

Are Bigger Banks Better?

Firm-Level Evidence from Germany

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Motivation

- The market share of the 10 biggest banks in the US has risen from 25% in 1990 to over 60% (McCord & Prescott 2014). Failures of large banks had devastating effects in 2008/09.
- Policymakers are considering size regulation, e.g. asset caps or higher capital requirements for big banks.
- Benefits: Size regulation may improve financial stability and competition.
- Costs: Size regulation may harm real growth if there are economies of scale in banking.

Empirical Approach of This Paper

- Question: I focus on the potential costs. Do increases in bank size lead to internal efficiency gains in banks that improve real outcomes?
- Empirical challenge: Bank size is endogenous to bank efficiency and real outcomes, e.g. banks merge strategically.
- Method: I identify a natural experiment, where the timing of bank consolidation was exogenous.
- Main contribution: I estimate the causal impact of increases in bank size on the growth of firms.

The Natural Experiment in Postwar Germany

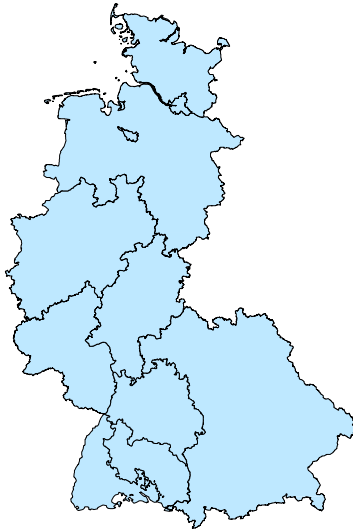
- American, British, and French military governments occupied West Germany after WWII.
- The Allies blamed financial centralization for the rise of the Nazis and the war.
- As punishment and to prevent future wars, three "treated" commercial banks were not allowed to operate at the national level for 10 years: Deutsche, Dresdner, Commerzbank.
- Other banks were untreated by the policy: other commercial banks, savings banks, credit unions, public banks.

Phases of the Banking Policy

- Bank managers wanted to reconsolidate. They were allowed to do so only when the Allied-German relations improved. The timing did not depend on the German economy.
- Phase 1, 1947-1952: The Morgenthau Plan aimed to deindustrialize Germany → treated banks only allowed to operate branches within states.

Phase 1: 1947-1952

State-level restriction

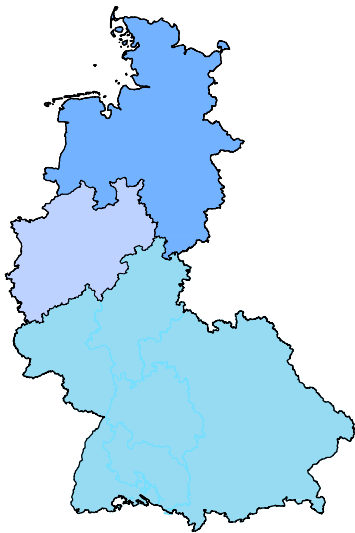


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- Phase 2, 1952-1957: “Friendly foes” → treated banks only allowed to operate branches within one of three banking zones.

Phase 2: 1952-1957

Zone-level restriction

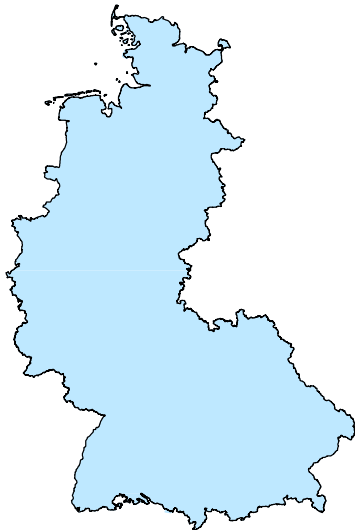


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- Phase 3, from 1957: Sovereign Germany → restrictions lifted.

Phase 3: From 1957

Restriction lifted



The Impact of the Banking Policy on Bank Size

- The majority of treated bank managers always wanted to merge. They did so soon after the restrictions were lifted.
- Take the example of Dresdner Bank.
- 1947-1952: 11 state-level banks, made up from branches that had belonged to one national Dresdner Bank before the war.
- 1952-1957: 3 zone-level banks.
- from 1957: 1 national bank.

