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Health Crisis, Mobility Restrictions, and Group Trade

Evidence from Small-Scale Cross-Border Transactions in the Great Lakes Region

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Abstract

The mobility restrictions and health measures imposed during the COVID-19 pandemic have had highly adverse impacts on small-scale cross-border trade. One coping strategy that traders have pursued is to engage in group trade, that is to combine their loads and cross the border using a larger cart or vehicle. This paper uses a cross-sectional data set derived from a survey of traders at the borders between the Democratic Republic of Congo and Burundi and Rwanda to assess the determinants of participation in group trade. The findings from the econometric analysis point to association membership, business registration, and motorized transport as being important factors for traders' participation in new cooperative trade arrangements. Moreover, successful group traders have been in a position to increase their incomes by reaching new clients and obtaining higher prices. These results suggest that policy efforts to promote group trade could usefully focus on enhancing the integration of small-scale traders into regional supply chains. However, group trade has mainly benefitted the better-off segments of the trader population, so that any assistance projects to enhance group trade risk further increasing the income gap in border communities.

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Health Crisis, Mobility Restrictions, and Group Trade: Evidence from Small-Scale Cross-Border Transactions in the Great Lakes Region[1]

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1. Introduction

The COVID-19 pandemic has resulted in substantial disruptions to international trade. The enforcement of lockdown policies and mobility restrictions suppressed economic activity and upset international supply chains (Bas et el. 2022; Bonadio et al. 2021; Espitia et al. 2022; Lachitew and Socrates, 2020). Global trade volumes experienced double-digit declines during the early phase of the pandemic but subsequently stabilized and recovered since mid-2020 (World Bank, 2022).

One economic activity that has been particularly vulnerable to the COVID-19-related health measures and mobility restrictions has been small-scale cross-border trade (SSCBT). It is widely recognized that SSCBT is of substantial importance in many African countries (Lesser & Moisé-Leeman, 2009; Golub, 2012 & 2015). Small consignments of goods are exempt from Customs duties and other border formalities, resulting in lively exchanges between border communities. At some border crossings, 20,000 to 30,000 traders per day ship merchandise into the neighboring country (Fruman & Soprano, 2015). The aggregate value of these unrecorded transactions has been estimated to often reach or exceed the value of Customs recorded, truck-based trade between countries (Nkendah, 2013; Bouët et al., 2018; World Bank, 2018).

SSCBT has been affected by the COVID-19 pandemic in several ways (Bouët et al., 2020). The most direct impacts have resulted from the closing of border crossings for pedestrian traffic, as well as the closure of border markets. In addition, health inspections and testing requirements have led to delays and burdened traders with new fees. Also, curfews prevented traders from moving products to the border during the cooler hours at night, which led to higher wastage of perishable produce. The empirical information on the extent of the impact of COVID-

19-related policy measures on SSCBT points to a contraction in small-scale trade volumes that in percentage terms by far exceeded the reduction in global trade (Mvunga & Kunaka, 2021; World Bank, 2021).

This paper analyzes group trade as a coping strategy that has been employed by small-scale traders to deal with the sanitary restrictions following the COVID-19 outbreak.[2] By consolidating their consignments, small-scale traders were able to jointly send their products across the border in a larger vehicle, using the formal border clearance channel. This arrangement overcame the closure of the pedestrian border crossing lanes and reduced the number of individuals that needed to cross the border and were, thus, vulnerable to contracting or spreading the virus. Some observers see this new institution of group trade as a promising arrangement to advance formalization and achieve benefits from scale economies in regional trade, and advocate that it should be sustained and promoted even once the COVID-19-related measures have been phased out (Uganda MTIC, 2020).

Using evidence from a field survey of small-scale traders at the eastern borders of the Democratic Republic of Congo (DRC) with Burundi and Rwanda, this paper addresses two related questions. First, what have been the determinants that made some small-scale traders participate in group trade while others pursued other coping strategies? And second, among the group traders, what aspects of the group trade arrangement are susceptible to making cooperative trade clusters viable in the long term?

