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DOES FAIR TRADE LABELING LOWER OR INCREASE CONFLICT?

KENYA CASE STUDY

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This paper aims to understand if there is an impact of fair trade labeling on conflict in developing countries, taking Kenya as a case study from 1997 to 2020. The analysis is done for tea, a key commodity in Kenya's economy, and coffee, a secondary crop in the country. Fixed-effects and instrumental variables conclude that there is a positive relationship between the number of labels in an area and the conflict observed in it. The same positive relationship holds for the impact of commodity price shocks of tea, enforcing the hypothesis that fair trade labeling increases conflict.

Keywords: Development Economics, fair trade, conflict, tea, Kenya.

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1 INTRODUCTION

Increasing social and sustainability awareness of consumers has led to a rise in demand for Voluntary Sustainability Standard (VSS) labeled products. Only 2.4% of global tea production in 2008 was VSS compliant, versus 19.4% in 2016. Seemingly, VSS coffee experienced a 24% compound annual growth rate[1] from 2008 to 2016, leading to 34% of total coffee production being VSS compliant (Voora et al. 2019). However, the impact of increased labeling demand on small-scale producers in developing countries remains unclear.

Many small-scale producers find in food labeling an opportunity to enter into new international markets. They obtain so by marketing and producing in a socially and environmentally friendly way aligned with the market demands. For instance, Fairtrade's vision, one of the main VSS certifications, is working towards a world where trade is based on fairness so that producers earn safe and sustainable livelihoods. To do so, Fairtrade collaborates with different actors, from governments to privately-owned companies, setting social, economic, and environmental standards for farmers and intermediaries involved in the supply chain (Fairtrade Foundation 2021).

Interestingly, in terms of VSS certifications, Kenya is a pioneer country. Small-scale farm owners embraced fair trade practices as early as 2003 (Dolan and Blowfield 2010). For instance, the top commodities produced in Kenya are tea, coffee, and cut flowers (International Trade Administration 2021). But in recent years, media has echoed an increase in protests from tea farmers, a key commodity in Kenya. For instance, the Daily Motion published the following on October 4th, 2021: "*Farmers in the Mt Kenya region have protested low tea bonus payments, saying they expected more after recent sector reforms. Farmers in Kirinyaga, Embu, Nyeri, and*

[1] CAGR is the mean annual growth rate of production, in this case, for a period longer than one year.

Meru threatened to uproot their tea and replace it with other crops with better returns" (allAfrica 2021). Back in 2019, Kenya News Agency broadcasted: "*hundreds of tea farmers affiliated to Tegat Tea Factory Company limited in Kericho County yesterday protested what they termed as low second payment for their produce" (Kenya News Agency 2021).*

Considering the qualitative evidence of a spark in conflict, particularly in protests, investigating the potential rise in conflict in relation to fair trade labeling from a quantitative angle is a meaningful contribution to literature. The main objective of this paper is to understand whether food labeling influences conflict in Kenya. To do so, food labeling and commodity price shocks of tea and coffee are considered. Fixed effects and instrumental variable methods are used and the results indicate that there is a positive relationship between label intensity and conflict. According to the results, commodity price shocks of tea also increase conflict in an area.

This paper is structured in the following manner. First, an introduction to ethical labeling and a literature review is presented. Then, data resources and variable setup are explained. After that, the empirical method is detailed, followed by the results. In the final part, policy implications and conclusions are discussed.

2 ETHICAL LABELLING

"Fair trade" refers to the general movement, not considering particular certifications (Fair Trade Advocacy Office 2021). The first fair trade labels started in 1988 when a Netherlands-based organization launched an initiative to ensure "sufficient wages" to farmers in developing countries. Their main goal was not only to improve livelihoods but also contribute to forging long-term producer-seller relationships. They wanted to make access to financing easier and encourage productivity improvements (Dragusanu et al. 2014).

The certifications, or labels, signal the conditions under which commodities are produced (Dragusanu et al. 2014). The VSS-compliant fair trade labels considered for this study are Fairtrade, Rainforest Alliance, and Organic certifications. They all understand the urgent need to develop new agricultural practices and commit to empowering socially, environmentally, and economically friendly production and market practices. However, each certification follows a different approach. In Kenya, all three certifications sparked in 2003.

By definition Fairtrade products ensure that the production of commodities is done under proper working conditions, mainly considering fair wages for farmers. They also ensure that crops are grown sustainably. Additionally, the Fairtrade price premium is directed towards social development activities such as building infrastructure, roads, schools, and hospitals that contribute to communities' welfare. Fairtrade tackles producers' poverty and aims to transform the way trade is done by setting better prices and decent working conditions. Altogether the program tackles issues of human rights, climate resilience, gender equality, and youth inclusion (Fairtrade Foundation 2021). Rainforest Alliance, in contrast, pursues sustainable practices to protect nature and improve the lives of farmers and forest communities (Rainforest Alliance 2021). Organic labeled foods are grown and processed following precise guidelines in terms of soil quality, pest and weed control, and use of the additive. Being organic labeled means that the producer uses natural substances together with physical, mechanical, or biologically based farming strategies primarily (USDA Organic 2021).

There are several mechanisms that the fair trade movement uses to achieve its goal. *Price floor* provides a minimum price for the products covering production and transaction costs, even when global markets price commodities below their cost barrier. *Fair trade premium* is a surplus over the commercial price destined for community development. *Stability and access*

to credit are long-term contracts with buyers securing producer sales for the contract time. *Working conditions* that ensure producer rights[2]. *Institutional structure* to encourage farmer motivation to organize in democratic associations. And, *environmental protection* encourages good environmental practices at the farm level. (Fairtrade Foundation 2021)

3 LITERATURE REVIEW

There is extensive literature on the benefits of fair trade and several studies that portrait the benefits of this practice are introduced in the following lines. A study on 845 coffee farming households in Oaxaca and Chiapas, Mexico, on fair trade organic coffee cooperatives, showed a positive contribution of a 0.7-year increase in girls schooling between 16- and 25-year-old females. It concluded that higher income opportunities coming from fair trade organic cooperatives increased educational attainment (Gitter et al. 2012). Seemingly, a survey carried out by Granville and Telford (2013) in 381 workers[3] of South Africa's wine industry, presented a higher likelihood of fair trade affiliated workers to have a higher minimum wage. As a consequence, they had higher saving rates. 91% of the participants indicated that fair trade was responsible for improving their living standards. 95% of workers explained that fair trade eased the way to education or health. 51% reported improvements in access to both, education and health (Dragusanu et al. 2014).

A study carried out in three countries in Latin America, looked at the impact of fair trade on health. It concluded that membership in the fair trade movement only had a positive impact on health when it was prolonged over time. Better overall health indexes of farmers were only seen after six years of affiliation to a fair trade program (Arnauld, Plastina and Ball 2009).

