Understanding non-tariff barriers and regional integration in the East African community

Lauren Falcao Bergquist
Matthew Grant
Meredith Startz

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1   Introduction

This study investigates trade and regional integration within the East African Community (EAC), with a particular focus on agricultural goods traded between Kenya and Uganda. In recent years, the EAC has instituted several changes in trade policy, including the introduction of the common market, One Stop Border Post (OSBP), and the single-window policy (a simplified trade regime clearance procedure for small traders). These reforms were generally targeted at simplifying the process of clearing the border, with a goal of reducing non-tariff barriers (NTBs) and facilitating greater trade.

Non-tariff barriers may be particularly prohibitive to small traders, and may therefore have the unintended consequence of concentrating market power at the border. This can influence the degree of competition in domestic markets within each country. The result is that border policies that influence these NTBs may affect businesses, farmers, and consumers throughout the country through not only the direct costs of engaging in cross-border trade, but also indirectly through the competitiveness of the trading and logistics sector.

At the outset of this study, we intended to shed light on the likely impact of such policy reforms in two ways. First, we proposed original data collection with traders engaged in cross-border movement of goods, as well as the agencies that have emerged to help them navigate this complex clearing process. This exercise would yield novel data on both the magnitude of non-tariff costs and their distribution as a function of trader size, This would allow us to understand how non-tariff barriers affect the flow of goods and the ability of firms of different sizes to engage in trade. With this survey data, we aimed to provide some of the first empirical evidence on whether NTBs may be a driver of market concentration.

Second we proposed using historical, transactions-level customs data to explore the impact of policy reforms designed to reduce NTBs. Due to its comprehensive historical coverage, the customs data was intended to enable difference-in-difference estimates of the impact of past reforms. Unfortunately, we faced major challenges in accessing the transaction-level customs data and ultimately were not successful in acquiring this data.

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See appendix for a full description of the steps pursued and the challenges faced. We therefore are limited in our ability to speak to the impact of these policy reforms.[1]

However, we were much more successful in collecting original survey data. While this data is more limited in its ability to speak to the global impact of NTB policy reforms, it does shed new light on the size and distribution of the barriers face in practice by those engaged in cross-border trade. Crucially, it allows us to speak to the experience of informal and small-scale traders who may not appear in customs data. It also enables measurement of typically difficult-to-observe costs, such as bribes and fees paid to private agents and middlemen. We therefore focus in this report on this second set of descriptive issues, to which we can speak with our original data collection.

We find that indeed larger traders are more likely to engage in cross-border trade. Consistent with this, we find evidence of economies of scale in both transport and border crossing costs, both in trader self-reports of costs and in the fee structure charged by agencies facilitating border crossing. This suggests that barriers to trade likely fall heaviest on smaller traders, who may find the fixed costs associated with cross-border trade to be prohibitive. This has implications for market concentration, consumer welfare, and revenue collection. Perhaps partially as a result, we find substantial cross-border price gaps, even for markets immediately adjacent to each other on opposite sides of the border. Finally, we find that many traders opt to avoid the official border crossing by using informal trading routes, in order to reduce wait times and limit fees paid. This again has implications for revenue collection.

These results are relevant for governments as they consider policy changes to tariff and non-tariff trade costs, especially those that are designed to simplify the border-crossing process for smaller firms. In the conclusion, we discuss promising avenues for future work that would be feasible with greater access to data or future randomized controlled trials.

2   Background, Literature Review, and Policy Relevance

Evidence on the effects of non-tariff barriers is very limited. We contribute to the literature by providing rigorous micro-empirical evidence on this important and understudied set of trade barriers. Moreover, research on the welfare costs of trade barriers more generally typically focuses on how they distort the production decisions of firms and the consumption decisions of individuals. In this project, we examine a novel channel: the role of trade barriers in distorting intermediation and arbitrage across locations. Recent work by Atkin and Donaldson (2015) highlights the importance of spatially-varying markups in driving differences in prices across locations, finding that intermediaries capture a larger share of the surplus from traded goods in more remote areas. Thus, distortions and market power

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[1]In our pilot surveys with traders, we also tried to construct a panel by asking retrospective questions about the past five years of trading behavior. We had hoped that – in the absence of transactions-level customs data – this retrospective panel might provide an alternative method for measuring the impact of the recent NTB policy reforms. However, piloting revealed that traders keep very limited records and had a hard time remember the amount of goods traded – and in particular, the costs paid at the border associated with this trade – to make such an analysis feasible.

in intermediation may have important distributional consequences. Barriers at the border may also reduce traders' ability to smooth out large and potentially costly seasonal price fluctuations in agricultural goods through intraregional arbitrage.

In particular, border policy may be particularly costly for small traders if complying involves fixed costs. For instance, clearing agricultural goods across the Uganda-Kenya border generally requires obtaining certification of compliance with sanitary and phytosanitary measures. If fixed costs of this sort disproportionately affect smaller traders, this may both concentrate market power at the border and also influence the degree of competition in domestic markets within each country. The result is that border policies may affect businesses, farmers, and consumers throughout the country through not only the direct costs of engaging in cross-border trade, but also indirectly through the competitiveness of the trading and logistics sector.

From a policy-perspective, the agricultural goods that are the focus of this project are crucial to both producers and consumers throughout East Africa. The efficiency of the wholesale and retail trade sector will influence the prices received by farmers and small businesses, as well as the prices paid by consumers. Cross-border trade may be particularly important in managing large seasonal price fluctuations – reducing barriers at the border could facilitate arbitrage across regions with different growing seasons, smoothing out annual price jumps. If border policy also has the unintended side effect of concentrating market power in the trading sector, this will increase the gap between the prices received by farmers and that paid by consumers.

Finally, in many developing countries, taxes and fees on trade are a major source of public revenue, and border crossings are important points of contact between the government and the private sector. Unnecessarily complex or inefficient border policies may make it more difficult to manage this relationship effectively, however, by discouraging cross-border trade or pushing traders into informality. In this project, we shed light on what costs firms with different characteristics face when engaging in trade and how this may influence their choices to engage in trade. We hope this knowledge will be useful as government officials make decisions about how to design and implement border policy.

3   Data Description

For this project, we collected three forms of original data: surveys with traders, survey with clearing agents, and price data on both sides of the border. We describe each data collection process in turn here.