Due to the scarcity of available data, there has been relatively little research into the characteristics of SSCBT and the behavior of small-scale traders. Aker et al. (2014) analyzed commodity price data across 70 rural markets in Niger and Nigeria and found that markets across

[2] This coping strategy of group trade has alternatively also been called co-operative trading arrangement (CTA), cluster trade, or association trade.

borders were better integrated than those within countries as a result of the common ethnicity of informal traders in the border vicinity. Similarly, Walther et al. (2019) conducted field surveys of 490 entrepreneurs in the West African rice value chain and found that social networks were of key importance for economic outcomes. Their econometric analysis showed that women were less central than men in business networks and that women's income was significantly lower after controlling for age, experience, education, religion and matrimonial status. Another study on informal trade looked at the motivation for SSCBT using survey data for Benin and found that merchandise that was subject to high trade barriers was more likely to be traded informally rather than formally (Bensassi et al., 2019).[3]

The present study also relates to the literature on the role of cooperatives in economic development. Cooperatives can serve as platforms for collective action through which small-producers and traders can reduce transportation costs, disperse the costs of marketing, and negotiate more favorable prices. They can also be an institutional vehicle for policy makers to deliver direct benefits to small-scale producers, such as subsidized agricultural inputs. Yet, whether cooperatives help the poor and reduce poverty is a debated issue. For example, Bernard and Spielman (2009) analyze rural producer organizations in Ethiopia and find that poorer farmers tend not to participate in these organizations. Similarly, Fischer and Qaim (2012) and Blekking et al. (2021) study farmer groups in Kenya and Zambia, respectively, and find that wealthier households are overrepresented in cooperatives, and that cooperatives widen the rural poverty gap.

This paper uses a new dataset on SSCBT to build on and extend previous research on small-scale trade and on cooperative economic arrangements. Indeed, to the authors' knowledge,

[3] The data on informal trade reported in Bensassi et al. refers to survey findings from non-official border crossings and contains smuggling activity.

this is the first empirical study of SSCBT and group trade. The survey data used cover eight different border crossing locations along the Eastern DRC border with Burundi and Rwanda and are, thus, not specific to the institutional and locational conditions at any particular border post. The data were collected from almost 600 traders through face-to-face interviews, which assured a high response rate and the minimization of non-response bias.

The econometric results reveal that operating a registered business, being a member in a traders' association, and having access to motorized transport are significant determinants of traders' participation in group trade. Other personal traits, such as gender and trading experience, logistics features, like transport distance, or product characteristics, such as perishability or trade protection, do not play a decisive role. These findings suggest that it is the more prosperous, politically and institutionally well-established traders that have engaged in group trade. Other SSCBT operators have been left to resort to other, presumably less advantageous strategies to cope with the COVID-19 sanitary measures. Group trade, thus, appears to have increased the intra-trader income gap within the border communities.

Another important finding is that those group traders who report increased incomes from the cooperative trading arrangement have achieved this success by being able to reach new clients and obtain higher prices for their products. In contrast, cost savings do not play a decisive role. Hence, it seems that better integration of small-scale traders into cross-border regional supply chains is key for the long-term viability of group trade once the COVID-19-related sanitary measures are phased out.

These core findings suggest that policy support for group trade might well be justified to increase marketing efficiency and enhance trader incomes, but such assistance is unlikely to advance poverty reduction objectives. The less prosperous segments of the trader population

have not engaged in and benefitted from group trade, so that group trade promotion activities risk to further marginalize them.

The remainder of this paper falls into four sections. Section 2 provides a context for the subsequent analysis by discussing the advantages and challenges related to group trade. Section 3 describes the dataset and the empirical strategy used to investigate the determinants for group trade participation, as well as the long-term viability of group trade arrangements. Section 4 reports the econometric results of the study and discusses their policy implications. Section 5 concludes.

2. Advantages and challenges of group trade

Group trade gained prominence as a new trade institution because of COVID-19 policy measures that severely impeded the business of small-scale traders, such as the closure of border markets and pedestrian lanes at border crossings. As a result, some traders started to consolidate their loads and jointly transported products across borders on larger carts or vehicles, going through the official border clearance channel.[4] Sales on the other side of the border were handled by designated agents. Mvunga and Kunaka (2021) report that at four border crossings in Eastern DRC almost 9,000 small-scale traders have engaged in group trade. This practice drastically reduced the need for people to pass physically into neighboring countries and thereby helped to respect the sanitary restrictions on mobility and social distancing. Only a small number of traders and transport providers had to transfer to the other side of the border and this small group has been much easier to protect through regular instruction, testing and inspection than the large

[4] In some countries, such as Uganda and DRC, this clustering was actively promoted by public authorities.

population of small-scale traders that normally ventures back and forth across border crossings. The reduction in the number of border transits has also reduced congestion in the immigration line or the offices of other border agencies and thereby helped to ensure a greater social distance.