The Size of the Treated Banks Compared to Today

- Average loans / GDP for the:
 - 3 largest banks in the US today = 5.0%
 - 3 treated German banks after re-consolidation = 3.0%
- Regulators today often treat banks whose assets exceed 1-2% of GDP as systemically important.
- All of the treated banks were initially below this threshold (relative to 1950s GDP) and were moved above it by consolidation.

The Reforms Affected Bank Operations

- The reforms changed how the treated banks operated through multiple channels.
- Theory predicts how each channel affects bank operations. Some channels may improve, some may hurt bank efficiency and real outcomes.
- Today's policy discussions about size regulation refer to many of the same channels as discussions in the 1950s.

Theoretical Benefits of Bigger Banks

- Increase in the number of borrowers of one bank → diversification → lower funding costs → Banking is a natural monopoly (Diamond 1984, Holtrreich 1995).
- Use of internal capital markets, with no need to settle through central bank (Adler 1949) → optimal when interbank markets are costly (Stein 1997), but may facilitate rent-seeking (Scharfstein & Stein 2000)
- Larger capital base, large loans (Wolf 1994) → efficient when syndicates are costly
- Spread out fixed costs, e.g. joint payments system, credit specialists, and legal experts (Horstmann 1991)

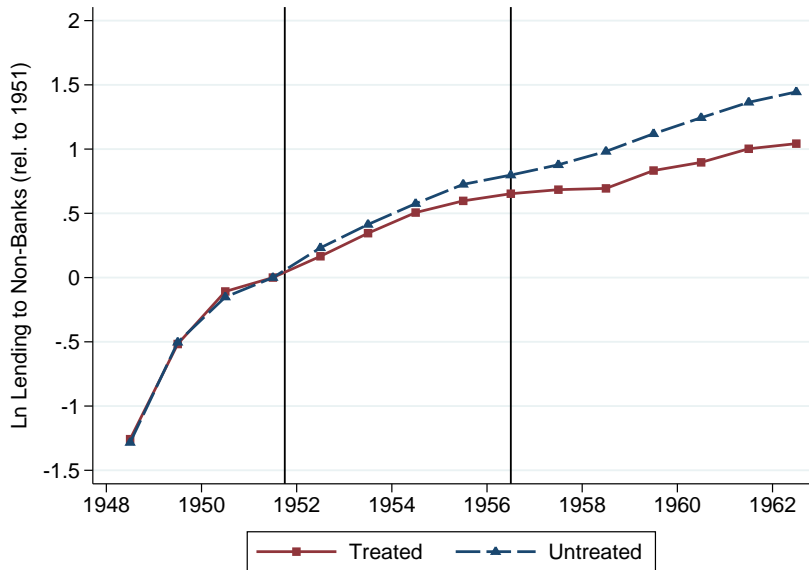
Theoretical Costs of Bigger Banks

- Complex management, long hierarchies → Limited managerial resources imply increasing marginal costs (Williamson 1967, Cerasi & Daltung 2000, Horstmann 1991).
- Before 1952, banks decided on loans independently in regional credit councils (Horstmann 1991). After 1952, a centralized structure took over. → Large organizations may be less able to process soft information (Stein 2002, Berger & Udell 2002, and Brickley et al. 2003).
- Moral hazard (Freixas 1999, Dávila & Walther 2017) or agency problems (Rajan 2005, Kashyap et al. 2008) → excessive risk-taking
- The reforms did not affect the number of banks operating in each state or the threat of new banks entering.

Bank Data

- Data from the Deutsche Bundesbank aggregated by groups of banks, e.g. the treated banks, other commercial banks.
- A key aim of the treated banks in the postwar period was to increase market share in lending and deposit-taking (Ahrens 2007).

