The Credit Channel in Germany's Great Depression

Micro Evidence from the 1931 Banking Crisis

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The Question

How much did losing your house bank cost?

James (1986) built the canonical account of credit transmission in the German Depression from case studies. Bernanke (1983) theorised the aggregate mechanism. Whether firms that lost their specific bank fared worse than firms whose banks survived has never been tested at the firm level.

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This Paper

Every firm faced credit contraction after July 1931. This paper measures the additional cost of being connected to the bank that closed its doors, and finds the relationship-specific channel was real but modest, adding $\sim$5pp to distress probability against a baseline where all firms faced severe credit tightening.

The Approach

If bank-specific credit channels mattered, it should show up in the data.

The Logic

- Four major banks served German industry. One failed in July 1931.
- All banks contracted credit. The question is whether Danat clients fared *worse* than clients of the surviving three.
- The coefficient captures the *marginal* effect of relationship destruction, over and above general credit tightening.

The Design

Cross-sectional comparison of Danat vs. non-Danat firms, with city $\times$ sector FE and pre-1931 controls.

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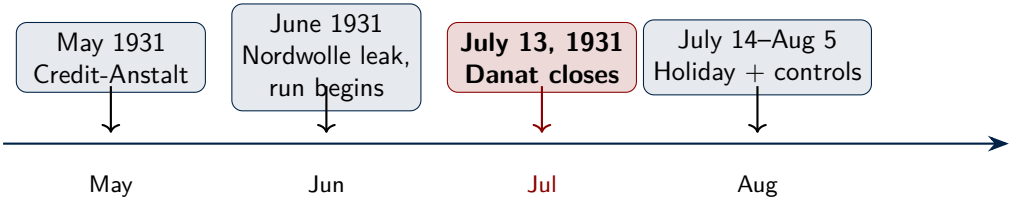
The Test

The key alternative, that selection into any great bank drives the result, is directly testable. If great-bank clients were inherently fragile, clients of all four banks should show elevated distress. Only Danat clients do.

The July 1931 Banking Crisis



- **Danat** (Darmstädter und Nationalbank): One of Germany's "Big Four"
- Nordwolle, a textile conglomerate whose owners had concealed losses through fraudulent accounting, collapsed in mid-June. Danat held ∼RM 50 million in Nordwolle debt, roughly half the total bank exposure, and bled liquidity for three weeks before closing
- Danat reopened 5 August under a government trustee, but the best customers left immediately.

What Bank Failure Meant for a Firm

The problem. Firms routinely sold goods on credit, receiving short-term bills from buyers. To convert these bills into cash, firms needed their bank to back them with its own signature. That signature made the paper acceptable throughout the financial system, ultimately to the Reichsbank.

When your bank failed, that backing vanished. Your bills became unmarketable. Receivables piled up with no way to turn them into cash.

A firm-level example.

> *Küppersbusch & Söhne AG (Gelsenkirchen, machining sector) lost its bank's backing. To keep its bills marketable, the firm's directors registered a* ***RM 150,000 mortgage*** *on two of their personal residences as collateral for the Reichsbank.*

The firm survived!! It still makes kitchen appliances in Gelsenkirchen today, 150 years after its founding.

The Hausbank System

The universal bank as operating partner

- Great banks combined deposit-taking, equity underwriting, and long-term industrial credit within a single institution (Fohlin, 2007)
- Current account advances were nominally short-term but rolled over continuously, functioning as permanent working capital

Measurement

- No firm-level loan data survive. Following Doerr et al. (2022), I use **paying agents** (*Zahlstellen*) to identify bank relationships
- The paying agent was typically the lead bank, the same institution that extended credit and sat on the supervisory board

Big Four Market Shares (1928–30)

Bank	Firms
Deutsche Bank	16.2%
Danat	**8.1%**
Dresdner Bank	7.3%
Commerzbank	6.1%

Paying Agent Coverage

Category	Firms
Big Four bank	26.6%
Other external bank	11.5%
No external bank	61.9%

Data: The *Handbuch der Deutschen Aktien-Gesellschaften*

Source

- Directory of medium and large German joint-stock companies
- Annual editions (1929–1933)
- Extracted via large language models (Gemini)