Yet, whether the institution of group trade will continue and prosper once all the COVID-19-related mobility restrictions have been lifted is unclear. The idea that businesspeople join up in cooperatives to enhance their transport scale and marketing capacity has been well established and practiced in other circumstances. Yet, such an organization of small-scale cross-border traders did not emerge before COVID-19 despite favorable circumstances, such as a large number of small-scale operators living and working in close proximity and the similarity of their economic activity. So has COVID-19 been the catalyst to launch a new trade institution that has the potential to enhance the earnings of poor border communities, or will the arrangement wither away as soon as the sanitary restrictions are fully lifted?

2.1 Advantages of group trade

Group trade has several economic advantages. The switch in transportation mode, for example, from foot or bicycle-based transport to cars or trucks makes longer trips feasible, so that small-scale traders are no longer bound to supply the closest market on the other side of the border but could now reach a potentially more rewarding destination in a population center further afar.

Similarly, the larger consignment that results from the aggregation of the supplies of many individual traders might pass the threshold where the quantity supplied becomes interesting for a downstream operator on the other side of the border, such as a food processor.

Hence, by joining their consignments, small-scale traders can reach an entirely new class of customers that they individually could not approach because of their lack of scale.

Moreover, group trade frees up traders' time, as they do no longer need to accompany their merchandise across the border, queue at border offices, and wait for clients. This makes it possible to trade more frequently, thus handling overall larger sales volumes, or engage in other activities.

Another advantage of group trade is that border agencies are getting a better control over imports and exports. On the regulatory side, veterinary and plant health inspections might be undertaken on aggregated shipments, while individuals crossing the border with only a few animals, or a small amount of produce might entirely escape SPS controls and thus transfer health risks into the destination country.

On the Customs side, it would reduce border tax evasion and extend the coverage of Customs-recorded trade statistics to better reflect the full extent of imports and exports. To date, only a few countries monitor SSCBT on a systematic basis, while most miss out on these important regional trade flows in their import and export statistics (World Bank, 2020a). Better statistics would mean a better information base for decision makers on issues of food security, regional integration, and macroeconomic management.

2.2 Challenges of group trade

On the other hand, group trade faces several challenges. With clustering, individual traders must rent the vehicle and driver, pay for the loading and unloading, and cover the fee for coordination and sales services. In addition, there are the trade taxes and other border fees that

apply to imports and exports that pass through the official channel.[5] While it has been well established that many small-scale traders have to pay informal fees when crossing the border without official documentation (Bensassi & Jarreau, 2019; World Bank, 2020b), the official border taxes and fees are likely to exceed the informal bribes, in particular if the larger transport vehicle being used is subject to separate vehicle taxation.[6] Use of a larger vehicle might also require more sturdy packaging to avoid damage to goods from stacking.

The large number of traders even when organized along product-lines means that the variety and quality of the produce is likely to be heterogeneous. This makes it necessary to keep the individual consignments separate and trace them carefully. If traceability is not economical or otherwise not feasible, there is a risk of an adverse selection effect. If members who provide low quality supplies obtain the same price as members who contribute high quality produce, the arrangement is more attractive for low-quality suppliers and the average quality of the products offered in the cluster will deteriorate over time.

If in response group trade administrators try to set and enforce minimum quality standards and compliance with regulatory requirements, the burden placed on small-scale traders might be prohibitively high. Many quality maintenance, inspection and certification processes are subject to economies of scale, so that the costs of regulatory compliance become regressive. For example, many small-scale traders do not have the means to ensure refrigeration of perishable produce during transport and storage or to test their supplies for aflatoxin or pesticide

[5] Some small-scale traders have benefitted from a Simplified Trade Regime (STR), and tracing solutions might need to be developed in order to make it possible for individuals to respect the STR thresholds and continue to trade under STR while engaging in group trade.

[6] Large transport vehicles, such as trucks, are often subject to border taxes and harassment in Africa. Analysis by Starkey (2001) suggests that a good loading factor is more important than the size of the vehicle in determining transport costs. This might suggest that small-scale traders are best served by intermediate transport solutions, such as cycle rickshaws or motorized tricycles, rather than large pickups or trucks that they might struggle to fill.

residues. Hence, trying to achieve consistently high quality in a cluster might turn out to be too expensive for many potential participants.

