The Economic Determinants of Political Violence: Evidence from the Occupied Palestinian Territories*

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Abstract

Do economic conditions matter for political violence? The existing empirical literature shows little evidence of a correlation between poor economic conditions and willingness to engage in political violence. Establishing a causal relationship between the two is problematic due to simultaneity and omitted variables bias. In this paper, we exploit the restrictions imposed by Israel on imports to the West Bank and the Gaza Strip as a quasi-experiment. Motivated by internal security considerations, Israel issued in 2008 a list of goods and materials subject to severe import restrictions, *de facto* banning a number of production inputs from entering the Occupied Palestinian Territories. We frame the issuance of such list as a negative exogenous shock to economic conditions, and implement an empirical strategy in two steps. In the first step, we show how restrictions in the accessibility of listed materials decreased firm performance and wages in those sectors which use those materials more intensively as production inputs. In the second step, we demonstrate that episodes of political violence were more likely to occur in those districts where the list had the largest negative effect in economic terms. To measure the incidence of political violence, we use attitudinal and behavioral outcomes, including the number of fatalities among Israeli civilians as well as the number of Palestinians in the custody of the Israeli Prison Service. Our paper contributes to the literature on the political economy of violence and economic sanctions.

Keywords: political violence, firms, economic sanctions, Palestine.

JEL Codes: D22, D24, F51, N45, O12.

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1 Introduction

Do economic conditions affect political violence? While prominent observers have often advocated increased economic and financial support to fight terrorism, a large body of empirical studies shows little evidence of a robust correlation between poor economic conditions and the occurrence of political violence (Krueger and Malecková 2003; Abadie 2006; Drakos and Gofas 2006; Piazza 2006; Krueger and Laitin 2008). As Krueger and Laitin (2008) note, "[w]hile poverty is an attractive answer to the question of "why terrorism?", the data do not lend much support for it." Aside from the conceptual complexity of the phenomenon, the problem is also an empirical one. Assessing the *causal* effect of economic conditions on political violence presents severe identification challenges. To put it in plain words, "the absence of a correlation [between poverty and terrorism] does not prove the absence of a causal relationship: simultaneity and omitted variables could render a correlation to be zero even in the presence of a causal relationship" (Krueger and Malecková 2003).

In this paper, we contribute to the literature on the relation between economic conditions and political violence using a micro-level analysis, which helps us to better identify the effect at play. In particular, we exploit the restrictions imposed by Israel on imports to the West Bank and the Gaza Strip as a quasi-experiment. For security reasons, Israel issued in 2008 a list of *dual-use* goods and materials subject to severe import restrictions, *de facto* banning a number of production inputs from entering the Occupied Palestinian Territories. We use the issuance of such list as an exogenous shock to economic conditions, and implement an empirical strategy in two steps. In the first step, we use the information pertaining to more than 30,000 firms in the years 1999 to 2012, and show how restrictions in the accessibility of markets for listed materials decreased firm performance. After the issuance of the list, those firms relying heavily on listed materials as production inputs experienced a differential drop in output value and wages. Importantly, the same industries operating in Gaza, which was affected by an overall blockade even before 2008, did not experience the same pattern of declining output and wages in the post-2008 period.

In the second step, we link worsening economic conditions to political violence. Our theoretical framework suggests that a decrease in wages reduces the opportunity cost of engaging in political violence, increasing its supply. Empirically, we exploit the fact that industries are not evenly spatially distributed within the Occupied Palestinian Territories. As such, there is a great deal of variation among district in terms of intensity in dual-use inputs, i.e. the list has heterogeneous effects across districts depending on their industrial composition. Armed with this exogenous source of variation, we implement reduced form analyses to explore the spatial pattern of political violence at the district level. Our identification strategy relies on the assumption that, in absence

of the list, the pattern of political violence would have been not systematically different across districts whose economies rely on dual-use inputs to different extents.

Using a battery of attitudinal and behavioral outcomes, our results point all in the same direction: political violence is more likely to occur in those districts where the dual-use list had the largest negative economic effect. Specifically, we show that support for Hamas and for attacks against Israeli civilians increase more in districts that are highly dependent on dual-use inputs with respect to the other districts. Similarly, we find that production intensity in dual-use inputs affects number of fatalities of Israeli civilians killed by Palestinians and number of Palestinian detainees in Israeli prisons. Importantly, these results hold only for the post-2008 period and only for the West Bank. On the contrary, we find no effect of the treatment on outcomes capturing political violence in Gaza.

Our paper speaks to different streams of research. First, our paper contributes to the vast literature exploring the effect of economic conditions on political violence. While several theoretical models link the state of the economy to terrorism (Bueno de Mesquita 2005, 2008; Rosendorff and Sandler 2010), the large majority of the empirical literature find weak or no correlation between poverty and terrorism (Russell and Miller 1983; Taylor 1988; Hudson 1999; Berrebi 2003; Atran 2003; Li and Schaub 2004; Krueger and Malecková 2003; Krueger and Laitin 2008). Relying on an exogenous economic shock allows us to demonstrate that previous empirical studies might have underestimated the impact of the opportunity cost on engaging in political violence. Our results are in line with recent micro-level studies arguing that poor economic conditions have an effect on the quality of terrorism (Benmelech, Berrebi, and Klor 2012) and that positive trade shocks reduce conflict (Calí and Miaari 2015).

More generally, our paper contributes to the literature on the relationship between income shocks and civil conflict. Cross-country evidence shows that income growth is associated with lower conflict incidence (Collier and Hoeffler 1998, 2004; Fearon and Laitin 2003; Miguel, Satyanath, and Sergenti 2004). Focusing on Sub-Saharan Africa, Brückner and Ciccone (2010) show that civil wars are more likely to start following downturns in the international price of countries' main export commodities. Evidence from within-country analyses also supports the hypothesis of a negative relationship between economic conditions and violence (Deininger 2003; Barron, Kaiser, and Pradhan 2004; Do and Iyer 2010). Focusing on Colombia, Dube and Vargas (2013) combine time-variation in international prices with cross-municipality variation in resource endowment to show that negative shocks to wages increase conflict at the local level.

Our paper also speaks to the literature of economic sanctions and their effectiveness. While seminal studies argue that economic sanctions are not effective policy instruments (Tsebelis 1990; Pape 1997, 1998), another body of literature claims that

sanctions can influence targets' behavior under identifiable conditions, e.g. endorsement from an international institution or when senders and targets do not anticipate frequent future conflicts (Drury 1998; Drezner 1999, 2000; Navin, Heinrich, Kobayashi, and Morgan 2013). Our findings point out important unintended consequences and negative externalities produced by economic sanctions. Indeed, we show that import restrictions have increased the probability of political violence in the fraction of the Palestinian population negatively affected by the economic sanctions imposed by the Israeli government.

Finally, our paper contributes to a large literature on the political and economic sources of conflict between Israel and the OPT. Several studies have analysed the economic determinants of violence during the Second Intifada. Sayre (2009) documents that deteriorating economic conditions are associated with more Palestinian suicide bombings against Israelis. Miaari, Zussman, and Zussman (2014) argue that the employment restriction for Palestinians working in Israel contributed to increase conflict intensity after the beginning of the Second Intifada. Calí, Miaari, and Fallah (2015) document that increases in the public (private) wage bill are associated with higher (lower) levels of conflict violence. Our paper contributes to this literature by exploring the economic determinants of the conflict *after* the end of the Second Intifada providing evidence of the economic effect of Israeli occupation on political violence in the OPT.

The remainder of the paper proceeds as follows. The next section provides background information on the Israeli-Palestinian conflict. The third section presents a simple theoretical framework linking economic conditions to political violence. The fourth section describes the data. The fifth section explains the empirical strategy. The fifth section reports the results of the empirical analysis. A last section concludes.

2 Political and Economic Context

The Israeli-Palestinian conflict In 1967, the Six-Day War ended with the Israeli occupation of the West Bank and the Gaza Strip, previously part of Jordan and Egypt respectively. The Israeli occupation continued for thirty years, leading to an increasing tension between the two parties. In 1987 erupted into an unarmed but violent and widespread Palestinian uprising. The so-called First Intifada ended in 1993, when the Oslo Accord created the Palestinian National Authority (PNA). The PNA was given the control over some domestic civilian matters (e.g. education, health and taxation). At the same time, Israel maintained control over strategic issues such as security, border controls and foreign trade between the Occupied Palestinian Territories (OPT) and Israel, Jordan and Egypt. The Olso Accord was followed by period of significant reduction in the number of violent episodes and also an increase in the degree of economic

integration between Israel and the OPT. This process ended in September 2000 with the beginning of the so-called Second Intifada. The Second Intifada (also called the Al-Aqsa Intifada) was been a period of significant violence between the occupying Israeli Defense Forces (IDF) and the Palestinians including Palestinian attacks in Israel and in the OPT, target assassination of Palestinians leaders in the OPT, demolitions of Palestinian houses by the IDF and IDF killings of Palestinians militants and civilians. In order to enhance security and control in the OPT during Second Intifada, the IDF also increased the intensity of the restrictions on the mobility of goods and people within the OPT as well as across the borders with Israel, Jordan and Egypt.

While there is no established ending date for the Second Intifada, violence decreased substantially after 2006. The 2006 elections caused a de facto division of OPT into a Fatah-controlled West Bank and a Hamas-controlled Gaza Strip. In retaliation to Hamas victory at the elections, Israel imposed a complete blockade on the Gaza Strip in 2007. Israel instead continued the occupation of the West Bank. Since then, the West Bank and the Gaza Strip have started to diverge in economic and political terms.

Economic (inter)dependence and the dual-use list The performance of the OPT economy has always been strictly dependent on the Israel one. Even after the Second Intifada, Israel has remained the main trade partner of the OPT, with around 70% of Palestinian imports coming from Israel. Also, almost 15% of Palestinian workers is commuting daily to his job in Israel. In fact, the very functioning of the OPT has depended on Israeli political and military decisions. Israel has been controlling several crucial aspects of the Palestinian economy from the collection of import duties to the issue of building permits.[1] Given this strict dependence, it is not surprising that security and military actions taken by Israel have had a large impact on the OPT economy. Previous studies have shown that security measures put in place by the IDF (such as border closures, internal mobility restrictions, increased controls for Palestinian imports and export at ports and borders) as well as the intensity of conflict have negative economic effects for the OPT (Calí and Miaari 2013; Di Maio and Nandi 2013; Amodio and Di Maio 2016; PALTRADE 2010).

Among these security-motivated measures adopted by the Israeli government, one particularity important is the imposition of the dual-use list on Palestinians firms. Dual-use goods are goods, services or technologies that can be used for both civilian and military applications and/or can contribute to the proliferation of Weapons of Mass Destruction (WMD). The trade of dual-use items is subject to controls to prevent the risks that these items may pose for international security. The controls derive from inter-

[1] The fact that Israel collects tax and customs revenues for the PA gives Israel a very strong political leverage because such revenues constitute 60% of the total PA budget. This implies that the PA administration is exposed to retaliation from Israel

national obligations (in particular UN Security Council Resolution 1540, the Chemical Weapons Convention and the Biological Weapons Convention) and are in line with commitments agreed upon in multilateral export control regimes.[2] Internationally, the control of the export, transit and brokering of dual-use items is a key instrument contributing to international peace and security and it is regulated by several international treaties.[3] As such, export of dual-use items is not prohibited in principle, but is subject to restrictive controls, generally in the form of a required licence.

While the dual-use list is agreed internationally, the list of dual-use items whose import to West Bank and Gaza is restricted is decided by Israel and is unusually extensive as compared with that of other countries (World Bank 2013).[4] It should also be noted that in any country in the world the dual-use list regulates export activities and is directed to domestic firms. In the case of the OPT, it is instead imposed by Israel as a form of import restriction motivated by internal security reasons since items included in the list are claimed to be possibly used in the development and production of military capabilities. Yet, the list includes chemicals, fertilizers, raw materials for industry, steel pipes, lathe and milling machines, optical equipment and navigation aides, and others. Anecdotal evidence indicates that the most of Palestinian industries are affected by the dual-use list, especially food and beverages, pharmaceuticals, textiles, information technology, agriculture and metal processing (World Bank 2013). While rigorous empirical evidence is lacking, it is expected that that these restrictions raise the cost of inputs, force Palestinian businesses to use inefficient input mixes and affect productivity and firm survival PALTRADE (2010).

