

Middleman Minorities and Ethnic Violence: Anti-Jewish Pogroms in the Russian Empire

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Motivation

Ethnic minorities that dominate middleman occupations, such as traders and financiers, often become targets of persecution and ethnic violence:

- Chinese in Philippines and Indonesia
- Igbos in Nigeria
- Lebanese in Sierra Leone
- Muslims in India
- Greeks and Armenians in the Ottoman Empire
- Jews in Medieval Western and Modern Eastern Europe

Motivation: political scientists' view

- Political scientists (e.g., Bonacich 1973; Sowell 2005; Chua 2004) have argued that “middleman minorities” are persecuted because of the very nature of their occupations
 - The middleman minorities are viewed as “unproductive”
 - The majority considers that they earn their living dishonestly through “parasitism” and “exploitation” of the majority
 - According to political scientists, this sentiment could explain why middleman minorities are vulnerable to persecution

Motivation: economists' view

- Economic literature considers economic competition between ethnic groups as one of the primary drivers of ethnic conflict
- Since Horowitz (1985), the literature has argued that the likelihood of conflict is higher when minority competes with the majority than when it occupies economic niches complementary to the majority
 - Recent systematic evidence in support of this conjecture:
 - Muslim traders in ports of South Asia (Jha 2013, 2014)
 - Jewish moneylenders during the outbreak of the Black Death in Western Europe (Jedwab et al., 2017)
 - The reformation caused pogroms in the Protestant but not in the Catholic parts of Germany because of the increase in competition in the middleman sector (Becker & Pascali 2018)

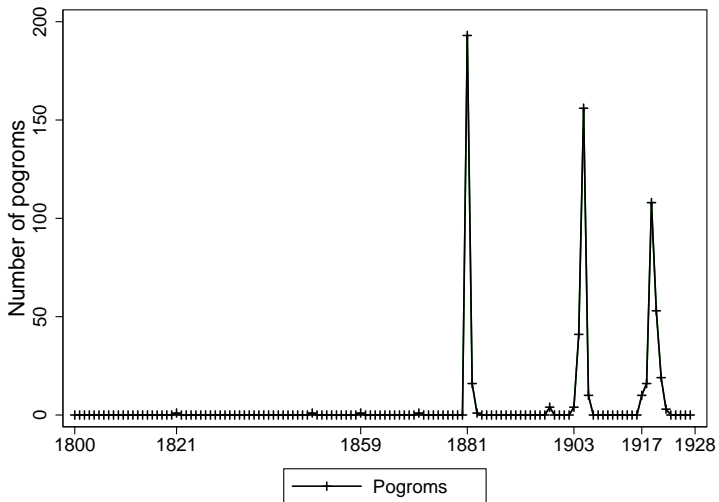
Puzzle

- Many episodes of violence against middleman minorities occur without any increase in competition
 - The puzzle:
 - Economic segregation in general decreases ethnic violence,
 - but segregated middleman minorities are persecuted because they are middlemen
 - To address this puzzle, we study the conditions, under which such violence broke out
 - focusing on anti-Jewish pogroms in the Russian Empire throughout the 19th and at the beginning of the 20th century
 - the historical events that brought the word *pogrom* into European languages

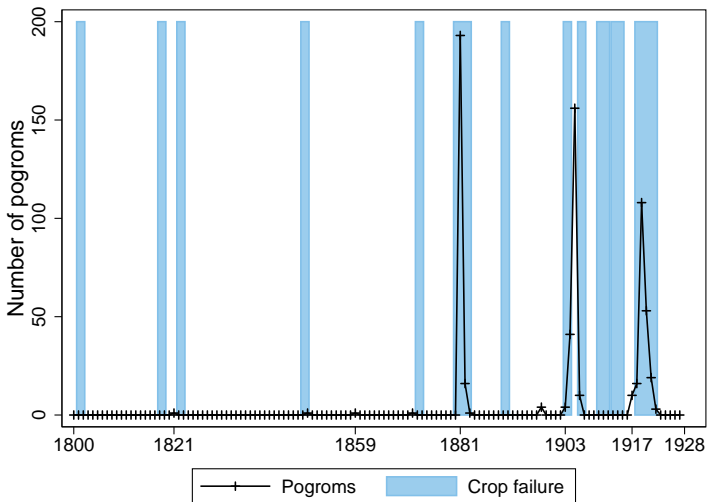
Preview of the main findings

- As a starting point, we replicate the result of the previous literature that ethnic violence is often associated with economic shocks:
 - e.g., Anderson et al. (2017) for anti-Jewish violence before 1600 and Miguel (2005), Harari & La Ferrara (2018) for other contexts
- but show that it masks two key sources of heterogeneity:
 - 1 Pogroms occurred in localities where Jews dominated middleman occupations servicing agriculture
 - 2 at times when economic shocks—crop failures and grain price increases—coincided with political turmoil
 - Economic shocks did not lead to pogroms if they were not concomitant with political turmoil
 - Economic and political shocks together did not result in pogroms in localities where Jews specialized in other occupations, including middleman occupations unrelated to agriculture

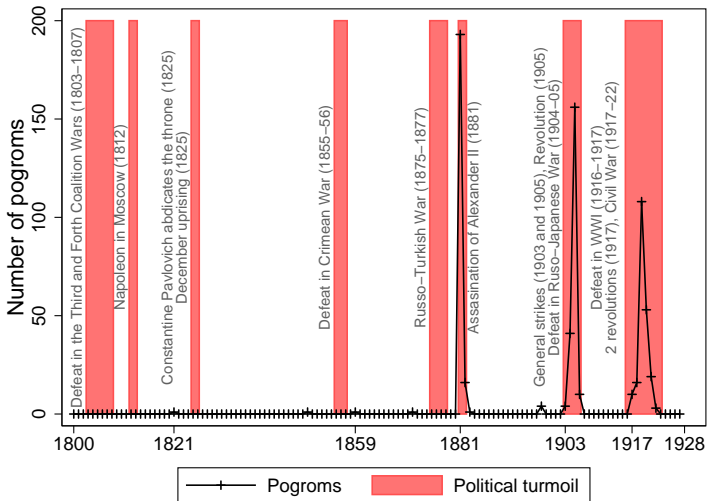
Pogroms over time



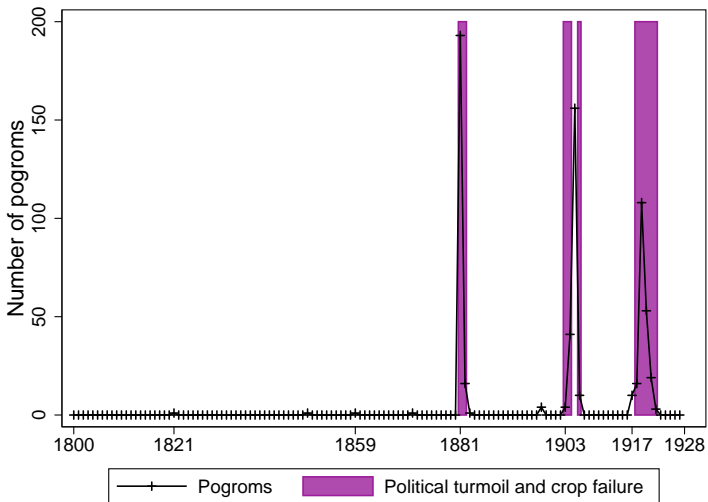
Pogroms over time and negative income shocks



Pogroms over time and political turmoil

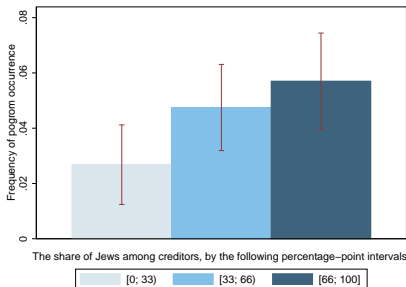


... with both at the same time

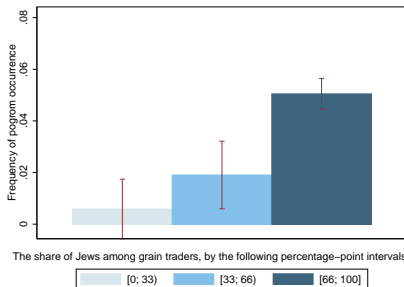


Share of Jews among middlemen and pogroms

During political turmoil across localities hit by local crop failure:



During political turmoil and the period of high grain prices across all localities:



Historians also noticed extraordinary combination of economic and political crises that led to violence

- Aronson (1990) on the 1st wave: *“Exceptional circumstances existed in 1881.[.] Unknown tsar had scended the throne in the wake of the violent assassination of the “Tsar liberator,” and the peasants were uncertain [about their future]. The weather was unseasonably hot.[.] During 1880 and 1881 local crop failures had brought on near famine conditions in some areas.”*
- Lambroza (1992) on the 2nd wave: *”Poor harvest in 1902-1903 caused wide-scale violent unrest in rural areas.[.] Urban areas also experienced their share.[.] Political conditions were worsened by the disastrous Russo-Japanese War of 1904 and the massacre of innocents at the Winter Palace in January 1905.”*

The picture is not specific to pogroms in Russia:

- Violence against Jewish lenders in Germany, Austria, and French Alsace (Roger 1992)
- Witch trials in New England in the 17C (Boyer and Nissenbaum 2001)

Identification by exhaustion

- ① Selection on observables and unobservables:
 - The shares of Jews among middlemen are uncorrelated with preexisting antisemitism, conditional on basic controls
 - Altonji, Elder, Taber (2005) and Oster (2016) conditional on preexisting antisemitism
- ② Spatial matching

Mechanisms

We consider several potential mechanisms behind our findings

- ① We argue that the evidence is inconsistent with traditional theories related to scapegoating, group stereotyping, fall in enforcement of law and order, or inequality
- ② and is consistent with a novel politico-economic mechanism, in which peaceful equilibrium based on repeated interactions is broken by the uncertainty about the future associated with political turmoil

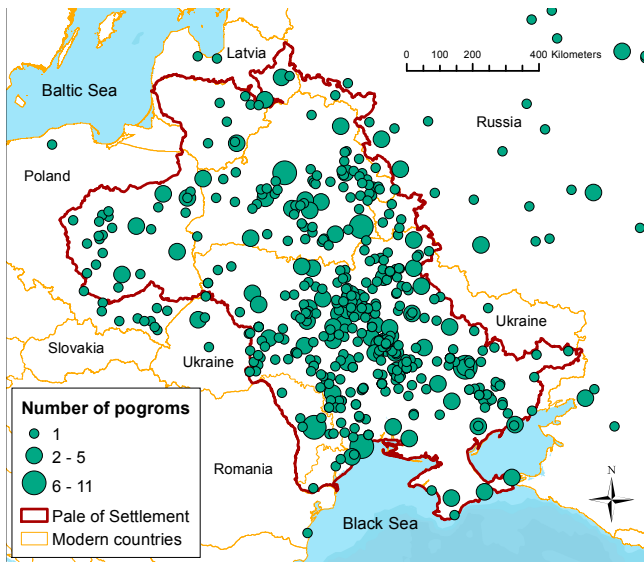
Roadmap

- 1 Intro
- 2 Background
- 3 Data
- 4 Results
 - Main
 - Identification
 - Robustness
 - Mechanisms
- 5 Conclusions

The geographical and historical context

- We focus on the so-called *Pale of Jewish Settlement*, area in the Russian Empire where Jews were allowed to live
 - home of 4.8 million Jews—the largest Jewish population in the world at that time
 - Russian Empire got Jews as a result of the partition of Poland (1772–1795) and confined them to live in the Pale
- The time period spans 1800 to 1927
 - Soviet collectivisation started 1928
- The unit of analysis is a grid cell (0.5×0.5 degrees) in each year
 - total of 576 grid cells

