Security, Trade, and Political Violence

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Motivation

- Security concerns are of paramount importance for countries and their sovereignty
- Trade restrictions as tools to address security concerns in a cost-effective way
  - U.S. bans exports of arms and related products to Somalia
  - China bans export of products and technologies to North Korea
- Negative externalities on targeted economies
  - Decrease in opportunity cost of violence
  - Grievance
- Can security-motivated trade restrictions backfire?
  - Nature of restrictions × production structure of targeted economy
This Paper

The Israeli *dual-use* list:

- Introduced by the Israeli government on December 31st, 2007
- Severe restrictions on imports to the West Bank of a detailed set of materials that can be used for military application
- 56 items: chemicals, fertilizers, raw materials for industry, steel pipes, milling machines, optical equipment

We show that:

1. Industrial output and wages decrease differentially more in dual-use input intensive sectors after 2008
2. Labor market outcomes worsen differentially in localities where employment is more concentrated in these sectors
3. Political violence is differentially higher in these same localities
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3. Political violence is differentially higher in these same localities
Conceptual Framework

Negative economic shocks and violence:

- In choosing whether or not to engage in political violence, individuals weigh and equate the marginal benefit and cost.
- Negative economic shocks affect individuals’ payoff and their decisions in two ways:
  1. opportunity costs
  2. grievances
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  2. grievances

Hypothesis:

- A decrease in wages increases the individual likelihood of engaging in political violence and the proportion of the population willing to take action.
The Tale of a Palestinian Company: Pal Karm

- Pal Karm Company for Cosmetics, which is also located in Nablus, is a leading industrial cosmetics firm.
- Around 50-60% of the company’s sales were going to the Israeli market before the de facto banning.
- Glycerin is an essential input for the company.
- Since the issuance of the dual-use list, which includes glycerine, Pal Karm has not been able to sell skincare products in the Israeli market because the Israeli Health Authorities require glycerin to be part of such products.
- Between 2008 and 2010 the company estimated a drop in exports of products using glycerine to Israel by 30%.
Intensity in Dual-use Input

By sector ($m_s$):

- Each product in the dual-list → corresponding 10-digit product (HS)
- Link each 10-digit code to the U.S. Input-Output table code
- Calculate for each commodity $i$ its intensity in dual-use inputs
- Take the average at 4-digit level
Intensity in Dual-use Input

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By locality \((m_l)\):

- Number of workers operating in a sector in the same locality
- Total number of workers operating in the same locality (1997 data)
- Calculate our locality-level measure of intensity in dual-use inputs

Formula
## Intensity in Dual-use Input by Sector

<table>
<thead>
<tr>
<th>ISIC 4</th>
<th>$m_s$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Least Intensive Sectors</strong></td>
</tr>
<tr>
<td>1600</td>
<td>0.0001</td>
<td>Manufacture of tobacco products</td>
</tr>
<tr>
<td>1532</td>
<td>0.0001</td>
<td>Manufacture of starches and starch products</td>
</tr>
<tr>
<td>1543</td>
<td>0.0002</td>
<td>Manufacture of cocoa, chocolate and sugar confectionery</td>
</tr>
<tr>
<td>1542</td>
<td>0.0003</td>
<td>Manufacture of sugar</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Most Intensive Sectors</strong></td>
</tr>
<tr>
<td>2696</td>
<td>0.4687</td>
<td>Cutting, shaping and finishing of stone</td>
</tr>
<tr>
<td>3592</td>
<td>0.4911</td>
<td>Manufacture of bicycles and invalid carriages</td>
</tr>
<tr>
<td>2411</td>
<td>0.4930</td>
<td>Manufacture of basic chemicals</td>
</tr>
<tr>
<td>2421</td>
<td>0.5637</td>
<td>Manufacture of pesticides and other agrochemical products</td>
</tr>
</tbody>
</table>
Dual-use Intensity Across Localities

Colors correspond to the degree of intensity in dual-use inputs in each location according to their quintile of the distribution of the $m_i$ variable, from yellow to red.
Dual-use Intensity and Labor Market Variables at Baseline

Data are from the Palestinian Labor Force Survey in 1999.
Dual-use Intensity, Unemployment, and Education at Baseline