The management of the clusters themselves is another potential problem area. The leadership might be tempted to exploit their institutional position and informational advantage to extract undue rents from the group trade activities. This risk seems particularly pertinent in a context of many small-scale traders being illiterate and lacking the market knowledge and accounting skills to effectively supervise the cluster management. Rent seeking might also occur from intermediaries, such as truck-transport or storage facility providers, who find themselves in a dominant position and can extract excessive fees for their services from group trade participants.

3. Data and empirical strategy

Given the advantages and challenges of group trade discussed above, the empirical analysis addresses two questions related, respectively, to the determinants of group trade participation and the long-term viability of group trade. The analysis draws on field surveys on SSCBT, which were augmented by information on the physical and policy characteristics of traded products.

Empirical information on SSCBT at the eastern borders of DRC was collected through cross-sectional field surveys in December 2021. The surveys were carried out in eight border crossing locations: six sites at the border between DRC and Burundi (Gatumba, Kavimvira, Kiliba, Rumonge, Nyamoma, Uvira) and two near the DRC border with Rwanda (Goma,

Rubavu). The data collection was undertaken in the context of the World Bank's Great Lakes Trade Facilitation and Integration Project and carried out by IPSOS, the market research firm.

The field surveys were administered by trained enumerators as face-to-face, structured interviews of small-scale traders who were intercepted at the different border crossing locations.[7] Traders were asked to report on their personal characteristics (e.g., trading experience, association membership, business status), their typical product portfolio, transport means, and traveling distance, and their participation in and assessment of group trade. A total of 664 questionnaires were completed.

SSCBT at the Eastern DRC borders is largely unidirectional, with the vast majority of interviewed traders reporting that they mainly or exclusively ship merchandise into DRC. There were only 22 traders in the sample (3 percent) who specialize on exports from DRC to Burundi or Rwanda. A further 9 percent trade at least sometimes in both directions. Given that the group of DRC exporters is very small, and that the magnitude and direction in which different products are traded by the bi-directional traders is unobserved in the dataset, the empirical analysis was carried out based on the 581 traders that exclusively ship products into DRC. Among these 581 DRC importers, 142 individuals reported that they had experience with group trade.

3.1 Potential determinants of group trade participation

The first question concerns the determinants that make some traders use group trade while others continue to trade individually. This question is important from a policy perspective as some observers see group trade as a promising strategy to formalize SSCBT, reap benefits

[7] We use a broad definition of "trader" that also comprises "transporters", who do not own the products they carry across the border (9 percent of the interviewed individuals). This choice was motivated by some of the "transporters" also reporting that they were participating in group trade arrangements.

from economies of scale in cross-border trade, and reduce distortions that result from unequal treatment of SSCBT and truck-based trade. The protagonists argue that group trade should indeed be promoted by public policy. Knowing the factors that facilitate participation in group trade is thus helpful in deciding which promotion or support activities might be most appropriate.

The empirical analysis uses a Probit model that links the participation decision in group trade to the trader's personal traits, logistics features, and merchandise characteristics. The specification thus takes the following form:

$$\Pr(Y_i = 1|X) = \Phi(ß_0 + \Sigma_j ß_j X_{j,i}) \quad (1)$$

where Y_i is the observation whether a trader participates in group trade, $X_{j,i}$ is a set of j different trader, logistics, and product characteristics of trader i, and $\Phi(.)$ is the cumulative normal distribution function.

The following factors were considered as potential determinants of group trade participation for analysis related to Equation (1): the gender of the trader (GEND), the trading experience of the trader (EXPE), membership in a traders' association (ASSO), registration of a formal business (FORM), use of a fuel-powered vehicle for transportation (FUEL), time to assemble and transport the merchandise to the border (TIME), perishability of the products carried (PERI), and trade protection accorded to the carried products (PROT). These potential determinants are described below.

GEND: Women play a prominent role in SSCBT. The available sample of DRC importers is almost gender-balanced, with 52 percent of interviewed traders being women. Other surveys at border locations in the Great Lakes area have found an even larger majority of traders

to be female (Brenton et al., 2013). Given that social networks have proven important for informal trade (Aker et al., 2014; Walther et al., 2019), the coordination of shipments for group trade might be easier along gender lines, so that it is expected that women traders are more likely to engage in group trade than men.

