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Guns and Roses: The Impact of the Kenyan Post-Election Violence on Flower Exporting Firms

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Abstract

While political instability is broadly believed to be bad for economic growth, firm performance and foreign direct investment, few studies convincingly identify the causal impact of conflict on firms and export performance. In this paper, we analyze the impact of the Kenyan post-election violence on a hugely successful export oriented industry, the Kenyan flower industry. Using export information on all Kenyan grower-exporters, we show that the conflict reduced Kenyan flower exports by 24% overall. To account for demand shocks in the export markets, we then exploit the cross-regional variation in the post-election violence to identify the effect of the conflict on firms' export volumes. We find that the conflict reduced exports by 38% for firms located in conflict areas, mainly through displacing workers. The displacement of semi-skilled workers is also shown to have had impacts substantially beyond the duration of the conflict.

While there is no evidence to suggest that the conflict affected export volumes in the areas without conflict, we find evidence that it did change exporters' behaviour. Shipments were consolidated and exported less frequently, while security expenses rose. This suggests that exporters in non-conflict areas reacted to the increased insecurity by transporting larger, more secured shipments to the airport less frequently.

Keywords: Ethnic Violence, Non-Traditional Agriculture, Export Oriented Industry, Kenya.

JEL Codes: F14, F23, L14, O13, Q17.

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1   Introduction

Adam Smiths notion of comparative advantage squarely assigns Africa to the exploitation of its natural resources. Across the developing world, however, governments have tried to foster local manufacturing sectors believing them to be stepping stones towards economic development. These attempts at creating higher-value-added manufacturing sectors have largely been unsuccessful. Yet, a number of success stories stand out, where the initial comparative advantage in agriculture was the foundation for developing a high-value-added export sector, such as in pineapple farming in Ghana or horticulture in Kenya. Due to sanitary and technical requirements for quality, these agro-industries often require quite substantial changes to the growing process of these crops, and therefore substantial investments - investments that investors, foreign or local, are less likely to make with the risk of political instability. Political instability lowers growth, a link that has been documented at the macro-level (Alesina et al., 1996).

We provide some of the first evidence of the impact of political violence on export oriented industries at the micro-level, by focussing on the impact of the Kenyan post-election violence on the Kenyan flower industry. The Kenyan flower industry is a very successful export oriented industry with average growth rates on 24 % over the last 10 years. At the end of 2008, Kenyas elections erupted into a period of violence, an instance of violence unanticipated by the vast majority of observers (and all flower producers interviewed). The violence occured during a clearly defined period lasting for about 6 weeks. We use export records on all export transactions made by Kenyan flower exporters before and after the violence. We rely on the cross-regional variation in the post-election violence within Kenya to identify the effect of the conflict on firms' export volumes. We find that the violence had a strong immediate effect on exports during the period of the violence, operating through transportation difficulties and worker absense. The effects of the displacement of semi-skilled workers affected exports for months after the violence.

Our main identification comes from a triple difference approach, requiring regions within Kenya without violence to not be affected by the violence, nor to pick up the slack and export more flowers. We find no evidence to suggest that the conflict affected export *volumes* in the areas without conflict. However, we do find evidence that it did change exporters' *behaviour*. Exports from the non-conflict areas increased in size after the onset of violence. At the same time the frequency of shipments decreased. A survey administered to a sample of firms documents that security expenses rose. This

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suggests that exporters in non-conflict areas reacted to the increased insecurity: they transported larger, more secured shipments to the airport less frequently.

This work is related to the growing literature on the microeconomics of civil conflict (see, e.g., Blattman and Miguel (2008) for a survey of the literature, most of which is concerned with the impact of conflict on health and education outcomes). While there is a large literature linking exports of natural resources to civil conflict at the macro-level, studies providing micro-evidence on the relationship between firms and conflict are few, amoung them Abadie and Gardeazabal (2003) and Guidolin and La Ferrara (2007). Abadie and Gardeazabal (2003) study the impact of the Basque civil war on growth in the Basque region by constructing a counterfactual region. They then look at stock market returns of firms who initially operated in the Basque region and find that they have lower stock market returns. Guidolin and La Ferrara (2007) conduct an event study of the sudden end of the civil conflict in Angola, marked by the death of the rebel movement leader in 2002, and find that the stock market perceived this event as "bad news" for the diamond companies holding concessions there.[1]

The remainder of the paper proceeds as follows. Section 2 provides background information on the Kenyan flower industry and the post-election violence. Section 3 describes the data. Section 4 and presents the empirical results. Section 5 offers some concluding remarks.

2 Background

2.1 Kenyan Flower Industry

Background and Production Process

Figure 2 displays the dramatic increase in the exports of cut flowers from Kenya. In slightly more than a decade the country has become one of the leading exporters of flowers in the world, overtaking Israel, Colombia and Ecuador in the process.[2] The flower industry recently became the largest foreign exchange earner, earning about 1% of total Kenyan GDP in 2007.

Kenya has been endowed with ideal natural conditions for floriculture. Located on the equator, it offers warm temperature ranges that allow flowers to grow rapidly

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[1]Dube and Vargas (2007) provide micro-evidence on the relationship between export and civil violence in Colombia. They find that an increase in the international price of labor-intensive export commodity, reduces violence while an increase in the international price of a capital-intensive export good increases violence. Martin et al. (2008) investigate the relationship between international trade and civil war at the macro-level (see Collier and Goderis (2008) and Besley and Persson (2008)).

[2]Kenya supplies about 90% of its produce to the EU, where it has a market share in cut flowers of around 35% (see EUROSTAT (2007))

while having limited days with rain and without sunshine. These conditions allow growers Kenya to grow a large variety of quality flowers year-round at internationally competitive prices without the necessity of green house conditions.[3]

Producing flowers for exports is a complex business. Rapidly changing tastes require highly capital intense R&D by breeders to develop new varieties. Disease management at the growing stage is costly. Moreover, flowers are a highly perishable commodity. In order to ensure the supply of high-quality flowers to distant markets, temperatur control and careful flower handling along the supply chain are important. Flowers are (hand-) picked in the field, immediately transferred to cool storage rooms at constant temperature and transported to the airport in refrigerated trucks, and flown to overseas markets in temperature controlled containers. Most flowers reach the sales shelf within 24-48 hours.

Because of both demand and supply factors, floriculture is a business characterized by significant seasonality. On the demand side, particular dates such as Valentine's day and Mothers' day lead to large spikes in the demand of particular varieties. On the supply side, the large market power and vertical integration of Dutch producers imply that demand for Kenyan flowers is much lower during summer in the northern hemisphere, when flowers are cheaper to produce in the Netherlands.[4] From the point of view of Kenyan producers, therefore, the season starts in September and ends in June.

Because flowers are perishable, they are handpicked and handwrapped, a task for which the labour intensive industry mostly employs low educated women. However, these workers receive significant training in harvesting, handling, grading, packing, and acquire skills which are difficult to replace in the short-run. Growers tend to hire new workers in September, slowly training them in flower handling for about three months so that they are ready for the high demand season.

Flowers are exported from Kenya through two channels operating in parallel, the Dutch auctions and direct sales to wholesalers/specialist importers. While selling to the auctions minimizes the marketing effort of the exporting firms, prices at the auctions vary substantially throughout the season, and margins tend to be lower due to the additional intermediation step in the chain.

Sales through direct relationship, instead, offer a stable demand with typically

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[3]Flower harvesting requires adequate access to water. A typical rose plant, for instance, needs one litre of water per day. For this reason, concerns about the environmental impact of the industry have accompained its economic success (see for instance, Boix Fayos, C. (2002) and Harper et al (2003)).

[4]The Dutch auctions are owned by Dutch cut-flower grower cooperatives. Dutch producers are also heavily vertically integrated into R&D and breeding of new varieties.