While restrictions on import of some specific products have been in place for decades, their number have started to increase after the beginning of the Second Intifada. In 2007, the Ministry of Defense (MoD) granted the authority to Civil Administration of Judea and Samaria on this issue (TIDCA, 2011). Then, in 2008, as part of the new Defence Export Control Law, the final list was approved by MoD that includes 56 item which was then updated in 2009 (see Appendix A for the full list of items).[5]

The entry of the materials included in the dual-use list to be strictly monitored by the Trade and Industry Department of the Civil Administration (TIDCA). The control system requires Palestinian importers to obtain a license in order to import items in-

[2] http://ec.europa.eu/trade/import-and-export-rules/export-from-eu/dual-use-controls/

[3] Treaties that regulate the export of dual-use goods and technologies used to manufacture them are the Wassenaar Arrangement, The Australia Group, The Nuclear Suppliers Group, and the The Missile Technology Control Regime (MTCR).

[4] The dual-use list for Palestinian import does not apply to Israeli importers. In fact, while Israel is a large arm exporter and has some export controls on these products, officially it is not part of the Wassenaar Arrangement.

[5] The list of restricted dual-use goods below is excerpted from the Defense Export Control Order 2008 (Controlled Dual-Use Equipment Transferred to Areas under the Palestinian Authority Jurisdiction), last updated on 2 August, 2009. Defense Export Control Law, 5766-2007, October 2007, entering in force 31 December 2007

cluded in the dual-use list.[6] While formally the authorization can be obtained through an application process, the authorization is rarely obtained implying that, in effect, the goods are banned (ARIJ 2010).[7] Under this system, the process of handing out permissions must be repeated for every truckload of dual-use item, even for the same type of goods. According to the TIDCA, the average time to receive a license is minimum 4 weeks up to eight weeks. Each license lasts 21 days.[8]

3 Conceptual Framework

After having provided a brief historical background of the Israeli-OPT relations, we turn our attention to the theory driving our empirics. The logic behind our argument can be formalized using a simple conceptual framework. The fundamental idea is that negative economic shocks decrease the opportunity cost for individuals of engaging in political violence (Becker 1968; Grossman 1991; Bueno de Mesquita 2005, 2008; Rosendorff and Sandler 2010). Consider a continuum of individuals of overall mass 1. Each individual faces the choice of whether to engage in political violence or be formally employed. Such choice is captured by a binary choice variable $a_i = \{0, 1\}$, with $a_i = 1$ meaning engagement in political violence.

The payoff of individual i is given by

$$u_i = ba_i - \theta_i a_i - qa_i + (1 - a_i)w \tag{1}$$

where b represents the benefits from engaging in political violence. The cost of engaging in political violence has two components: q represents the part of those costs which is common to all individuals, while θ_i captures individual-specific costs associated with political violence, which we assume to be heterogenous in the population. Finally, w is the wage the individual can earn in the formal sector, which represents the opportunity cost of engaging in political violence.

Each individual i will decide to engage in political violence as long as the payoff

[6] Some other items are officially banned from import in both the West Bank and the Gaza Strip, such as glycerine and lathe machines (PALTRADE 2010).

[7] The Trade Facilitation Project (World Bank) identifies key problems that severely restrict the authorization process: 1) the list and scope of restricted dual-use goods has been increasing despite an environment of improved security; 2) lack of specificity regarding the items causes uncertainty and confusion; 3) no easy access to information on which are to be considered dual-use goods; 4) military orders do not explain the application process or establish timelines for processing applications, taking decisions and resolving disputes; 5) Exceptions Committee meets infrequently and with unclear timelines and there is limited staff at the Israeli civil administration to process applications.

[8] Trade and Industry in the West Bank: Inside the Trade and Industry Department (2011). The Civil Administration of Judea and Samaria, May

from doing so is higher than the one she would get as an employee, i.e.

$$b - \theta_i - q > w \tag{2}$$

It follows immediately that a decrease in the wage w will increase the chances that any given individual engages in political violence. The same holds for an increase in the benefits from action b, or a decrease in common q and individual-specific costs θ_i of engagement.

Let θ_i be distributed in the population according to a cumulative distribution function $F(\theta)$ over $[0, 1]$. Let $\tilde{\theta}$ be the individual who is indifferent between the two options. Setting the above as equality, we have

$$\tilde{\theta} = b - q - w \tag{3}$$

The fraction n_a of population engaging in (the supply of) political violence is therefore given by

$$n_a = F(b - q - w) \tag{4}$$

Such fraction increases with the benefits b, and decreases with the common cost q or the wage w.

Our very simple conceptual framework has two testable implications. First, a decrease in the wage w will increase the individual likelihood of engaging in political violence and the fraction of population who is willing to take action. Second, a decrease in the common cost of engagement q acts in the same direction.

4 Data and Measurement

4.1 Firm-level Data and Intensity in Dual-use Inputs

In our empirical analysis, we combine several different data sources. In the first part of the analysis, we study the impact of the dual-use list on the manufacturing sector in the OPT. For this purpose, we rely on the information provided in the Industry Survey. This is a yearly survey of a representative sample of Palestinian establishments in the manufacturing sector, designed and administered by the Palestinian Central Bureau of Statistics. Our sample counts 33,000 establishments surveyed in both West Bank and the Gaza Strip over the years 1999 to 2012. A new sample of establishments is drawn every year, preventing us from following the same firms over time. Nonetheless, the data provide information on the ISIC 4-digit sector of economic activity each establishment

belongs to.[9] We are thus able to aggregate the establishment-level data at the 4-digit sector and track the evolution of output, prices, and wages in each sector over time. Our final sample contains information on more than 100 manufacturing sectors over the years 1999 to 2012.

A crucial component of our empirical analysis is a measure capturing the extent to which each manufacturing sector relies on dual-use inputs in production. In order to rule out any concern about endogeneity, we take the US economy as benchmark, and compute such dual-use input intensity measure using the information available from the Bureau of Economic Analysis (BEA).

We start by identifying, for each product in the dual-use list, its corresponding 10-digit Foreign Trade Harmonized (HS) code. This is the finest product-level classification available in trade, allowing us to identify almost every item in the dual-use list as a separate 10-digit product. As a second step, we use BEA correspondence table and link the HS codes to the 2002 Input-Output Commodity (IO) codes. We can then turn to the Input-Output matrix, and calculate for each commodity i its intensity in dual-use inputs as

$$d_i = \sum_j \frac{b_j \, v_j}{v_j} \tag{5}$$

where v_j is the value of input j that is directly and indirectly required to deliver a dollar of the commodity i to final users. b_j is an indicator equal to one if any of the dual list items belongs to the input j commodity code. d_i is equal to the fraction of dual-use inputs used to deliver one dollar unit of commodity i: the higher is the value of dual-use inputs in production, the higher is d_i.

We then assign 4-digit codes to each commodity i, and finally calculate the intensity in dual-use inputs for sector s by taking the average of d_i within each 4-digit sector s, meaning

$$m_s = \frac{1}{n_s} \sum_{i \in s} d_{is} \tag{6}$$

where n_s is the number of commodities i delivered by sector s. The value of m_s is between 0 and 1 by construction. Table 2 shows a list of the bottom and top 10 sectors according to our measure of dual-use input intensity.

We expect the dual-use list to affect more those sectors which are more intensive in dual-use inputs, as captured by m_s. If this is the case, we also expect the list to have a heterogeneous impact across districts depending on their sectoral composition. We therefore combine the measure m_s of intensity in dual-use inputs at the sector level with information on the sectoral composition of each district in the OPT to derive a new

[9] This information is not available for the year 2011, so that we do not include establishments surveyed in that year in our final sample.

measure m_d of intensity at the district level. This credibly captures the extent to which the economy and employment of each district are dependent on dual-use inputs, thus informing the spatial distribution of the changes in economic conditions due to the list. Once again, we need to rule out the possibility that our measure is itself affected by the issuance of the dual-use list. As a benchmark, we consider the sectoral composition of districts in the OPT in 1999. This is the year prior to the beginning of the Second Intifada. The distribution of economic activity across sectors in that year is therefore arguably exogenous to the conflict that followed, and the issuance of the dual-use list nine years later.

We derive the sectoral composition of each district using a confidential version of the Industry Survey dataset, which contains information on the district of location of each establishment.[10] We calculate our district-level measure of intensity in dual-use inputs as

$$m_d = \sum_s \frac{L_s^d \, m_s}{L^d} \tag{7}$$

where L^d is the total number of workers in district d in 1999, and L_s^d is the number of workers operating in sector s in the same district in the same year. m_s is our previously derived measure of intensity in dual-use inputs at the sector level. Given the the latter, m_d is higher if a higher share of workers in district d was employed in 1999 in those sectors which are more intensive in dual-use inputs. The measure credibly captures the extent to which employment in district d is dependent on dual-use inputs.

It is worth highlighting here that the measures of intensity in dual-use inputs we derived at the sector (m_s) and district (m_d) level are time-invariant: they are calculated using the US and the OPT in 1999 as benchmark economies, and thus do not vary over time. This allows us to rule out from the start any concern that variation in these measures is itself informed by the issuance of the list. Figure 1 shows the geographical distribution of the intensity in dual-use inputs at the district level.

Figure 1 about here

4.2 Individual-level Data

To assess attitude towards political violence, we first rely on individual-level data. In particular, we focus on variables capturing support for Hamas political party and support for attacks perpetrated by Palestinians against Israeli civilians in Israel. Data

[10] In order to preserve anonymity, such confidential version provides the ISIC 2-digit sector of activity instead of the ISIC 4-digit sector. We use the standard version of the data to calculate an employment-weighted measure m_s of intensity in dual-use inputs of each 2-digit sector.

come from the Palestinian Center for Policy and Survey Research (PSR).[11] We use waves between 2001 and 2011. The number of respondents is about 1,300 each year and represents a random sample of the Palestinian population. Respondents change from one year to another and we are therefore unable to follow the same individuals over time. However, we take advantage of the fact that some questions are included in all waves. In particular, we focus on two questions:

1. Which of the following political parties do you support? (Listing 13 political parties)

2. Concerning armed attacks against Israeli civilians inside Israel, I (1) certainly support, (2) support, (3) oppose, (4) certainly oppose.

We code our first outcome variable *Hamas* one if respondents support Hamas as their main political party and zero otherwise. About 20 percent of the respondents support Hamas in our sample. This percentage has increased between 2002 and 2006 and has then declined in subsequent years. We code our second outcome variable *Support Attacks* one if respondents "certainly accept" and "accept" attacks against Israeli civilian and zero otherwise. 39 percent of the respondents scores one in this variable, which is quite stable over time. While *Support Attacks* is a direct proxy of support of political violence against Israeli civilians, support for Hamas should capture a more confrontational attitude towards Israel than support for other more moderate parties, e.g. Fatah and Palestinian People's Party.

Finally, we rely on a variable capturing the self-reported income of the respondents. This ordinal variable has nine categories. The median of *Income* is two, i.e. income between 601 and 1,200 *New Israeli Shekel* (~0.2-0.3 *US Dollars*), and has increased over time. We use this outcome to further document that self-reported income drops in district that are highly dependent on dual-use inputs more than in districts that are not highly dependent on dual-use inputs.

4.3 District-level Data

We use two behavioral outcomes for political violence. First, we use the number of fatalities of Israeli civilians killed by Palestinian in both the West Bank and Gaza. Data come from B'tselem, an Israeli independent non-profit organization.[12] Data are available between 2000 and 2015. During this time span there have been 279 fatalities

[11] Information on the survey, including methodology, questions, and summary results are available from the PSR web site: http://webcache.googleusercontent.com/search?q=cache:H053St7cnVMJ:www.pcpsr.org/+&cd=1&hl=it&ct=clnk&gl=it. For another study relying on these data, see Calí and Miaari (2015).

[12] Data are publicly available at http://www.btselem.org/statistics. For other studies relying on these data, see Benmelech, Berrebi, and Klor (2012).

among Israeli civilians, and 40 fatalities since 2009. The dependent variable *Fatalities* is arguably our most direct measure of political violence.

