less competitive. The technical regulations exist in many forms, including requirements to demonstrate proof of the territory where the exported products originate, the input composition of the exported product, sources of the inputs used in making a product, level of processing undertaken in the originating

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[5]. The 2-digit HS codes for these products are 17, 04, 16, 02, 34, 20, 11, 01, 07, 10, 61, 64, 63, 08, and 03, respectively.

[6]. The 2-digit HS codes for these products are 14, 26, 30, 36, 47, 48, 49, 80, 93, and 97 respectively.

territory, or even the procedure that should be followed in undertaking processing. For instance, for petroleum oils and oils obtained from bituminous minerals, petroleum gas and other gaseous hydrocarbons, petroleum jelly, paraffin wax, micro-crystalline petroleum wax, and slack wax, the regulations for accessing the EU market require processing of this product to have been done through vacuum distillation, redistillation by thorough fractionation process, cracking, reforming, extraction by means of selective solvents, polymerisation, alkylation, isomerisation, among other acceptable processes. This means any product that does not satisfy the required method of processing technically cannot access the EU market.

In other circumstances, the regulations require the ingredients used to produce the final exported product to either fully come from the exporting country or a proportion of the ingredients to come from non-originating territory. For example, all live animals and meat and edible meat offal should wholly be obtained from the originating territory. For other products such as fish fillets and other fish meat, the regulations require any ingredients used in processing not to exceed 15 per cent of the original product while for other products such as buttermilk, curdled milk and cream, and yoghurt should not contain more than 30 per cent of sugars obtained from cane or beet. Even though these regulations aim to ensure quality and safety of the exported products, the cost associated with compliance can be prohibitive especially among Micro, Small, and Medium Enterprises (MSMEs). These costs could adversely affect the competitiveness of Kenyan exports by reducing the number of products exported by each firm and the number of firms exporting each product (the extensive margin). Further, the regulations could make the EU market only attractive to large firms with capacity and scale economies to comfortably meet the regulations. The MSMEs would need to consolidate operations or merge to become larger enterprises for them to satisfy the regulations and access the EU market. However, with financial support and targeted capacity building initiatives, MSMEs could meet the regulations and become competitive.

Notably is that Kenyan exporting firms to the European Union market are subject to technical regulations, with the majority of EU countries (16) having an average of 13 technical regulations, while seven (7) countries have the highest average number of technical regulations faced by Kenyan exporting firms. They include Latvia (15.95), Bulgaria (15.77), Estonia (15.53), Slovakia (15.12), Lithuania (15.11), Luxembourg (14.73), and Poland (14.11). From Appendix Table A2, the data reveals that countries offering the largest preferential margin to Kenyan exporting firms are the very same countries with the largest number of technical regulations faced by Kenyan exporters. Existing studies observe that reduction of tariff barriers with trade liberalization has seen a surge in non-tariff barriers in the form of technical regulations and standards to trade in goods (Daly and Kuwahara, 1998; Aisbett and Silberberge, 2020; Maria, 2010). Concerns rise that such barriers may vitiate expected benefits from tariff liberalization. The implication is that despite the existence of a trade agreement, which significantly reduces tariff barriers to market entry, exporting firms find it hard to access the European Union market due to introduction of non-tariff measures on exports in the form of technical requirements.

Products facing the largest number of technical regulations include oil seeds and oleaginous fruits, miscellaneous grains, seeds and fruit, industrial or medicinal plants, straw and fodder (26), albuminoidal substances, modified starches, glues, and enzymes (24), salt, sulphur, earths and stone, plastering materials, lime and cement (24), edible vegetables and certain roots and tubers (23), animal or vegetable fats and oils and their cleavage products, prepared edible fats, animal or vegetable waxes (23), inorganic chemicals, organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or isotopes (23), coffee, tea, mate, and spices (22), edible fruit and nuts, peel or citrus fruits or melons (22), miscellaneous edible preparations (21), fish and crustaceans, molluscs and other aquatic invertebrates (21), sugars and sugar confectionery (20), miscellaneous chemical products (19), and cereals (18).[7]

2.3   Standards

Standards provide for rules, guidelines, and characteristics for products, processes, and production methods for which compliance is voluntary. Despite compliance to standards being largely voluntary, there are mandatory standards incorporated into law and made compulsory for implementation.

Kenyan exports to the EU face at least four broad standards. These include environmental, social, management and ethics, and quality standards. Environmental standards require soil conservation and erosion control practices to be embraced, adequate soil fertility to be promoted for long-term productivity, and to not use synthetic fertilizers. The source and quantity of water used should be declared, agricultural activities should not engage in destruction of forest and forest cover, only approved agro-chemicals and post-harvest treatments using insecticides, herbicides, and fungicides are used, waste should be reduced and managed responsibly with efforts geared towards recycling, production means should undertake to mitigate against climate change and embrace use of renewable energy while minimizing emission of greenhouse gases, and that producers enhance well-being of animals. On the social front, the standards focus on ensuring that basic human rights are promoted while considering interests of local communities. On management and ethics, the standards require that production is sustainable, diversification is prioritized and that operations of producers adhere to legal and ethical principles both nationally and internationally. On quality, the applicable standards require mechanisms to be put in place to address any product quality concerns, that ingredients used in manufacturing products must be approved and certified as valid and acceptable, that workers are protected against any risks emanating from the work environment, and that products are traceable. Although these standards promote quality of exported products, there is a cost associated with obtaining relevant quality certifications. Whereas large firms may ably meet costs associated with quality certifications,

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[7]. The 2-digit HS codes for these products are 12, 35, 25, 07, 15, 28, 09, 08, 21, 03, 17, 38, and 10 respectively.

the costs could discourage export-oriented production among MSMEs. In effect, export activity could highly be dominated by large firms with little participation by MSMEs. Ensuring standards do not discourage export activity by offering targeted support to MSMEs could enhance Kenya's extensive margin from export trade. All the European Union members have at least 4 broad standards that Kenyan firms exporting to the market should satisfy except Malta, which has just three (3) standards faced by exporting firms from Kenya.

