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The Role of Intellectual Property Rights Protection on Intra-Comesa Trade with A Specific Focus on Trademarks

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ABSTRACT

This paper employs the Pseudo Poisson Maximum Likelihood estimation technique to investigate the impact of trademarks, as a proxy for Intellectual Property Rights (IPRs), on intra-Common Market for Eastern and Southern Africa (COMESA) trade using panel data from 2000 to 2022. While the study establishes significant aggregate-level market expansion effects of trademarks on imports within COMESA, it also reveals sector-specific variations. Specifically, the study confirms a positive correlation between trademark-related imports of plastics, pharmaceuticals, rubber, tobacco, paper, and footwear products, suggesting that stronger trademark enforcement could enhance market expansion in this sector. Conversely, a negative correlation between trademark-related imports of dairy and clothing products is exposed, indicating potential market power effects that might restrict intra-COMESA trade. These findings underscore the importance of tailored IPRs policies across sectors, advocating for strengthened trademark protection in sectors that are significant and positively affected, while suggesting a more lenient approach for promoting trade in negatively affected sectors within the COMESA region.

Keywords: Intellectual Property Rights, Trademark, TRIPS Agreement, PPML, COMESA
JEL Classifications: F15, F17, F51

1. INTRODUCTION

The discourse surrounding the effects of strengthening Intellectual Property Rights (IPRs) protection on international trade traverse theoretical, empirical, and policy dimensions. According to World Intellectual Property Organization (WIPO, 2020), IPRs encompass various creative products of the mind – such as literary works, designs, trademarks, patents and geographical indications – protected by law to grant creators recognition and financial benefits for their innovations. In terms of policy considerations, the significance of IPRs intensified with the United States' 1988 Act, which linked foreign policy to IPRs regimes in bilateral trade partnerships and culminated in the World Trade Organization (WTO)'s Trade Related Intellectual Property Rights (TRIPS) agreement in 1994, addressing global disputes over IPRs (Maskus and Penubarti, 1995; Awokuse and Yin, 2010).

In the empirical realm, however, the impact of IPRs on international trade is a contentious issue with divergent views among scholars. For instance, some scholars maintains that IPRs stifle competition and limit cross-border trade, citing barriers to market entry and limited knowledge diffusion (Campi and Dueñas, 2019; Shin et al., 2016. Conversely, proponents of robust IPRs contend that strong intellectual property frameworks foster trade, encourage innovation-driven investments, and promote economic growth by protecting creators' rights. Alongside economic debates, concerns over IPRs include access to essential medicines and broader humanitarian implications, where critics fear that strict protections may exacerbate disparities in access to critical medications, particularly in developing regions including Africa. The discourse underscores the complex interplay between IPRs policies, economic incentives, innovation dynamics, and global equity considerations, shaping ongoing discussions on the optimal balance between protection and access in global trade systems.

Against this backdrop, the Common Market for Eastern and Southern Africa (COMESA) region, characterised by diverse economic profiles and significant trademark use, faces challenges like counterfeiting that can hamper trade (Ncube, 2015). Recognising the importance of IPRs in international trade and economic growth, the COMESA regional bloc developed an IPRs policy document which obligates member countries to facilitate the increase in regional trade in IPRs-intensive products, and the flow of IPRs using all the flexibilities in international and regional instruments on IPRs. Further the policy document asserts that member countries shall develop an effective IP promotion and protection system so as to create incentives for innovation and creativity as well as foreign direct investment (COMESA, 2013).

In light of the above, this study seeks to examine the role of IPRs in promoting intra-COMESA trade. Particularly the study seeks to establish whether the strengthening of IPRs in COMESA has promoted the movement of Intellectual Property (IP)-intensive products between COMESA member countries. This paper, therefore, makes significant contributions to literature in two primary ways. Firstly, it empirically examines the impact of IPRs, specifically trademarks, on intra-COMESA trade flows, a focus distinct from previous studies that primarily concentrated on developed or non-African developing countries. By analysing trade dynamics within a homogeneous geographic and economic context, the study offers unique insights into how trademark-related IPRs influence regional economic integration in Africa, where the implications of IPRs on trade are contextualised within varying developmental contexts. Secondly, it provides a sectoral analysis of the effects, shedding light on how different product sectors within COMESA are affected by trademark protection. By responding and occupying these gaps, the current paper informs policy discussions on intellectual property reforms tailored to enhance economic growth and trade within COMESA and similar regional contexts across Africa.

The remainder of this paper is structured as follows: Section 2 offers an overview of IPRs landscape within the COMESA region; Section 3 reviews relevant theoretical and empirical literature; Section 4 outlines the methodology employed, detailing the data sources, variables, and analytical techniques used to achieve the aims of this paper; Section 5 presents the empirical findings from the analysis and discusses their implications in the context of intellectual property reforms in Africa, particularly within COMESA; and Section 6, which concludes the paper by summarising key findings, discussing their broader implications for policy, and suggesting recommendations for future research and policy development in the context of IPRs protection and regional trade integration in Africa.

