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THE IMPACT OF POLITICAL INSTABILITY ON EGYPT'S EXPORTS: EVIDENCE FROM FIRM-LEVEL AND GEO-LOCALIZED DATA[1]

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Abstract

Egyptian foreign trade figures have deteriorated abruptly after the 2008 global economic crisis, and then continued to go down since the Arab Spring and terrorism events after 2011. Such a deterioration affected firms' performance (in terms of the quantity and the value of exports as well as the number of exporters). Thus, using firm-level exports data at monthly levels merged with data on Arab Spring and terror events from the Armed Conflict Location & Event Data Project (ACLED) dataset (2005-2016), this paper examines the effect of political instability (measured by riots and terrorist events) on firm level performance to export. Our main findings show that the individual exports are negatively affected by different events. This effect is more pronounced for small firms followed by medium ones for both the quantities and the values of exports, though two to three times stronger for quantities. Egyptian exporters tend also to reallocate their exports from destination where they face a fiercer competition during period of political instability. Moreover, unit values experience an increase, notably for small and medium exporters, a result consistent with their probable capacity constraints during the turmoil.

الملخص

شهدت أرقام التجارة الخارجية المصرية تدهورا مفاجئا في أعقاب الأزمة الاقتصادية العالمية عام ٢٠٠٨، ثم واصلت تراجعها منذ أحداث الربيع العربي والأحداث الإرهابية بعد عام ٢٠١١. وقد أثّر هذا التدهور على أداء الشركات (من حيث كمية الصادرات وقيمتها وكذلك عدد المصدرين). وعليه، باستخدام البيانات الشهرية للصادرات على مستوى الشركات مع البيانات المتعلقة بالربيع العربي والأحداث الإرهابية المستمدة من مجموعة بيانات "مشروع بيانات مواقع النزاع المسلح" (٢٠٠٥-٢٠١٦) تبحث هذه الدراسة تأثير عدم الاستقرار السياسي (قياسا بأعمال الشغب والأحداث الإرهابية) على الأداء التصديري للشركات. وتشير نتائجنا الرئيسية إلى أن فرادى الصادرات تتأثر سلبا بأحداث مختلفة. وهذا التأثير أكثر وضوحا في حالة الشركات الصغيرة تليها الشركات المتوسطة بالنسبة لكميات الصادرات وقيمها، وإن كان أقوي ثلاثة أضعاف بالنسبة للكميات. ويميل المصدرون المصريون أيضا إلى إعادة تخصيص صادراتهم من المقصد الذي يواجهون فيه منافسة شرسة خلال فترة عدم الاستقرار السياسي. علاوة على ذلك، تشهد قيم الوحدات زيادة، لا سيما بالنسبة لصغار ومتوسطي المصدرين، وهي نتيجة تتسق مع القيود المحتملة على الطاقات أثناء الاضطرابات.

JEL Classification: F10, F12, F14, D74.

Keywords: Egypt, Exports, Revolution, Political Instability

1. INTRODUCTION

Egyptian foreign trade figures deteriorated abruptly after the 2008 global financial crisis, and continued to decline with the Arab Spring and its ramifications (Gates et al., 2010). Exports and imports with respect to GDP have declined by 15 to 25 percent since 2011. Reasons behind such deterioration include riots and other forms of violence, such as acts of terrorism that might have been responsible for Egypt's loss of competitiveness. Following the Armed Conflict Location & Event Data (ACLED) (Raleigh et al, 2010), a dataset that lists all violent events by date and type (riots/terrorism/other violence), Egypt experienced around 6,200 violent events since 2011, about 4500 of which are related to riots/protests.

This paper studies the extent to which conflicts and tensions in Egypt explain these dramatic losses in competitiveness during the period 2005-2016. In particular, the objective is to see how firms reacted to the events during the turmoil, in terms of volumes and values of firm exports on one hand and prices charged, on the other.

The Egyptian case is very interesting for several reasons. First, the period 2011 to 2014 witnessed many demonstrations and protests along with terrorist acts, the latter having extended to 2015. This constituted an important shock for Egypt, following that of the global financial crisis in 2008-2009. While the latter had hit the world economy, thus reducing world demand, the former was more localized in Egypt (and in some countries of the Middle East and North Africa (MENA) region). Nevertheless, during the same period, other shocks hit the Egyptian Economy like the Egyptian pound depreciation, violence in neighboring countries and the debt crisis in the European Union (EU). One way to identify more clearly the impact of the Egyptian Arab Spring and terrorist acts inside Egypt on the export performance of its firms is to consider events at the monthly level and match these with monthly export data of firms. More interestingly, in order to identify more closely the effect of our conflict variables, we draw on some further information about the potential location of firms across Egyptian governorates (through the World Enterprise Survey from the World bank). Together with the geo-localization of the events in the ACLED data, we could then build a measure of the potential exposure to monthly events faced by each of our firms in the firm-level dataset provided by the General Organization of Exports and Imports Control (GOEIC).

There is growing literature on the economic consequences of war and terrorist acts on international trade (see, for instance, Polachek, (1980), Blomberg and Hess (2006), Mirza and Verdier (2008, 2014), Anderson and Marcouiller (2002), Glick and Taylor (2010), Martin, Mayer and Thoenig (2008), Karam and Zaki (2016)). In these studies, the idea put forward is

that different types of conflicts may affect individual economic decisions by increasing both transaction costs on one hand and on the other hand, feelings of uncertainty, fear, and risk aversion.[5] An influential paper by Abadie and Gardeazabal (2003) found a sizable and long-lasting (equal to 10 percentage points) drop in the GDP of the Basque region due to the ETA related conflicts over the period 1968-2000, using as a counterfactual a synthetic control group drawn from other Spanish regions. An important share of the literature models wars and/or terrorism acts as provoking a reduction in productivity, or an increase in transaction costs as a natural channel through which economic activity might be affected. Another strand evokes uncertainty (Collier et al, 2003 and Goenner, 2004).

Yet, it is important to note that most of the work in the literature is undertaken on yearly based data (Mansfield and Pevehouse, 2000; Keshk et al, 2004 and Karam and Zaki, 2019). To the best of our knowledge, no work has been undertaken so far on the short-term effects of conflicts on the firm level trade of a developing country. Crucially, we want to see by how much high frequency conflicts are affecting developing countries' performance in the short run.

On the theory side, a firm being exposed to a revolution on one hand or terrorism acts on the other hand, is expected to experience a cut in its production capacities (cuts in factors of production: employment hours decrease together with more electricity and water cuts) and/or shipment capacities (army checkpoints, roadblocks by rioters, disorganization of seaports and airports, etc.). At given demand in foreign destinations, this should be increasing costs for the firms and, through higher induced prices, should reduce in turn quantities that are shipped to these destinations. This is why it is important to have access to quantities and prices in order to be able to identify these channels with our data.

Our main findings show that the intensive margin of trade is negatively affected by those events. This effect is more pronounced for small firms followed by medium ones for both the quantities and the values of exports, though stronger for quantities. Egyptian exporters tend also to reallocate their exports from destinations where they face fiercer competition during periods of political instability. Moreover, unit values experience an increase, notably for small and medium exporters. Big exporters, in turn, seem to gain exports from these events, possibly because they can overcome more easily the burden of the shock and thus could offer products that replace the undelivered ones by smaller firms. Another reason is that demand reductions in

[5] See Sandler and Enders, 2012 on issues linked to security related transaction costs and Becker and Rubinstein, 2011 for issues related to fear and risk aversion. In the same vein, Oneal and Russett (1999) and Polachek et al. (1999) examine the link between conflicts, interdependence and trade.

Egypt due to the events might incite big exporters to ship out of the country their unsold products where demand has not been affected *a priori*.

The paper is organized as follows. Section 2 reviews the literature. Section 3 presents some stylized facts. Section 4 explains the theoretical framework with the main model predictions. Section 5 is dedicated to the methodology and data. Section 6 presents the empirical findings and Section 7 concludes.

2. LITERATURE REVIEW

Economic consequences of conflicts, war and terrorism acts on international trade have been the focus of a growing body of literature (Barbieri, 1996 and 2002; Barbieri and Levy, 1999; Maoz, 2006 and Robst et al., 2006). Abadie and Gardeazabal (2003) investigate the economic effects of conflict, using the terrorist conflict in the Basque Country as a case study. They find that after the outbreak of terrorism in the late 1960s, the GDP per capita in the Basque Country declined about 10 percentage points relative to a control region that is not exposed to terrorism. In addition, using the 1998–1999 truce as a natural experiment, they find that stocks of firms with a significant part of their business in the Basque Country showed a positive relative performance when truce became credible, and a negative relative performance at the end of the cease-fire. In the same line, several papers examined the political determinants of international trade (see Pollins, 1989; Morrow et al., 1998 and 1999; Gartzke, et al., 2001 and Kinsella and Russett, 2002).

In their paper on the impact of war on trade, Anderton and Carter (2001) use an interrupted time-series model to study the impact of war on trade for 14 major power dyads. They find strong evidence that major power war is associated with a decline in trade relative to pre and postwar periods. They also investigate the impact of war on trade for 13 non-major power dyads. The evidence is weaker but, on balance, remains supportive of the trade disruption premise.

Blomberg and Hess (2004) investigate, in their paper on how much violence taxes trade, the empirical impact of violence as compared to other trade impediments on trade flows. Using a panel dataset with annual observations on 177 countries from 1968 to 1999, their analysis shows that, for a given country year, the presence of terrorism, as well as internal and external conflict is equivalent to as much as a 30 percent tariff on trade. Similarly, Martin, Mayer and Thoenig (2008) analyze theoretically and empirically the relationship between military

conflicts and trade. They show that the conception that trade promotes peace is only partially true. Even in a model where trade is economically beneficial, military conflicts reduce trade.