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higher margins. However, direct relationship comes with significant costs related to the search of customers overseas, as well as product changes and quality specifications that are tailored to the particular demand of a client.

Industry Structure

The Kenyan flower industry counts around 120 established grower-exporters located at various clusters in the country. The largest concentration is found surrounding Lake Naivasha, where one quarter of the regular exporters are located. The rest of the farms are located in various parts of the country, with important clusters in, for instance, Athi River, Thika, and Mount Kenya, as illustrated in Figure 5. There are a handful of large vertically integrated firms that have their own freight-forwarding company, cargo planes as well as large distribution and marketing operations in overseas markets. Most of these large firms have direct relationships with large retail/wholesale outlets in the EU (e.g. Tesco, Waitrose, Marks & Spencer, Sainsburys, Aldi) and account for around one third of annual exports. In addition, there are also around 25 traders or consolidators, who do not produce flowers, but rather procure flowers domestically from other firms and often specialize in sales to particular export destination, (e.g. Lebanon, Qatar, UAE, Japan, Cyprus, Italy). These traders have a market share of around 10%. The rest of the market is divided among firms which greatly vary in acerage and other characteristics, and are the focus of our empirical analysis.

2.2 Ethnic Violence

Kenya's fourth multi-party general elections were held on the 27th of December 2007 and involved two main candidates: Mwai Kibaki the incumbent, a Kikuyu hailing from the Central province representing the Party of National Unity (PNU) and Raila Odinga a Luo from Nyanza province representing the main opposition party, the Orange Democratic Movement (ODM).[5]

Since the winning ODM's primary in September 2007, the polls showed Odinga as narrowly, but consistently, ahead of Kibaki in all the polls leading to the December elections. The support bases for the two opposing coalitions were clearly marked along ethnic lines. Regional polls showed that Kibaki's support base was primarily in

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[5]Kenya became independent in 1963. After a brief period of democracy, a long period of governance under a one-party state started in 1969. The period from 1969-1983 was the period of a *de jure* single party state and following the military coup a *de facto* one-party state arose under Moi, who took office after Kenyatta's sudden death in 1978. Moi's regime lasted until 2002, after he had already won two multi-party elections, when he was constitutionally barred to contest in the election, and Kibaki won the seat. For details on the recent political history of Kenya, see, e.g., Maupeu et al (2005) and Kasara (2007).

the Central province, the traditional homeland of the Kikuyus, parts of the Eastern province (the Embu and Meru locations) as well as parts of Nairobi. Raila Odinga, on the other hand, had a strong support base from his ethnic homeland (Nyanza province), as well as in the provinces of Western, Nairobi, North-Eastern and the Coast through a coalition with leaders from these ethnic groups.

On the day of the election (28th December 2007), Odinga had a strong lead both in polls and exit polls. The following day ODM declared that they had won. However, towards that evening, as polling stations reported in with tallies, Odinga's led had been narrowed to 38,000 with only 30 (of the 210) constituencies (in the Central province) remaining to be counted.[6] The following afternoon (30th December), the head of the Electoral Commission of Kenya declared Kibaki the winner. Kibaki took the oath of office the same evening and Odinga accused the government of fraud. Within minutes of Kibaki being sworn in, targeted ethnic violence broke out in various parts of the country with ODM supporters (in Nyanza, Mombasa, Nairobi and some parts of the Rift Valley) targeting the Kikuyu's who were living outside their traditional settlement areas of the Central province to show their discontent.[7]

The second dramatic outbreak of violence, which occurred between the 25th and the 30th of January 2008, instead was mainly seen as a Kikuyu revenge attack on the ODM supporters initiated by the Kikuyus in the areas of Nakuru, Naivasha and Limuru.[8] There was repeated occurrence of ethnic violence and chaos until a power sharing agreement was reached on the 29th of February. It was reported that by the end of the violence some 1,700 people had died in the clashes and 300,000 people were displaced and living in internally displaced camps.

3 Data

3.1 Data

Firm Level Data

Our data come from three sources, administrative data from the export authority,

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[6]According to international electoral observers from the EU as well as the US (the International Republican Institute (IRI) for instance), the elections were flawed with severe discrepancies between the parliamentary and presidential votes. For further details, see `http://www.iri.org/africa/kenya` or `http://www.senate.gov/~foreign/testimony/2008/MozerskyTestimony080207a.pdf`

[7]Figure 4 shows that the first outbreak of violence, which occurred during the period between the 30th of December 2007 and the 3rd of January 2008, happened in locations which are not traditional Kikuyu homelands, i.e., in areas where the Kikuyu's migrated for work (such as the areas of Kitale, Eldoret and Kericho) and in areas which supported Odinga in the Luo heartland of Nyanza.

[8]Detailed accounts can be found in Kenya National Commission on Human Rights (2008), Independent Review Commission (2008) and Catholic Justice and Peace Commission (2008).

data from a survey collected by the authors as well as information on conflict locations from the Kenya Red Cross. The administrative export data is a daily transaction-level dataset, covering all exports of flower during the period from September 2004 to August 2008. These data are collected by Horticultural Crops Development Authority (HCDA), a parastatal body, which regulates the horticultural industry in Kenya and charges a small weight-based levy. The record for each transaction contains information on the date of the transaction, the volume of export, the export destination, the export consignee, and self-reported price.

The firm-level survey was administered to a sample of around eighty firms in July to September 2008. The survey response rate was very high compared to comparable firm-level surveys in developing countries. Firms surveyed were located in all the producing regions of the country. Information is available on the exact geographical location of the firms, their labour force, the ownership (whether the owner is a indegenious Kenyan, Kenyan Indian or Foreign) and the ethnicity of the labor force.

Violence and Conflict Location

Table [A1] shows in which towns firms are located in and whether that location suffered violence or not. Information on whether these localities experienced conflict or not comes from the Kenya Red Cross Society's (KRCS) *Information Bulletin on the Electoral Violence* and is corroborated by personal communication with industry officials.[9][10]

Because seasonal patterns are important, we restrict our sample to established exporters that export throughout most of the season. Among those, we focus on firms that have exported in December 2006 and January 2007 as well as in November and December 2007, and abstract from entry and exit of firms in export markets. There are approximately 120 producers satisfying those requirements and they cover more than ninety percent of all exports in our dataset. The four largest firms in the industry are large multinationals with fully vertically integrated value operations. Those firms are all located in the conflict region. They are omitted from the regressions analysis.

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[9]Information on the severity of the conflict and the number of instances of violence is controversial, and politically sensitive. We sidestep this issue to a large extent, because the classification of whether a location suffered conflict or not *is* uncontroversial.

[10]Three firms have multiple estates, some in conflict and others in no-conflict areas. We code the firm according to the location of the largest estate. Alternative coding rules do not affect the results. The four largest firms in the industry are large multinationals with fully vertically integrated value operations. Those firms are all located in the conflict region. They are omitted from Table 1 and from the regressions analysis when specified.

4 Econometric Model

4.1 Effect of Violence on Exports

This section presents evidence on the effects of violence on the exports of firms. It does so by exploiting cross-regional variation in the exposure to violence as well as within firm time-variation in exports. We use export volumes as our measure of interest. The price information when sales are made to the auction is based on hypothetical prices: sales to the auction have pro-forma receipts since the prices remain to be determined. On the other hand, the export weight is the basis for a small export levy and all export containers are weighed by the HCDA. In Figure 1, we show that there is little reason to believe that prices at the auctions were affected by the violence.