The Pale, the grid, and pogroms (1800–1927)



Jews in the Russian Empire were economically segregated and some were segregated into the middleman occupations

- Jews made up 11.3% of the population and dominated market intermediary professions, i.e., trade and credit:

Across 576 grid cells within the Pale of Settlement, 1897	Mean	Std. Dev.	Min.	Max.
Share of Jews in population	0.103	0.051	0.009	0.263
Share of Jews among creditors (0.04% of total employment)	0.534	0.281	0	1
Share of Jews among grain traders (0.5% of total employment)	0.882	0.175	0.176	1
Share of Jews among non-agricultural traders (1% of total empl.)	0.820	0.198	0.087	0.993
Share of Jews among general traders (1% of total employment)	0.791	0.226	0.068	0.995
Share of Jews among craftsmen (5% of total employment)	0.481	0.208	0.035	0.841
Share of Jews among transporters (1.5% of total employment)	0.350	0.209	0.003	0.913
Share of Jews among peasants (72% of total employment)	0.007	0.006	0	0.041
Share of creditors among Jews	0.002	0.001	0	0.011
Share of grain traders among Jews	0.051	0.037	0.007	0.158
Share of non-agricultural traders among Jews	0.082	0.029	0.032	0.165
Share of general traders among Jews	0.080	0.039	0.011	0.243
Share of craftsmen among Jews	0.249	0.047	0.162	0.491
Share of transporters among Jews	0.039	0.015	0.006	0.095
Share of peasants among Jews	0.046	0.045	0.002	0.278

55% of all Jews are in these 7 occupations

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Novel data covering:

Pogroms:

- Georeferenced pogroms between 1800–1927
 - the first pogrom was in Odessa in 1821
 - 638 pogroms in 385 grid cell \times years

Occupational composition by ethnic groups:

- 1897 census of the Russian Empire
 - data on 65 occupations by 38 ethnicities at the district level

Weather:

- Seasonal temperature for 1725–1927 at the 0.5 x 0.5 degrees grid level

Yield and Price:

- Grain yield at the province level for 1862–1900
- Grain price at the province level for 1860–1915

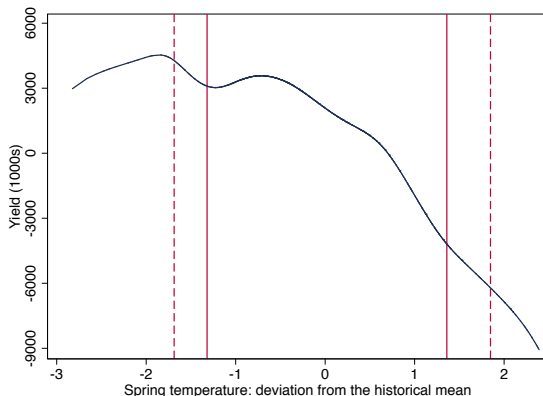
Political turmoil:

- Violent successions (with revolt or assassination), defeats in wars, invasions of Russia, general political strikes, revolutions [▶ List](#)

Agriculture was the dominant sector of the Russian empire

Exposure to heat during early growing season caused crop failure

Spring temperature and grain harvest (1862–1914):



Notes: From left to right, dashed vertical lines represent 5th and 95th percentiles, solid vertical lines represent 10th and 90th percentiles.

Hot spring reduced the grain yield in the 19th and 20th centuries...

	Log of grain yield: 1862–1914								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Hot spring (Local econ shock)	-0.209*** (0.075)								-0.221*** (0.082)
Cold spring		0.109 (0.204)							0.105 (0.203)
Hot summer			-0.363 (0.454)						-0.428 (0.480)
Cold summer				0.181 (0.160)					0.168 (0.162)
Hot autumn					0.120 (0.222)				0.154 (0.220)
Cold autumn						-0.059 (0.098)			-0.053 (0.101)
Hot winter							-0.173 (0.179)		-0.119 (0.179)
Cold winter								0.088 (0.178)	0.090 (0.177)
R-squared	0.593	0.591	0.592	0.592	0.592	0.592	0.592	0.591	0.595
Observations	535	535	535	535	535	535	535	535	535
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47
s.d. of dependent var.	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724

...but other climatic shocks did not

	Log of grain yield: 1862–1914								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
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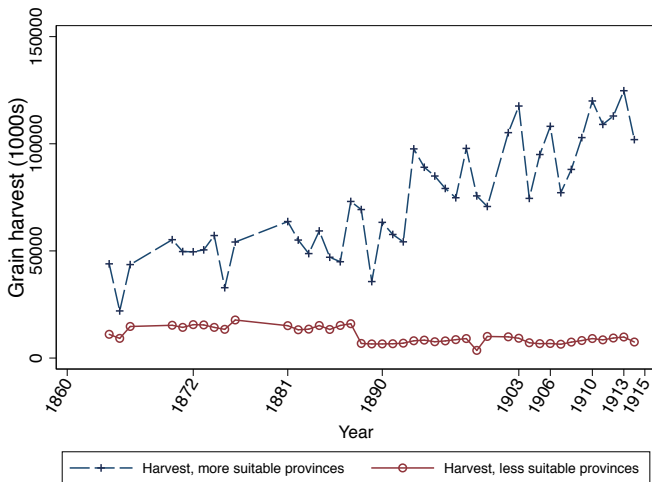
Thus, we define local economic shock as occurrence of hot spring (local crop failure)

	Log grain harvest: 1864–1914			Log price of rye: 1860–1915				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local econ shock	-0.209*** (0.075)	-0.213*** (0.070)	-0.196** (0.080)	0.012 (0.017)	-0.009 (0.021)			
Local econ shock lag		0.028 (0.114)		0.016 (0.019)	-0.015 (0.020)			
Local econ shock x Political turmoil			-0.033 (0.170)					
Local econ shock × High grain suitability					0.035* (0.021)			
Local econ shock lag × High grain suitability					0.061* (0.031)			
Marketwide econ shock						0.053** (0.023)	0.063*** (0.023)	0.077*** (0.027)
Political turmoil							-0.055** (0.022)	-0.026 (0.027)
Marketwide econ shock x Political turmoil								-0.066 (0.044)
High grain suitability					-0.039*** (0.008)			
Log grain price lag				0.745*** (0.029)	0.695*** (0.032)			
Observations	535	535	535	1,294	1,294	1,312	1,312	1,312
R-squared	0.593	0.593	0.593	0.804	0.810	0.013	0.022	0.026
Year FE	Yes	Yes	Yes	Yes	Yes	No	No	No
Province FE	Yes	Yes	Yes	No	No	No	No	No
Mean of dependent var.	15.47	15.47	15.47	3.865	3.865	3.866	3.866	3.866
s.d. of dependent var.	0.724	0.724	0.724	0.216	0.216	0.216	0.216	0.216

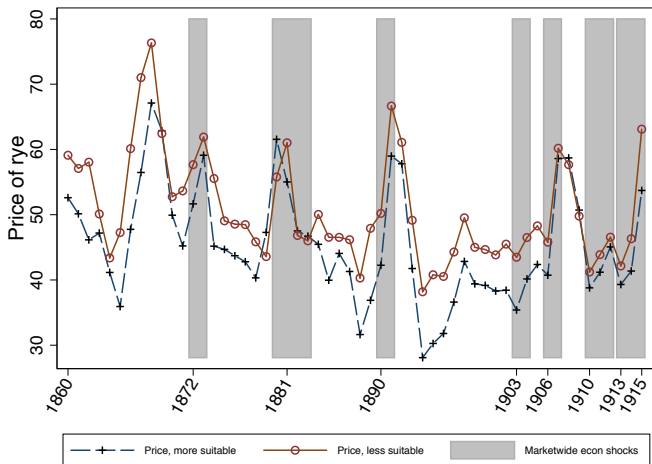
Grain price increased only following crop failure in areas suitable for grain cultivation

	Log grain harvest: 1864–1914			Log price of rye: 1860–1915				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local econ shock	-0.209*** (0.075)	-0.213*** (0.070)	-0.196** (0.080)	0.012 (0.017)	-0.009 (0.021)			
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Year FE	Yes	Yes	Yes	Yes	Yes	No	No	No
Province FE	Yes	Yes	Yes	No	No	No	No	No
Mean of dependent var.	15.47	15.47	15.47	3.865	3.865	3.866	3.866	3.866
s.d. of dependent var.	0.724	0.724	0.724	0.216	0.216	0.216	0.216	0.216

Majority of the total grain was produced in areas with high grain suitability inside the Pale



Pale was a single market for grain: prices co-moved

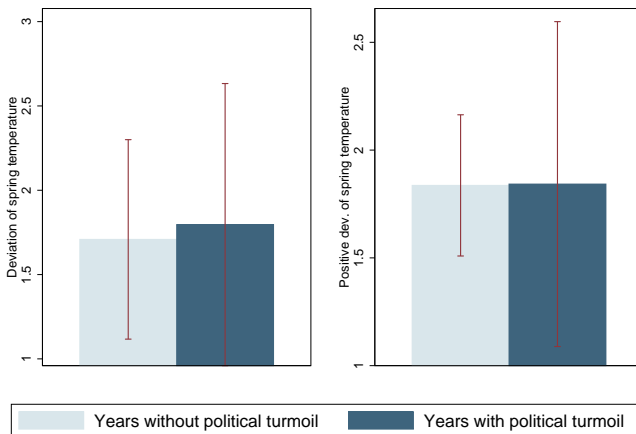


Thus, we define marketwide economic shock as time dummy for local economic shock in suitable areas at time t or $t - 1$

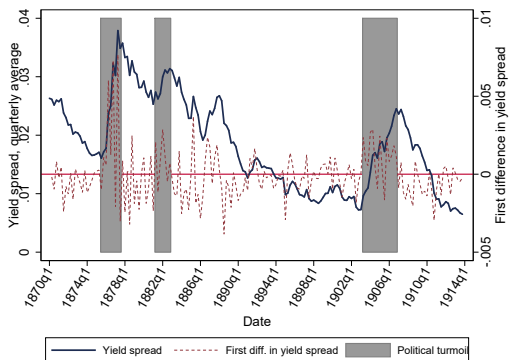
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Economic shocks were not more severe during years with political turmoil

Across grid cells with local economic shock



A check on political turmoil using data from Mauro et al. (2002)
Russia's sovereign bond yield spread (against the British consol) and political turmoil



Political turmoil explains 40% of all of the variation in
year-to-year rise in sovereign yield spread [▶ Table](#)

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Identification stems from within cell variation over time

$$V_{it} = \alpha + \beta E_{it} P_t M_i + \gamma E_{it} + \sigma E_{it} P_t + \delta E_{it} M_i + \theta P_t M_i + X'_{it} \phi + \mu_t + \eta_i + \varepsilon_{it}$$

- V (for violence): dummy for the occurrence of pogroms in a cell×year
- E (for economic shock):
 - local: a dummy for top 5% percent of the distribution of deviation of planting-season temperature from its historical grid-specific mean
 - marketwide: dummy for local econ shock in the same or previous year in areas of the Pale suitable for grain cultivation
- P (for political turmoil): the time of extreme uncertainty about the future
- M (for middlemen): share of Jews among moneylenders, share of Jews among grain traders
- X_i (controls): interactions of shocks with the share of Jews and with sector size
- μ_t = year fixed effect; η_i = grid cell fixed effect
- Standard errors are corrected for both spatial and temporal correlation following Conley (1999) and Hsiang (2010): 100 km radius & one lag ▶ Map

Local and marketwide economic shocks caused pogroms

	Pogrom occurrence						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local econ shock	1.757*** (0.474)		0.003 (0.038)		1.088* (0.584)	0.047 (0.061)	0.058 (0.062)
Marketwide econ shock		1.374*** (0.205)		0.002 (0.022)			
Political turmoil			1.799*** (0.214)	0.861*** (0.162)			
Local econ shock × Political turmoil			2.752*** (0.971)			2.937* (1.620)	3.274** (1.602)
Marketwide econ shock × Political turmoil				3.810*** (0.591)			
Local econ shock × Political turmoil × Share of Jews							33.637* (19.367)
Political turmoil × Share of Jews							0.335 (1.610)
Local econ shock × Share of Jews							-0.105 (0.859)
Marketwide econ shock × Political turmoil × Share of Jews							-0.856 (9.646)
Marketwide econ shock × Share of Jews							-0.049 (0.592)
Observations	73,728	73,728	73,728	73,728	73,728	73,728	73,728
R-squared	0.016	0.019	0.032	0.043	0.113	0.114	0.115
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207	7.207	7.207

But only during political turmoil ...