EXPE: The age and trading experience of the respondents in the sample varies widely. The reported years of trading activity ranges from 1 to 50 years, with a median of 6 years. It is expected that more experienced traders will have a more extensive network of contacts in the trading community that they could leverage for participation in group trade.

ASSO: At some border locations, trader associations have played a prominent role as organizers of group trade (Mvunga & Kunaka, 2021). In the sample of DRC importers, 29 percent of respondents report that they are a member of a traders' association.[8] Such membership is expected to increase the propensity of a trader to engage in group trade.

FORM: SSCBT is not necessarily an informal business activity (Karkare et al., 2021). Indeed, in the sample under consideration, 46 percent of traders report that they operate a business that they have registered with the authorities. Having formally registered their activity might make traders less reluctant of going through the formal border clearing process and, hence, is expected to enhance participation in group trade.

FUEL: SSCBT takes many different forms. Some traders walk their merchandise across the border, others use carts or bicycles, while a third group uses motorbikes or cars. In the DRC importer sample, 20 percent of traders used muscle-powered means of transport and 80 percent fuel-powered motorbikes or vehicles. Access to a fuel-powered means of transport might

[8] The survey asked respondents specifically about a "trader association" at the specific border location in order to avoid confusion with any other professional association membership.

indicate a higher socio-economic standing, which is expected to facilitate participation in the cooperative activity of group trade.

TIME: Living and operating in proximity to the border will increase the likelihood of interacting with other traders in the community and building trusted relationships. Thus, a short time to assemble the load and bring it to the border is expected to increase the propensity of a trader to participate in group trade.

PERI: Due to COVID-19 health and safety regulations, the delays of clearance by Customs and other border agencies increased, which can cause higher wastage for perishable products. The following products are taken as perishable as their quality deteriorates quickly through time: meat and meat by-products, fish and seafood, dairy products, fruit and vegetables, and flowers. Individuals trading in these time-sensitive products would, hence, be expected to participate in group trade to expediate their shipments.

PROT: High border taxes and fees discourage small-scale traders to pass through the official border clearance channel. Trade protection is approximated through the DRC import tariff. The simple average of applied rates is calculated at the HS-2 level and then matched to the 29 product groups that were identified in the field survey. Lower formal trade protection on the products carried is expected to increase a trader's propensity to participate in group trade.

Based on the above discussion, the regression model sketched out in Equation (1) can be more explicitly specified as follows:

$$\Pr(GT_i = 1|X) = \Phi(ß_0 + ß_1\, GEND_i + ß_2\, EXPE_i + ß_3\, ASSO_i + ß_4\, FORM_i + ß_5\, FUEL_i + ß_6\, TIME_i + ß_7\, PERI_i + ß_8\, PROT_i) + ß_9\, DGAT_i + ß_{10}\, DGOM_i + ß_{11}\, DKAV_i + ß_{12}\, DKIL_i) + ß_{13}\, DNYA_i + ß_{14}\, DRUB_i + ß_{15}\, DRUM_i) \quad (1A)$$

where GT_i takes the value of 1 if the trader participates in group trade and 0 otherwise, $GEND_i$ is a dummy variable that take the value of 1 if the trader is a women, $EXPE_i$ is a dummy variable that takes the value of 1 if the trader has at least 5 years of trading experience, $ASSO_i$ is a dummy variable that takes the value of 1 if the trader is a member of a trader association, $FORM_i$ is a dummy variable that takes the value of 1 if the trader has a registered business, $FUEL_i$ is a dummy variable that take the value of 1 if the trader uses a fuel-powered vehicle for transport, $TIME_i$ is a dummy variable that takes the value of 1 if the trader requires no more than 3 hours to reach the border, $PERI_i$ is a dummy variable that takes the value of 1 if the trader carries products that are classified as perishable, $PROT_i$ is the applied tariff for the products that the trader carries,[9] and DGAT, DGOM, DKAV, DKIL, DNYA, DRUB, and DRUM are dummy variables that represent the different border locations and thus account for location-specific effects. $\Phi(.)$ is the cumulative normal distribution function.

3.2 Long-term viability of group trade

[9] If a trader carries several products that are subject to differing tariffs, the highest level of protection for the respective products is used.

A second, related question is whether group traders see the arrangement as being advantageous for themselves in the longer run. Out of the 142 DRC importers that had experience with group trade, 67 traders reported that group trade had increased their trading income. This positive outcome suggests that these traders are likely to continue trading as a group even after the COVID-19 sanitary measures have been phased out.