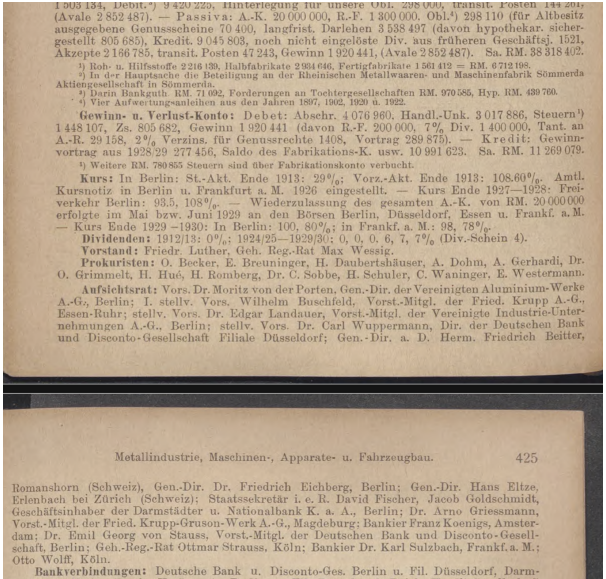
Coverage

- Industrial firms only (Chemical, Electrical, Machinery & Engineering, Textiles)
- ∼18,300 firm-year observations
- ∼6,000 unique firms

Variables

- **Treatment.** Paying agents (Zahlstellen), which proxy for bank exposure
- **Controls.** Balance sheet and dividend history (1924 to 1929)
- **Outcome.** Firm distress (bankruptcy, liquidation, or restructuring)

A Sample Entry from the *Handbuch* – Rheinmetall



1 503 134, Debit.[2]) 9 420 225, Hinterlegung für unsere Obl. 298 000, transit. Posten 144 201 (Avale 2 852 487). — Passiva: A.-K. 20 000 000, R.-F. 1 300 000, Obl.[4]) 298 110 (für Altbesitz ausgegebene Genussscheine 70 400, langfrist. Darlehen 3 538 497 (davon hypothekar. sichergestellt 805 685), Kredit. 9 045 803, noch nicht eingelöste Div. aus früheren Geschäftsj. 1521, Akzepte 2 166 785, transit. Posten 47 243, Gewinn 1 920 441, (Avale 2 852 487). Sa. RM. 38 318 402.

[2]) Rob- u. Hilfsstoffe 2 216 139, Halbfabrikate 2 934 646, Fertigfabrikate 1 561 412 = RM. 6 712 198.
[3]) In der Hauptsache die Beteiligung an der Rheinischen Metallwaren- und Maschinenfabrik Sömmerda Aktiengesellschaft in Sömmerda.
[4]) Darin Bankguth. RM. 71 092, Forderungen an Tochtergesellschaften RM. 970 585, Hyp. RM. 439 760.
[4]) Vier Aufwertungsanleihen aus den Jahren 1897, 1902, 1920 u. 1922.

Gewinn- u. Verlust-Konto: Debet: Abschr. 4 076 960, Handl.-Unk. 3 017 886, Steuern[1]) 1 448 107, Zs. 805 682, Gewinn 1 920 441 (davon R.-F. 200 000, 7% Div. 1 400 000, Tant. an A.-R. 29 158, 2% Verzins. für Genussrechte 1408, Vortrag 289 875). — Kredit: Gewinnvortrag aus 1928/29 277 456, Saldo des Fabrikations-K. usw. 10 991 623. Sa. RM. 11 269 079.

[1]) Weitere RM. 780 855 Steuern sind über Fabrikationskonto verbucht.

Kurs: In Berlin: St.-Akt. Ende 1913: 29%; Vorz.-Akt. Ende 1913: 108.60%. Amtl. Kursnotiz in Berlin u. Frankfurt a. M. 1926 eingestellt. — Kurs Ende 1927—1928: Freiverkehr Berlin: 93.5, 108%. — Wiederzulassung des gesamten A.-K. von RM. 20 000 000 erfolgte im Mai bzw. Juni 1929 an den Börsen Berlin, Düsseldorf, Essen u. Frankf. a. M. — Kurs Ende 1929 –1930: In Berlin: 100, 80%; in Frankf. a. M.: 98, 78%.