Data are from the Palestinian Labor Force Survey in 1999.
Sector-level Analysis

- Difference-in-differences specification:

\[ y_{st} = \delta_t + \gamma_s + \beta m_s \times Post2008_t + u_{st} \]  

- \( y_{st} \) is the average log of wages paid by firms in each sector \( i \) in year \( t \)
- \( m_s \) is benchmark dual-use input intensity
- \( Post2008_t \) is equal to one after 2008
- \( \delta_t \) and \( \gamma_s \) are year and sector fixed effects
- Clustering at the sector level
- \( \beta \) captures differential changes in \( y_{st} \) after 2008 according to dual-use input intensity
Results: Wages Across Sectors

Moving from 25th to 75th percentile of intensity yields 22% differentially lower wages.
Locality-level Analysis

- Difference-in-differences specification:

\[ y_{lt} = \delta_t + \gamma_l + \beta \ m_l \times Post2008_t + u_{lt} \] (2)

- \( y_{st} \) is the average daily wages and the sum of violent events perpetrated by Palestinian civilians against Palestinians or Israelis in locality \( k \) in year \( t \)

- \( m_l \) is baseline employment concentration in dual-use input intensive industries

- Post2008\(_t\) is equal to one after 2008

- \( \delta_t \) and \( \gamma_l \) are year and locality fixed effects

- Clustering at the locality level

- \( \beta \) captures differential changes in \( y_{lt} \) after 2008 according to employment concentration in dual-use input intensive industries
Results: Wages Across Localities

Moving from 25th to 75th percentile of intensity yields 1% lower average wages
Results: Political Violence Across Localities

Moving from 25th to 75th percentile of intensity yields 8% differential increase in number of violent episodes
Additional Evidence

- Results are similar for firms’ output value
- Sector- and locality-specific trends
- Checkpoint, observation tower, and road block
- Measure of intensity in imported inputs
- Standard error adjustment for spatial correlation
- Nothing is significant for Gaza (placebo)
Dual-use Intensity and Political Violence in Gaza
Conclusion

Key findings:

▶ Based on our estimates, we calculate that the policy
  ▶ Accounts for 1.3% loss in the value of industrial output
    (economic costs)
  ▶ Accounts for 13% of episodes of political violence in the period
    (political costs)
Conclusion

Key findings:

▶ Based on our estimates, we calculate that the policy
  ▶ Accounts for 1.3% loss in the value of industrial output (economic costs)
  ▶ Accounts for 13% of episodes of political violence in the period (political costs)

Policy implications:

▶ Security policies cannot be implemented independently from economic policies
▶ Economic development as a key tool to reduce the supply side of political violence
▶ Negative externalities of economic sanctions
Many thanks!
A. Chemicals

1. Chlorate salts
   a. Potassium chlorate – KClO₃
   b. Sodium chlorate – NaClO₃
2. Perchlorate salts
   a. Potassium perchlorate – KClO₄
   b. Sodium perchlorate – NaClO₄
3. Hydrogen peroxide – H₂O₂
4. Nitric acid – HNO₃
5. Musk xylene – C₁₂H₁₅N₃O₆
6. Mercury – Hg
7. Hexamine – C₆H₁₂N₄
8. Potassium permanganate
9. Sulfuric acid – H₂SO₄
10. Potassium cyanide – KCN
11. Sodium cyanide – NaCN
12. Sulfur – S
13. Phosphorus – P
14. Aluminum powder – Al
15. Magnesium powder – Mg
16. Naphthalene – C₁₀H₈
17. Fertilizers
   a. Ammonium nitrate – NH₄NO₃
   b. Potassium nitrate – KNO₃
   c. Urea – CH₄N₂O
   d. Urea nitrate – CH₄N₂ONO₃
   e. Fertilizer 27-10-17
   f. Fertilizer 20-20-20
   g. Any fertilizer containing any of the chemicals in items a – c
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
Data

- Palestinian Industry Survey 1999-2012 (PCBS)
  - Repeated cross-section of Palestinian establishments in the manufacturing sector

- US Input-Output Matrix 2002 (BEA)
  - Benchmark measure of dual-use input intensity

- Palestinian Labor Force Survey 1999-2012 (PCBS)
  - Rotating panel, data aggregated at the locality level

- Palestinian Census 1997 (PCBS)
  - Baseline measure of employment concentration in dual-use input intensive sectors

- ICEWS 1999-2014 (LMATL)
  - Integrated Crisis Early Warning System
  - Records any interaction between socio-political actors

- UN-OCHA 2004-2012
  - Checkpoints, observation towers and road blocks.
Intensity in Dual-use Input By Sector

\[ d_i = \sum_j b_j \frac{v_j}{v_j} \]  

- \( v_j \) 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 \( d_i \)
Intensity in Dual-use Input By Sector, cont.