As described in the previous section, we divided firms into whether they are in the *conflict* or in the *no-conflict* region, depending on whether the location of the firm was affected by violence. Table [1] provides summary statistics for the firms in the two geographical locations. It relies on official export statistics as well as on a sample of surveyed firms. Along many characteristics, differences across firms in the two regions are not statistically significant. However, firms in the no-conflict region have larger areas covered by greenhouses, were started more recently and have different types of owners. In particular, they are more likely to be owned by foreigners, and less likely to be owned by Kenyans. The difference in size, measured by hectares under greenhouses, only appears in the survey data. Measuring size in terms of export volumes, which allows to look at the entire sample, does not show any statistically significant difference. Neither are firms in the two groups different in terms of marketing channels, housing programs, fair trade, exporters' association certification, or ownership of trucks.

As discussed above, seasonality is a key characteristic of the industry. A season begins in September and ends in June. Let $s \in \{1, 2, 3, 4\}$ denote the four seasons for which we have data. Season 4, which begins in September 2007 and ends in June 2008, is the season in which the violence occurred. We therefore distinguish dates d (e.g., October 24th) from periods of violence t (which are all in the season of 2007/2008). Let $t \in \{0, 1\}$ be an indicator of the violence period, which takes value $t = 1$ in the period(s) of violence. Finally, let $C \in \{0, 1\}$ be an indicator of the region, with $C = 1$ if the firm is located in a region with conflict.

Estimates of the effect of the violence on output can be obtained by comparing exports in the violence region with exports of firms located in the non-violence region during the same period, while accounting for exports of these firms in previous years

or firm fixed effects. That is, the effects of violence on exports can be estimated by

$$\beta = (Y^{C=1}_{t=1,s=4} - Y^{C=1}_{t=1,s<4}) - (Y^{C=0}_{t=1,s=4} - Y^{C=0}_{t=1,s<4}) \tag{1}$$

where $Y^{C}_{t,s}$ are exports of firms located in region C, in period t of season s and $Y^{C=1}_{t=1,s<4}$ are the (average) exports of the firm in previous periods). The coefficient β compares the change in exports in 2007/2008 across the two regions. While this "difference in difference" estimator controls for the seasonality, it does require the assumption that the average grow rate across seasons is the same in both regions.

Assuming that the potentially different seasonal growth rates across regions are constant throughout a season, i.e., separable from seasonality, it is then possible to further differentiate the "difference in difference" in (1) to control for differential growth across the two regions, by estimating

$$\widehat{\beta} = \left[(Y^{C=1}_{t=1,s=4} - Y^{C=1}_{t=1,s<4}) - (Y^{C=0}_{t=1,s=4} - Y^{C=0}_{t=1,s<4})\right] - \\ - \left[(Y^{C=1}_{t=0,s=4} - Y^{C=1}_{t=0,s<4}) - (Y^{C=0}_{t=0,s=4} - Y^{C=0}_{t=0,s<4})\right] \tag{2}$$

The coefficient $\widehat{\beta}$ compares the increase in exports in 2007/2008 across the two regions during the period of violence, relative to the differential growth between the two regions before the onset of violence in 2007/2008.

Rearranging terms, $\widehat{\beta}$ can be rewritten as

$$\widehat{\beta} = \beta_{s=4} - \beta_{s<4} = \left(\Delta^{C=1}_{s=4} - \Delta^{C=0}_{s=4}\right) - \left(\Delta^{C=1}_{s<4} - \Delta^{C=0}_{s<4}\right) \tag{3}$$

where $\Delta^{C}_{s} = Y^{C}_{t=1,s} - Y^{C}_{t=0,s}$. $\widehat{\beta}$ can then be seen as the difference in the "within seasons difference in difference" β_{s}.

In regression form, we have

$$y^{dts}_{fc} = \alpha^{s}_{f} + \eta^{dt}_{c} + \widehat{\gamma}\mathbf{I}_{s=08} \times \mathbf{I}_{t=1} + \widehat{\beta}\left(\mathbf{I}_{s=4} \times \mathbf{I}_{t=1} \times \mathbf{I}_{c=1}\right) + \varepsilon^{dts}_{fc} \tag{4}$$

where y^{dts}_{fc} are exports of firm f, located in region $c \in \{0,1\}$, at date d (e.g., October 24th) in period $t \in \{0,1\}$ and season s, and α^{s}_{f} are firm-season specific effects, η^{dt}_{c} are region-date specific effects and ε^{dts}_{fc} is an error term.[11] The indicator functions $\mathbf{I}_{s=4}$, $\mathbf{I}_{t=1}$ and $\mathbf{I}_{c=1}$ take value equal to one in, respectively, the season, period and region in which the violence took place, and zero otherwise. Let us define the violence treatment as $V_{stc} = \mathbf{I}_{s=4} \times \mathbf{I}_{t=1} \times \mathbf{I}_{c=1}$, and let $V_{st} = \mathbf{I}_{s=4} \times \mathbf{I}_{t=1}$. The coefficient of interest is

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[11]In all the regressions y is equal to the log of one plus kgs of exports.

$\widehat{\beta}$, which provides an estimate of whether exports of firms in the conflict areas were different from exports in the no-conflict areas during the period of the violence, relative to the previous seasons and to no-violence periods. The coefficient $\widehat{\gamma}$, corresponding to the term V_{st}, instead, provides an estimate of the country-wide effect of the violence, i.e., takes into account all the channels through which the violence has affected all the firms through the country in the same way (e.g., the exchange rate depreciation or the reduction in passenger flights to and from Europe). Since the identification of this coefficient does not exploit cross-regional variation in violence, its interpretation requires stronger assumptions than $\widehat{\beta}$, which remains the main focus of our analysis.[12]

As described above, the definition of $\mathbf{I}_{s=4}$ and $\mathbf{I}_{c=1}$ is uncontroversial: violence happened in the fourth season in our database and, among those locations with flower firms, those affected by the violence are clearly identified.

A possible concern with our empirical strategy is catch-up effects, namely the possibility that firms might have recovered very quickly and exported more than originally planned in the days and weeks immediately following the outburst of violence. This would be the case if flowers could be stored and then sold once the violence is over. As mentioned before, flowers are highly perishable products, and firms' managers confirm that they could not store flowers to export them later. Nonetheless, in our empirical specification, we collapse exports by week, which reduces the possible postponement to a large extent.[13]

Table [2] documents that the exports from Kenyan flower firms declined in January and February 2008, and significantly so in weeks 1 and 6 of that year. These results control for season fixed effects as well as seasonality fixed effects (through week fixed effects) and correspond to the coefficient $\widehat{\gamma}$. If global demand for flowers displayed the same seasonal pattern as in previous years and there was no trend in the logarithm of demand, $\widehat{\gamma}$ would identify the aggregate impact of the post-election violence on Kenyan flower firms.

Since these assumptions are quite strong, we exploit the cross-regional variation in violence within Kenya. To the extent that the the ethnic violence affected operations even for areas that were not directly touched by the violence - for example through

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[12]Note that the triple interaction of indicator functions is saturated by the inclusion of μ_c^{dt} and α_f^s. In some specifications, and for robustness check purpose, we also include firm-period effects η_f^{dt}, where we define periods as weeks of the year. Results are also robust in (unreported) specifications that include φ^{sdt} season-period fixed effects.

[13]In future work, we also implement the standard error corrections suggested by Hansen (2007) that allow for serial correlation among the residuals. A technical requirment is that the number of time periods cannot increase faster than the number of observations (firms). By collapsing the data into weeks, we meet this requirement.

transportation difficulties - these results are an underestimate of the true impact of violence.

Table [3] shows that the pattern of exports mirrors the pattern of violence and insecurity across regions within Kenya. The first week of January saw the first wave of violence starting in the Rift Valley, with insecurity continuing through the rest of the month. In weeks 4 and 5, violence erupted in the areas around Lake Naivasha, the largest hub of flower growers. The results in this table correspond to Difference-in-Difference estimates that compare locations in Kenya that experienced violence to those that did not, accounting for seasonality patterns and restricting ourselves to the growing season from September 2007 to May 2008.