Dividenden: 1912/13: 0%; 1924/25—1929/30: 0, 0, 0. 6, 7, 7% (Div.-Schein 4).

Vorstand: Friedr. Luther, Geh. Reg.-Rat Max Wessig.

Prokuristen: O. Becker, E. Breuninger, H. Daubertshäuser, A. Dohm, A. Gerhardi, Dr. O. Grimmelt, H. Hué, H. Romberg, Dr. C. Sobbe, H. Schuler, C. Waninger, E. Westermann.

Aufsichtsrat: Vors. Dr. Moritz von der Porten, Gen.-Dir. der Vereinigten Aluminium-Werke A.-G., Berlin; I. stellv. Vors. Wilhelm Buschfeld, Vorst.-Mitgl. der Fried. Krupp A.-G., Essen-Ruhr; stellv. Vors. Dr. Edgar Landauer, Vorst.-Mitgl. der Vereinigte Industrie-Unternehmungen A.-G., Berlin; stellv. Vors. Dr. Carl Wuppermann, Dir. der Deutschen Bank und Disconto-Gesellschaft Filiale Düsseldorf; Gen.-Dir. a. D. Herm. Friedrich Beitter,

Metallindustrie, Maschinen-, Apparate- u. Fahrzeugbau. 425

Romanshorn (Schweiz), Gen.-Dir. Dr. Friedrich Eichberg, Berlin; Gen.-Dir. Hans Eltze, Erlenbach bei Zürich (Schweiz); Staatssekretär i. e. R. David Fischer, Jacob Goldschmidt, Geschäftsinhaber der Darmstädter u. Nationalbank K. a. A., Berlin; Dr. Arno Griessmann, Vorst.-Mitgl. der Fried. Krupp-Gruson-Werk A.-G., Magdeburg; Bankier Franz Koenigs, Amsterdam; Dr. Emil Georg von Stauss, Vorst.-Mitgl. der Deutschen Bank und Disconto-Gesellschaft, Berlin; Geh.-Reg.-Rat Ottmar Strauss, Köln; Bankier Dr. Karl Sulzbach, Frankf. a. M.; Otto Wolff, Köln.

Bankverbindungen: Deutsche Bank u. Disconto-Ges. Berlin u. Fil. Düsseldorf, Darm-

Extracted Data (FY 1930)

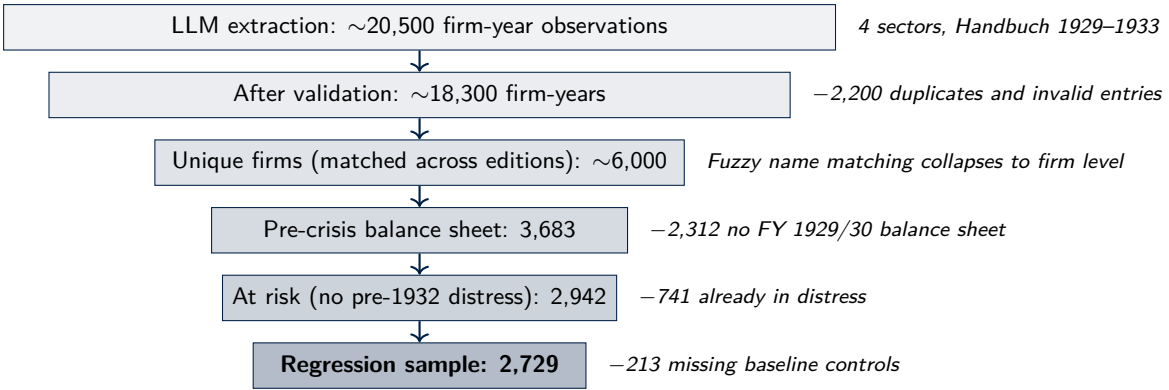
Field	Value
Location	Düsseldorf
Founded	1889
Balance Sheet Date	30.06.1930
Total Assets	RM 38,318,402
Net Profit	RM 1,920,441

Paying Agents (5 cities)

