

# Violence, Instability, and Trade: Evidence from Kenya's Cut Flower Sector

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**Summary.** — We examine the implications of the violence and instability following the 2007 Kenyan elections and how it affected cut flower trade between Kenya and the EU. Using the Rotterdam demand model, we find that the post-election violence had a negative impact on EU imports from Kenya equivalent to €33 million – which is significant given the importance of flowers to Kenya's economy. Results show that even a short period of violence can have an effect on trade since instability in an exporting country causes importers to source from other countries perceived as less risky (persisting even when order is restored).  
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## 1. INTRODUCTION

Violence stemming from election conflicts can have serious economic consequences. Electoral conflict and violence occurs through random or organized acts or threats to intimidate, physically harm, blackmail, or abuse a political stakeholder in seeking to determine, delay, or otherwise influence an electoral process (Fischer, 2002, p. 4). Violence affects 19–25% of elections in Africa (Bekoe, 2010). In recent years there have been episodes of electoral violence throughout the continent: Cote d'Ivoire (2000); Ethiopia (2005); Ghana (2008); Kenya (1991, 1993, 1997, 2007); Nigeria (2007, 2011); Republic of Congo (1993–94); Togo (2005); Uganda (2011); Zanzibar (2000); and Zimbabwe (2008). Often such violence is accompanied by instability (Neumayer, 2004).

While conflicts have been associated with lower per capita income and economic growth (Collier & Hoeffler, 2004), the conflicts and instability that follow can affect international trade as well. Although the trade literature mostly focuses on long-term conflicts such as civil wars, even brief periods of violence can result in increased uncertainty and can have negative impacts on trade. For example, when importers are risk averse, increased uncertainty and instability in a given country could decrease imports from that country and increase demand for identical or similar products from countries perceived as less risky (Wolak & Kolstad, 1991). Given the adjustment costs associated with importing (Amano & Wirjanto, 1997; Sawyer & Sprinkle, 1996), import demand from the unstable country may not quickly recover even when order is restored.<sup>1</sup> These barriers to trade can represent serious impediments to developing countries, many of which employ export-oriented strategies as a source of growth.

In this study, we examine the trade implications of the violence and instability following the 2007 Kenyan presidential election. Only days after the December 2007 Kenyan general elections, one of the most stable and prosperous economies in East Africa was in the midst of a political crisis and ethnic

conflict. The scale and rapid spread of the violence were largely unanticipated (Human Rights Watch, 2008; Klopp, 2008; Mkangi & Githaiga, 2012) and unprecedented (Anderson & Lochery, 2008). By the time a power-sharing agreement was negotiated (two months later), over a thousand people were killed, more than a half million people were displaced, and property worth billions of dollars was damaged (United Nations High Commissioner for Human Rights, 2008).

We address the following question in this paper: did the post-election violence and resulting instability affect one of Kenya's leading export sectors – the fresh cut flowers sector? This sector is the second largest foreign exchange earner, after tea (Kenya Ministry of Agriculture, 2010) and indirectly employs over 500,000 people (Kenya Flower Council, 2009). Fresh cut flowers are highly perishable, requiring a stable and effective supply chain (including a skilled and reliable work force) and an efficient transportation system; consequently this sector was particularly vulnerable during the outbreaks of violence that disrupted transportation networks and displaced workers.

The vast majority of Kenyan flowers are exported to the European Union (EU). We take a global perspective when assessing the impact of the post-election violence by modeling EU import demand from Kenya as well as other exporting sources. This approach allows us to take into account price differentials across exporting sources, as well as EU import expenditure allocation across sources. We use the Rotterdam model to estimate EU import demand for fresh cut flowers assuming a Armington (1969) framework (source heterogeneity)

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and a gradual switching regression procedure to test for structural breaks (Moschini & Meilke, 1989; Ohtani, Kakimoto, & Abe, 1990). We assume that EU cut flower imports are heterogeneous across exporting sources due to factors specific to the country of origin, incorporating elements of competition among exporting sources within a given destination market. We use monthly EU import data from January 2000 to March 2012. Roses are Kenya's most important flower export. During this period, Kenya, Ecuador, and Other East Africa (Ethiopia, Tanzania, and Uganda) accounted for over 80% of EU imports of roses on average; Kenya accounted for 52% and Ecuador and Other East Africa approximately split the remaining share. Kenya accounts for a much smaller share (less than 20%) of EU imports of other cut flowers (an aggregation of remaining varieties).

Our analysis reveals evidence of a structural change in the EU import growth rate for Kenyan roses following the post-election violence. Controlling for prices and total expenditures, the average rate of growth in EU imports of Kenyan roses was 3.2% before the violence, but decreased to 0% (statistically) thereafter. We find that, controlling for prices and total expenditures, the implications of the post-election violence and instability that followed are equivalent to a 17.2% tariff or a €33 million cumulative loss during the period 2008–11. Concerns about the violence, and more generally, overall insecurity may have triggered a fundamental shift in how EU firms view Kenyan flower producers vis-à-vis their competitors in other flower exporting countries.