	Pogrom occurrence						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
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s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207	7.207	7.207

Magnitude

- Mean probability of a pogrom in a grid cell in any given year during 1800–1927 was 0.5%
- A local economic shock during political turmoil increased the probability of pogroms by 2.9 percentage points (41% of the SD of pogrom occurrence)
- A marketwide shock during political turmoil increased it by 3.8 percentage points (52% of the SD of pogrom occurrence)

Share of Jews in middleman occupations

Jewish creditors matter for local shocks and grain traders – for marketwide shocks

	Pogrom occurrence				
	(1)	(2)	(3)	(4)	(5)
Local econ shock × Political turmoil × Sh. Jews among creditors	6.56*** (2.47)				5.95** (2.48)
Local econ shock × Political turmoil × Sh. Jews among grain traders		0.82 (4.41)			
Marketwide econ shock × Political turmoil × Sh. Jews among grain traders			9.38*** (2.75)	9.42*** (2.69)	10.13*** (2.83)
Political turmoil × Sh. Jews among creditors	0.34 (0.62)				0.08 (0.61)
Local econ shock × Sh. Jews among creditors	-0.01 (0.10)				-0.02 (0.10)
Political turmoil × Sh. Jews among grain traders		3.03*** (0.91)	0.05 (0.56)		
Local econ shock × Sh. Jews among grain traders		0.21 (0.19)			
Marketwide econ shock × Sh. Jews among grain traders			0.00 (0.15)		
Local econ shock × Political turmoil	3.34** (1.59)	3.32** (1.57)			4.23*** (1.59)
Local econ shock × Political turmoil × Share of Jews	20.51 (18.05)	38.02* (21.00)			26.53 (19.61)
Observations	73,728	73,728	73,728	73,728	73,728
R-squared	0.118	0.119	0.118	0.118	0.123
Grid and year FE	Yes	Yes	Yes	Yes	Yes
Other interactions with the share of Jews	Yes	Yes	Yes	Yes	Yes
Interactions with the share of creditors in total employed	Yes	No	No	No	Yes
Interactions with the share of grain traders in total employed	No	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207

Local economic shocks and Jews in all main occupations

Panel A: The effects of local economic shocks	Pogrom occurrence							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local econ shock × Pol. turmoil × Sh. Jews among creditors	6.24*** (2.36)							6.92** (2.87)
Pol. turmoil × Sh. Jews among creditors	-0.73 (0.55)							-0.07 (0.64)
Local econ shock × Pol. turmoil × Sh. Jews among grain traders		2.18 (4.45)						-0.88 (5.53)
Pol. turmoil × Sh. Jews among grain traders		2.35*** (0.86)						3.79*** (0.98)
Local econ shock × Pol. turmoil × Sh. Jews among non-agric. traders			2.29 (3.55)					-6.38 (5.59)
Pol. turmoil × Sh. Jews among non-agric. traders			0.29 (0.92)					0.56 (1.59)
Local econ shock × Pol. turmoil × Sh. Jews among general traders				3.18 (3.47)				5.70 (6.72)
Pol. turmoil × Sh. Jews among general traders				0.10 (0.77)				-0.48 (1.45)
Local econ shock × Pol. turmoil × Sh. Jews among craftsmen					8.50* (5.13)			1.54 (7.31)
Pol. turmoil × Sh. Jews among craftsmen					-3.83*** (1.25)			-4.06*** (1.58)
Local econ shock × Pol. turmoil × Sh. Jews among transporters						1.83 (3.29)		-3.75 (3.87)
Pol. turmoil × Sh. Jews among transporters						-1.30 (0.83)		-0.97 (1.05)
Local econ shock × Pol. turmoil × Sh. Jews among peasants							131.37 (159.61)	122.65 (156.28)
Pol. turmoil × Sh. Jews among peasants							-78.33*** (23.74)	-44.05** (21.60)
R-squared	0.117	0.116	0.116	0.116	0.116	0.116	0.116	0.119
Observations	73,728	73,728	73,728	73,728	73,728	73,728	73,728	73,728
Grid and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with the share of Jews	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with local economic shocks in Panel A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207	7.207	7.207	7.207

Marketwide economic shocks and Jews in all main occupations

Panel B: The effects of marketwide economic shocks	Pogrom occurrence							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Marketwide econ shock × Pol. turmoil × Sh. Jews among creditors	1.52 (1.48)							2.14 (1.83)
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders		8.19*** (2.51)						9.41*** (2.89)
Marketwide econ shock × Pol. turmoil × Sh. Jews among non-agric. traders			4.01 (2.47)					2.09 (3.91)
Marketwide econ shock × Pol. turmoil × Sh. Jews among general traders				2.86 (2.08)				-1.43 (3.66)
Marketwide econ shock × Pol. turmoil × Sh. Jews among craftsmen					-2.66 (3.40)			-6.32 (4.57)
Marketwide econ shock × Pol. turmoil × Sh. Jews among transporters						-0.50 (2.29)		-2.86 (2.97)
Marketwide econ shock × Pol. turmoil × Sh. Jews among peasants							-134.90* (75.10)	-71.28 (69.55)
R-squared	0.114	0.116	0.114	0.114	0.114	0.113	0.114	0.117
Observations	73,728	73,728	73,728	73,728	73,728	73,728	73,728	73,728
Grid and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with the share of Jews	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with local economic shocks in Panel A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207	7.207	7.207	7.207

Thus, domination of Jews over middleman occupations servicing agriculture and not over any other occupation was associated with pogroms

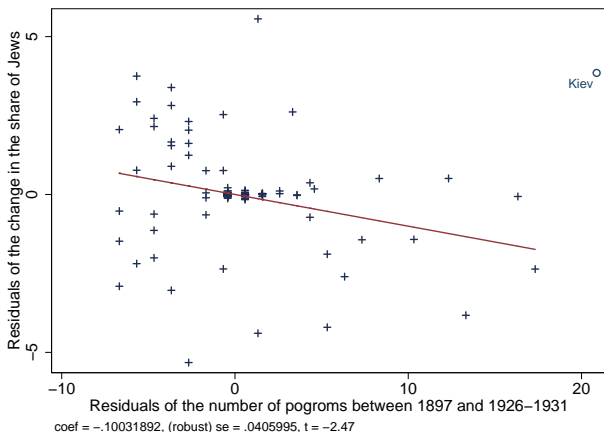
Magnitude

- At the intersection of political turmoil and local and marketwide economic shocks:
 - A 1 SD increases in the share of Jews among creditors (=0.28) and in the share of Jews among grain traders (=0.18), conditional on the share of Jews
 - led to an increase in the probability of a pogrom by 2 percentage points or a 1/4 of the SD of pogrom occurrence (same-size effect)
 - The probability of pogroms was a precisely estimated zero in localities with minimum share of Jews among middlemen and 12.5% in localities where all middlemen were Jews

Likely sources of downward bias in the estimated effects:

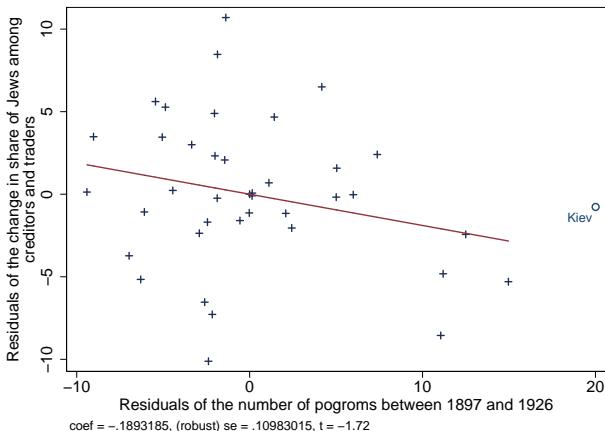
- Measurement error: Jewish inn and bar owners also lent money to Gentiles for interest
- Reverse causality: The share of Jews among creditors and grain traders was measured during 1897 census, but it could be affected by pogroms before 1897
- Omitted variables: Jewish creditors and grain traders might have self-selected into places where Gentiles were less prone to violence

Reaction to pogroms: Emigration



Despite pogroms, in Kiev, the share of Jews increased a lot, as it was easier to hide from pogroms in large cities than in small shtetls

Reaction to pogroms: Move out of middleman occupations



No data for credit and trade separately in 1926 in USSR

A potential source of an upward bias:

The main threat to identification: if in more antisemitic localities, Jews were pushed into specializing more in middleman occupations

- Extremely unlikely because:
 - ① No restrictions on occupational choice beyond agriculture
 - If antisemitism affected occupational composition, it should primarily concern the presence of Jews in agriculture (which was the main traditional occupation of the majority)
 - ② Creditors and grain traders were not common Jewish occupations (0.1% and 5% of Jews), there were always other occupational choices
 - ③ If the shares of Jews among middlemen were a proxy for another unobserved determinant of pogroms, we would have had exactly the same results for grain traders and creditors; in contrast, different economic shocks mattered for different middleman occupations

Are the shares of Jews among middlemen correlated with past antisemitism?