3.1   Trader Data

In August 2019, we carried out a census of traders in all Kenyan markets located within 30 kms radius of the Kenya-Uganda border. Traders were defined as individuals who buy goods in locations that are different to locations where their goods are sold, implying they play a role in moving goods along the value chain. We focused on traders trading in maize, fruits, vegetables or fish. 1,160 traders were censused across 20 markets. A majority of them are small and medium size traders: they are foot traders and/or use

small vehicles like bicycles, motorbikes or small carts to trade. Traders found in markets can either trade internationally (in our context, mostly importing goods from Uganda) and be referred to as cross border traders or can trade domestically (in our context buying and selling in Kenya) and be referred to as domestic traders.

758 traders were then randomly selected to be part of our sample. Surveys were run in the fall of 2019. We stratified the selection by type of good traded, trader size, whether the trader engages in domestic or cross border trade and gender. The data collected included trader demographic information, suppliers, buyers, cross border trade activities among others. 539 traders were successfully surveyed (see **??** for an overview of attrition) and the analysis carried out on 518 traders for whom we were able to collect full data.

While we had hoped to return to collect additional data with this sample, the events of COVID beginning in the spring of 2020 severely hampered any future attempts to conduct surveys. Attempts at phone surveys suggested that follow-up rates were too low to provide reliable data.

3.2 Clearing Agents Data

We complemented this data with surveys from agencies that facilitate this cross-border trade. To sample these agencies, we began with a list of all clearing agents in Kenya provided by the Kenya International Freight and Warehousing Association (KIFWA). In collaboration with the local agencies, we narrowed down to focus mainly on the clearing agents based in Busia and Malaba border posts (the major one stop border posts). From this census, we identified 125 clearing agents. We then attempted to contact these agencies to conduct a screening survey during the summer and fall of 2018. We used the screening survey to narrow our sample to those agencies that (1) were still in business; (2) worked in clearing agricultural commodities; and (3) were willing to participate in our research study. It is worth noting that there are two kinds of agencies: fully registered agencies and "briefcase" agents. The latter are freelance agents who are not officially registered, but who use the registration pin of existing companies to clear goods for their clients while paying a fee for this opportunity. We did not screen out these "briefcase agents," as they make up an important part of the community of agents active in supporting the border clearing process. In total, of the 125 agents screened in the screening survey, 77 matched our inclusion criteria and consented to participate. We completed the agents survey with managers of these 77 agencies.

This survey collected data on agent profits, revenues, and costs, including those incurred to cross the border on behalf of their clients. It also asked about the perceived barriers that agricultural traders face during their cross-border operations and the kind of services the clearing agents offer in an attempt to mitigate the trader barriers. Finally, surveys asked about the impact of the recent policy changes on enhancing the ease of operations and procedures regarding cross border trade.

3.3 Price Data

Finally, through the grant period, we collected weekly prices for maize at markets on both the Ugandan and Kenyan side of the Busia border crossing. We collected both the price

per bag (which is approximately 90 kilos), which can be thought of as the wholesale price, and the price per "goro" (which is approximately 2.3 kgs), which can be thought of as the retail price. In Busia Kenya, we collected the data from traders in Kasarani market and Soko Matope market, with the former being mostly a retail market center and the latter mainly a wholesale market center. Through the maize traders, we were able to capture the Uganda purchase prices since we did not have research clearance to work in Uganda.

4   Results from Qualitative Interviews

During the project we carried out multiple qualitative interviews on the Kenya-Uganda borders of Busia and Malaba with several actors and agencies to understand border crossing procedures. These included border officials, clearing agents, brokers and traders. The border officials from different departments included Kenya Plant Health Inspectorate Service (KEPHIS) which is tasked to assure the quality of agricultural inputs and produce, public health/port health responsible for inspecting goods of public health importance, customs department for collecting tax if applicable and Kenya Bureau of Standards which ensures imported manufactured goods meet required standards. All of them provided valuable information on the processes for clearing goods using the official border crossing. Clearing agents, brokers and traders were able to complement this information, providing details about both official and non-official border crossing procedures.

Figure 1 summarizes the processes at the official border crossing for cereals, as reported by our interview subjects. The top panel describes each step, along with the time and fees associated with completing that step. The bottom panel presents, for each mode of crossing the border, which steps are required. Note that the process for clearing goods at the official border crossing can be done by either the trader or an agent. For goods worth more than $2,000, the trader must use a registered clearing agent. For goods under $2,000, there are several options for the trader. The trader can clear the goods by himself or using an agent (a process called "direct assessment"). Alternatively, a good number of small traders choose to carry their goods on bicycles ("boda bodas") either to aggregate on the other side of the border or to sell as retail directly in the border town of Busia, Kenya.

In addition to these formal channels, our qualitative interview also suggested that many small-scale traders use informal border crossing. Some of these border crossings have police on guard and local county officials. There is normally no paperwork required to get goods across the informal border crossings. An informal fee of around $0.5 is charged by the police for each crossing per 90Kg bag. See Section 5.3 for more information on these informal crossing points.

Figure 1: **Process for clearing the border**

Steps	Contract Clearing agent	Obtain passed clearance entry	Obtain EAC Simplified Certificate of Origin	Obtain exit note	Obtain KEPHIS release	Obtain National Biosafety Authority release	Obtain port health/public health services release	Obtain KEBs release	Obtain KRA release	Obtain KRA final release	Agency follow up on bond
Duration	Depends on negotiations	1 − 2 Days	5 mins max	5 mins max	10 − 30 mins	15 − 30 minutes	10 − 30 mins	5 − 20 mins	5 − 30 mins	5 − 10 mins	1 − 2 Days
Fees (Ksh)	~2,000 commission for agent (negotiable). Client pays all other expenses.	~10,000–15,000 (bulk) ~8,000 (single)	~10 (purchase a copy of the form)	0	22.5 for > 10,000 90Kg bags 42 for < 10,000 90 Kg bags	1,000 (flat statutory fee)	1,000 (flat statutory fee)	6,200 (flat statutory fee)	Fees: 0	Fees: 0	Fees: 0
Mode of clearing the border											
Indirect assessment using clearing agent (> USD 2,000)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Direct assessment (< USD 2,000)	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Mamas/Bicycle Boda Bodas Aggregating	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Mamas/Bicycle Boda Bodas to Busia Kenya (N.B. pay about ~65 Ksh per bag to Police as bribe)	No	No	No	No	No	No	No	No	No	No	No
Transit	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	Yes

5   Results from Trader Survey

5.1   Selection into Cross-border Trade

Table 1 summarizes the characteristics of the traders in our sample, which are a mix of domestic traders and those engaged in cross-border trade. Traders are on average 42 years old, though ages range from 20 to 81 years old. Most of the traders in our sample are importers; 88% of traders found in the Kenyan market are Kenyan. In line with estimates highlighted by other reports and studies, 12% of traders are men and 88% are women[2]. Small size trading is predominantly carried out by women, while larger scale trading by men. Table 1 shows that 6% of small-scale traders in our sample are men while 16% of medium and large scale traders are men. Almost all traders (93%) have access to mobile phones.

