The Emergence of a National Capital Market, 1870–1940*

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This article documents the integration of the American capital market with the first long-run, geolocated, firm-level record of the asset holdings of large institutional investors: over 100,000 holdings of life insurers, 1870–1940. Between 1880 and 1890 the mean distance of insurers' bonds from home more than doubled and their home-state share fell from over half to under a quarter. The shift occurred within firms, across bond classes and charters. Mortgage lending was national wherever state law permitted it. Integration was largely complete by 1890.

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How quickly do investors reallocate their portfolios when the capital markets of a large economy become integrated? The evidence on the timing of integration comes mostly from prices: interest rates across regions or countries converge, and the convergence is taken to date integration. Price convergence, however, is an equilibrium outcome. It is consistent with large reallocations of capital, with arbitrage by a small number of marginal lenders, or with changes in regional risk. Portfolio holdings are observed directly in a separate literature, but it measures the level of home bias rather than its change during integration. Investors hold more of their own country's assets than diversification warrants and favor nearby issuers within a country (French and Poterba 1991; Coval and Moskowitz 1999; Coeurdacier and Rey 2013), but these studies observe investors long after their markets were opened, and the historical studies concern foreign investment from a single financial center (Goetzmann and Ukhov 2006; Chabot and Kurz 2010). None of this evidence shows how quickly the principal investors of a market abandoned their home regions once a national market became available, or whether their portfolios moved before or after prices converged.

The United States after the Civil War is a natural setting for this question. Regional interest rates differed widely in the 1870s and narrowed only gradually before the First World War (Davis 1965). The dispersion of bank rates narrowed mainly after 1900 (Smiley 1975; Choi and Dupont 2007). Davis (1965) attributed the persistence of the differentials to the slow development of intermediaries able to move funds across regions. He found no institution in the long-term market as important as the commercial-paper houses were in the short-term market. He counted the life insurance companies, once freed of managerial and legal restrictions on their investments, among the first investors willing to move funds across regional boundaries. Others emphasized local market power under the National Banking System (Sylla 1969; James 1976). Both accounts make a prediction about quantities, namely about where the funds of the intermediaries were invested, but the debate has been conducted almost entirely in prices.

I construct the first firm-level, geolocated record of the bond holdings of one class of

investors, American life insurers, between 1870 and 1935, together with the distribution of their mortgage loans across states from 1908 to 1940.[1] Life insurers were among the principal institutional investors in long-term securities. They held 33 percent of the corporate bonds owned by financial institutions in 1900, second only to commercial banks, and 49 percent in 1929, more than any other class of institution (Goldsmith 1958).

The source is the annual statement that a licensed life insurer filed with a state insurance department. Its investment schedule lists every bond and stock the firm owned, line by line, and from 1908 its mortgage loans by state. I digitize these schedules from the reports of six states at fourteen benchmarks between 1870 and 1935, 104,092 holdings in all, and match each non-federal domestic issuer to its location. For each firm and benchmark I measure three statistics: the value-weighted mean distance of its holdings from the head office, the share within 300 miles of the head office, and the share in its home state. I compare the last with the share of that state in the holdings of insurers chartered elsewhere.

The financial holdings of American life insurers became national by 1890. Between 1880 and 1890 the mean distance of a firm's bonds from its head office rose from 288 to 635 miles, and the share held in the home state fell from 54 to 23 percent. The levels were already rising in the 1870s, and more than two-thirds of the change between 1880 and 1930 had occurred by 1890.

The shift took place within firms, not through entry into the sample or a change in the mix of bond classes. Firms present at every benchmark from 1870 to 1900 reproduce the aggregate. The geographic distribution of railroad and municipal bonds changed in parallel, as did that of firms chartered in New York and elsewhere. The shift also extended beyond securities traded in national markets. By 1890 the firms chartered in the Northeast held the bonds of 519 local governments outside the Northeast, against 102 in 1880, most of them by value in the Plains states and the South.

[1] Loan-level records of the urban mortgages of a sample of life insurers survive from 1920 in the survey of the National Bureau of Economic Research (Saulnier 1950; Angelova and D'Amico 2026), and bank-level records of interbank deposits from the 1860s (Anderson, Paddrik, and Wang 2019; Calomiris and Carlson 2017).