	Occurrence of past anti-Jewish violence				The share of antisemitic books			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share of Jews among creditors	9.11 (13.79)	-7.35 (15.71)	-7.89 (15.97)	-0.54 (14.28)	0.011 (0.017)	-0.005 (0.018)	-0.008 (0.018)	-0.010 (0.019)
Share of Jews among grain traders	44.00*** (15.03)	15.63 (16.46)	22.23 (14.49)	-5.50 (15.52)	0.028* (0.017)	-0.003 (0.016)	0.000 (0.014)	-0.006 (0.010)
Segregation index		78.93** (36.50)				0.082** (0.039)		
Segregation index (w/o middlemen)			75.07** (33.17)				0.087** (0.036)	
Share of Jews among peasants				-1,702.29*** (587.41)				-0.693 (0.537)
Share of Jews among non-agr. traders				23.73 (22.34)				-0.013 (0.023)
Share of Jews among general traders				40.29* (24.01)				0.042** (0.021)
Share of Jews among craftsmen				-49.80** (25.02)				0.056 (0.040)
Share of Jews among transporters				49.73*** (17.50)				0.013 (0.035)
Share of Jews	82.09 (63.23)	66.62 (55.72)	56.91 (55.50)	241.08*** (91.81)	0.233*** (0.073)	0.193*** (0.067)	0.170** (0.068)	0.086 (0.112)
Distance to the origin of 1648 uprising	-2.30** (1.05)	-3.02*** (1.10)	-3.19*** (1.13)	-4.35*** (1.02)				
R-squared	0.092	0.113	0.113	0.245	0.128	0.146	0.152	0.164
Observations	576	576	576	576	576	576	576	576

Local shocks: the results are robust to controlling for past violence, antisemitic books, and occupational segregation

	Pogrom occurrence					
	(1)	(2)	(3)	(4)	(5)	(6)
Local econ shock \times Pol. turmoil \times Sh. Jews among creditors	6.56*** (2.47)	6.89*** (2.51)	5.72** (2.46)	6.14** (2.51)	6.18*** (2.36)	5.88** (2.31)
Local econ shock \times Pol. turmoil \times Past violence against Jews		-1.70 (2.14)		-1.48 (2.33)	-1.47 (2.35)	-1.51 (2.35)
Political turmoil \times Past violence against Jews		2.04*** (0.57)		1.96*** (0.59)	1.67*** (0.57)	1.75*** (0.57)
Local econ shock \times Pol. turmoil \times Log literate non-Jews \times Antisemitic books			0.16 (0.13)	0.14 (0.14)	0.13 (0.15)	0.14 (0.15)
Political turmoil \times Log literate non-Jews \times Antisemitic books			0.06* (0.04)	0.09** (0.04)	0.12*** (0.04)	0.12*** (0.04)
Local econ shock \times Pol. turmoil \times Segregation					-0.15 (9.78)	
Political turmoil \times Segregation					8.54*** (2.23)	
Local econ shock \times Pol. turmoil \times Segregation (w/o middlemen)						1.72 (9.45)
Political turmoil \times Segregation (w/o middlemen)						7.36*** (2.10)
R-squared	0.118	0.120	0.120	0.122	0.123	0.123
Oster's δ for $\beta = 0$		1.918	1.067	2.239	2.238	1.834
Observations	73,728	73,728	73,728	73,728	73,728	73,728
Grid and year FE	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with the share of Jews and the middleman sector shares	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with total number of books published	No	No	Yes	Yes	Yes	Yes
All lower-level interactions	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207	7.207

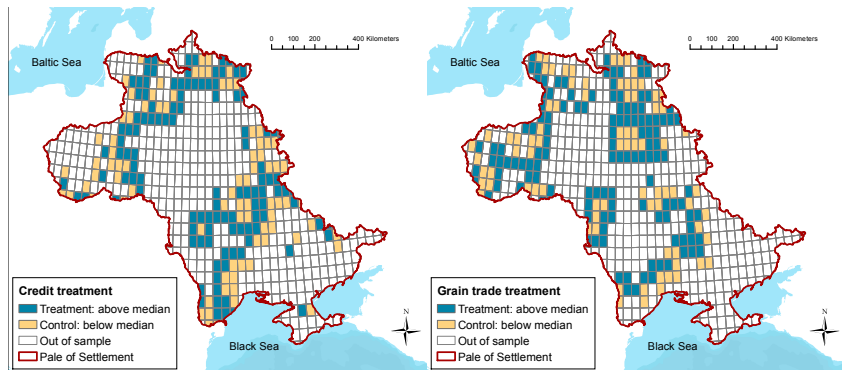
Marketwide shocks: the results are robust to controlling for past violence, antisemitic books, and occupational segregation

	Pogrom occurrence					
	(1)	(2)	(3)	(4)	(5)	(6)
Marketwide econ shock \times Pol. turmoil \times Sh. Jews among grain traders	9.42*** (2.69)	7.85*** (2.59)	9.36*** (2.70)	7.85*** (2.63)	7.07** (3.02)	7.41*** (2.75)
Marketwide econ shock \times Pol. turmoil \times Past violence against Jews		2.90* (1.55)		3.40** (1.63)	3.34** (1.68)	3.36** (1.68)
Marketwide econ shock \times Pol. turmoil \times Log literate non-Jews \times Antisemitic books			0.26*** (0.08)	0.31*** (0.08)	0.32*** (0.09)	0.32*** (0.09)
Marketwide econ shock \times Pol. turmoil \times Segregation					1.62 (5.60)	
Marketwide econ shock \times Pol. turmoil \times Segregation (w/o middlemen)						1.05 (5.12)
R-squared	0.118	0.120	0.120	0.122	0.122	0.122
Oster's δ for $\beta = 0$		5.490	-10.05	9.531	1.789	2.442
Observations	73,728	73,728	73,728	73,728	73,728	73,728
Grid and year FE	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with the share of Jews and the middleman sector shares	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with total number of books published	No	No	Yes	Yes	Yes	Yes
All lower-level interactions	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207	7.207

Spatial matching

The geographic distribution of treatment and control cells in the matching samples

- Treatment (vs. control): above (vs. below) median share of Jews in one of the two middleman occupations
- Each treatment-control pair are subject to the same shocks and the same treatment status for the other middleman occupation



Balance test b/w treated and control cells in the matching samples

Panel A: Sample of all grid cells in the matching sample for T1 with local economic shock and political turmoil						
Treatment 1: Share of Jews among creditors above the median	Unconditional			Conditional on urbanization		
	Coefficient	Standard error	R-squared	Coefficient	Standard error	R-squared
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Jews	-0.0017	(0.0079)	0.0003	0.0070	(0.0080)	0.2090
Share of creditors	-0.0002**	(0.0001)	0.0666	-0.0001	(0.0001)	0.3740
Share of grain traders	0.0002	(0.0004)	0.0012	0.0003	(0.0004)	0.0018
Rye suitability index	0.6524	(1.8363)	0.0003	-0.5586	(2.1463)	0.0249
Past violence against Jews	-0.0600	(0.0490)	0.0052	-0.0658	(0.0492)	0.0063
Share of antisemitic books	0.0013	(0.0046)	0.0001	0.0037	(0.0062)	0.0119
Literacy rate of Jews	0.0019	(0.0076)	0.0002	0.0001	(0.0077)	0.0039
Literacy rate of non-Jews	-0.0086	(0.0112)	0.0022	-0.0022	(0.0118)	0.0314
Gap in literacy rate between Jews and non-Jews	0.0018	(0.0130)	0.0018	0.0023	(0.0126)	0.0284
Share of Catholics	-0.0328	(0.0478)	0.0029	-0.0235	(0.0538)	0.0085
Share of agriculture	0.0329**	(0.0153)	0.0363	0.0164	(0.0140)	0.2590
Urbanization rate	-0.0371**	(0.0148)	0.0398			
N=649						
Panel B: Sample of all grid cells in the matching sample for T2 with marketwide economic shock and political turmoil						
Treatment 2: Share of Jews among grain traders above the median	Unconditional			Conditional on urbanization		
	Coefficient	Standard error	R-squared	Coefficient	Standard error	R-squared
	(1)	(2)	(3)	(4)	(5)	(6)
Share of Jews	-0.0079	(0.0073)	0.0092	-0.0024	(0.0070)	0.1690
Share of creditors	-0.0002**	(0.0001)	0.0329	-0.0001	(0.0001)	0.6190
Share of grain traders	0.0001	(0.0004)	0.0002	0.0003	(0.0004)	0.0518
Rye suitability index	0.3176	(2.0168)	0.0001	1.0282	(2.1296)	0.0152
Past violence against Jews	-0.0308	(0.0734)	0.0016	-0.0372	(0.0770)	0.0040
Share of antisemitic books	0.0078	(0.0048)	0.0071	0.0085	(0.0054)	0.0086
Literacy rate of Jews	-0.0088	(0.0096)	0.0038	-0.0092	(0.0101)	0.0040
Literacy rate of non-Jews	-0.0295*	(0.0171)	0.0217	-0.0191	(0.0175)	0.1180
Gap in literacy rate between Jews and non-Jews	0.0207	(0.0186)	0.0068	0.0099	(0.0196)	0.0717
Share of Catholics	-0.0134	(0.0408)	0.0004	0.0003	(0.0423)	0.0151
Share of agriculture	0.0394**	(0.0173)	0.0330	0.0141	(0.0120)	0.5150
Urbanization rate	-0.0361*	(0.0191)	0.0275			
N=2,120						

Results of nearest neighbor matching estimation

Panel A: The effect of the treatment T1:		Pogrom occurrence					
Share of Jews among creditors > the median	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local econ shock x Political turmoil × 1(T1)	4.76*** (1.33)	4.30*** (1.54)	4.13*** (1.54)	4.17*** (1.52)	4.17*** (1.52)	4.30*** (1.42)	3.52** (1.37)
Local econ shock x Political turmoil x Share of Jews	15.29 (18.13)		16.88 (21.64)	16.93 (21.96)	16.93 (21.96)	17.88 (17.96)	105.31** (41.07)
Observations	73,728	24,652	24,652	24,652	24,652	649	800
R-squared	0.119	0.152	0.156	0.156	0.156	0.109	0.247
Mean of dependent var.	0.522	0.564	0.564	0.564	0.564	3.852	3.250
Panel B: The effect of the treatment T2:		Pogrom occurrence					
Share of Jews among grain traders > the median	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Marketwide econ shock × Pol. turmoil × 1(T2)	1.99** (0.93)	2.33** (1.02)	2.18** (0.99)	2.23** (0.98)	2.49*** (0.96)	2.23** (1.06)	2.44** (0.98)
Market-wide econ shock × Political turmoil × Share of Jews	-2.33 (10.67)		-14.73 (22.27)	-16.62 (26.90)	19.15 (29.00)	-17.53 (32.61)	-5.72 (23.53)
Observations	73,728	27,136	27,136	27,136	27,136	2,120	2,600
R-squared	0.117	0.108	0.111	0.111	0.125	0.0407	0.141
Mean of dependent var.	0.522	0.604	0.604	0.604	0.604	5.802	5.462
Sample grid cells (M for matched):	All	M	M	M	M	M	M
Sample years (EP for econ & pol. shocks only):	All	All	All	All	All	EP	EP
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid FE	Yes	Yes	Yes	Yes	Yes	No	No
Treatment-control pair FE	No	No	No	No	No	No	Yes
Interactions with the share of Jews and sectors shares	Yes	No	Yes	Yes	Yes	Yes	Yes
Interactions with urbanization rate	No	No	No	Yes	Yes	Yes	Yes
Interactions with latitude and longitude	No	No	No	No	Yes	No	No

The results are also robust to:

- Using alternative measures:
 - Dummy for rising sovereign bond yield spread as political turmoil
 - Log grain price as marketwide economic shock [▶ Table](#)
 - Deviation of spring temperature from grid-specific mean as local economic shock [▶ Table](#)
 - Logs rather than shares of Jews in middleman occupations [▶ Table](#)
- Changes in the sample and in the aggregation level: [▶ Table](#)
 - Subsample after the abolition of serfdom
 - Subsample without large cities
 - Districts instead of grid cells as the cross-sectional unit of analysis
 - 1×1 degree grid cells instead of 0.5
- Different assumptions about variance-covariance matrix: [▶ Table](#)
 - Conley correction at 50, 200, 500 km spatial radii and 1, 3, 5, 10 lags
 - Cluster by grid cell or by district
- Additional controls:
 - Other minorities, agricultural commercialization, distance to railways, land Gini, tax rate [▶ Minorities local](#) [▶ Minorities marketwide](#)
[▶ Other controls local](#) [▶ Other controls marketwide](#)

Mechanism: Repeated interactions and uncertainty

- Historians show that both complete forgiveness of debt and rolling over debt to the future period were common despite good enforcement of debt contracts in the Russian empire
- Both moneylenders and grain traders extended credit
 - In times of crop failure, creditors forgave peasants' debts and traders in grain extended trade credit to grain buyers
- Thus, middlemen served as providers of insurance
 - This could be sustained in equilibrium only because of the repeated interactions: the value of future transactions made it worthwhile to forgive debt in case of a shock
- Political turmoil made the continuation too uncertain, debtors could not commit to borrow in the future, thus, creditors/grain traders demanded immediate repayments
 - Commercialization of agriculture reduced the effects of shocks and Jewish middlemen, consistent with the view that it helps to smooth shocks

Mechanism: Scapegoating?

