Discrimination, Managers, and Firm Performance

Evidence from "Aryanizations" in Nazi Germany

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Discrimination Against Highly Qualified Individuals

- Increases in discrimination can lead to dismissals of highly qualified business leaders and managers.
- Recent events have renewed interest in this form of discrimination.
  - USA: Travel ban on citizens of 7 Muslim-majority countries. US corporations fear that discrimination may rise and they may not retain talent, e.g., Ben & Jerry's, MasterCard, Nike.
  - Turkey: Thousands of executives who follow the cleric Gülen have been arrested or have fled overseas since 2016.

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  - Turkey: Thousands of executives who follow the cleric Gülen have been arrested or have fled overseas since 2016.
- Many historical examples
  - France: 17th century eviction of Protestant Huguenots
  - USA: WWII internment of Japanese-Americans
  - Uganda: 1972 expulsion of South Asians (Indians owned 90% of businesses)
  - Indonesia: 1959 and 1998 emigration of Chinese following ethnic riots

Firm-Level Effects of Discrimination

- We study antisemitism in Nazi Germany, arguably the most horrendous episode of discrimination in human history.
- We examine how the removal of managers of Jewish origin affected some of the largest German firms (e.g., Deutsche Bank, BMW, Allianz).
- How do discriminatory removals affect firms and the economy, beyond hurting discriminated individuals?
  - Which managerial characteristics are hard to replace?
  - How large are the effects on firms?
  - How persistent are the effects on firms?

Main Findings I/II

- Part I: Manager characteristics
  - The number of managers with experience, university degrees, and connections to other firms fell in firms that lost managers of Jewish origin.

- Part II: Stock prices
  - Stock prices of affected firms fell by around 10%.
  - No recovery for at least 10 years after the Nazis came to power.
  - Losing managers of Jewish origin only mattered when they had connections or a university degree. Otherwise, no effect.
  - Results are not driven by other discriminatory measures by the Nazis.

Main Findings II/II

- Part III: Aggregate effect
  - Back-of-the-envelope: aggregate market valuation of firms listed in Berlin declined by 1.8% of German GNP.
  - Does not measure lost non-managerial human capital and horrendous human suffering.

- Part IV: Profitability and efficiency
  - Dividend payments fell by approximately 7.5%.
  - Return on assets declined by 4.1 ppt.

Related Literature I: Discrimination

- We highlight the effects of taste-based discrimination on firms, going beyond the effects on discriminated individuals.
  - Becker's (1957) theory predicts that discrimination can hurt firms.
- We focus on discrimination "at the top" against highly qualified leaders. Current literature focuses on wages and hiring of women, Blacks, and underprivileged groups.
  - Altonji & Blank 1999, Bertrand 2011, List & Rasul 2011, Bertrand & Duflo 2017

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  - Altonji & Blank 1999, Bertrand 2011, List & Rasul 2011, Bertrand & Duflo 2017
- We use a quasi-experimental methodology to estimate firm-level effects.
  - Cross-sectional variation: Szymanski 2000, Hellerstein et al. 2002, Weber & Zulehner 2014
- We use stock prices to measure firm-level effects of discrimination. Stock prices value the long-run costs of discrimination on firms.

Related Literature II: Managers and Firm Performance

- Better management practices are adoptable and teachable.
  - Bloom & Van Reenen 2007, Bloom et al. 2016, Bianchi and Giorcelli 2019, Gosnell et al. 2020.
- We emphasize a complimentary channel: management quality also depends on exceptional individual managers.
  - Losing managers can have large and persistent effects on firms.
  - Wide cadre of senior managers were important (not just the CEO).
  - Educated and connected, but not experienced, managers mattered.

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  - Wide cadre of senior managers were important (not just the CEO).
  - Educated and connected, but not experienced, managers mattered.
- Firm performance is associated with CEO abilities and behavior.
  - Bertrand & Schoar 2003, Bertrand 2009, Kaplan et al. 2012, 2016, Bandiera et al. 2017, 2020
- Owner deaths persistently affect firm performance.
  - Becker and Hvide 2017, Smith, Yagan, Zidar, Zwick 2019
- Short-run effects of CEO deaths or absences are often small, and of varying sign.
  - Johnson et al. 1985, Borokhovich et al. 2006, Salas 2010, Fee et al. 2013, Bennedsen et al. 2016
  - Jenter et al. 2017 show that only young and short-tenured CEO deaths cause large value losses.

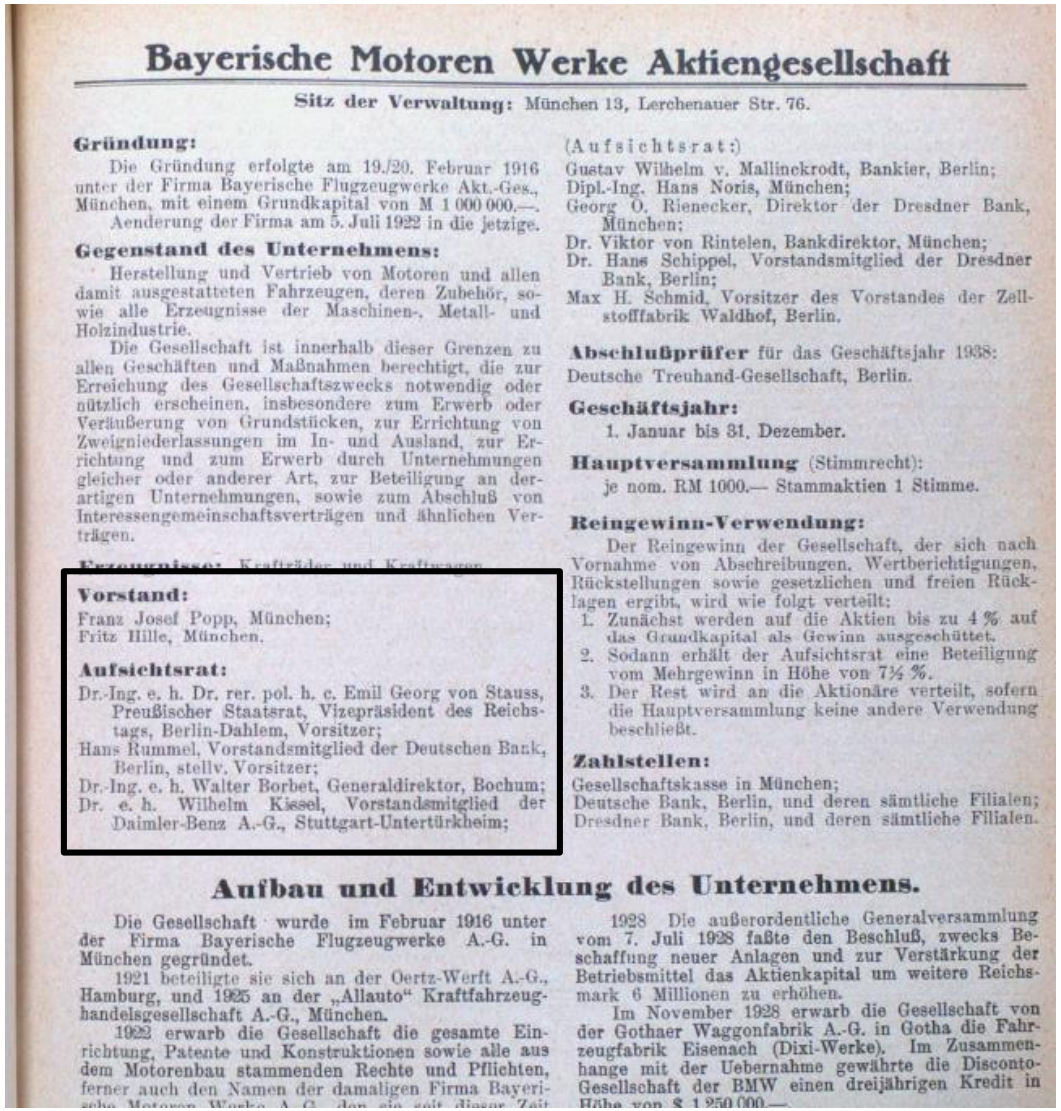
The Role of Jews in the German Economy

- Only 0.77% of the German population in 1933 was Jewish.
- Nonetheless, individuals of Jewish origin played a key role in the economy:
  - In 1908, 21.7% of the 747 richest people (above 5 million RM) were of Jewish origin (Mosse 1987).
- The "economic role of Jews in Germany (…) was greater than in Western industrialized countries like England, France, or Holland. It also exceeded their role in the development of the American economy" (Mosse 1987, p. 23).
- German Jews were economically assimilated. There was no distinct Jewish economic elite (Münzel 2006).