1.1. Snapshot of IPRs Landscape in Selected COMESA Countries

The COMESA is a trading bloc comprising 21 African countries. It aims to promote regional integration through trade and the development of natural and human resources, ultimately enhancing the welfare of the region's citizens. Initially established in 1981 as the Preferential Trade Area (PTA) for Eastern and Southern Africa under the Organization of African Unity (OAU)'s Lagos Plan of Action and the Final Act of Lagos, it transformed into COMESA in 1994. The PTA's goal was to leverage a larger market, share the region's common heritage and destiny, and enhance social and economic cooperation. COMESA is one of the eight Regional Economic Communities (RECs) recognised by the African Union (AU).

Within its intellectual property framework, the COMESA has an IPRs policy in place, which aims to harmonise and strengthen the protection and enforcement of IPRs across its Member States. The policy is designed to foster innovation, creativity, and technological development by ensuring that creators and inventors receive adequate protection and recognition for their works and inventions (COMESA, 2013). By establishing a unified approach to IPRs, COMESA seeks to enhance regional trade, attract foreign investment, and stimulate economic growth. The policy also emphasizes the importance of balancing the rights of intellectual property (IP) holders with the public interest, ensuring access to knowledge and technology while promoting fair competition and economic development within the region.

Table 1 shows IP performance measures for selected COMESA countries. It is evident that the selected COMESA countries exhibit varying levels of performance in intellectual property (IP) protection and global competitiveness. Mauritius, Rwanda, and Kenya are notable high performers in terms of IP protection, with scores of 4.50, 4.70, and 4.40 respectively, indicating robust IP protection frameworks. Conversely, the Democratic Republic of Congo and Burundi are among the weakest, with IP protection scores of 3.00 and 3.20 respectively, highlighting a greater latitude for improvement.

When examining the IP protection dimension of the global competitiveness index (GCI), Seychelles emerges as the best performer among the listed countries, ranking 74th out of 140. Mauritius and Kenya also perform relatively well, with GCI rankings of 49 and 93, respectively. On the other hand, Burundi and the Democratic Republic of Congo are at the bottom of the list, with GCI rankings of 136 and 135, indicating challenges in their competitive positioning on the global stage.

An interesting observation from Table 1 is that COMESA countries are major users of trademarks compared to patents. The data reveals notable disparities in patent registrations and trademark filings. Seychelles leads in patent registrations with a notable 8.06/million population, while many countries, such as Burundi and the Democratic Republic of Congo, report no patents at all. In terms of trademark registrations, Egypt (147.69/million population) and Kenya (87.52) significantly outperform other nations like Ethiopia and Eswatini, which report minimal or no

Table 1: IPRs performance measures for selected COMESA countries (2022)

Countries	Patents	Trademarks	Property rights	IP protection	GCI Rank/140
Burundi	0.00	0.00	3.00	3.20	136
Congo, Dem republic	0.00	0.00	3.10	3.00	135
Egypt	0.21	147.69	4.60	3.30	94
Ethiopia	0.01	0.00	4.20	3.80	122
Kenya	0.16	87.52	4.70	4.40	93
Malawi	0.00	24.53	4.20	3.40	129
Mauritius	0.81	29.26	5.10	4.50	49
Rwanda	0.01	17.70	4.80	4.70	108
Seychelles	8.06	20.35	4.60	4.10	74
Eswatini	0.15	0.00	4.30	3.40	120
Uganda	0.01	32.54	4.00	3.40	117
Zambia	0.02	32.93	4.20	3.70	118
Zimbabwe	0.04	19.26	2.60	3.40	128
Average	0.73	31.68	4.11	3.72	110

Countries in the sample were chosen basing on data availability; Patents and trademarks indicate the number of applications for a million persons in the population; GCI: Global Competitiveness Index; property rights is an index ranging from 0 to 7 with seven being the strongest.
Source: Author Compilation from WIPO (2024) Database

trademark filings. Generally, COMESA countries have registered trademark applications at an average of 31.68/million population, compared to just 0.73 for patents. This indicates a preference for trademarks as a form of IP protection within the region. Along with the averages for trademarks (31.68), property rights (4.11), IP protection (3.72), and a GCI rank of 110 out of 140, the reflection is that of high and low performers, underscoring the diverse landscape of IP protection and competitiveness within the COMESA region.

2. LITERATURE REVIEW

This section discusses theoretical and empirical literature on the role of IPRs, with emphasis on trademarks, on international trade. It begins with the presentation of the theoretical literature which is subsequently followed with a review of related studies.