To further analyze the group trade outcome, a Probit model is devised that links trader information on whether group trade has increased trader income to different aspects of the group trade process, such as transaction costs, trading frequency, or product pricing. Hence, the specification becomes:

$$Pr(Y_i^* = 1|X^*) = \Phi(ß_0 + \Sigma_j ß_k X_{k,i}^*) \quad (2)$$

with Y_i^* being the observation that a trader increases their income with group trade, $X_{k,i}$ being a set of k different group trade aspects related to trader i, and $\Phi(.)$ being the cumulative normal distribution function.

The following group trade aspects, for which information is available from the field surveys, were considered for the estimation of Equation (2): lower trading costs (COST), higher trading frequency (FREQ), higher trade volume (VOLU), reach of new clients (NEWC), higher prices (PRIC), higher quality requirements (QUAL), and additional free time (FREE). Information on all these group trade aspects was derived from the field surveys and implemented through dummy variables as described below.

COVI: The variable takes the value of 1 if the trader reported that group trade reduced their costs related to COVID-19 sanitary compliance, and 0 otherwise. Lower trading costs should have a positive impact on income, so that a positive sign on the coefficient is expected.

COST: The variable takes the value of 1 if the trader reported that group trade reduced their trade transaction costs, and 0 otherwise. Lower trading costs should have a positive impact on income, so that a positive sign on the coefficient is expected.

FREQ: The variable takes the value of 1 if the trader reported that group trade made it possible for them to trade more frequently, and 0 otherwise. Higher trading frequency should have a positive impact on income, so that a positive sign on the coefficient is expected.

VOLU: The variable takes the value of 1 if the trader reported that group trade made it possible for them to trade larger volumes, and 0 otherwise. Higher trading volumes should have a positive impact on income, so that a positive sign on the coefficient is expected.

NEWC: The variable takes the value of 1 if the trader reported that group trade made it possible for them to reach new clients, and 0 otherwise. New selling destinations or buyers should have a positive impact on income, so that a positive sign on the coefficient is expected.

PRIC: The variable takes the value of 1 if the trader reported that group trade led to higher sales prices, and 0 otherwise. Higher prices should have a positive impact on income, so that a positive sign on the coefficient is expected.

QUAL: The variable takes the value of 1 if the trader reported that group trade required them to supply higher quality merchandise, and 0 otherwise. Higher quality requirements should have a negative impact on income, so that a negative sign on the coefficient is expected.

FREE: The variable takes the value of 1 if the trader reported that group trade freed up some of their time so that they could pursue other activities, and 0 otherwise. Additional free

time should have a positive impact on income, so that a positive sign on the coefficient is expected.

Having specified the group trade aspects under consideration, the regression model sketched out in Equation (2) becomes:

$$\begin{aligned}\Pr(INCO_i = 1|X) = \Phi(&ß_0 + ß_1\, COVI_i + ß_2\, COST_i + ß_3\, FREQ_i + ß_4\, VOLU_i + \\ &ß_5\, NEWC_i + ß_6\, PRIC_i + ß_7\, QUAL_i + ß_8\, FREE_i) + \\ &ß_9\, DGAT_i + ß_{10}\, DGOM_i + ß_{11}\, DKAV_i + ß_{12}\, DKIL_i) + \\ &ß_{13}\, DNYA_i + ß_{14}\, DRUB_i + ß_{15}\, DRUM_i) \qquad (2A)\end{aligned}$$

where $INCO_i$ takes the value of 1 if the group trader reports an increase in income due to group trade and 0 otherwise, COVI, COST, FREQ, VOLU, NEWC, PRIC, QUAL, FREE are dummy variables defined above, and DGAT, DGOM, DKAV, DKIL, DNYA, DRUB, and DRUM are dummy variables that represent the different border locations and thus account for location-specific effects. $\Phi(.)$ is the cumulative normal distribution function.

4. Findings

The results from the maximum likelihood estimations of equation (1A) and equation (2A) are reported below.

4.1 Results concerning the determinants of group trade participation

Table 1 summarizes the estimation results concerning equation (1A). The estimates in regression [i] show that association membership, business registration, and fuel-powered transportation are important determinants of traders participating in group trade. The estimation coefficients have the expected sign and are statistically significantly different from zero at the

95 percent or 99 percent level. In contrast, gender, trading experience, proximity to the border, perishability of products, and tariff protection do not have a statistically significant impact on the likelihood of a trader engaging in cooperative trade.