Our study complements two recent microeconomic studies that analyze the impact of the post-election violence in Kenya on the behavior of flower exporting firms. Ksoll, Macchiavello, and Morjaria, (2009, 2010) find a 38% reduction in exports for firms in violence-affected areas relative to those in nonviolence-affected areas and a 50% increase in worker absence as a result of the violence. They also find that firms consolidated their shipments and exported less frequently during this period, most likely in reaction to higher security expenses. These analyses demonstrate an immediate and significant impact of the violence on the operations and the performance of exporting flower firms. Given the length and coverage of our data, we are able to take a longer-term perspective, accounting for trends in imports from Kenya and other major exporting countries and examining implications of the violence four years after it occurred.

Our study contributes to the literature on conflict and international trade. There are several channels by which conflict impacts international trade. Conflicts may lead to civil war, destruction of goods and capital, increases in insecurity and thus the costs of doing business, and increases in transportation costs (e.g., longer delivery times due to insecurity). For example, Glick and Taylor (2010) find large and persistent effects of war on bilateral trade. Anderton and Carter (2001) also find very strong evidence of declines in trade due to wars. Blomberg, Hess, and Orphanides (2004) and Blomberg and Hess (2006) find that conflicts (internal and external) have economically and statistically significant impacts on bilateral trade. They estimate that the presence of violence can be equivalent to as much as a 30% tariff.

Our study also contributes to the literature on the impact of insecurity and uncertainty on international trade. These factors can increase transaction costs between exporters and importers and thus reduce the incentives to create and maintain trading relationships, hindering international trade.<sup>2</sup> For example, Anderson and Marcouiller (2002) show that insecurity can serve as a hidden tax on trade, raising the price

of traded goods and placing certain countries at a comparative disadvantage.

The remainder of the paper proceeds as follows. In the next section we provide an overview of Kenya's fresh cut flower sector and we describe the post-election violence and the implications for the cut flower sector. In Section 3, we present the empirical model and data used to estimate EU demand for imported roses and other flowers. In Section 4, we describe the estimation procedure and present the results. In Section 5, we discuss potential explanations for and implications of our results. In the last section, we provide closing remarks.

## 2. BACKGROUND

### (a) Kenya's cut flower sector

Kenya is a major global supplier of cut flowers; the sector is estimated to employ approximately 50,000 to 60,000 people directly and over 500,000 people indirectly (Kenya Flower Council, 2009). Cut flowers, along with fruits and vegetables, make up Kenya's horticulture industry – one of the country's major foreign exchange earners (along with tea and tourism). Horticulture is one of the fastest growing sectors in the Kenyan economy, largely attributable to cut flower exports (Barrientos, Dolan, & Tallontire, 2003). Agriculture, more broadly, accounts for approximately one quarter of GDP and 60% of export earnings and is the source of livelihood for the majority of Kenyans (International Monetary Fund, 2010). Based on a large sample of countries, the World Bank estimates that GDP growth originating from the agriculture sector is twice as effective in reducing poverty as GDP growth originating outside the agriculture sector, underscoring the potential importance of agriculture for a developing country like Kenya (World Bank, 2007, p. 6).

The success of the cut flower sector is due to several key factors, namely, an ideal climate, good infrastructure, proximity to large import markets, and an enabling policy environment. The Government of Kenya has supported the industry by establishing intellectual property rights, enabling legislation, functional quality controls and other regulatory regimes, and market incentives for private enterprises to thrive.<sup>3</sup> Over 2,000 hectares of agricultural land in Kenya is used for cut flower cultivation. The major flower-growing areas are Naivasha, Thika, Limuru, Nairobi, and the Athi river plains in the west, and the Nakuru, Nanyuki, Mount Kenya region, and Eldoret in the north. Naivasha – located about 100 kilometers northwest of Nairobi – accounts for about 50% of the total land under cut flower cultivation, and about one-quarter of all flower exporters are located in the region. Additionally, the area is in close proximity to the Jomo Kenyatta International Airport and is linked by the Nairobi-Nakuru highway. Well-developed transportation networks are particularly important since fresh cut flowers are highly perishable.

There are over 150 flower producers in Kenya, many of which are medium to large scale commercial operations. In 2008, Ksoll *et al.* (2009) conducted a firm-level survey of over 100 exporter-producers. According to their data, there are about 120 established grower-exporters who export throughout most of the year, with substantial heterogeneity across firms with respect to key characteristics, such as acreage, ownership structure, and level of vertical integration.<sup>4</sup> Major investment over the past two decades and duty-free access to the EU has contributed to strong growth in the sector. Cut flower importers and retailers in the EU have established (largely unwritten) contractual relationships with Kenyan producers to ensure adequate

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