- In history, the majority often channeled anger from economic or political hardships into violence against Jews, as the minority was falsely accused of being a reason for majority's misfortunes
- Both cross-sectional and over-time determinants of pogroms suggest a more complicated mechanism
 - Religious persecution implies that Jews are targeted as a group irrespective of their occupations (contrary to evidence)
 - Group stereotyping of an “unproductive” middleman minority should concern all middlemen and not only those servicing agriculture

Is political turmoil a proxy for weak enforcement of law and order?

The results hold for the pre-1917 subsample, when state capacity was intact

	Pogrom occurrence							
	(1)		(2)	(3)		(4)	(5)	(6)
	Waves 1 & 2	Wave 3	All waves	Waves 1 & 2	Wave 3	All waves		
Sample of pogroms waves: 1 (1881–1882); 2 (1903–1906); 3 (1917–1922):								
Local econ shock × Sh. Jews among creditors	10.62*** (3.93)	6.46* (3.78)	10.62*** (3.93)					
Local econ shock × Sh. Jews among creditors × 1(Wave 3)			-4.16 (5.45)					
Local econ shock × Share of Jews	-6.15 (22.20)	57.19*** (20.49)	-6.15 (22.20)					
Local econ shock × Share of Jews × 1(Wave 3)			63.34** (30.21)					
Marketwide econ shock × Sh. Jews among grain traders				7.59* (4.23)	8.57*** (2.85)	7.59* (4.23)		
Marketwide econ shock × Sh. Jews among grain traders × 1(Wave 3)						0.98 (5.10)		
Marketwide econ shock × Share of Jews				-25.76 (17.41)	18.44 (13.95)	-25.76 (17.41)		
Marketwide econ shock × Share of Jews × 1(Wave 3)						44.20** (22.31)		
Observations	3,456	3,456	6,912	3,456	3,456	6,912		
R-squared	0.285	0.279	0.203	0.0659	0.0425	0.0610		
Year FE	Yes	Yes	Yes	Yes	Yes	Yes		
Grid FE	Yes	Yes	Yes	No	No	No		
Mean of dependent var.	6.887	3.993	5.440	6.887	3.993	5.440		
s.d. of dependent var.	25.33	19.58	22.68	25.33	19.58	22.68		

Are we picking up general crime increase (as in Bignon et al. 2015)?
Theft, homicide, and arson (1900-1912) as placebo outcomes

	Pogrom occurrence	Theft per capita	Homicide per capita	Arson per capita
Panel A: Effect of local econ shock	(1)	(2)	(3)	(4)
Local econ shock × Political turmoil × Sh. Jews among creditors	9.84*** (3.44)	-98.87 (76.71)	-8.91 (9.13)	-77.83 (59.32)
Local econ shock × Political turmoil × share of Jews	-6.11 (20.33)	413.97 (334.49)	35.03 (45.93)	298.28 (254.76)
R-squared	0.205	0.921	0.831	0.915
Panel B: Effect of marketwide econ shock	(1)	(2)	(3)	(4)
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders	3.77* (2.13)	91.60 (88.67)	30.78 (23.79)	7.81 (13.70)
Marketwide econ shock × Pol. turmoil × share of Jews	14.79 (9.43)	-168.53 (145.73)	-40.87 (31.98)	-11.75 (9.54)
R-squared	0.201	0.921	0.831	0.915
Observations	7,488	6,422	6,422	5,434
Grid and year FE	Yes	Yes	Yes	Yes
Interactions with the share of Jews	Yes	Yes	Yes	Yes
All lower level interactions	Yes	Yes	Yes	Yes
Mean of dependent var.	1.950	50.51	7.758	20.45
s.d. of dependent var.	13.83	624.6	102.9	287.7

Ethnic inequality or shocks to *relative* income (as in Mitra and Ray 2014)?

- Jews were not the economic elite due to discrimination, but middlemen were richer than cobblers
 - Yet, grain traders and creditors were not richer than other middlemen
- Shocks to income gap depended on occupations of Jews
 - Jewish creditors were hit by the crop failure shocks directly through an increase in default rate
 - Traders in nonagricultural products and craftsmen through a demand shock
 - Grain traders may actually have benefitted from increase in grain price
- Given that traders in non-agricultural goods are not associated with pogroms, but traders in grain and creditors are, the evidence is inconsistent with the relative income mechanism
 - The Hindu-Muslim violence story is about competition; Mitra and Ray recognize that in the case of occupational segregation the results would not hold

Roadmap

- 1 Intro
- 2 Background
- 3 Data
- 4 Results
 - Main
 - Identification
 - Robustness
 - Mechanisms
- 5 Conclusions**

Conclusions

- Pogroms occurred when severe economic shocks coincided with political turmoil in localities where Jews dominated credit and trade in grain
- Scapegoating and ethnic inequality cannot fully explain this evidence
- Jewish middlemen were the providers of insurance to the majority against economic crises; but political turmoil made the implicit insurance contracts nonviable as they were based on repeated interactions
- As a result, the concomitance of economic and political shocks resulted in three major waves of pogroms in which Jewish middlemen were the primary target

Broader lessons:

- Political shocks interact with income shocks to trigger ethnic conflict
- Occupational segregation across ethnic groups might not reduce conflict, even though it does reduce interethnic competition
 - this happens when minorities specialize in middleman occupations

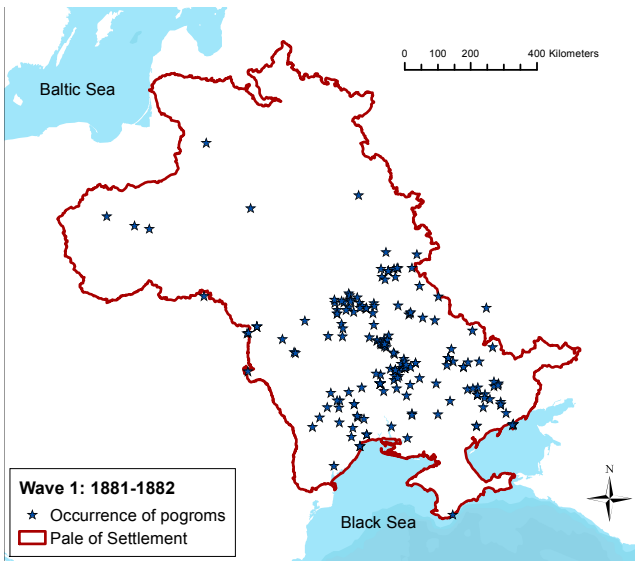
Appendix

Definition of political turmoil

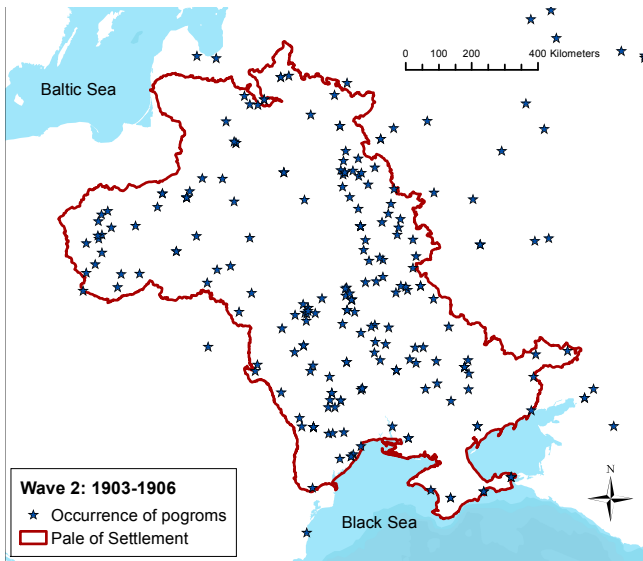
- 1803–1807 – Defeat in the Third and Fourth Coalition Wars
- 1812 – Napoleon in Russia
- 1825 – Abdication of Throne by Constantine Pavlovich
 - December uprising
- 1855–1856 – Defeat in Crimean War
- 1875–1877 – Russo-Turkish War
- 1881 – Assassination of Alexander II
- 1903–1905 – General strikes
- 1904–1905 – Defeat in Russian-Japanese War
- 1905 – The first Russian revolution
- 1916–1917 – Defeat in WWI
- 1917 – The second and third Russian revolutions
- 1917–1922 – The Russian Civil War

▶ Back

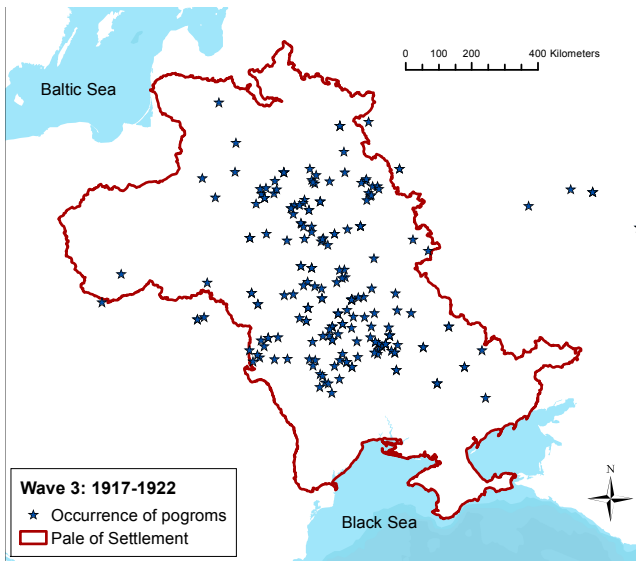
First pogrom wave (1881–1882)



Second pogrom wave (1903–1906)



Third pogrom wave (1917–1922)



Distribution of ethnic groups in middleman occupations

Variable	Mean	Std. Dev.	Min.	Max.	N
Panel A: The share of ethnic groups in credit					
Share of Jews among creditors	0.534	0.281	0	1	576
Share of Russians among creditors	0.218	0.230	0	1	576
Share of Poles among creditors	0.136	0.219	0	1	576
Share of Ukrainians among creditors	0.046	0.092	0	0.51	576
Share of Germans among creditors	0.015	0.038	0	0.285	576
Share of Belorussians among creditors	0.015	0.063	0	0.84	576
Share of Lithuanians among creditors	0.005	0.028	0	0.232	576
Share of Moldovans among creditors	0.002	0.012	0	0.141	576
Share of Latvians among creditors	0.0003	0.002	0	0.027	576
Share of other ethnicities among creditors	0.016	0.056	0	0.45	576
Panel B: The share of ethnic groups in grain trade					
Share of Jews among grain traders	0.882	0.175	0.176	1	576
Share of Russians among grain traders	0.043	0.091	0	0.521	576
Share of Ukrainians among grain traders	0.018	0.036	0	0.289	576
Share of Poles among grain traders	0.010	0.047	0	0.674	576
Share of Latvians among grain traders	0.003	0.016	0	0.163	576
Share of Belorussians among grain traders	0.007	0.030	0	0.281	576
Share of Lithuanians among grain traders	0.002	0.012	0	0.222	576
Share of Germans among grain traders	0.003	0.008	0	0.091	576
Share of Moldovans among grain traders	0.001	0.005	0	0.048	576
Share of other ethnicities among grain traders	0.028	0.095	0	0.697	576