Traders in our sample trade on average 2.1 goods each. Small traders tend to take an opportunistic approach in terms of goods traded, switching from one good to another (within a given industry) depending on price gaps and availability, and trade in more goods, with an average of 2.3 goods per traders. Traders tend to specialize as they grow in size, with an average of 1.9 goods for medium and larger size traders). 11% of traders in our sample trade in maize (as their main good), 32% in fruit, 20% in vegetables, 33% in fish (although mostly dry fish) and 14% mainly trade other goods.

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[2]See for example 2017 FAO report "Formalization of informal trade in Africa"

Table 1: Trader's characteristics

	Full Sample			Small Traders			Medium-Large Traders		
	mean	sd	count	mean	sd	count	mean	sd	count
Basic Characteristics									
Age	42.00	11.12	517	42.50	11.69	195	41.65	10.76	317
Kenya Resident	0.88	0.32	518	0.93	0.25	196	0.85	0.36	317
Male	0.12	0.33	518	0.06	0.23	196	0.16	0.37	317
Access to phone	0.93	0.25	518	0.93	0.25	196	0.94	0.24	317
Goods Sold									
Num of goods sold in past 12 months	2.06	1.41	518	2.27	1.55	196	1.93	1.32	317
Main good traded: Maize	0.11	0.31	518	0.13	0.33	196	0.10	0.30	317
Main good traded: Fruit	0.32	0.47	518	0.28	0.45	196	0.34	0.47	317
Main good traded: Veg	0.20	0.40	518	0.21	0.41	196	0.20	0.40	317
Main good traded: Fish	0.33	0.47	518	0.35	0.48	196	0.33	0.47	317
Main good traded: Other	0.14	0.35	518	0.16	0.37	196	0.13	0.33	317
Main good traded: Fresh Fish	0.04	0.19	518	0.06	0.23	196	0.03	0.17	317
Main good traded: Dry Fish	0.31	0.46	518	0.32	0.47	196	0.31	0.46	317
Type of Trader									
Cross border trader	0.27	0.44	518	0.23	0.42	196	0.28	0.45	317
Cross border and domestic trader	0.42	0.49	518	0.39	0.49	196	0.44	0.50	317
Domestic trader	0.31	0.46	518	0.38	0.49	196	0.28	0.45	317

Traders choose where to source their goods from, specifically whether to source goods domestically or internationally. We define trade as cross-border when when the trader crosses the border herself (or uses am employee or rents the services of a transporter who does not own the goods in transit); this is distinguished from "domestic traders," who source their goods in Kenya (these good may originate in Uganda, but were owned by another trader when they crossed the border). About 69% of traders in our sample have engaged in cross border trade at least once in the past year and 31% are purely domestic traders.

Engaging in cross border trade allows trader to access goods at potentially cheaper prices and/or better quality. On the other hand, they have to face bureaucracy and paperwork to be able to import goods, increased transport costs, border costs such as taxes and tariffs and non-tariff barriers such as corruption, long waiting times and harassment.

We see clear evidence of selection in whether to engage in cross border trade or remain domestic traders. Table 2 and Table 3 highlight some determinants of cross border trade[3]. Cross-border traders tend to be younger, but are also more experienced. Not surprisingly, those traders who engage in cross-border trade are less likely to be Kenyan. Interestingly, we see no difference by gender in engagement in cross-border trade. We also see no difference in access to phones, which are near-ubiquitous in use among both domestic-only and cross-border traders. Cross-border traders are typically located closer to the border.

Importantly, we find that the traders who engage in cross-border trader tend to be larger, in terms of both revenues and profits. For example, cross-border traders have annual revenues of USD 27,500; nearly double the amount of yearly revenues for domestic traders (USD 17,500). This difference in size remains significant even when controlling for other differences between cross-border and domestic-only traders, and holds even after controlling for market fixed effects (see Table 3).

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[3]We code trader who engage in any cross-border trade (including those who specialize in cross-border trade only and those who engage in both cross-border and domestic trade).

Table 2: Determinants of Cross Border Trade

	Domestic	Cross Border	P-value of Diff
Age	43.93	41.13	0.008***
Kenya Resident	1.00	0.83	0.000***
Male	0.10	0.13	0.284
Access to phone	0.94	0.93	0.809
Distance to Border	17.67	15.92	0.082*
Yearly revenues (per 100,000 Kshs)	17.47	27.54	0.051*
Yearly profits (per 100,000 Kshs)	2.94	4.81	0.014**
Experience (years)	12.55	12.65	0.912

Note: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 3: Determinants of Cross Border Trade: Regression

	(1) Cross Border	(2) Cross Border	(3) Cross Border
Age	-0.006***	-0.005*	-0.005**
	(0.002)	(0.003)	(0.002)
Kenya Resident	-0.333***	-0.368***	-0.224***
	(0.028)	(0.035)	(0.044)
Male	0.037	0.050	0.051
	(0.058)	(0.073)	(0.061)
Access to phone	0.032	0.109	0.094
	(0.074)	(0.110)	(0.080)
Experience (years)	0.005**	0.006**	0.006**
	(0.002)	(0.003)	(0.003)
Yearly profits (per 100,000 Kshs)	0.005**	0.008**	0.006**
	(0.002)	(0.003)	(0.002)
Distance to Border		-0.005*	
		(0.003)	
Constant	1.105***	1.043***	0.856***
	(0.092)	(0.139)	(0.219)
Market FE	No	No	Yes
R squared	0.083	0.066	0.179
Observations	517	388	450

5.2   Trading Costs by Trader Size: Existence of Fixed Costs

In the previous section, we saw that cross-border traders are more likely to be large, in terms of profits or revenues. What might account for this pattern? One hypothesis is that there are large fixed costs to engaging in cross-border trade. In our trader survey, we asked respondents about a variety of costs they face in their trading business. Table 4 shows the different components of costs, measured in different ways: Panel A shows annual total profits and revenues (values reported by traders when asked for an estimate of their annual profits and revenues), Panel B shows annual values estimated by scaling up traders' estimates of a typical trip (values reported by traders when asked about a typical trip) by the number of trips they carry out in a year and Panel C shows those values per typical trip. All measures are in 100,000 Kenya shillings.