2.1. Theoretical Literature

The theoretical literature on the relationship between IPRs and international trade is not conclusive on whether strong IPRs protection promotes or discourages bilateral trade (Maskus and Penubarti, 1995; Curtis, 2012). According to Maskus and Penubarti (1995), two theoretical expositions exist on the relationship between IPRs and international trade. These are market expansion and the market power effects. The market expansion effect occurs when the strengthening of IPRs discourages domestic firms from imitating the technologies embodied in imported goods. This results in an increase in the supply of products by firms with better technologies, leading to an increase in the net demand for these firms' products. Conversely, in the absence of strong IPRs, firms might reduce their exports to countries where their technologies are likely to be imitated. This reduction is more pronounced in cases where importers have adequate resources to reproduce or imitate the technologies or products. Strong IPRs increase exports to such markets by reducing the costs associated with preventing the loss of technologies, which includes foregone revenues from reduced exports and expenses incurred in making technologies difficult to imitate.

The market power effect, on the other hand, postulates that strong IPRs reduce trade by allowing firms to engage in monopolistic behaviour. For instance, firms can take advantage of the increase in net demand by reducing the supply of the product and increasing prices. In this way, the strengthening of IPRs generates market power effects, which reduce trade. Firms in countries with strong trademark protection can exercise their market power by restricting the quantity of exports and increasing their unit prices to extract monopoly rents. Therefore, since the market power and market expansion effects are countervailing, the direction of the relationship between IPRs and trade, from a theoretical perspective, is indeterminate.

Trademarks, as a form of IPRs, primarily serve to identify the source of goods and services. This function enables trademarks to both reduce consumer search costs and incentivize producers to develop goodwill in their products or services. Trademark rights are determined by priority of use in commerce, and trademark registration confers significant benefits to a mark owner. Trademark registration is a powerful tool for an entity interested in building a strong brand, conferring nationwide rights, serving as prima facie evidence of ownership of a particular mark, and enabling enhanced protections against counterfeits. This is expected to have the market expansion effect and protecting trademarks is crucial for preventing deceit, fostering fair competition, and securing the business community's advantage of reputation and goodwill.

Given the countervailing effects of market power and market expansion, the impact of strengthening IPRs becomes an empirical issue, as the theoretical perspectives suggest indistinctness. Furthermore, Curtis (2012) argues that weak or non-existent IPRs reduce international trade by diminishing direct foreign investment, technology transfer, joint ventures or licensing agreements, and demand. Therefore, recommending the non-existence of IPRs is not the best option.

2.2. Empirical Evidence

The relationship between IPRs and international trade has garnered substantial empirical attention, predominantly focusing on developed nations, with a notable paucity of research centred on developing countries, particularly those in Africa. This complex and heterogeneous relationship presents both positive and negative effects across different studies and contexts. For instance, Awokuse and Yin (2010) demonstrated that stronger patent rights protection boosts China's imports, particularly of knowledge-intensive products, indicating a market expansion effect of IPRs protection. Similarly, Raizada and Dhillon (2017) found a significant positive correlation between IPRs and trade in India, with unilateral causality from trade to patent protection and from IPRs to trade for trademarks and copyrights.

Conversely, some studies highlight the negative or uneven impacts of IPRs on trade. For instance, Maskus and Penubartib (1995) established a positive relationship between patent protection and the volume of manufactured exports but noted limited evidence on the varying effects of different levels of IPRs protection on trade flows. Shin et al. (2016) argued that IPRs might function as export barriers for LDCs in the process of technological catch-up, thus creating a distributional bias favouring exporters from developed countries. Prasetyo (2013) also reported a negative effect of a composite IPRs index on trade.

Further complicating the landscape, Campi and Dueñas (2019) found negative effects on trade for agreements with IPRs chapters, using a gravity model with panel data fixed effects. Their 2016 study observed negative and uneven effects on agricultural trade using a composite IPRs index through a gravity model. However, Maskus and Ridley (2016) emphasized that deeper regional trade agreements, which often include IPRs provisions, significantly enhance trade flows among member countries, particularly benefiting middle-income countries.

Despite these mixed findings, Liu and Lin (2021) showed that stronger IPRs enforcement in developing countries boosts high-tech exports, though it has a negligible effect on low-tech exports. Krammer (2022) further noted that whereas stronger IPRs protection increases trade in high-value goods, it can hinder the export competitiveness of sectors reliant on incremental innovation. In fact, while stronger IPRs protection generally enhances trade, the effects are highly heterogeneous, depending on the development level of countries, product types, and specific provisions within trade agreements. As such, developing countries and LDCs may not experience the same benefits as their developed counterparts, underscoring the necessity for nuanced and context-specific IPRs policies in international trade agreements. Recent research continues to shed light on these complexities, highlighting both the opportunities and challenges that IPRs protection presents for regional trade dynamics.