Table [4] combines the periods of violence and insecurity into one variable - weeks of violence in 2008 - and an interaction whether the locations of the firms were affected by violence ("Weeks of violence in 2008 & location affected").[14] Across all columns the estimated coefficients on $\widehat{\beta}$ show a negative, economically large and statistically significant effect of the violence on exports. While the coefficients are somewhat reduced as we saturate the model with fixed effects, the estimated effect of violence remains large and significant across all specifications. Column (1) reports results from a regression that includes week fixed effects and using only the growing season of 2007/2008. Column (2) also includes data from all 4 growing seasons and season fixed effects and corresponds to a "Triple-Difference" specification. Columns (3) and (4) add additional fixed effects. Column3 (3) includes firm specific fixed effects interacted with the growing season, and column 4 also allows for the seasonality to be different for different firms by including firm - week fixed effects. Column (4) includes both firm-season and firm-week effects. In other words, it allows each firm to have had a differential growth rate across seasons, as well as having a different seasonality pattern throughout the season (due, for instance, to different types of flowers under production).

Table [5] disaggregates the results again by weeks and contains our preferred specifications. By disaggregating into weeks we also account for the critique of Difference-in-Difference estimators in the presence of serially correlated regressors (see Bertrand et al. (2004) and Hansen (2007)). The top 6 coefficients (and standard errors) are estimates on week dummies for January and February 2008 interacted with whether the firm had experienced conflict during that week. The next 6 coefficients display the main effects on the week dummies for all firms within Kenya. As in Table [4] all

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[14]Note that we have two waves of violence. For areas suffering from the second wave of violence only, the violence interaction only takes a value of one during weeks 4, 5 and 6. We include dummies for post-violence periods, to take into account possible lasting effects.

specifications document the strong impact of violence on exports and the week pattern of violence is similar to Table [3]. Column (1) reports results from a regression that corresponds to a "Triple-Difference" specification. Column (2) in addition adds time-trend and a time-trend interacted with conflict location, so that there can be de facto a different change in the growth rate across the two areas. Columns (3) and (4) add additional fixed effects. Column (3) includes firm specific fixed effects interacted with the growing season, and Column (4) also allows for the seasonality to be different for different firms by including firm - week fixed effects. All specifications document the large impact of violence on flower exports, but the size and precision with which the estimates are measure in weeks 2 and 3 varies somewhat.

Heterogeneous impacts

Table [5B] presents heterogeneous results of the conflict by the size of the firm. Firms are ranked according to their size and a cutoff drawn at 30 (top 25%) [15] Here we collapse the weeks of violence into a single dummy again. We find that large firms are much better able to deal with the shock than are small firms.

Robustness checks

Figures 2 and 3 provide graphical views of the effects of the violence across the two regions, and are combined the graphical counterpart to the difference-in-difference regressions. Both figures plots the (smoothed) density of residuals from a regression of log export weight on firm fixed effects, week fixed effects and season fixed effects during the first six weeks of the year (the weeks of conflict). In Figure 2, the densities shown are from the conflict region, separately for the season of 07/08 and the other seasons combined. The fifth percentile line is based on residuals from the seasons before 07/08. We can clearly see that the density for season 07/08 residuals is shifted to the left in the conflict area and has two modes to the left of the 5th percentile line. Figure 3 provides some visual support that the two regions were not dissimilar in previous years, nor did the no-conflict area look substantially different from the conflict area. In this figure, there are three densities, the first being the density for the previous years from the conflict area that was also depicted in the previous graph. The second density (dash-dot) is the density of residuals for the previous seasons of the no-conflict area. The densities look remarkably similar. The last density is of residuals from the no-conflict area in 07/08 and is again remarkably similar to the other two densities.

A crucial assumption for the identification of the impact of violence is that there

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[15] The cutoff does not affect the conclusions of this table, nor for quite a range of cutoffs the statistical precision

are no spillovers between the conflict and the no-conflict areas. Spillovers could occur for two reasons: First, the producers in the conflict areas could also be affected by violence. Second, producers in the no-conflict areas could have produced *more* due to higher demand. The latter assumption seems quite innocent for the first week(s) of the conflict due to the lag between planting and harvesting flowers. While we cannot present conclusive evidence, the bottom six coefficients in Table [5] suggest that - compared to previous seasons and the demand patterns in September-December 2007 - firms in the no-conflict areas did not export significantly more *or less* during the first 6 weeks of 2008.

A second assumption we make is that conflict and no-conflict areas were comparable before the onset of violence during the period from September - December 2007. Table [6] shows that no differential pattern emerges between conflict and no-conflict areas in the weeks before the violence, a placebo type regression. This again suggests that our use of the no-violence areas as control regions for export volumes is justified.

Changes in Behaviour in the No-conflict areas

While we have argued that potential spillovers to the conflict areas seem minimal, and that in particular average export weight was not affected, the threat of violence certainly existed in the no-conflict areas as well. Table [7] shows how exports from the non-conflict region reacted along other dimensions. All columns use the specification of Column (2) in Table [4], and the regressands are the number of sales during the week (Column (1)), the number of days during which growers exported (Column (2)) and the average weight per sale (Column(3)). While the number of sales and the number of days during which growers in no-conflict areas exported went down in week 2, the average weight per sale went up. This suggests that exporters in non-conflict areas reacted to the increased insecurity by sending more secured shipments to the export airports less frequently. The firm-level survey also presents some evidence that growers perceived transportation as problematic during the period of violence (see discussion of mechanism section).

Medium-run differences

In the medium run, the assumption that there were no effect on the export volumes in the no-conflict region seems even less attractive. Yet, Column (1) of Table [8] ("Main Effects") shows that there are no no positive effects on the no-conflict areas, mitigating our worries of spillovers. Column (2) of Table [8] also shows that the conflict region was still affected between weeks 12 and 16, i.e. 3 months after the second wave of violence. In the next section, we argue that these medium -run differences are due to

the displacement of semi-skilled workers, that occurred as a result of the violence.

4.2 Further Mechanisms and Qualitative Discussion

This section discusses mechanisms through which the ethnic violence has affected the industry. It relies on further information gathered through extensive field visits and interviews with various players in the industry, including a survey of approximately eighty managers and/or owners of firms.[16]

First of all, from interviews with firms' managers as well as others stakeholders in the private and public sector alike, it emerged that the violence was an unanticipated event. Among surveyed firms, not a single respondent claimed to have anticipated the event. From the point of view of this study, this rules out the possibility that firms had anticipated the violence and had accordingly put in place extraordinary production or marketing measures before the onset of violence. While the temporal pattern in the spikes of violence, a first one around the New Year's eve and a second one a few weeks later, could suggest that at least the second episode of violence had been somewhat anticipated, this appeared not to be the case in practice. However it is possible that while not fully anticipated, growers in the region of the second violence were aware of the possibility of violence spilling over into their area. The lower results for the second spike of violence compared with the first do not conclusively speak to this, since we do not have good measures of the conflict intensity in the areas (and as we noted, the intensity of conflict in different locations is a highly controversial topic).

Second, there has been almost no reported episode of violence on, or purposefully directed towards, firms' premises. Apart from a relatively small firm that was assaulted and completely destroyed, other firms have not reported direct losses in assets due to the violence.[17] The main physical assets that could have been damaged by the violence, therefore, are the flower plants, one of the main assets owned by firms. For instance, workers absence induced [has caused] **a** higher incidence of pests and diseases in a few firms.