[2] Main producer rights considered by fair trade are freedom to associate, safe working conditions, ban of child labor, and fair wages.
[3] Granville and Telford studied 273 fair trade farmers and 108 conventional farmers.

However, not all studies show positive outcomes of fair trade. Sandy Brown (2013), looked into inequalities originating from such practices. She observed the role of Fairtrade in arbitrating banana production in Urabá, Colombia. Due to the tumultuous economic situation of the area, the transition into the Fairtrade banana commodity chain was initially seen as a great opportunity for social peace. An opportunity to add value and enter global markets. However, the transition to fair supply chains came after increasing marginalization and devaluation, leading to decades of armed conflict in the late 20th century. The fieldwork underlined the conflict of interests between fair trade programs, and the local industry's long-term strategy to motivate voluntarism as the approach for fighting against poverty and inequality. On top of that, fair trade led to new uneven geographies within the regional banana production. It emphasized the differences in the resources and structures of negotiation. All these factors meant a threat to regional control (Brown 2013).

Additionally, Catherine S. Dolan (2008) studied fair trade Kenyan tea farmers. She concluded that many fair trade practices were developed under certain historical, cultural, and social structures. She pointed out that it is mainly Latin American countries that set the standards of fair trade. Countries where commodity chains and political context are different from elsewhere. This study showed that the hierarchical setup of the fair trade industry was not inclusive to all socio-economic realities among countries (Dolan 2008). Dolan also analyzed the area of Kiegoi, Kenya. An area that is riven by competition and constrained possibilities for access to natural resources. She concluded that access to fair trade, could potentially spark conflict and competition, given that it was associated with economic and personal gains (Dolan 2008). In fact, in Kenya, fair-traded tea symbolizes monetary opportunities and can be a path to power. Power can reflect on private property acquisition, consumption, and capital mobility. This power defines the potentialities of fair trade in Kenya setting prices, flows, and times of

payments (Dolan 2008). Additionally, FLO[4] certifications can hinder opportunities for women or landless, contributing to social inequalities (Fridell 2006).

Additionally, alterations of peace hinder productivity and economic development (Institute for Economics & Peace 2021). From the researches above mentioned it can be withdrawn that, often affiliated and non-affiliated individuals to fair trade practices share a community. In such cases, it seems logical that cohabitations under different circumstances could lead to frictions, a threat to development. This is precisely what this paper aims for, to understand whether fair trade labeling negatively affects the development of a country by increasing conflict in an area.

4 DATA AND VARIABLE OVERVIEW

4.1 Data resources.

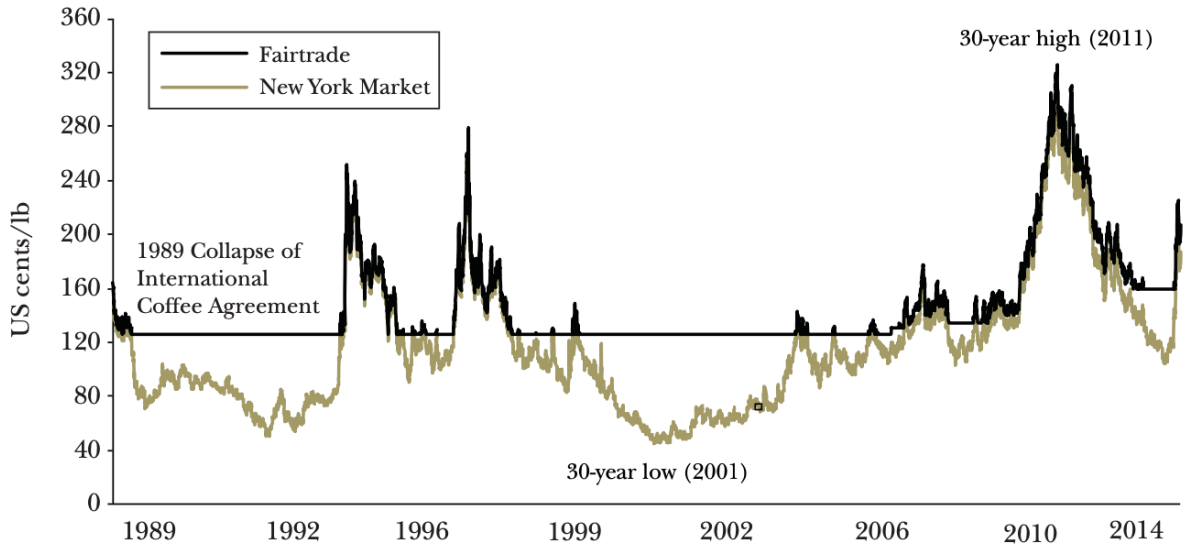
Fair trade label data was publicly available and retrieved from the Fairtrade Foundation, USDA Organic, and Rainforest Alliance. They all provide certifier, company/farm name, certification date, expiration date, and product. Farm data was geocoded using Google Maps obtaining exact coordinates for each farm. Data on tea and coffee crop harvest area (in hectares) and production (in tons) were taken from Earthstat providing a grid cell map from the year 2000.

Commodity price data was gathered from the International Monetary Fund (IMF) where price indicators are determined by the largest import markets. Fairtrade Foundation provides the price data of reference for fair trade products. The fair trade price of tea is 15% over the commercial price of conventional tea (Fairtrade Foundation). Fair trade prices of coffee are obtained from the Fairtrade Foundation 2009 report adapted by Dragusanu et al. 2014 (Figure 1). As seen in

[4] FLO-CERT is the official Fairtrade certifier. They manage all information and paperwork related to the agricultural practices, farms, security inspections, production, and marketing of certified products. It works independently from other interests and follows international ISO standards for certification.

Figure 1, fair trade prices acted as a safety net for coffee farmers when world market prices were below the standard minimum (Figure 1; Dragusanu et al. 2014).

Figure 1 Coffee price volatility. Conventional and Fairtrade coffee price comparison, 1989-2014.



Source: Fairtrade Foundation (2009) adapted by Dragusanu et al., 2014. Economics of Fair Trade.

Conflict data was provided by "Armed Conflict Location & Event Data Project" (ACLED). It contains data on types of conflict, fatalities, and actors across all countries giving a solid database for analysis. It offers detailed coordinates (latitude, longitude) on the position of each event. ACLED differentiates several types of attacks and for the narrative of this research, we differentiate those of a violent nature and those that are not. Violent attacks refer to *battles*, a violent clash between at least two armed groups; *explosions* refer to events with explosions, bombs, or similar; *violence against civilians* involves violent attacks on unarmed civilians; and *riots* by definition violent demonstrations often done by spontaneous, unorganized members. By contrast, *protests* are considered non-violent demonstrations that are commonly done by unorganized members of society. ACLED also classifies *strategic developments*, which are usually nonviolent but vary in their role within a context of disorder. It includes agreements,

arrests, changes to group/activity, disrupted weapons use, headquarters or base established, looting/property destruction, non-violent transfer of territory, and others (ACLED Data 2021).