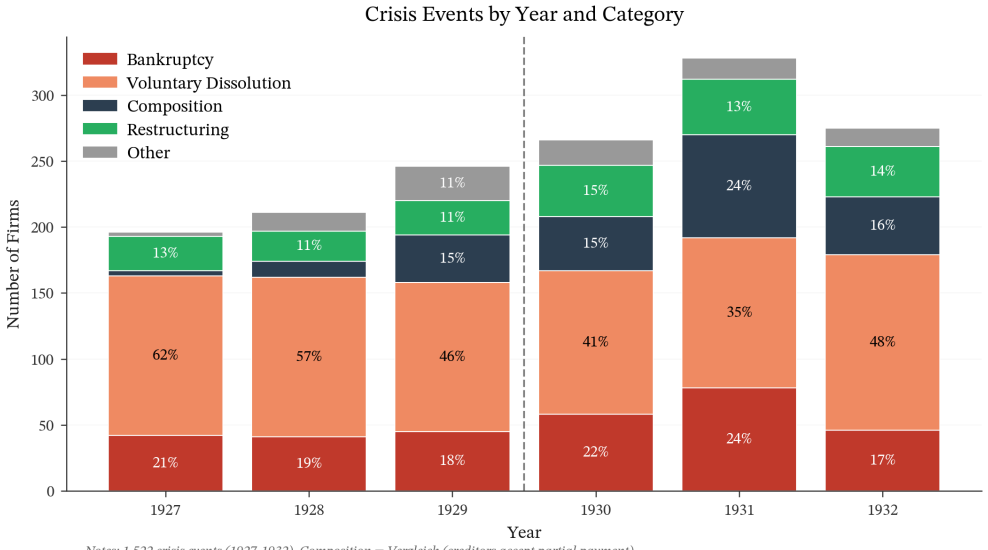
Deutsche Bank & Disconto-Ges.
Darmstädter & Nationalbank
Commerz- & Privat-Bank
Delbrück Schickler & Co.
+ 9 others across Berlin, Düsseldorf, Essen, Frankfurt, Cologne

Source: Handbuch 1931, extracted via Gemini LLM

Sample Construction



Corporate Distress by Type



Notes: 1,522 crisis events (1927-1932). Composition = Vergleich (creditors accept partial payment).

Who Were the Danat Clients?

Pre-crisis characteristics measured from the last available balance sheet before July 1931 (FY 1929/30).

	Non-Danat	**Danat**
N firms	2,705	238
Distress rate (1932+)	9.6%	10.9%
Log assets	13.87	15.45
Liquid assets / Total assets	0.36	0.32
Profitability (return on assets)	−0.02	−0.00
Firm age (years)	17	28
Current liabilities ratio	0.37	0.32
Dividend payer (%)	47%	78%

Danat clients were larger, older, and more profitable.

Empirical Approach

Treatment. Pre-1931 Danat exposure, measured by paying agent relationships in 1929 or 1930.

Outcome. Corporate distress in 1932 or later, defined as bankruptcy, liquidation, or restructuring.

Estimating equation.

$$\text{Distress}_i = \beta \cdot \text{Danat}_i + \mathbf{X}_i'\gamma + \alpha_{cs} + \varepsilon_i$$

- α_{cs} denotes city $\times$ sector fixed effects
- $\mathbf{X}_i$ includes baseline controls (log assets, return on assets, cash/assets, firm age, liabilities/assets, dividend payer)
- Sample restricted to firms with no distress before 1932

Baseline Results

$$\text{Distress}_i = \beta \cdot \text{Danat}_i + \mathbf{X}_i'\gamma + \alpha_{cs} + \varepsilon_i$$

	(1) FE only	(2) + Size	(3) Full controls
Danat	0.009	0.040*	**0.051****
	(0.023)	(0.024)	(0.024)
City × Sector FE	Yes	Yes	Yes
Baseline controls	No	Partial	Full
Observations	2,943	2,928	2,729

HC1 SE in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

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Finding

Danat clients faced ∼**5pp** higher distress probability (sample mean: ∼10%)

What the Estimate Captures

Losing your house bank meant more than losing a credit line. Deposits were frozen. Overdrafts stopped. Acceptances became suspect. Rebanking was hard because the surviving great banks were on state life support, with little capacity to take on new clients.