In the short-run, therefore, the violence has had a *differential impact* on the firms

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[16]The survey was conducted in the summer that followed the violence. From the face-to-face interviews we are confident that recall biases of the events during the period violence are unlikely to be a significant source of bias in the results that follow. The post-election violence is considered a "defining" moment for the Kenyan population, and respondents easily remembered the exact dates and the extent of the violence.

[17]In this particular case, the attack was perpetrated by organized groups of looters. The owner of the firm, whom we interviewed, belongs to an ethnic group that supported the opposition coalition but the firm was located in a area supporting the incumbent.

across regions primarily through the following channels: i) workers lost or absent, and ii) transportation problems (mostly for firms directly affected during the first spike of violence). Table [9] shows differences between conflict and no-conflict regions in the extent to which workers were absent during the conflict and to which respondents mentioned transportation problems.

Table [10] presents partial correlations on three other "outcomes" variables: losses in revenues, extra costs incurred due to the crisis and hiring of extra security.[18] It shows that firms in regions that were affected by the conflict report significantly higher losses in export revenues, incurred significantly higher costs, and were more likely to hire extra security.

5 Conclusions

This paper exploited cross-regional variation in the post-election violence in Kenya to identify the impact of conflict on exports of flowers. We find a large, negative and statistically significant effect of around 38% on flower exports of firms located in regions affected by violence. We also document that firms in no-conflict areas did change their behaviour although their total exports were not affected. As these two results show, conflict has direct and indirect impacts on firm behaviour and performance, ultimately leading to lower investment and growth.

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[18]This information is coded from the firm level survey. The other possible dimension in which firms might have tried to react to the crises was through increased usage of chemicals and fertilizers. It has not been possible to gather credible information on this for all surveyed firms.

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6 Data Appendix

This appendix provides information (supplementary to Section 4.1) on the various data sources used in this paper. The HCDA Annual Statistics for the period 1995-2007 are obtained from the Value of Flowers in the Export Statistics Report to produce Figure 2.[19] Firm transaction level data is obtained from HCDA. Each transaction invoice contains the following information: the name of the Kenyan exporter, the foreign consignee/client, the type of produce, the weight (kgs), the units, the unit value, the total value, the date, the destination, the currency, the agreement on freight (C&F, FOB) as well as the airway bill.

A firm level survey was desgined by the authors which covered i) general questions about the firm (history, farm certification, ownership structure, level of vertical integration, location of farms etc), ii) contractual relationships in export markets and marketing channels (direct wholesaler and/or auction houses), iii) firm production (covering detailed information on labor force, input use and assets), iv) post-election violence period (effect on operations, loss of workers by week, issues on transportation and air-freight, financial losses and extra-costs incurred). The survey was administrated and implemented by the two authors in July to September 2008.[20] The survey was administrated to the most senior person at the firm, which on most occasions was the owner himself/herself. Upon previous appointment, face-to-face interviews of one to two hours were conducted by the authors with the respondent. Of the 120 regular exporters in the industry, a representative sample of around eighty firms located in all producing regions of the country were surveyed.

From various different sources we obtain the location of the 120 regular exporters. We established contacts with the Horticultural Crops Development Authority (HCDA), Kenya Flower Council (KFC) and Kenya Private Sector Alliance (KEPSA) to assist us in obtaining the location of all the 120 regular exporters.[21] Further, the names of the directors of the firms are obtained from the Registrar of Companies at the Attorney General's Office.[22] These pieces of information allows us to classify the owner's nationality (Kenyan indigenous, Kenyan Indian or Foreign). For the firms which are under the ownership of Kenyan indigenous and Kenyan Indians, we map

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[19] See, for details http://www.hcda.or.ke.

[20] We are extremely grateful to The Steadman Group for assistance at various stages of the implementation.

[21] We grateful to various people at these organisations for helping our work.

[22] The first procedural step in starting a business (private and public) in Kenya is to register the company at the Registrar of Companies at the Attorney General's Chambers at *Sheria House* in Nairobi. For details see World Bank (2008). Database accessed on 15 September 2008.

out whether the owners are politically connected or not. In particular this data was assembled by taking a detailed look into the Member of Parliament's biographies for their Employment History/Business Interests, snowballing from interviews in the field, and various sources from the internet (e.g., The Kroll Investigative Report). Given the relatively small number of firms (120), it is widely known in the industry which firms are politically connected. For each firm we would check our information at least from three different sources for its the authencity.

To classify whether a location suffered conflict or not as mentioned we rely on the Kenya Red Cross Society's (KRCS) *Information Bulletin on the Electoral Violence.* The KRCS issued the bulletins in the early stages of the crisis daily and later on they were issued every 3/4 days till the end of the crisis.[23] The first information bulletin (no. 1 of 3 January 2008) also contained a map which outlined locations where unrest had occured. We further obtain access to various sources to supplement our understanding on both whether the location suffered conflict and when this took place. These are (i) *Disaster Desk* of the Data Exchange Platform for the Horn of Africa (DEPHA)[24], during the post election violence DEPHA provided maps with hot spots on where and when the violence had occured,[25] (ii) the open source project known as *Ushahidi,* was launched to gather information from the general public on events occuring in near-real time. The general public could on a map of Kenya pin up a town/area where conflict had erupted and when,[26] (iii) the Kenya National Commission on Human Rights Report (2008) which was intitiated by the Human Rights organisation itself (iv) Independent Review Commission Report (2008) which was initiated by the Government of Kenya to set up a commission into the post election violence. These sources are useful to make sure our approach is exhasutive and that smaller towns are not missed out. We use these reports to aid our understanding but are aware that there could be measurement error inherent due to their purpose.

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[23]See Kenya Red Cross Society (2008) for details.

[24]DEPHA's goal is to provide geographic information data and services to the region under the UN's OCHA.

[25]We obtain all the DEPHA maps from: `http://www.depha.org/Post_election_Violence.asp` (Accessed on 23 September 2008). Similiar information is also available from `http://www.reliefweb.int` which is also under the UN's OCHA.

[26]For details about *Ushahidi* see `http://www.ushahidi.com/about`. For the Kenya project see `http://legacy.ushahidi.com/` (accessed on 30 September 2008).