Data on temperature and precipitations were gathered from the Climate Knowledge Portal of the World Bank. Population data was provided by the PRIO-GRID Institute Hyde Data, a spatial-temporal grid structure that compiles, manages, and analyzes spatial data within a time framework (PRIO-GRID Institute 2021). The analysis is done from 1997 to 2020. However, data for the control variables were only available for 1990, 2000, and 2005. These years are taken as a baseline for the years in between.

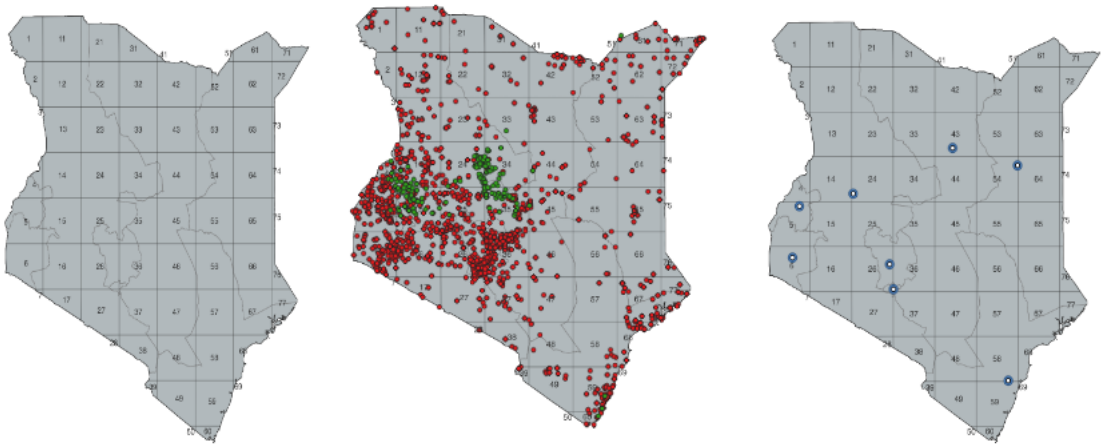
4.2 QGIS data merging procedure.

QGIS is an open-source program for geographic information. This research uses QGIS to merge all datasets into a unique grid system. The geographical country map used follows the old Kenyan Constitution (1992-2010) where the eight provinces (Admin level 1) are divided into 46 districts (Admin level 2). First, Kenyan Admin level 1 and 2 data are merged, which sets the map according to preestablish political frontiers. The software enables an unbiased land separation by grids avoiding endogeneity due to province-specific characteristics.

The geocoded conflict and label datasets are converted into dots within the map, showing the exact location of events and farms (Figure 2, map 2). Consequently, the grided Kenyan map is merged with label and conflict data creating a unique file with all events categorized by the grid, identified by *id* as shown in Figure 2. Temperature and precipitation values were provided at the province level and had to be transformed into Admin 2 level data. By doing so, the provincial data got attached to the grid most present in that area (Figure 2, map 3).

Crop-specific harvest area and production are given by grid cell style datasets. With zonal statistics, the mean values of each crop are obtained categorized by grid *id*. The same process is done for the population. The following maps show, respectively, Kenya divided by grid cells, conflict events (in red) and labels (in green) per grid, and meteorology per province.

Figure 2 Kenya in grid cells; Kenya with conflict events and labels; Kenya with precipitations and temperature representation



4.2. Variable Definition.

In this section, the setup of the variables is explained. Additionally, a visual definition of the variables is included in Appendix Table 12. Data in all cases date from 1997 to 2020.

The number of labels is defined by using indicator variables for each type of product created and summing them to obtain the total amount of labels per product. However, for the purpose of this study, apart from the grand total of labels, only tea and coffee are considered. They represent 83% of the labels in the dataset. The number of labels is considered first by grid and year of certification. Then, the summed total of labels within a grid is calculated. Finally, the consideration of the grid ever having had a label is done. To study so, two variables are created. The first one indicates if at year *t* the grid had at least one label. The second states if during the years of the study the grid had an active label at any point in time.

Price variables for the conventional and fair trade prices of tea and coffee are created from the data provided by the IMF and Fairtrade Foundation respectively. Crop intensity is defined based on land used for cultivation and is represented by the interaction between the natural log of crop price and the hectares (Dube and Vargas 2013). The intensity variable is created for conventional and fair trade crops. Lacking fair trade tea harvest area data, the variable is created by approximation. It considers that 19.4% of total tea crops worldwide are destined to VSS labeled production and that Kenya is a top three tea producer worldwide (Voora et al. 2019). For fair trade coffee, the production land used is again obtained from approximation, considering that 24% of total coffee production worldwide is destined to fair trade coffee.

Furthermore, conflict indicator variables are generated for each type of conflict: battles, explosions, protests, riots, strategic developments, and violence against civilians. These dummy variables will take value 1 if they meet the event type and 0 otherwise. An extra variable considering only violent attacks is created, summing all kinds of attacks except protests and strategic developments. Additionally, the natural logarithm of conflict is considered to observe the results in percentage points (pp).

Control variables of temperature and rainfall are important as the growth of a crop lays in specific meteorological conditions. For analytical purposes, the interaction between both, temperature and rainfall, is created as a new variable. Finally, for the control variable population, the mean values of the population for the years 1990, 2000, and 2005 are considered and used as a baseline for the years in between as commented before.

4.3 Descriptive Statistics.

Data on conflict shows that 74% of total attacks are violent attacks. Protests are not considered violent and are 23% of the total events. Strategic developments are 3% of the data and refer to activities that are "broadly" described as non-violent but differ in their role within the context of disorder (ACLEC 2021).

Table 1 Conflict events by type of conflict

Conflict events	Total events	%
No. violence against civilians	1893	26%
No. riots	1878	25%
No. protests	1713	23%
No. battles	1425	19%
No. explosions	239	3%
No. strategic development	219	3%
No. violent attacks	5435	74%
No. total attacks	7367	100%

Percentages are given by decimal approximations; violent attacks consider battles, explosions, riots, and violence against civilians

Regarding labels and farmers, there are 181 certifications in total. Out of the total, 111 are tea labels and 40 are coffee labels, the two commodities studied (Table 2). Other labels are 17% of the share and include cut flowers, oil, avocados, camellia oleifera, cocoa, ginger, hibiscus, mango, nuts, peppermint, and thyme. However, they will not be considered in this analysis.