Total yearly costs are on average about 76% of revenues. Costs associated with purchasing their goods account for the majority of the costs, accounting for 90% of total costs on average. Traders also have to face transport costs (5% of total costs). Border costs such as tariffs and taxes only account for less than 1% of total costs. Other costs, which include corruption and/or facilitation fees, account for less than 1% as well.

Table 4: Overview of Existing Costs (in Kshs)

	Full Sample		
	mean	sd	count
Yearly Profitability			
Yearly profits (per 100,000 Kshs)	4.22	8.06	518
Yearly revenues (per 100,000 Kshs)	24.39	54.41	518
Yearly Storage Costs (per 100,000 Kshs)	0.05	0.09	518
Trip based (Per Year)			
Revenues from trips (Year) (per 100,000 Kshs)	21.78	49.85	518
Total Costs from trips (Year) (per 100,000 Kshs)	17.70	40.83	518
Purchasing Costs (inc. broker fees) from trips (Year) (per 100,000 Kshs)	16.73	38.62	518
Transport Costs from trips (Year) (per 100,000 Kshs)	0.78	3.04	518
Border Costs from trips (Year)(per 100,000 Kshs)	0.10	0.45	518
Other Costs from trips (Year) (per 100,000 Kshs)	0.03	0.15	518
Trip based (Per Trip)			
Revenues from average trip (per 100 Kshs)	439.69	2108.27	518
Total Costs from average trip (per 100 Kshs)	435.76	3685.65	518
Purchasing Costs (inc. broker fees) from average trip (per 100 Kshs)	424.47	3669.46	518
Transport Costs from average trip (per 100 Kshs)	5.69	16.69	518
Border Costs from average trip (per 100 Kshs)	0.98	3.73	518
Other Costs from average trip (per 100 Kshs)	0.68	9.70	518

Table 5 shows that the high costs face by traders disproportionately burden smaller traders. Indeed, total costs do not proportionately increase with trader size (proxied by estimates of revenues), especially yearly. Columns 1 and 2 regress yearly costs on yearly revenues, with Column 1 using total revenues as reported by traders as proxy for size while Column 2 uses yearly revenues calculated by aggregating revenues per trip. Both seem to show the existence of fixed costs, as highlighted by a large constant term. Column

3 runs the same analysis but on costs and revenues per trip, rather than per year.

Table 5: Existence of Fixed Costs (in Kshs)

	(1) Yearly Costs	(2) Yearly Costs	(3) Cost per Trip
Yearly revenues (per 100,000 Kshs)	0.274***		
	(0.103)		
Revenues from trips (Year) (per 100,000 Kshs)		0.739***	
		(0.076)	
Revenues from average trip (per 100 Kshs)			1.459***
			(0.527)
Constant	11.019***	1.601	-205.577
	(2.041)	(1.264)	(150.909)
R squared	0.133	0.814	0.696
Observations	518	518	518

Table 6 digs deeper and looks at whether this trend is prevalent in specific costs. While purchasing (and broker) costs seem to rise closer to 1:1 with revenues, we see strong evidence of fixed costs in transport, border crossing costs, other costs, and storage.

Table 6: Fixed Costs by type of cost (in Kshs)

	Yearly					Per Trip			
	(1) Purchasing (and broker) costs	(2) Transport Costs	(3) Border Costs	(4) Other Costs	(5) Storage Costs	(6) Purchasing (and broker) costs	(7) Transport Costs	(8) Border Costs	(9) Other Costs
Revenues from trips (Year) (per 100,000 Kshs)	0.693***	0.041***	0.004***	0.001***	0.000***				
	(0.015)	(0.002)	(0.000)	(0.000)	(0.000)				
Revenues from average trip (per 100 Kshs)						1.446***	0.000	0.000	0.002***
						(0.043)	(0.000)	(0.000)	(0.000)
Constant	1.651**	-0.117	0.018	0.008	0.041***	-211.169**	5.574***	0.971***	-0.414
	(0.830)	(0.108)	(0.020)	(0.007)	(0.004)	(91.806)	(0.750)	(0.168)	(0.367)
R squared	0.799	0.454	0.172	0.139	0.060	0.690	0.001	0.000	0.293
Observations	518	518	518	518	518	518	518	518	518

5.3 Formal versus Informal Cross Border Trade

Traders who cross through the official border crossing go through multiple departments while crossing the border. They face revenue authorities where they may have to pay taxes depending on the value of goods imported, type of goods and origin. They also face other departments such as quality control, disease prevention, etc. where tariffs and fees are levied. Traders who import goods valued at less than 2000 USD can follow a simplified procedure. Indeed, member states from the East African Community (EAC) and the Common Market for East and Southern Africa (COMESA) have adopted simplified trade regimes for small-scale cross-border traders. The aim is to make it easier to conduct small-scale cross- border trade activities by putting in place instruments and mechanisms tailored to the trading requirements of small-scale traders that are operating in border areas, where informal trade is rampant. The Simplified Certificate of Origin is a trade facilitation document (introduced in 2007) which is used for clearance of goods that have been grown or produced in the EAC partner states and whose value is less than USD 2000. In the EAC, 370 products currently qualify for clearance through the simplified certificate of origin. The ease of use of the simplified certificate of origin has allowed cross-border traders to clear their consignments quickly and with less hassle.

Many traders opt to avoid the official border crossing by using side routes, usually referred to as informal routes. Those informal routes are well-known by the population, the government and especially the police who now strategically position themselves at informal border crossings to collect bribes. By opting to use informal routes, traders avoid official fees such as taxes and tariffs as well as potential longer waiting times and bureaucracy. By paying a facilitation fee to the police, they can cross through informal routes.