Second, we use the number of Palestinian detainees in Israeli prisons. The original data come the Israeli Prison Service and were made available to us by B'tselem. Importantly, these data include information on the district in which each detainee has her official residency. The original data, which are available in Hebrew, have been translated in English. We have monthly data on number of detainees between 2007 and 2015. Since data are non-stationary, we use the first difference of this outcome variable in our estimates. Assuming that at least a fraction of these arrests are related to political violence, we expect that *Detainees* increase in districts that are highly dependent on dual-use inputs more than in districts that are not highly dependent on dual-use inputs.

Figures A.1 and A.2 in the appendix show the trend by district. For both variables we observe a great deal of heterogeneity across district and evidence of volatility over time.[13] Moreover, Figure A.3 shows the scatter plot of differences of fatalities between pre- and post-2008 and m_d for West Bank districts. Specifically, we calculated the average deaths by district in the pre-treatment period and the average fatalities by district in the post-treatment period. Then we took the difference of these two values, and plotted it against the district intensity in dual-use inputs. The plot shows a clear positive correlation between the two variables.[14]

5 Empirical Strategy: the Dual-use List as a Quasi-experiment

Our approach to identification is a standard *difference-in-difference* where we compare the evolution of economic and political outcomes across sectors or districts according to their intensity in dual-use inputs.

Our measures of intensity are calculated using the 2002 US Input-Output matrix, and the sectoral composition of districts in the OPT in 1999. We can thus safely assume that these are exogenous to the evolution of the Israeli-Palestinian conflict from the year 2000 onwards. Over this period, the issuance of the dual-use list represents an exogenous shock that differentially affects those sectors and districts more intensive in dual-use inputs. We therefore expect economic and political outcomes to evolve in a differential way after the issuance of the dual-use list in 2008.

As a first step, we test for the hypothesis that the dual-use list differentially affected

[13] The outcome *Detainees* misses data for three districts.

[14] The difference of fatalities between pre- and post-2008 is negative since there have been more fatalities in the pre-treatment period due to the Second Intifada.

those manufacturing sectors which are more intensive in dual-use inputs after 2008. The list constraints the possibility for firms to import dual-use inputs, with an impact on their production choices and productivity per worker. We therefore expect the value of output to decrease differentially more for sectors which are more intensive in dual-use inputs after 2008. If workers are (at least to some extent) paid according to their marginal productivity, wages will decrease. Moreover, if labor market frictions prevent workers from moving freely across sectors, wages will decrease differentially more in those sectors which are more intensive in dual-use inputs.[15]

As shown in our conceptual framework in Section 3, lower wages decrease the opportunity cost of engaging in political violence. We should therefore expect the supply of political violence to increase disproportionally more after 2008 in those districts where employment is highly dependent on dual-use inputs. We test for this hypothesis in the second part of our empirical analysis. We first investigate whether, consistent with the firm-level analysis, the average income of individuals decreases disproportionally more in those districts which are highly dependent on dual-use inputs. Second, we use both public opinion data and information on detainees and conflict-related fatalities to test whether these same districts experienced higher levels of engagement in political violence after 2008.

One possible concern with our identification strategy is that the exact composition of the dual-use list was informed by strategic considerations. First, the issuance of the list was motivated by internal security reasons. Those goods and materials included in the list are claimed to be possibly used in the development and production of military capabilities. We would therefore expect the adoption of the list to decrease the willingness of individuals to engage in political violence, as it increases the cost of accessing double-use materials. Notice that our argument leads to the opposite prediction. We argue that, as a result of the list, output and wages decreased relatively more in those industries which use dual-use materials as inputs, decreasing the opportunity cost of political violence. In this respect, the concern that the list was primarily issued for internal security reasons would go against us and make it harder for us to find a positive impact of the list on political violence.

A somewhat more sophisticated concern is the one that the composition of the dual-use list was motivated by economic considerations. In particular, the Israeli government could have chosen the list of goods subject to import restrictions with the objective of hurting more the economy of those districts where political violence was more prevalent or on the rise. As shown later, evidence does not show any evidence of differential changes in the level of political violence in the years prior to the issuance of the list across districts and according to their economy's intensity in dual-use inputs. This

[15] Abrahams (2015) provides evidence of the consequences of reduced workers' mobility on welfare in the OPT.

allows us to rule out this concern, and further confirms the validity of our approach.

6 Results

6.1 The Effect on Industrial Output and Wages

We start our empirical analysis by comparing the evolution of economic activity across sectors according to their production intensity in dual-use inputs. We implement the following baseline regression specification

$$y_{st} = \delta_t + \gamma_s + \beta\, m_s \times Post2008_t + u_{st} \tag{8}$$

where y_{st} is the outcome of interest of sector s in year t. The year fixed effects δ_t capture and control for overall trends in economic activity which are common to all sectors. Sector fixed effects γ_s capture instead average differences across sectors which are constant over time. Our variable of interest is the interaction term, where m_s is the sector-level measure of intensity in dual-use inputs derived as explained in Section 4.1, and $Post2008_t$ is a dummy equal to one for all observations belonging to year 2008 and after. Finally, u_{st} accounts for residual differences across sectors and years. In our estimation, we cluster the standard errors at the sector level in order to take into account the possibility of non-zero correlation across residuals of observations belonging to the same sector over time.

Our coefficient of interest is β: it captures whether differences in production intensity in dual-use inputs map systematically into differences in sector-level outcomes, and differentially so after the implementation of the dual-use list in 2008.

Table 3 about here

Table 3 shows the corresponding coefficient estimates obtained using only data from the West Bank. In the first column, the dependent variable is the log of the value of output of each sector in each year. Our estimate of β is negative and significant at the 5% level. Evidence therefore suggests that those districts which are more intensive in dual-use inputs experienced a differential loss in output value after the issuance of the list. In order to readily interpret these number, we can calculate the differential loss in output value associated with moving from the 25th to the 75th percentile of our measure of intensity in dual-use inputs (from value 0.014 to 0.17). This is corresponds to an 11% differential loss in output value. In the second column, we restrict our sample to those sectors for which we have price information available, finding very similar results. We do this in preparation for the results in columns (3) and (4), where we use as dependent variable the log of the price index at the sector level, and physical output as given by

the ratio between output value and the price index. Our coefficient of interest in the price regression is positive but insignificant. This shows that the differential increase in equilibrium prices is insignificant, which suggests that the elasticity of demand in these sectors is very high. Given the results in column (2) and (3), it comes as no surprise that, when having physical output as dependent variable in column (4), our estimate of β is negative, significant at the 5% level and comparable to the one we previously estimated for output value. Finally, in column (5), we use the log of wages paid in each sector as dependent variable. The estimate of our coefficient of interest is double in magnitude than the one we found for output. This means that moving from the 25th to the 75th percentile of our measure of intensity in dual-use inputs is associated with a 22% differential decrease in wages.

Evidence shows that those sectors which are highly intensive in dual-use inputs paid differentially lower wages after 2008. Our claim is that this is the result of the issuance of the dual-use list. If this is the case, we should not observe any differential in wage patterns according to intensity in dual-use inputs in the years prior to 2008. Figure 2 plots the estimates of the interaction of the dual-use intensity measure m_s with the full set of year dummies from the year 2002 to 2012.[16] Consistent with our hypothesis, we do not see any significant differential trend in wages paid to dual-use input intensive sectors before 2008.

Figure 2 about here

Another possible concern is that those sectors which are highly intensive in dual-use inputs are also more intensive in foreign inputs in general. If that is the case, our measure m_s is not only capturing the extent to which each sector is impacted by the list, but it captures also heterogeneity in exposure to trade shocks in general. We address this concern by deriving a measure f_s of intensity in foreign material inputs. We calculate f_s by dividing the total value of foreign produced materials used in production in each sector by its total output value in the year 2000 (the first year for which separate information on foreign produced materials is available in the data).[17] We then include in our specification the interaction of f_s with the $Post2008_t$ dummy. This allows us to control for and net out any differential change that occurs across sectors according to their intensity in foreign inputs.

Table 4 about here

Table 4 reports the coefficients estimates from this augmented specification. Comparing these results with those in Table 3, we can see that the estimated coefficient of our

[16] As explained in Section 4.1, we exclude the year 2011 from our analysis as no information in the ISIC 4-digit sector of activity is available for that year.

[17] The correlation between m_s and f_s is low, i.e. $\rho = 0.25$, which indicates that these two variables capture different mechanisms.

variable of interest $m_s \times Post2008_t$ is very similar in both magnitude and significance. This indicates that the differential loss in output and wages that we observe in dual-use input intensive industries is not related to generic trade-related shocks, but it is the result of the issuance of the dual-use list.

Finally, Table A.1 in the Appendix shows the corresponding coefficient estimates when restricting the sample to establishments in the Gaza Strip. Given that a strict blockade was enforced in the Gaza Strip in 2007-2010, we have no reasons to believe that intensity in dual-use inputs is correlated with a differential evolution of economic outcomes in this region after 2008. Results from Panel B show that this is the case. None of the coefficients is significant. In the case of wages, the point estimate is both insignificant and small in magnitude. This further corroborates the validity of our approach to identification in the West Bank.

Taken all together, results from this section show that the issuance of the dual-use list had a negative impact on the economic activity of those sectors in the West Bank which are more intensive in dual-use inputs. Output and output value fall disproportionally more for these sectors after 2008, and the same holds for wages. This negatively affects the labor market of those districts where employment is highly concentrated in these sectors, an hypothesis we can directly test using individual-level data.

6.2 The Effect on Political Violence

Individual-level Data To test the effect of economic conditions on political violence, we begin by comparing individual-level outcomes over time across districts according to their economies' intensity in dual-use inputs. We implement the following baseline regression specification

$$y_{idt} = \delta_t + \gamma_d + \sum_{t=1}^{T} \beta_t \, m_d \times d_t + \sum_{t=1}^{T} \pi_t \, X_d \times d_t + \kappa \; Z_{idt} + u_{idt} \tag{9}$$

where y_{idt} is the outcome of interest for individual i in district d in year t. The year fixed effects δ_t capture and control for overall trends in the outcome variable which are common to all individuals surveyed in a given year. District fixed effects γ_d capture average differences across individuals in different districts which are constant over time, and u_{idt} accounts for idiosyncratic residual differences across individuals. In our OLS estimations, we cluster the standard errors at the district level in order to take into account the possibility of non-zero correlation across residuals of observations belonging to the same district over time.[18]

[18] Results are similar if we use bootstrap standard errors. Results are similar if we use probit models for these dichotomous outcomes.

We aim to test whether differences in production intensity in dual-use inputs map systematically into differences in individual outcomes in the West Bank, and differentially so after the implementation of the dual-use list in 2008. We therefore include as regressors the district-level measure of intensity in dual-use inputs m_d - derived as explained in Section 4.1 - and its interaction with year dummies d_t. We thus break down the effect of the main independent variable by year, which allows us to also directly check for possible violation of the parallel trend assumption. Indeed, based on our conceptual framework, we expect political violence to increase more in districts that are highly dependent on dual-use inputs than in districts that are not highly dependent on dual-use inputs, *but only after 2008 and only in the West Bank*.

Individual outcomes may evolve differentially across districts not because of differences in their dependance on dual-use inputs, but because of other differences that correlate with dual-use input intensity. To account for the presence of such confounding factors, we allow individual outcomes to vary differentially over time according to baseline district-level characteristics. We include as controls the interactions between the average wage and unemployment in the district in 2006 and the year dummies d_t.[19] Finally, we also include a number of individual-level controls (Z_{idt}): gender, age, occupation, education, religion, refugee status, marital status, family size, and place of residency (more dis-aggregated than district). All the individual-level controls come from PSR.