In the same line, Glick and Taylor (2010) investigate trade disruption and the economic impact of war on bilateral trade. Using the gravity model on available data extending back to 1870, they estimate the contemporaneous and lagged effects of wars on the trade of belligerent nations and neutrals, controlling for other determinants of trade as well as the possible effects of reverse causality. They find large and persistent impacts of wars on trade, on national income, and on global economic welfare. In addition, they also find costs associated with lost trade, which might be at least as large as the conventionally measured "direct" costs of war, such as lost human capital, illustrated by case studies of World War I and World War II.

In their paper on terrorism networks and trade, De Sousa, Mirza and Verdier (2014) study the impact of transnational terrorism diffusion, on security and trade. Setting up a simple theoretical model, they predict that the closer a country is to a source of terrorism, the higher the negative spillovers on its trade. Their research demonstrates that countries located far from terror could benefit from an increase in security by trading more. They find, first, a direct negative impact of transnational terrorism on trade; second, an indirect negative impact emanating from terrorism of neighbor countries; and third, that trade is increasing with remoteness to terror.

Marano et al. (2013) study the impact of interstate and intrastate conflict on trade. Relying on a pooled time-series cross-sectional dataset with observations for 134 countries from 1979 to 2000, their results show that intrastate conflict has a larger negative impact on trade than interstate conflict; conflict in the exporting country has a more negative impact on trade than conflict in the importing country; and, finally, conflict's destructive effects go beyond the borders of the countries that directly experience it, as trade flows are also negatively influenced by conflict in neighboring countries.

Makarin and Korovkin (2019) analyze Ukrainian trade transactions before and after the 2014 Russia-Ukraine conflict. In a difference-in-differences framework, they find that Ukrainian firms from districts with fewer ethnic Russians experienced a deeper decline in trade with Russia. This decline is economically significant, persistent, and explained by erosion of trust and the rise of local nationalism. Affected Ukrainian firms suffered a decrease in performance and diverted trade to other countries. Their results suggest that, through social effects, conflict can be economically damaging even away from conflict areas.

On Middle Eastern conflicts and their impact on trade, Karam and Zaki (2016) investigate the effects of wars on trade in the Middle East and North Africa (MENA) region. Using an augmented gravity model, they introduce a war variable and distinguish between different types of conflicts. Their results show that, in general, wars have a significantly negative impact on exports, imports and trade. Civil conflicts hinder exports, imports and trade significantly. Non-state conflicts have a detrimental effect on bilateral trade flows in manufacturing; however, no types of conflicts do affect trade in services. Finally, they find that, on an average country level, a conflict is equivalent to a tariff of 5 percent of the value of trade.

Against this background, this paper studies the extent to which conflicts and tensions in Egypt explain dramatic losses in export competitiveness during the period 2005-2016. We contribute to this literature in three ways. First, we present a simple theoretical model on trade and conflict. Second, we empirically test this model using trade monthly data to capture the short-term effects of terrorism on exports. Third, we disentangle the effect of political instability by exporters' size.

3. STYLIZED FACTS

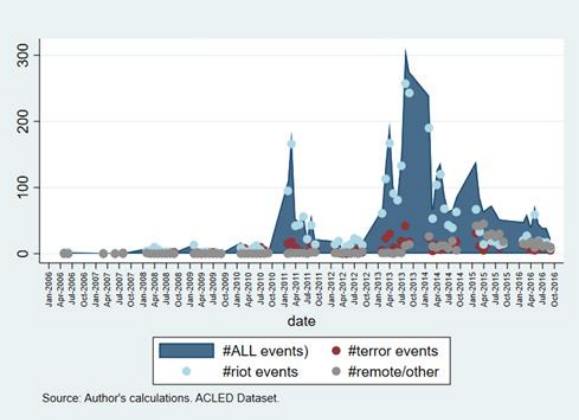
This section provides some stylized facts on the revolution episode and trade performance in Egypt. Figure 1 shows the surge of events in the wake of the political turmoil of 2011. Indeed, while most of these events were chiefly riots[6] (blue dots) followed by terrorism events[7] (red dots), they were concentrated in specific periods of time with the highest level after the ouster of the Islamist President Mohamed Morsi in June 2013. Other events[8] were more frequent but very limited in terms of their number (the gray dots in Figure 1).

[6] Riots (violent events where demonstrators or mobs engage in disruptive acts or disorganized acts of violence against property or people).

[7] Terrorism means violence against civilians, violent events where an organized armed group deliberately inflicts violence upon unarmed non-combatants).

[8] Other events include the following: *Demonstrations*: A public demonstration against a political entity, government institution, policy or group in which the participants are not violent; *strategic development*: accounts for often non-violent activity by conflict and other agents within the context of the war/dispute. Recruitment, looting and arrests are included; *battles*: Violent interactions between two organized armed groups; *explosions/remote violence*: One-sided violence events in which the tool for engaging in conflict creates asymmetry by taking away the ability of the target to respond.

Figure 1. Monthly Events



If we look at the fatalities associated with monthly riots (see Figure 2), one can notice that they were also concentrated during the Revolution of January 2011 (especially after the death of 74 individuals in a match in Port-Said in February 2012); during the anti-Morsi demonstrations that took place in the first half of 2013 and other clashes that took place in August 2013 (see Figure 3). Another important fact to notice and recall when reading our econometric work is that the number of monthly fatalities and that of monthly events are hardly correlated, except for some few events cited above. Another important feature of the data is that the number of monthly events vary much more than the number of fatalities. This is why the former seems then to be a better indicator of variations in tensions and political instability that would affect the activity of firms than the information that would be delivered by the number of fatalities.

Figure 2. Monthly Riots and Fatalities

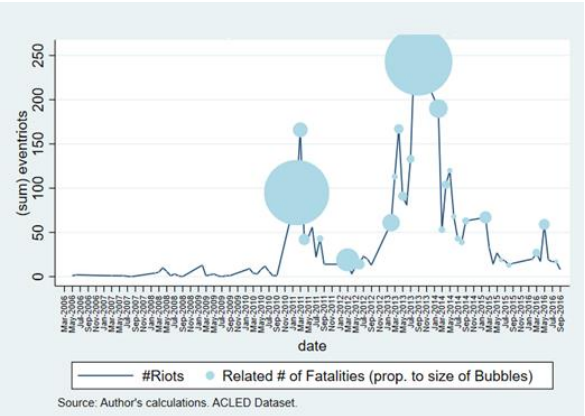
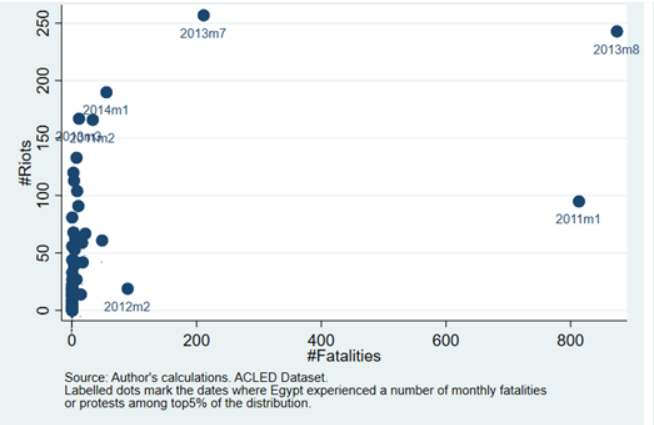
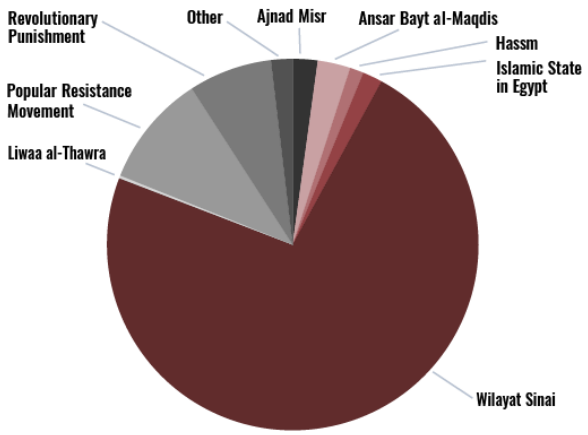


Figure 3. Number of Riots and Related Fatalities



As mentioned before, as attacks and assassinations occurred with greater regularity after the summer of 2013, so too did counter-terror operations across the country, especially in North Sinai. Moreover, while 50 percent of the attacks (around 1,343) have had claims of responsibility by established groups such as Ansar Bayt al-Maqdis (ABM) in North Sinai, Popular Resistance Movement and Revolutionary Punishment; or Hassm and Liwaa al-Thawra, the others took place in Wilayat Sinai as it is shown in Figure 4.

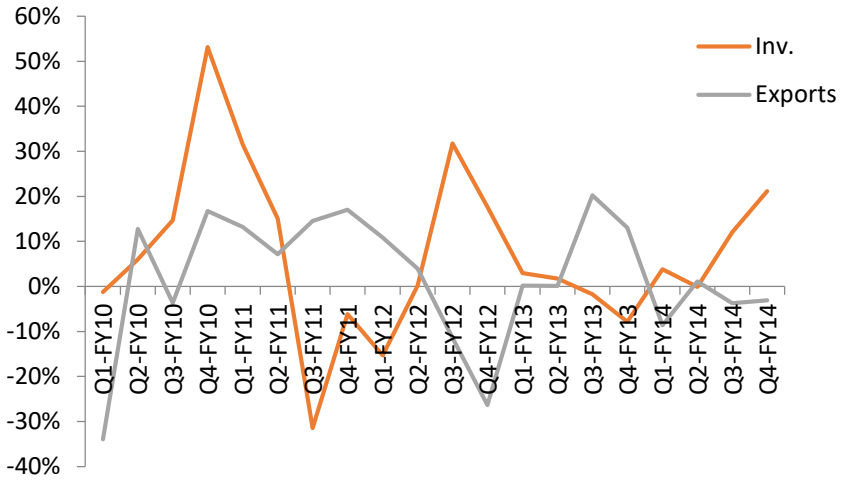
Figure 4. Attacks Claimed 2010 to 2018



Source: TIMEP, 2018.