Holding the set of issuers fixed separates a change in portfolio allocation from a change in where the available issuers were located. I fix the set of issuers at a base year and recompute each firm's statistics over that set, so that only portfolio weights can vary. Between 1880 and 1885 the change reflected mainly purchases of issuers new to the sample. Between 1885 and 1890 it reflected reallocation across issuers the firms already held: over the 1885 set, the mean distance rose from 470 to 602 miles.

Firms chartered outside New York continued to favor their home states after their portfolios became national. In 1920 those chartered in Connecticut, Massachusetts and New Jersey held between 10 and 11 percent of their bonds at home, where other insurers held at most 1.6 percent of theirs. The New York firms' excess had disappeared by 1930. A plausible reason is that a firm headquartered in New York, close to the investment banks and underwriting syndicates that distributed securities nationally, faced a home market that largely coincided with the national one.

Mortgage loans separate the effect of distance from that of a statute confining lending to the home state. Where no statute confined it, mortgage lending was national from the first observation: firms chartered in Connecticut, Massachusetts and New Jersey held their loans 875 miles from the head office in 1908. Until 1906 a statute confined the New York firms' mortgage loans largely to New York and its adjacent states. They still held 90 percent of their loans at home in 1908 and about half in 1940, because a stock of illiquid loans changed only as fast as new lending replaced it.

Taken together, the holdings date the integration of the market for long-term securities to the two decades before 1890, as measured by the portfolio allocation of its principal institutional investors. This chronology precedes the convergence of regional bank rates documented by Davis (1965) and Smiley (1975), which continued until the First World War. The regional differentials that persisted after 1890 therefore cannot be attributed to institutional investors confining their bond purchases to their home regions. They point instead to markets in which local intermediation remained important. Regional mortgage

rates reflected the cost of transferring funds between markets as well as lending risk (Snowden 1987), bank credit was still regionally segmented in the 1950s (D'Amico and Alekseev 2025), and regional mortgage spreads narrowed only after the federal housing policies of the 1930s (Angelova and D'Amico 2026).

This paper contributes to three literatures. First, it adds firm-level quantities to the debate on American capital market integration (Davis 1965; Sylla 1969; James 1976; Bodenhorn 1995; Odell 1989), which has been conducted largely in prices. The quantity evidence concerns short-term balances in the correspondent banking system (James 1978; James and Weiman 2010), the mortgage companies that placed Western loans with Eastern lenders (Snowden 1995, 2010), and the premium income of life insurers, which became national while control of the savings stayed with firms chartered in a few states (Janas 2026a,b). The closest antecedent in quantities, Pritchett (1970), reports regional aggregates of life insurance assets to 1900. Second, it contributes to the literature on distance and home bias in portfolios. Investors hold more of their own country's assets than diversification warrants (French and Poterba 1991; Tesar and Werner 1995; Lewis 1999), and within a country they favor nearby issuers (Coval and Moskowitz 1999, 2001). Those studies measure a cross section at a point in time against a market portfolio. British share registers record the local bias of individual investors weakening outside London between 1870 and 1935 (Rutterford, Sotiropoulos, and van Lieshout 2017). The schedules provide the corresponding record for institutional investors, following the same investors over seventy years, including the decade in which most of the change took place. Third, it bears on the literature on regulation and taxation as sources of home bias (Ongena, Popov, and Van Horen 2019; Hochberg and Rauh 2013; Babina et al. 2021). New York's mortgage statute is an early instance of a location rule, and the schedules show that its effect on a stock of loans decayed at the rate at which the stock turned over.

Life Insurers and the Market for Long-Term Securities

A life insurer collected premiums in every state in which it was licensed and invested the reserves that the premiums accumulated. The industry grew rapidly after the Civil War. The growth was driven largely by the deferred-dividend, or tontine, policy, which the Equitable introduced in 1868, and by the competition of the large New York firms for new business through their agency systems (Stalson 1942; Ransom and Sutch 1987). The sampled firms' bonds other than federal and foreign securities rose from 67 million dollars in 1880 to 203 million in 1890 and 582 million in 1900, in nominal terms. The portfolio of 1890 therefore consisted largely of funds invested after 1880 (Keller 1963; North 1954).