Figure 1: Cut Flower Exports from Kenya, 1995-2007

Source: HCDA Annual Statistics
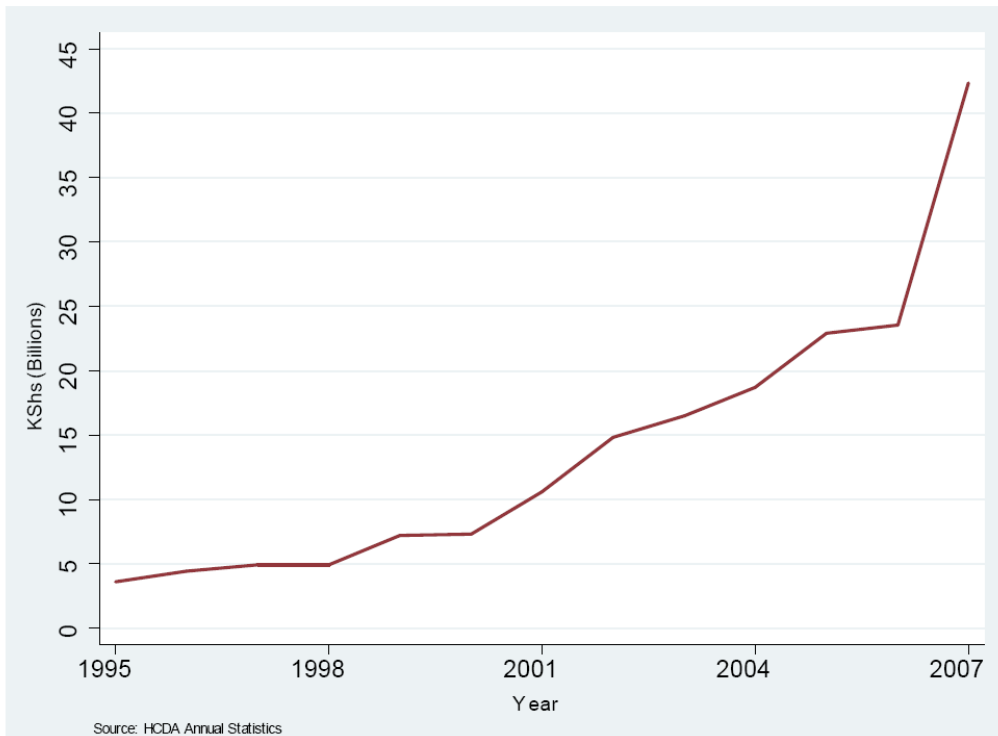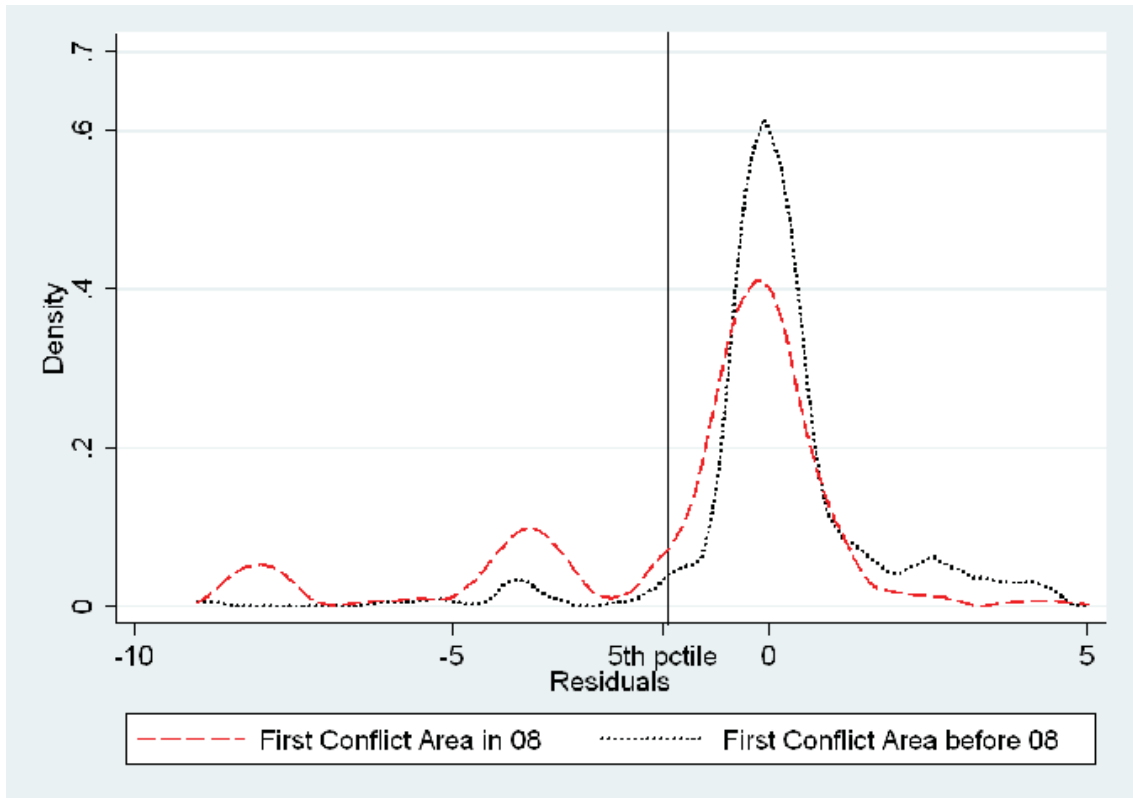
Figure 2: Density of residuals from a regression of log export weight on firm fixed effects, week fixed effects for only the first 6 weeks of the year. The dashed density is the smoothed density of the residuals for season 08 for the conflict area only. The dotted density combines residuals from the three years 05, 06, 07 for the conflict area only.

Figure 3: Density of residuals from a regression of log export weight on firm fixed effects, week fixed effects for only the first 6 weeks of the year. The dotted density combines residuals from the three years 05, 06, 07. The dash-dot line represents the density for the non-conflict area for years 05,06,07 combined. The line for the year 08 for the non-conflict area.

Table 1: Firms in Areas with and w/out Conflict

Panel A - Export Records

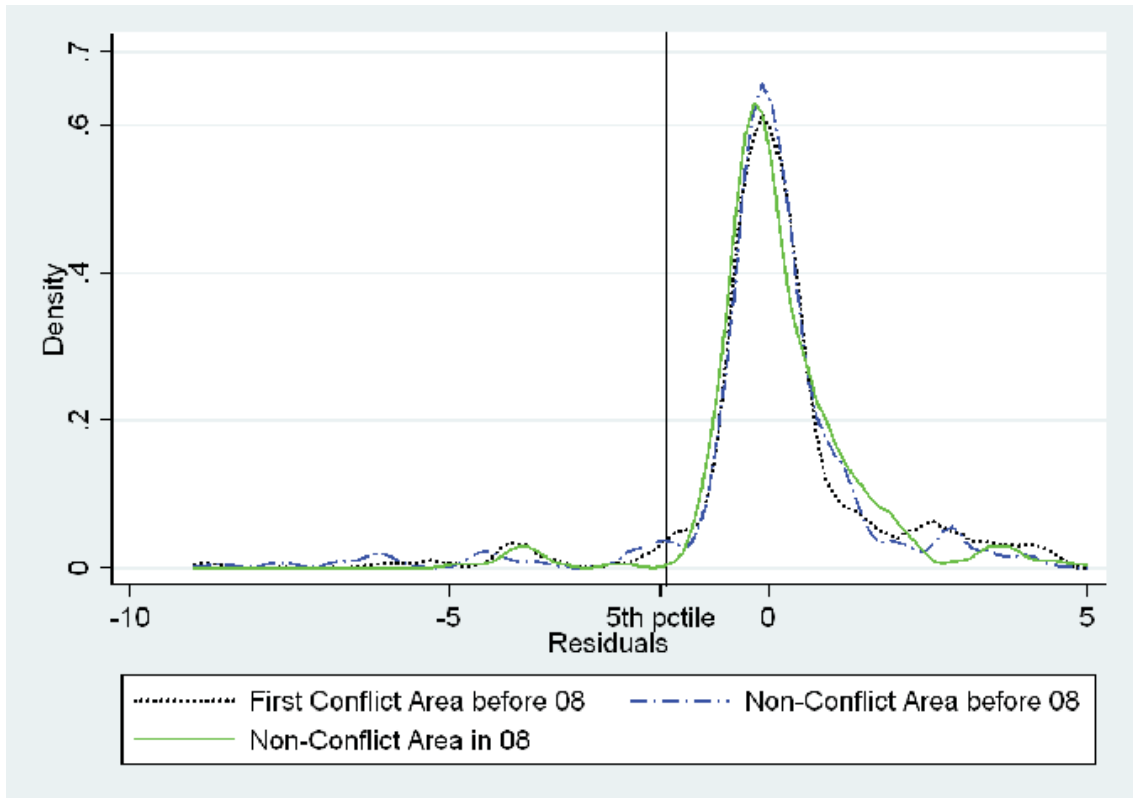| Variable	Observations	Mean in No-Conflict	St. Dev. No-conflict	Mean in Conflict	St. Dev. Conflict	p-value
Export, Jan+Feb 07, in Kg '000	107	90.5	[80.73]	104.6	[119.16]	0.24
% Production in Roses	107	0.662	[0.435]	0.591	[0.454]	0.2
% sold to Auctions	107	51.68	[35.00]	52.22	[35.44]	0.47