All these events and the political instability implied by them exerted a negative effect on production, investments and exports. Indeed, starting the quarter of the 2011 Revolution (January-March 2011 – Q3FY11), the main macroeconomic aggregates affected by these developments were investment and exports. They declined significantly leading to very low growth rates with a significant decrease in exports in April-June 2012 and July-September 2013 (see Figure 5) with the surge of riots and other events.

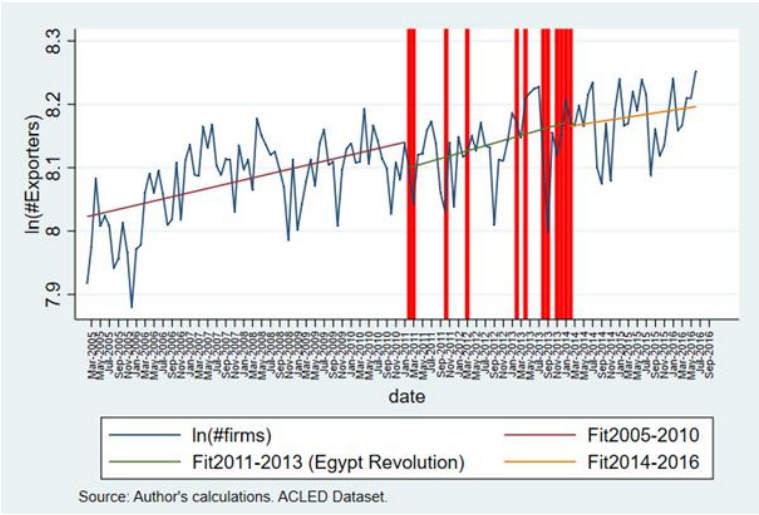
Figure 5. Growth Rates in Exports and Investment



Source: Constructed by the author using the Central Bank of Egypt datasets.

This negative effect at the macroeconomic level was reflected also at the firm level. In fact, Figure 6 shows that while the number of exporters has been volatile over the whole period, two structural breaks can be observed in 2011 and in 2014 leading to a shift downward of the linear tendency of exporters. This shows the extent to which the extensive margin of exports has been negatively impacted by political instability, in particular during periods where riots and events were remarkably intense (shown by the red lines).

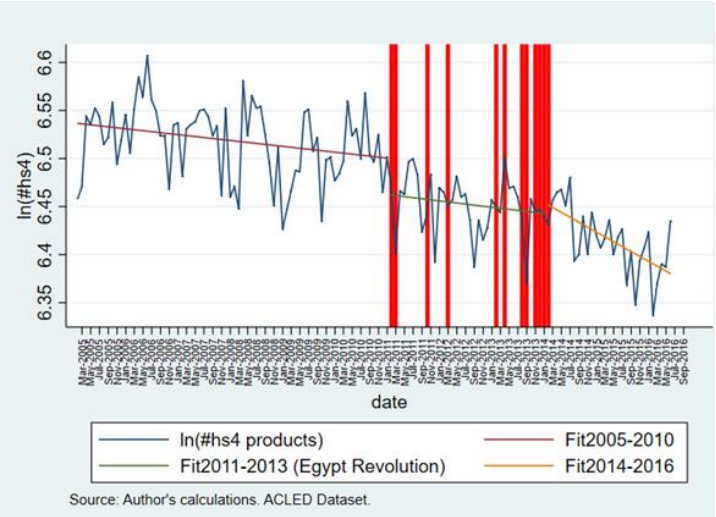
Figure 6. Number of Exporters and Events



At the product level, the declining linear trend is even more pronounced since, over the period 2005-2016, a rationalization of the number of HS4 products has been observed with a significant shift downwards starting 2011 and with a steeper declining slope starting 2014. The latter figure might have to do with factors that are external to Egypt (probably linked to the

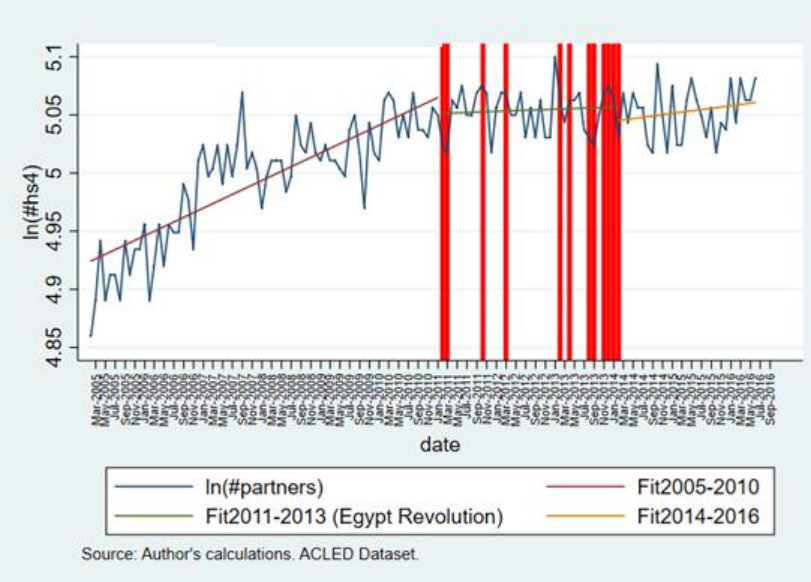
reduction of world demand and the slowdown of Asia's growth). In any case, this is consistent with the idea that, during difficult times, firms tend to focus on less products or the ones they master most as is shown in Figure 7. Meanwhile, severe troughs can be observed for periods with more riots and events as it is shown by the red line.

Figure 7. Number of Products and Events



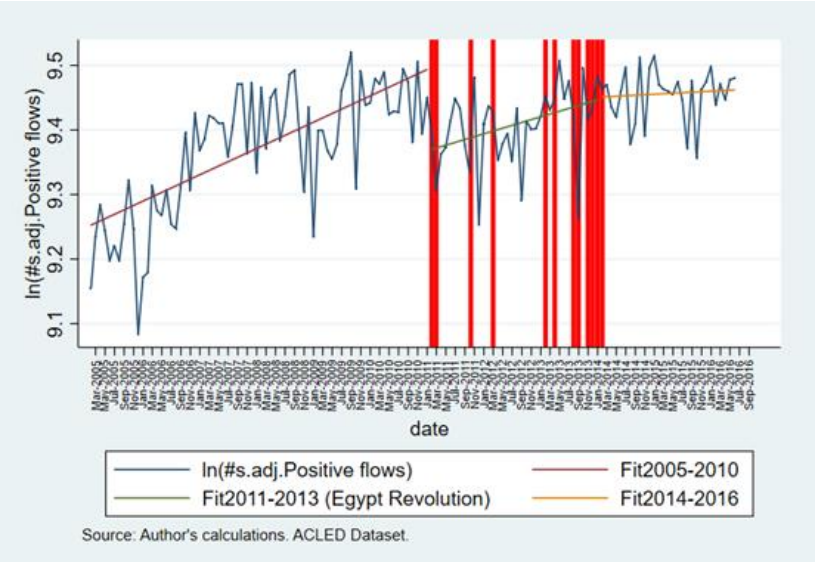
At the trade partners level, the rationalization effect was not observed. In fact, especially between 2005 and 2010, Egypt tended to diversify its markets by concluding different regional trade agreements and removing several non-tariff measures that affected both exports and imports. After the Revolution of 2011 onwards, the number of partners remained relatively stable despite a slight decline since 2014 (see Figure 8). Indeed, flows are reallocated across countries due to the degree of competition and competitiveness of exporters. Indeed, Egyptian exporters will avoid destinations with tougher competition since their competitiveness is partially eroded by political instability. The dynamics behind that will be shown later in proposition 2 of the theoretical framework.

Figure 8. Number of Partners and Events



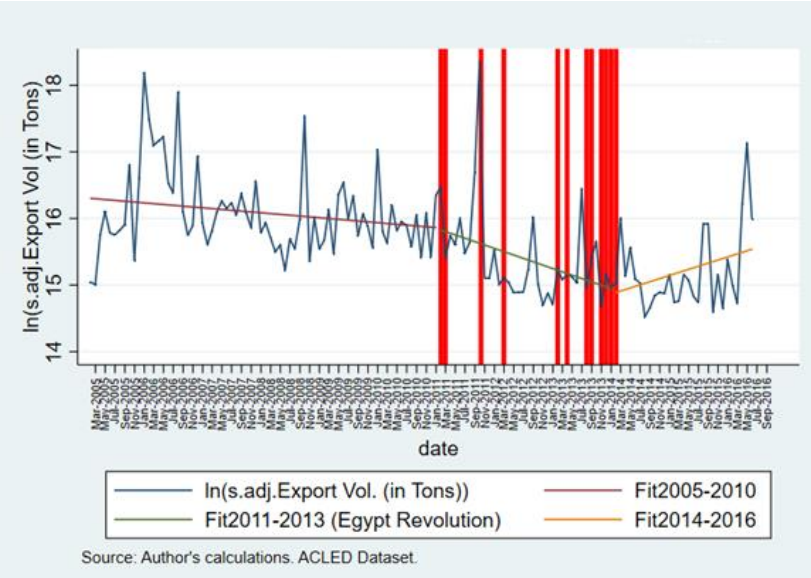
In the same vein, during the period of trade reforms (2005-2008), the total number of monthly business relationships between the Egyptian firms and the rest of the world (positive flows from GOEIC data) experienced a significant increase in tendency until 2010. Then, these flows decreased intensely with the Revolution of 2011 (as highlighted by the green fitted line) and started to increase modestly to stabilize from 2014 to 2016. Hence, political instability might have led to a decrease in positive flows because of higher uncertainty and higher transaction costs.