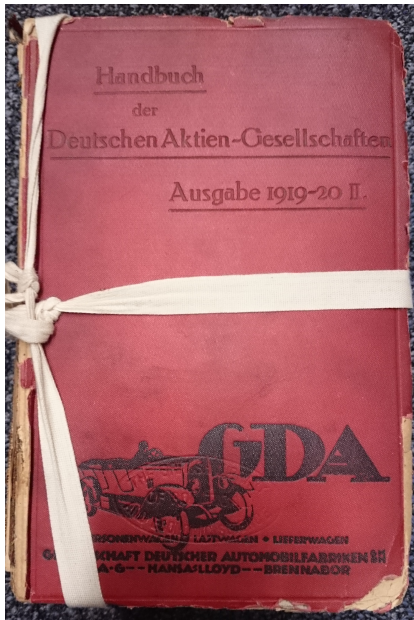
Lending by the Treated Banks Did Not Grow Faster



Firm Data

- Aggregate lending statistics do not tell us if firms in the real economy benefited. E.g., the treated banks may have improved loan terms, the quality of underwriting, or advice.
- I newly digitize a dataset on German firms in the 1950s.
- Data source: historic publications by the commercial information provider Hoppenstedt.

Source of the Firm Data



Source of the Firm Data

Dr.-Ing. Ludwig Schmitt (seit Oktober 1942), Aufsichtsrat; Dr. Alfred Bessie, Aufsichtsrat, Vorr. (in E.-L. seit Gründung); Dr. Herbert Dick, Kassier; stellv. Vorr., Dr. Straß von der Tann, Substanzrat (seit Oktober 1942); Dipl.-Ing. Alois Liebrich, KStB (seit Oktober 1942); Walter Knoke, Kassier (seit Mai 1941), Abschlagsleiter; Karl Opitz, Wirtschaftsprüfer, Kassier; Abschlagsleiter; Alexander Jahr, Kassier; Kassier (in der E.-V.); Dr. med. Dr. G. W. ... 1. Klasse; Wagnisverwendung:
 a) Zuschuß werden auf die Aktien bis zu 4 als Gewinnanteil zugerechnet;
 b) wenn erhält der Aufsichtsrat den ihm nach § 15 der Satzung zustehenden Anteil am Jahresgewinn in Höhe von 10 von Hundert;
 c) der Rest wird nach dem Prozentsatz der E.-V. an die Aktionäre als weiterer Gewinnanteil verteilt oder in anderer Weise verwendet.
Abteilung: Gesellschaften, Anlagen.

Aufbau und Entwicklung

1925: Gründung unter der Firma "Color-Elektrizitäts-Aktiengesellschaft" in Dalsburg. Eingetr. wurde in die Gesellschaft Geschäftsanteile der "Color-Elektrizitäts-Aktiengesellschaft m.H.G." in Essen in Höhe von RM 20.000.-. Die Gesellschaft befaßt sich mit der Herstellung von Motorschaltgeräten und befaßt auf diesem für die damalige Zeit völlig neuartigen Gebiet eine Reihe Patente.
 1930: Umstellung in größere Werkstätten in Dalsburg. Mehr und mehr orientierte sich das Fabrikationsprogramm über das gesamte Gebiet der Niederspannungs- und Schaltgeräte und Anlagen.
 1933: Ende des Jahres übernahm die Gesellschaft ein Werk in Frankfurt (Main) das sich in erster Linie mit der Herstellung von Hochspannungs-Schaltgeräten und Anlagen befaßte. Die Fabrikationsbetriebe blieben getrennt, jedoch unter Verwaltung und Verkauf zusammengefaßt. Die Übernahme des Werkes Frankfurt wirkte sich sehr günstig aus, da die Gesellschaft lastende war, als Gesamtunternehmer auch bei großen Projekten aufzutreten für die Lieferung der gesamten schalttechnischen Einrichtung auf dem Gebiet der Hoch- und Niederspannungsschaltgeräte und Anlagen.
 1935: Firmengründung in "Color-Baug Elektrische-Aktiengesellschaft".
 1936: Ankauf eines Apperates von 60.000 Gm in Balingen, da die bisherigen Werkstätten in Dalsburg und Frankfurt bei dem ständig steigenden Geschäftsumsatz nicht mehr ausreichten. Verlegung des Gesellschaftssitzes von Dalsburg nach Balingen.
 1943: Durch umfassende Rationalisierungsmaßnahmen konnte der Umsatz bei verringertem Beschäftigt trotz Kriegseindringender Schwierigkeiten im Vergleich zum Vorjahr gehalten werden.
 1945: Einstellung der Produktion in den letzten Wochen vor der Besetzung. Nach der Besetzung langsame Wiederaufbau des Balingener Betriebes, begonnen mit Montagearbeiten. Das Frankfurter Werk stand infolge wesentlicher Kriegsschäden und wegen Schwierigkeiten in der Fortfertigung praktisch während des ganzen Jahres still.
 1948: Teilweise Ankauf des Hauptbetriebes Balingen, der Betrieb Frankfurt (Main) konnte zwar in kleinem Umfang anlaufen, der Umsatz war jedoch auch sehr gering.
 1948/49: Neubeschaffung von Maschinen und Einrichtungen; Verlebung der Balingen auf 22 1/2.
 1950: 25jähriges Firmenjubiläum.