Panel B - Firm-level survey

Variable	Observations	Mean in No-Conflict	St. Dev. No-conflict	Mean in Conflict	St. Dev. Conflict	p-value
HA of Land	68	44.92	[26.28]	98.61	[398.04]	0.23
HA under Greenhouse	69	13.92	[12.73]	24.54	[20.17]	**0.08***
number of workers	74	480.83	[568.38]	479.18	[374.31]	0.49
Year of Firm creation	73	1997	[5.73]	1999	[4.81]	**0.10***
indian owner	111	0.25	[0.44]	0.22	[0.42]	0.36
kenyan owner	111	0.38	[0.49]	0.27	[0.45]	**0.10***
foreign owner	111	0.27	[0.45]	0.45	[0.50]	**0.02****
politically connected owner	111	0.27	[0.45]	0.19	[0.39]	0.15
% workers housed	73	11.2	[19.58]	11.21	[20.58]	0.5
KFC member	74	0.63	[0.49]	0.52	[0.51]	0.18
Fair Trade Certification	74	0.3	[0.47]	0.32	[0.47]	0.43
Number of Trucks	68	1.5	[1.24]	1.14	[1.48]	0.16

Note: ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. The Table tests differences in sample-means for firms in the regions affected by the violence and firms in regions unaffected by the violence. Information in Panel A comes from official trade statistics (Source: HCDA), information in Panel B from a survey conducted by the authors. Ownership information has been collected from various sources.

Table 2: Exports of Kenyan Flower Firms - Beginning of 2008

Dependent Variable = Log (1 + weekly exports of firm f [in kgs])	(1)
Week 1 of 2008	-0.400
	(0.229)*
Week 2 of 2008	-0.051
	(0.176)
Week 3 of 2008	-0.158
	(0.180)
Week 4 of 2008	-0.003
	(0.186)
Week 5 of 2008	-0.211
	(0.198)
Week 6 of 2008	-0.332
	(0.190)*
FIXED EFFECTS	
week	Yes
firm-season	Yes
Observations (firm-day)	15831
Adjusted R-squared	0.68
SAMPLE	
Excluding 4 largest firms	Yes

Notes: Results from a regression of log export weight on week dummies, firm-season dummies as well as dummies for the first weeks of 2008 (period of violence). ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust standard errors are reported in parenthesis.

Table 3: Difference-in-Difference Results (Season 4)

Dependent Variable = Log (1 + weekly exports of firm f [in kgs])	(1)
Week 1 of 2008 * Conflict	-2.238
	(0.693)***
Week 2 of 2008 * Conflict	-0.487
	(0.259)*
Week 3 of 2008 * Conflict	-0.622
	(0.220)***
Week 4 of 2008 * Conflict	-0.139
	(0.231)
Week 5 of 2008 * Conflict	-0.598
	(0.239)**
Week 6 of 2008 * Conflict	-0.399
	(0.233)*
FIXED EFFECTS	
week	Yes
firm	Yes
Observations (firm-day)	4321
Adjusted R-squared	0.81
SAMPLE	
Only Season 4	Yes

Notes: Results from a difference in difference regression within the season of 2007/2008. Log export weight regressed on week dummies, firm dummies as well as dummies for the first weeks of 2008 (period of violence) and first weeks of 2008 interacted with conflict location (latter coefficients are shown). Include a post-week 6 dummy, as well as a post-week 6 * conflict dummy. ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust standard errors are reported in parenthesis.

Table 4: Effects of Violence

Dependent Variable = Log (1 + weekly exports of firm f [in kgs])

	(1)	(2)	(3)	(4)
Weeks of violence in 2008 & location affected	-1.197	-0.986	-0.703	-0.606
	(0.295)***	(0.176)***	(0.145)***	(0.131)***
Weeks of violence in 2008	-0.193	0.160	0.053	0.020
	(0.174)	(0.091)*	(0.076)	(0.075)
FIXED EFFECTS				
week * conflict location	Yes	Yes	Yes	Yes
season	No	Yes	No	No
firm	Yes	Yes	Yes	Yes
firm-season	No	No	Yes	Yes
firm-week	No	No	No	Yes
SAMPLE				
Only Season 4	Yes	No	No	No
Observations (firm-day)	4321	15831	15831	15831
Adjusted R-squared	0.81	0.68	0.78	0.86

Notes: Weeks of violence takes on a value of one if week 1 - week 6 in 2008. Weeks of violence in 2008 & location affected takes on a value of one if and once the location has been affected by violence. Table reports various specifications. All specifications include a post-week 6 dummy, as well as a post-week 6 * conflict dummy. ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust standard errors are reported in parenthesis.

Table 5: Baseline Specification

Dependent Variable = Log (1 + weekly exports of firm f [in kgs])

	(1)	(2)	(3)	(4)
Week 1 of 2008 * conflict	-2.780	-2.751	-2.233	-2.220
	(0.720)***	(0.722)***	(0.700)***	(0.663)***
Week 2 of 2008 * conflict	-1.225	-1.195	-0.678	-0.702
	(0.495)**	(0.497)**	(0.270)**	(0.292)**
Week 3 of 2008 * conflict	-1.368	-1.336	-0.821	-0.707
	(0.486)***	(0.489)***	(0.247)***	(0.258)***
Week 4 of 2008 * conflict	-0.565	-0.491	-0.430	-0.359
	(0.359)	(0.373)	(0.290)	(0.275)
Week 5 of 2008 * conflict	-0.742	-0.665	-0.610	-0.490
	(0.379)**	(0.393)*	(0.305)**	(0.279)*
Week 6 of 2008 * conflict	-0.574	-0.493	-0.445	-0.425
	(0.360)	(0.376)	(0.283)	(0.249)*
Week 1 of 2008	0.103	0.105	0.015	0.022
	(0.190)	(0.191)	(0.168)	(0.166)
Week 2 of 2008	0.177	0.179	0.088	0.054
	(0.172)	(0.174)	(0.135)	(0.140)
Week 3 of 2008	0.096	0.099	0.009	-0.016
	(0.183)	(0.186)	(0.153)	(0.149)
Week 4 of 2008	0.300	0.271	0.234	0.229
	(0.232)	(0.238)	(0.177)	(0.179)
Week 5 of 2008	0.180	0.150	0.108	0.059
	(0.251)	(0.258)	(0.216)	(0.209)
Week 6 of 2008	-0.028	-0.059	-0.097	-0.118
	(0.204)	(0.213)	(0.179)	(0.163)
FIXED EFFECTS				
season	Yes	Yes	No	No
week of the year * conflict location	Yes	Yes	Yes	Yes
firm	Yes	Yes	No	No
firm * season	No	No	Yes	Yes
firm * week of season	No	No	No	Yes
time trend * conflict location	No	Yes	Yes	Yes
Observations (firm-day)	15831	15831	15831	15831
Adjusted R-squared	0.68	0.68	0.78	0.86

Notes: Table reports results from regressions of log weekly export weight on weeks of 2008 and weeks of 2008 interacted with the location being affected by conflict. All specifications include a post-week 6 dummy, as well as a post-week 6 * conflict dummy. ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust standard errors are reported in parenthesis.