"Aryanizations"

- Hitler became chancellor on January 30, 1933. This led to a surge in antisemitism.
- The Nazis initially focused on the economic recovery. There were few antisemitic measures against large firms before 1935.
- Companies were not forced to dismiss Jews until 1938. But many firms preemptively forced out managers of Jewish origin for ideological reasons starting in 1933.
- Targeted managers included those who had converted to Christianity. Henceforth: Jewish = of Jewish origin.
- Many firms that the public did not perceive to be Jewish lost a significant fraction of their managers (e.g., *Allianz*, *BMW*, *I.G. Farben*).

Data 1: Managers in Listed Companies



Bayerische Motoren Werke Aktiengesellschaft

Sitz der Verwaltung: München 13, Lerchenauer Str. 76.

Gründung:
Die Gründung erfolgte am 19./20. Februar 1916 unter der Firma Bayerische Flugzeugwerke Akt.-Ges., München, mit einem Grundkapital von M 1 000 000,—. Aenderung der Firma am 5. Juli 1922 in die jetzige.

Gegenstand des Unternehmens:
Herstellung und Vertrieb von Motoren und allen damit ausgestatteten Fahrzeugen, deren Zubehör, sowie alle Erzeugnisse der Maschinen-, Metall- und Holzindustrie.
Die Gesellschaft ist innerhalb dieser Grenzen zu allen Geschäften und Maßnahmen berechtigt, die zur Erreichung des Gesellschaftszwecks notwendig oder nützlich erscheinen, insbesondere zum Erwerb oder Veräußerung von Grundstücken, zur Errichtung von Zweigniederlassungen im In- und Ausland, zur Errichtung und zum Erwerb durch Unternehmungen gleicher oder anderer Art, zur Beteiligung an derartigen Unternehmungen, sowie zum Abschluß von Interessengemeinschaftsverträgen und ähnlichen Verträgen.

Erzeugnisse: Krafträder und Kraftwagen.

Vorstand:
Franz Josef Popp, München;
Fritz Hille, München.

Aufsichtsrat:
Dr.-Ing. e. h. Dr. rer. pol. h. c. Emil Georg von Stauss, Preußischer Staatsrat, Vizepräsident des Reichstags, Berlin-Dahlem, Vorsitzer;
Hans Rummel, Vorstandsmitglied der Deutschen Bank, Berlin, stellv. Vorsitzer;
Dr.-Ing. e. h. Walter Borbet, Generaldirektor, Bochum;
Dr. e. h. Wilhelm Kissel, Vorstandsmitglied der Daimler-Benz A.-G., Stuttgart-Untertürkheim;
(Aufsichtsrat:)
Gustav Wilhelm v. Mallinckrodt, Bankier, Berlin;
Dipl.-Ing. Hans Noris, München;
Georg O. Rienecker, Direktor der Dresdner Bank, München;
Dr. Viktor von Rintelen, Bankdirektor, München;
Dr. Hans Schippel, Vorstandsmitglied der Dresdner Bank, Berlin;
Max H. Schmid, Vorsitzer des Vorstandes der Zellstofffabrik Waldhof, Berlin.

Abschlußprüfer für das Geschäftsjahr 1938:
Deutsche Treuhand-Gesellschaft, Berlin.

Geschäftsjahr:
1. Januar bis 31. Dezember.

Hauptversammlung (Stimmrecht):
je nom. RM 1000.— Stammaktien 1 Stimme.

Reingewinn-Verwendung:
Der Reingewinn der Gesellschaft, der sich nach Vornahme von Abschreibungen, Wertberichtigungen, Rückstellungen sowie gesetzlichen und freien Rücklagen ergibt, wird wie folgt verteilt:
1. Zunächst werden auf die Aktien bis zu 4 % auf das Grundkapital als Gewinn ausgeschüttet.
2. Sodann erhält der Aufsichtsrat eine Beteiligung vom Mehrgewinn in Höhe von 7½ %.
3. Der Rest wird an die Aktionäre verteilt, sofern die Hauptversammlung keine andere Verwendung beschließt.

Zahlstellen:
Gesellschaftskasse in München;
Deutsche Bank, Berlin, und deren sämtliche Filialen;
Dresdner Bank, Berlin, und deren sämtliche Filialen.

Aufbau und Entwicklung des Unternehmens.

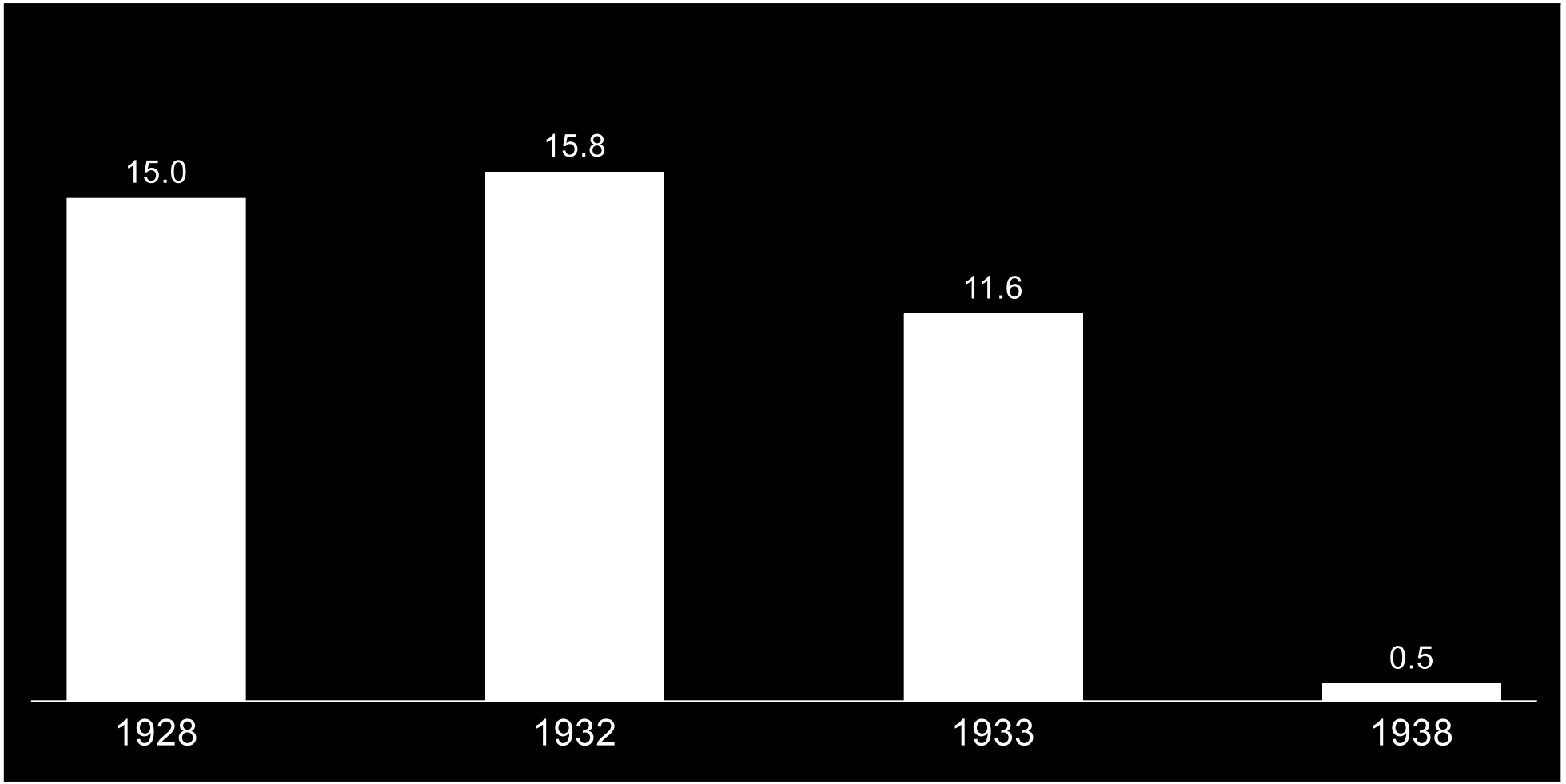
Die Gesellschaft wurde im Februar 1916 unter der Firma Bayerische Flugzeugwerke A.-G. in München gegründet.
1921 beteiligte sie sich an der Oertz-Werft A.-G., Hamburg, und 1925 an der „Allauto" Kraftfahrzeughandelsgesellschaft A.-G., München.
1922 erwarb die Gesellschaft die gesamte Einrichtung, Patente und Konstruktionen sowie alle aus dem Motorenbau stammenden Rechte und Pflichten, ferner auch den Namen der damaligen Firma Bayerische Motoren Werke A.-G., den sie seit dieser Zeit
1928 Die außerordentliche Generalversammlung vom 7. Juli 1928 faßte den Beschluß, zwecks Beschaffung neuer Anlagen und zur Verstärkung der Betriebsmittel das Aktienkapital um weitere Reichsmark 6 Millionen zu erhöhen.
Im November 1928 erwarb die Gesellschaft von der Gothaer Waggonfabrik A.-G. in Gotha die Fahrzeugfabrik Eisenach (Dixi-Werke). Im Zusammenhange mit der Uebernahme gewährte die Disconto-Gesellschaft der BMW einen dreijährigen Kredit in Höhe von $ 1 250 000.—