In light of the above, this paper makes dual significant contributions to the literature. Firstly, it empirically examines the impact of IPRs, specifically trademarks, on intra-COMESA trade flows. This focus on a homogeneous geographic and economic context offers unique insights into how trademark-related IPRs influence regional economic integration in Africa, diverging from previous studies primarily centred on developed or non-African developing countries. Secondly, it provides a sectoral analysis, highlighting how different product sectors within COMESA are affected by trademark protection. By addressing these gaps, the paper informs policy discussions and provide exciting opportunities for evidence-based policy interventions and reforms on IP aimed at enhancing economic growth and trade within COMESA and similar regional contexts across Africa.

3. DATA AND RESEARCH METHODOLOGY

In attempting to establish the impact of IPRs on international trade, a number of approaches have been applied in existing literature. This section, therefore, discusses the variable and data sources, the model to be estimated together with the potential issues associated with the choice of the model, and the appropriate estimation technique employed in this paper.

3.1. Data

The sample panel data includes five COMESA countries (i.e., Egypt, Ethiopia, Kenya, Mauritius, and Zimbabwe) covering the period from 2000 to 2022. While Kenya and Egypt are leaders in intra-COMESA trade, the countries in the sample were selected based on data availability. Import data was obtained from the World Integrated Trading System (WITS) of the World Bank (WB, 2024a), while GDP data was drawn from the WB (2024b) World Development Indicators (WDI). Information on distance, common borders, and common languages was sourced from the *Centre d'Études Prospectives et d'Informations Internationales* (CEPII, 2024) database. The import data for the ten sectors, organized according to the 2-digit Standard International Trade Classification (SITC) nomenclature, consist of dairy, beverages, tobacco, pharmaceutical, plastics, rubber, paper, furniture, clothing, and footwear. Trademark data was sourced from the WIPO (2024). Additional information pertaining to the variables is provided in Table A.1.

3.2. Empirical Model and Variable Construction

The study utilizes a gravity model to examine the effects of intellectual property protection on intra-COMESA trade. The gravity model is renowned in empirical trade research for its ability to predict bilateral trade flows based on the economic size and distance between trading partners. The derivation of the Anderson and van Wincoop (2003) gravity model, as simplified by Baldwin and Taglioni (2006), begins with the demand equals supply equation and the specification of the expenditure share identity, stating that the value of trade flow from country i to j, $P_{ij}x_{ij}$ should equal the share country i has in expenditure of country j as represented by Equation 1:

$$P_{ij}x_{ij} = s_{ij}E_j \tag{1}$$

Where P_{ij} = import price from i to j, s_{ij}=share of i in j's expenditure E_j. This share (s_{ij}) is assumed to follow from the Constant Elasticity of Substitution (CES) demand structure, allowing the derivation of an explicit expression for the imported goods' share in E_j. Assuming all goods are traded, this share depends on the bilateral prices relative to the price index presented as follows:

$$s_{ij} = \left(\frac{P_{ij}}{P_j}\right)^{1-\sigma}, where; P_j = \left[\sum_{i=1,\ldots,N}\left(n_i P_{ij}\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}} \tag{2}$$

Where P_j is the Dixit-Stiglitz CES Consumer Price Index (CPI) for country j, and the parameter σ denotes the elasticity of substitution between varieties and is assumed to be >1. N is the number of countries and $n$denote the distribution parameter of the utility function or the number of varieties supplied by country i. The number of varieties is defined symmetrically, providing room for ignoring the varieties.

Equation 2 is further improved by incorporating trade costs, which is a crucial element in the gravity model. Letting t_{ij} represents bilateral trade costs, the price in the market j equals:

$$P_{ij} = P_j t_{ij} \tag{3}$$

Where$P_i$the price of a variety in country i. Thus, adding transport, the price in market j becomes P_{ij} Aggregating across varieties to get total trade between two countries results in:

$$T_{ij} = n_i s_{ij} E_j = n_i \left(P_i t_{ij}\right)^{1-\sigma} \frac{E_j}{P_j^{1-\sigma}} \tag{4}$$

Assuming that all goods are traded, the budget constraint states that total output of country (i.e., Y_i) equals the total sales to all destinations (j) including country i itself:

$$Y_i = \sum_j T_{ij} = n_i P_j^{1-\sigma} \sum \left(t_{ij}^{1-\sigma} \frac{E_j}{P_j^{1-\sigma}} \right) \tag{5}$$

Equation 5 can mathematically be re-formulated as:

$$n_i P_i^{1-\sigma} = \frac{Y_i}{\pi_i^{1-\sigma}}; where, \pi_i = \left(\sum \left(t_{ij}^{1-\sigma} \frac{E_j}{P_j^{1-\sigma}} \right)^{\frac{1}{1-\sigma}} \right) \tag{6}$$