We start reporting the results of *Income*. Table 5 shows that the coefficient of our main independent variable, $m_d \times d_t$, is negative and statistically significant across all the model specification. In line with the mechanism that we propose, individual-level economic conditions seem to worsen in the West Bank after 2008, and differentially so for individuals living in those districts which are highly dependent on dual-use inputs.[20]

Table 5 about here

Let's turn our attention to the two key individual-level variables: *Hamas* and *Support Attacks*. We report the results graphically in Figures 3 and 5, which show a similar pattern.[21] For the West Bank, support of Hamas and for attacks to Israeli civilians increases significantly and differentially in 2009 in those districts that are highly dependent on dual-use inputs. An increase of a standard deviation of m_d leads to an increase of the probability of support for Hamas and support for attacks to Israeli civilians by respectively 14 percent and 47 percent. The positive and significant in 2009 matches nicely

[19] Data on average wage and unemployment come from the Labor Force Survey, administered quarterly by the Palestinian Central Bureau of Statistics. We also run models with f_s and its interaction with year dummies. Results are unchanged and f_s and its interactions are never significant.

[20] Results are similar if we use a multinomial logit.

[21] Tables 6 and 7 report the corresponding point estimates.

with the negative effect of wages (showed in Figure 2), which is the largest exactly in 2009. On the contrary, estimates are never statistically significant in the pre-treatment period in the West Bank.

Figures 3 and 5 and Tables 6 and 7 about here

As a placebo, in Figure 4 we show that, for the Gaza Strip , estimates of are never statistically significant in the post-treatment period when *Hamas* is the outcome variable.[22]

Figure 4 about here

District-level Data At last, we focus explicitly on conflict outcomes. We compare the number of Israeli fatalities and number of Palestinian detainees across district according to their production intensity in dual-use inputs. We implement the following baseline regression specification

$$y_{dt} = \delta_t + \gamma_d + \sum_{t=1}^{T} \beta_t \, m_d \times d_t + \sum_{t=1}^{T} \pi_t \, X_d \times d_t + u_{dt} \tag{10}$$

where y_{dt} is the outcome of interest in district d in year t. The year fixed effects δ_t capture and control for overall trends in economic activity which are common to all districts. District fixed effects γ_d capture instead average differences across district which are constant over time. As we did in the individual-level analysis, we include the interaction of baseline district-level characteristics - average wage and unemployment - with the year dummies, and let u_{dt} account for residual differences across district and years. Our coefficients of interest β_t are able to capture whether differences in production intensity in dual-use inputs map systematically into differences in district-level outcomes in the West Bank, and differentially so after the implementation of the dual-use list in 2008.

Results of *Fatalities* are reported in Figure 6.[23] Our treatment is positive and statistically significant in 2012 and 2014. If we focus on the effect in 2012 in Model 3, an increase of a standard deviation of m_d leads to an increase of the probability of fatalities of Israeli civilians by 1 unit. If we focus on the effect in 2014 in Model 3, an increase of a standard deviation of m_d leads to an increase of the probability of fatalities of Israeli civilians by 2 units. Given the low number of fatalities in the post-2008 period (e.g. only

[22] As a robustenss check, we consider a model specification which excludes controls and include district specic trends. results reported in the appendix show that our main results remain unchanged.

[23] As before, in our OLS estimations, we cluster the standard errors at the district level in order to take into account the possibility of non-zero correlation across residuals of observations belonging to the same sector over time. Results are similar if we use jacknife standard errors to detect the impact of outliers, or if we use poisson models to take into account the count nature of these outcome variables. Tables 6 and 7 report the corresponding point estimates.

seven fatalities in 2014), these effects are remarkably. Our treatment is never statistically significant in the pre-treatment. Although there are a relative low number of fatalities after 2008, results are consistent with our conceptual framework: worsening economic conditions trigger political violence in the West Bank.

Figures 6 and 7 about here

Finally, we look at results of *Detainees*. While the original data are monthly, we modify our model specification to reduce the volatility of the outcome variable and improve the precision of our estimates. Specifically, we use semester fixed effects and we break down our treatment by semester.[24]

Results are reported in Figure 7. The number of detainees increases after 2008 as a result of intensity in Dual-use inputs. The positive effect is statistically significant throughout the post-treatment period with the exception of few semesters in 2009 and 2010. In the first semester of 2008 an increase of a standard deviation of m_d leads to an increase of number of detainees by 7 units. In the first semester of 2011 an increase of a standard deviation of m_d leads to an increase of the number of detainees by more than 10 units. Since the average value of *Detainees* is -3.2, our effects are not trivial.

As a placebo test, we show in Figure 8 that for the Gaza Strip estimates of *Detainees* are never statistically significant neither in the pre-treatment nor in the post-treatment period.[25] In the appendix we report other model specification, which exclude controls and include leads and district-specific trends (see Figures A and A). Our main results remain unchanged.

Figure 8 about here

In sum, using a combination of attitudinal and behavioral outcomes, we have consistently showed that political violence increases in districts that are highly dependent on dual-use inputs more than in districts that are not highly dependent on dual-use inputs. This result holds only for the West Bank and only in the post-2008 period.

7 Conclusion

In this paper we have empirically assessed the impact of economic conditions on political violence. Our empirics are driven by a simple theoretical framework suggesting that a decrease in firm profitability and in wages reduces the cost of engaging in political violence. To create a quasi-experiment design, we exploited the issuance of a list of

[24] Results are similar if we use quarterly or year instead of semester.

[25] We do not report the placebo test for Gaza, since there no Israeli civilians killed by Palestenians in Gaza after 2008.

production inputs which were *de facto* banned from entering the Occupied Palestinian Territories by the Israeli government in 2008. We used such list as a negative exogenous shock to economic conditions and showed that restrictions in the accessibility of markets for listed materials decreased firm performance and wages in those sectors which use those inputs more intensively in production. In the second step of the empirical analysis, we explored whether a decrease in firm profitability and wages reduces the cost of engaging in political violence.

We find consistent evidence that poor economic conditions affect political violence in the West Bank, using both attitudinal and behavioural outcomes. First, support for Hamas and for attacks against Israeli civilians increase more in districts that are highly dependent on dual-use inputs more than in districts that are not highly dependent on dual-use inputs. Second, the issuance of the dual-list increase the number of Israeli civilians killed by Palestinians and the number of arrests among Palestinians. The effect of our treatment is significant only for the West Bank and only after 2008. We find no evidence that the blockade affects political violence in Gaza, to which a blockade was imposed before 2008. Taken together, our results indicate that much of the previous empirical literature have underestimated the effect of poor economic conditions on political violence. Moreover, our findings indicate that trade restrictions produce severe negative externalities, raising doubts on the effectiveness of economic sanctions.

The policy implications of our findings are important and timely. Our research shows that security policies alone are unlikely to be sufficient to eradicate political violence. In a period in which much of the political debate in developed democracies focuses on anti-terrorism intelligence and border fences, our results point out the importance of policies that favorite economic development and, in turn, reduce the supply of political violence. Paradoxically, security policies that produce negative economic shocks are at risk of empowering those terrorist groups that are the original target, by helping them recruiting perpetrators of political violence.

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Tables and Figures

TABLE 1: TIME LINE OF EVENTS, 2000-2010

Year	*Month*	*West Bank*	*Gaza Strip*
2000	September	Second Intifada begins	
2005	August		IDF occupying forces disengagement
2005	August	Second Intifada ends	
2006	January	Elections in the OPT Hamas wins the elections Economic sanctions against the Palestinian National Authority	
2007	June		Battle of Gaza (Hamas Fatah conflict)
	June	*de facto* division of the OPT: West Bank (PNA), Gaza (Hamas)	
	June	Removal of sanctions	Israeli imposes the blockade
2008	January	Issue dual-use list	
2010	January	Reduction of number of items in the dual-use list	Loosening of the blockade

Notes. Various sources. See Section 2 for detailed information on the political and economic background.

Table 2: Intensity in Dual-use Inputs by Sector

		Least Intensive Sectors
ISIC 4	m_s	Description
1600	0.0001	Manufacture of tobacco products
1532	0.0001	Manufacture of starches and starch products
1543	0.0002	Manufacture of cocoa, chocolate and sugar confectionery
1542	0.0003	Manufacture of sugar
1554	0.0010	Manufacture of soft drinks; production of mineral waters
1549	0.0013	Manufacture of other food products n.e.c.
1553	0.0014	Manufacture of malt liquors and malt
1544	0.0014	Manufacture of macaroni, noodles, couscous, etc.
1520	0.0018	Manufacture of dairy products
1533	0.0020	Manufacture of prepared animal feeds
		Most Intensive Sectors
ISIC 4	m_s	Description
2720	0.3457	Manufacture of basic precious and non-ferrous metals
1723	0.3614	Manufacture of cordage, rope, twine and netting
3220	0.4102	Manufacture of television and radio transmitters, etc.
2922	0.4142	Manufacture of machine tools
2732	0.4343	Casting of non-ferrous metals
2731	0.4343	Casting of iron and steel
2696	0.4687	Cutting, shaping and finishing of stone
3592	0.4911	Manufacture of bicycles and invalid carriages
2411	0.4930	Manufacture of basic chemicals, except fertilizers and nitrogen compounds
2421	0.5637	Manufacture of pesticides and other agrochemical products

Notes. The table reports the bottom and top 10 ISIC 4-digit sectors with the lowest and highest value of intensity in dual-use inputs m_s. The value of m_s is between 0 and 1 by definition, as explained in Section 4.1.

Table 3: Industrial Output, Prices and Wages in the West Bank

	Output Value	Output Value 4-digit PPI	Price	Output	Wages
$m_s \times Post2008_t$	-0.704**	-0.646**	0.044	-0.691***	-1.428***
	(0.303)	(0.257)	(0.110)	(0.242)	(0.325)
Year FE	YES	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES	YES
Observations	1039	607	619	607	946
R^2	0.893	0.884	0.789	0.872	0.924

Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is a 4-digit sector in a year. m_s is intensity of each sector in dual-use inputs as derived from US Input-Output matrix. All dependent variables are in log. *Post2008* is a dummy equal to 1 for observations belonging to the year 2008 or after. Observations are weighted by the number of establishments per sector. Standard errors are clustered at the 4-digit sector level.

Table 4: Robustness: Intensity in Imported Inputs as Control

	Output Value	Output Value 4-digit PPI	Price	Output	Wages
$m_s \times Post2008_t$	-0.686**	-0.622**	-0.034	-0.589*	-1.444***
	(0.340)	(0.310)	(0.121)	(0.321)	(0.371)
$f_s \times Post2008_t$	0.040	0.101	-0.320*	0.421	-0.014
	(0.468)	(0.602)	(0.193)	(0.556)	(0.289)
Year FE	YES	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES	YES
Observations	878	593	599	593	815
R^2	0.884	0.883	0.795	0.872	0.924

Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is a 4-digit sector-year. m_s is intensity of each sector in dual-use inputs as derived from US Input-Output matrix. f_s is intensity in imported material inputs calculated by dividing the value of imported materials by total output value in each sector in 2000. All dependent variables are in log. *Post2008* is a dummy equal to 1 for observations belonging to the year 2008 or after. Observations are weighted by the number of establishments per sector. Standard errors are clustered at the 4-digit sector level.

Table 5: Income in the West Bank, 2002-2011

	(1) Income	(2) Income	(3) Income	(4) Income	(5) Income
$m_d \times Post2008_t$	-4.40**	-2.93***	-4.86**	-5.55**	
	(1.796)	(0.492)	(2.060)	(2.435)	
$m_d \times d2008_t$					4.28
					(4.79)
$m_d \times d2009_t$					-11.02**
					(4.57)
$m_d \times d2010_t$					7.66
					(6.08)
$m_d \times d2011_t$					9.72
					(6.42)
Constant	1.08***	1.04***	0.53**	-120.16***	-118.85***
	(0.116)	(0.112)	(0.250)	(43.366)	(41.030)
Year FE	YES	YES	YES	YES	YES
District FE	YES	YES	YES	YES	YES
Individual Controls	NO	YES	YES	YES	YES
District Controls	NO	NO	YES	YES	YES
Trends	NO	NO	NO	YES	YES
Observations	8,884	8,884	8,884	8,884	8,884
R^2	0.286	0.408	0.413	0.418	0.418

Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is district-year. m_d is intensity of each district in dual-use inputs as derived from US Input-Output matrix. *Post2008* is a dummy equal to 1 for observations belonging to the year 2008 or after. All control variables are interacted with year fixed effects. OLS regressions include district and year fixed effects. Standard errors are clustered at the district level.