Besitz- und Betriebsbeschreibung

Fabrikationsbetrieb Frankfurt (Main); Herstellung von Hochspannungs-Schaltgeräten.
 Hauptwerk Balingen: Herstellung von Niederspannungs-Schaltgeräten und Hochspannungsschaltanlagen.
 Maschinen-Einrichtung: Für die Herstellung aller wichtigeren elektrischen Einzelteile (Isolierungen, Normteile, Schrauben etc.), für Hoch- und Niederspannungs-Schaltgeräte und Schaltanlagen.
 Kraftanlagen: Stromberg von auswärts.

W e s e n t l i c h e s

Color-Elektrizität-Gesellschaft, Frankfurt (Main)
 Gründung: 18. November 1925.
 Kapital: DM 5.000.-.
 Zweck: Herstellung und Vertrieb von elektrischen Schaltgeräten und Anlagen für Hoch- und Niederspannung und sonstige Geschäfte der Elektroindustrie.
 Beteiligung: 100 %.
 Zugehörigkeit zu Berufsverbänden:
 Zentralverband der Elektroindustrie, Frankfurt (Main);
 Zentralverband d. Elektrotechnischen Industrie e.V., Kasseler (Fachabteilung 6 "Schaltgeräte, Schaltanlagen").

Statistik

Kapitalentwicklung: Uepr. RM 500.000.-, 1937: Kapitalaufbau auf RM 500.000.-, und Wiederrückbildung auf RM 410.000.-, und 1940: Kapitalaufbau in E.-V. von 27. November um RM 30.000.- auf RM 500.000.-, 1941: Kapitalberichtigung gem. GAB von 11. Juni 41. Beschluß des A.-V. von 26. November um 50 % von RM 500.000.- auf RM 750.000.-, 1951 (E.-V. von 26. Mai Beschluß) um RM 750.000.- auf DM 3.000.000.- (1:4).
Umsatz-Gewinn: DM 3.000.000.- St.-G.M. 1950/51.
 Stückzahl: 3.000 Stücke zu DM 1.000.-.
Gewinn: Li 1950 Li 1951 Li 1952
 a) Umsatz Gm 26.000 26.000 26.000
 b) Umsatz Gm 26.000 26.000 26.000
Beschäftigte:
 a) Arbeiter: 1.135 951
 b) Angestellte: 325 316
Jahresumsatz: 1925 1950
 in Mill. RM/GM 8 14

Verweise auf Werke, übergeben

Wichtigste Mitarbeiter:
 Schriftliche: Heinrich-Westfälische Bank, Kasseler.
 Stichtag: 31. April 1950.
Dividenden: 1934-1936 ST 20 30 40-41 44-50
 in % 20 30 40 41 44-50
Tg. der letzten E.-V.: 7. September 1952.