Figure 9. Number of Positive Flows and Events



When we analyze the evolution of total export volumes[9] (Figure 10) and values (Figure 11) at monthly dates, three main remarks are worthy of note. First, during the pre-revolution period (2005-2010), while volumes of exports remained relatively stable in tendency, values of exports were dramatically increasing *a priori* due to increase in prices of Egyptian exporters, themselves being influenced by macroeconomic inflation in Egypt and world markets at that time.

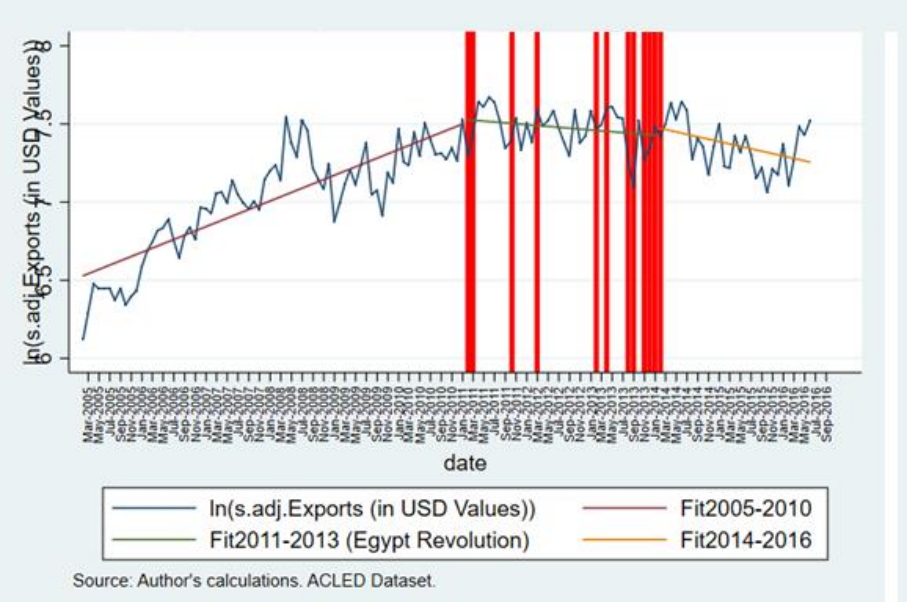
Figure 10. (Season and Specific Product-Adjusted) Export Volumes (in Tons) and Events



Yet, when political instability emerged in 2011, the downward trend of the volume of exports was strongly coupled with a decline in the values of exports but not at the same rate. At the firm level, this seems to indicate that export prices might not have been decreasing but rather increasing during the turmoil probably due to an induced increase in the costs of production or cost shipment. This might be also the result of a self-selection effect where a significant proportion of low-quality firms (low price firms) might have exited the market. In the last period, 2014-2016, these trends were rather reversed however, since export volumes increased marginally coupled with a slight decrease in export values.

[9] Total monthly volumes shown here are seasonally-adjusted (i.e., monthly-adjusted) and specific-product-adjusted (adjusted to the nature of products). This is realized through a prior regression where each exported flow in volumes at the firm, month and hs4 product levels is regressed on monthly and product fixed effects. The firm residuals of the volumes are then aggregated up to the monthly total. Of course, this is an imperfect measure of total volumes of exports, but we think that monthly changes in this total could give an idea about changes in the true volumes of Egyptian exports.

Figure 11. Season-Adjusted Export Flows (in Values, Truncated) and Events



In a nutshell, with the surge of riots and other events in Egypt, while exporters kept their relatively geographically diversified structure of their markets, they rationalized the products they export and exported less quantities. Moreover, the number of exporters happened also to be in decline.

4. THEORETICAL FRAMEWORK

In order to have a better idea of how the events experienced by the Egyptian economy druing the 2011-2014 turmoil might have been affecting the exports of the firms, we propose a simple set-up, based on the gravity (Anderson, 1979; McCallum, 1995; Feenstra et al, 2001; Feenstra, 2002; Evenett and Keller, 2002; Anderson and van Wincoop, 2003 and Santos Silva and Tenreyro, 2006) and firm-heterogeneity (Melitz, 2003) literature.

The revolts on one hand, and the terror related events on the other, might decrease the productivity of producers and transporters (alternatively increasing the hourly costs of production and transportation), especially in the locations where the conflictual environments were the most frequent and intense. The possible increase in the costs of production of a firm facing those events, might come from two sources: the events might disorganize firms' activity by probably increasing the movements of stop and go during the production process and increasing absence of working times of factors of production (employees might not show up to work at due times, working time of machines might also be altered). Thus, firms might face capacity constraints due to the events, all the more so when they are small. Big firms should be hit by the events too but they are expected to be more resilient. They can reorganize themselves

by shifting labour and capital across units of production and/or tasks helping them adjust better to the shock.

Besides, the events might slow down—if not impede—transportation of goods in some areas, due to insecurity in some areas maintained independantly either by rioters or by terror groups. In turn, transportation networks could be further affected by the setting of security measures by the authorities (checkpoints, and banning access to some roads and ports). Also, producers might not receive in time the raw materials or other intermediary inputs they needed to enable production of their goods. All in all, outputs produced and ready to serve the domestic and foreign markets might be limited either by production limitations or transport constraints. These additional costs of production and transport are expected to negatively affect exporters, but by how much?

Besides these induced costs, uncertrainty might curb exports. Uncertainty arises from both demand and the supply sides. On the supply side, Egyptian producers might be less willing to invest in the short term, which should be reducing exports in the medium term. As we study more what happens in the short run, this effect is beyond the scope of our work. We are more interested in this paper in the rise of uncertainty from the demand side. Because of an uncertainty climate, buyers (here foreign importers) might be less willing to import from Egyptian export suppliers. This is again all the more likely that suppliers are small, irrespective of the destination served. But, conditioning out for the size of the producers, exports to some destinations for some typical exporter might be more resilient than for others because of long standing networks and solidarity purposes. For instance, one would expect exports to Arab and Mediterranean countries to be more resilient than exports to faraway countries.

To treat these issues we begin by setting a simple set-up that aims is to empahasize the impact of the events on firm-level exports. We follow here a very simple trade model à la Melitz (2003) with firm heterogeneity. To make things simple and close to the standard theory, let us assume a distribution of N_i heterogenous firms in country i, where each firm f produces only one variety (also referred to as f) of a differentiated product, in a monopolistic competition set-up. The heterogeneity of firms is expressed here, as in Melitz, in terms of their respective abilities being discovered when each firm enters the market and after having paid a fixed cost, F.

Furthermore, in addition to a level of an *ex-ante* ability, expressed by a_{ft} that a given firm f discovers when it begins producing, we assume that it cannot control an additional parameter

linked to the business environment in which it produces. A particular event or set of events around a time t, expressed by a variable e_t in what follows, might then disrupt the business environment, changing consequently the ex-post cost of production of the firm. Thus we denote the ex-post costs of the firm when an event is experienced by $c_{ft} = c(a_{ft}, e_t)$. Besides, the events can also affect within (and at) the-border transportation costs that we can represent by $\tau_{ft} = \tau_f(e_t)$.

As in the traditional set-up, and in a monopolistic environment, profit maximizing firms charge a price to the final consumer in destination d (i.e. p_{dft}), that is directly proportional to unit costs involved to reach d, inflated by a mark-up μ_{ft}. These unit costs include costs of production, within-border transportation and beyond-the-border transport costs to final destination d, the latter being expressed by τ_{djt}. For f located in an exporting country, say o, its delivered price can be then expressed by the following:

$$p_{odft}(a_{oft}, e_{ot}) = \mu_{oft}\ c\left(c_{oft}, \tau_{oft}, \tau_{odjt}\right) = \mu_{oft} c\left[a_{oft}, e_{ot}, \tau_{odjt}\right] \qquad (1)$$

On the consumer side, let us assume a particular situation where consumers in the observed country of destination d are uncertain to get delivered the varieties of products they would like to purchase from a subset of countries, where they observe a fragile economic environment linked to political instability or conflicts escalation. These consusmers have traditional quasi-concave constant of elasticity of substitution (CES) preferences (consistent with risk-aversion in an uncertain environment) but where each subutility linked to a variety from some particular country is associated with a certain probability to get delivered the amount of varieties purchased. To make things tractable for the econometric part, and without loss of generality, we consider that each time consumers obtain information about a conflictual situation in one country they associate to the merchandize originating from the latter some probability θ_t strictly inferior to 1. This probability corresponds to the beliefs of the consumers of that country d about the likelihood they will get delivered the product. These beliefs are linked to a public and a private source information. Public source information comes from the information delivered by the media about the intensity of the conflicts in the country of origin at date t (summarized by e_t), while the private source delivers supplementary private information to buyers in d (summarized by I_{dt}). Thus $\theta_{dt} = \theta(e_t, I_{dt})$ and tends the more to be 0 the more intense the events happen to be, for a given level of private information. The consumers thus divide the countries of origin of their purchased products into 2 families: one group of secure countries S where products purchased from will be delivered with certainty and

another group of countries O from which the purchased products might not be delivered eventually. The CES function can be thus expressed in the following manner:

$$U_{dt} = (\sum_s \sum_{f_s} x_{sft}^{\frac{\sigma-1}{\sigma}} + \sum_o \sum_{f_o} \theta_{odt} x_{oft}^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}}$$

By updating discreetly their beliefs about the parameter θ_{odt} at each time period with respect to the events e_{ot} which take place in O countries and the private information I_{dt} they have, the consumers from d maximize the above utility function with respect to their budget constraint. From first order conditions, the obtained optimal value of demand for a certain variety delivered by a firm f from an unsafe country o to destination d is then:

$$x_{odft} = \left(\frac{p_{odft}}{\Phi_{dt}}\right)^{1-\sigma} . E_{dt} . \theta_{odt}^{\sigma} \qquad (2)$$

where x_{odft} represents the amount of exports from o to d by firm f at time t. The variable E_{dt} represents total expenditure of consumers from d on the product being observed. Φ_{dt} is an index of prices that apply in country d. It is expressed by $\Phi_{dt} = (\sum_o \sum_f \theta_{odt}^{\sigma} p_{odft}^{1-\sigma} + \sum_s \sum_f p_{sdft}^{1-\sigma})^{\frac{1}{1-\sigma}}$.