The coefficient captures the **total cost of relationship destruction**, not "credit supply" in a narrow sense.

And even this total effect turns out to be modest.

Did Backup Banks Help?

63% of Danat clients also listed another Big Four bank. Did that insulate them?

	N	Distress rate	$\hat{\beta}$
Danat + surviving backup (Deutsche or Commerz)			
Insured	122	7.4%	+0.024
			(0.035)
No surviving backup			
Combined	113	15.0%	**+0.074***
			(0.038)
of which: exclusive Danat	86	12.8%	
of which: Danat + Dresdner only	27	22.2%	
Pooled (baseline)	235	11.1%	+0.051**
			(0.023)

Same controls and FE as baseline. Cluster(city × sector) SE in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Robustness: Is the Effect Danat-Specific?

The logic. If selection into great banks drove the Danat result, then clients of *all four* major banks should show elevated distress rates. They do not.

$$\text{Distress}_i = \beta_1 \text{Danat}_i + \beta_2 \text{Dresdner}_i + \beta_3 \text{Deutsche}_i + \beta_4 \text{Commerz}_i + \mathbf{X}_i'\gamma + \alpha_{cs} + \varepsilon_i$$

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Bank	Coefficient
Danat (β_1)	$+0.052$**
	(0.023)
Dresdner (β_2)	$+0.006$
	(0.027)
Deutsche (β_3)	-0.024
	(0.018)
Commerzbank (β_4)	-0.007
	(0.022)

Same controls and FE as baseline. Cluster(city $\times$ sector) SE in parentheses.
* p<0.10, ** p<0.05, *** p<0.01.

Pre-Trend Falsification

Test. Does 1929 bank exposure predict distress in 1930–1931H1 (before Danat fails)?

	(1) All firms	(2) Exclusive Big Four
Danat	+0.010	+0.040
	(0.024)	(0.051)
Dresdner	−0.015	−0.039
	(0.029)	(0.028)
Deutsche	+0.013	−0.041
	(0.020)	(0.039)
Commerz	+0.068**	+0.047
	(0.027)	(0.049)
Observations	2,459	478

Same FE and controls as baseline (1929 values). Cluster(city × sector) SE in parentheses.
Column (2) restricts to firms with exactly one Big Four relationship. * p<0.10, ** p<0.05, *** p<0.01.

Danat shows no pre-trend in either sample. Commerz is significant in the full sample but disappears among exclusive Big Four clients (column 2), consistent with correlated bank exposure rather than a genuine pre-trend.

What Selection Would Require

1. Danat attracted firms that were *observably stronger* (larger, more profitable, higher dividend payers)
2. These firms were *no more likely to fail* in 1930–1931H1, when the Depression was already culling weak firms

What Selection Would Require

1. Danat attracted firms that were *observably stronger* (larger, more profitable, higher dividend payers)
2. These firms were *no more likely to fail* in 1930–1931H1, when the Depression was already culling weak firms
3. Yet they were destined to fail *specifically after* July 1931
4. For reasons *unconnected* to losing their house bank, yet correlated with Danat and not the other great banks

Which Firms Were Most Exposed?

The question.
The 5pp effect bundles everything that came with losing a house bank. Is it consistent with credit disruption specifically?

The prediction.
If short-term credit disruption drove the effect, firms with greater short-term funding needs should suffer disproportionately. Bills payable, acceptance liabilities, and current creditors all require continuous bank access.

The timing.
Immediate distress (1931H2) isolates the acute liquidity squeeze: frozen deposits, lost overdrafts, bills market closure.

Short-Term Funding Vulnerability

Specification. Interact Danat exposure with pre-crisis funding intensity:

$$\text{Distress}_i^{1931H2} = \beta_1 \cdot \text{Danat}_i + \beta_2 \cdot \text{Channel}_i + \beta_3 \cdot (\text{Danat}_i \times \text{Channel}_i) + \mathbf{X}_i'\gamma + \alpha_{cs} + \varepsilon_i$$

Channel	β_3 (Danat × Channel)	N
Outcome: Distress in 1931H2 only		
Bills / Total Assets	**+0.860****	431
	(0.344)	
Current Liabilities / Total Assets	+0.266***	845
	(0.078)	

Cluster(city) SE in parentheses. City × sector FE. * p<0.10, ** p<0.05, *** p<0.01.