In our sample, out of the 69% who are cross-border traders, 25% of them mainly cross the official border while 75% prefer using the non-official border crossings. Table 7 summarizes how profitability and costs vary by trader type, namely whether they are domestic trader, cross border traders who cross the official border crossing or cross border trader who cross informally. This table is consistent with the idea that cross border trade is correlated with higher profits and revenues compared to domestic traders. When comparing formal and informal cross border traders, it is important to remember that formal cross border traders can either be larger traders who cannot use informal routes due to the quantity they have to transport (and have to clear their goods officially); or can be traders with small consignments who can therefore cross the official border without being stopped or having to file any paperwork. Table 8 focuses on non-tariff barriers and how those compare across formal and informal border crossings. Official border crossings are associated with longer waiting times. Corruption is reported to be present at both types of border crossing.[4]

Table 9 shows how the probability of using informal routes relative to using the official border crossing varies by traders' characteristics. Table 9 only includes cross border traders. Women cross border traders are more likely to engage in informal trade compared to men. Traders who have access to a phone and more experienced traders (although not significant) are more likely to use the official border crossing. In addition,

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[4]It is important to note that paying a facilitation fee at the informal crossings has become a norm and therefore measures of corruption incidence are likely under-reported for informal crossings.

goods traded and home markets seem to also influence whether traders cross informally or not. Column (4) includes controls for type of goods and for how far the trader's home market is from the border and Column (5) includes type of goods controls and home market fixed effects. Traders who primarily trade in fish are less likely to choose informality compared to traders who trade in fruit (the omitted category in Table 9); whereas traders who trade in maize are more likely to cross informally. Home market also plays a role as seen by the significance of the distance coefficient (Column 4) and the coefficients on market fixed effects in Column 5 (not shown). We do not find a strong correlation between trader size (proxied here by revenues) and informality but our data suggests that smaller traders tend to opt for informality (Columns 1 and 2), although the coefficient is not significant, and that trader size seems to be correlated with markets and goods (Columns 3-5). However, informal traders do not seem to have lower profit margins, to the contrary. Table 7 shows that informal traders total costs account for 80% of their revenues compared to 88% for formal traders.

Table 7: Profitability and costs by type of trader (in Kshs)

	Full Sample			Domestic Traders			Formal CB			Informal CB		
	mean	sd	count	mean	sd	count	mean	sd	count	mean	sd	count
Yearly Profitability												
Yearly profits (per 100,000 Kshs)	4.22	8.06	518	2.94	5.41	162	4.47	7.46	88	4.92	9.40	268
Yearly revenues (per 100,000 Kshs)	24.39	54.41	518	17.47	40.58	162	30.45	56.68	88	26.58	60.38	268
Yearly Storage Costs (per 100,000 Kshs)	0.05	0.09	518	0.04	0.10	162	0.07	0.10	88	0.05	0.09	268
Trip based (Per Year)												
Revenues from trips (Year) (per 100,000 Kshs)	21.78	49.85	518	17.39	40.51	162	19.07	32.10	88	25.32	58.82	268
Total Costs from trips (Year) (per 100,000 Kshs)	17.70	40.83	518	14.16	35.77	162	16.74	30.49	88	20.14	46.25	268
Purchasing Costs (inc. broker fees) from trips (Year) (per 100,000 Kshs)	16.73	38.62	518	13.43	34.95	162	15.87	29.97	88	19.01	42.97	268
Transport Costs from trips (Year) (per 100,000 Kshs)	0.78	3.04	518	0.65	2.06	162	0.61	1.48	88	0.91	3.82	268
Border Costs from trips (Year)(per 100,000 Kshs)	0.10	0.45	518	0.00	0.01	162	0.18	0.41	88	0.14	0.57	268
Other Costs from trips (Year) (per 100,000 Kshs)	0.03	0.15	518	0.04	0.15	162	0.01	0.07	88	0.03	0.16	268
Trip based (Per Trip)												
Revenues from average trip (per 100 Kshs)	439.69	2108.27	518	932.44	3700.85	162	258.63	409.71	88	201.28	279.17	268
Total Costs from average trip (per 100 Kshs)	435.76	3685.65	518	991.88	6555.32	162	248.54	468.29	88	161.07	211.15	268
Purchasing Costs (inc. broker fees) from average trip (per 100 Kshs)	424.47	3669.46	518	977.56	6527.45	162	237.51	460.07	88	151.54	198.60	268
Transport Costs from average trip (per 100 Kshs)	5.69	16.69	518	0.00	0.00	162	8.69	22.12	88	8.14	18.75	268
Border Costs from average trip (per 100 Kshs)	0.98	3.73	518	0.01	0.10	162	2.21	7.10	88	1.15	3.07	268
Other Costs from average trip (per 100 Kshs)	0.68	9.70	518	1.70	17.29	162	0.13	0.44	88	0.24	1.05	268

Table 8: Comparison across Official and Informal

	Official	Informal	P-value of Diff
N trips across border in past year	92.39	133.91	0.162
Goods confiscated in past year	0.05	0.02	0.257
Goods temp. confiscated in past year	0.16	0.10	0.110
Harassment in past year	0.15	0.09	0.152
Long waiting times in past year	0.12	0.04	0.008***
Spoiled goods in past year	0.08	0.05	0.347
Bribes in past year	0.36	0.28	0.120
N bribes in past year	24.96	26.90	0.818

Note: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 9: Determinants of Informal Cross-border Trade

	(1) Informal CB Trade	(2) Informal CB Trade	(3) Informal CB Trade	(4) Informal CB Trade	(5) Informal CB Trade
Age	-0.001 (0.003)	-0.003 (0.003)	-0.003 (0.003)	-0.002 (0.003)	-0.001 (0.003)
Kenya Resident	-0.118** (0.054)	-0.021 (0.104)	0.022 (0.067)	0.070 (0.105)	0.116* (0.063)
Male	-0.059 (0.070)	-0.057 (0.086)	-0.002 (0.060)	-0.081 (0.092)	-0.022 (0.062)
Access to phone	-0.133** (0.064)	-0.033 (0.109)	-0.103 (0.063)	-0.049 (0.104)	-0.102 (0.064)
Experience (years)	-0.002 (0.003)	-0.000 (0.004)	-0.002 (0.003)	0.002 (0.003)	-0.000 (0.003)
Yearly revenues (per 100,000 Kshs)	-0.000 (0.000)	-0.000 (0.001)	0.000 (0.000)	0.000 (0.001)	0.000 (0.000)
Distance to Border		-0.011*** (0.003)		-0.010*** (0.003)	
Main good traded: Maize				0.069 (0.198)	0.030 (0.160)
Main good traded: Veg				-0.040 (0.064)	-0.027 (0.046)
Main good traded: Fish				-0.221*** (0.075)	-0.196*** (0.069)
Main good traded: Other				-0.310* (0.170)	-0.368*** (0.140)
Market FE	No	No	Yes	No	Yes
R squared	0.027	0.073	0.289	0.127	0.354
Observations	356	241	294	241	294

6 Results from Agency Survey

This survey gathered information on business characteristics and income, listed goods and quantities cleared, use of simplified COMESA as to which goods are cleared using this option and comments on the use of the system. It also included number of shipments, additional questions on maize and the most common good with their number of KRA PINs used, types of customers and their distribution. In addition to this, the survey asked about determinants of prices charged clients.