- 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

$$m_s = \frac{1}{n_s} \sum_{i \in s} d_{is}$$  \hspace{1cm} (4)$$

- $n_s$ is the number of commodities $i$ delivered by sector $s$. The value of $m_s$ is between 0 and 1 by construction.
Intensity in Dual-use Input By Locality

- Using a confidential version of the 1997 Population Census, which contains information on the sector of employment of each individual in the Census (570 localities in the West Bank and the Gaza Strip)
- We calculate our locality-level measure of intensity in dual-use inputs as

\[
m_l = \sum_s \frac{L_s^l}{L^l} m_s
\]  

(5)

- \(L^l\) is the total number of workers in locality \(l\) in 1997, and \(L_s^l\) is the number of workers operating in sector \(s\) in the same locality in the same year
- \(m_s\) is our previously derived measure of intensity in dual-use inputs at the sector level.
Dual-use Intensity and Population at Baseline

Data are from the Palestinian Labor Force Survey in 1999.
### Industrial Output, Prices and Wages in the West Bank

<table>
<thead>
<tr>
<th></th>
<th>Output Value</th>
<th>Output Value</th>
<th>Price</th>
<th>Output</th>
<th>Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-digit PPI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$m_s \times \text{Post2008}_t$</td>
<td>-0.704** (0.303)</td>
<td>-0.646** (0.257)</td>
<td>0.044 (0.110)</td>
<td>-0.691*** (0.242)</td>
<td>-1.428*** (0.325)</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Sector FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>1039</td>
<td>607</td>
<td>619</td>
<td>607</td>
<td>946</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.893</td>
<td>0.884</td>
<td>0.789</td>
<td>0.872</td>
<td>0.924</td>
</tr>
</tbody>
</table>
## Robustness: Intensity in Imported Inputs as Control

<table>
<thead>
<tr>
<th></th>
<th>Output Value</th>
<th>Output Value 4-digit PPI</th>
<th>Price</th>
<th>Output</th>
<th>Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>$m_s \times Post2008_t$</td>
<td>-0.686**</td>
<td>-0.622**</td>
<td>-0.034</td>
<td>-0.589*</td>
<td>-1.444***</td>
</tr>
<tr>
<td></td>
<td>(0.340)</td>
<td>(0.310)</td>
<td>(0.121)</td>
<td>(0.321)</td>
<td>(0.371)</td>
</tr>
<tr>
<td>$f_s \times Post2008_t$</td>
<td>0.040</td>
<td>0.101</td>
<td>-0.320*</td>
<td>0.421</td>
<td>-0.014</td>
</tr>
<tr>
<td></td>
<td>(0.468)</td>
<td>(0.602)</td>
<td>(0.193)</td>
<td>(0.556)</td>
<td>(0.289)</td>
</tr>
<tr>
<td>Year FE</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Sector FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>878</td>
<td>593</td>
<td>599</td>
<td>593</td>
<td>815</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.884</td>
<td>0.883</td>
<td>0.795</td>
<td>0.872</td>
<td>0.924</td>
</tr>
</tbody>
</table>
## Industrial Output, Prices and Wages in the Gaza Strip

<table>
<thead>
<tr>
<th></th>
<th>Output Value</th>
<th>Output Value 4-digit PPI</th>
<th>Price</th>
<th>Output</th>
<th>Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>$m_s \times \text{Post2008}_t$</td>
<td>-0.456</td>
<td>-0.899</td>
<td>-0.013</td>
<td>-0.900</td>
<td>0.089</td>
</tr>
<tr>
<td></td>
<td>(0.742)</td>
<td>(0.659)</td>
<td>(0.110)</td>
<td>(0.573)</td>
<td>(0.460)</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Sector FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>794</td>
<td>503</td>
<td>569</td>
<td>503</td>
<td>636</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.853</td>
<td>0.851</td>
<td>0.803</td>
<td>0.849</td>
<td>0.898</td>
</tr>
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</table>
# Wages in the West Bank