Table 2 Amount of labels by type of commodity

Labels	Total labels	%
Tea labels	111	61%
Coffee labels	40	22%
Other labels	30	17%
Total labels	181	100%

Descriptive statistics are presented in Appendix Table 9. There are a total of 1608 observations considering the 24 years of study (1997-2020) and 67 grids on the Kenyan map created with QGIS and presented in Figure 2. All variables for conflict, labeling, and controls of temperature,

precipitations, and population are considered, and their means, standard deviations, minimum and maximum values are given. Additionally, in Appendix Table 10 the variables that sustain the Instrumental Variable model later explained are defined.

5 METHODOLOGY

5.1 Fixed effects.

Fixed Effects are introduced to work with the panel data since Pooled OLS would lead to biased results. Pooled OLS is a linear regression model that in order to provide unbiased and consistent estimators the explanatory variable needs to be exogenous. The aim is to study if fair trade food labeling impacts conflict, the dependent variable. In this case, fair trade food labeling can be correlated with unobserved heterogeneities, which can be unobserved variations in product characteristics, ability, or managing skills of farmers. This correlation between the unobserved individual effect in the error term and the explanatory variable would lead to biased estimators with pooled OLS. [5] In section 6.1 the results for Pooled OLS are presented to understand the direction of the bias.

FE considers that something within the grid can impact or bias the outcome variable conflict. It omits time-invariant unobservable heterogeneities that can affect fair trade food labeling. For example, geography, and laws. By dropping the effect of time-invariant characteristics, the method helps understand the relationship between the explanatory variables and the dependent variable. First, FE is used to understand the impact that active labels, the number of active labels in a grid, have on conflict. Then, FE is used to study the impact that fair trade active labels together with commodity price shocks of tea and coffee have on conflict. [6]

[5] This method would only be consistent if there was no unobserved heterogeneity or if it was uncorrelated with all regressors, a very unlikely scenario in this context.
[6] Standard errors are clustered at grid level (*id*).

5.2 Instrumental Variables.

Following literature and in order to dig more into the effect of commodity price shocks on conflict, an alternative approach is proposed. The empirical strategy presented, mirrors the methodology proposed by Dube and Vargas in 2013. A *difference-in-differences* estimator where the effect of commodity price shocks on conflict is studied. The hypothesis is that commodity price shocks impact more in areas with more tea production. Time variation comes from variations in annual prices for conventional and fair trade coffee and tea.

To analyze the effect of coffee shocks the international yearly price of coffee according to IMF standards is taken,[7] together with the production of coffee in Kenya. The international price of coffee is exogenous to Kenya's coffee production, as the country produces less than 1% of the world's total coffee. [8] For tea, the analysis is slightly different. Kenya is a top three tea exporter worldwide (Voora et al. 2019) and its production can influence international prices (Dube and Vargas 2013). Therefore, using the international price of tea could bias the estimates. In this case, reverse causality would be the main concern as if an intensification of conflict in tea regions lowered tea productions, there could be an impact in global dynamics of demand and supply, ultimately affecting the international price of tea. By implementing the Dube & Vargas approach, the international price of tea is instrumented with tea exports of the other top three tea exporting countries: India, China, and Sri Lanka (International Trade Center 2021). By doing so, fluctuations in tea prices coming from the export supply of other countries are captured.[9]

[7] IMF values for commodity prices. Arabica milds are considered, as they are the most commonly produced in Kenya. (Coffee Research Institute)
[8] In Dube & Vargas 2013, oil is considered seemingly.
[9] In Dube & Vargas 2013, Colombian coffee is treated equally.

The empirical strategy uses cross-sectional variation between grids. Dividing by grid handles the differences created by provinces, or political frontiers, and lowers endogeneity problems. The main coffee measure is the production (in tons) of coffee in 2000[10]. It is considered an approximation for the period of analysis, being aware of potential endogeneity problems due to exogenous coffee production and distribution in the country over the time scope of the research.

However, tea intensity cannot be simply measured in tons of production and prices. Because Kenya is a top three tea exporter in the world prices could be biased, introducing measurement errors. To address this issue, tea intensity is instrumented with precipitations and temperature, capturing the production ability of a grid. Additionally, the interaction between precipitations and temperature with the tea exports of the other three biggest tea exporters is considered; China, India, and Sri Lanka[11]. It is important to consider meteorological conditions as tea needs a precise environment to grow; usually temperatures between 10-30º, high humidity, and heavy rainfall during the growing season (Jayasinghe and Kumar 2020). Therefore, the instrument proposed is a linear combination between precipitations, temperature, and the interaction between both with exports (Appendix Table 10).

From the two stages of the model, the second-stage estimates show the effect of commodity shocks on conflict. It follows as:

$$y_{it} = \alpha_i + \beta_t + (Cof_{it} \times CofP_t)\gamma + (Tea_{it} \times TeaP_t)\rho + X_{it}\phi + \varepsilon_{it} \quad (1)$$

where y_{it} are conflict outcomes for all types of attacks considered (total attacks, battles, riots, explosions, protests, strategic developments, and attacks against civilians) at i grid level and year t; α_i are grid fixed effects; β_t are year fixed effects; $X_{it}\phi$ are time-varying controls that

[10] Data from Earthstat: total crop production in metric tons on the land-area mass of a grid cell.
[11] Following Dube & Vargas approach for coffee price shocks on conflict in Colombia. (Dube & Vargas, 2013)

consist of the log of population, temperature, and precipitations. Additionally, for the coffee Cof_{it} the measure of coffee production in tons and $CofP_t$ stands for the coffee price in international markets. For tea, Tea_{it} is the grid-level measure for harvest area dedicated for tea plantation in 2000; and $TeaP_t$ is the natural log of the tea price in international markets. Considering so, in equation (1) γ captures the differential effect of the coffee price on conflict in those grids that are more coffee label intense; ρ provides the differential effect of tea price on conflict in areas where tea labeling is more rooted. The first stage of tea intensity is represented as:

$$(Tea_{it} \times TeaP_t) = \alpha_i + \beta_t + \Sigma(R_i \times T_i \times TE_i)\theta_i + X_{it}\phi + \mu_{it} \qquad (2)$$

Where R_i is the average annual precipitations by country *i*; T_i is the average temperature of the countries; TE_i is the log of tea export volumes of the leading exporter's China, India, and Sri Lanka; X_{it} includes all the explanatory variables in the second stage seen in equation (1).

Even if the process is shown in two stages it runs in a one-step procedure using 2SLS[12]. Standard errors are clustered at the grid level to control for potential serial correlation over time and across grids. Logarithms are used for price measurement to consider the effects in percentage points.

[12] 2SLS, Two Stages Least Square. Is a regression that uses an instrumental variable that is uncorrelated with the error terms to calculate estimated values of the endogenous variables (1st stage). Then it computes the values to estimate a linear regression model of the dependent variable (2nd stage).