Table 6: Political violence in the West Bank

VARIABLES	(1) Hamas	(2) Attacks	(3) Fatalities	(4) Detainees
$m_d \times d2001_t$			-58.88	
			(48.596)	
$m_d \times d2002_t$	0.90	1.92	-46.99	
	(0.499)	(1.076)	(37.063)	
$m_d \times d2003_t$	0.55	2.83	11.11	
	(0.405)	(2.188)	(25.732)	
$m_d \times d2004_t$	-0.72	0.16	11.55	
	(0.774)	(1.250)	(8.529)	
$m_d \times d2005_t$	0.73	1.02	34.68*	
	(0.746)	(1.479)	(17.573)	
$m_d \times d2006_t$	0.90*	0.86	4.15	
	(0.426)	(0.855)	(16.850)	
$m_d \times d2007_t$	0.27	0.66	18.37	
	(0.342)	(0.743)	(20.794)	
$m_d \times d2008_t$	1.09	0.47	19.36	
	(0.681)	(0.789)	(19.078)	
$m_d \times d2009_t$	4.78***	15.51***	18.21	
	(0.462)	(1.104)	(18.720)	
$m_d \times d2010_t$	0.48	2.80*	45.68	
	(0.541)	(1.404)	(28.441)	
$m_d \times d2011_t$	0.50	-0.11	12.00	
	(0.401)	(1.016)	(16.818)	
$m_d \times d2012_t$			27.16**	
			(12.186)	
$m_d \times d2013_t$			23.56	
			(13.518)	
$m_d \times d2014_t$			56.58**	
			(24.810)	
$m_d \times d2015_t$			9.43	
			(16.700)	
$m_d \times d2007(2)_t$				-2.13
				(192.476)
$m_d \times d2008(1)_t$				237.28**
				(94.657)
$m_d \times d2008(2)_t$				202.23
				(175.446)
$m_d \times d2009(1)_t$				116.59
				(109.981)
$m_d \times d2009(2)_t$				424.88
				(310.375)
$m_d \times d2010(1)_t$				196.94
				(242.778)
$m_d \times d2010(2)_t$				331.09*
				(159.775)
$m_d \times d2011(1)_t$				349.56**
				(103.339)
$m_d \times d2011(2)_t$				394.94
				(213.444)
$m_d \times d2012(1)_t$				135.47**
				(54.389)
$m_d \times d2012(2)_t$				242.44*
				(105.840)
$m_d \times d2013(1)_t$				315.51***
				(66.160)
$m_d \times d2013(2)_t$				271.79***
				(72.301)
$m_d \times d2014(1)_t$				260.55***
				(60.847)
$m_d \times d2014(2)_t$				307.23***
				(79.558)
$m_d \times d2015(1)_t$				222.86
				(119.100)
Constant	0.53**	1.75***	1.71	-124.84
	(0.202)	(0.385)	(3.648)	(96.488)
Individual control	YES	YES	NO	NO
District control	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
IObservations	8,901	8,901	172	784
R-squared	0.044	0.166	0.702	0.004

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

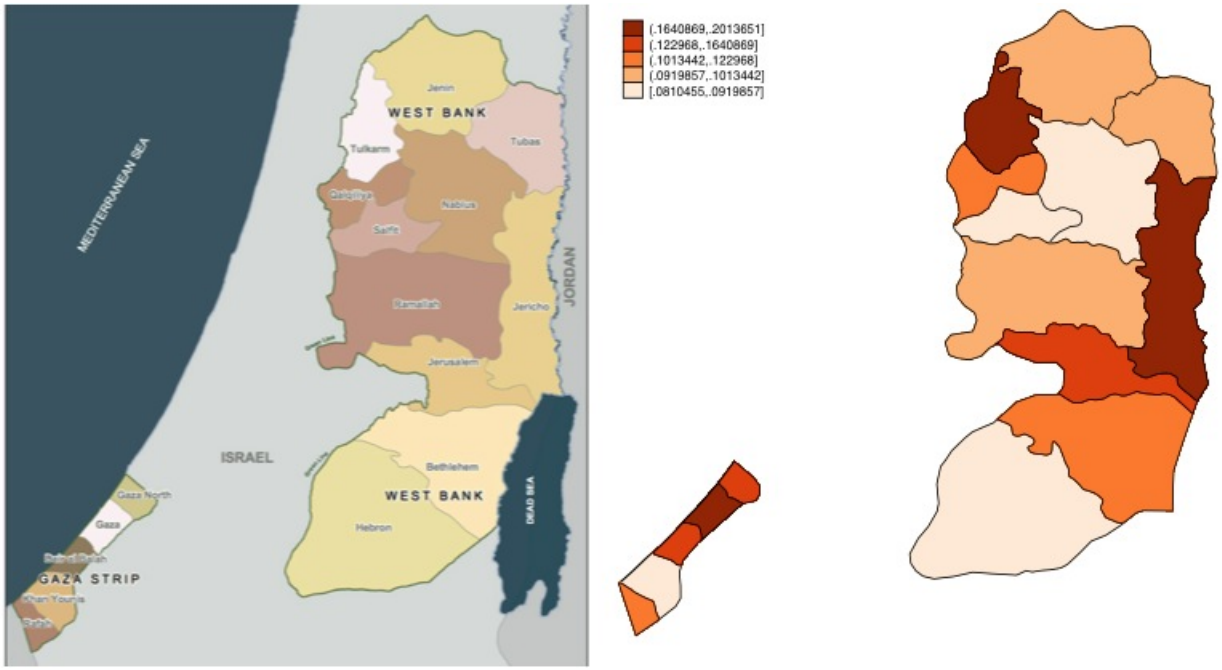
Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is district-year. m_d is intensity of each district in dual-use inputs as derived from US Input-Output matrix. *d20XX* are dummies equal to 1 for observations belonging to the corresponding year. All control variables are interacted with year fixed effects. OLS regressions include district and year fixed effects. Standard errors are clustered at the district level.

Table 7: Political violence in the Gaza Strip

VARIABLES	(1) Hamas	(2) Attacks	(3) Fatalities	(4) Detainees
$m_d \times d2001_t$			-0.45	
			(59.304)	
$m_d \times d2002_t$	0.13	3.89*	-124.02***	
	(1.790)	(1.762)	(21.219)	
$m_d \times d2003_t$	-3.84	-2.12	-53.25	
	(2.177)	(2.042)	(33.991)	
$m_d \times d2004_t$	0.22	-0.60	-153.42	
	(3.789)	(5.914)	(211.237)	
$m_d \times d2005_t$	1.58	8.17**	-92.00	
	(1.835)	(2.690)	(117.343)	
$m_d \times d2006_t$	-3.42	0.85	-54.27	
	(3.314)	(1.028)	(31.779)	
$m_d \times d2007_t$	-4.61*	1.28	-57.44	
	(1.894)	(1.145)	(34.492)	
$m_d \times d2008_t$	-1.78	3.52*	-58.42	
	(3.252)	(1.553)	(52.567)	
$m_d \times d2009_t$	0.10	-1.70	-60.07	
	(3.677)	(2.920)	(42.929)	
$m_d \times d2010_t$	-4.30	3.19	-57.13	
	(2.072)	(2.086)	(49.968)	
$m_d \times d2011_t$	-1.91	0.98	-40.91	
	(1.468)	(1.668)	(44.381)	
$m_d \times d2012_t$			-57.84	
			(49.023)	
$m_d \times d2013_t$			-116.36	
			(57.014)	
$m_d \times d2041_t$			-61.08	
			(47.935)	
$m_d \times d2015_t$			-83.88	
			(46.435)	
$m_d \times d2007(2)_t$				89.59
				(49.984)
$m_d \times d2008(1)_t$				78.83
				(74.045)
$m_d \times d2008(2)_t$				49.97
				(49.783)
$m_d \times d2009(1)_t$				28.48
				(49.988)
$m_d \times d2009(2)_t$				58.60
				(51.320)
$m_d \times d2010(1)_t$				72.53
				(62.321)
$m_d \times d2010(2)_t$				70.66
				(51.364)
$m_d \times d2011(1)_t$				240.59
				(748.375)
$m_d \times d2011(2)_t$				39.41
				(52.609)
$m_d \times d2012(1)_t$				39.41
				(52.609)
$m_d \times d2012(2)_t$				39.41
				(52.609)
$m_d \times d2013(1)_t$				-90.15
				(479.789)
$m_d \times d2013(2)_t$				49.35
				(52.569)
$m_d \times d2014(1)_t$				34.82
				(50.069)
$m_d \times d2014(2)_t$				40.56
				(50.195)
$m_d \times d2015(1)_t$				37.38
				(49.927)
Constant	0.67	0.89	7.11	-62.94
	(0.901)	(0.479)	(12.766)	(60.430)
Individual control	YES	YES	NO	NO
District control	YES	YES	YES	YES
District FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	5,008	5,008	80	486
R-squared	0.044	0.227	0.751	0.013

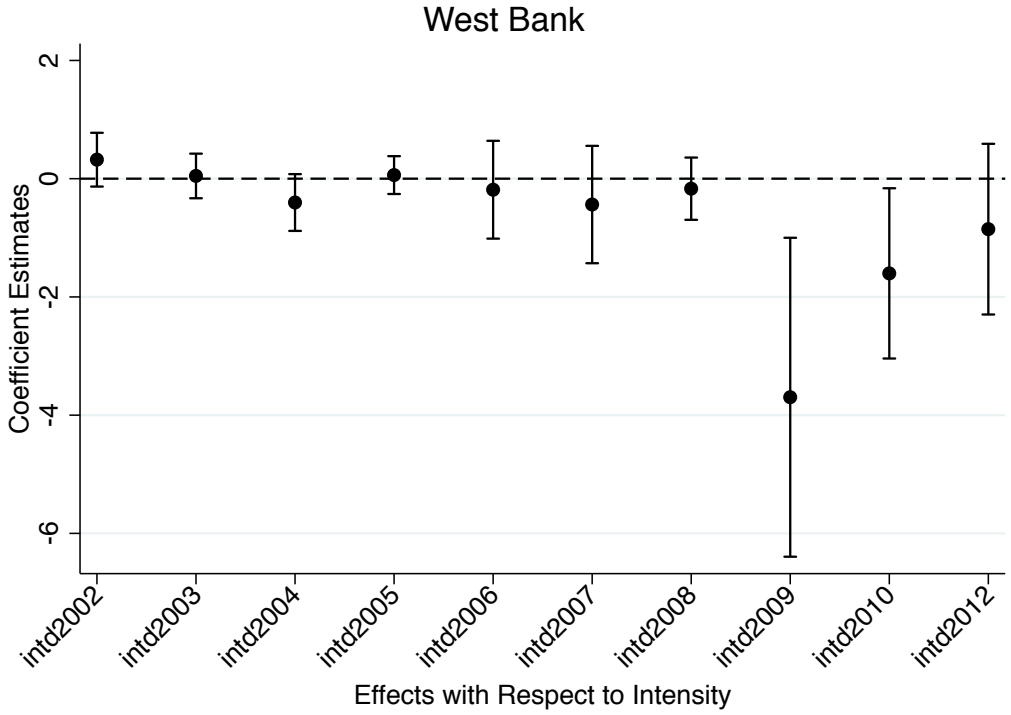
Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is district-year. m_d is intensity of each district in dual-use inputs as derived from US Input-Output matrix. *d20XX* are dummies equal to 1 for observations belonging to the corresponding year. All control variables are interacted with year fixed effects. OLS regressions include district and year fixed effects. Standard errors are clustered at the district level.