The pattern is consistent with credit disruption: short-term funding intensity amplified the Danat effect.

Conclusion

The main result. Losing your bank raised the probability of corporate distress by 5pp on a 10% base rate, a **50% increase** for affected firms. The pattern is consistent with short-term credit disruption: firms with high bills exposure and current liabilities were disproportionately affected.

How large is this in aggregate?

Per-firm effect	50% increase in distress probability
235 Danat firms $\times$ 5pp	$\approx$ 12 additional distress events
Out of $\approx$ 267 total	(2,729 $\times$ 9.8%)

The per-firm effect was large. The aggregate footprint was small, because Danat served few firms. This design measures the *marginal* cost of losing your specific bank. The overall credit channel, including contraction common to all banks, could be substantially larger.

Thank You

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Appendix (LLM Extraction Validation)

Validated against OCR transcripts of original Handbuch pages (Metal sector 1931, $N = 277$).

Field	N	Error rate
Financial variables (regression controls)		
Balance-sheet date	235	2.1%
Total assets	238	4.6%
Treatment assignment (identification)		
Danat flag	186	**0%**
Dresdner flag	186	**0%**
Any Big Four	186	**0%**

Treatment flags are error-free. Any noise in financial controls attenuates the coefficient, biasing *against* finding an effect. Residual financial errors are digit substitutions and rounding (>10% numeric disagreement). Full error decomposition in the paper appendix.

Appendix (Sample Characteristics: Big Four Clients)

	Danat	Dresdner	Deutsche	Commerz
N firms	88	103	269	96
Distress rate (1932+)	12.5%	10.7%	7.8%	7.3%
Regression controls:				
Log assets	14.76	14.88	14.79	14.44
Liquid assets / Total assets	0.34	0.35	0.34	0.31
Profitability (return on assets)	−0.01	0.01	−0.01	−0.01
Firm age (years)	25	27	28	21
Current liabilities ratio	0.31	0.29	0.34	0.33
Dividend payer (%)	77%	78%	75%	73%
Avg dividend (1925–29)	0.046	0.054	0.046	0.046

Sample: B2 risk set (no distress before 1932) and exactly one Big Four exposure ($n_{bf} = 1$).

Appendix (Alternative Estimators)

Method	Estimate
Inference robustness (same specification):	
HC1 (robust)	0.051**
	(0.024)
Cluster (city × sector)	0.051**
	(0.023)
Permutation (1000 draws)	0.051**
Matching estimators:	
Coarsened Exact Matching	0.042**
	(0.021)

SE in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

All methods yield estimates in the range of 4 to 5 percentage points. Matching restricts to comparable firms, and permutation provides exact inference.

Appendix (Controls Build Table)

Step	Coef
FE only	0.009
	(0.028)
+ Log assets	0.040*
	(0.030)
+ Profitability, liabilities	0.048**
	(0.029)
+ Full baseline	0.051**
	(0.028)

Cluster(city × sector) SE in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Note: Controls *increase* the coefficient (negative selection into Danat)

Appendix (Great Bank Clients Only)

Question. Is the Danat effect driven by comparing great bank clients to firms without any major bank relationship?

Sample	N	Coef
Main specification:		
Danat vs. all firms	2,729	0.051**
		(0.023)
Restricted to great bank clients:		
Danat vs. Surviving Three	793	0.056*
		(0.030)
Any great bank relationship:		
Big Four vs. No Big Four	2,729	0.007
		(0.018)

Cluster(city $\times$ sector) SE in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Appendix (Channel Variable Definitions)

Bills / Total Assets (`bills_total_ratio_w`)

- **Numerator:** `Wechsel_Asset` + `Liab_Akzepte`
  - `Wechsel_Asset` = Bills of exchange the firm *holds* (AKTIVA). These are receivables from customers, not yet discounted at a bank.
  - `Liab_Akzepte` = Acceptance liabilities (PASSIVA). Bills the firm has *accepted* as obligor, typically drawn by suppliers.
- **Denominator:** `Total_Assets`
- **Winsorized** at 1st/99th percentiles
- **Coverage:** N = 431 in regression sample (firms with non-missing bills data)