6 RESULTS

6.1 Effect of tea and coffee active labels on conflict.

To study the effect of active labels[13] on conflict, first, a simple pooled OLS is run with no significant results. It presents a downward bias in column 1. FE is then applied. The results in Table 3 column 2 show that active labels increase the dependent variable total attacks by 1.5 pp, significant at a 1% level. This initial finding is aligned with the hypothesis that fair trade labeling has an impact on conflict of an area. Results indicate that there is indeed an increasing impact of having more labels within an area with the conflictive events observed in it. In column 3, the effect of having any active label during the years is considered. Results are not significant.

Table 3 Effect of total active labels on conflict

VARIABLES	(1) OLS	(2) FE Model 1	(3) FE Model 2
Active labels	0.009	0.015***	
	(0.009)	(0.003)	
Any active labels			0.153
			(0.127)
Observations	1,608	1,608	1,608
R-squared	0.352	0.124	0.120
Number of id		67	67

Note: dependent variable: total attacks; explanatory variables: active labels, and any active labels; other variables not shown include a log of the population, controls of temperature, precipitations, interaction between the two, and constant.
*Robust standard errors in parentheses. ***is significant at 1% level; **is significant at 5%; *is significant at 10%*

Zooming into the effects of active labels in each type of conflict, results are presented in Table 4. A 1.3 pp and 1.4 pp increase in violent attacks and protests are seen respectively, 1.8 pp increase in riots, and 0.3 pp decrease in explosions. No significant findings for battles, strategic developments, and violence against civilians are found. Notice that violent attacks include riots. These findings highlight that labeling incentivizes mainly protests and riots, increasing their frequency, which will be further explored.

[13] Active label refers to a valid certification at a year t, within a grid.

Table 4 Effect of active labels on type of conflict

VARIABLES	(1) All attacks	(2) Violent attack	(3) Battles	(4) Explosions	(5) Protests	(6) Riots	(7) Strategic development	(8) Violence civilians
Active labels	0.015***	0.013***	0.005	-0.003**	0.014**	0.018**	0.001	0.004
	(0.003)	(0.003)	(0.005)	(0.001)	(0.006)	(0.008)	(0.002)	(0.004)
Observations	1,608	1,608	1,608	1,608	1,608	1,608	1,608	1,608
R-squared	0.124	0.082	0.014	0.038	0.189	0.135	0.055	0.033
Number of id	67	67	67	67	67	67	67	67

Note: dependent variables: types of conflict shown on the top row; explanatory variable: active labels; other variables not shown include a log of the population; controls of temperature, precipitations, and interaction between the two; and constant.
*Robust standard errors in parentheses. ***is significant at 1% level; **is significant at 5%; *is significant at 10%*

6.2 Effect of tea and coffee active labels, and commodity price shocks on conflict.

So far results indicate that the number of labels in a grid does have an impact on conflict. As commented in the methodology, it seems interesting to also consider commodity price shocks. It will clarify if there is a link between the number of fair trade certifications and the price shocks experienced, in conflict. From the previous section, it is observed that types of attacks can be grouped into two main groups: violent attacks[14] and protests[15]. For simplicity, only these two will be considered now.

To answer the trigger of active labels and commodity price shocks, in Table 5 a more accurate analysis considering both insights is given. Results are obtained following FE and the standard errors are clustered at the grid level. Results confirm that number of active labels in an area has a positive relationship with protests and violent attacks, increasing conflict by 2.2 pp and 2.4 pp respectively. Furthermore, commodity price shocks of fair trade tea have a significant effect on protests, increasing them by 15.6 pp.

[14] It considered: battles, explosions, riots and violence against civilians.
[15] Strategic developments will not be considered as they represent a 3% of the dataset and are not strictly violent nor non-violent.

The difference in the effect of active labeling when shocks are considered (from 1.4 pp before to 2.2 pp now), leads to thinking that commodity price shocks play an important role in the unsettled situation of an area. It also reinforces the initial hypothesis that fair trade does raise concerns in terms of its effect on community peace. Results show that fair trade pricing considerably increases protests in an area with a higher volume of certifications of tea, a key commodity in Kenya. Fair trade coffee results are not significant.

Table 5 Effect of active labels and commodity price shocks in total attacks

VARIABLES	(1) Protests	(2) Violent attacks
Active labels	0.022***	0.024***
	(0.003)	(0.005)
Commodity price shock (FT tea)	0.156**	0.056
	(0.065)	(0.103)
Commodity price shock (FT coffee)	0.042	0.006
	(0.028)	(0.044)
Observations	1,608	1,608
Number of id	67	67

*Note: dependent variables: protests and violent attacks; explanatory variables: active labels, commodity price shock of fair trade tea and coffee; other variables not shown include a log of the population; controls of temperature, precipitations, and interaction between the two; and constant. Robust standard errors in parentheses. ***is significant at 1% level; **is significant at 5%; *is significant at 10%*

Additionally, the isolated extent to which price shocks incentivize conflict are studied. As before, the comparison is done between protests, by definition pacific, and violent attacks. Results in Table 6 indicate that a rise in fair trade tea price increases protests by 48.3 pp, results being significant at 90% level. For fair trade coffee, results remain insignificant. Again, the hypothesis that fair trade pricing has a significant impact on Kenya's protest scenarios is highlighted, aligned with the rise in protests carried out by small-scale tea producers portraited by the media.

Table 6 Commodity price shocks on conflict

	Violent attacks			Protests		
	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	tea	coffee	both	tea	coffee	both
Commodity price shock (FT tea)	0.361		0.349	0.483*		0.536**
	(0.234)		(0.238)	(0.255)		(0.267)
Commodity price shock (FT coffee)		0.106	0.036		-0.047	-0.155
		(0.186)	(0.181)		(0.124)	(0.135)
Observations	1,608	1,608	1,608	1,608	1,608	1,608
R-squared	0.144	0.143	0.144	0.248	0.241	0.249
Number of id	67	67	67	67	67	67

*Note: dependent variables: protests and violent attacks; explanatory variables: commodity price shocks of fair trade tea and coffee; other variables not shown include a log of the population; controls of temperature, precipitations, and interaction between the two; and constant. Robust standard errors in parentheses. ***is significant at 1% level; **is significant at 5%; *is significant at 10%*

Results in Table 6 are expanded in Appendix Table 11, where year dummies are shown. The yearly dummies capture the aggregated trend in violence in the entire country of Kenya. From Appendix Table 11, it can be concluded that there is a significant positive yearly impact on the increase of protests due to fair trade tea, as compared to the baseline year 1997. This year is excluded from the analysis due to collinearity.