3. Literature Review

This section reviews existing literature relevant to trade agreements, standards, regulations, and export competitiveness. The theories reviewed include the theory of industrial organization, the theory of the firm, and game theory. Empirical literature on what previous studies have done on the topic and existing gaps is documented.

3.1 Theoretical Literature

3.1.1 Theory of industrial organization

Industrial organization is a strategic behaviour that firms in different industries engage in with the aim of benefiting from scale economies emanating from horizontal and vertical integration while circumventing market access barriers. The organization is also dictated by the structure of the market and encompasses the number of firms selling a product, the degree of product differentiation, the structure of costs incurred, and the level of vertical integration with suppliers. To enhance strategic competitiveness, firms within integrated industries undertake research and development, competitive pricing, advertising to promote product awareness, invest towards quality improvement, expand on production capacity, undertake product differentiation and innovation, and invest in logistics to get products into the market (Tirole, 1988).

Trade agreements and the ensuing regulations and standards disrupt existing markets and necessitate a re-organization of industries and firms within a market. Removal of tariff barriers under free trade agreements, for instance, encourages new firms to join certain industries while creating incentives for increased production. The ensuing regulations and standards, which aim to ensure quality and safety of products and protection of certain domestic industries from excessive competition may, however, discourage new firms from entering a certain industry or encourage new and existing firms to integrate either vertically or horizontally to comfortably comply with the regulations and standards accompanying trade agreements. The outcome is revealed strategic behaviour among firms in integrated industries to re-organize activities with the aim of tapping into the new market opportunities created by a trade agreement.

This study therefore examines how existence of a trade agreement, and the resulting regulations and standards, influence competitiveness of Kenyan firms exporting to the European Union. Firms would be expected to undertake re-organization of their activities while engaging in strategic behaviour to enhance competitiveness and access to the expanded market.

3.1.2 Theory of the firm

This theory stipulates that firms exist as a network of relationships between different units working in synergy to maximize returns while minimizing costs incurred in the process of executing economic activities (Coase, 1937). To

maximize returns, firms make strategic decisions, including sourcing for market opportunities for goods and services while undertaking to minimize risks and costs associated with producing and getting the goods and services to the market. Strategic decisions also include choices to integrate either horizontally or vertically to expand production and selling synergies while undertaking to minimize risks and costs. Contractual decisions formalizing relationships among other firms and employees are made with an aim of creating certainty while reducing risks and costs.

Existence of a trade agreement creates an opportunity for firms to expand production and get goods and services to a wider market. Firms get incentive to produce and supply efficiently to achieve the objective of maximizing returns. In circumstances where the firms involved are MSMEs and the costs of expanding production and accessing the widened market are high, especially in presence of technical regulations and standards, strategic decisions are made to integrate vertically and horizontally with the aim of minimizing exposure to risks and costs and to better tap into economies of scale. In presence of a trade agreement, the revealed strategic behaviour by individual firms may include increasing the number of exported products, pooling operations with other firms for better compliance and access of the European Union market, or even an increase in the number of firms exporting a specific product. With the firm as the unit of analysis, this study examines how trade agreements, and the resulting regulations and standards affect Kenyan export competitiveness to the European Union market.

3.2   Empirical Literature

Studies have demonstrated contradictory influence of trade liberalization on export activity. Whereas some studies have shown positive influence on trade liberalization on product diversification (Gnangnon, 2019; Shikher and Yaylaci, 2014; Yang and Jesus, 2022; Zhou et al., 2019; McNab and Moore, 1998; Martincus and Gomez, 2010; Kahouli, 2016; Nguyen, 2014; Egger et al., 2011), others paint a pessimistic outlook to the influence of tariff liberalization on trade activity (Mayda and Steinberg, 2009; Mujahid and Kalkuhl, 2016; Udbye, 2017). Most of these studies have estimated the gravity model using panel data at firm-level and have attempted to control for potential endogeneity. Although these studies have examined the influence of trade agreements on trade, we are not aware of studies that have explored the effect of trade agreements on competitiveness of Kenyan firms exporting to the European Union. This study contributes to the existing literature by examining how trade agreements influence the competitiveness of exporting firms to the European Union in a developing country context.

Bown et al. (2021) have argued that high-income countries introduce antidumping regulations on imports. Most of the European Union members are high-income countries and would be expected to introduce non-tariff regulations and standards as antidumping measures even in presence of a trade agreement. Further, most of the trade agreements have exception provisions stating the circumstances under which protective measures would be invoked to curtail imports. Under

Kenya's trade agreement with the EU, protective measures in the form of higher tariff rates, non-tariff regulations, and standards would be introduced to protect human, animal or plant life or health, public security, or national treasures of artistic, historic, or archaeological value.

Evidence shows that artistic products (HS code 97) face higher restrictions in accessing the EU market, yet they are strategic products for the creative economy not only in Kenya but also among other developing countries. Schuenemann and Kerr (2019) argue that African countries have not benefited from the EU market opportunities due to introduction of regulatory requirements in the form of non-tariff barriers as they face challenges in complying with the standards and regulations' requirements.

The evidence from Rose (2007) and Gil et al. (2008) suggests that having foreign missions in the form of embassies, consulates, and regional trade agencies in export destination countries positively promotes and influences exports. Nonetheless, these studies have not demonstrated the channel through which foreign missions encourage export activity. Our study extends this work by arguing that foreign missions could be used as a promotion strategy and could engage governments in destination countries to reduce most of the non-tariff regulations while disseminating information to firms back home on the quality standards required to access the foreign market. The outcome is enhanced market access and competitiveness of exporting firms.

Although a large share of the literature shows non-tariff regulations and standards to be a barrier to African exports to the European Union (Santeramo and Lamonaca, 2019; Liu et al., 2019; Kerr, 2019), some studies view non-tariff regulations and standards as trade catalysts (Anders and Caswell, 2009; Medin, 2018). Further evidence shows that non-tariff barriers and standards encourage exports among developed countries but discourages exports among developing countries (Anders and Caswell, 2009; Disdier et al., 2008). Our study contributes to this literature by demonstrating that, within the context of Kenyan exports (Kenya is a developing country) to the EU, standards are associated with a decline in the number of products per exporter and the number of exporters per product, but a rise in market power while non-tariff regulations are associated with increase in market competitiveness and the extensive margin.[8]

According to the findings of a study conducted by Tijani and Masuku (2019), there was a 41 per cent decrease in West African exports to the EU following the implementation of EU regulations on export products from West Africa when compared to exports to non-EU importing countries. The study concludes that EU regulations restrict West Africa's export potential by requiring the exporting countries to step up efforts to exporters comply with EU-mandated international standards and to actively participate in international standard-setting to influence future standards and prevent them from becoming trade barriers.