The gravity equation can then be derived from incorporating Equation 6 into 4 to get;

$$T_{ij} = Y_i E_j \left(\frac{t_{ij}}{\pi_i P_j} \right)^{1-\sigma} \tag{7}$$

Equation 7 represents the theoretical gravity equation that governs bilateral trade flows. This equation can be decomposed into two important terms: (i) the size term $Y_i E_j$[1]; and (ii) the trade cost term $\left(\frac{t_{ij}}{\pi_i P_j} \right)^{1-\sigma}$. The size term measures the level of frictionless trade, while the trade costs measures the effects of trade costs on the frictionless trade. Bilateral trade cost is mostly proxied by various geographical and trade policy variables such as bilateral distance, tariffs, and other dummy variables indicating common border, common language, membership to a preferential trade agreement, and colonial ties.

1 The original Anderson and van Wincoop, (2003) uses income shares in the derivation of the structural gravity model

Several issues arise in the empirical estimation of gravity models. These include multilateral resistance, zero trade flows, distance, the level of disaggregation, endogeneity, and heteroscedasticity. To address multilateral resistance, approaches that can be applied include fixed effects, linearisation, and analytical solutions. For zero trade flows that are normally distributed, measures include dropping zero variables or adding constants to enable logarithmic transformation. The Hausman-Taylor two-step estimator and the Pseudo Poisson Maximum Likelihood (PPML) estimator can correct for selection bias in cases where zero trade flows are not normally distributed (Awokuse and Yin, 2010). The gravity model can be estimated at both macro- and micro-levels, with more disaggregated analysis capturing the actual behaviour of micro-units.

The study estimates a stochastic form of the gravity equation (Equation 8), modifying it to include gravity variables such as distance, common border, common language, and IPRs measures as proxies for bilateral trade costs.

$$lnM_{ij,t} = (1-\sigma)ln\tau_{j,t} + lnY_{i,t} + lnE_{j,t} - (1-\sigma)ln\pi_{i,t} - (1-\sigma)lnP_j + \varepsilon_{ij,t} \tag{8}$$

However, for the purposes of this paper, the estimated model is simplified to:

$$\begin{aligned} &\ln M_{ij,t} = \alpha_0 + \alpha_1 \ln Y_{i,t} + \alpha_2 \ln Y_{j,t} + \alpha_3 \\ &\ln tmark + \delta_1 \ln Dist_{ij} + \delta_i \sum_{i=2}^{n} t_{ij} + \varepsilon_{ij,t} \end{aligned} \tag{9}$$

where M_{ij} measures imports, and Y_i and Y_j are the GDPs of countries i and j, respectively. These variables are expected to have a positive effect on trade, with the coefficient of the estimated parameter α\alphaα expected to be positive. The parameter t_{ij}includes other trade cost variables such as common border and language, with distance serving as a proxy for transportation cost. Distance is expected to negatively affect imports, while common language and border positively influence trade. The effect of IPRs on trade is ambiguous, as either the market expansion effect or the market power effect could dominate.

3.3. Estimation Technique

A variety of approaches have been used to estimate Equation 8, ranging from Ordinary Least Squares (OLS) to maximum likelihood estimation techniques, each with its strengths and weaknesses. OLS estimates can be biased in the presence of heteroscedasticity and zero trade flows, and they are subject to unobservable heterogeneity bias in panel data (Hsiao, 2022). To address this, country-specific effects can be included in the regression, with fixed effects and random effects models as alternative specifications. The fixed effects model assumes correlation between independent variables and unobserved fixed effects, while the random effects model assumes uncorrelated random effects. The Hausman test, which checks for correlation between unobserved characteristics and explanatory variables, helps choose between these models. If the null hypothesis of no correlation is rejected, the fixed effects model is preferred.

The random effects model allows for time-invariant variables, such as distance, but can face endogeneity issues if independent variables are correlated with unobserved random effects. To correct for endogeneity, methods like the Hausman-Taylor estimator or the Pseudo Poisson Maximum Likelihood (PPML) technique can be used. PPML effectively handles zero trade flows and heteroscedasticity, common in trade data (Baldwin and Taglioni, 2006). Considering these factors, this paper employs the PPML method to examine the effects of IPRs on intra-COMESA trade.

4. RESULTS AND DISCUSSIONS

The section commences by presenting an initial overview of the dataset, providing insights into the central tendencies and dispersions of the variables. Subsequently, the PPML estimation results are presented.

4.1. Descriptive Statistics

The descriptive statistics of the variables used in the gravity model are shown in Table 2. The mean imports of the ten selected products averaged USD 918.91 million from 2000 to 2022. The low standard deviation of distance (0.65) suggests that the countries in the sample are relatively close to each other spatially. Approximately 74.2% of the countries in the sample share a common language, and 14.1% share a border. Additionally, 49% of the countries have a shared colonial history.