The findings are robust to the omission of the non-significant group trade determinants (regression [ii]).

The estimation results suggest that it is the well-connected, formally established, and socio-economically better off traders that have been engaging in group trade. It is, thus, an "elite" among small-scale traders that has been using the new institution of group trade to cope with the mobility restrictions and sanitary measures that were imposed during the COVID-19 pandemic. The typical group trade participant is not the proverbial poor, illiterate woman who walks across the border with a headload of produce from her own garden for sale in a nearby border market.

It seems, thus, that the COVID-19 crisis has further widened the income gap between groups of poor and better-off traders. The more prosperous, better institutionalized traders had access to and used group trade, while less fortunate traders were left to pursue less favorable coping strategies, including redirecting their supplies to domestic markets, crossing the border on unmonitored paths, or giving up trade altogether.

Table 1: Estimation results: Group trade participation

	Dependent variable: Participation in group trade	
	[i]	[ii]
Constant	-3.002 *** (0.526)	-3.289 *** (0.366)
GEND	0.087 (0.167)	
EXPE	-0.091 (0.169)	
ASSO	2.316 *** (0.271)	2.277*** (0.263)
FORM	0.606 *** (0.163)	-0.595 *** (0.154)
FUEL	0.479 ** (0.220)	0.507 ** (0.212)
TIME	-0.230 (0.164)	
PERI	0.137 (0.219)	
PROT	-0.010 (0.023)	
Observations	581	581

Note: Estimation results for location dummies omitted. The superscripts *, **, and *** denote significance, respectively, at the 90%, 95% and 99% level.

One caveat to the findings is that given the cross-sectional nature of the underlying data, reverse causality cannot be ruled out. If, for example, a traders' association plays a prominent role in the organization of group trade shipments, a trader may decide to join the association in order to be in a better position to participate in group trade. That said, a substantial minority of

33 percent of group traders in the sample are not members of any traders' association, so that such membership is generally not a prerequisite for group trade participation.

Moreover, the findings on the determinants of group trade participation are consistent with the literature on cooperatives and poverty reduction. Similar to this study, several empirical investigations found that more prosperous households are overrepresented in cooperatives and that the effect of collective economic action on poverty reduction is at best unclear (Bernard & Spielman, 2009; Blekking et al., 2021, Fischer & Qaim, 2012).

4.2 Results concerning the long-term viability of group trade

Group traders who report an overall income increase as a result of their cooperative engagement can be expected to continue their group trade practice in the long term. In contrast, group trade participants who do not see an income improvement are susceptible to revert back to individual trading once the COVID-19 related sanitary measures are phased out. So, what are the drivers of income increases for the successful group traders?

The estimation results concerning equation (2A) are summarized in Table 2. Several factors are significantly associated with an income increase of group traders and have the expected sign (regression [iii]). In particular, traders whose income increased due to group trade reported that the arrangement frees up time (FREE) and makes it possible for them to trade more frequently (FREQ). Also, group trade helps them to reach new clients (NEWC) and obtain higher prices (PRIC). Conversely, lower COVID-19 compliance costs (COVI), lower trade transactions costs (COST), and larger batches (VOLU) do not significantly contribute to higher incomes.

Table 2: Estimation results: Group trade viability

	Dependent variable: Income increase from group trade	
	[iii]	[iv]
Constant	-2.136 (0.411)	-1.831 (0.364)
COVI	0.058 (0.353)	
COST	0.402 (0.294)	
FREQ	0.677 ** (0.339)	0.687 ** (0.311)
VOLU	-0.055 (0.333)	
NEWC	0.593 * (0.360)	0.621 * (0.366)
PRIC	0.577 ** (0.291)	0.633 ** (0.285)
QUAL	0.752 ** (0.337)	0.765 ** (0.313)
FREE	0.748 ** (0.330)	0.860 *** (0.320)
Observations	142	142

Note: Estimation results for location dummies omitted. The superscripts *, **, and *** denote significance, respectively, at the 90%, 95% and 99% level.