- We collect data on all senior managers (executive and supervisory board members) of all firms listed in Berlin from *Handbuch der Deutschen Aktiengesellschaften 1932*.
  - 7,791 manager positions in 655 firms in 1932
- We collect similar data for 1928, 1933, and 1938.
  - 29,669 manager positions for all four years
- The source contains information on manager characteristics.

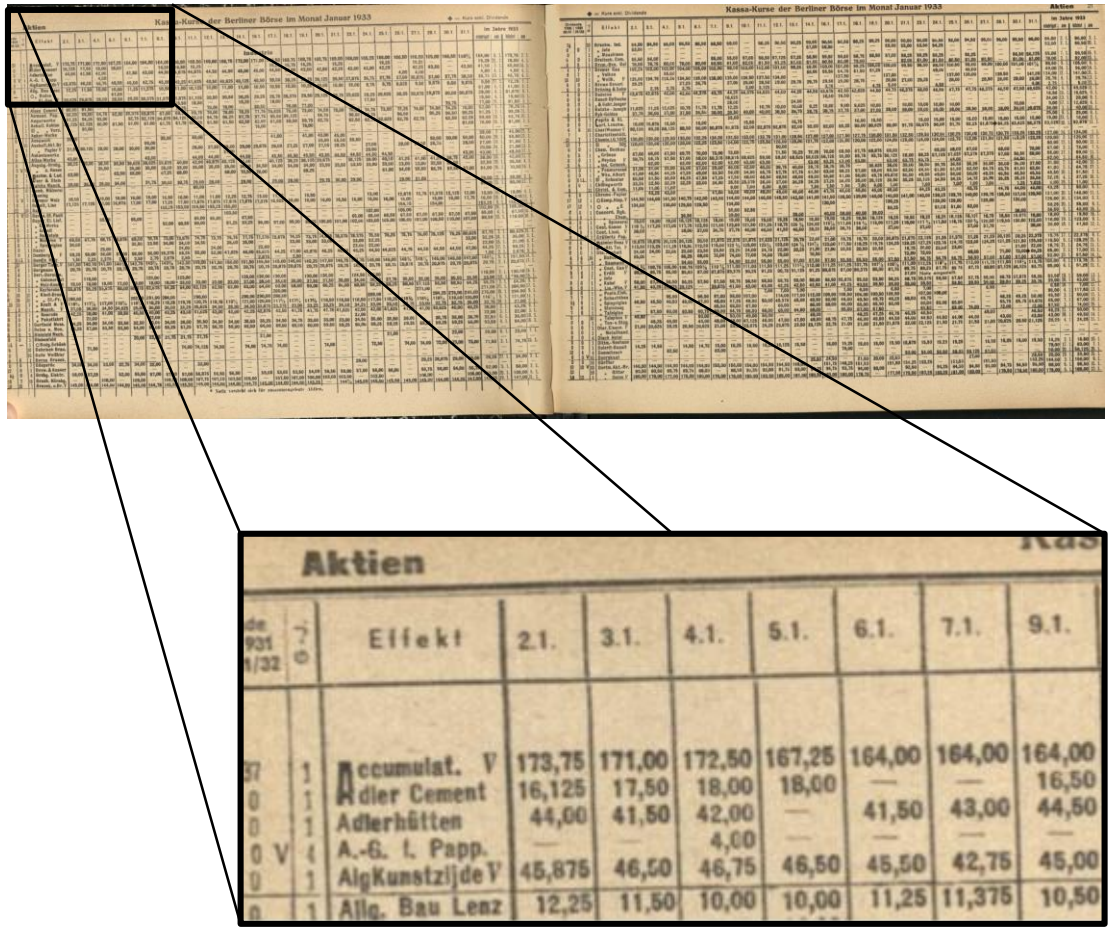
Data 1: Jewish Managers in Listed Firms

- Identify Jewish managers from:
  - Münzel (2006): Jewish managers in the 300 largest German firms
  - Windolf (2009): List of Jewish managers in smaller firms
  - Biographisches Handbuch der deutschsprachigen Emigration nach 1933
  - Köhler (2008): Jewish bankers
  - World Biographical Information System (WBIS): collection of biographies
  - Google search all remaining managers
- Jewish managers were more educated, connected, experienced, and had more honorary titles.

Data 1: Positions Held by Jewish Managers Over Time



Data 2: Historical Stock Prices Berlin



Aktien

Effekt	2.1.	3.1.	4.1.	5.1.	6.1.	7.1.	9.1.
Accumulat. V	173,75	171,00	172,50	167,25	164,00	164,00	164,00
Adler Cement	16,125	17,50	18,00	18,00	—	—	16,50
Adlerhütten	44,00	41,50	42,00	—	41,50	43,00	44,50
A.-G. f. Papp.	—	—	4,00	—	—	—	—
AlgKunstzijde V	45,875	46,50	46,75	46,50	45,50	42,75	45,00
Allg. Bau Lenz	12,25	11,50	10,00	10,00	11,25	11,375	10,50

- 240,000 Berlin stock prices between 1929 and 1943 from *Monatskursblatt Berliner Börse*.
- We record average stock prices during ±10 days around January 10, and July 10 of each year.

Firm Summary Statistics in 1932

	No Jewish Managers	At Least One Jewish Manager		
		All	Fraction Jewish Managers ≤ Median	Fraction Jewish Managers > Median
Number of firms	247	408	215	193
Number of senior managers	8.64	13.86	13.56	14.20
Number of Jewish senior managers	0.00	3.01	1.61	4.58
Fraction of Jewish senior managers	0.00	0.22	0.12	0.33
Managers with tenure since 1928	5.43	8.82	8.40	9.29
Managers with experience since 1928	6.37	10.92	10.41	11.50
Managers with university education	3.11	6.06	5.71	6.44
Managers with graduate education	1.97	3.97	3.80	4.17
Connections to large and medium-sized German firms	24.26	67.25	57.93	77.64
Nazi connection	0.09	0.21	0.22	0.20
Nominal capital (in million RM)	4.72	55.52	91.67	15.24
Firm age (in years)	42.89	41.55	40.95	42.23
Balance sheet reported in January	0.66	0.69	0.70	0.68