Figure 1: Dual-use Intensity Across Districts



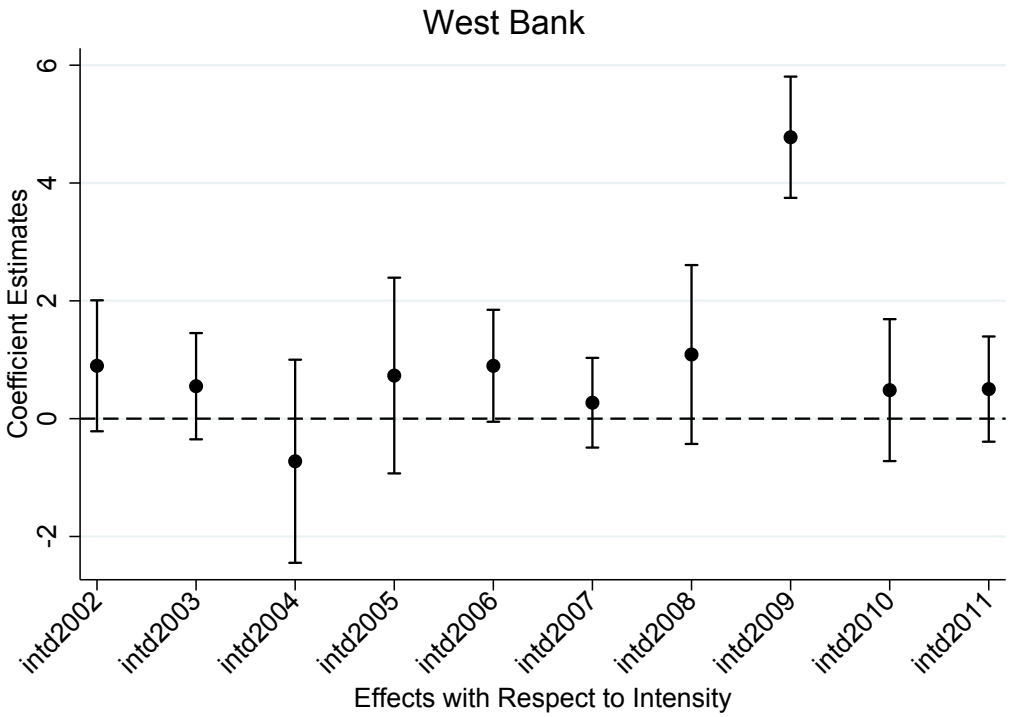
Notes. The left Figure shows the boundaries and name of each district in both the West Bank and the Gaza Strip. The right Figure shows the degree of intensity in dual-use inputs in each district according to their quintile of the distribution of the m_d variable.

Figure 2: Dual-use Intensity and Wages, 2002-2012.



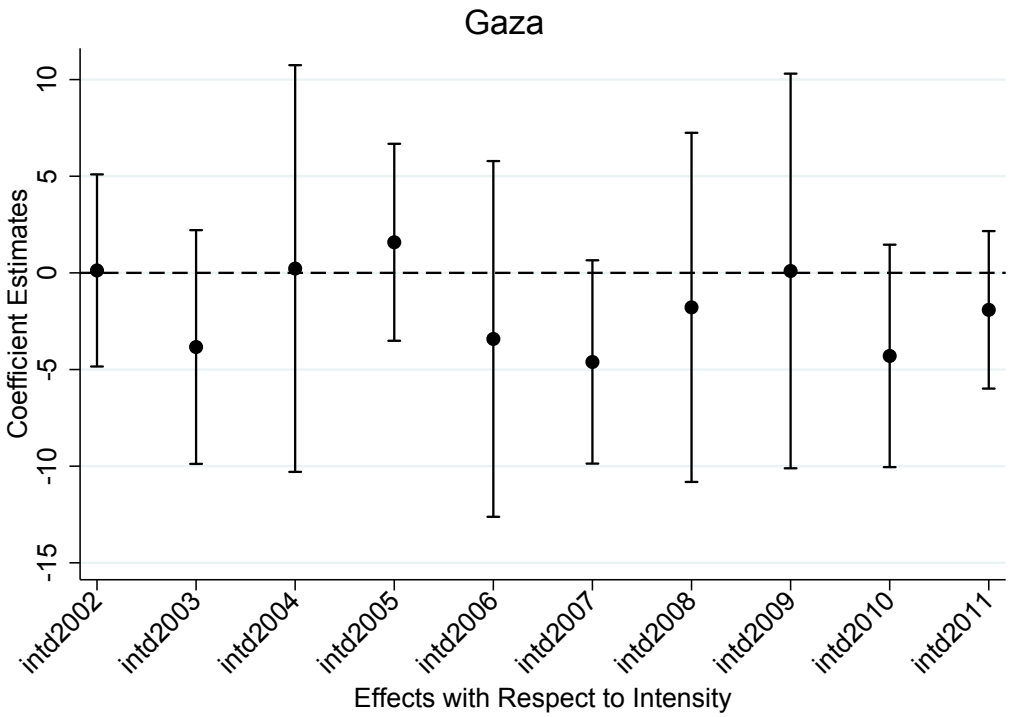
Notes. Dependent variable is the log of wages. The Figure plots the estimated coefficient of the interaction of the dual-use input intensity variable m_s with the corresponding year dummy. The solid vertical lines show the 95% confidence interval of each estimate, while the dash horizontal line indicates zero.

Figure 3: Support for Hamas in the West Bank, 2002-2010



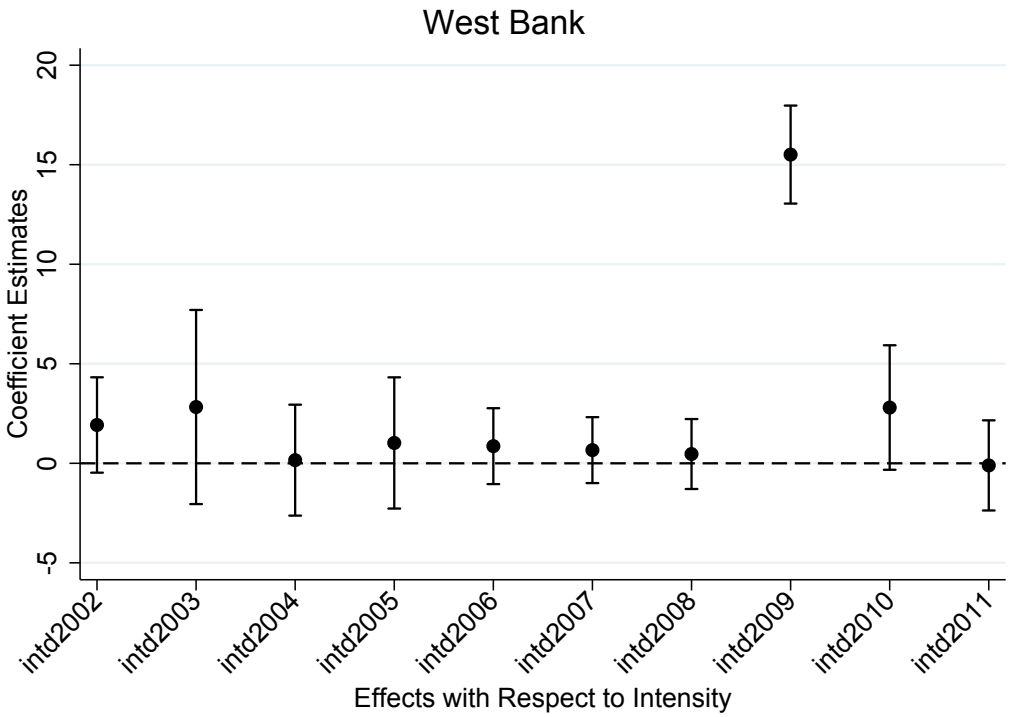
Notes. Dependent variable captures support for Hamas. The Figure plots the estimated coefficient of the interaction of the dual-use input intensity variable m_d with the corresponding year dummy. The solid vertical lines show the 95% confidence interval of each estimate, while the dash horizontal line indicates zero. Control variables and their interaction are also included as additional regressors.

Figure 4: Support for Hamas in the Gaza Strip, 2002-2010



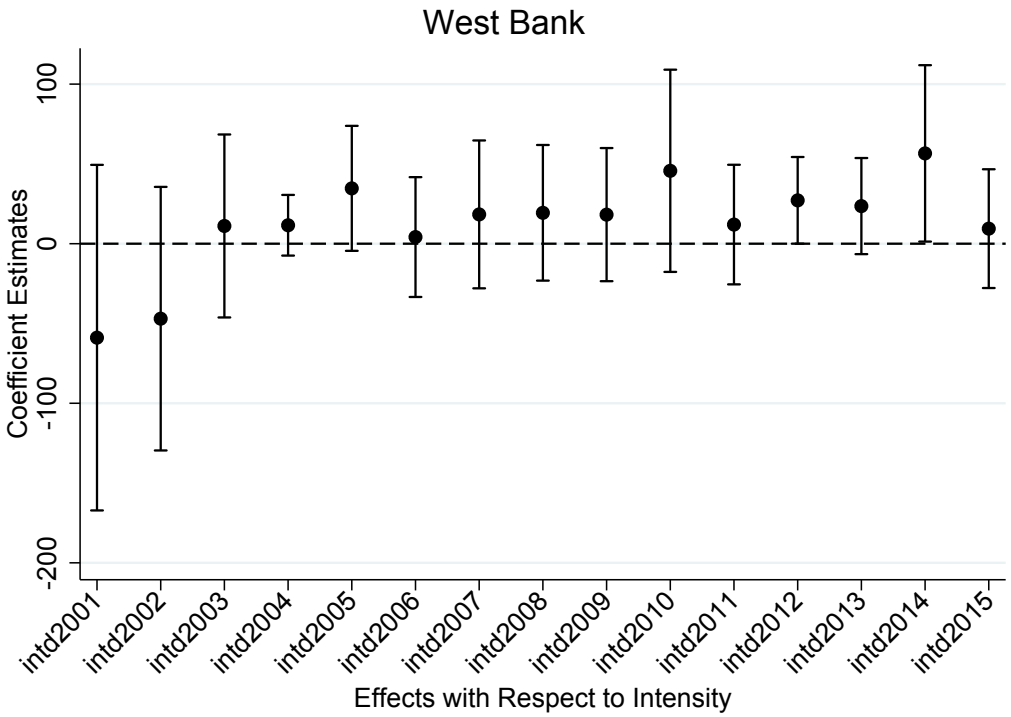
Notes. Dependent variable captures support for Hamas. The Figure plots the estimated coefficient of the interaction of the dual-use input intensity variable m_d with the corresponding year dummy. The solid vertical lines show the 95% confidence interval of each estimate, while the dash horizontal line indicates zero. Control variables and their interaction are also included as additional regressors.

Figure 5: Support for Attacks to Israeli Civilians in the West Bank, 2002-2010



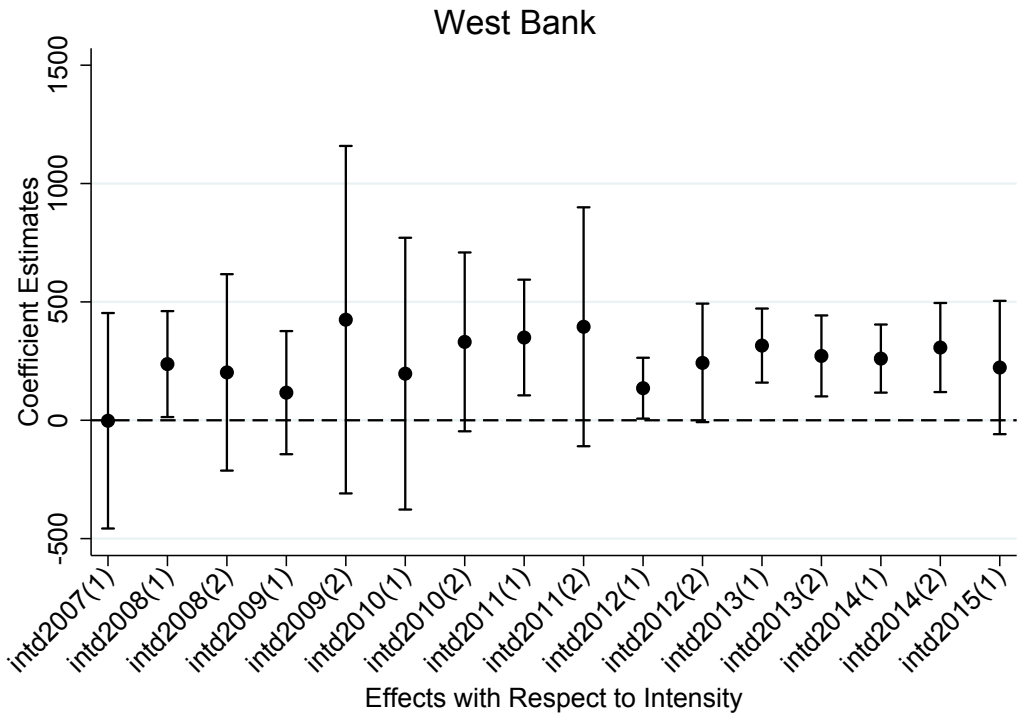
Notes. Dependent variable captures support for attacks to Israeli civilians. The Figure plots the estimated coefficient of the interaction of the dual-use input intensity variable m_d with the corresponding year dummy. The solid vertical lines show the 95% confidence interval of each estimate, while the dash horizontal line indicates zero. Control variables and their interaction are also included as additional regressors.