The sample consists of a mix between companies (22) and freelance businesses (55). On average, the agencies have 3.3 employees, of which 1.6 are full-time and 1.7 are part-time. The biggest agency, and one of only three with more than 10 employees, has 20 workers. The agencies in our sample operate at two different borders, Busia and Malaba. Almost all were surveyed at the border where the entity does the most business: 50 at Busia and 22 at Malaba. However, 32 agencies are involved in the clearing process in more than one border, either at both Busia and Malaba, or a combination of Busia or Malaba and another border.

Agencies work by clearing different goods for different clients, typically traders. Most of them help clearing maize (69%), in addition to other goods such as millet, soy beans, and wheat. On average, agencies work with 5.8 goods (50% of the agencies are involved in the clearing process of between 2 and 6 goods and another 20% between 7 and 10 goods). Each of the agencies has a different spectrum of clients. The number of clients ranges from 1 to 350 and the mean is 15.4 at Busia and 24 at Malaba. However, 75% of the agencies have 10 or fewer clients. Agencies also meet new clients every year. On average, agencies meet 4.6 new clients with a standard deviation of 8.3. The most

common ways of meeting new clients are by reference of a current client (69% of the sample) and by references from brokers (53% of the sample)[5].

6.1   Difference by Client Size

Agencies set different prices depending on the good traded and the number of 90kg bags traded. The prices are set for 60, 120, and 300 bags containing 90 kgs of the good each.[6] For maize, the average prices charged by the agencies are 82 KSh, 41 KSh and 16 KSh per bag, respectively. For other goods, these costs are on average 189 KSh, 94 KSh and 38 KSh. This price schedule, which offers discounts for larger volumes, is another source of advantage for larger traders.

Table 1 intends to shed light on how much of the variability of the fee agencies charge is explained by their size, after controlling for the agencies' characteristics (number of clients, employees, goods, etc). The size of the firm is measured in two ways: (i) total quantity of 90kg bags the agency helps clear each year and (ii) average quantity of 90kg bags per shipment. We observe in Columns 1 and 2 a negative relationship between the fee and the average shipment size. However, this effect could be driven by the total number of bags the agency is actually clearing. After controlling for this, and for other agencies' characteristics, we find that having 1% higher average quantities is associated with a charging a 0.23% lower fee. Looking at pooled data for the different number of bags (Columns 5 and 6), the result increases to 0.43%.

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[5]Note that these categories are not exclusive.
[6]The usual amount of maize shipped is 194 bags of 90kg.

Table 10: Regressing Fee on Quantity

	(1) Log(Fee)	(2) Log(Fee)	(3) Log(Fee)	(4) Log(Fee)	(5) Log(Fee)	(6) Log(Fee)
Log(average shipment quantity)	-0.414***	-0.314***	-0.349***	-0.234***	-0.350***	-0.426***
	(0.000)	(0.001)	(0.002)	(0.002)	(0.000)	(0.000)
Log(total quantity per year)			-0.0628	-0.0947*	-0.154***	-0.148***
			(0.122)	(0.061)	(0.000)	(0.000)
Controls	No	Yes	No	Yes	No	Yes
Agency FE					No	Yes
Mean	9404.4	9404.4	9404.4	9404.4	9404.4	9404.4
Adjusted R2	0.296	0.503	0.338	0.551	0.829	0.943
Observations	94	62	93	61	279	183

p-values in parentheses

Dependent variable is Log(feeprice), where fee price is the weighted average of the prices for 60, 120 and 300 bags and weights correspond to the % of shipments for the three categories. Specifications (1), (2), (3) and (4) are cross section regressions of the price on measures of quantity with and without controls. Specification (5) and (6) include pooled data for different number of bags of 90 kgs of the good.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.2 Bulk Access and Differences by Agency Size

The agencies themselves face some incentive to operate at large scale, through a process called "bulk entry." Bulk entry allows agencies to clear allowable goods for a month or until the amount of goods permitted by the bulk entry permit is exceeded, whichever comes first. The bulk entry is lodged like any other entry on the KRA portal. The difference between bulk entry and the ordinary entry is in the quantities and number of shipments allowed per entry. Going by the name, bulk entry allows the clearing agent to use the same entry for multiple shipments and a large quantity of goods. With every shipment cleared the quantity in the bulk entry is knocked down until the amount specified before is exhausted.

Access to clear under bulk entry changed over the years and it is different for agencies that clear maize or other goods. For maize, the percentage of agencies that cleared under bulk entry increased from 83% in 2013, reaching 100% in 2018. For other goods, it was 64% in 2013, reached its peak in 2016 with 73% and went back to 65% in 2018.[7]

Table 11: Access to clear under bulk entry

Year	Most Common Good		Maize	
	Mean	SD	Mean	SD
2013	0.64	0.49	0.83	0.38
2014	0.72	0.45	0.92	0.28
2015	0.70	0.46	0.94	0.24
2016	0.73	0.45	0.95	0.23
2017	0.69	0.47	1.00	0.00
2018	0.65	0.87	1.00	0.00

In all cases, agencies usually have access during a whole season, but not the whole year. Table 12 illustrates this.

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[7]We were told that in 2019, the KRA nullified the use of bulk entry for maize. The clearing agents were required to raise ordinary entries. From what we gathered from the clearing agents, this proved challenging in terms of the process taking longer, with substantial delays at the border. After the clearing agents had consultations with KRA, they were asked to use simplified COMESA forms.

Table 12: Percentage of firms by frequency of bulk access

Maize

Frequency \ Year	2013	2014	2015	2016	2017
Never	16.67	8	6.06	5.41	0
Occasionally	0	4	0	0	2.33
Whole season	61.11	56	54.55	48.65	55.81
Any time all year round	22.22	32	39.39	45.95	41.86

Most Common Good

Frequency \ Year	2013	2014	2015	2016	2017
Never	36.36	27.59	29.73	27.27	30.91
Occasionally	0	0	0	0	1.82
Whole season	54.55	58.62	51.35	47.73	38.18
Any time all year round	9.09	13.79	18.92	25	29.09

In order to understand why it might be worth it for agencies to get access to clear under bulk entry, we explore which characteristics of agencies are associated with agencies obtaining bulk access. Table 13 illustrates this. Column 1 regresses whether an agency had bulk access in 2018 on agency characteristics from that year. We observe that agencies the clear more goods and have more years of experience are more likely to have bulk access. Perhaps surprisingly, agencies that have more clients and employees are *less* likely to have bulk access. We also asked a retrospective question about bulk access in the years 2013-2017. Because of recall issues, we were not able to collect reliable data on all agency characteristics for this past period. However we were able to collect total quantity cleared per year. We see no relationship between the quantity cleared per year and having bulk access (Column 3), nor do we see a relationship between average quantity cleared from 2013-2017 and having any access to bulk clearing during this period (Column 2), but again, we worry hear about recall issues.