Part I: Effects on Manager Characteristics

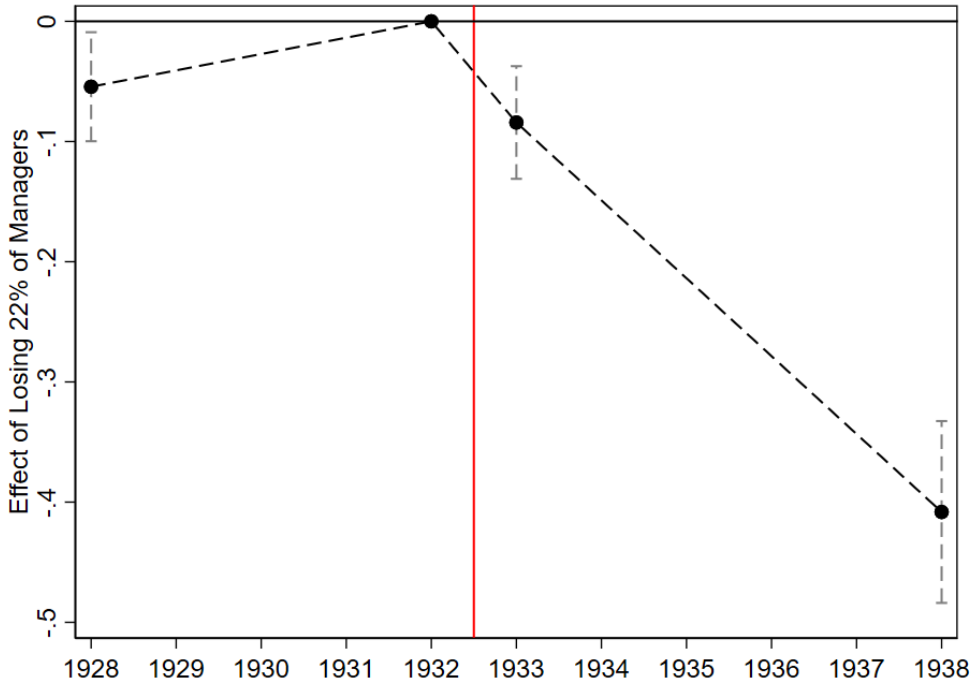
- We measure manager characteristics at four points in time (1928, 1932, 1933, 1938).
- We regress firm-level changes in manager characteristics on the fraction of Jewish managers (in 1932):

$$\log(Characteristic)_{it} = \beta_1 + \sum_{\tau=1928}^{1938} \beta_\tau Fraction\ Jewish\ Managers\ (1932)_i \times 1[t = \tau]$$
$$+ Firm\ FE_i + Year\ FE_t + \varepsilon_{it}$$

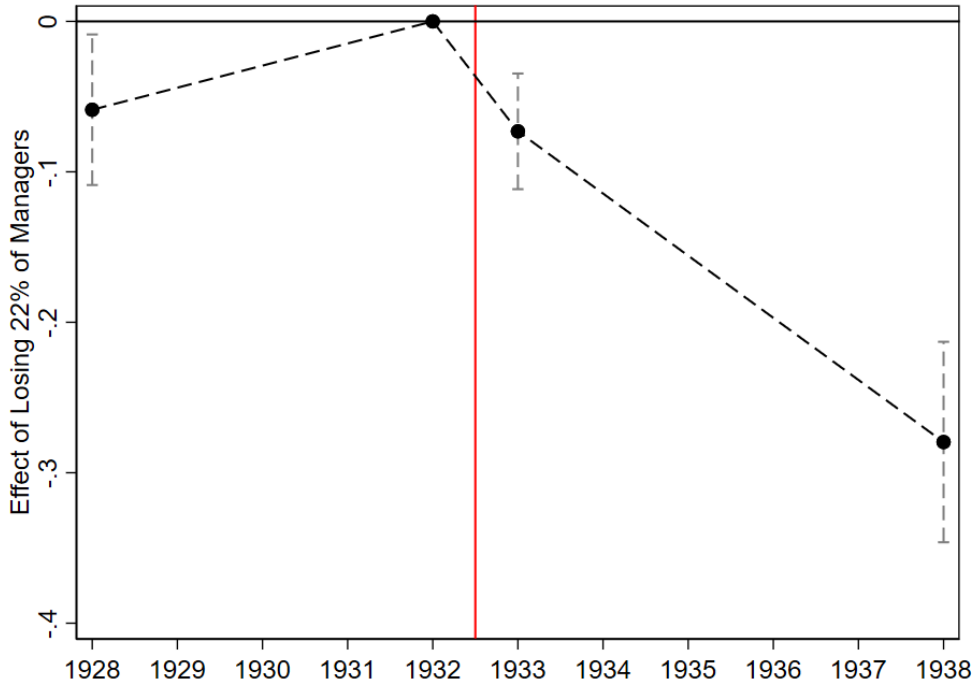
- Firm-level controls: connection to Nazis, reporting period, age, size, industry FE.