Then, one can emphasize further the role played by the events in Egypt on the performance of its exporters. Applying equation 2 to these exporters one obtains:

$$x_{dft}^{Egy} = \left(\frac{p_{dft}^{Egy}(a_{ft}, e_t, \tau_{djt})}{\Phi_{dt}}\right)^{1-\sigma} E_{dt} . \theta(e_t, I_{dt}^{Egy}) \qquad (3)$$

Equation 3 constitutes the basis of our econometric work. It has important features that allow to link the impact of the events in Egypt to the performance of its exporters into each destination. The first remark is that the events can affect supply via the supply capabilities of the firm or within border transportation. But those same events might have an effect on demand via a change in the perceived risk by consumers abroad. Second, what should matter for the performance of Egyptian firms in any destination market is relative prices $\frac{p_{dft}^{Egy}}{\Phi_{dt}}$, more than absolute prices *per se*. The price index Φ_{dt} which represents the average price in market d, depends upon all costs of production and transportation of all selling firms to d. In a destination market where the number of sellers is very high (high competition), the price index would be little affected by what happens in Egypt. However, in another destination where competition is relatively low, and the share of Egyptian exporters rather significant, the price index might be much more affected.

From equation 3, one can emphasize different predictions to be tested:

Prediction 1: The Egyptian events have a negative impact on the Egyptian firms in general (first order effect)

A shock of events in Egypt reduces exports, either through higher costs of production, higher costs of transportation (and internal security measures) or through a decrease in the likelihood of receiving the merchandize in due time by the consumers of destination d. This is all the more true for firms that are mostly exposed to the events (i.e., located near the events)

Prediction 2: The Egyptian events could reallocate flows across countries

The reallocation of flows across countries is due to two possible factors. The first is related to the degree of competition in each destination: in destination markets where competition faced by Egyptians is sufficiently high (due to competitors producing similar products), an increase in Egyptian costs due to the events will affect more the performance of Egyptian firms in those destinations compared to other destinations where competition faced by Egyptians is lower.

The second is related to the beliefs of the buyers in a destination about the degree of insecurity related to the shipping of mechandize from Egypt. If in some countries the negative effect of the events are expected to be compensated by some private sets of information suggesting that the mechandize shipment is being secured, exports from Egypt would be then less affected than one could expect.

Prediction 3: The Egyptian events should affect more smaller firms than bigger ones (reallocative effect across firms)

As already discussed in the introduction of this section, the additional fixed and variable costs induced by the events are likely to be better borne by the biggest exporters. Also, on the demand side, importers might well be more confident about the receiving of their goods when they deal with big exporters than when they deal with smaller ones. This should be the case in each of the destination markets considered. Further, through the relative price term, when hit by the same shock, big exporters might find themselves relatively more advantaged than small ones through a reduction *in their relative costs* compared to the latter competitors. In fact, as their costs tend to increase less than small exporters their relative prices compared to the small actors go down. Although faced by the same shock on costs, this then tends to make big Egyptian exporters export more during the events. Another way to identify the reallocative effect is to look at a possible differential impact in prices across the sizes of the firms. If small

firms experience a higher price increase due to higher costs induced by the events compared to bigger ones, this should be also consistent with a reallocative effect across firms.

5. METHODOLOGY AND DATA

5.1 Methodology

This section tries to test each of the three predictions above. In order to test for the **first prediction**, one needs to transform equation 3 in logs and consider a testable version consistent with it. To make things clearer, we have replaced the t subscript with a monthly date and yearly suscripts m and y. We further included an additional product dimension, h. We then propose to test the following equation:

$$ln\left(x_{dfm,h}^{Egy}\right) = a_{fy} + \beta.(\textbf{Events var})_{my,(h)} + \lambda_{dhy} + \lambda_m + u_{dftmh} \qquad (4)$$

where a_{fy} is a (year x firm) mixed effect which should capture the ability of the firm to export at time y (here we use a yearly effect instead of a monthly one to capture the yearly ability of the firm). λ_{dhy} is a mixed effect of (destination*product* year), supposed to capture all factors related to the destination market at year y (including demand and the yearly tendancy of the price index). λ_m is a (monthly)-seasonal effect.

The events variable (**Events var**) can take two alternative forms:

1. The first form we consider is the simplest one where **Events var** is directly linked to the total number of events experienced in Egypt over time (month-year frequencies). By using this simple form, we assume that all firms are being equally exposed to the events that are taking place in Egypt, in whichever location. However, because in many dates, especially before 2011, there were no events to be reported, considering logs would have eliminated all the observations where there were no events. We propose an alternative that is now becoming quite known in the literature, based on the Inverse Hyperbolic Sine (IHS) function imagined by Burbidge, Magee and Robb (1988). A version of the inverse hyperbolic sine function of any variable *x* is simply computed as $\ln(x + (x^2 + 1)^{0.5})$. We thus apply this function to the total monthly number of events experienced by the Egyptian economy and label it as **IHS-N.Event**s in the rest of our study.

2. Further, we consider an alternative variable that we shall call (expected)-Exposure to Events hereafter. This variable considers that firms are not equally exposed to events across governorates. In some governorates, events were much more intense than in others and

because sectors of activities are concentrated in few locations in Egypt (for instance, agriculture being more pronounced in governorates along the Nile while some manufacturing sectors being in or around big cities), we compute an exposure to events measure in the following manner:

$$\text{Exposure to events}_{my,s} = \sum_{g=1}^{G} w_{g,s}.\,\text{Events}_{g,my}$$

where $w_{g,s}$ expresses the weight of the region *g* in national production of sector *s*, and where the number of events variable is being computed at the level of the governorate at time *(m,y)*. Weights are computed from the 2008 Egypt's Enterprise survey dataset provided by the World Bank where Egyptian representative firms from all of the country are being surveyed. Information about the firms' belonging to a typical ISIC sector is also provided. To understand better the exposure to events variable, let us imagine that the firms from a typical sector s are located in 3 different sites or governorates, following the survey. Say, 60 percent are in Cairo, 30 percent in Alexandria and the remaining 10 percent in Sharkia. Besides, suppose that the number of events in Cairo, Alexandria and Sharkia in a typical date are respectively about 120, 25 and 5 provided by ACLED data, then the expected exposure to events by a firm producing a product *h*, that belongs to industry *s* would be equal to: (0.6*120) + (0.30*25) + (0.10*5)= 80. Notice in passing that the expected exposure to the events by this firm is necessarily smaller than the one given by the total number of events experienced by the coutry at the same date (130 events). Hence, unless all the events in one typical date are experienced in one location and the whole industry is concentrated in that location, applying the simple formula of the total number of events would overestimate the exposure of each firm to these events, ending up underestimating the impact of the events on exports. This is why we prefer to work on the Exposure to Events variable. Again, we apply the IHS function and label the new variable as **IHS-Exposure to Event**s in what follows.

In order to test **the second prediction,** we need to interact the number of events with a dummy identifying countries with some particular characteristics. We propose here to define four groups of countries (Arab countries, Med countries, Europe/North America and RoW). By so doing we expect to obtain some differences in the effects with respect to each group of countries. For instance, because of close resources and similar preferences, one might think that the degree of substitution is rather high between Egyptian products and similar goods produced

and sold in the Arab Gulf or around the Mediterranean. This makes consumers from these markets rather sensitive to an increase in prices proposed by Egyptian exporters.

On the other hand, one could think that because of the existence of high networks between these areas and Egypt, importers might give less weight to public (media) information on these events and more weight to private information. As private information in the business environment is more biased towards maintaining businesses despite the intensity of events, and for some even a willingness to increase business for solidarity reasons, one can think that Egyptian exporters to these areas might be, through such a channel, less harmed by the events than exporters to other regions. Hence, the net effect going through these two channels ends up being ambiguous. The way to test this is by running:

$$ln(x_{dfm,h}^{Egy}) = a_{fy} + \sum_G \beta_G . \textbf{Events vars}_{my,h} * G_{dh} + \lambda_{dhy} + \lambda_m + u_{dftmh} \qquad (5)$$

where G_d is a dummy representing each of the group partners (4 groups) and β_G being the impact on firm-level exports, that is specific to each of the groups.

The third prediction can be tested through another set of interactions. We can first define 3 size classes (top third of firms with the highest total exports to world, bottom third of firms with lowest exports and the remainig firms were classified under mid-size firms).[10] Then we group each third into a dummy class variable and run a regression while interacting with the number of events variable.

$$ln(x_{dfm,h}^{Egy}) = a_{fy} + \sum_Q \beta_Q . \textbf{Events vars}_{my,h} * Q_{dh} + \lambda_{dhy} + \lambda_m + u_{dftmh} \qquad (6)$$

where Q represents each of the 3 group of firms[11].

Since we are merging two datasets with different levels of aggregations, we clustered our errors by month and year.