BILANZ ZUM 31. DEZEMBER 1951 (1950)

AKTIVA DM 14.687.000 (9.004.634)
 Anlagevermögen: Debita 260.000 230.000 (225.000); Fabrik- und Verwaltungsvermögen 421.875 (420); Forderungsbilanz auf Fremde Grund und Boden 183.492 (182.227); andere Debita 1 (1); in Sum. befindliche Anlagen 24.948 (-); Maschinen und wassch. Anlagen

Firm Data Collection

- I photographed 15,000 pages from these publications in archives across Germany.
- The data were entered by hand.
- The data include employment, bank debt, and the **names of firms' relationship banks**.

Relationship Banking

- Relationship banking has played an important role in German corporate finance since the 19th century.
- Relationship banks provide the full range of financial services.
- Firms of all sizes form close and durable ties to their banks, reducing asymmetric information (Sharpe 1990, Boot 2000).
- Switching banks is costly, so shocks to relationship banks affect firms, e.g. Doerr et al. (2018) for Germany 1931, Benmelech et al. (2017) for the US Great Depression, Amiti and Weinstein (2011) for Japan 1990-2010, Chodorow-Reich (2014) for US 2008-09.

Empirical Strategy: Firm-Level Analysis

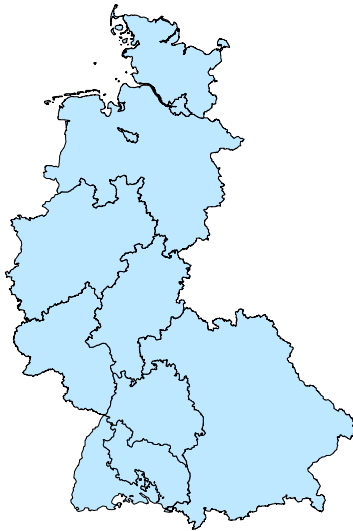
- The reforms of 1952 and 1957 exogenously increased the size of the relationship banks of a number of firms.
- I test whether firms with a treated relationship bank grew faster.
- Identifying assumption: Firms with a treated relationship bank would have grown at the same rate as firms with untreated relationship bank, had the reforms not happened.
- No differential pre-trends 1949-1951.

The "Focused" Sample

- I analyze two samples: the full sample and a subset called the “focused” sample.
- The identifying assumption is more likely to hold in the focused sample.
- The size of banks in the Western zone remained unaffected by the 1952 reform.

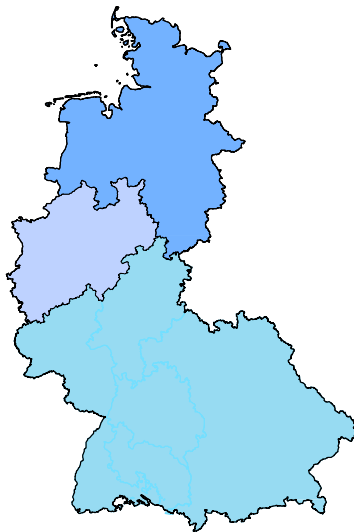
Phase 1: 1947-1952

State-level restriction



Phase 2: 1952-1957

Zone-level restriction



The "Focused" Sample

- The size of banks in the Western zone remained unaffected by the 1952 reform.
- Develop a sharper identification strategy with the following sample restrictions:
 - Keep only firms that had a relationship to a bank that was treated by the 1957 reform.
 - Drop firms in states that do not border the Western zone. Western zone was a hasty postwar creation by the British.
 - Drop Ruhr area and coal and steel producers (European Coal and Steel Community formed in 1952).
- Focused experiment: bank treated in 1952 and 1957 (not in Western zone) vs. bank treated only in 1957 (in Western zone).

Results on the Real Growth of Non-Stock Firms

	Employment growth 1951-56			
Rel. bank treated in 1952	-0.001 (0.003)	-0.001 (0.004)	0.001 (0.007)	-0.001 (0.007)
Observations	1,521	1,472	353	342
R ²	0.000	0.063	0.000	0.110
Industry FE*Zone FE	No	Yes	No	No
In age*Zone FE	No	Yes	No	No
Size bin FE*Zone FE	No	Yes	No	No
Industry FE	No	No	No	Yes
In age	No	No	No	Yes
Size bin FE	No	No	No	Yes
Sample	All		Focused	

Growth is the average annual symmetric growth rate. Controls: 18 industry FE, age, size, all interacted with zonal FE (North, West, South).