Correlations between government grain assistance and grain yields and prices and between sovereign bond yield spread and political turmoil dummy

	Dummy: Received government assistance	No. of provinces that received government assistance	Rising sovereign bond spread yield
<i>Data set:</i>	panel	time series	time series
	(1)	(2)	(3)
Grain harvest (1000s chet)	-0.020** (0.010)		
Log grain price		2.254** (0.954)	
Political turmoil			0.744*** (0.117)
Observations	333	34	42
R-squared	0.298	0.172	0.452
Province and year FE	Yes	No	No

Correlation between past anti-Jewish violence and antisemitic books in the 18th century

Dependent variable:	Occurrence of past anti-Jewish violence					
	Publication			Publication		
Sample:	All cells	All cells	towns	All cells	All cells	Publication
	(1)	(2)	(3)	(4)	(5)	towns
	(1)	(2)	(3)	(4)	(5)	(6)
Number of anti-Semitic books	12.97* (7.27)	12.94* (7.41)	12.27* (6.43)			
Number of published books	-0.22** (0.11)	-0.21* (0.11)	-0.20** (0.10)			
Share of anti-Semitic books				156.23 (98.26)	210.43** (90.07)	144.50* (77.18)
Distance to the origin of 1648 uprising (km)		-0.59 (0.90)	-4.38* (2.58)		-1.92** (0.82)	-5.06** (2.42)
Observations	576	576	64	576	576	64
R-squared	0.0540	0.0566	0.180	0.0374	0.0653	0.145
Mean of dependent var.	16.84	16.84	29.69	16.84	16.84	29.69
s.d. of dependent var.	37.45	37.45	46.05	37.45	37.45	46.05

▶ Back

Grain yield and grain price and robustness of the definitions of local and marketwide economic shocks

	Log price of rye: 1860-1915					
	(1)	(2)	(3)	(4)	(5)	(6)
Log grain harvest	-0.120*** (0.019)	-0.020** (0.010)				
Local econ shock			-0.009 (0.021)			
Local econ shock lag			-0.016 (0.021)			
Local econ shock second lag			0.013 (0.019)			
Local econ shock × High grain suitability				0.035 (0.021)		
Local econ shock lag × High grain suitability				0.059* (0.032)		
Local econ shock second lag × High grain suitability				0.004 (0.031)		
Marketwide econ shock					0.064*** (0.022)	0.086*** (0.027)
Political turmoil					-0.055*** (0.021)	-0.029 (0.024)
Marketwide econ shock × Political turmoil						-0.056 (0.042)
High grain suitability			-0.039*** (0.009)			
Log grain price lag				0.694*** (0.032)		
Log grain price second lag					0.349*** (0.045)	0.347*** (0.045)
Observations	523	523	1,294	1,280	1,280	1,280
R-squared	0.130	0.823	0.810	0.134	0.143	0.145
Year FE	No	Yes	Yes	No	No	No
Province FE	No	Yes	No	No	No	No
Mean of dependent var.	3.810	3.810	3.865	3.865	3.865	3.865
s.d. of dependent var.	0.241	0.241	0.216	0.217	0.217	0.217

Local econ shocks lead to pogroms in harvesting season: and it is not driven by the direct effect of temperature

	Pogrom occurrence harvesting season	
	(1)	(2)
Hot spring	0.011 (0.029)	0.009 (0.029)
Hot spring × Political turmoil	1.353* (0.715)	1.355* (0.715)
Hot spring × Political turmoil x Share of Jews	25.573** (12.441)	25.570** (12.440)
Hot spring × Share of Jews	-0.311 (0.621)	-0.309 (0.632)
Political turmoil × Share of Jews	3.154*** (0.848)	3.061*** (0.877)
Marketwide econ shock × Political turmoil x Share of Jews	-1.415 (4.705)	-1.314 (4.717)
Marketwide econ shock × Share of Jews	0.312 (0.520)	0.293 (0.523)
Hot summer		-0.047 (0.031)
Hot summer × Political turmoil		-0.013 (0.239)
Hot summer × Political turmoil x Share of Jews		2.552 (5.159)
Hot summer × Share of Jews		-0.508 (0.335)
R-squared	0.0491	0.0492
Observations	73,728	73,728
Year FE	Yes	Yes
Grid FE	Yes	Yes
Mean of dependent var.	0.167	0.167
s.d. of dependent var.	4.081	4.081

Robustness to changes in the sample, aggregation, and definition of political turmoil, and the construction of climate data

Robustness to:	Pogrom occurrence								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Climate data:		Definition of political turmoil:			Sample:		Aggregation:	
	without years 1880-82	no data correction	do not add year after	add 2 years after	add 1 year before	post 1861	without large cities	1x1 degree level	uezd level
Local econ shock × Pol turmoil × Sh. Jews among creditors	5.52** (2.18)	5.58** (2.20)	6.83** (3.40)	6.13** (2.45)	6.78** (3.19)	5.70** (2.66)	5.77** (2.48)	14.08** (6.89)	9.66*** (3.18)
Marketwide econ shock × Pol turmoil × Sh. Jews among grain traders	7.65*** (2.32)	7.72*** (2.33)	10.84*** (3.49)	8.37*** (2.35)	7.85*** (2.51)	11.25*** (2.87)	9.07*** (2.80)	21.96*** (7.67)	8.14** (3.77)
Local econ shock × Pol turmoil	1.00 (0.75)	0.94 (0.75)	5.42*** (2.04)	4.05** (1.58)	4.87*** (1.54)	4.20*** (1.59)	4.32*** (1.61)	6.01* (3.37)	6.98** (3.15)
Local econ shock × Pol turmoil × Share of Jews	16.52 (17.95)	18.65 (17.98)	35.10 (28.48)	24.06 (18.81)	30.47 (24.51)	32.90* (19.75)	30.05 (19.39)	38.44 (49.47)	-6.53 (29.60)
Observations	72,000	73,728	73,728	73,728	73,728	38,016	72,576	21,376	30,208
R-squared	0.117	0.120	0.125	0.122	0.123	0.133	0.119	0.243	0.206
Grid and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other interactions with the share of Jews	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with the share of creditors in total employed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions with the share of grain traders in total employed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.407	0.522	0.522	0.522	0.522	1.005	0.508	1.244	0.943
s.d. of dependent var.	6.366	7.207	7.207	7.207	7.207	9.974	7.112	11.09	9.667

▶ Back

Robustness to different assumptions about the variance-covariance matrix

	Pogrom occurrence			
	(1)	(2)	(3)	(4)
Explanatory variable of interest:	Local econ shock × Political turmoil × Sh. Jews among creditors	Marketwide econ shock × Political turmoil × Sh. Jews among grain traders	Local econ shock × Political turmoil × Share of Jews	Local econ shock × Political turmoil
Coefficient:	5.95	10.13	26.53	4.23
Standard error under the following assumptions:				
(1) Conley correction at 50 km and 1 lag	(1.99)***	(2.01)***	(14.64)*	(1.08)***
(2) Conley correction at 200 km and 1 lag	(2.95)**	(3.64)***	(24.67)	(1.88)**
(3) Conley correction at 500 km and 1 lag	(2.81)**	(4.22)**	(17.50)	(1.75)**
(4) Conley correction at 100 km and 3 lags	(2.50)**	(2.84)***	(19.56)	(1.60)***
(5) Conley correction at 100 km and 5 lags	(2.50)**	(2.84)***	(19.56)	(1.60)***
(6) Conley correction at 100 km and 10 lags	(2.51)**	(2.85)***	(19.56)	(1.60)***
(7) Conley correction at 500 km and 10 lags	(2.84)**	(4.24)**	(17.44)	(1.75)**
(8) Cluster by grid cell	(1.71)***	(2.00)***	(12.97)**	(0.87)***
(9) Cluster by district (uezd)	(2.08)***	(2.73)***	(16.01)*	(1.16)***
Observations:	73,728			
R-squared:	0.123			

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Robustness of results to using a continuous measure of local economic shocks

	Pogrom occurrence							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dev spring temperature	0.142*** (0.028)	0.328*** (0.120)	0.000 (0.023)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Dev spring temp. × Political turmoil			1.063*** (0.379)	1.04*** (0.38)	1.03*** (0.38)	1.02*** (0.38)	1.03*** (0.38)	0.93*** (0.41)
Dev spring temp. × Political turmoil × Share of Jews				7.27** (3.08)	5.53* (2.85)	5.95* (3.26)	6.89** (3.46)	7.46* (3.96)
Dev spring temp. × Share of Jews				0.10 (0.21)	0.10 (0.27)	0.12 (0.33)	0.12 (0.30)	0.10 (0.27)
Political turmoil × Share of Jews				2.49 (3.22)	1.84 (3.37)	-2.09 (4.00)	-2.45 (4.04)	4.67 (3.06)
Dev spring temp. × Political turmoil × Sh. Jews among creditors					0.87** (0.42)	0.93** (0.47)		0.60 (0.45)
Dev spring temp. × Sh. Jews among creditors					0.00 (0.04)	0.00 (0.03)		-0.00 (0.04)
Political turmoil × Sh. Jews among creditors					0.13 (0.56)	-0.44 (0.60)		-0.39 (0.57)
Dev spring temp. × Political turmoil × Sh. Jews among grain traders						-0.31 (0.56)	0.24 (0.48)	
Dev spring temp. × Sh. Jews among grain traders						-0.02 (0.05)	-0.01 (0.06)	
Political turmoil × Sh. Jews among grain traders						2.87*** (0.99)	2.74*** (0.93)	
Marketwide econ shock × Political turmoil × Share of Jews								-19.91 (14.33)
Marketwide econ shock × Political turmoil × Sh. Jews among grain traders								8.17*** (2.65)
Observations	73,728	73,728	73,728	73,728	73,728	73,728	73,728	73,728
R-squared	0.0133	0.113	0.114	0.115	0.116	0.117	0.116	0.119
Grid FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207	7.207	7.207	7.207

Robustness of results to using log number of Jews in middleman occupations

	Pogrom occurrence				
	(1)	(2)	(3)	(4)	(5)
Local econ shock × Political turmoil × Log Jewish creditors	4.14*** (1.39)				3.75*** (1.40)
Local econ shock × Political turmoil × Log Jewish grain traders		1.86 (2.64)			
Marketwide econ shock × Political turmoil × Log Jewish grain traders			4.47*** (1.39)	4.29*** (1.34)	4.09*** (1.33)
Political turmoil × Log Jewish creditors	0.71* (0.38)				0.53 (0.37)
Local econ shock × Log Jewish creditors	0.06 (0.06)				0.05 (0.06)
Political turmoil × Log Jewish grain traders		1.03** (0.47)	-0.22 (0.35)		
Local econ shock × Log Jewish grain traders		0.08 (0.09)			
Marketwide econ shock × Log Jewish grain traders			0.00 (0.08)		
Local econ shock × Political turmoil	3.40** (1.58)	3.50** (1.59)			4.23*** (1.59)
Local econ shock × Political turmoil × Share of Jews	19.60 (20.50)	36.67* (21.46)			33.42 (22.18)
Observations	73,728	73,728	73,728	73,728	73,728
R-squared	0.121	0.120	0.121	0.121	0.128
Grid and year FE; interactions with the share of Jews	Yes	Yes	Yes	Yes	Yes
Interactions with log creditors	Yes	No	No	No	Yes
Interactions with log grain traders	No	Yes	Yes	Yes	Yes
Interactions with log total population	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207

Robustness to controlling for the presence of other minorities, local econ shocks