One surprising finding from the econometric analysis is that increased quality requirements of group trade (QUAL) are significantly related to higher trader incomes, while it would be expected that meeting higher quality standards is costly and would, hence, reduce income. However, this outcome might be the result of multicollinearity between the QUAL and the PRIC variables or between the QUAL and the NEWC variables. The respective correlation

coefficients are indeed positive and amount, respectively to $r_{qual\text{-}pric} = 0.33$ and $r_{qual\text{-}newc} = 0.54$. Hence, reaching new clients, especially, is often associated with higher quality requirements.

Another possible explanation for the counterintuitive sign on the QUAL variable is that traders do not necessarily use group trade for all their transactions. If the cooperative arrangement has higher quality requirements, traders might segment their merchandise and ship higher quality items through group trade and lower quality products individually. If the quality premium on group-traded merchandise then exceeds the discount on the individually traded items, overall income could increase.

The findings have important implications for the long-term viability of group trade and possible policy interventions to support trade clusters. Successful group traders increase their income by reaching new clients and obtaining higher prices, rather than reducing their trade transaction costs. Policies to support group trade should, hence, focus on creating opportunities for traders to link up with downstream operators. In this context, the formation of productive alliances could be a promising development approach (World Bank, 2016). A productive alliance typically involves three core agents: a group of small-scale producers or traders, one or more buyers, and the public sector. These three agents are connected through a business proposition, which describes the capital and services needs of the producer-traders and proposes improvements that would allow them to upgrade their production scale and quality to satisfy the requirements of the buyer(s). The implementation of such a business plan is typically supported through three core inputs and activities: productive investments, technical assistance, and business development help. These core inputs are financed through public grants, with matching financing provided by the beneficiary producer-traders and the buyer(s). However, bringing together private and public sector entities from different countries, as would be required for

SSCBT-related alliances, and coordinating their actions would present an additional layer of complexity.

5. Conclusion

This study used survey data collected at the eastern borders of DRC with Burundi and Rwanda to analyze the new institution of SSCBT group trade. This institution emerged as a coping strategy among small-scale traders to overcome mobility restrictions and other sanitary measures imposed by the authorities to protect the population from COVID-19. Traders joined up to collectively ship their merchandise to the other side of the border in larger vehicles and thereby reduced the need for personnel movement and inter-person contact.

The econometric analysis finds that motorized transport, business registration, and trader association membership are important determinants of group trade participation among small-scale traders. This finding suggests that it is the socio-economically more advanced and institutionally better-established traders who have been engaged in group trade, while poor, politically less well-connected traders have been underrepresented. Group trade, thus, has not been inclusive and has tended to further increase the intra-trader income gap.

The analysis further investigated the factors that have made it possible for successful group traders to increase their income and found that getting access to new clients and obtaining higher prices for their products are significant explanatory factors. These group traders for whom the collective arrangement has proven income-enhancing will likely continue the practice once the COVID-19 restrictions that gave rise to the new group trade institution have been phased out. To achieve similar long-term viability for other group traders and possibly pull additional traders

into the system will require policy support actions that focus on the better integration of small-scale traders into regional supply chains.

In any case, the finding that the participation in group trade is skewed towards the better-off traders limits the policy scope to use group trade as a broad-based formalization strategy. The current practice does not seem to be very inclusive and has made a limited contribution to poverty reduction. Other policy measures and strategies might be more effective in improving the wellbeing of poor small-scale traders and the livelihoods of border communities.

Our findings are to some extent limited due to the challenges of data collection in the Great Lakes region, a conflict-prone area, following the COVID-19 pandemic. Survey data were collected by interception of traders at official, secure border crossings during a two-week period in December 2021. The cross-sectional nature of the survey means that we might have missed seasonal variations in trading behavior. Also, as discussed earlier, we cannot rule out reverse causality.

Given the focus of the empirical survey and analysis in this study on determinants of group trade participation, the investigation of other policy actions to support border communities and the formalization process is left for future research. Complementary analysis seems also warranted on other potential determinants of group trade that were not covered by the Great Lakes region survey, as well as on any differences in marketing behavior related to the increased business volume. If participation in cooperative trading structures changes the sales partners, locations, and prices, then these marketing aspects are certainly policy-relevant and deserve further scrutiny. Finally, our study did not explore the reasons why poorer traders are underrepresented in group trade arrangements. Possible hypotheses could include higher risk aversion to engage in new activities due to fewer savings, concerns of being exploited by better-

off, better-educated peers, or lack of social capital so that poor traders are not seen as welcome group trade members.

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