Table 13: Bulk access and agencies' characteristics

	(1) Bulk Access 2018	(2) Bulk Access 2013-2017	(3) Frequency 2013-2017
Log(total quantity per year)	0.0356 (0.136)		
Log(average shipment quantity)	-0.0632 (0.110)		
Log(number of clients)	-0.104** (0.018)		
Log(number of goods)	0.162* (0.066)		
Log(employment)	-0.129** (0.041)		
Log(years of experience)	0.185* (0.069)		
Log(total quantity per year)		0.873 (.)	-0.0140 (0.206)
Maize Dummy			0.00552 (0.471)
Observations	81	50	231
Adjusted R^2			0.987
Year Dummies			Yes
Agency Dummies			Yes

p-values in parentheses

Specification (1) consists of a cross section regression where the dependent variable is a dummy for having access or not to bulk entry in 2018. Specification (2) and (3) use panel data from 2013-2017 to account for this relationship. In specification (2) we regress a dummy for bulk access on the total quantity cleared per year while specification (3) uses as dependent variable the frequency which which agencies have bulk access. The coefficient for specification (2) corresponds to the marginal effect calculated at the mean, after doing a probit regression. The level of signicance is 1% although no p-value is shown.

In Table 14 we construct a retrospective panel in order to analyze this relationship for the period covering the policy shocks on bulk access, 2013-2018. The dependent variable corresponds to the log of the price charged per 90kg bag, for when the client needs to clear 60 and 300 bags pooled with and without controls, and fixed effects per agency, year and number of bags.

For all the cases, we obtained negative coefficients for the relation between bulk access and the fee, which implies that bulk access reduces the cost of clearing goods in the border. Specifically, having bulk access decreases prices by 1.6%.

Table 14: Time Series 2013-2017

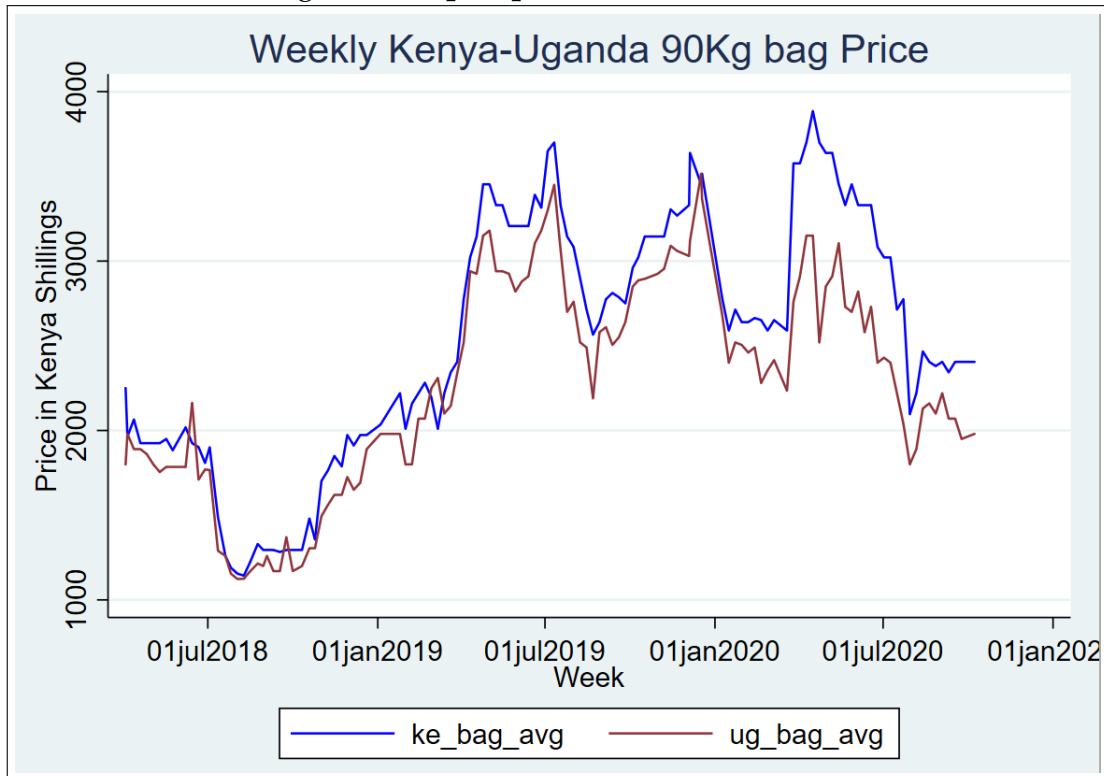|	(1)	(2)
	Log(FeePrice)	Log(FeePrice)
Bulk Access Dummy	-1.276*	-1.652***
	(0.063)	(0.000)
Log(total quantity per year)		-0.0203*
		(0.088)
Maize Dummy		-0.0600**
		(0.014)
Adjusted R^2	0.006	0.996
Year Dummies	No	Yes
Agency Dummies	No	Yes
Bags Dummies	No	Yes
Observations	468	392

p-values in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

7 Results from Price Survey

Through the grant period, we collected weekly prices for maize at markets located immediately across the Busia border, on the Ugandan side and on the Kenyan side. Figure 2 presents the weekly prices for a 90kg bag of maize, as measured in the surveys.

First, we note that there is often a discernible gap between the Kenya and Uganda price for maize – at times more than 5%—even in markets that are in very close physical proximity, suggesting that the cost of crossing the border is substantial. Not surprising, given that most maize flows from Uganda to Kenya, the Kenya prices are typically higher during these periods of divergence. On average, price gaps are larger in the months leading up to the main harvest season in western Kenya in August. Average price gaps have also increased substantially during the COVID-19 pandemic, likely reflecting increased border controls and delays between Kenya and Uganda due to public health measures. The size of these price gaps during periods of net flow from Uganda to Kenya is of a magnitude consistent with transport and border costs reported by traders in our surveys.