5.2 Data

We have access already to data on conflicts and tensions in Egypt provided by the ACLED dataset. This data source delivers information about the exact date of an event, the exact geo-localization coordinates and the number of fatalities and/or injuries due to the event.

[10] We have opted for a classification based on total exports data between 2005 and 2010, because we did not want the classes we define to be endogenous to the events.

[11] Firms classification is done by using the HS4 code since we compare the size of companies that produce comparable goods. For the sake of robustness checks, we made other classifications based on values and we obtained very comparable results.

On the trade side, we use the data provided by GOEIC at the monthly level between 2005 and 2016. We already have access to yearly level data but we think that in order to identify clearly the effect of the events on trade flows, it is extremely important to coincide as much as possible the dates of the events with those of the date of registration of the flows being exported from Egypt. We have cross-checked the GOEIC data with the UN-Comtrade-CEPII data on trade, one of the most used to run gravity equations. After aggregating up the ECES data to destination-product and yearly levels, we could indeed find good correlation between both datasets, for quantities of exports expressed in tons (or ton equivalents) and for values of exports with correlations between both datasets around 0.90.

Nevertheless, for a high proportion of flows at the firm level in the GOEIC, we have noticed that many firm-level quantities were declared with positive figures while the corresponding values where registered as 0s (in the Egyptian currency and even more so, in dollars). To anticipate the questions by the readers about the consequence of this truncation, we have run systematically three series of regressions. First, one regression is based on the whole sample, around 1,300 million of observations. Here, all positive quantities in the GOEIC dataset are considered and the econometric model tries to look at the impact of the events on quantities at the finest level of observation (firm-product-destination-year and month of the year levels). Second, we run a similar specification but now to explain values of exports (expressed in thousands of US$) which, because of the truncation in values, is based on a smaller set of observations (around 300, 000 thousand). Lastly, we re-run the same regression on quantities but now based on exactly the same sample as that being used for export values. As one shall notice, some differences arise when comparing the results on quantities for the whole sample and those on quantities for the smaller sample. Nevertheless, in the last tables when we interact our events variables with the type of destinations on one hand and different classes of firms on the other the results based on quantities appear to be quite similar for the big and the small samples. In our opinion, the reader should weight more the results based on the whole sample in all the tables being shown. And in the last series of tables where interaction terms are being introduced, the results based on both samples for quantities (and the corresponding small sample on values) could be considered to be equally reliable.

6. EMPIRICAL FINDINGS

In Tables 1, 2 and 3, we take **prediction 1** to the test. Table 1 presents the results of the most basic specification where we examine the effect of events on individual exports (measured by

both the quantity and the value of exports). In this table, the variable based on the plain number of events is considered (**IHS-N.Event**s).

In all our specifications, we control for the nominal exchange rate (defined as the number of units of Egyptian pounds per dollar) to condition out the effect of exchange rate developments on exports. We actually think that changes in the exchange rates might be themselves endogenous to political instability (and the events). That being said, most if not all of our results in magnitude and signs are robust to the exclusion or inclusion of exchange rates.

Two empirical remarks are worth mentioning. First, we run our regressions with three sets of fixed effects. The first set includes the benchmark simple fixed effects (month, year, firm, product and destination) as shown in columns 1, 4 and 7 of Table 1. One can think that the firm effect captures the average productivity of the firm during the observed period, while the destination effect on exports controls for all gravity time invariant variables (distance, language, etc.). Columns 2, 5 and 8 combine both simple fixed effects (month and products) and interacted ones (firm x year and destination x year). Here, we control better for all variables that are specific to firms and destinations but that vary over time. One could think of firm changes in capability over time (firm productivity changes or quality of products changes of the firm). The destination x year fixed effect controls for all changes in transaction costs overtime across destinations faced by Egyptian firms (tariffs, transportation costs changes, but also macroeconomic changes in the destination country, etc.). The last set contains month fixed effects, along with (firm x year) and (destination x product x year) effects. We believe that the last set is the most consistent with the recent gravity literature and controls for several unobservables, including yearly average prices of observed products and changes in specific demand for these products at destination. While some regressions are run using the first two sets, we stick to the third set of fixed effects in most of the empirical analysis from Table 3 onward (see below).

Second, as already mentioned, columns 1 to 3 regarding quantities are based on the large sample, columns 4 to 6 regarding values are based on the smaller sample and columns 7 to 9 are based on the same small sample but now reporting against quantities.

As shown in Table 1, while the exchange rate is negatively associated with both the value and the quantity of exports (an increase in exchange means depreciation), events are in general

insignificant with different fixed effects and for both quantities and values.[12] Table A.1 in Appendix 1 decomposes events by distinguishing between riots and other events, but both remain in general insignificant.

In Table 2, we reproduce exactly the same specifications than those of Table 1, while replacing the plain number of events' variable by the Expected Exposure to Events variable (**IHS-Exposure to Events**). Interestingly, when using the whole sample (columns 1 to 3), the effect turns out to be negative and statitiscally significant on individual quantities being exported. However, the estimates on this new events variable is still small (about 0.07 in the most constrained specification (3). Note however, that when turning to values of exports in the smaller sample (col. 4 to 6 in Table 2), the impact turns now to be positive and statistically significant. Lastly, col. 7 to 9 provide non-robust estimates (mostly statistically insignificant). This counterintuitive result can be attributed to the fact that columns 4 to 9 cover the sample with reported positive values. This is why results are not robust and the number of observations is divided by three.

In Table 3, we introduce an interaction term to test for an additional effect of intense events (those most deadly months, where fatalities were ranked in top 10 percent of events). Columns 1 and 2 show the results for the plain number of events and exposure to events, respectively. While the estimates do not change compared to Tables 1 and 2, the interaction terms do not seem to appear with a statistically significant negative sign. Columns 3 and 4 produce the same types of specifications than 1 and 2 but by replacing the current event variables by the total events observed during the last three months. Only the Exposure to events appears to be negative and statistically significant with an estimate of around 0.01 but surprisingly the impact of exposures to intense events appear to be 0.003 smaller. It is only when we split the sample into events related to riots and the rest of the events that we observe an additional negative deviation effect from the mean estimate in Column 6 with exposure to riots. It is worthy to note, however, that exposure to other intense deadly events (terrorism or remote terror) does not appear with a negative sign. Surprisingly, they turn out to be positive for reasons we still do not understand.

All in all, even if the exposure to events measure appears to produce most results in line with Prediction 1, in particular when the whole sample on quantities is considered, the obtained

[12] The difference between columns 1-3 and 7-9 pertains to the number of observations included. While the former includes the full sample, the latter focuses on flows that have non-zero values.

estimates appear to be rather small (around -0.07 to -0.12). However, as we shall see in the next tables, these results seem to be hiding a composition effect across firms and countries. Besides, we shall also see that the obtained positive and rather surprising estimate on values hides a composition effect too.

In Table 4, we take **Prediction 2** to the test. We look at whether exports are being affected differently across groups of destinations. As already discussed, we have constituted four rather homogenous groups: Western economies (EU and US); the Arabian Gulf economies; the Mediterranean economies (North Africa, Turkey and Greece); the big Asian economies (China, Japan and India); and the rest of world sample. Syria, Iraq and Libya were taken out of the studied sample because of war that was going on in these countries during the same period. Table 4 presents the results. The first two columns are based on the whole sample (quantities). Column 1 reproduces the same constrained specification than in the prior tables, with a month, firm x year and destination x product x year fixed effects. Column 2 adds up an additionnal constraint, by adding a month x year fixed effect (instead of month fixed effect only). Actually one can undertake such a specification because the exposure to events variable at hand is varying not only with month and year but also across products (across industries to which the observed product belongs). Thus, in such specification we are asking what is the impact on exports of a firm which is presumably close to the events at a given date (month-year), compared to a firm observed the same date but that is not being as exposed (because it belongs to another industry). As one can see, the results do not differ between Columns 1 and 2 here where the impact appears to be quite different across types of countries: while the negative effect on exports to the West and Asia appears to be high (around -0.20 for Wetsern economies and -0.15 for Asia, it is still negative and statitically significant for Arab countries but rather small while positive and statistically significant for Med countries. This is consistent indeed with Prediction 2 whereby countries where competition is high for Egyptian products and where events produce high uncertainties (rich countries and big Asian countries probably) the negative impact on exports is significant.

Tables 5 and 6 present the results by accounting for differences in responses across size classes of firms (**Prediction 3**). We class firms into three size classes in terms of their total exports during the period 2005-2010. We then follow the performance of those three classes of firms overtime and study how their bilateral exports respond to Egyptain events.

Table 5 shows that smaller firms bear the main cost of political instability in terms of quantities but also values as presented in Columns 1 and 2. It is worthy to note that the effect

on quantity is almost three times stronger than that on value, suggesting that small firms adjust by rising their cost of production (prices) and selling less. Medium firms suffer also from the events for both values and quantities but to a lesser extent when compared to small ones. On othe other hand, we obtain a positive interaction between large firms and events. This result may be chiefly due to a substitution effect. Indeed, when small and medium firms (that represent around 95 perent of the total number of firms in Egypt) reduce their exports because of political instability, they are substituted by larger ones who increase their exports. Our results remain the same when we introduce a three-month lag of the events (in Columns 3 and 4), when we distinguish between riots and other events (in Columns 5 and 6), although for terrorism events the impact appears to be the highest on big firms rather than small ones. We have also run exactly the same regressions, by group of country sub-samples. We found the same effects: small firms are always hurt more than medium ones, which in turn are more affected than big firms.[13]

It is important to note from most of the results in Table 5 also that the effect on quantities is always stronger than on values; which means that prices are likely to increase the more we have an unstable political environment. This is confirmed by Table 6 that examines the effect of events on unit-values. Interestingly, the interaction between events and small firms is always positive and statistically significant (whether we introduce events only, with a lag or when we distinguish between riots and other events). The rationale behind it is as follows: more political instability affects the production capabilities of small firms since roads can be blocked affecting the likelihood of workers going to work. Hence, supply will decrease leading to a significant increase in prices (for a specific variety if it is monopolized by a certain producer). Yet, large exporting firms are not significantly affected by these developments since they can easily adapt to overcome the cost implied by such instability.