Table 5B: Heterogeneous Impacts of the violence

Dependent Variable = Log (1 + weekly exports of firm f [in kgs])	(1)
Weeks of violence in 2008	0.080
	(0.052)
Weeks of violence in 2008 & location affected	-0.423
	(0.216)**
Weeks of violence in 2008 * small	0.095
	(0.128)
Weeks of violence in 2008 & location affected * small	**-0.719**
	(0.307)**
FIXED EFFECTS	
week * conflict location *large	Yes
firm	Yes
season *large	Yes
Observations (firm-day)	16146
Adjusted R-squared	0.68
SAMPLE	
Weekly Aggregated Data	Yes
Excluding 4 largest firms	Yes

Notes: Table presents the different impacts of the violence by large and small firms. Firms are defined as large if they rank among the 30 largest firms in export weight (according to their 06/07 exports). The fourth coefficient reports the result of the interaction. ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust standard errors are reported in parenthesis.

Table 6: Exports before January 2008, by conflict region (Placebo)

Dependent Variable = Log (1 + weekly exports of firm f [in kgs])	(1)
Week 46 *Conflict	-0.177
	(0.251)
Week 47 *Conflict	-0.128
	(0.275)
Week 48 *Conflict	-0.259
	(0.254)
Week 49 *Conflict	0.200
	(0.256)
Week 50 *Conflict	0.325
	(0.236)
Week 51 *Conflict	0.317
	(0.223)
Week 52 *Conflict	0.204
	(0.331)
Week 46	0.122
	(0.174)
Week 47	0.204
	(0.191)
Week 48	0.268
	(0.182)
Week 49	0.069
	(0.133)
Week 50	-0.091
	(0.142)
Week 51	-0.055
	(0.137)
Week 52	-0.403
	(0.277)
FIXED EFFECTS	
week * conflict location	Yes
time trend * conflict location	Yes
firm-season	Yes
Observations (firm-day)	15831
Adjusted R-squared	0.78
SAMPLE	
Weekly Aggregated Data	Yes
Excluding 4 largest firms	Yes

Notes: Table reports results from regressions of log weekly export weight on weeks in 2007 just before the onset of violence and these weeks interacted with the location being affected by conflict in a later period. ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust standard errors are reported in parenthesis.

Table 7: Changes in Export Behaviour in the No-Conflict Region

	#SALES/WEEK	#DAYS/WEEK	AVE. WEIGHT/SALE
	(1)	(2)	(3)
Week 1 of 2008	-0.689	-0.080	0.147
	(0.459)	(0.138)	(0.161)
Week 2 of 2008	-1.127	-0.278	0.259
	(0.422)***	(0.155)*	(0.142)*
Week 3 of 2008	-0.477	-0.034	0.111
	(0.506)	(0.141)	(0.153)
Week 4 of 2008	-1.031	0.341	0.291
	(0.944)	(0.193)*	(0.181)
Week 5 of 2008	-0.648	-0.080	0.250
	(0.705)	(0.167)	(0.220)
Week 6 of 2008	-1.073	-0.196	0.086
	(0.992)	(0.175)	(0.167)
Week 1 of 2008 * conflict	-3.878	-1.856	-1.997
	(1.223)***	(0.442)***	(0.632)***
Week 2 of 2008 * conflict	-0.290	-0.105	-1.043
	(1.102)	(0.352)	(0.384)***
Week 3 of 2008 * conflict	-1.057	-0.413	-1.069
	(1.182)	(0.338)	(0.374)***
Week 4 of 2008 * conflict	0.723	-0.438	-0.475
	(1.173)	(0.265)*	(0.293)
Week 5 of 2008 * conflict	-1.325	-0.557	-0.578
	(1.029)	(0.265)**	(0.318)*
Week 6 of 2008 * conflict	0.055	-0.197	-0.556
	(1.311)	(0.282)	(0.289)*
FIXED EFFECTS			
season	Yes	Yes	Yes
week of the year * conflict location	Yes	Yes	Yes
firm	Yes	Yes	Yes
firm * season	No	No	No
firm * week of season	No	No	No
time trend * conflict location	No	No	No
Observations (firm-day)	15831	15831	15831
Adjusted R-squared	0.01	0.68	0.86

Notes: Table reports results from regressions of Number of Sales during the week (Column(1)); Number of days during the week the firm exported (Column(2)); Average Weight per sale (Column(3)) on weeks in 2008 and these weeks interacted with the location being affected by conflict. ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust standard errors are reported in parenthesis.

Table 8: Exports in the medium term, by Region of Conflict

Dependent Variable = Log (1 + weekly exports of firm f [in kgs])	Main Effects	Interactions with Conflict Status
Week 1 of 2008	0.019	-2.234
	(0.168)	(0.701)***
Week 2 of 2008	0.094	-0.680
	(0.135)	(0.271)**
Week 3 of 2008	0.015	-0.823
	(0.154)	(0.247)***
Week 4 of 2008	0.243	-0.434
	(0.177)	(0.291)
Week 5 of 2008	0.119	-0.616
	(0.217)	(0.306)**
Week 6 of 2008	-0.085	-0.451
	(0.180)	(0.285)
Week 7 of 2008	-0.217	-0.185
	(0.222)	(0.293)
Week 8 of 2008	-0.289	0.023
	(0.202)	(0.292)
Week 9 of 2008	-0.330	-0.185
	(0.206)	(0.294)
Week 10 of 2008	-0.197	-0.007
	(0.197)	(0.274)
Week 11 of 2008	0.070	-0.356
	(0.144)	(0.232)
Week 12 of 2008	0.022	-0.492
	(0.176)	(0.260)*
Week 13 of 2008	-0.024	-0.521
	(0.162)	(0.243)**
Week 14 of 2008	-0.217	0.088
	(0.237)	(0.323)
Week 15 of 2008	-0.084	-0.662
	(0.239)	(0.348)*
Week 16 of 2008	0.088	-0.556
	(0.189)	(0.293)*
Week 17 of 2008	-0.092	-0.004
	(0.249)	(0.332)
Week 18 of 2008	0.084	-0.540
	(0.245)	(0.366)
Week 19 of 2008	-0.271	0.053
	(0.262)	(0.357)
Week 20 of 2008	-0.217	-0.080
	(0.236)	(0.355)
Week 21 of 2008	-0.068	-0.277
	(0.237)	(0.349)
FIXED EFFECTS		
week * conflict location	Yes	
firm season	Yes	
Observations (firm-day)	15831	
Adjusted R-squared	0.78	
SAMPLE		
Weekly Aggregated Data	Yes	
Excluding 4 largest firms	Yes	

Notes: Coefficients in column 1 and 2 are from the same regression. Column 2 contains the interactions with conflict status. Conflict status takes on a value of one after the onset of violence in that location and keeps that value thereafter. ***, **, * denote statistical significance at the 1, 5 and 10 percentage-level respectively. Robust Standard Errors in Parentheses.

Table 9: Workers lost and transportation difficulties

	% Workers Lost	% Firms facing challenges with transportation
Areas without Violence	1%	32%
Areas with Violence	38%	69%

Notes: Authors' own calculation based on a survey of firms in Kenya

Table 10 - Other differences between Conflict and No-conflict regions

Dependent Variable	Revenue loss (log)	Extra Costs (log)	Extra Security Hired
Areas with Violence	10.070***	7.653***	0.323***
	[1.375]	[1.529]	[0.094]
Observations	55	55	66

Table A1: Location of Firms

Province	Town	Conflict =1, Non-conflict=0
Central	Juja	0
Central	Kiambu	0
Central	Kikuyu	1
Central	Limuru	1
Central	Nyeri	0
Central	Thika	0
Eastern	Athi River	0
Eastern	Timau	0
Nairobi	Nairobi	0
Rift Valley	Elburgon	1
Rift Valley	Eldoret	1
Rift Valley	Kericho	1
Rift Valley	Kitale	1
Rift Valley	Naivasha	1
Rift Valley	Nakuru	1
Rift Valley	Nanyuki	0
Rift Valley	Nyahururu	0