Panel A: The effects of the share of Jews among creditors and local economic shocks	Pogrom occurrence				
	(1)	(2)	(3)	(4)	(5)
Local econ shock × Pol. turmoil × Sh. Jews among creditors	6.16*** (2.35)	6.30*** (2.40)	6.24** (2.45)	7.52*** (2.48)	7.11** (2.80)
Local econ shock × Sh. Jews among creditors	-0.01 (0.10)	-0.02 (0.10)	-0.03 (0.10)	-0.02 (0.09)	0.01 (0.10)
Pol. turmoil × Sh. Jews among creditors	0.18 (0.61)	0.05 (0.62)	0.21 (0.61)	0.61 (0.62)	0.79 (0.66)
Local econ shock × Pol. turmoil × Share of Germans	-21.92 (15.71)				
Local econ shock × Share of Germans	-0.40 (0.74)				
Pol. turmoil × Share of Germans	-10.22*** (3.96)				
Local econ shock × Pol. turmoil × Share of Germans among creditors		-7.31 (6.84)			
Local econ shock × Share of Germans among creditors		-0.36 (0.40)			
Pol. turmoil × Share of Germans among creditors		-8.88*** (2.50)			
Local econ shock × Pol. turmoil × Share of Russians			-7.22 (5.55)		
Local econ shock × Share of Russians			-0.39* (0.21)		
Pol. turmoil × Share of Russians			-3.07** (1.21)		
Local econ shock × Pol. turmoil × Sh. of Russians among creditors				3.52 (4.74)	
Local econ shock × Sh. of Russians among creditors				-0.03 (0.16)	
Pol. turmoil × Sh. of Russians among creditors				0.96 (0.82)	
Local econ shock × Pol. turmoil × Share of the biggest minority among creditors					1.59 (3.48)
Local econ shock × Share of the biggest minority among creditors					0.06 (0.13)
Pol. turmoil × Share of the biggest minority among creditors					1.34** (0.67)
R-squared	0.119	0.118	0.119	0.119	0.119
Observations	73,728	73,728	73,728	73,728	73,728
Grid and year FE	Yes	Yes	Yes	Yes	Yes
Interactions with the share of Jews and sector shares	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207

Robustness to controlling for the presence of other minorities, marketwide econ shocks

	Pogrom occurrence				
	(1)	(2)	(3)	(4)	(5)
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders	7.71*** (2.45)	9.28*** (2.60)	8.13*** (2.63)	9.37*** (2.50)	9.95*** (2.56)
Marketwide econ shock × Pol. turmoil × Share of Germans	-25.99*** (9.65)				
Marketwide econ shock × Pol. turmoil × Share of Germans among grain traders		-11.41 (46.95)			
Marketwide econ shock × Pol. turmoil × Share of Russians			-3.75 (2.56)		
Marketwide econ shock × Pol. turmoil × Share of Russians among grain traders				-0.12 (4.62)	
Marketwide econ shock × Pol. turmoil × Share of the biggest minority among grain traders					2.19 (4.44)
R-squared	0.119	0.118	0.118	0.118	0.118
Observations	73,728	73,728	73,728	73,728	73,728
Grid and year FE	Yes	Yes	Yes	Yes	Yes
Interactions with the share of Jews and sector shares	Yes	Yes	Yes	Yes	Yes
Mean of dependent var.	0.522	0.522	0.522	0.522	0.522
s.d. of dependent var.	7.207	7.207	7.207	7.207	7.207

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Potential heterogeneous effects of specialization of Jews in credit and grain trade, local econ shocks

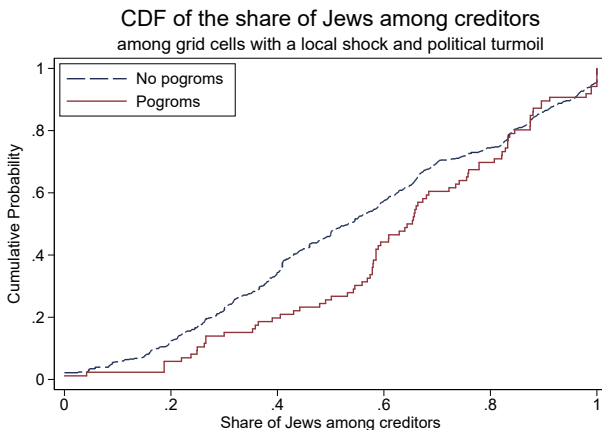
Panel A: The effects of local economic shocks	Pogrom occurrence			
	(1)	(2)	(3)	(4)
Local econ shock × Pol. turmoil × Sh. Jews among creditors	6.55*** (2.36)	6.62*** (2.51)	5.24* (2.98)	7.15*** (2.76)
Local econ shock × Sh. Jews among creditors	0.00 (0.10)	0.01 (0.11)	-0.04 (0.12)	-0.01 (0.10)
Pol. turmoil × Sh. Jews among creditors	0.37 (0.62)	0.60 (0.63)	-0.90 (0.82)	0.08 (0.60)
Local econ shock × Pol. turmoil × Agricult. commercialization	-5.56** (2.28)			
Pol. turmoil × Agricult. commercialization	-0.03 (0.42)			
Local econ shock × Pol. turmoil × Sh. Jews among creditors × Agricult. commercialization	-12.90 (8.43)			
Local econ shock × Pol. turmoil × Distance to railway network		-0.67 (1.83)		
Pol. turmoil × Distance to railway network		-1.34** (0.38)		
Local econ shock × Pol. turmoil × Sh. Jews among creditors × Distance to railway network		2.49 (5.17)		
Local econ shock × Pol. turmoil × Land Gini			0.92 (2.96)	
Pol. turmoil × Land Gini			4.19*** (0.87)	
Local econ shock × Pol. turmoil × Sh. Jews among creditors × Land Gini			-10.39 (11.72)	
Local econ shock × Pol. turmoil × Tax rate				-0.02 (0.55)
Pol. turmoil × Tax rate				0.21 (0.15)
Local econ shock × Pol. turmoil × Sh. Jews among creditors × Tax rate				-4.47*** (1.59)
R-squared	0.120	0.119	0.129	0.119
Observations	73,216	73,728	66,176	73,728
Grid and year FE	Yes	Yes	Yes	Yes
Interactions with the share of Jews and sector shares	Yes	Yes	Yes	Yes
Mean of dependent var.	0.524	0.522	0.558	0.522
s.d. of dependent var.	7.223	7.207	7.446	7.207

Potential heterogeneous effects of specialization of Jews in credit and grain trade, marketwide econ shocks

Panel B: The effects of marketwide economic shocks	Pogrom occurrence			
	(1)	(2)	(3)	(4)
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders	8.50*** (2.66)	8.81*** (2.83)	8.38*** (2.75)	11.71*** (3.82)
Marketwide econ shock × Pol. turmoil × Agricult. commercialization	-3.67*** (1.19)			
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders × Agricult. commercialization	-16.92** (6.82)			
Marketwide econ shock × Pol. turmoil × Distance to railway network		-1.86* (1.09)		
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders × Distance to railway network		-0.40 (3.99)		
Marketwide econ shock × Pol. turmoil × Land Gini			7.00*** (2.36)	
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders × Land Gini			10.87 (7.92)	
Marketwide econ shock × Pol. turmoil × Tax rate				-0.24 (0.38)
Marketwide econ shock × Pol. turmoil × Sh. Jews among grain traders × Tax rate				1.11 (1.75)
R-squared	0.121	0.118	0.130	0.119
Observations	73,216	73,728	66,176	73,728
Grid and year FE	Yes	Yes	Yes	Yes
Interactions with the share of Jews and sector shares	Yes	Yes	Yes	Yes
Mean of dependent var.	0.524	0.522	0.558	0.522
s.d. of dependent var.	7.223	7.207	7.446	7.207

Jews among creditors across cells hit by local econ shock

Local econ shock leads to pogroms in places with a greater share of Jews among creditors



Jews in grain trade across cells exposed to marketwide shock

Marketwide econ. shock leads to pogroms in places with a greater share of Jews among grain traders

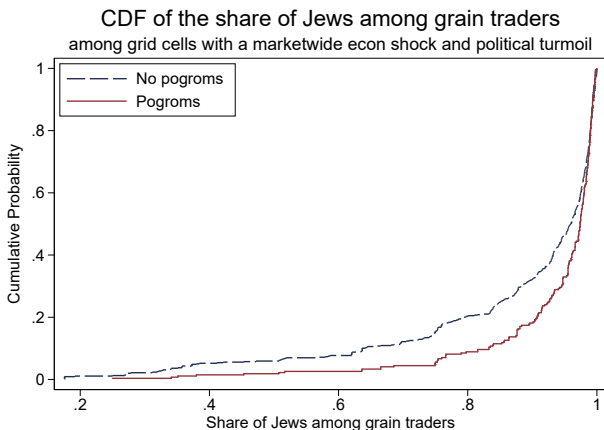
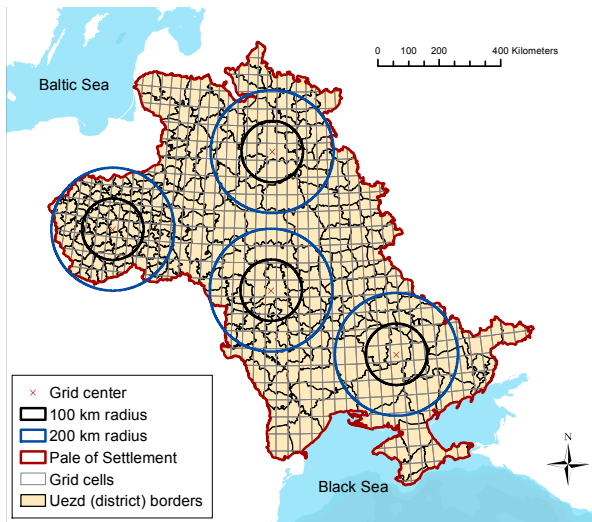


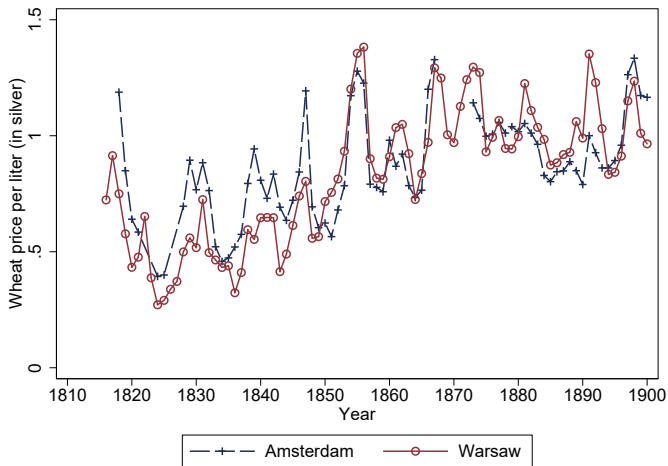
Illustration: Conley bandwidth



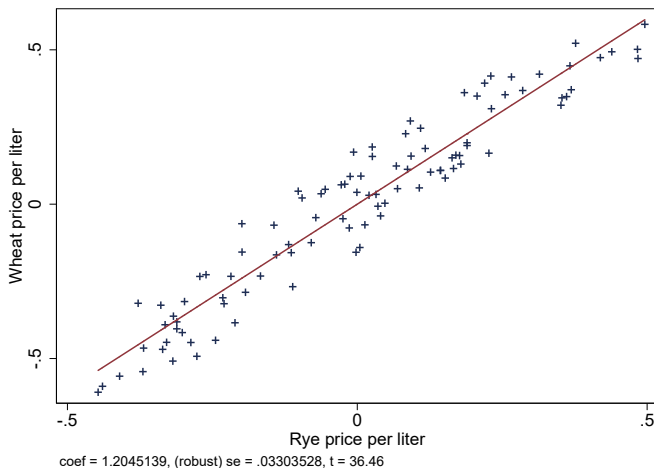
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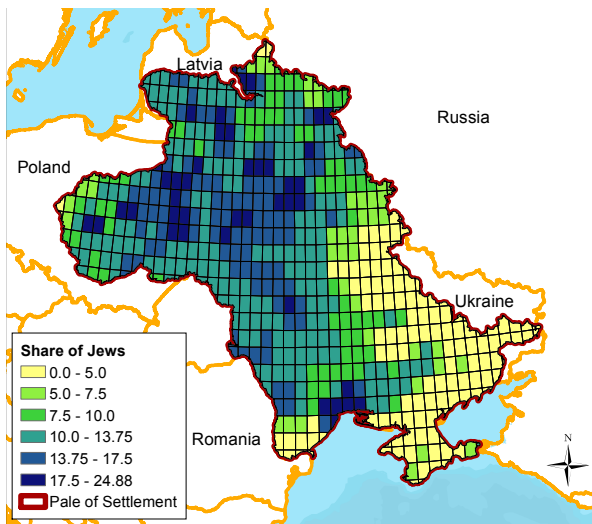
Prices of wheat in Warsaw and Amsterdam over time