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8. The extensive margin constitutes the number of products per exporter and the number of exporters per product.

Empirical evidence from Casadesus, Gimenez and Heras (2001) shows that technical conformance is a requirement for successful export trade. Further, Henson and Loader (2001) establish that sanitary and phytosanitary measures (SPS) can stifle trade by imposing an import ban or prohibitively raising production and marketing costs. Further finding was that it may lead to trade diversion from one trading partner to another due to imposed regulations that discriminate across potential goods, hence erecting barriers for all potential exporters.

Further evidence suggests that removal of non-tariff barriers has a greater effect on the intensive margin compared to removal of tariff barriers (Muchopa et al., 2019) while recent evidence suggests that standards are forms of non-tariff barriers (Aisbett and Silberberge, 2020). The existing literature, however, has largely focused on the effect of non-tariff barriers and standards on the intensive margin of agricultural exports. The current study contributes to the literature by examining the effect of non-tariff regulations and standards on the extensive margin of all products.

Masood and Brummer (2014) using the OLS estimation of gravity model examined the possible impact of certification on banana exports to the EU. The study established that standards could lead to increased exports, and provide a competitive advantage to complying producers, affirm high product quality, and signal sustainable production practices that facilitate their market access to foreign markets. Furthermore, the findings elucidate that standards facilitate international trade by improving access to new markets, increasing price premium, enhancing product quality, product differentiation and increasing cooperation between producers and agri-businesses. Further, the findings indicated that there is a positive impact of certification on the value of trade.

Kaplinsky and Morris (2017) examined the effects of sustainability-related standards on developing countries and found that, while standards compliance can encourage developing country firms' integration into Global Value Chains (GVC), leading to higher wages, better working conditions, and better environmental outcomes, there is evidence that standards can also act as outright barriers to entry into GVCs. In this context, the findings of Redden (2017) asserts that many developing countries are the least able to adhere to sustainability standards due to persistent disparities in access to information and financial resources.

Evidence has shown that having foreign missions in the form of embassies, consulates, and regional trade agencies in export destination countries positively influences exports (Rose, 2007; Gil et al., 2008). The work, however, fails to demonstrate the channel through which these foreign missions encourage export activity. The current study extends this work by arguing that foreign missions could engage governments in destination countries to reduce most of the technical regulations while disseminating information to firms back home on the specific standards required to access the foreign market. The outcome is enhanced market access and competitiveness of the exporting countries.

Using cross sectional data from the World Bank, Chen et.al (2010) found that technical barriers to trade compliance and firm participation in export markets is impacted by different types of standards. Quality standards and labelling

requirements were found to be positively correlated with a firm's average export volume across destinations and products, while certification procedures are associated with a decrease in export volumes.

Chen, Otsuki and Wilson (2006) found that technical regulations have a negative impact on firms' overall propensity to export and their market diversification. Furthermore, firms affected by testing procedures have a lower share of the export market. It was also observed that, on average, difficulties in gaining access to information deter exporters due to the length of the inspection process, which significantly reduces the ability of the firm to export. Testing procedures and lengthy inspection procedures are major concerns for exporting firms.

4. Methodology

This section presents a detailed description of the data, measurement of variables, summary statistics and a specification of the model.

4.1 Theoretical Framework

The theoretical framework for this study is anchored on the theory of industrial organization and the theory of the firm. With the firm as the unit of analysis, the study investigates how firms engage in a revealed strategic behaviour aimed at exploiting expanded market opportunities created by a trade agreement such as the EAC-EU EPA. Free trade agreements reduce tariff barriers to market access and in effect create an incentive for firms to make strategic decisions and re-organize their activities to better comply with resultant regulations and standards that arise in presence of tariff liberalization. For Kenyan firms exporting to the EU market, the revealed strategic behaviour may include increasing the number of products exported to the market by each firm, a rise in the number of firms exporting each product, and even deliberate decisions to merge and consolidate operations to reduce exposure to risks and costs and better comply with ensuing regulations and standards.

4.2 Data

This paper uses panel data covering the period from 2007 to 2020 from the Exporter Dynamics Database by the World Bank (Fernandes et al., 2016)[9] with reinforcement from CEPII, World Development Indicators, and International Trade Centre (ITC). The data provides details of exporting firms in terms of the country of origin, destination country, year of export, and exported products in 2-digit HS classification. Since this is a very broadly defined class of products, the examined variations reveal cross-sector differences largely driven by technology and economies of scale.

The study considers 27 members of the European Union (EU) that existed up to December 2020, including the United Kingdom, but excluding Croatia, which joined the Union way later in 2013. In particular, the EU countries considered include Austria (AUT), Belgium (BEL), Bulgaria (BGR), Cyprus (CYP), Czech Republic (CZE), Germany (DEU), Denmark (DNK), Spain (ESP), Estonia (EST), Finland (FIN), France (FRA), United Kingdom (GBR), Greece (GRC), Hungary (HUN), Ireland (IRL), Italy (ITA), Lithuania (LTU), Luxembourg (LUX), Latvia (LVA), Malta (MLT), Netherlands (NLD), Poland (POL), Portugal (PRT), Romania (ROM), Slovakia (SVK), Slovenia (SVN), and Sweden (SWE).