To sum up, our results show that political instability exerts a negative effect on exports, more on the quantity than the value of exports and more on small than large exporting firms.

[13] Results are available upon request.

Table 1. Impact of the Nb. of Egyptian Events on Firm-level Exports

	(1) Ln(Exp.Q)	(2) Ln(Exp.Q)	(3) Ln(Exp.Q)	(4) Ln(Exp.Val)	(5) Ln(Exp.Val)	(6) Ln(Exp.Val)	(7) Ln(Exp.Q)	(8) Ln(Exp.Q)	(9) Ln(Exp.Q)
Inv. Hyperbolic Sine **(IHS)-N.Events**	-0.005	-0.002	-0.004	-0.002	-0.005	-0.006	-0.006	-0.004	-0.009
	(0.007)	(0.008)	(0.011)	(0.003)	(0.004)	(0.004)	(0.009)	(0.008)	(0.011)
log of exch.rates	-0.368**	-0.496***	-0.545	-0.746***	-0.798***	-0.831***	-0.488**	-0.681***	-0.873**
	(0.181)	(0.189)	(0.307)	(0.105)	(0.127)	(0.259)	(0.205)	(0.207)	(0.395)
Observations	1279488	1266308	1215507	314147	308342	292164	314147	308342	292164
R^2	0.695	0.744	0.824	0.405	0.460	0.648	0.812	0.865	0.918
Month_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes			Yes			Yes		
Firm_FE	Yes			Yes			Yes		
Product_FE	Yes	Yes		Yes	Yes		Yes	Yes	
Destination_FE	Yes			Yes			Yes		
Firm x Year_FE		Yes	Yes		Yes	Yes		Yes	Yes
Dest x Year_FE		Yes			Yes			Yes	
Dest x Pdt x Year_FE			Yes			Yes			Yes
Cluster	Month-Yr	Month-Yr	Month-Yr	Month-Yr	Month-Yr	Month-Yr	Month-Yr	Month-Yr	Month-Yr

Columns 1 to 3 cover the whole sample (all reported quantities). Columns 4 to 9 cover the sample with reported positive values.

Standard errors in parentheses

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

Errors are clustered by month and year.

Table 2. Impact of Expected Exposure to Events on Firm-level Exports

	(1) Ln(Exp.Q)	(2) Ln(Exp.Q)	(3) Ln(Exp.Q)	(4) Ln(Exp.Val)	(5) Ln(Exp.Val)	(6) Ln(Exp.Val)	(7) Ln(Exp.Q)	(8) Ln(Exp.Q)	(9) Ln(Exp.Q)
(IHS)-Events Exposure	-0.082**	-0.036*	-0.070***	0.058***	0.062***	0.050***	0.005	0.047***	0.030
	(0.035)	(0.019)	(0.004)	(0.015)	(0.008)	(0.000)	(0.041)	(0.011)	(0.097)
log of exch.rates	-0.378***	-0.500**	-0.551*	-0.753***	-0.810***	-0.846***	-0.504***	-0.693**	-0.895**
	(0.021)	(0.210)	(0.285)	(0.180)	(0.218)	(0.266)	(0.112)	(0.295)	(0.360)
Observations	1279488	1266308	1215507	314147	308342	292164	314147	308342	292164
R^2	0.695	0.744	0.824	0.405	0.460	0.648	0.812	0.865	0.918
Month_FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes			Yes			Yes		
Firm_FE	Yes			Yes			Yes		
Product_FE	Yes	Yes		Yes	Yes		Yes	Yes	
Destination_FE	Yes			Yes			Yes		
Firm x Year_FE		Yes	Yes		Yes	Yes		Yes	Yes
Dest x Year_FE		Yes			Yes			Yes	
Dest x Pdt x Year_FE			Yes			Yes			Yes
Cluster	Month-Yr-Pdt	Month-Yr-Pdt	Month-Yr-Pdt	Month-Yr-Pdt	Month-Yr-Pdt	Month-Yr-Pdt	Month-Yr-Pdt	Month-Yr-Pdt	Month-Yr-Pdt

Columns 1 to 3 cover the whole sample (all reported quantities). Columns 4 to 9 cover the sample with reported positive values.

Standard errors in parentheses

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

Errors are clustered by month and year.

Table 3. Impact of Intense Events and 3 months Lagged Events on Firm-level Exports

	(1) Ln(Q)	(2) Ln(Q	(3) Ln(Q)	(4) Ln(Q)	(5) Ln(Q)	(6) Ln(Q)
Inv. Hyperbolic Sine (IHS)-N.Events	-0.006					
	(0.011)					
IHS-N.Events x High Fatal.	0.004*					
	(0.002)					
(IHS)-Events Exposure		-0.068***				
		(0.004)				
IHS-Events Exposure x High Fatal.		-0.007				
		(0.012)				
3months IHS-N.events			0.000			
			(0.005)			
3months IHS-N.Events x High Fatal.			0.002**			
			(0.001)			
3months IHS-Events Exposure				-0.108***		
				(0.011)		
3months IHS-Events Exposure x High Fatal.				0.032***		
				(0.003)		
3months IHS-N.Riots					0.008	
					(0.007)	
3 months IHS-N.Riots x High Fatal.					-0.005**	
					(0.002)	
3months IHS-N.Other events					0.002	
					(0.005)	
3months IHS-N.Other events x High Fatal.					-0.002	
					(0.002)	
3months IHS-Riots Exposure						-0.076***
						(0.020)
3 months IHS-Riots Exposure x High Fatal.						-0.055***
						(0.011)
3months IHS-Exposure Other events						0.010
						(0.009)
3months IHS-Expos. Oth. events x High Fatal.						0.132***
						(0.005)
log of exch.rates(N.Eg.curr.units/$)	-0.559	-0.738*	-0.034	-0.554*	-0.057	-0.546*
	(0.316)	(0.404)	(0.148)	(0.287)	(0.294)	(0.285)
Observations	1215507	824814	770921	1215323	770921	1215323
R^2	0.824	0.829	0.841	0.824	0.841	0.824
Month_FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm x Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Dest x Year_FE						
Dest x Pdt x Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Month-Yr	Month-Yr-Pdt	Month-Yr	Month-Yr-Pdt	Mo-Yr	Month-Yr-Pdt

Standard errors in parentheses

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

Errors are clustered by month and year .

Table 4. Heterogenous Effects across Destinations?

	(1) Ln(Q)	(2) Ln(Q)	(3) Ln(V)	(4) Ln(V)
IHS-Riots Exposure x Arab	-0.026***	-0.014***	0.124***	0.126***
	(0.002)	(0.002)	(0.030)	(0.004)
IHS-Riots Exposure x West.	-0.225***	-0.215***	-0.007*	-0.007***
	(0.013)	(0.003)	(0.004)	(0.001)
IHS-Riots Exposure x Big Asia	-0.159***	-0.146***	0.299***	0.286***
	(0.008)	(0.002)	(0.007)	(0.002)
IHS-Riots Exposure x Med.	0.038	0.054***	-0.010**	-0.005***
	(0.022)	(0.002)	(0.005)	(0.001)
IHS-Riots Exposure x RoW	-0.019	-0.009***	0.096***	0.098***
	(0.011)	(0.000)	(0.006)	(0.001)
log of exch.rates(Eg.curr.units/$)	-0.551*		-0.846***	
	(0.285)		(0.266)	
Observations	1215507	1215507	292164	292164
R^2	0.824	0.824	0.648	0.649
MonthFE	Yes		Yes	
Month x Year_FE		Yes		Yes
Firm x Year_FE	Yes	Yes	Yes	Yes
Destination x Year_FE	Yes	Yes	Yes	Yes

Standard errors in parentheses

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

Errors are clustered by month and year.

Table 5. Firm Heterogeneity Responses to Events

	(1) Ln(Q)	(2) Ln(V)	(3) Ln(Q),3m	(4) Ln(V),3m	(5) Ln(Q)	(6) Ln(V)
Small x Exposure to events	-0.574***	-0.150***				
	(0.083)	(0.032)				
Med x Exposure to events	-0.152***	-0.048*				
	(0.048)	(0.026)				
Big x Exposure to events	0.247***	0.107***				
	(0.044)	(0.023)				
Small x Exposure to 3m events			-0.244***	-0.060***		
			(0.038)	(0.016)		
Med x Exposure to 3m events			-0.067**	-0.019		
			(0.023)	(0.013)		
Big x Exposure to 3m events			0.122***	0.056***		
			(0.022)	(0.012)		
Small x eventriots					-0.626**	-0.240
					(0.213)	(0.139)
Med x eventriots					-0.113	-0.013
					(0.102)	(0.070)
Big x eventriots					0.367***	0.089***
					(0.053)	(0.025)
Small x eventterror					0.502	0.145
					(1.014)	(0.585)
Mid x eventterror					0.552	0.296
					(0.420)	(0.221)
Big x eventterror					-0.759***	-0.082
					(0.126)	(0.056)
Small x eventremote					-0.701	0.126
					(0.644)	(0.237)
Mid x eventremote					-0.749***	-0.434**
					(0.198)	(0.142)
Big x eventremote					0.290	0.254*
					(0.222)	(0.122)
Observations	696033	249058	695929	249017	696033	249058
R^2	0.839	0.652	0.839	0.652	0.839	0.652
Month x Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm x Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Destination x Pdt x Year_FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

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

Errors are clustered by month and year.