To assess multicollinearity, zero-order pairwise correlations were computed and are presented in Table A2. All zero-order pairwise coefficients are <0.8, indicating no perfect multicollinearity, allowing all variables to be included in the regression model.

4.2. Results of the PPML

The regression results from the PPML estimation are detailed in Table 3, focusing on the effects of IPRs and the traditional gravity model variables on intra-COMESA trade. The first column (all products) shows the effect of trademarks on international trade at an aggregate level.

The coefficient corresponding to trademarks for all sectors is positive and statistically significant. This highlight the significant role of trademarks in influencing the trade volumes of trademark related products. Subsequent columns display the results of IPRs on the 10 different sectors as IPRs are considered to have different effects at a highly disaggregated level. The results indicate that stronger intellectual property protections, as indicated by trademarks, consistently boost trade. For example, a 1% increase in trademark intensity leads to a significant 0.224% increase in plastics trade and a 0.164% increase in pharmaceuticals trade, both at the 5% significance level. Trademarks also significantly raise rubber trade by 0.232% (1% significance) and tobacco by 0.131% (10% significance), underscoring the importance of intellectual property protections in facilitating trade. Trademark strengthening also has a positive and significant effect on the trade of paper, and footwear (though weakly significant) products. However, trademark strengthening has significantly negative effects on the trade of dairy and clothing products.

These findings above align with prior studies by Maskus and Penubarti (1995) and Raizada and Dhillon (2017), who also observed positive trade effects from stronger IPRs in specific sectors. Conversely, the negative coefficients for dairy and clothing sectors indicate that stronger trademark protection leads to a decrease in imports of these products. This is supported by Campi and Dueñas (2019), who found that increased trademark protection can raise product prices, thus reducing trade volumes.

GDP and population size both play significant roles in shaping trade patterns of trademark-related products, with varying effects across sectors. A 1% increase in the GDP of an importing country raises dairy imports by 2.377%, while pharmaceutical imports decrease by 0.691%. On the export side, a 1% increase in the GDP of the exporting country boosts beverage exports by 2.392% and pharmaceutical exports by 1.686%. Population size has mixed effects: a 1% increase in the importing country's population reduces dairy imports by 1.703%, yet pharmaceutical imports rise by 0.526%. Meanwhile, a 1% increase in the exporting country's population reduces beverage exports by 1.211%. These trends highlight how economic strength and population size differentially impact trade flows across sectors.

Distance, language, and borders significantly influence trade patterns across sectors, acting as both barriers and facilitators. A 1% increase in distance reduces dairy imports by 3.092% and footwear imports by 3.201%, highlighting the negative impact of transportation costs and logistical challenges over long distances. Language and borders show mixed effects on trade in trademark products within COMESA: sharing a common language reduces tobacco trade by 1.680% but increases footwear trade by 1.659%, both at 5% significance. Similarly, shared borders boost beverage trade by 2.002% while reducing footwear trade by 1.260%, indicating that cultural and geographic proximity affect trade in different sectors in diverse ways.

Table 2: Descriptive statistics of the included variables

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
M_{ijt}	5704	918.91	5792.42	0.00	130652.76
$ln\ GDP_{importer}$	5704	23.98	1.13	22.21	26.89
$ln\ GDP_{exporter}$	5704	23.67	1.41	20.30	26.89
$ln\ Population_{importer}$	5704	16.92	1.50	13.99	18.63
$ln\ Population_{exporter}$	5704	16.43	1.80	11.30	18.63
$ln\ Dist_{ij}$	5704	7.69	0.65	6.37	8.74
In Trademark	5704	4.55	2.23	0.00	9.10
Language	5704	0.74	0.44	0.00	1.00
Border	5704	0.14	0.35	0.00	1.00
Colony	5704	0.49	0.50	0.00	1.00