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[9]. Appreciation to Ana Fernandes from the World Bank for sharing the current Exporter Dynamics Database to support this study

4.3   Measurement of Variables

Table 4.1: Measurement of variables

Variables	Measurement	Purpose
Dependent variables		
Herfindahl-Hirschman Index (HHI)	Index ranging from 0-1 with values close to zero indicating an increase in competitiveness while values close to 1 indicate a decline in competitiveness	Measures export competitiveness of Kenyan products exported to the European Union
Products per exporter	Number of products per exporter	Measures export competitiveness of Kenyan products exported to the European Union
Exporters per product	Number of exporters per product	Measures export competitiveness of Kenyan products exported to the European Union
Independent variables		
Preferential margin	Preferential margin (Difference between the MFN rate and the preferential tariff effectively applied)	Measures the entry barriers removed by tariff liberalization within a trade agreement
Technical regulations	The number of technical measures imposed by each of the European Union countries to products exported by Kenyan firms	Indicative of entry barriers emanating from technical regulations such as pre-shipment inspections, import licensing procedures and safeguards

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[9]. Tariff rate that would exist in absence of a free trade agreement (FTA).
[11]. Tariff rate that would exist in absence of a free trade agreement (FTA).

Standards	The number of quality standards touching on quality of manufactured products, adherence to environmental specifications, product and service quality management, and food and feed management systems	Indicator of quality requirements for Kenyan products exported to the European Union
Weighted distance	Weighted distance in kilometres	Measure of transport costs
Population	Population of each EU member country in millions	Measure of market size
Per capita GDP	Per capita GDP in US$	Measure of purchasing power
Unit price	Unit price in US$	Influences attractiveness and competitiveness of a market

The study identifies variables measuring trade agreements, technical regulations, standards, and competitiveness. The variable on trade agreements is measured using the preferential margin, which indicates the strength of a trade agreement. It is calculated by obtaining the difference between the Most Favoured Nation (MFN) rate[10] and the preferential tariff that is effectively applied.[11] This variable is measured on a ratio scale and quantifies the size of tariff barriers to market access eliminated by a trade agreement. On standards, the study examines the number of quality standards touching on quality of manufactured products, adherence to environmental specifications, product and service quality management, and food and feed management systems. Technical regulations are measured using the number of technical measures imposed by each of the European Union countries to products exported by Kenyan firms. Examples of technical regulations include pre-shipment inspections, import licensing procedures and safeguards, and antidumping measures.

Numerous variables on competitiveness of Kenyan exports to the European Union are used. The first measure of competitiveness used is the Herfindahl-Hirschman Index (HHI). Previous studies have used the index as a measure of market competitiveness as it is derived from sum of squares of market shares (Akio et al., 2012; Owen and Owen, 2020; Tripe et al., 2021; Kang and Park, 2018). Usually, an increase in the value of the Herfindahl-Hirschman Index means a decrease in competitiveness and a rise in market power usually associated with monopolies (Akio et al., 2012).

The number of products per exporter and the number of exporters per product are similarly used as measures of competitiveness. Li and Qian (2005) observe that diversification enhances firm performance but fails to indicate the channel through which diversification enhances performance. Can and Gozgor (2017) have argued that diversification enhances the quality of exported goods and services. In this study, we extend the existing knowledge by arguing that export quality is possible due to enhanced competitiveness. Evidence shows that export promotion actions increase the number of exporters per product (Volpe and Carballo, 2012; Sorensen, 2014). We argue that trade agreements are an example of an export promotion action, which would be expected to not only increase the number of exporters per product, but also the number of products per exporter. Persson (2013) has also shown that transaction costs related to cross-border trade procedures affect export trade. The current study extends this knowledge by arguing that technical regulations and standards that exporters must comply with could raise transaction costs and affect competitiveness of exports to the European Union. This is even so among MSMEs for which compliance to the technical regulations and standards implies rise in transaction costs compared to large firms and multinational corporations that experience lower transaction costs due to specialization, technology, and economies of scale.

The study uses the weighted distance between Kenya and each of the European Union destination countries to control for transport costs. Inmaculada and Felicitas (2007) also used weighted distance as a measure of transport costs. Evidence shows that high transport costs deter trade activity (Inmaculada and Celestino, 2007; Inmaculada et al., 2011; Borgatti, 2008; Friedt and Wilson, 2020; Jorge and Barbero, 2022). In concentrated markets such as the EU, transport costs are, however, highly likely to deter trade activity among MSMEs for which longer distance means higher transport costs. For large firms and multinational corporations, however, longer distance may not necessarily discourage trade activity since they already enjoy cost advantage emanating from economies of scale, integration into the global value chains, technology, and specialization. This means that for highly concentrated markets that are attractive to large firms and multinational corporations, increase in distance could encourage export competitiveness.

The population of each of the EU member countries over the study period is included in the analysis as a measure of market size. Previous studies have used population as a measure of market size (Lianos et al., 2022; Mundle, 2007; Zhou, 2009). Per capita GDP of each of the EU countries is used as a measure of purchasing power. Existing research has similarly used per capita GDP as a measure of purchasing power (Happich and Geppert, 2010; Bassino and Pierre, 2019). The unit price (US$) per exporter influences competitiveness, the number of exporters per product, and the number of products per exporter.

4.4   Summary Statistics

Table 4.2: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Herfindahl-Hirschman Index	5,815	0.595	0.264	0.019	1
Number of products per exporter	5,815	1.290	0.542	1	10.500
Number of exporters per product	5,815	2.851	4.486	1	67.714
Preferential margin	5,815	0.057	0.066	0	0.328
Number of regulations (NTBs)	5,815	12.135	7.94	0	30
Number of standards	5,815	3.981	0.138	3	4
Weighted distance	5,815	6,260.729	716.933	4067.625	7,302.636
Population (Million)	5,815	31.341	28.091	0.440	81.910
Per Capita GDP	5,815	39,098.794	15,496.571	7653.070	112,244.310
Unit price per exporter	5,815	383.380	5,048.921	0.001	326,784.440

The summary statistics indicate that Kenyan firms exporting to the European Union enjoy an average preferential margin of 5.7 per cent with the minimum and maximum preferential margin enjoyed being 0.000 per cent and 32.8 per cent, respectively. Kenyan firms exporting to the European Union face an average of 3 standards that exported products should satisfy with the maximum number of standards being 4. Kenyan firms exporting to the EU face an average of 12 technical regulations, with the minimum and maximum number of regulations being 0 and 30, respectively (Table 4.2).