6.3 Effect of tea and coffee commodity price shocks on conflict. Instrumental variables.

After observing the high relevance that price shocks have on conflict a deeper analysis is proposed. By the methodology explained in section 5.2, the effects of coffee and tea price shocks over the conflict in Kenya are assessed. The equations (1)-(2) presented represent the first and second stages. However, 2SLS estimates it in a single step. The results are presented in Table 7. The regression is run for two case scenarios. First, conventional tea and coffee values are considered, as seen in rows (1)-(2) of Table 7. Then, a mimicked analysis on fair traded commodities follows, seen in rows (3)-(4). The results show that a rise in price in tea and coffee have opposite results on conflict. For instance, if the price of tea increases, so does conflict.

The contrary holds for coffee; when coffee prices go up, conflict goes down. Bearing this in mind, the estimates suggest that an increase in tea price augments total attacks by 5.2 pp; an increase in conventional coffee price lowers total attacks by 2.5 pp.[16]

Table 7 Commodity price shocks. Instrumental variables.

VARIABLES	(1) Conventional	(2) Fairtrade
Commodity price shock (tea)	0.052***	
	(0.016)	
Commodity price shock (coffee)	-0.025**	
	(0.010)	
Commodity price shock (FT tea)		0.132
		(0.106)
Commodity price shock (coffee)		0.015
		(0.045)
Observations	1,608	1,608
Number of id	67	67

*Note: dependent variable: all attacks; explanatory variables: commodity price shocks for conventional and fair trade tea and coffee; variables not shown include a log of the population; controls of temperature, precipitations, and interaction between the two; and constant. Robust standard errors in parentheses. ***is significant at 1% level; **is significant at 5%; *is significant at 10%*

Now commodity price shocks are observed by type of conflict, contrary to the grouping in section 6.2, all types of conflict are considered in order to precisely see the extent of the shocks in each type of conflict. Still, the coefficients for tea price shock have a positive relationship with conflict: when the price of tea increases, so does conflict in most measures. In columns (3)-(5), it can be seen that conventional tea price shocks increase protests and riots by 5.9 pp and 4.7 pp, respectively. Overall, violent attacks increase by 3.5 pp. All are statistically significant. (Table 8)

In the results for the overall events, fair trade prices in Table 7 did not show significant results. However, when detailed by type of conflict the results vary, Table 8. Fair trade tea increases

[16] As reference, Dube & Vargas observed in Colombia, a worldwide coffee producer leader, that coffee increased conflict while oil lowered it. When observing the results of this study the same holds for tea, key in Kenya and coffee, secondary.

17.7 pp protests and 14.6 pp riots in areas where more fair trade tea is produced, columns (8)-(9). Results are significant. The conclusions remain unchanged from the analysis-driven with FE. However, the coefficients are more subtle than before. With FE, fair trade tea price shocks increased protests by 48.3 pp while with IV the increase is 17.7 pp.

For conventional coffee, an increase in commodity price has a negative relationship with conflict types. Therefore, an increase in coffee prices in international markets lowers protests by 2.1 pp and riots by 2.2 pp. Thus, violent attacks lower 2.0 pp when coffee prices increase. No significant effect from fair trade coffee price shocks is observed.

Table 8 Commodity price shocks, by type of conflict

	Conventional products					**Fairtrade products**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES	Battles	Explosions	Protests	Riots	Violent attacks	Battles	Explosions	Protests	Riots	Violent attacks
Commodity price shock (tea)	0.006	0.004	0.059***	0.047***	0.035**					
	(0.012)	(0.006)	(0.011)	(0.011)	(0.016)					
Commodity price shock (coffee)	-0.011	0.003	-0.021***	-0.022***	-0.020**					
	(0.008)	(0.004)	(0.007)	(0.007)	(0.010)					
Commodity price shock (FT tea)						0.025	0.011	0.177***	0.146**	0.081
						(0.078)	(0.040)	(0.067)	(0.069)	(0.103)
Commodity price shock (FT coffee)						-0.040	0.010	0.040	0.014	0.003
						(0.033)	(0.017)	(0.029)	(0.029)	(0.044)
Observations	1,608	1,608	1,608	1,608	1,608	1,608	1,608	1,608	1,608	1,608
Number of id	67	67	67	67	67	67	67	67	67	67

*Note: dependent variables: types of conflict shown in the top row; explanatory variables: commodity price shocks for conventional and fair trade tea and coffee: other variables not shown include a log of the population; controls of temperature, precipitations, and interaction between the two; and constant. Robust standard errors in parentheses. ***is significant at 1% level; **is significant at 5%; *is significant at 10%*

7 POLICY IMPLICATIONS

Results show that fair trade labels and commodity price shocks of tea have an impact on conflict in Kenya. These results are especially significant for protests, a non-violent form of conflict

that includes unorganized actions by members of the society. In fact, results indicate that when the intensity of fair trade labels increases in an area, so do protests. The same holds for commodity price shocks of fair traded tea. When prices of fair traded tea increase, conflict increases as well. Riots are similarly impacted by the number of labels and price shocks of commodities. Results show that the frequency of riots also increased within the grid due to the number of fair trade labels and the commodity price shocks.

Such findings are especially important considering that Kenya is a top-three world tea exporter. Alterations in tea production in Kenya can affect global supply/demand and ultimately, international tea prices. Tea is the most consumed beverage in the world so, this conflict of interest could rise global concerns. For coffee results suggest a different scenario. However, commodity price shocks of coffee obtained through IV suggest that an increase in price contributes to lowering protests and riots in an area as observed in Table 8. This could potentially be a source for future studies, understanding the different effects that fair trade commodities have on the conflict of a country by considering their relevance in the economy of such country.

It is particularly interesting that fair trade labeling and commodity price shocks impact mainly protests and riots. From analyzing the raw ACLED protests dataset more carefully it is seen that 96% of protests[17] during the time frame of this study were carried out by Kenyan protesters. This refers to the nationality of the manifests, as opposed to Ethiopian or international protesters for example. Mining the data, it is observed that out of the total 1647 protests initiated by Kenyan protesters, for 58% of Kenyan protest events there is no specification of who was responsible for the organization. Students and teachers motivated 7% and 4% of the protests

[17] Total protests in the time scope of the study and grids under consideration is 1713. Kenyan protestants are responsible of 1647 of these peaceful demonstrations.

respectively. 3% were started by the labor group. When observing rioters' data almost the same scenarios are observed. Out of the 1918 riot events, 1777 were carried out by Kenyan rioters, 93% of total riot events. For 41% out of the Kenyan rioter's events, there is no reference to the actor that originated the confrontation. From the main actors within this category, it can be seen that 19% of the events were motivated by vigilante groups and 13% by students.

Due to data limitations, no strong conclusions can be withdrawn in terms of the actors of the conflict. This paper acknowledges its limitations in that sense. For instance, having more farmers' data and more information on the nature of conflict could help determine more precisely the extend of the effects and also contribute to shaping future policy implications more accurately. Certainly, it would be interesting to explore this in future research, as understanding the nature of such demonstrations could clarify their relationship to fair trade.