Figure 6: Israeli Civilians Killed by Palestinians in the West Bank, 2001-2015



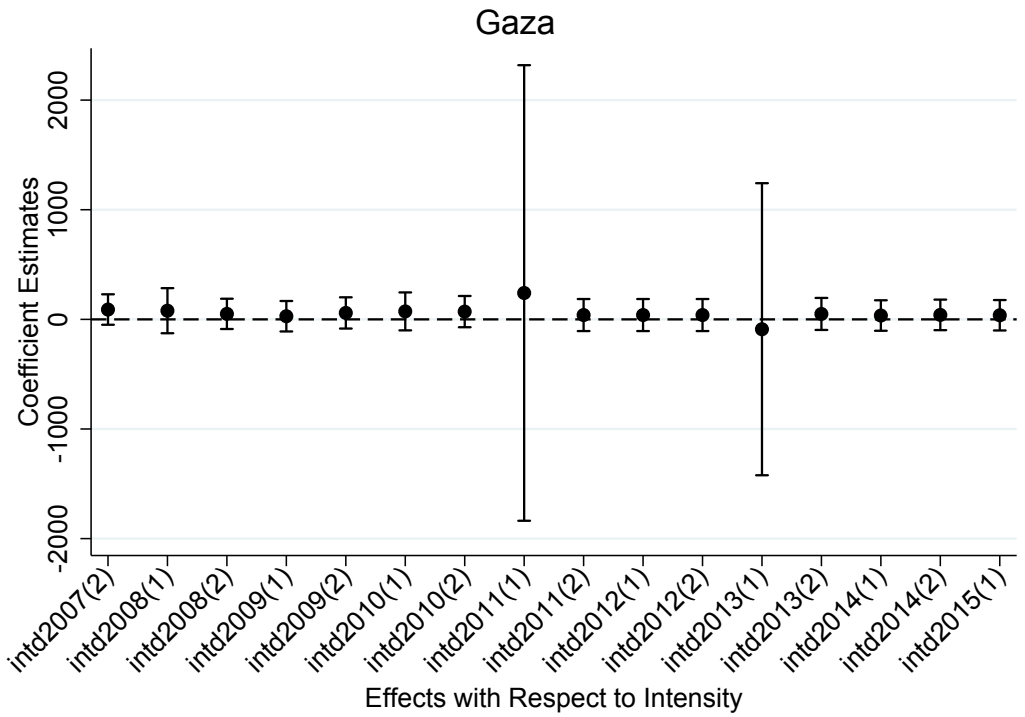
Notes. Dependent variable is the number of Israeli civilians killed by Palestinians. The Figure plots the estimated coefficient of the interaction of the dual-use input intensity variable m_d with the corresponding year dummy. The solid vertical lines show the 95% confidence interval of each estimate, while the dash horizontal line indicates zero. Control variables and their interaction are also included as additional regressors.

Figure 7: Palestinian Detainees Resident in the West Bank, 2007-2015



Notes. Dependent variable is the stock of Palestinian detainees. The Figure plots the estimated coefficient of the interaction of the dual-use input intensity variable m_d with the corresponding year dummy. The solid vertical lines show the 95% confidence interval of each estimate, while the dash horizontal line indicates zero. Control variables and their interaction are also included as additional regressors.

Figure 8: Palestinian Detainees Resident in the Gaza Strip, 2007-2015



Notes. Dependent variable is the stock of Palestinian detainees. The Figure plots the estimated coefficient of the interaction of the dual-use input intensity variable m_d with the corresponding year dummy. The solid vertical lines show the 95% confidence interval of each estimate, while the dash horizontal line indicates zero. Control variables and their interaction are also included as additional regressors.

A Appendix

Table A.1: Industrial Output, Prices and Wages in the Gaza Strip

	Output Value	Output Value 4-digit PPI	Price	Output	Wages
$m_s \times Post2008_t$	-0.456	-0.899	-0.013	-0.900	0.089
	(0.742)	(0.659)	(0.110)	(0.573)	(0.460)
Year FE	YES	YES	YES	YES	YES
Sector FE	YES	YES	YES	YES	YES
Observations	794	503	569	503	636
R^2	0.853	0.851	0.803	0.849	0.898

Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is a 4-digit sector in a year. m_s is intensity of each sector in dual-use inputs as derived from US Input-Output matrix. All dependent variables are in log. *Post2008* is a dummy equal to 1 for observations belonging to the year 2008 or after. Observations are weighted by the number of establishments per sector. Standard errors are clustered at the 4-digit sector level.

Table A.2: Robustness Checks: Individual-level Political Violence in the West Bank

	(1) Hamas	(2) Hamas	(3) Hamas	(4) Hamas	(5) Hamas	(6) Attacks	(7) Attacks	(8) Attacks	(9) Attacks	(10) Attacks
$m_d \times d2008_t$	0.61	0.70***	0.75***	0.84***	0.75**	-0.24	-0.21	-0.49***	-0.58***	0.55
	(0.499)	(0.107)	(0.218)	(0.201)	(0.369)	(0.762)	(0.305)	(0.056)	(0.105)	(0.684)
$m_d \times d2009_t$	-0.47	4.44***	4.25***	4.43***	4.83***	-0.68	14.79***	14.53***	14.36***	13.29***
	(0.433)	(0.299)	(0.359)	(0.494)	(0.855)	(0.597)	(0.866)	(0.579)	(0.468)	(1.002)
$m_d \times d2010_t$	-0.34	-0.38	0.14	0.24	-0.25	0.98	1.03***	1.84***	1.75***	2.50**
	(0.417)	(0.268)	(0.308)	(0.414)	(0.349)	(1.078)	(0.315)	(0.353)	(0.358)	(0.971)
$m_d \times d2011_t$	-0.19	-0.14	0.16	0.26	0.02	-1.41*	-1.39	-1.07	-1.16	0.28
	(0.387)	(0.403)	(0.483)	(0.382)	(0.965)	(0.706)	(0.847)	(0.762)	(0.699)	(1.626)
$m_d \times d2007_t$				0.32					-0.30	
				(0.418)					(0.366)	
Constant	0.12***	0.09**	0.49**	0.51**	18.10**	0.56***	0.74***	1.75***	1.73***	56.52***
	(0.019)	(0.035)	(0.212)	(0.225)	(8.702)	(0.040)	(0.036)	(0.066)	(0.068)	(12.387)
Individual control	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES
District control	NO	NO	YES	YES	YES	NO	NO	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Trends	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES
Observations	9,117	8,901	8,901	8,901	8,901	9,117	8,901	8,901	8,901	8,901
R-squared	0.024	0.039	0.043	0.043	0.042	0.140	0.158	0.164	0.164	0.166

Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is district-year. m_d is intensity of each district in dual-use inputs as derived from US Input-Output matrix. *d20XX* are dummies equal to 1 for observations belonging to the corresponding year. All control variables are interacted with year fixed effects. OLS regressions include district and year fixed effects. Standard errors are clustered at the district level.

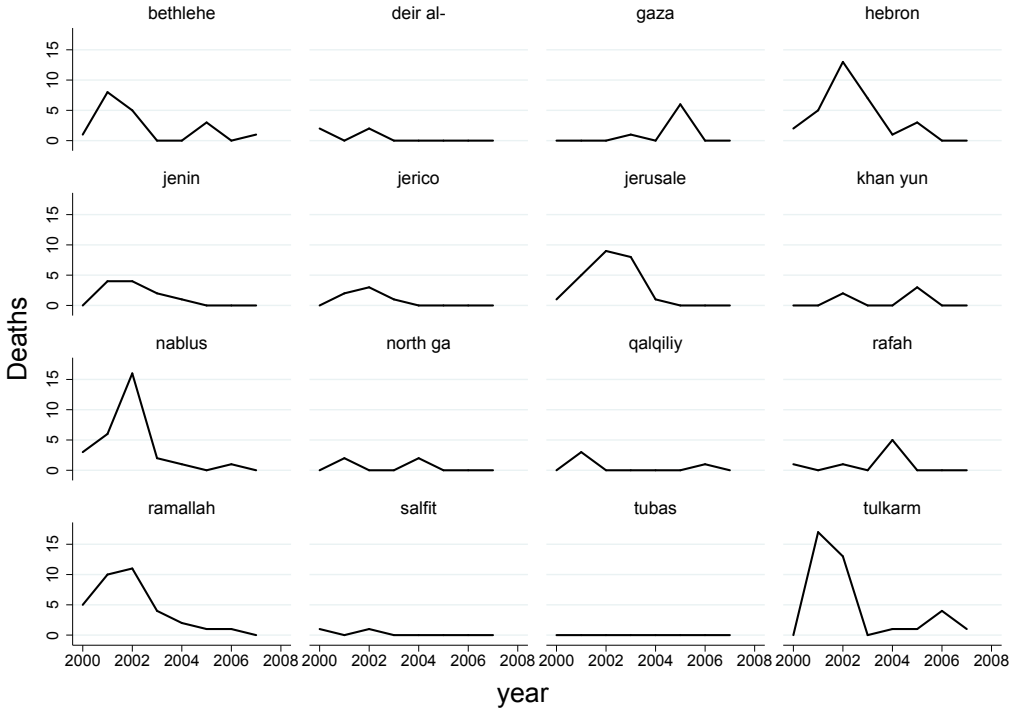
Table A.3: Robustness Checks: District-level Political Violence in the West Bank

VARIABLES	(1) Fatalities	(2) Fatalities	(3) Fatalities	(4) Fatalities	(5) Detainees	(6) Detainees	(7) Detainees	(8) Detainees
$m_d \times d2008_t$	11.04	20.25	22.54	20.28				
	(12.150)	(15.462)	(16.967)	(15.473)				
$m_d \times d2009_t$	17.92	18.63	21.03	18.68				
	(11.149)	(13.887)	(15.470)	(13.901)				
$m_d \times d2010_t$	23.05*	45.85*	48.02*	45.91*				
	(11.415)	(23.823)	(24.337)	(23.821)				
$m_d \times d2011_t$	11.92	11.64	13.44	11.71				
	(12.662)	(15.128)	(15.554)	(15.144)				
$m_d \times d2012_t$	16.08	28.58**	30.84**	28.65**				
	(12.166)	(12.308)	(13.201)	(12.340)				
$m_d \times d2013_t$	18.91	23.60	25.66	23.69				
	(13.779)	(17.664)	(18.343)	(17.707)				
$m_d \times d2014_t$	21.00	56.46**	58.43**	56.56**				
	(14.465)	(24.080)	(24.990)	(24.106)				
$m_d \times d2015_t$	7.00	10.45	12.82	10.55				
	(11.076)	(15.482)	(16.429)	(15.533)				
$m_d \times d2007_t$			22.67					
			(17.692)					
$m_d \times d2008(1)_t$					198.19**	238.72***	237.28**	238.83***
					(66.071)	(38.613)	(94.657)	(38.636)
$m_d \times d2008(2)_t$					-70.48	203.67**	202.23	203.80**
					(222.723)	(68.170)	(175.446)	(68.158)
$m_d \times d2009(1)_t$					-21.68	118.03	116.59	118.28
					(216.050)	(200.704)	(109.981)	(200.745)
$m_d \times d2009(2)_t$					394.77	426.32	424.88	426.57
					(245.299)	(272.132)	(310.375)	(272.136)
$m_d \times d2010(1)_t$					36.80	198.38	196.94	198.77
					(233.872)	(238.889)	(242.778)	(238.898)
$m_d \times d2010(2)_t$					242.61*	332.53***	331.09*	332.90***
					(112.778)	(72.479)	(159.775)	(72.473)
$m_d \times d2011(1)_t$					260.64**	351.00***	349.56**	351.50***
					(106.041)	(41.053)	(103.339)	(41.123)
$m_d \times d2011(2)_t$					290.93*	396.39***	394.94	396.89***
					(147.203)	(85.582)	(213.444)	(85.490)
$m_d \times d2012(1)_t$					132.32	136.91	135.47**	137.54
					(100.066)	(77.472)	(54.389)	(77.591)
$m_d \times d2012(2)_t$					177.94	243.88**	242.44*	244.51**
					(106.324)	(73.328)	(105.840)	(73.380)
$m_d \times d2013(1)_t$					210.24	316.95***	315.51***	317.70***
					(140.030)	(90.143)	(66.160)	(90.276)
$m_d \times d2013(2)_t$					214.25*	273.23***	271.79***	273.98***
					(100.011)	(62.894)	(72.301)	(63.029)
$m_d \times d2014(1)_t$					242.34	261.99**	260.55***	262.87**
					(136.134)	(87.363)	(60.847)	(87.534)
$m_d \times d2014(2)_t$					211.83	308.67**	307.23***	309.55**
					(136.825)	(93.701)	(79.558)	(93.856)
$m_d \times d2015(1)_t$					91.00	224.30**	222.86	225.31**
					(120.251)	(79.134)	(119.100)	(79.240)
$m_d \times d2007(2)_t$							-2.13	
							(192.476)	
Constant	0.37	1.24	1.39	2.48	-26.39	-125.16	-124.84	-127.33
	(0.411)	(2.306)	(2.562)	(2.392)	(20.006)	(99.695)	(96.488)	(112.472)
District control	NO	YES	YES	YES	NO	YES	YES	YES
District FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Trends	NO	NO	NO	YES	NO	NO	NO	YES
Observations	176	172	172	172	784	784	784	784
R-squared	0.568	0.656	0.659	0.656	0.003	0.004	0.004	0.004