Table 6. Firm Heterogeneity, Events and Unit Values

	(1)	(2)	(3)	(4)	(5)
	Ln(UV)	Ln(UV),3m	Ln(UV)	Ln(UV)	Ln(UV)
SmallQ-Exp x (IHS)-N.Events	0.072***				
	(0.018)				
MidQ-Exp x(IHS)-N.Events	0.023***				
	(0.008)				
BigQ-Exp x (IHS)-N.Events	-0.011				
	(0.007)				
SmallQ-Expx 3M(IHS)-N.events		0.050***			
		(0.015)			
MidQ-Exp x 3M(IHS)-N.events		0.007			
		(0.006)			
BigQ-Exp x 3M(IHS)-N.events		-0.026***			
		(0.006)			
SmallQ-Exp x (IHS)-N.Riots			0.047*	0.062**	
			(0.027)	(0.025)	
MidQ-Exp x (IHS)-N.Riots			0.012	0.018**	
			(0.008)	(0.008)	
BigQ-Exp x (IHS)-N.Riots			0.001	0.002	
			(0.006)	(0.006)	
SmallQ-Expx (IHS)-N.Other events			0.025		
			(0.036)		
MidQ-Exp x (IHS)-N.Other events			0.011		
			(0.009)		
BigQ-Exp x (IHS)-N.Other events			-0.021***		
			(0.007)		
SmallQ-Exp x 3M(IHS)-N.Riots					-0.021
					(0.026)
MidQ-Exp x 3M(IHS)-N.Riots					0
					(0.009)
BigQ-Exp x 3M (IHS)-N.Riots					0.009
					(0.008)

SmallQ-Exp x 3M(IHS)-N.Other events					-0.027
					(0.030)
MidQ-Exp x 3M (IHS)-N.Other events					-0.033***
					(0.010)
BigQ-Exp x 3M (IHS)-N.Other events					0
					(0.010)
SmallQ-Exp x (IHS)-N.Terror acts				0.063*	
				(0.035)	
MidQ-Exp x (IHS)-N.Terror acts				0.005	
				(0.008)	
BigQ-Exp x (IHS)-N.Terror acts				-0.021***	
				(0.006)	
SmallQ-Exp x (IHS)-N.Remote events				-0.094***	
				(0.024)	
MidQ-Exp x (IHS)-N.Remote events				0.002	
				(0.007)	
BigQ-Exp x (IHS)-N.Remote events				0.003	
				(0.005)	
log of exch.rates(N.Eg.curr. Uni/$)	1.047***	0.700***	0.956***	0.916***	-1.207***
	-0.232	-0.245	-0.227	-0.226	-0.261
Obs.	289664	195278	289664	289664	195278
R-squared	0.945	0.959	0.945	0.945	0.673
MonthFE	Yes	Yes	Yes	Yes	Yes
FirmYearFE	Yes	Yes	Yes	Yes	Yes
DestinationPdtYearFE	Yes	Yes	Yes	Yes	Yes

Note: Standard errors in parentheses

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

Errors are clustered by month and year.

7. CONCLUSION

Using firm-level data merged with geo-localized data on terrorism events, this paper has three main contributions. First, it examines the effect of political instability on the intensive margin of exports. It also compares the effect of the different events on firms (by differentiating between small, medium and large firms) and on quantity and values of exports (to disentangle the price and quantity effects). Second, to capture short-term effects, as mentioned before, it relies on monthly data for both trade and events. Third, it merges two rich datasets. Regarding the firm-level trade data, one can take advantage of two dimensions in particular that are crucial for our identification: product-level information and the final destination of the good exported (or country of origin of the good imported).

Our main findings show that the intensive margin of trade is negatively affected by different events. This effect is more pronounced for small firms followed by medium ones for both the quantities and the values of exports, though stronger for quantities. Moreover, unit values experience an increase, notably for small and medium exporters. Egyptian exporters tend also to reallocate their exports from the destination where they face fiercer competition during periods of political instability.

From a policy standpoint, given the large trade costs of war, it is indispensable to see how conflicts can affect trade in general and particularly exporters in Egypt. This point is fundamental as policymakers in Egypt, through the new strategy of the Ministry of Trade and Industry, are currently aiming at increasing and upgrading exports. This cannot happen unless political stability is guaranteed. Second, since small and medium firms bear the cost of political instability, it is important to guarantee a more stable environment if the government is seeking SMEs promotion.

Our research agenda includes several points. First, armed with the likelihood locality of production of some of these importantly traded products, and thanks to information about the final destination of the product, we can re-trace the most likely route in Egypt these products have been taking, to reach the usual port of export to that destination. By doing so, we can then look at how the firms producing and exporting products (to which we could associate a place of production and a route), have been affected by the conflictual events in their locality and on the road to being shipped outside the country. Second, our results show political instability matters for the intensive margin of trade. To complete our analysis, we are planning to examine the effect of such instability on the extensive margin of exports (probability of entry and of exit

of firms). Indeed, any events might discourage exporters from entering the export market and can lead some existing exporters to leave it if they are facing more uncertainty.

Table A.1. Decomposing Events

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Ln(Exp.Q)	Ln(Exp.Q)	Ln(Exp.Q)	Ln(Exp.Val)	Ln(Exp.Val)	Ln(Exp.Val)	Ln(Exp.Q)	Ln(Exp.Q)	Ln(Exp.Q)
IHS-N.Riots	-0.006	-0.004	-0.004	0.000	-0.002	-0.003	-0.010**	-0.006	-0.011
	(0.006)	(0.006)	(0.008)	(0.003)	(0.003)	(0.002)	(0.005)	(0.006)	(0.007)
IHS-N. Other events	0.01	0.009	0.006	-0.002	-0.004	-0.002	0.039***	0.009	0.01
	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)	(0.006)	(0.010)	(0.007)	(0.010)
log of exch.rates(N.Eg.curr.units/$)	-0.341*	-0.464**	-0.513	-0.803***	-0.842***	-0.866***	-0.777***	-0.628***	-0.761*
	(0.177)	(0.186)	(0.293)	(0.096)	(0.112)	(0.244)	(0.090)	(0.191)	(0.354)
Observations	1420188	1406121	1342130	363765	357362	336747	363765	357362	336747
R-squared	0.687	0.734	0.821	0.423	0.474	0.668	0.808	0.859	0.916
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes			Yes			Yes		
Firm FE	Yes			Yes			Yes		
Product FE	Yes	Yes		Yes	Yes		Yes	Yes	
Destination FE	Yes			Yes			Yes		
Firm x Year FE		Yes	Yes		Yes	Yes		Yes	Yes
Destination x Year FE		Yes			Yes			Yes	
Destination x Pdt x Year FE			Yes			Yes			Yes

Note: Standard errors in parentheses

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

Errors are clustered by month and year

Table A2. Summary Statistics

Variable	Label	Obs	Mean	Std. Dev.	Min	Max
quantity	quantity in tons or ton-equivalents	758,610	18475.12	869102.5	0	5.98E+08
value_IMF	value in 1000s USD (converted into USD by IMF official monthly exch. rates)	758,600	.1808909	1.053978	0	136.7693
lnquantity	ln(quantity in tons or ton-equivalents)	725,643	4.476366	2.688749	0	20.20926
lnvalueD	ln(value in 1000s USD)	267,982	-1.28106	.8281305	-2.181242	4.918295
lnuv	ln(value/quantity)	267,573	-5.292188	2.547055	-19.11065	5.863631
lnex	ln(exchange rates Egy. Pounds vs Dollars)	758,610	1.808409	.1201091	1.669592	2.181242
events	Number of events	758,610	39.99979	58.72633	0	311
events3m	Number of events (last 3 months)	478,488	152.1455	173.3709	5	756
IHS_events	IHS_formula on number of total events	758,610	2.959583	2.005864	0	6.432943
IHS_events3m	IHS_formula on number of total events 3m	478,488	4.902118	1.430782	2.312438	7.321189
IHS_eventriots	IHS_formula on number of riot events	758,610	2.582441	1.971244	0	6.242227
IHS_eventrest	IHS_formula on number of rest of events (total - riots)	758,610	1.957621	1.557601	0	4.983654
IHS_eventteror	IHS_formula on number of terror only events	758,610	1.677578	1.336186	0	4.430958
IHS_eventremote	IHS_formula on number of only other remote events	758,610	.9897491	1.417531	0	4.499933
IHS_eventriots3m	IHS_formula on number of riot events, last 3m	478,488	4.41909	1.609166	1.443635	7.146773
IHS_evenrest3m	IHS_formula on number of est of events, last 3m (total-riots)	478,488	3.667354	1.242051	1.443635	5.863639
IHS_eventterror3m	IHS_formula on number of only terror events, last 3m	478,488	3.318087	1.057131	0.8813736	5.062635
IHS_eventremote3m	IHS_formula on number of only other remote events, last 3m	478,488	1.967726	1.852566	0	5.552975
w_events	Number of events	758,610	1.630135	.738878	0	65
w_events3m	Number of events (last 3 months)	478,488	7.259023	1.90689	0	207.0909
IHS_w_events	IHS_formula on number of total events	758,610	1.216819	.3235743	0	4.867594
IHS_w_eventriots	IHS_formula on number of riot events	758,610	.9972054	.3497466	0	4.665242
IHS_w_eventrest	IHS_formula on number of rest of events (total - riots)	758,610	.3684565	.0808374	0	3.231288
IHS_w_eventterror	IHS_formula on number of terror only events	758,610	.1589658	.0912262	0	3.084838
IHS_w_eventremote	IHS_formula on number of only other remote events	758,610	.2157074	.0625291	0	2.951945

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