Each firm invested under the statute of the state that chartered it. The statutes listed the classes of assets a firm could hold and, for some classes, where the issuer or the mortgaged property had to be located (Halaas 1932). Securities reached the firms through the bond houses of New York, Boston and Philadelphia, which marketed railroad and municipal issues to institutions (Carosso 1970). Information on distant issuers was published regularly. *Poor's Manual of the Railroads of the United States* was issued annually from 1868, and the *Investors' Supplement* of the *Commercial and Financial Chronicle* from 1875. Both reported the mileage, earnings and funded debt of the roads whose bonds the insurers bought (Chandler 1956). The other large asset available to the firms was the federal debt left by the Civil War. It was 59 percent of the insurers' securities in 1870 and 37 percent in 1880, and the Treasury retired most of it during the 1880s (Noyes 1898).

Sources and Construction

The holdings are transcribed from the annual reports of the insurance departments of six states. Before 1925 each state required every firm doing business there to file an annual statement and printed its investment schedule in full; from 1925 the volumes print only the state's domestic firms. The schedule lists every bond and stock the firm owned as of

31 December. It gives the issuer and the security, often the coupon and maturity, and the par, book or market value, or several of these. I use fourteen benchmarks, one every five years from 1870 to 1935. New York supplies every benchmark. Massachusetts supplies every benchmark from 1870 to 1920, and Connecticut every benchmark from 1875 to 1930. Pennsylvania supplies every benchmark from 1875 to 1915 and again in 1930. New Jersey supplies 1880, 1895, 1925, 1930 and 1935, and Illinois 1925 and 1930. Table 1 lists the states behind each benchmark, and Online Appendix Table A1 lists every volume. New York and Connecticut also report each firm's mortgage loans and real estate owned by state at eight benchmarks from 1908 to 1940.

The reports also print the schedules of insurers in other lines of business, and these firms are excluded. A firm is classified as a non-life insurer if it is absent from both the firm-by-state premium panel of Janas (2026a) and the New York life-insurer asset tables of Janas (2026b) and its name states a non-life line of business. The accident and casualty departments that some multi-line firms reported inside their life filings are dropped.

The schedules report value on several bases (book, cost, ledger, market and amortized), and the mix changes over the period. Each holding is valued at its carrying value, taken as book, cost or ledger value in that order. Market or amortized value is used only where the schedule prints no carrying value, as is common in the volumes before 1900. Valuing holdings at par instead leaves the results unchanged.

A firm licensed in several states filed in each, so the same portfolio frequently appears more than once at a benchmark. Where it does, one filing is retained, chosen by proximity to the statement date, then by the number of holdings, then by value. The number of holdings takes precedence over value because value depends on the valuation basis, which differed across states in the early volumes.[2]

[2]Across all benchmarks 371 firm-years were filed in more than one state; Online Appendix Table A2 reports the value at stake under three alternative rules. Online Appendix Table A3 reports the firms and value retained at every stage of the construction. Online Appendix Table A4 compares the securities in the New York schedules with the "stocks and bonds" line that New York prints, independently, in each firm's balance sheet. Online Appendix Table A5 makes the same comparison for mortgage loans by state.

Table 1 reports coverage by benchmark. The sample captures nearly the whole industry's bond holdings until 1920 and a declining share thereafter. Measured against the bonds of all American life insurers, the sampled firms held at least 88 percent at every benchmark from 1890 to 1920. Before 1890 the only industry series combines bonds with stocks and covers the firms reporting to New York; against it, the sample accounts for all or nearly all of the total. Because the six states' volumes print only their own domestic firms from 1925, the share falls to 70 percent in 1925, 75 percent in 1930 and 57 percent in 1935.