Effects on the Average Firm

- Small and insignificant coefficients.
- Results insensitive to controls.
- Bank debt: 95 CI excludes growth differences above 3 ppt (bank debt / assets: 0.5 ppt, employment: 0.7 ppt, revenue per worker: 1.4 ppt).
- Liberti et al. (2016): introduction of Argentine credit registry raised lending to affected firms by 61 percent in 2 years.

Firm Heterogeneity

- Effect on exporters and firms with high bank debt / assets not larger.
- Effect on newly added relationship borrowers of treated banks not larger (relative to other firms with new rel. banks).
- No heterogeneity by treated banking group.
- Dealing with opaque firms requires collecting and processing soft information. Opaque firm employment grew more slowly.
 - less than 50 employees.
 - younger than 10 years in 1951.
 - low asset tangibility (bottom 10 % of industry avg. of fixed tangible assets / assets).

Findings

1. Treated banks did not gain market share, become more profitable, or cost-efficient (non-interest cost / assets, salaries / assets).
2. Firms did not grow faster when their banks consolidated.
3. Opaque firms (small, young, low-collateral) grew more slowly.
4. The banks formed more relationships with risky firms, without adding fast-growing or efficient borrowers.
5. The media presence of the treated banks increased, which could indicate an incentive for banks to become bigger.
6. Municipalities with a treated bank branch did not have faster employment growth.

Conclusion

- Romer (2013): “What is needed is a more fundamental rethinking of the design of our financial system.”
- The Allied reforms were a fundamental redesign of the German financial system with respect to bank size. I examine whether this redesign can affect the real economy.
- Increased bank size did not raise firm growth, bank lending or cost efficiency, and municipal employment.
- Some arguments against bank size regulation rely on a universally positive relationship between bank size, bank efficiency, and real growth.
- The results of this paper throw into question such arguments.

Contribution to the Literature 1

- Cross-sectional analyses of bank size and efficiency produce mixed results. So do analyses of mergers.
 - Berger and Mester 1997, Berger et al. 1999, Feng & Serletis 2010, Wheelock & Wilson 2012, Hughes & Mester 2013, Davies & Tracey 2014, Kovner et al. 2014
 - Rhoades 1998, Berger et al. 1999, Calomiris 1999, Calomiris & Karceski 2000, Focarelli et al. 2002.
- Big banks lend less to small firms.
 - Berger et al. 1995, 2005, Berger et al. 1998, Peek & Rosengren 1998, Strahan & Weston 1998, Berger et al. 2001, Sapienza 2002, Jagtiani et al. 2016.
- Evidence that large hierarchies use less soft information and that loan officers' incentives matter.
 - Liberti & Mian 2009, Canales & Nanda 2012, Skrastins & Vig 2018, Cerqueiro et al. 2011, Qian et al. 2015.
- Causal identification in this paper: Exogenous variation in the size of the same bank serving the same firm.
- *Real* outcomes relevant to today's policy discussion: firm growth and bank efficiency, risk-taking, and media mentions.

Contribution to the Literature 2

- The natural experiment from postwar Germany allows isolating the effects of increases in bank size.
- U.S. deregulation removed limits on bank entry and expansion. The effects were generally driven by increased competition.
 - Output: Jayaratne & Strahan 1996; Entrepreneurship: Black & Strahan 2002, Cetorelli & Strahan 2006, Kerr & Nanda 2009; House price co-movements across states: Landier et al. 2017; Lower volatility: Morgan et al. 2004, Demyanyk et al. 2007; Lower income inequality: Beck et al. 2010.
 - Competition was the mechanism: Hubbard & Palia 1995, Jayaratne & Strahan 1998, Stiroh & Strahan 2003, Berger et al. 2004, Evanoff & Ors 2008.
- Banks use internal capital markets in response to shocks.
 - Houston et al. 1997, Gilje et al. 2016, Cortés & Strahan 2017.
- Geographic diversification raises banks' agency problems, reduces risk, and lowers funding costs.
 - Goetz et al. 2013, 2016, Levine et al. 2016.