The evidence reveals an average HHI of 0.595, with the minimum and maximum values being 0.019 and 1.000, respectively. This means that the EU market is highly concentrated[12] and is thus more attractive to large firms. These firms influence prices, making it endogenously determined (Tirole, 1988). Evidence shows that high-income countries, like most of the EU members, invoke antidumping measures on imports in the form of technical regulations and standards (Bown et al., 2021). The antidumping measures are mostly likely to be complied with by larger firms, a condition that could highly likely lead to the observed market power.

On average, each exporting firm sends 1 product to the European Union, with the maximum number of products per exporter being 10. Similarly, the average number of exporters per product is 2, with the maximum number of exporters handling the same product being 67 (Table 4.2). The average distance between

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[12]. Tariff rate that would exist in absence of a free trade agreement (FTA).

Kenya and a random EU country is 6,261 kilometres, with the shortest and longest distance being 4,068 and 7,303 kilometres, respectively.

The average population of a random EU country is 31.340 million, with the lowest and highest population being 0.440 million and 81.910 million, respectively. The average per capita GDP of a random EU country was US$ 39,098.790 with the lowest and highest per capita GDP for the bloc being US$ 7,653.070 and US$ 111,244.310, respectively. The summary statistics show that the average price is US$ 383.380 with the lowest and highest price being US$ 0.001 and US$ 326,784.440, respectively. Evidence has shown that prices are set by rational and forward-looking firms (Thorarinn, 1998; Wohlgenant, 1985). This insight points that price could be potentially endogenous especially if exporting firms that have influence on the unit price for their exports. Further, from the summary statistics coming from Table 4.2, the EU market is highly concentrated. The high market power means the market is attractive to a few but large firms that have power to endogenously influence prices (Tirole, 1988). Moreover, the large variations in the effectively applied tariff rates across products in the EU filters into prices, implying the observed export prices are affected by trade policy. In the next section, an attempt is made to control for potential simultaneity.

4.5   Model Specification

Since the identification problem precedes the estimation problem, the study embraces the Hausman simultaneity test to detect potential simultaneity and thus control for potential endogeneity (Gujarati, 2003). In the absence of simultaneity, OLS estimators yield consistent and efficient estimates (Gujarati, 2003; Holly, 2006; Zegeye, 2006; Winegarden, 1978). The study embraces the conventional inclusion (equation 1) and exclusion (equations 2, 3, and 4) approach to address potential simultaneity. The per capita GDP in each of the EU members is used as an instrument for the unit price per exporter, which is suspected to be endogenous. Its use as an instrument is guided by the reasoning that per capita GDP is not only highly correlated with the price EU buyers would be willing to pay for goods exported by Kenyan firms, but also by the understanding that Kenyan exporters would hardly influence it— making it exogenous.

4.5.1   Deriving residuals and interaction term

$LogPrice_{it} = \beta_o + \beta_1 LogPreferential\ margin it + \beta_2 LogTechnicalregulations_{it} + \beta_3 Log\ Standards_{it} + \beta_4 Log\ Distance it + \beta_5 Log\ Population it + \beta_6 Log\ per\ capita\ GDP_{it} + \varepsilon_{it}$ (1)

Equation (1) is the inclusion approach to addressing simultaneity. Unit price, which is suspected to be endogenous, is used as the dependent variable in equation (1) with per capita GDP used as an instrument. The other variables are

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[13]. The residuals are then included in the estimation of equations 2, 3, and 4. The interaction term between the residuals and price are also included in the estimation of equations 2,3, and 4.

used as covariates. After equation (1) is estimated, the residuals are obtained. The interaction term between the residuals and the unit price are also obtained.

Table 4.3: Regression results – deriving the residuals[13]

Variables	Log Prices
Log preferential margin	-10.571*** (0.462)
Log technical regulations	0.017 (0.026)
Log standards	-2.686** (1.362)
Log distance	-0.016 (0.326)
Log population	0.130*** (0.024)
Log per capita GDP	.651*** (0.083)
Constant	-0.385 (2.755)
Observations	5815
Overall r-squared	0.103
Chi-square	668.234
P-value	0.000

*** p<.01, ** p<.05, * p<.1

The results from estimation of equation (1) are elasticities. The elasticities can be less than 1, greater than 1, or just equal to 1. For this analysis, the coefficient for preferential margin indicates the responsiveness of export prices to changes in the preferential margin (measure of tariff liberalization). The coefficient is negative (-10.571), which means unit export prices are inelastic to changes in preferential margin. In other words, an increase in the preferential margin is associated with a decline in the unit price faced by Kenyan firms exporting to the European Union— only that the decline in unit export prices is more than the change in the preferential margin. Specifically, custom duties as trade costs are usually passed on to final commodity unit prices and reduction of custom duties by trade agreements reduces the custom costs faced by exporting firms. As such, the final unit export price declines with tariff liberalization (rise in the preferential margin) and therefore the negative sign for the coefficient associated with the variable named preferential margin in Table 4.3. In Table 4.3, per capita GDP was a relevant instrument (p=0.00).

Table 4.4 presents the characteristics of the residuals and interaction term obtained from estimation of equation (1). The residuals control for endogeneity while the interaction term controls for heterogeneity (Mwabu, 2008; Mwatu, 2022). Endogeneity and heterogeneity usually inflate the final coefficients reported from estimation of the structural equations and relying on such coefficients could lead to inefficient policy decisions. By including the residuals and the interaction term in the estimation of equations 2, 3, and 4, the possibility of inflating the final coefficients (Table 4.4) is reduced by 2.564 per cent and 6.996 per cent respectively.