All six states lie in the Northeast and the Midwest, so the firms of the South and the West are under-represented throughout. Because these firms were small, the omission matters more for the count of firms than for the value of holdings. Between 1870 and 1920 the bond holdings come from firms headquartered in 9 to 23 states at each benchmark. In 1925, 1930 and 1935 they come from four, five and two states. The estimates after 1920 therefore rest on firms chartered in New York, New Jersey, Connecticut and Illinois, with Pennsylvania in 1930.

I match each issuer to the states in which it operated and, where it has one, to a point location. A city, county or school-district bond is placed at the issuing place, a state's bond in that state, and a utility, industrial or financial firm at its head office. Distances are great-circle miles from the insurer's head-office city to the geographic center of each destination state. A point for each state is the only location common to every holding. Railroads cross state lines and are divided among states by miles of road, as described below, so they have no single location. The head office of a corporation is a legal address rather than the place where its funds were invested. The state is also the unit of the home-state share and of the benchmark defined below. State centers overstate the distance of holdings near a head office that lies far from the center of its state. New York City, for example, is 112 miles from the center of New York State. The bias is largest in the early portfolios, which were concentrated at home, so it understates the rise in distance. Measuring issuers located in a single place at their own coordinates gives a mean distance of 258 miles in 1880 and 631 in

Table 1. Sources, Coverage and Assignability of the Holdings

Panel A. By Benchmark

Year	Firms	Holdings	Sample bonds ($m)	Sample/ industry	Place- able	Source states	Mortgage firms
1870	68	597	42.5	1.01	0.41	NM	–
1875	56	871	61.7	1.02	0.67	NCPM	–
1880	39	907	110.7	1.04	0.63	NCPMJ	–
1885	37	1435	132.5	0.98	0.92	NCPM	–
1890	43	2342	217.7	0.90	0.94	NCPM	–
1895	48	3841	371.2	0.88	0.91	NCPMJ	–
1900	51	5048	646.1	0.91	0.91	NCPM	–
1905	61	7021	1080.5	0.89	0.90	NCPM	–
1910	72	12108	1672.7	1.01	0.91	NCPM	38
1915	87	15456	2143.5	1.02	0.89	NCPM	39
1920	42	14740	3223.0	0.98	0.69	NCM	40
1925	45	10332	3043.5	0.70	0.74	NCJI	43
1930	73	19510	4823.6	0.75	0.86	NCPJI	52
1935	28	9880	5678.8	0.57	0.75	NJ	57

Panel B. Bonds by Issuer Class, All Benchmarks Pooled

Bond class	Value ($m)	Share assignable	Mean states
Railroad	12782.7	0.978	3.23
Utility	2987.1	0.972	1.21
US federal	2771.0	0.000	–
US municipal	1839.2	0.998	1.00
Foreign	1560.9	0.000	–
Industrial	575.8	0.987	1.14
Other / unclassified	383.7	0.830	1.11
US state	347.5	0.998	1.00

Sources: The holdings are from the investment schedules printed in the annual reports of the insurance departments of New York, Connecticut, Pennsylvania, Massachusetts, New Jersey and Illinois, 1870–1935. Railroad mileage by state is from the editions of *Poor's Manual of the Railroads of the United States* and Moody's railroad manuals published between 1869 and 1941. Industry totals are from the Institute of Life Insurance.

Notes: Panel A has one row per benchmark, the position at 31 December of the year before. It reports firms, holdings, sampled bond value in millions of dollars, sampled bonds as a share of the industry's, the share of securities value assignable to a U.S. state, the states whose reports supply the benchmark, and the firms in the mortgage schedules from 1908. The ratio of sample to industry bonds can exceed one because sample bonds are at the printed value and the industry total is at book value. Before 1890 the industry series covers the bonds and stocks of the firms reporting to New York, at the year-end before the benchmark. The source states are New York (N), Connecticut (C), Pennsylvania (P), Massachusetts (M), New Jersey (J) and Illinois (I). The mortgage schedules covered 35 firms in 1908 and 60 in 1940. Panel B pools the benchmarks by bond class and reports value, the share assignable to at least one state, and the mean number of states per assignable holding. Values are nominal.

1890, against 288 and 635 with state centers (Online Appendix Table A6).