What can be commented on is that protests are peaceful demonstrations and therefore these events could mean that farmers are standing up to improve their labor conditions, salaries, and job security. These are the claims that media has shown in recent years, and data support. So, it could potentially lead to constructive criticism of the current fair trade pricing and management model, forging change. As mentioned in the literature, social movements can help adapt fair trade practices to the cultural, social, and economic scenarios of each country. In this case, to the specific needs of Kenyan small-scale producers.

8 CONCLUSIONS

The fixed effects and instrumental variable models used led to the same conclusions. The effect that the explanatory variables have on the dependent variable always has the same direction and leads to the same conclusion. However, as discussed earlier, the effect through IV is more

moderate than with FE. Additionally, the robustness checks done ensure that the instrument used is appropriate to study the impact that commodity price shocks have on the conflict in Kenya.

Therefore, the main conclusion is that fair trade labeling, in general, motivates conflict within an area. Furthermore, the conclusions of the research by commodity are the following. For tea, price shocks encourage conflict within an area no matter if the product is certified or not. For coffee, results conclude that price shocks of this commodity are different if the product is certified or not. Results indicate that there is only a significant effect of coffee price shocks on conflict when the product is not labeled. Furthermore, in this case, the relationship is negative, meaning that coffee price shocks lower conflict.

To sum up, this research explores the idea that fair trade practices, although noble at purpose, remain a cause of controversy. It aims to draw attention to the real extent of this kind of poverty aid schemas by raising awareness and offering a critical viewpoint based on quantitative methods. It also triggers future researches that will propose new solutions that will help cope with the current trade challenges faced by small-scale producers in developing countries.

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10 APPENDIX

Table 9 Descriptive Statistics for General Variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
No. total attacks	1608	4.581	12.467	0	202
No. battles	1608	.886	2.253	0	29
No. explosions	1608	.149	.884	0	17
No. protests	1608	1.065	4.011	0	62
No. riots	1608	1.168	4.837	0	98
No. strategic developments	1608	.136	.565	0	7
No. violence against civilians	1608	1.177	3.007	0	41
No. violent attacks	1608	3.38	8.808	0	135
Active labels per grid and year	1608	.113	.737	0	14
Tea active labels per grid and year	1608	.069	.53	0	10
Coffee active labels per grid and year	1608	.025	.233	0	4
Cumulative active labels per grid	1608	.761	4.446	0	50
Sum active labels per grid	1608	2.896	9.848	0	52
Dummy if grid has label at year t	1608	.085	.279	0	1
Dummy if grid has ever a label	1608	.194	.396	0	1
Dummy if grid has tea label at year t	1608	.028	.165	0	1
Dummy if grid has coffee label at year t	1608	.014	.119	0	1
Tea active labels per grid	1608	.501	3.018	0	39
Sum of tea labels per grid	1608	1.716	6.302	0	40
Dummy if grid had ever tea label per grid	1608	.164	.371	0	1
Coffee active labels per grid	1608	.163	1.255	0	14
Sum of coffee labels per grid	1608	.657	2.976	0	16
Dummy if grid had ever coffee label per grid	1608	.06	.237	0	1
Log of Population	1608	31.613	5.086	5.746	34.536
Temperature	1608	25.225	2.72	16.41	28.38
Precipitations	1608	770.407	359.947	269.78	2452.96

Table 10 Descriptive Statistics for variables used in the instrumentation

Variable	Obs.	Mean	Std. Dev.	Min	Max
Log tea price	1608	4.494	.2	4.133	4.836
Log FT tea price	1608	4.634	.2	4.272	4.976
Tea intensity x log tea price	1608	61.374	98.815	0	555.136
FT tea intensity x log FT tea price	1608	12.277	19.765	0	110.809
Log top 3 tea exports	1608	12.976	2.736	0	14.108
Precipitations x log top 3 tea exports	1608	9979.792	5249.15	0	34496.559
Temperature x log top 3 tea exports	1608	327.196	77.994	0	397.849
Precipitations x Temperature x log top 3 tea exports	1608	242857.9	107758.42	0	770998.06
Log top 3 FT tea exports	1608	11.538	2.439	0	12.608
Precipitations x log top 3 FT tea exports	1608	8876.539	4678.213	0	30816.789
Temperature x log top 3 FT tea exports	1608	290.949	69.526	0	355.41
Precipitations x Temperature x log top 3 FT tea exports	1608	216012.12	96098.076	0	688755.25
Log coffee price	1608	4.36	.382	3.602	5.112
Log FT coffee price	1608	5.252	.407	4.787	5.733
Coffee harvest area (hectares mean)	1608	17.838	27.241	0	140.976
Coffee production (tons mean)	1608	6.042	12.343	0	70.968
FT coffee production (tons mean)	1608	1.45	2.962	0	17.032
Coffee intensity	1608	26.344	54.075	0	362.794
FT coffee intensity	1608	7.616	15.617	0	97.652