Table 4.4: Characteristics of generated residuals and interaction term

Variable	Obs.	Mean	Std. Dev.	Min	Max
Residuals	5,815	2.564	0.642	-0.965	3.348
Interaction term	5,815	6.996	6.128	-10.776	34.315

4.5.2 Structural equations with residuals and interaction term

$Log\ HHI_{it}=\beta_o+\beta_1 LogPreferential\ margin_{it}+\beta_2 LogTechnical\ regulations_{it}+\beta_3 Log\ Standards_{it}+\beta_4 LogDistance_{it}+\beta_5 LogPopulation_{it}+\beta_6 LogPrice_{it}+\beta_7\ Residuals_{it}+\beta_8\ Interaction_{it}+\varepsilon_{it}$ (2)

$LogProducts_{it}=\beta_o+\beta_1 LogPreferentialmargin_{it}+\beta_2 LogTechnical\ regulations_{it}+\beta_3 LogStandards_{it}+\beta_4 Log\ Distance_{it}+\beta_5 LogPopulation_{it}+\beta_6 LogPrice_{it}+\beta_7 Residuals_{it}+\beta_8\ Interaction_{it}+\varepsilon_{it}$ (3)

$LogExporters_{it}=\beta_o+\beta_1 LogPreferential\ marginit+\beta_2 LogTechnical\ regulations_{it}+\beta_3 Log\ Standards_{it}+\beta_4 Log\ Distance_{it}+\beta_5 Log\ Population_{it}+\beta_6\ LogPrice_{it}+\beta_7\ Residuals_{it}+\beta_8 Interaction_{it}+\varepsilon_{it}$ (4)

The residuals and the interaction term obtained from estimation of equation (1) are now introduced into equations (2, 3, and 4), which are structural equations. The variable on unit export price, which was suspected to be endogenous, reappears in these equations as an independent variable. The variable on per capita GDP, which was used as an instrument in estimating equation (1), has now been dropped— it was to be included in equation (1) but excluded in estimation of equations (2, 3, and 4)— all of which are structural equations. Since the study uses panel data, the Hausman specification test is carried out to determine whether the Random-Effects or the Fixed-Effects model should be employed in estimation of the structural equations. The test indicated that the Random-Effects Model was appropriate for estimation of the three equations presented in section 4.5.2 (p=0.56, p=0.33, and p=0.90), respectively. In Table 5.1, the residuals were insignificant for the results from estimation of equation 2 (Column I), equation 3 (Column II), and equation 4(Column III), respectively. This meant that simultaneity was absent and OLS estimators could therefore be used. The interaction was insignificant from estimation of equation 2 (Column I) but significant from estimation of equations

3 (Column II) and equation 4 (Column III). The significance of the interaction term meant firm heterogeneity was detected, but resolved (Mwabu, 2008; Mwatu, 2022).

14. The residuals are then included in the estimation of equations 2, 3, and 4. The interaction term between the residuals and price are also included in the estimation of equations 2,3, and 4.

5.   Results

Table 5.1: Random-effects regression results

Variables	Column I (Equation 2)	Column II (Equation 3)	Column III (Equation 4)
	LogHerfindahl-Hirschman Index (HHI)	Log number of products per exporter	Log number of exporters per product
Log preferential margin	0.653	0.977***	-0.173***
	(0.441)	(0.215)	(0.053)
Log technical regulations	-0.018**	0.021***	0.001
	(0.008)	(0.004)	(0.001)
Log standards	0.426	-0.434**	-0.156***
	(0.438)	(0.214)	(0.052)
Log distance	-0.148	0.068	0.05***
	(0.101)	(0.049)	(0.012)
Log population	-0.039***	0.003	0.005***
	(0.009)	(0.005)	(0.001)
Log unit price	0.058***	-0.042***	0.005**
	(0.02)	(0.01)	(0.002)
Log residuals	0.045	-0.033	-0.007
	(0.041)	(0.02)	(0.005)
Log interaction	-0.012	0.023***	-0.004***
	(0.007)	(0.004)	(0.001)
Constant	-0.004	0.134	-0.128
	(0.857)	(0.417)	(0.102)
Observations	5,815	5,815	5,815
Overall r-squared	0.011	0.051	0.039
Chi-square	65.074	308.476	235.834
Model p-value	0.000	0.000	0.000

*** p<.01, ** p<.05, * p<.1

5.1   Herfindahl-Hirschman Index (HHI)

Column I of Table 5.1 presents results from estimation of equation 2. The results show that a 1 per cent increase in the preferential margin is associated with a

0.653 per cent increase in market concentration as measured by the Herfindahl-Hirschman Index (HHI).[14] For Kenya, this means that larger preferential margins are likely to create incentives to larger firms to export to the European Union market. The Herfindahl-Hirschman Index has been used as a proxy for the level of competition in a market and demonstrates how close a market is either to perfect competition or to a monopoly (Naldi and Flamini, 2018). Hasan et al. (2021) observe that a higher HHI indicates that a market is shared by a few large firms and, in effect, competition is weak. Within the Kenyan context and that of other developing countries, the rise in market power (market concentration) with rise in the preferential margin created by trade agreements may be explained as a strategic action by firms to consolidate operations to meet technical regulations and standards for accessing the European Union market. This explanation is in line with the stylized fact that within the European Union, larger preferential margins are associated with a higher number of technical regulations that exporters and exported products must satisfy to access the market. Yang and Jesus (2022) demonstrate that trade liberalization erodes market power and promotes market competitiveness among emerging and developing economies. The current study extends this work by demonstrating that trade liberalization, in contrast, promotes market power and erodes market competitiveness if the destination country is a developed economy.

The results also show that if the number of technical regulations increases by 1 per cent, then the HHI reduces by 0.018 per cent and this indicates a rise in market competitiveness. Eckhardt and Wang (2019) have argued that trade agreements oblige exporters to satisfy a set of technical rules that leave little room for violation. To successfully enforce trade agreements, countries have undertaken to strengthen their technical regulations. Naldi and Flamini (2018) intimate that regulations may encourage competition by eroding the sales and market share of the largest firms existing before the trade agreement. Medin (2018) also holds that non-tariff barriers may encourage trade through creation of certainty among consumers about the quality and safety of imported goods, thus enhancing demand. Within the context of Kenyan exporters to the European Union, the study argues that technical regulations enhance competitiveness by breaking monopoly power in specific areas such as price setting, domination of export sales, and by supporting consumer demand once certainty on the safety and quality of imported goods is guaranteed. Further, a 1 per cent increase in the number of standards raises the HHI by 0.426 per cent, and this implies a decline in market competitiveness. Standards are used to demonstrate compliance to acceptable principles protecting health and safety of consumers (Zurek, 2013; Carroll and Jarvis, 2013) and they could encourage or discourage market entry. For the Kenyan context, this study argues that standards are likely to discourage market entry for smaller firms while encouraging market entry for larger firms. In effect, standards are likely to encourage market power as the results demonstrate. The findings have also shown that a 1 per cent increase in distance lowers the HHI by 0.148 per cent and this indicates an increase in market competitiveness. Distance has been used as a measure of transport costs and this indicates that higher transport costs are associated with improvement in market competition. Its effect is, however, insignificant. Asche et al. (2019) found that for small and