Figure 2: **Gap in prices across the border**

8 Discussion and Future Work

In both the trader and agency survey, we see that it is the larger actors who engage in cross-border trade. Consistent with this, we see evidence of the existence of fixed costs associated with border crossing. This suggests that policy reforms designed to lower the fixed costs associating with crossing the border have the potential to increase entry by smaller traders into cross-border trade, which might in turn increase competition among these agents.

Several such policies have been implemented in recent years. These include the introduction of the One Stop Border Post program and the single-window policy. The latter, which is a simplified trade regime clearance procedure for small traders, may be particularly valuable. We had hoped to access customs data that would allow us to measure the impact of these policies using a difference-in-difference approach (e.g. using differences in the effect of the policies across products and locations) or a regression discontinuity approach (e.g. using variation generated by the cutoff for eligibility in certain simplified regimes). Unfortunately, COVID-related delays and ultimately a rejection by the KRA for detailed transaction-level data access meant that we have not been able to conduct such an analysis yet, but we view this as a fruitful area of future, policy-relevant research.

There is also potential for future randomized control trials (RCTs) in this space. We had many conversations with TradeMark East Africa, which is supporting the EAC in its NTB reforms, about conducting such an RCT back in 2018 and 2019. Though these con-

versations unfortunately have not yet translated into a concrete plan for collaboration, we are optimistic that groups like TradeMark East Africa would be interested in randomizing programs like information campaigns or trade facilitation services in the future.

Appendix: Challenges with Customs Data Access

Over a period of about three years, the PIs worked with the Kenya Revenue Authority (KRA) to attempt to access customs data. The engagement started in April 2018, when an initial overview of the project scope and its interest in accessing trade data was shared with the KRA. The specifications of the data request included: data records from 2008 to the present with both import and export data at the shipment level for all years, including date, importer/exporter, type of goods, value of goods, and point of entry/exit. As well as data on quantity, identity of clearing agent/forwarder, any fees or charges levied, and any identification of goods for transhipment or special status if possible. Separate from this dataset request the project also requested that the KRA share contact and listing data on clearing agents to facilitate a potential survey with these agents.

IPA-Kenya had already been working and partnered with the KRA on another study for several years prior to 2018 which assisted in introductions and coordination with relevant KRA departments. The engagement was with the Strategy, Innovation, and Risk Management (SIRM) department of the KRA as it is the department that manages and supports external research requests/partnerships. Initial feedback in April 2018 was positive from the SIRM department and a dataset was shared with IPA and the PIs. This dataset was not as detailed as requested.

In May 2018 the project shared this feedback with the SIRM department on the initial dataset provided along with clarifying questions about the content of the dataset and a request to discuss a larger and more complete dataset. The IPA Research Manager (RM) for the project met with a SIRM department manager to provide a more detailed overview of the project scope and to discuss the data request further. The meeting was generally positive with a result of a mutual interest in moving forward with a collaboration. It was requested that the project share some more information on the trade data request as well as a preferred template/list of variables for the dataset. This was prepared and shared with the SIRM department in May 2018. The SIRM department tasked its data staff to review the request and list of variables to prepare an updated dataset. By the end of May 2018, the SIRM department shared a sample of clearing agents which assisted the project in its clearing agent survey.

Through June 2018 the project continued its coordination and follow up with the SIRM department. A detailed proposal of the project was requested by SIRM to provide context for the larger trade data request and to identify the utility and possible outcomes of the partnership for the KRA. The proposal was shared and in July 2018 PIs Lauren Falcao Bergquist and Meredith Startz and the IPA RM met with the SIRM manager at the KRA offices in Nairobi to further discuss the project proposal and data request. The meeting resulted in a plan of action and a number of next steps were identified. The SIRM manager provided input on the proposal and data request with suggestions for items to add to the proposal and how to expand the detail of the data request to assist with its review. It was also noted that the proposal and data request would need to be reviewed and approved by the KRA Commissioner of the SIRM department.

In August 2018 IPA shared an updated proposal, expanded data request, and official letter to the SIRM Commissioner highlighting the data request submitted and key components of the proposal. The SIRM manager shared this internally with the SIRM

Commissioner to gather feedback and to facilitate the review as the required next step in process. The project continued to follow up with the SIRM department through the end of 2018 and received an update in December 2018 that the review was ongoing. The SIRM department requested that a second letter following up on the proposal and data request be submitted to the SIRM Commissioner from IPA. This letter was submitted via hard copy with an official acknowledgement of receipt received.

Throughout the first few months of 2019 the project continued its follow up on the submitted materials and the review. The SIRM department communicated that it will be best if the project can set up an MOU with the KRA to proceed with the collaboration on the proposal and the data request review. At the time IPA already had an MOU for another project with the KRA. That MOU was due to be renewed in May 2019. In coordination with the SIRM department, it is agreed that the EAC Borders project will submit a second MOU in coordination with the renewal of the existing MOU. The MOU is prepared and shared with the SIRM department in May 2019.

By mid-2019 the SIRM department confirmed that the process for the trade data request will require the approval of the KRA Customs Department Commissioner as the requested data is within that department. In July 2019 an update is received from the SIRM Commissioner that the SIRM department had completed its review of the data request. The SIRM department forwarded the request to the Customs department Commissioner for action noting that the SIRM department had reviewed the request and was ready to proceed with the data request pending the Customs department review.

From July to December 2019 the Customs department reviewed the request while the MOU renewal and review process progressed. By late 2019, the MOU renewal and review process had been completed. The MOU was approved but the documentation shared was limited to the renewal of the MOU for the prior IPA project. Feedback was requested to determine why the official documentation approval for the EAC Border Project MOU was not included. Over this period, it was communicated that the Customs department Commissioner required an active MOU to review the request. It was unclear why only one MOU received the approval documentation but the SIRM department confirmed for the Customs department that the current approved IPA MOU is sufficient for the Customs department to proceed with its review of the trade data request for the EAC Borders project.

Over the early months of 2020 the project continued its high level coordination with the SIRM department to get a response from the Customs department on the data request. The SIRM Commissioner communicated that the request was still being reviewed by the Customs department and that the SIRM department was working to move the process forward. In March 2020, COVID-19 cases begin to appear in Kenya and the Government of Kenya issued lockdown and curfew measures. This interrupted the KRA review process. High level follow ups were still pursued by the project but there was a limited response due to the pandemic. In May 2021, the project received an update on its request and was notified that due to the size and scope of the data request it had been denied by the Customs department. The SIRM department also communicated that as of May 2021 it has limited capacity for further collaboration and suggested that the collaboration can be revisited later in the year. IPA will continue to keep in contact with the SIRM department on this collaboration for a potential renewal of the project down the line.