Current Liabilities / Total Assets (`current_liabilities_ratio`)

- **Numerator:** `Kreditoren_Total` = Total short-term creditors
  - **Includes:** Trade creditors, other creditors, accruals, provisions
  - **Excludes:** Aktienkapital (equity), Rücklagen (reserves), Hypotheken (mortgages), Anleihen (bonds)
- **Denominator:** `Total_Assets`
- **Winsorized** at 1st/99th percentiles
- **Coverage:** N = 845 in regression sample

Appendix (Why Might the 1932+ Effect Persist?)

Suggestive mechanism: rebanking frictions.

Chodorow-Reich (2014) on post-Lehman lending:

- Firms with unhealthy pre-2008 lenders were 50% less likely to obtain new credit
- Conditional on obtaining credit, they paid 33bp higher spreads
- Effects concentrated among small and medium firms who could not access bond markets
- Mechanism: relationship stickiness + asymmetric information makes switching costly

Applied to Danat survivors:

- Danat clients who survived 1931H2 needed to establish new banking relationships
- New lenders face adverse selection: is this firm a "lemon" that Danat should not have financed?
- Reputational taint: Danat was known for aggressive, risky lending even before failure.

Consistent with the 1932+ effect, but not separately identified.

Appendix (Sample Geography and Sector Composition, 1929–1930)

Top Cities (N = 3,698 firms)

City	Firms
Berlin	682
München	95
Frankfurt	94
Hamburg	84
Köln	84
Chemnitz	82
Düsseldorf	77
Leipzig	66
Dresden	61
Nürnberg	61

Sectors

Sector	Firms
Machinery & Engineering	1,431
Textiles	1,148
Chemical	636
Electrical	483

Sample covers medium and large joint-stock companies (Aktiengesellschaften) from the *Handbuch der Deutschen Aktien-Gesellschaften*, 1929–1930 editions.

Appendix (LLM Extraction Prompts)

LLM extraction requires iterative prompt refinement.

The production prompt (∼450 lines) evolved through dozens of iterations. Each rule addresses a failure mode discovered during validation: the model extracts incorrectly, we diagnose the error, and we add an instruction or worked example. Abstract rules drift; concrete examples anchor behavior.

Challenge	**Prompt Solution**
Combined line items	German balance sheets merge categories ("Banken u. Kreditoren" = Banks and Short-term Liabilities). When we cannot split the value, priority rules assign it to bank debt; the remainder is marked "not separately reported."
Missing vs. zero	"Bankschulden: 0" differs from no such line item. We use -1 for "not reported" and 0 for "explicitly zero" to preserve this economically meaningful distinction.
Ambiguous terminology	"Kredit" in the P&L means ledger credit (revenue), not debt. Zone boundaries halt extraction before the profit-and-loss section to prevent misclassification.

Appendix (Multi-Bank Firms and the Specification)

Q. If a firm lists both Danat and Commerzbank, where does it show up?

Each firm is one row. Bank indicators are not mutually exclusive.

Firm	Danat_i	Dresdner_i	Deutsche_i	Commerz_i	Distress_i
A (Danat only)	1	0	0	0	?
B (Danat + Commerz)	1	0	0	1	?
C (Commerz only)	0	0	0	1	?
D (no Big Four)	0	0	0	0	?

In the four-bank specification, Firm B's predicted value is $\hat{\beta}_1 + \hat{\beta}_4 + \mathbf{X}'_B\hat{\gamma} + \hat{\alpha}_{cs}$. OLS estimates all coefficients simultaneously from a single row per firm. $\hat{\beta}_1$ is identified by comparing firms with and without Danat, *holding other bank affiliations constant*.

Since $\hat{\beta}_4 \approx 0$, multi-bank coding barely affects the Danat estimate. The backup banks slide shows where it matters empirically: the 122 firms with a surviving backup show no excess distress. The 5pp pooled effect is driven by the 113 firms whose banking relationships were entirely destroyed.