Effects on Manager Characteristics

of Managers With **Tenure** Since 1928

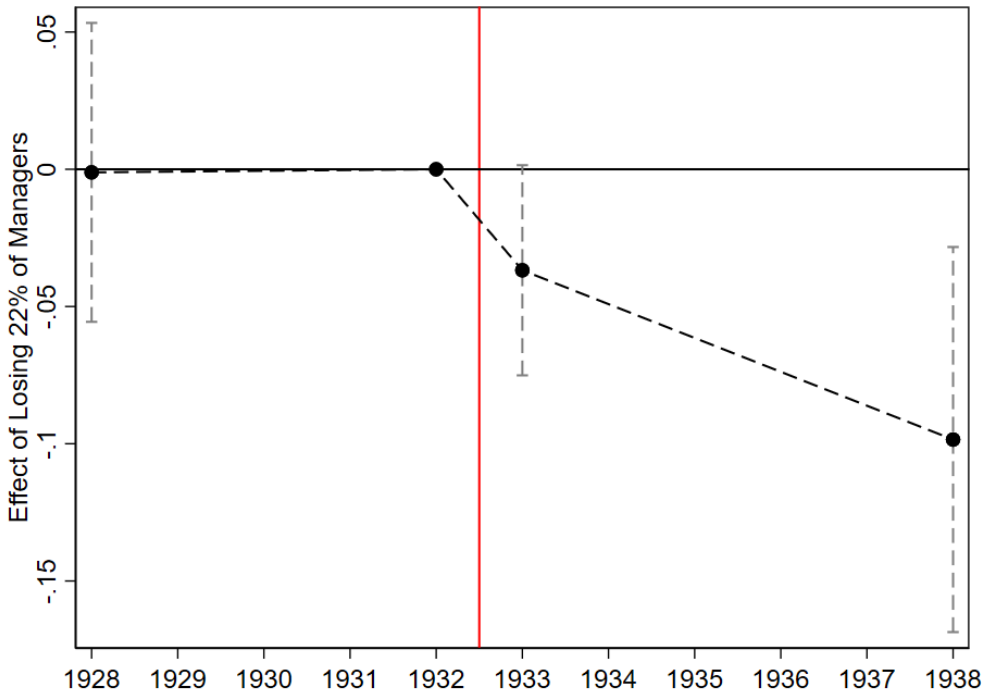


# of Managers With **Experience** Since 1928

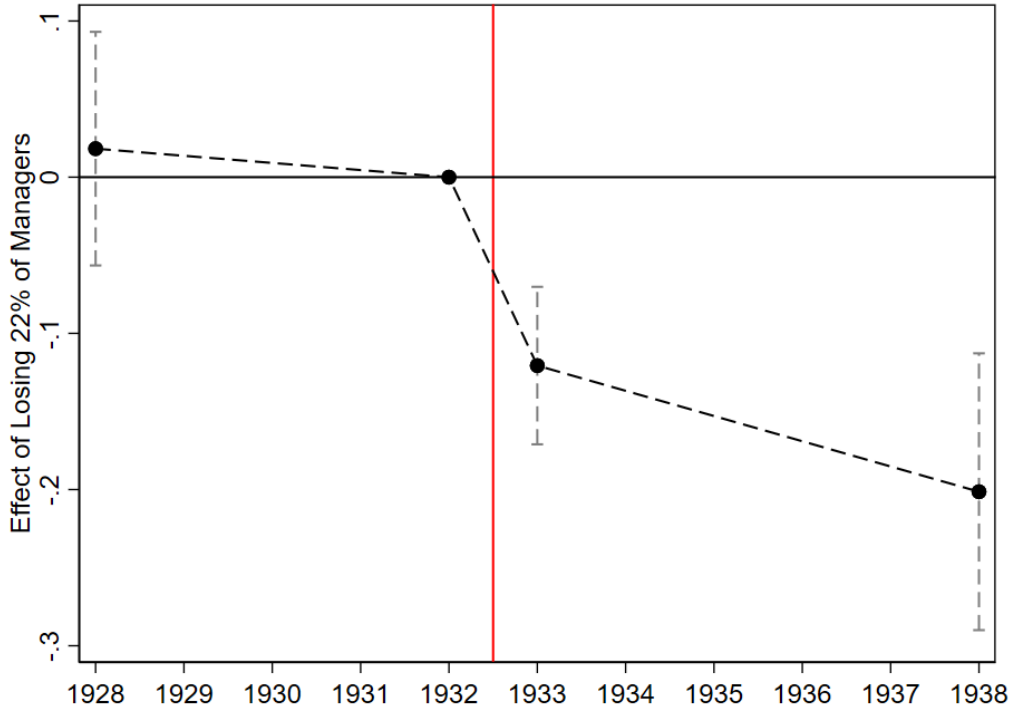


Effects on Manager Characteristics

of Managers With **University Education**



# of Firm **Connections** Through Managers



Theory on Manager Characteristics and Firm Value

- How can changes in manager characteristics affect firm market value?
- No effect if managers are fully compensated for their marginal product.
- Negative effect:
  - Tenure, experience, and education are likely associated with higher human capital (Acemoglu & Pischke 1998, Dessein & Prat 2018).
  - Connections to other firms could improve information flows (Glaeser et al. 2002, Cai & Szeidl 2018, Haselmann et al. 2018).
- Positive effect:
  - Experienced and educated managers may be more entrenched and may extract rents from their employers (Shleifer & Vishny 1989).
- To differentiate, we investigate the stock price response.

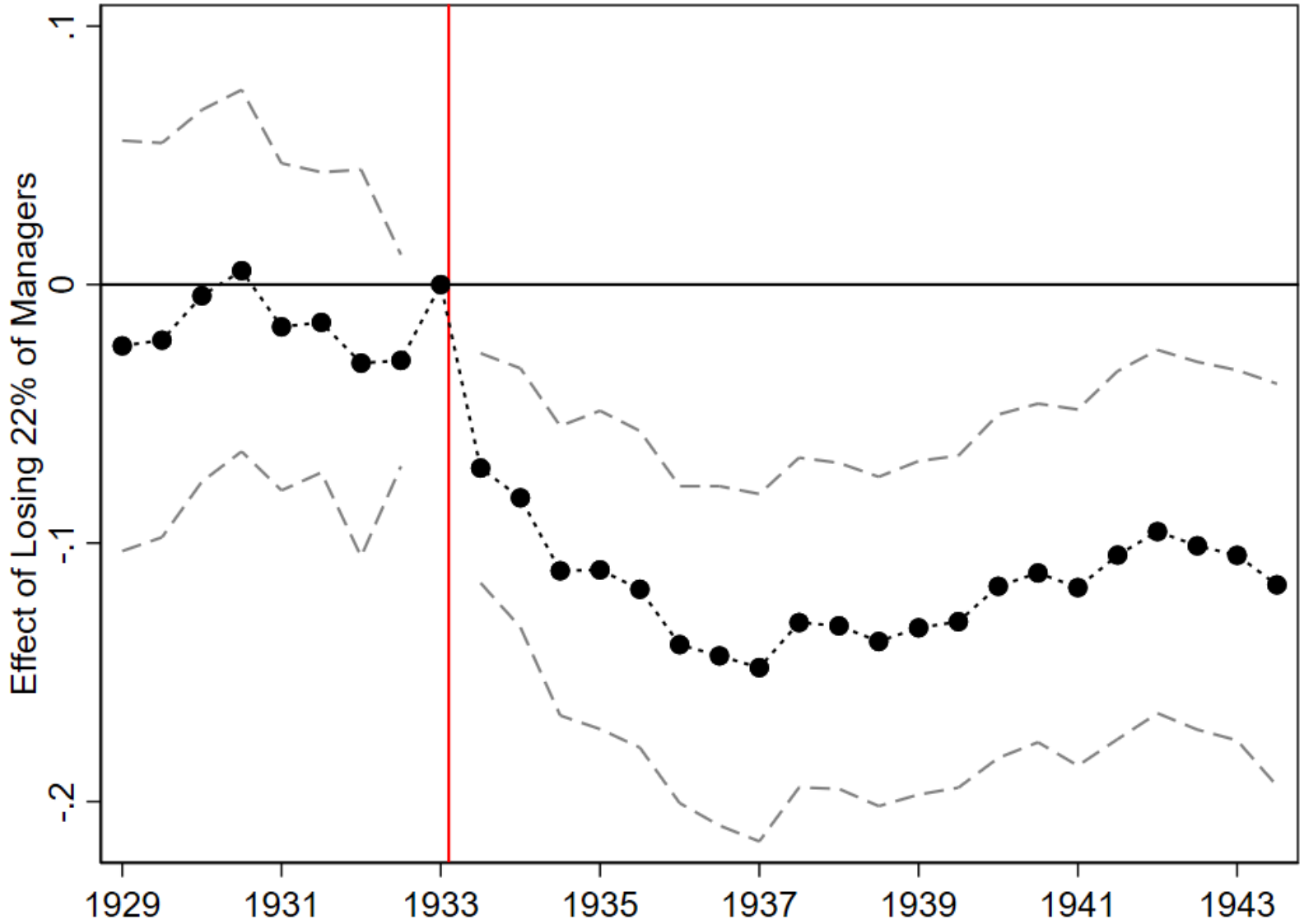
Part II: The Effect on Stock Prices

- We measure stock prices twice a year (January and July) from 1929 to 1943.
- We regress firm-level changes in stock prices on the fraction of Jewish managers (in 1932):

$$\log(Stock\ Price)_{it} = \beta_1 + \sum_{\tau=1929.0}^{1943.5} \beta_\tau Fraction\ Jewish\ Managers\ (1932)_i \times 1[t = \tau]$$
$$+ Firm\ FE_i + Year\ FE_t + \beta_c Controls_{it} + \varepsilon$$

- Firm-level controls: connection to Nazis, reporting period, age, size, industry FE.

Effect of Losing 22% of Managers - All Controls



Effect on Stock Prices

Dep. Variable: log(Stock Price)	(1)	(2)	(3)	(4)	(5)	(6)
Frac. Jewish Managers (1932) × Post 1933	-0.469*** (0.138)	-0.459*** (0.136)	-0.458*** (0.136)	-0.479*** (0.134)	-0.479*** (0.134)	-0.464*** (0.138)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Nazi Connection × Time FE		Yes	Yes	Yes	Yes	Yes
Reporting Period × Time FE			Yes	Yes	Yes	Yes
Firm Age × Time FE				Yes	Yes	Yes
Nominal Capital × Time FE					Yes	Yes
Industry FE × Time FE						Yes
Number of Observations	12710	12710	12710	12710	12710	12710
Number of Firms	655	655	655	655	655	655
R^2	0.566	0.569	0.570	0.580	0.582	0.622