Source: Author Computations

Table 3: PPML regression results

Variable	Import Sector										
	All sectors	Dairy	Beverages	Tobacco	Pharmaceutical	Plastics	Rubber	Paper	Furniture	Clothing	Footwear
ln GDP$_{importer}$	0.201	2.377***	−0.093	0.138	−0.691***	−0.116	−0.534	−0.735***	−0.405	−0.634	−1.000***
	(0.339)	(0.486)	(0.517)	(0.364)	(0.254)	(0.245)	(0.341)	(0.228)	(0.298)	(0.399)	(0.282)
ln GDP$_{exporter}$	0.151	0.105	2.392***	−0.193	1.686***	1.496***	1.085***	1.370***	0.867**	1.756***	1.210***
	(0.395)	(0.648)	(0.714)	(0.326)	(0.416)	(0.368)	(0.320)	(0.421)	(0.367)	(0.410)	(0.444)
ln Pop$_{importer}$	−0.151	−1.703***	−1.057*	−0.735***	0.526**	0.732***	0.821***	0.789***	0.119	0.053	−0.083
	(0.256)	(0.505)	(0.608)	(0.272)	(0.236)	(0.200)	(0.231)	(0.246)	(0.224)	(0.238)	(0.173)
ln Pop$_{exporter}$	0.028	0.868	−1.211**	0.149	−0.902**	−0.020	−0.529*	−0.532	−0.409*	−0.923***	−0.206
	(0.236)	(1.492)	(0.492)	(0.238)	(0.386)	(0.332)	(0.317)	(0.510)	(0.244)	(0.271)	(0.266)
ln Disti$_{j}$	−0.832	−3.092***	−3.247**	0.149	−0.705*	0.240	−1.227***	−0.810	−0.925	−0.317	−3.201***
	(0.597)	(0.872)	(1.340)	(0.907)	(0.422)	(0.757)	(0.362)	(0.810)	(0.590)	(0.300)	(0.449)
ln Trademark	0.157**	−0.182**	0.092	0.131*	0.164**	0.224**	0.232***	0.389***	0.050	−0.125**	0.104*
	(0.076)	(0.126)	(0.138)	(0.077)	(0.064)	(0.101)	(0.065)	(0.049)	(0.103)	(0.118)	(0.060)
Language	−1.476*	−1.030	−0.533	−1.680**	0.683	1.941***	−1.606**	−1.205*	−1.169**	1.659**	0.271
	(0.888)	(1.562)	(1.010)	(0.693)	(0.658)	(0.659)	(0.680)	(0.660)	(0.528)	(0.649)	(0.883)
Border	1.025	1.123*	2.002**	2.824*	0.361	−0.437	−0.508	−0.395	0.834	0.216	−1.260**
	(0.768)	(0.682)	(0.995)	(1.462)	(0.481)	(0.417)	(0.749)	(0.753)	(0.832)	(0.486)	(0.572)
Colony	0.612***	1.026***	1.450**	0.257	0.585***	0.959***	0.787**	0.782**	0.595**	0.854***	0.562
	(0.170)	(0.237)	(0.575)	(0.613)	(0.221)	(0.340)	(0.309)	(0.333)	(0.246)	(0.273)	(0.349)
Constant	6.636	−18.237**	10.159	18.188**	−8.056	−44.433***	−3.554	−8.006	4.564	−6.865	26.868***
	(7.082)	(8.254)	(9.520)	(8.774)	(6.052)	(14.587)	(8.877)	(9.446)	(8.793)	(4.615)	(6.610)
Observations	0.027	0.734	0.601	0.153	0.202	0.366	0.377	0.191	0.086	0.121	0.373
R-squared	5704	391	460	575	667	483	621	621	644	782	460

Standard errors are in parenthesis
*** P<0.01, ** P<0.05, * P<0.1

Colonial ties continue to exert a strong positive influence on trade. In the dairy sector, a colonial relationship increases trade by 1.026% (1% significance), while in plastics, it boosts trade by 0.959% (1% significance). These historical connections facilitate trade flows, likely due to enduring economic and institutional linkages. Overall, trademarks, GDP, population, distance, language, borders, and colonial ties all significantly influence trade within COMESA, with their effects varying in magnitude and significance across different sectors.

5. CONCLUSIONS AND POLICY IMPLICATIONS

The effects of strengthening IPRs remain inconclusive, with contradictory results characterising extant literature. Although numerous studies have examined the role of IPRs in international trade, few have specifically analysed the impact of enhancing IPRs in Africa. This paper investigates the effects of strengthening IPRs, particularly trademarks, on intra-COMESA sectoral imports, addressing the following two key questions: (i) what are the effects of strengthening trademarks on intra-COMESA imports; and (ii) are there any heterogeneous effects on product sub-sectors?

The empirical analysis suggests that overall, the enforcement and strengthening of trademarks significantly affect intra-COMESA trade in trademark-related products. However, at a disaggregated product level, the results indicate somewhat heterogeneous effects. Specifically, the strengthening of trademarks is detrimental to the trade of dairy and clothing products, while beneficial for the trade of plastics, pharmaceuticals, rubber, tobacco, paper, and footwear products. The empirical evidence reveals that plastics, pharmaceuticals, rubber, tobacco, paper, and footwear products are positively impacted by the strengthening of IPRs, whereas dairy and clothing products are negatively affected. Additionally, sectors such as beverages and furniture are unresponsive to changes in IPRs regimes.