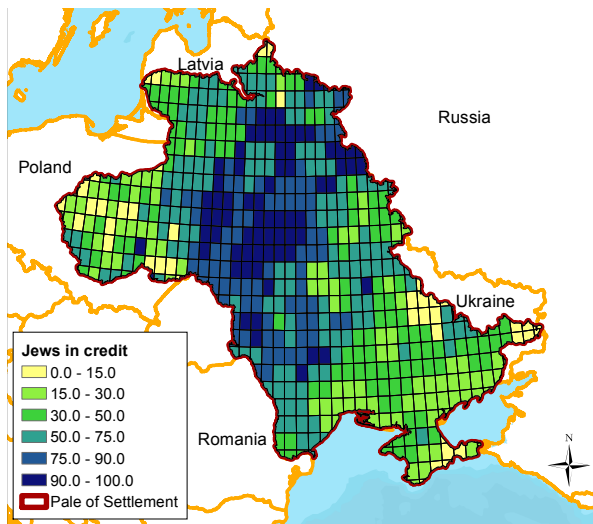
Correlation between prices of rye and wheat: Warsaw



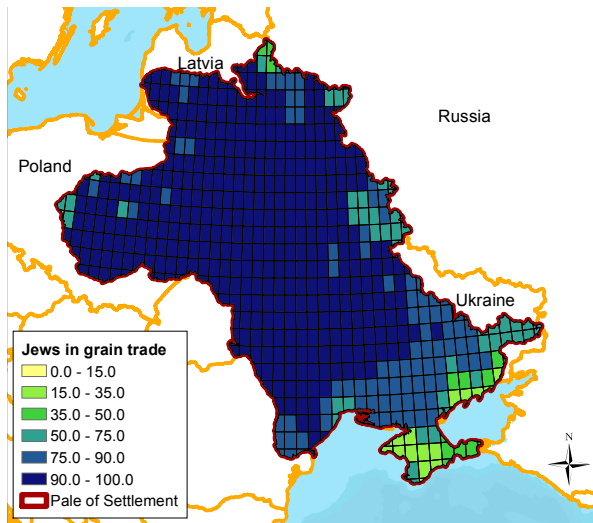
Share of Jews in 1897



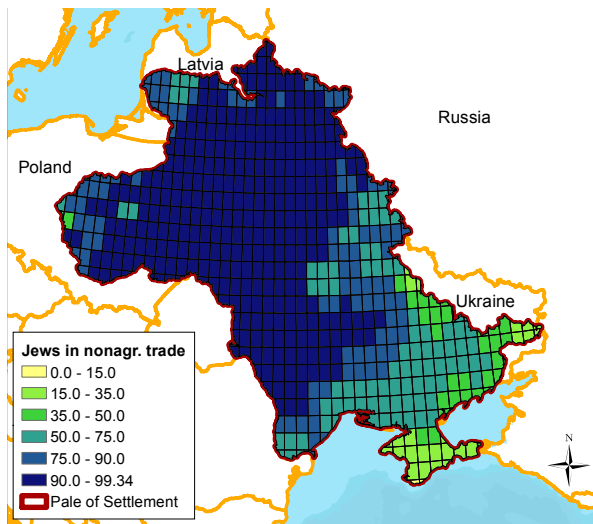
Share of Jews among creditors in 1897



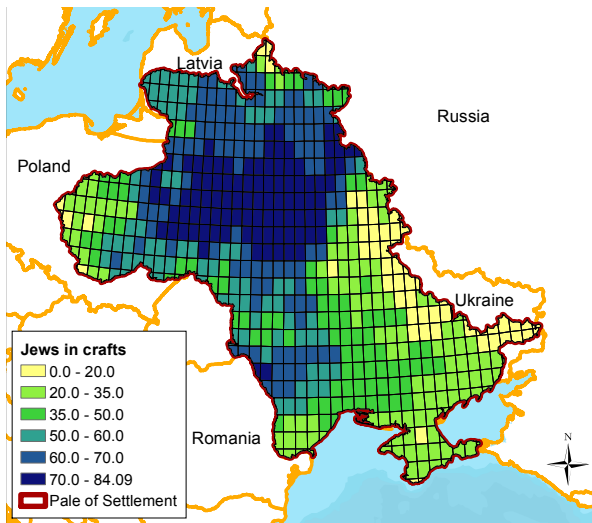
Share of Jews among grain traders in 1897



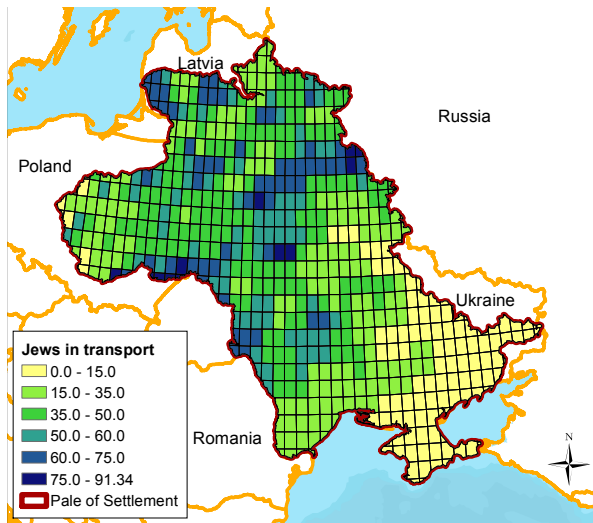
Share of Jews among nonagricultural traders in 1897



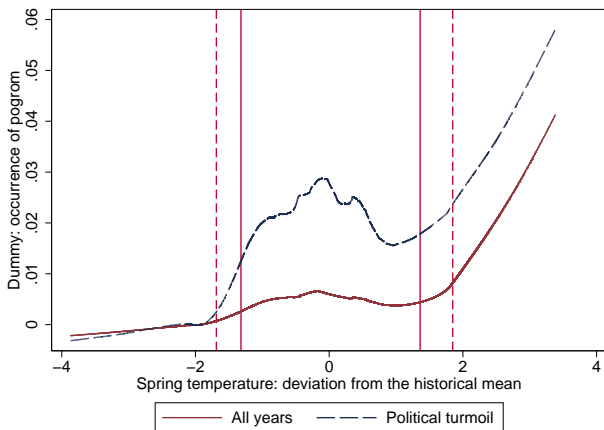
Share of Jews among craftsmen in 1897



Share of Jews among transporters in 1897

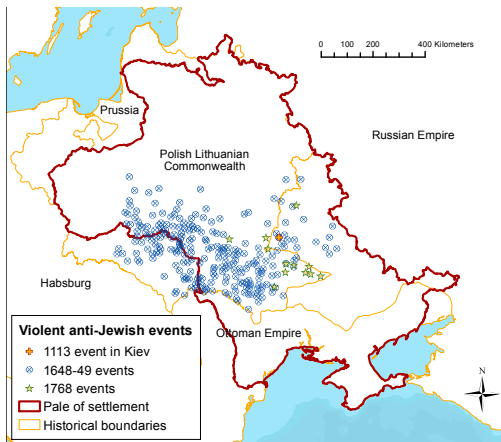


Pogroms were associated with local econ shocks on average
Spring temperature and occurrence of pogroms (1800–1927):



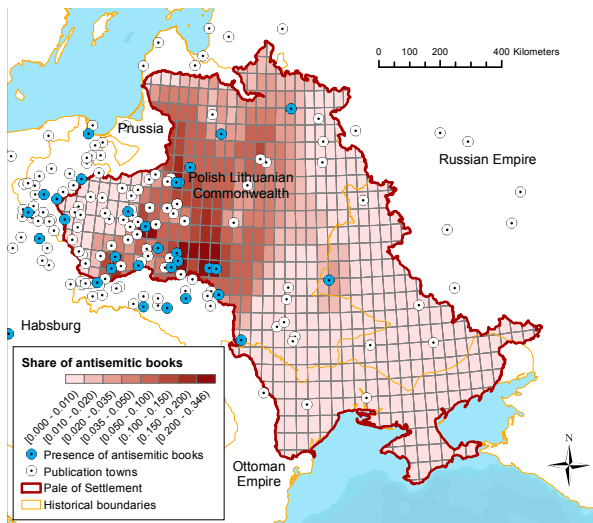
Notes: From left to right, dashed vertical lines represent 5th and 95th percentiles, solid vertical lines represent 10th and 90th percentiles.

Violence against Jews before the 19th century (1113–1768)



- Historians do not qualify past violence as pogroms, because Polish nobles and not the Jews were the primary target, yet, Jews were among the victims
- Jews were the arendars and managers of estates of Polish nobles, the practice that ended by the end of the 18th century

Antisemitic books published in the 18th century



▶ Back

Robustness to alternative measures of political turmoil and marketwide econ shock

Panel A: Rising spread as a measure of political turmoil and grain price as a measure of marketwide econ shock			
	Pogrom occurrence		
	(1)	(2)	(3)
Rising sovereign bond yield spread × Local econ shock × Sh. Jews among creditors	5.62* (2.97)		
Rising sovereign bond yield spread × Marketwide econ shock × Sh. Jews among grain traders		6.73* (3.46)	
Log grain price × Political turmoil × Log Jewish grain traders			11.37*** (3.62)
R-squared	0.149	0.148	0.160
Panel B: Baseline specification on the subsample where the alternative measures are available			
	Pogrom occurrence		
	(1)	(2)	(3)
Political turmoil × Local econ shock × Sh. Jews among creditors	7.10** (3.19)		
Political turmoil × Marketwide econ shock × Sh. Jews among grain traders		8.04* (4.13)	
Marketwide econ shock × Political turmoil × Log Jewish grain traders			2.94*** (0.79)
R-squared	0.151	0.149	0.151
Observations	24,192	24,192	31,225
Grid and year FE	Yes	Yes	Yes
All lower-level interactions	Yes	Yes	Yes
Interactions with the share of Jews	Yes	Yes	Yes
Interactions with dummy for former capital cities	Yes	Yes	No
Mean of dependent var.	1.009	1.009	0.781
s.d. of dependent var.	9.992	9.992	8.809

The variation Jews in trade in grain is limited; we can use the number of Jews in trade in grain