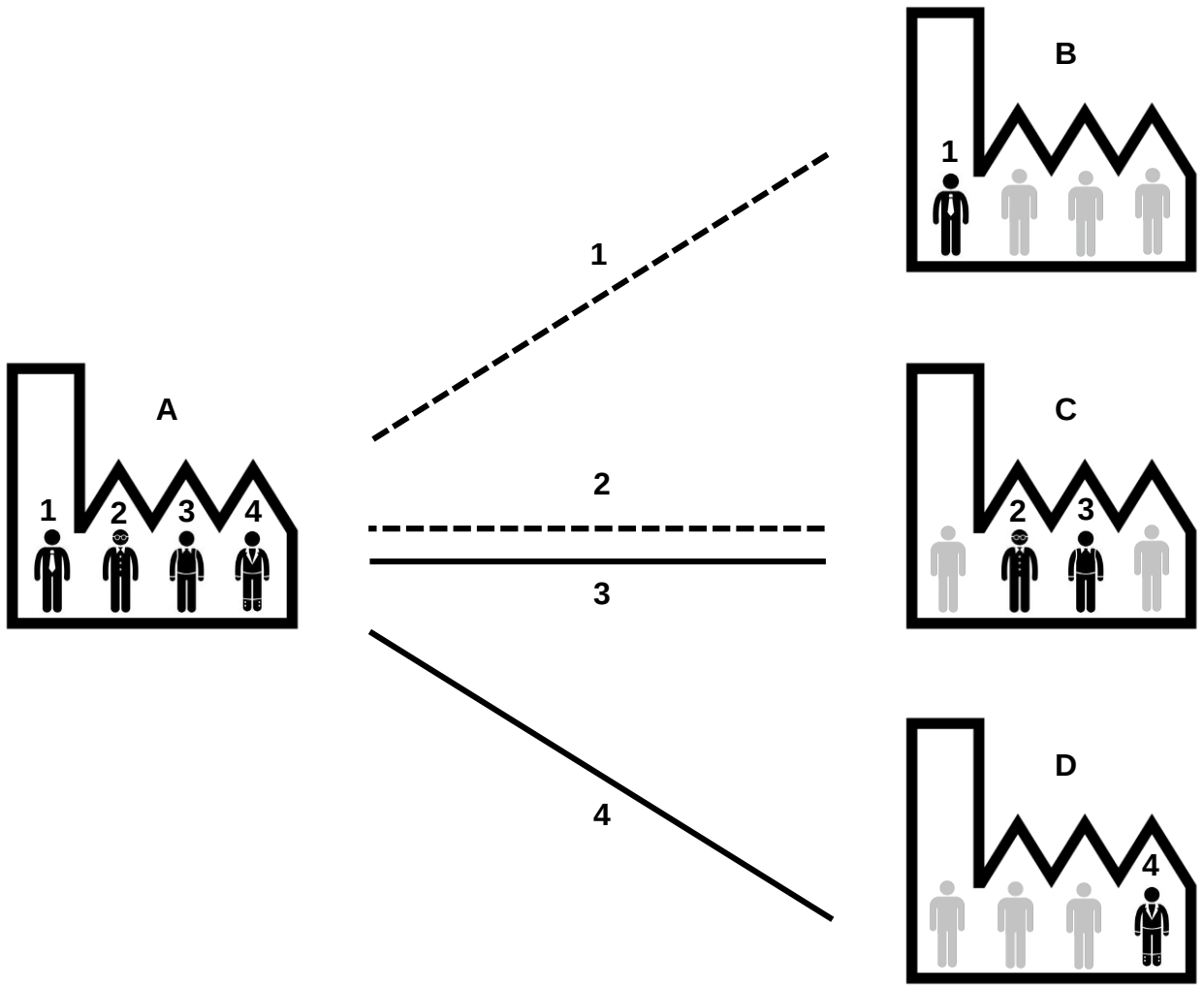
The Effect of Manager Characteristics on Stock Prices

- We investigate which managerial characteristics were associated with stock price declines:
  1) connections to other firms 2) university degrees 3) experience

- Main regressors are indicators for whether Jews were responsible for:
  1) < 20 % 2) 20 – 80 % 3) ≥ 80 %
  of a given managerial characteristic in 1932.

$$\log(Stock\ Price)_{it}$$
$$= \beta_1 \cdot \mathbb{1}[0 < Importance\ of\ Jews\ for\ Managerial\ \ Characteristic\ (1932) < 0.20]_i \times Post\ 1933_t$$
$$+ \beta_2 \cdot \mathbb{1}[0.20 \leq Importance\ of\ Jews\ for\ Managerial\ \ Characteristic\ (1932) < 0.80]_i \times Post\ 1933_t$$
$$+ \beta_3 \cdot \mathbb{1}[0.80 \leq Importance\ of\ Jews\ for\ Managerial\ \ Characteristic\ (1932)]_i \times Post\ 1933$$
$$+ Firm\ FE_i + Year\ FE_t + \beta_c Controls_{it} + \varepsilon_{it}$$

Measuring Connections to Other Firms



Share Jewish:

$\frac{1}{1}$

$\frac{1}{2}$

$\frac{0}{1}$

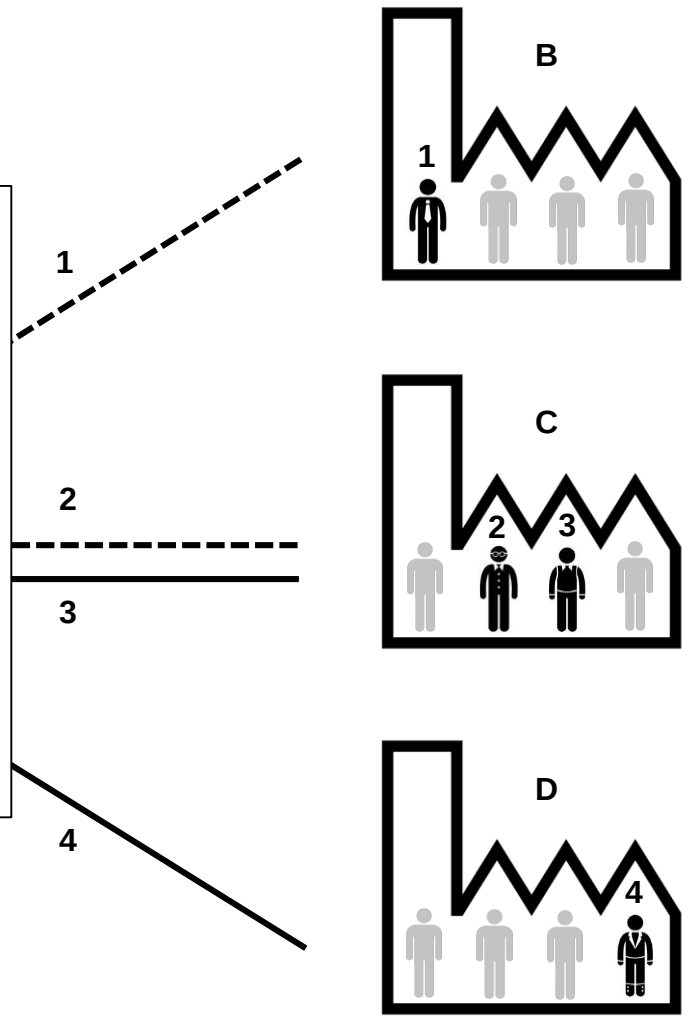
Measuring Connections to Other Firms

Importance of Jews for connections of firm A

= Average share of connections formed by Jews at firm A

= Influence of Jews on degree centrality of firm A (as in networks literature, e.g., Jackson 2010)

$$\frac{\frac{1}{1}+\frac{1}{2}+\frac{0}{1}}{3}=0.5$$



Share Jewish:

$\frac{1}{1}$

$\frac{1}{2}$

$\frac{0}{1}$

The Effect Jewish Managers with Connections

Dep. Variable: log(Stock Price)	(1)	(2)
$\mathbb{1}[0 < Frac.\ Connections\ due\ to\ Jewish\ Managers\ (1932) < 0.20]$	-0.034	-0.003
$\times$ Post 1933	(0.058)	(0.059)
$\mathbb{1}[0.20 \leq Frac.\ Connections\ due\ to\ Jewish\ Managers\ (1932) < 0.80]$	-0.179***	-0.164***
$\times$ Post 1933	(0.048)	(0.046)
$\mathbb{1}[0.80 \leq Frac.\ Connections\ due\ to\ Jewish\ Managers\ (1932)]$	-0.250**	-0.295***
$\times$ Post 1933	(0.103)	(0.098)
Firm FE	Yes	Yes
Time FE	Yes	Yes
All Controls		Yes
Number of Observations	12710	12710
Number of Firms	655	655
R^2	0.568	0.625