distant markets, competition is usually weaker and such markets are served by fewer firms. This study fills an important gap in showing that for large and distant markets like the EU compared to Kenya, competition is likely to rise with increase in distance especially if the market becomes attractive to fewer and large firms which enjoy internal and external economies of scale. Moreover, a 1 per cent rise in population lowers the HHI by 0.039 per cent and this indicates an improvement in market competitiveness. The argument is that larger population enhances market competitiveness by supporting demand and product diversification. Lastly, a 1 per cent increase in the unit price is associated with a 0.058 per cent increase in the HHI and this means that market concentration rises. Hernandez and Toreo (2013) also observe that prices are higher in concentrated markets. Efficiency losses associated with price increases explain the rise in market power.

5.2   Number of Products per Exporter

Column II in Table 5 presents findings from estimation of equation 3. Specifically, a 1 per cent increase in the preferential margin raises the number of products per exporter by 0.977 per cent and this indicates that tariff liberalization under trade agreements encourages product diversification. The literature reveals that trade agreements promote extensive margins (Nguyen, 2014; Bista, 2015). This study argues that the rise in the number of products per exporter is explained by the fact that trade agreements not only open-up market for products that previously had no access to the EU market because of high tariff barriers, but also because trade agreements encourage product diversification. Further, the findings have shown that a 1 per cent rise in technical regulations raises the number of products per exporter by 0.021 per cent.

Contrary to existing knowledge that non-tariff barriers impede exports (Liu et al., 2019), some studies have also shown that technical regulations could enhance trade especially through upgrade of quality standards, compliance, and certification of exported goods (Kareem, 2019). Moreover, the results show that a 1 per cent increase in the number of standards translates to a 0.434 per cent decrease in the number of products per exporter. Existing evidence has shown that EU market access conditions in the form of standards constitute a barrier to African exports to the bloc (Kareem et al., 2016). Swinnen (2017) has argued that although conventionally standards could be used for reasons like guaranteeing health and safety of consumers, they could also be used to achieve protectionist goals especially if they are mandatory standards. This study argues that when standards are used for protectionist motive, they raise marginal cost of exporting and in effect discourage export trade.

The evidence also shows that a 1 per cent increase in distance covered to reach the EU market translates to 0.068 per cent rise in the number of products per exporter. An explanation is provided that a rise in the extensive margin with a rise in distance is possible if exporting firms are fewer, larger, and enjoy economies of scale. A 1 per cent increase in population is associated with a 0.003 per cent rise in the number of products per exporter. Demand for goods and in effect the

market size would rise with growth in population. A 1 per cent increase in the price charged by exporting firms is associated with a 0.042 per cent reduction in the number of products per exporter. This evidence corroborates theory in that a price increase encourages supply of more goods by firms.

5.3   Number of Exporters per Product

The results from estimation of equation 4 are presented in Column III of Table 5. A 1 per cent rise in the preferential margin translates to a 0.173 decline in the number of exporters per product and this is mainly driven by firms engaging in specialization. The number of exporters per product increases by 0.001 per cent for every 1 per cent increase in technical regulations. Since technical regulations are mandatory and legally binding, they are likely to attract larger firms which enjoy internal and external economies of scale. A 1 per cent increase in standards reduces the number of exporters per product by 0.0156 and this is explained by enhanced specialization by firms on specific products and decreasing marginal returns to each exporter with rise in competition.

The number of exporters per product increases by 0.050 per cent if the distance as a measure of transport costs increases by 1 per cent. Given the EU market is attractive to large firms which have comparative advantage in internal and external economies of scale, the increase in distance encourages the number of exporters per product but among large firms. Population is indicative of the market size and demand, and this increases the number of exporters per product by 0.005 per cent for every 1 per cent increase in population. Finally, a 1 per cent increase in the unit export price translates to 0.005 per cent increase in the number of exporters per product. This is supported by theory in that price increase sends a signal to firms about a growing demand in the market and this would be expected to attract more exporters per product.

6.   Conclusion and Policy Recommendations

6.1   Conclusion

The study investigated the competitiveness implications of the preferential trade agreement between Kenya and the European Union and the resultant regulations and standards on Kenyan firms exporting to the market over a 14-year period. The findings demonstrate that higher preferential margins are associated with a rise in the HHI and thus a rise in market power from estimation of equation 2 and the number of products per exporter from estimation of equation 3 but associated with a decline in the number of exporters per product from estimation of equation 4. Technical regulations were found to lower the HHI and thus raise market competitiveness from estimation of equation 2, the number of products per exporter from estimation of equation 3, and the number of exporters per product from estimation of equation 4. Standards were associated with an increase in the HHI and thus a rise in market power from estimation of equation 2 and a decline in both the number of products per exporter and the number of exporters per product from estimation of equations 3 and 4 respectively.

6.2   Policy Recommendations

The results from estimation of equation 2 point to a need to strengthen domestic capacity especially among MSMEs to comply with existing technical regulations and standards for enhanced competitiveness. The findings from estimation of equation 3 support a need for enhanced cooperation in quality management and assurance through undertaking capacity building initiatives in areas such as conformity assessment, metrology, and standardization to enhance competitiveness of firms exporting to the European Union. The findings from estimation of equation 4 indicate that developing functioning links between institutions from developing countries and those from the European Union through foreign missions could enhance access to information on existing regulations and standards for adaption by exporting firms. Overall, the results from estimation of the three equations indicate that having financial facilities targeted to exporting MSMEs could further support compliance with regulations and standards with the outcome being enhanced export competitiveness.