Table 11 Commodity price shocks

	Violent attacks			Protests		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	tea	coffee	both	tea	coffee	both
FTshock_tea	0.361		0.349	0.483*		0.536**
	(0.234)		(0.238)	(0.255)		(0.267)
FTshock_coffee		0.106	0.036		-0.047	-0.155
		(0.186)	(0.181)		(0.124)	(0.135)
Precipitations	0.001*	0.001*	0.001*	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Temperature	0.830**	0.801**	0.831**	-0.341	-0.390	-0.345
	(0.356)	(0.360)	(0.356)	(0.259)	(0.272)	(0.258)
interactiontp	-0.000*	-0.000*	-0.000*	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
logPopulation	-0.007	-0.007	-0.007	0.002	0.001	0.001
	(0.007)	(0.007)	(0.007)	(0.004)	(0.004)	(0.004)
1998.year	-0.179	-0.167	-0.178	0.388***	0.399***	0.382***
	(0.129)	(0.130)	(0.130)	(0.112)	(0.115)	(0.109)
1999.year	0.199	0.208	0.201	0.132*	0.136*	0.126*
	(0.143)	(0.145)	(0.145)	(0.073)	(0.075)	(0.072)
2000.year	0.196	0.210	0.198	0.198**	0.210**	0.192**
	(0.151)	(0.152)	(0.153)	(0.087)	(0.092)	(0.086)
2001.year	-0.059	-0.054	-0.058	0.186	0.187	0.182
	(0.171)	(0.173)	(0.172)	(0.122)	(0.126)	(0.120)
2002.year	-0.197	-0.192	-0.196	0.359**	0.364**	0.357**
	(0.216)	(0.219)	(0.216)	(0.173)	(0.178)	(0.172)
2003.year	-0.346	-0.336	-0.345	0.465**	0.477**	0.463**
	(0.237)	(0.241)	(0.238)	(0.215)	(0.222)	(0.213)
2004.year	-0.142	-0.139	-0.141	0.378***	0.376***	0.374***
	(0.136)	(0.138)	(0.138)	(0.123)	(0.125)	(0.121)
2005.year	0.122	0.127	0.123	0.196**	0.197**	0.191**
	(0.130)	(0.133)	(0.132)	(0.086)	(0.089)	(0.085)
2006.year	-0.114	-0.101	-0.114	0.258**	0.273**	0.254**
	(0.136)	(0.138)	(0.137)	(0.109)	(0.113)	(0.107)
2007.year	0.277*	0.280*	0.278*	0.263**	0.262**	0.259**
	(0.152)	(0.154)	(0.153)	(0.101)	(0.103)	(0.100)
2008.year	0.364**	0.380**	0.365**	0.221**	0.238**	0.215**
	(0.156)	(0.157)	(0.158)	(0.088)	(0.093)	(0.087)
2009.year	-0.485*	-0.443	-0.484*	0.424*	0.484**	0.421*
	(0.264)	(0.266)	(0.265)	(0.220)	(0.234)	(0.218)
2010.year	-0.355	-0.318	-0.355	0.394*	0.448**	0.392*
	(0.230)	(0.231)	(0.231)	(0.201)	(0.215)	(0.199)
2011.year	-0.203	-0.168	-0.203	0.303**	0.356**	0.302**
	(0.157)	(0.153)	(0.158)	(0.139)	(0.152)	(0.138)
2012.year	0.295***	0.320***	0.295***	0.235***	0.271***	0.233***
	(0.110)	(0.108)	(0.110)	(0.086)	(0.093)	(0.085)
2013.year	0.425**	0.441***	0.424**	0.672***	0.700***	0.674***
	(0.165)	(0.166)	(0.165)	(0.173)	(0.182)	(0.172)
2014.year	0.223	0.233	0.223	0.726***	0.745***	0.729***
	(0.156)	(0.157)	(0.156)	(0.178)	(0.184)	(0.178)
2015.year	0.042	0.075	0.042	0.520***	0.570***	0.520***
	(0.183)	(0.182)	(0.184)	(0.160)	(0.170)	(0.159)
2016.year	-0.320	-0.286	-0.321	0.680**	0.737***	0.683**
	(0.302)	(0.303)	(0.302)	(0.260)	(0.274)	(0.259)
2017.year	0.425*	0.465**	0.425*	0.762***	0.824***	0.762***
	(0.226)	(0.223)	(0.226)	(0.211)	(0.224)	(0.210)
2018.year	0.529***	0.549***	0.529***	0.522***	0.551***	0.521***
	(0.147)	(0.145)	(0.147)	(0.127)	(0.134)	(0.127)

2019.year	-0.110	-0.083	-0.111	0.661***	0.705***	0.663***
	(0.241)	(0.243)	(0.241)	(0.217)	(0.229)	(0.217)
2020.year	0.057	0.078	0.056	0.642***	0.680***	0.645***
	(0.259)	(0.261)	(0.259)	(0.219)	(0.230)	(0.219)
Constant	-20.238**	-19.310**	-20.265**	7.802	9.384	7.916
	(8.753)	(8.850)	(8.770)	(6.343)	(6.660)	(6.330)
Observations	1,608	1,608	1,608	1,608	1,608	1,608
R-squared	0.144	0.143	0.144	0.248	0.241	0.249
Number of id	67	67	67	67	67	67

Table 12 Variable Description

Variable	Definition
Conflict variables	
totalattacks	Sum of all types of attacks
battles	Dummy variable that is 1 if battle and 0 otherwise
explosions	Dummy variable that is 1 if explosions and 0 otherwise
protests	Dummy variable that is 1 if protests and 0 otherwise
riots	Dummy variable that is 1 if riots and 0 otherwise
strategicdev	Dummy variable that is 1 if strategic development and 0 otherwise
violencecivilians	Dummy variable that is 1 if violence against civilians and 0 otherwise
violentattack	Dummy variable that is 1 if violent attack (battles, explosions, riots and violence against civilians) and 0 otherwise
Labels variables	
labelsperyear	Dummy variable that is 1 if there is a label that year and grid and 0 otherwise
tea	Dummy variable that is 1 if tea is the product and 0 otherwise
coffee	Dummy variable that is 1 if coffee is the product and 0 otherwise
cum_labels	Cumulative labels per year and grid
treatment	Dummy variable that is 1 if there is any active label within the grid and year and 0 otherwisse
ever_treated	Dummy variable that is 1 if at any point in time there is at least one label within the grid, and 0 otherwise
tea_treatment	Dummy variable that is 1 if there is a tea active label within the grid and year, and 0 otherwise
coffee_treatment	Dummy variable that is 1 if there is a coffee active label within the grid and year, and 0 otherwise
tea_evertreated	Dummy variable that is 1 if at any point in time there is a tea active label within the grid, and 0 otherwise
coffee_evertreated	Dummy variable that is 1 if at any point in time there is a coffee active label within the grid, and 0 otherwise
Controls	
temperature	Temperature at a grid and year
precipitations	Precipitations at a grid and year
interactiontp	Interaction between temperatures and precipitations at a grid and year
logpopulation	Logarithm of population by grid and year
Tea product	
logpricetea	Logarithm of tea price in international markets
logfairtrade	Logarithm of fair trade tea price in international markets
teahamean	Tea harvest area mean
FTteahamean	Fair trade tea harvest area mean (approximation from conventional tea)
teaintxlteaprice	Interaction between tea harvest are and logarithm of tea price
FTteaintxlteaprice	Interaction between fair trade tea harvest are and logarithm of fair trade tea price
log3teaexports	Logarithm of the exports of top three tea exporters: China, India and Sri Lanka
preci3teaexports	Interaction between precipitations and the logarithm of exports
temp3teaexports	Interaction between temperature and the logarithm of exports
pt3teaexports	Interaction between temperature, precipitations and the logarithm of exports
log3teaFTexports	Logarithm of the fair trade exports of top three tea exporters: China, India and Sri Lanka
preci3teaFTexports	Interaction between precipitations and the logarithm of fair trade exports

temp3teaFTexports	Interaction between temperature and the logarithm of fair trade exports
pt3teaFTexports	Interaction between temperature, precipitations and the logarithm of fair trade exports
Coffee product	
logPriceCoffee	Logarithm of coffee price in international markets
logFTCoffee	Logarithm of fair trade coffee price in international markets
CoffeeHAMean	Coffee harvest area mean (approximation from conventional coffee)
coffeeprodmean	Coffee production mean internationally
FTcoffeeprodmean	Fair trade coffee production mean internationally (approximation from conventional coffee)
coffeeintensity	Interaction between mean of coffee production and the logarithm of coffee price
Ftcoffeeintensity	Interaction between mean of fair trade coffee production and the logarithm of fair trade coffee price