The Effect of Jewish Managers with University Education

	(3)	(4)
Dep. Variable: log(Stock Price)		
$\mathbb{1}[0 < Frac.\,University\,Educated\,due\,to\,Jewish\,Managers\,(1932) < 0.20]$	-0.052	-0.037
× Post 1933	(0.047)	(0.046)
$\mathbb{1}[0.20 \leq Frac.\,University\,Educated\,due\,to\,Jewish\,Managers\,(1932) < 0.80]$	-0.214***	-0.199***
× Post 1933	(0.053)	(0.051)
$\mathbb{1}[0.80 \leq Frac.\,University\,Educated\,due\,to\,Jewish\,Managers\,(1932)]$	-0.623***	-0.733***
× Post 1933	(0.208)	(0.209)
Firm FE	Yes	Yes
Time FE	Yes	Yes
All Controls		Yes
Number of Observations	12710	12710
Number of Firms	655	655
R^2	0.572	0.629

The Effect of Jewish Managers with Experience

Dep. Variable: log(Stock Price)	(5)	(6)
$\mathbb{1}[0 < Frac.\ Experienced\ Managers\ due\ to\ Jewish\ Managers\ (1932) < 0.20]$	-0.111**	-0.093*
× Post 1933	(0.055)	(0.050)
$\mathbb{1}[0.20 \leq Frac.\ Experienced\ Managers\ due\ to\ Jewish\ Managers\ (1932) < 0.80]$	-0.170***	-0.163***
× Post 1933	(0.048)	(0.047)
$\mathbb{1}[0.80 \leq Frac.\ Experienced\ Managers\ due\ to\ Jewish\ Managers\ (1932)]$	-0.385***	-0.110
× Post 1933	(0.077)	(0.170)
Firm FE	Yes	Yes
Time FE	Yes	Yes
All Controls		Yes
Number of Observations	12710	12710
Number of Firms	655	655
R^2	0.566	0.622

All Characteristics

Dep. Variable: log(Stock Price)	(7)	(8)
$\mathbb{1}[0 < Frac.\ Characteristics\ due\ to\ Jewish\ Managers\ (1932) < 0.20]$	0.022	0.077
× Post 1933	(0.066)	(0.065)
$\mathbb{1}[0.20 \leq Frac.\ Connections\ due\ to\ Jewish\ Managers\ (1932) < 0.80]$	-0.120**	-0.115**
× Post 1933	(0.059)	(0.057)
$\mathbb{1}[0.80 \leq Frac.\ Connections\ due\ to\ Jewish\ Managers\ (1932)]$	-0.170	-0.215**
× Post 1933	(0.110)	(0.107)
$\mathbb{1}[0.20 \leq Frac.\ University\ Educated\ due\ to\ Jewish\ Managers\ (1932) < 0.80]$	-0.153**	-0.142**
× Post 1933	(0.067)	(0.063)
$\mathbb{1}[0.80 \leq Frac.\ University\ Educated\ due\ to\ Jewish\ Managers\ (1932)]$	-0.555***	-0.655***
× Post 1933	(0.209)	(0.216)
$\mathbb{1}[0.20 \leq Frac.\ Experienced\ Managers\ due\ to\ Jewish\ Managers\ (1932) < 0.80]$	0.065	0.068
× Post 1933	(0.077)	(0.067)
$\mathbb{1}[0.80 \leq Frac.\ Experienced\ Managers\ due\ to\ Jewish\ Managers\ (1932)]$	-0.117	0.142
× Post 1933	(0.114)	(0.188)

Effect of Managerial Networks

Dep. Variable: log(Stock Price)	Degree Centrality	Katz Centrality				Eigenvector Centrality
		$\alpha = 0.0005$	$\alpha = 0.001$	$\alpha = 0.005$	$\alpha = 0.01$	
$\mathbb{1}[0 <$ Importance of Jews for Managerial Characteristics (1932) $< 0.20]$	0.077	0.080	0.081	0.152	0.264	
× Post 1933	(0.065)	(0.068)	(0.071)	(0.111)	(0.165)	
$\mathbb{1}[0.20 \leq$ Importance of Jews for Managerial Connections (1932) $< 0.80]$	-0.115**	-0.107*	-0.112**	-0.092*	0.058	0.030
× Post 1933	(0.057)	(0.056)	(0.056)	(0.050)	(0.156)	(0.398)
$\mathbb{1}[0.80 \leq$ Importance of Jews for Managerial Connections (1932)]	-0.215**	-0.208*	-0.212**	-0.112	0.073	0.433
× Post 1933	(0.107)	(0.106)	(0.106)	(0.087)	(0.163)	(0.395)

- Only direct connections matter, captured by degree centrality.
- Higher order network linkages do not matter, captured by eigenvector centrality.
- Different to microfinance firms (Banerjee et al. 2013).

Effect of STEM Degrees

Dep. Variable: log(Stock Price)	Firms in STEM Industries	Firms in Non-STEM Industries
$\mathbb{1}[0 <$ Importance of Jews for Managerial Characteristics (1932) $< 0.20]$	0.032	0.029
× Post 1933	(0.083)	(0.063)
$\mathbb{1}[0.20 \leq$ Importance of Jews for STEM Graduate Education (1932) $< 0.80]$	-0.057	0.037
× Post 1933	(0.089)	(0.107)
$\mathbb{1}[0.80 \leq$ Importance of Jews for STEM Graduate Education (1932)]	-0.239*	0.110
× Post 1933	(0.141)	(0.116)
$\mathbb{1}[0.20 \leq$ Importance of Jews for SocSci Graduate Education (1932) $< 0.80]$	-0.166*	-0.131**
× Post 1933	(0.097)	(0.062)
$\mathbb{1}[0.80 \leq$ Importance of Jews for SocSci Graduate Education (1932)]	-0.278*	-0.189*
× Post 1933	(0.149)	(0.111)

- STEM education (engineering, chemistry) only matters in STEM industries (pharma, machinery production).

Effect of Social Science Degrees

Dep. Variable: log(Stock Price)	Firms in STEM Industries	Firms in Non-STEM Industries
$\mathbb{1}[0 <$ Importance of Jews for Managerial Characteristics (1932) $< 0.20]$	0.032	0.029
× Post 1933	(0.083)	(0.063)
$\mathbb{1}[0.20 \leq$ Importance of Jews for STEM Graduate Education (1932) $< 0.80]$	-0.057	0.037
× Post 1933	(0.089)	(0.107)
$\mathbb{1}[0.80 \leq$ Importance of Jews for STEM Graduate Education (1932)]	-0.239*	0.110
× Post 1933	(0.141)	(0.116)
$\mathbb{1}[0.20 \leq$ Importance of Jews for SocSci Graduate Education (1932) $< 0.80]$	-0.166*	-0.131**
× Post 1933	(0.097)	(0.062)
$\mathbb{1}[0.80 \leq$ Importance of Jews for SocSci Graduate Education (1932)]	-0.278*	-0.189*
× Post 1933	(0.149)	(0.111)

- SocSci education (economics, business, law, history) matters in all industries.

All Senior Managers Matter, Not Just CEOs

Dep. Variable: log(Stock Price)	(1)	(2)	(3)	(4)
Frac. Jewish Managers in Chief Executive Positions (1932) × Post 1933	-0.297***	-0.312***		
	(0.110)	(0.104)		
Frac. Jewish Managers in Regular Positions (1932) × Post 1933			-0.292**	-0.290**
			(0.125)	(0.126)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
All Controls		Yes		Yes
Number of Observations	12710	12710	12710	12710
Number of Firms	655	655	655	655
R^2	0.565	0.621	0.564	0.620

Additional Checks

- No effect on delisting
- Similar effects in a sample of firms with at least one Jewish manager [results]
- Drop the banking crisis year 1932 [results]
- Average stock prices in windows of ± 3 or 5 days [results]
- Restrict sample to firms that are regularly or always traded [results]

Alternative Explanations

- Stock prices of firms with Jewish managers may have declined because of other shocks.