This paper concludes that neither outright market power nor market expansion effects are confirmed through the strengthening of trademarks on intra-COMESA trade. Based on the results, it is recommended that trademarks should be enforced and strengthened for plastics, pharmaceuticals, rubber, tobacco, paper, and footwear products. Conversely, a more relaxed approach is advisable for dairy and clothing products within the selected COMESA countries. The strengthening of trademarks can have countervailing effects on trade across different sectors. For instance, it may reduce trade in certain sectors like dairy and clothing due to increased barriers or brand protection. However, in other sectors, such as plastics, pharmaceuticals, rubber, tobacco, paper, and footwear, stronger trademarks may promote trade by fostering brand differentiation and consumer trust. As a result, an important policy consideration will be the harmonisation of IPRs and competition laws to balance these effects and ensure fair competition.

In addition to the need for harmonising IPRs and competition laws, policymakers should also consider sector-specific strategies when enforcing and strengthening trademarks within COMESA countries. For sectors positively impacted by stronger trademarks, such as plastics, pharmaceuticals, rubber, tobacco, paper, and footwear, governments can further encourage trade by providing support for innovation, improving access to export markets, and enhancing brand development programs. For sectors negatively impacted, like dairy and clothing, more flexible trademark regulations may be necessary to avoid stifling competition, especially for smaller producers and new market entrants. Furthermore, international cooperation within COMESA is essential to address disparities in IPRs enforcement across member states, ensuring that trademark regimes are aligned with the development goals of each country. Supporting capacity-building initiatives for local firms and promoting technological transfer in sectors less responsive to trademark changes, such as beverages and furniture, could further enhance trade competitiveness across the region.

A significant caveat of the study is the data limitation on COMESA countries regarding IPRs, which makes it challenging to draw definitive conclusions about the effects of IPRs protection on international trade. Moreover, trademarks are just one subset of IPRs, and the number of trademark applications is a rough theoretical measure of intellectual protection. Therefore, future studies could benefit from expanding the subset of IPRs and broadening the analysis to provide a more conclusive exposition of the effects of IPRs on trade. Policymakers should carefully consider the sector-specific impacts of IPRs enforcement, and efforts to harmonise IPRs and competition laws should address the diverse effects on different product sectors. Further research is needed to fill data gaps and offer a more comprehensive understanding of the relationship between IPRs and trade.

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APPENDIX

Table A1: Variable definition and sources

Variable Name	Definition	Source
M_{ijt}	Total bilateral imports, measured in current US$ thousands, of country from country *j* in period	WB (2024b) WITS
$ln\ GDP_{importer}$	Natural logarithmic value of the total GDP of the importing country, measured in current US$ millions	WB (2024a) WDI
$ln\ GDP_{exporter}$	Natural logarithmic value of the total GDP of the exporting country, measured in current US$ millions	WB (2024a) WDI
$ln\ Population_{importer}$	Number of people in the importing country	WB (2024a) WDI
$ln\ Population_{exporter}$	Number of people in the exporting country	WB (2024a) WDI
$ln\ Dist_{ij}$	Distance between the main cities of the importing and exporting countries, measured in Kilometres.	CEPII (2024)
In Trademark	Natural logarithmic value of the annual number of trademark applications by foreign residents or firms in each of the five COMESA countries	WIPO (2024)
Language	Dichotomous variable with a value equal to 1 if countries share a common border and 0, if otherwise	CEPII (2024)
Border	Dichotomous variable with a value equal to 1 if countries share a common official language and 0, if otherwise	CEPII (2024)
Colony	Dichotomous variable with a value equal to 1 if countries share a common coloniser and 0, if otherwise	CEPII (2024)

CEPII: *Centre d'Études Prospectives et d'Informations Internationales*; COMESA: Common market for eastern and southern Africa; GDP: Gross domestic product; WB: World Bank; WDI: World development indicators; WITS: World integrated trade solution

Source: Authors' compilation

Table A2: Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) M_{ijt}	1.000									
(2) $ln\ GDP_{importer}$	0.067	1.000								
(3) $ln\ GDP_{exporter}$	0.076	0.250	1.000							
(4) $ln\ Population_{importer}$	0.020	0.653	0.052	1.000						
(5) $ln\ Population_{exporter}$	0.074	0.108	0.789	0.093	1.000					
(6) $ln\ Dist_{ij}$	−0.045	0.115	0.255	−0.082	−0.013	1.000				
(7) *In Trademark*	0.060	0.309	0.147	−0.384	0.009	0.223	1.000			
(8) *Language*	−0.067	−0.322	−0.562	−0.140	−0.419	−0.498	−0.226	1.000		
(9) *Border*	0.088	0.023	0.065	0.142	0.193	−0.623	−0.127	0.239	1.000	
(10) *Colony*	0.281	0.140	0.033	0.115	0.121	−0.538	−0.133	0.479	0.213	1.000