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

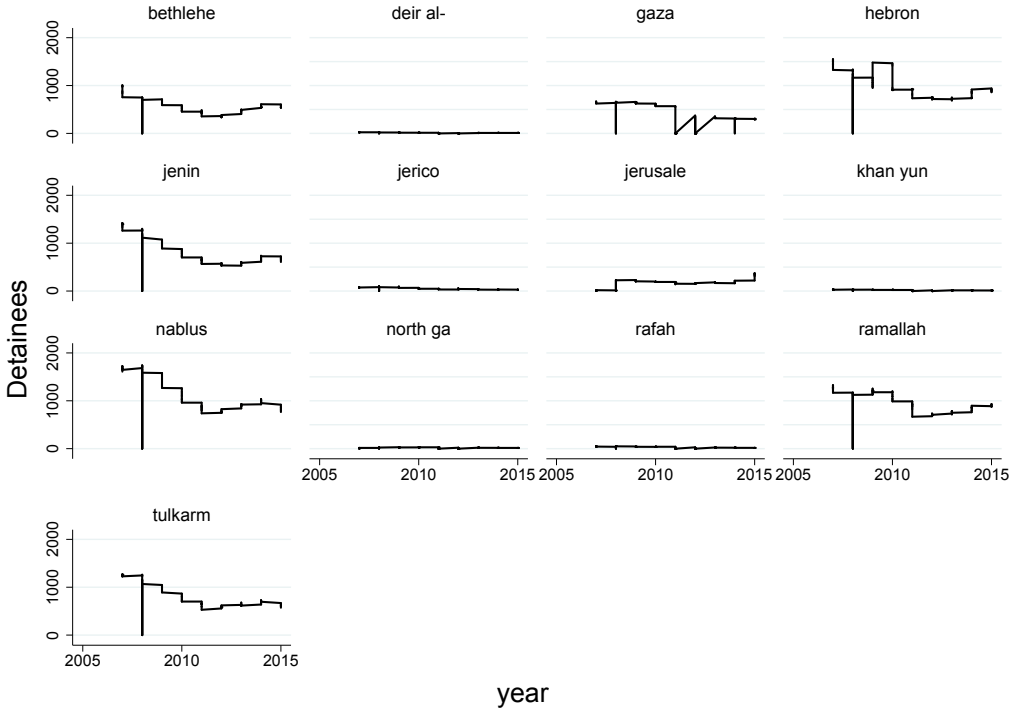
Notes. (* p-value< 0.1; ** p-value<0.05; *** p-value<0.01) Standard errors in parenthesis. Unit of observation is district-year. m_d is intensity of each district in dual-use inputs as derived from US Input-Output matrix. *d20XX* are dummies equal to 1 for observations belonging to the corresponding year. All control variables are interacted with year fixed effects. OLS regressions include district and year fixed effects. Standard errors are clustered at the district level.

Figure A.1: Fatalities over Time by Districts



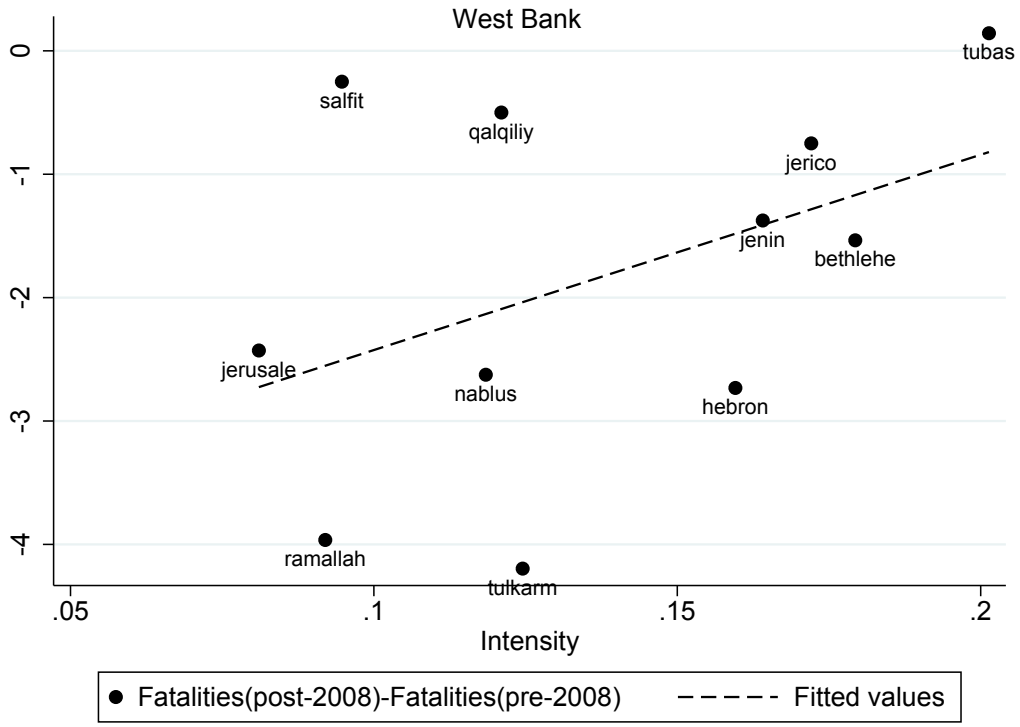
Notes. The Figures plot the number of fatalities in each district on a monthly basis from 2007 to 2015.

Figure A.2: Detainees over Time by Districts



Notes. The Figures plot the number of detainees in each district on a monthly basis from 2007 to 2015.

Figure A.3: Difference of Number of Fatalities between pre-and post-2008 and Intensity in Dual-use Inputs, 2000-2015



Notes. The Figure plots the difference in the number of fatalities between the pre- and post-2008 in each district against the intensity of each district in dual-use inputs. Fatalities(post-2008)-Fatalities(pre-2008) is calculated using the difference of average fatalities by district before and after 2008.

ISRAELI LISTS OF FORBIDEN & RESTRICTED GOODS TO THE WEST BANK

I. ARMS & MUNITIONS:

Forbidden transfer under all circumstances across Israel's frontiers without specific permits - as defined in the Control of Exports Security Order (Arms and Munitions) 2008, and in the Control of Exports Security Order (Missile Equipment) 2008.

II. LIST OF RESTRICTED DUAL-USE GOODS TO THE WB:

The list of restricted dual-use goods below is excerpted from the Defense Export Control (Controlled Dual-Use Equipment Transferred to Areas under the Palestinian Authority Jurisdiction) Order 2008 last updated on 2 August, 2009 and translated from Hebrew.

A. Chemicals

1. Chlorate salts
    a. Potassium chlorate – $KClO_3$
    b. Sodium chlorate – $NaClO_3$
2. Perchlorate salts
    a. Potassium perchlorate – $KCLO_4$
    b. Sodium perchlorate – $NaClO_4$
3. Hydrogen peroxide – H_2O_2
4. Nitric acid – HNO_3
5. Musk xylene – $C_{12}H_{15}N_3O_6$
6. Mercury – Hg
7. Hexamine – $C_6H_{12}N_4$
8. Potassium permanganate
9. Sulfuric acid – H_2SO_4
10. Potassium cyanide – KCN
11. Sodium cyanide – NaCN
12. Sulfur – S
13. Phosphorus – P
14. Aluminum powder – Al
15. Magnesium powder – Mg
16. Naphthalene – $C_{10}H_8$
17. Fertilizers
    a. Ammonium nitrate – NH_4NO_3
    b. Potassium nitrate – KNO_3
    c. Urea – CH_4N_{2O}
    d. Urea nitrate – $CH_4N_2ONO_3$
    e. Fertilizer 27-10-17
    f. Fertilizer 20-20-20
    g. Any fertilizer containing any of the chemicals in items a – c
18. Nitrous salts of other metals:
    a. Sodium nitrate – $NaNO_3$
    b. Calcium nitrate – $Ca(NO_3)_2$
19. Pesticides
    a. Lannate
    b. Endosulfan
20. Nitrite salt
21. Methyl bromide – CH_3Br
22. Potassium chloride – KCL

23. Formalin – CH_2O
24. Ethylene glycol – $C_2H_6O_2$
25. Glycerin – $C_3H_8O_3$

B. Other Materials and Equipment

26. Platen, titanium, or graphite plates not more than 10 cm thick
27. Communication equipment, communication support equipment, or any equipment that has a communication function
28. Equipment whose operation can cause interference in communication networks
29. Communication network infrastructure equipment
30. Lathe machines for removing metals (including center lathe machines)
31. Lathe machine spare parts, lathe machine equipment, and lathe machines accessories
32. Machine tools that can be used for one or more of the following functions: erosion, screwing, purifying, and rolling
33. Casting ovens of more than 600 degrees Celsius
34. Aluminum rods with a radius between 50 to 150 mm
35. Metal pipes of 50 to 200 mm radius
36. Metal balls with a radius of 6 mm and bearings containing metal balls with a 6 mm radius
37. Optical binoculars
38. Telescopes including aimers (and markers)
39. Laser distance measuring equipment
40. Laser pointers
41. Night vision equipment
42. Underwater cameras and sealed lenses
43. Compasses and designated navigation equipment including GPS
44. Diving equipment, including diving compressors and underwater compasses
45. Jet skis
46. External marine engines of more than 25 Hp and designated parts for such engines
47. Parachutes, surf-gilders, and flying models
48. Balloons, dirigible airships, hanging gliders, flying models, and other aircraft that do not operate with engine power
49. Devices and instruments for measuring gamma and x-rays
50. Devices and instruments for physical and chemical analysis
51. Telemetric measuring equipment
52. All-terrain vehicles
53. Firearms and ammunition for civilian use (e.g., for hunting, diving, fishing, and sports
54. Daggers, swords, and folding knifes of more than 10 cm
55. An object or a system of objects that can emit fire or detonators including fireworks
56. Uniforms, symbols and badges.
57. All items listed in the Defense Export Control Order (Controlled Dual-use Equipment), 2008 - Items listed under the Wassenaar Arrangement: As specified in the updated (2008) "Wassenaar Arrangement on Export Controls for Arms and Dual Use Goods and Technologies - List of Dual Use Goods and Technologies and Munitions List."