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Appendix

Appendix A

Table A1: Kenya's untapped export potential in EU

Country	Export potential in World ("000"USD): 4,300,000	EU Share in World: 51.3%
	Export potential in EU ("000"USD): 2,207,700	
Netherlands	911,000,000	21.20%
United Kingdom	471,000,000	11.00%
Austria	10,000,000	0.20%
Belgium	89,000,000	2.10%
Bulgaria	732,000	0.00%
Cyprus	5,200,000	0.10%
Czech Republic	6,800,000	0.20%
Germany	182,000,000	4.20%
Denmark	19,000,000	0.40%
Spain	71,000,000	1.70%
Estonia	1,200,000	0.00%
Finland	24,000,000	0.60%
France	200,000,000	4.70%
Greece	7,800,000	0.20%
Croatia	352,000	0.00%
Hungary	922,000	0.00%
Ireland	32,000,000	0.70%
Italy	48,000,000	1.10%
Lithuania	1,300,000	0.00%
Luxembourg	2,700,000	0.10%
Latvia	1,500,000	0.00%
Malta	594,000	0.00%
Poland	50,000,000	1.20%
Portugal	13,000,000	0.30%
Romania	13,000,000	0.30%
Slovakia	2,300,000	0.10%
Slovenia	2,300,000	0.10%

Sweden	41,000,000	1.00%

Source: Analysis based on data from International Trade Centre (ITC)

Table A2: Preferential margin, regulations, and standards faced by Kenyan exporters to the EU

Country	Preferential margin (%)	Regulations (NTMs)	Standards
Austria	5.20%	13.13	4
Belgium	5.28%	13.38	4
Bulgaria	8.75%	15.77	4
Cyprus	6.10%	13.67	4
Czech Republic	4.10%	13.25	4
Germany	5.82%	13.43	4
Denmark	5.86%	13.23	4
Spain	5.48%	13.05	4
Estonia	6.07%	15.53	4
Finland	4.61%	12.18	4
France	5.65%	13.47	4
United Kingdom	4.89%	0.25	4
Greece	5.39%	12.7	4
Croatia	6.37%	13.59	4
Hungary	5.70%	13.34	4
Ireland	6.16%	13.62	4
Italy	5.55%	12.99	4
Lithuania	6.31%	15.11	4
Luxembourg	7.20%	14.73	4
Latvia	6.32%	15.95	4
Malta	5.30%	13.48	3
Netherlands	6.23%	13.86	4
Poland	6.62%	14.11	4
Portugal	5.88%	12.76	4
Romania	6.96%	13.57	4
Slovakia	6.53%	15.12	4
Slovenia	8.49%	13.61	4
Sweden	5.82%	13.51	4

Source: Analysis based on data from ITC

Table A3: Average preferential margin, regulations, and standards for each exported product

2 HS product code	Preferential margin	Regulations	Standards
01	15.39%	12.08	3.98
02	28.36%	10.38	4.00
03	10.17%	21.80	3.95
04	30.89%	12.92	4.00
05	0.16%	11.83	4.00
06	7.03%	9.62	3.98
07	15.08%	23.57	3.98
08	10.23%	22.33	4.00
09	2.00%	22.91	3.97
10	13.74%	18.79	4.00
11	20.38%	15.65	4.00
12	0.34%	26.76	4.00
13	1.91%	18.35	4.00
14	0.00%	17.09	4.00
15	9.00%	23.11	4.00
16	28.41%	16.00	4.00
17	32.28%	20.43	4.00
18	3.48%	11.12	4.00
19	8.28%	17.71	4.00
20	23.19%	18.07	3.95
21	6.78%	21.93	4.00
22	4.40%	15.87	4.00
23	5.71%	15.85	4.00
24	28.03%	6.44	4.00
25	0.39%	24.67	4.00
26	0.00%	6.72	4.00
28	3.56%	23.06	3.98
29	3.48%	10.75	4.00
30	0.00%	18.31	3.97
31	4.04%	12.73	4.00
32	5.73%	8.84	3.94
33	1.53%	4.45	4.00

34	2.94%	12.02	4.00
35	6.40%	24.81	3.88
36	0.00%	0.00	4.00
37	2.42%	9.79	4.00
38	4.74%	19.46	4.00
39	6.00%	15.76	3.98
40	2.39%	12.36	3.98
41	2.95%	9.04	4.00
42	4.74%	14.85	3.98
43	1.01%	7.43	4.00
44	2.01%	12.38	3.97
46	3.40%	3.75	3.99
47	0.00%	1.56	4.00
48	0.00%	12.86	3.95
49	0.00%	0.00	3.94
50	5.92%	1.60	4.00
51	2.74%	5.25	4.00
52	4.18%	5.52	3.96
53	3.68%	3.63	4.00
54	4.88%	3.41	3.82
55	4.86%	1.72	4.00
56	4.82%	5.75	3.97
57	7.55%	1.69	4.00
58	7.07%	4.08	3.97
59	6.24%	1.41	4.00
60	7.92%	1.25	4.00
61	11.79%	7.34	4.00
62	11.52%	7.41	4.00
63	10.38%	9.42	3.98
64	10.69%	4.63	3.98
65	2.92%	5.00	3.98
66	4.33%	4.85	3.96
67	3.08%	1.70	3.98
68	1.04%	4.96	3.99
69	5.58%	5.60	3.98
70	4.55%	6.41	3.98

71	0.36%	11.28	4.00
72	0.22%	6.97	3.95
73	1.64%	10.24	3.97
74	1.16%	8.47	4.00
75	0.19%	5.45	4.00
76	5.30%	12.63	3.97
78	0.45%	3.25	4.00
79	2.55%	10.96	4.00
80	0.00%	8.00	4.00

81	1.40%	0.00	4.00
82	2.85%	4.57	3.99
83	2.07%	6.29	3.97
84	1.20%	15.19	3.95
85	1.16%	15.95	3.97
86	1.45%	6.33	4.00
87	8.11%	10.00	3.99
88	0.75%	3.51	3.98
89	0.74%	4.39	4.00
90	0.74%	13.03	3.97
91	0.80%	8.67	4.00
92	3.13%	9.00	3.98
93	0.00%	2.08	4.00
94	1.43%	16.89	3.97
95	1.33%	15.88	3.99
96	3.50%	14.72	3.97
97	0.00%	8.49	3.98

Source: Analysis based on data from ITC