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( m_l \times \text{Post2008}_t )</td>
<td>-15.988</td>
<td>-18.953**</td>
<td>-33.501*</td>
<td>-20.538*</td>
<td>-0.198*</td>
</tr>
<tr>
<td></td>
<td>(10.285)</td>
<td>(9.546)</td>
<td>(17.611)</td>
<td>(11.162)</td>
<td>(0.113)</td>
</tr>
<tr>
<td>Share of Manuf</td>
<td>18.985***</td>
<td>13.723***</td>
<td>13.906**</td>
<td>0.242***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.495)</td>
<td>(4.411)</td>
<td>(6.772)</td>
<td>(0.053)</td>
<td></td>
</tr>
<tr>
<td>Share of Agric</td>
<td>-7.661</td>
<td>-5.475</td>
<td>-15.001***</td>
<td>-0.111</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.313)</td>
<td>(5.184)</td>
<td>(5.641)</td>
<td>(0.075)</td>
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</tr>
<tr>
<td>Trends</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Obstacles</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Locality FE</td>
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<td>Yes</td>
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<tr>
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<td>2571</td>
<td>2571</td>
<td>1585</td>
<td>2571</td>
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<tr>
<td>( R^2 )</td>
<td>0.723</td>
<td>0.730</td>
<td>0.854</td>
<td>0.772</td>
<td>0.732</td>
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</table>
Wages in the Gaza Strip

<table>
<thead>
<tr>
<th>Daily Wage</th>
<th>(1)</th>
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<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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</thead>
<tbody>
<tr>
<td>$m_I \times \text{Post}2008_t$</td>
<td>15.166</td>
<td>-15.318</td>
<td>20.252</td>
<td>37.366</td>
<td>-0.261</td>
</tr>
<tr>
<td></td>
<td>(78.007)</td>
<td>(85.732)</td>
<td>(85.760)</td>
<td>(64.547)</td>
<td>(1.418)</td>
</tr>
<tr>
<td>Share of Manuf</td>
<td>-12.118</td>
<td>1.926</td>
<td>-11.789</td>
<td>-0.231</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(13.943)</td>
<td>(11.817)</td>
<td>(13.873)</td>
<td>(0.207)</td>
<td></td>
</tr>
<tr>
<td>Share of Agric</td>
<td>4.422</td>
<td>3.582</td>
<td>-2.558</td>
<td>0.086</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.812)</td>
<td>(5.248)</td>
<td>(5.606)</td>
<td>(0.092)</td>
<td></td>
</tr>
<tr>
<td>Trends</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Obstacles</td>
<td>No</td>
<td>No</td>
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<td>No</td>
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</tr>
<tr>
<td>Year FE</td>
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<td>Yes</td>
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<tr>
<td>Locality FE</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
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<td>447</td>
<td>420</td>
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<td>221</td>
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<tr>
<td>$R^2$</td>
<td>0.502</td>
<td>0.514</td>
<td>0.778</td>
<td>0.628</td>
<td>0.526</td>
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### Political Violence in the West Bank

<table>
<thead>
<tr>
<th></th>
<th>Number of Violent Events</th>
<th>Poisson</th>
<th>Log</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>$m_t \times \text{Post}2008_t$</td>
<td>1.671**</td>
<td>2.008**</td>
<td>2.575*</td>
</tr>
<tr>
<td></td>
<td>(0.759)</td>
<td>(1.009)</td>
<td>(1.538)</td>
</tr>
<tr>
<td>Trends</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Obstacles</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Locality FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>7488</td>
<td>7488</td>
<td>3600</td>
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<tr>
<td>$R^2$</td>
<td>0.661</td>
<td>0.785</td>
<td>0.687</td>
</tr>
</tbody>
</table>
## Political Violence in the Gaza Strip

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Violent Events</td>
<td>Poisson</td>
<td>Log</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$m_l \times Post2008_t$</td>
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<td>(57.289)</td>
<td>(152.397)</td>
<td>(261.167)</td>
<td>(2.913)</td>
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Dual-use Intensity and Political Violence (targeting OPT)
Dual-use Intensity and Political Violence (targeting Israel)

![Graph showing effects with respect to intensity over the West Bank from 2004 to 2014.](image)