1. Other antisemitic measures
   a. Firms favored by the Nazis [results]
   b. Firms perceived as "Jewish" [results]
   c. Lower-ranked Jewish employees [results]
   d. Jewish shareholders [results]
   e. Retail boycotts [results]

2. Correlated demand shocks (unrelated to antisemitism)
   a. Rearmament investment [results]
   b. Infrastructure investment [results]
   c. Reduced demand by international customers [results]

1a. Effects in a Sample of Firms Favored by Nazis

- Identify firms favored by the Nazis
  - Donors or political network that supported the Nazi Party before 1932 (Ferguson & Voth 2008)
  - Firms that received forced labor workers from the Nazi government; data source: "Catalogue of Camps and Prisons in Germany and German-occupied Territories 1939-1945"
  - Exclude firms that were perceived as Jewish

Dep. Variable: log(Stock Price)	(1)	(2)
Frac. Jewish Managers (1932) × Post 1933	-0.576*	-0.704**
	(0.333)	(0.313)
Firm FE	Yes	Yes
Time FE	Yes	Yes
All Controls		Yes
Number of Observations	3834	3834
Number of Firms	171	171
R^2	0.563	0.663

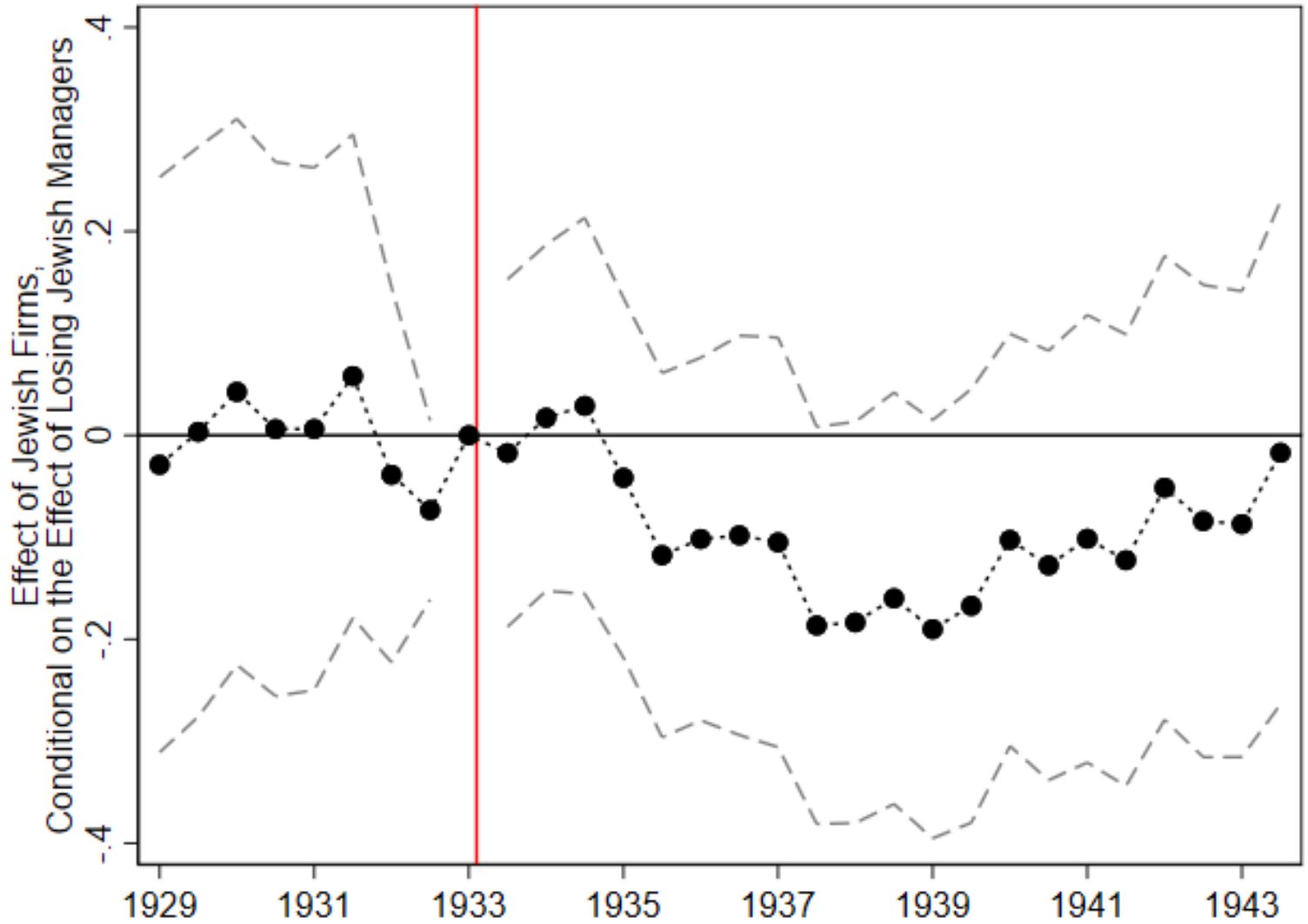
1b. “Jewish Firms”

- Firms that employed Jewish managers may have been associated with Jews in general and may have suffered from government or customer discrimination.
- The Nazi government began to target large firms perceived to be Jewish after 1935 (Barkai 1990, p. 83; Strauss 1999, p. XVII; James 2001, p. 38).
- We record all firms that are mentioned as being connected to Jews or Judaism in historical sources (Bruer 1927; Landsberg 1927a,b; Priester 1927; Mosse 1987).
- “Jewish firms” are distinct from firms with managers of Jewish origin.
  - Examples of “Jewish Firms”: *Leonhard Tietz*, *AEG*
  - Examples of firms with Jewish Managers: *Allianz*, *BMW*, *I.G. Farben*

1b. "Jewish Firms"

Dep. Variable: log(Stock Price)	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Firm	-0.127	-0.137	-0.021	-0.041	0.029	0.007
× Post 1933	(0.096)	(0.084)	(0.097)	(0.090)	(0.099)	(0.092)
Jewish Firm			-0.140**	-0.128**	-0.142**	-0.131**
× Post 1935			(0.057)	(0.059)	(0.058)	(0.060)
Frac. Jewish Managers (1932)					-0.446***	-0.441***
× Post 1933					(0.138)	(0.138)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
All Controls		Yes		Yes		Yes
Number of Observations	12710	12710	12710	12710	12710	12710
Number of Firms	655	655	655	655	655	655
R^2	0.563	0.619	0.563	0.620	0.567	0.623

1b: “Jewish Firms”



Part III: Aggregate Market Valuation

- We approximate the loss in aggregate market valuation of firms listed in Berlin.
- We test for spillovers. Were firms without Jewish managers affected by the removal of Jewish managers at other firms?
- We estimate models that include the share of Jewish managers in the same industry and region. Coefficients on the shares are negative and insignificant, suggesting no or negative spillovers.
- Decline in aggregate market valuation of 1.04 bn. RM → 1.8% decline of German GNP in 1933 (58.4 bn. RM)

Part IV: Dividends and Return on Assets

- Dividend payments affect investor returns and are correlated with firm profits.
  - Dividend data for every year from 1929 to 1943.
  - Average dividend = 4.6% of nominal stock value.
- Returns on assets measure how efficiently firms generate profits.
  - Return on assets = profits pre interest and tax payments / total assets.
  - Data for 1931, 1936, 1940.
  - Average return on assets = 13.8%

Part IV: Dividends and Return on Assets

Dep. Variable:	Dividends		Return on Assets	
Frac. Jewish Managers (1932)	-1.266	-1.557**	-0.235**	-0.187**
× Post 1933	(0.960)	(0.778)	(0.105)	(0.079)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
All Controls		Yes		Yes
Number of Observations	7379	7379	492	492
Number of Firms	655	655	289	289
R^2	0.176	0.240	0.401	0.560

Conclusion

- Individual managers can have first-order effects on firm performance.
  - Firms were unable to replace characteristics of dismissed managers.
  - Large losses in market value, profitability, and efficiency.
  - Effects persisted for at least ten years.
  - Losing connected and educated, but not experienced, managers had large effects.
- A discriminatory ideology can cause first-order economic harm.
- We study the most severe form of discrimination. But even the perception of not being welcome may lead to outflows of highly qualified individuals
  - Brexit: 12% of Europeans earning £100,001-200,000 p.a. plan to leave UK.