Obligations of the United States and the securities of foreign governments and firms have no state and are excluded. Federal debt was 37 percent of the insurers' securities in 1880 and 4 percent in 1890, and foreign securities were 7 to 11 percent from 1900. Issuers that could not be identified are at most 0.20 percent of value at any benchmark. Railroads, 55 percent of pooled bond value, cross state lines. Each railroad holding is divided among the states in proportion to the road's mileage in each. The mileage is read from the edition nearest each benchmark among sixteen editions of Poor's and Moody's railroad manuals published between 1869 and 1941. The edition is taken within six years of the benchmark, and a road held before 1900 and absent from those editions is read from Poor's 1901. Railroads absent from the manuals, most of them small single-state roads, are divided equally among their states.

Measurement

For firm i in year t, let w_{ist} denote its holdings located in state s, $W_{it} = \sum_s w_{ist}$ its total, and d_{is} the distance from its head-office city to the geographic center of state s. The states are the 48 contiguous states and the District of Columbia. I use three statistics of each portfolio. The first is the mean distance of the holdings from the head office,

$$D_{it} \;=\; \sum_s \frac{w_{ist}}{W_{it}}\, d_{is}.$$

The second is the share of the holdings within 300 miles of the head office, $N_{it} = \sum_s (w_{ist}/W_{it})\, \mathbf{1}[d_{is} \leq 300]$, a radius that contains the home state and its neighbors for the Northeastern head offices. The third is the home-state share, $H_{it} = \sum_s (w_{ist}/W_{it})\, \mathbf{1}[s = h(i)]$, where $h(i)$ is the state that chartered the firm.

A high home-state share does not by itself show a preference for the home state. A state that issued a large part of the nation's securities would rank high in any investor's

holdings. A firm chartered there would therefore hold much of its portfolio at home even if it had no preference for home. Separating the two requires each state's share of the securities available to investors, and no such series exists for these decades. I use the holdings of the other insurers as a proxy. Firms chartered outside h bought from the same national market but had no home-state reason to favor h. The share of h in their combined holdings therefore measures what investors with no tie to h held there. For a firm chartered in h, the benchmark is

$$B_{it} \;=\; \frac{\sum_{j:\, h(j)\neq h(i)} w_{jh(i)t}}{\sum_{j:\, h(j)\neq h(i)} W_{jt}},$$

where $h(j)$ is the charter state of firm j. The proxy is imperfect, because most of the other firms were themselves in the Northeast. If they also held more near home, the benchmark overstates the neutral share of the Northeastern states and so understates the overweight of their firms. The log of H_{it} over B_{it}, aggregated to the firms of a head-office state, is the home-state overweight. A value of zero indicates that a state's firms held its securities in the same proportion as the other insurers. Group series are value-weighted averages of the firm statistics, with the weight equal to the firm's holdings in the class. The aggregates thus describe the geographic allocation of the industry's funds, and the median firm is reported alongside them.

The overweight compares a firm with the other insurers but does not separate the home state from its proximity. For that purpose I estimate the gravity equation that the literature applies to cross-border holdings (Portes and Rey 2005). The unit of observation is a firm, a destination state and a benchmark. At each benchmark every firm with positive holdings in the asset class is paired with each of the 48 contiguous states and the District of Columbia. A state in which the firm held nothing enters with a value of zero. The regression is

$$w_{ist} \;=\; \exp\Big(\alpha_{it} + \delta_{st} + \beta_t \ln d_{is} + \gamma_t^{NY}\,\mathrm{Home}_{is}\,NY_i + \gamma_t^{O}\,\mathrm{Home}_{is}\,(1-NY_i)\Big)\,\varepsilon_{ist}, \qquad (1)$$

with $\mathbb{E}[\varepsilon_{ist} \mid \alpha_{it}, \delta_{st}, d_{is}, \mathrm{Home}_{is}, NY_i] = 1$. The dependent variable w_{ist} is the carrying value

of firm i's holdings in state s at benchmark t, in millions of dollars. The distance d_{is} is in miles and is set to ten where it is shorter. Home_{is} equals one if s is the firm's charter state $h(i)$, and NY_i equals one if that state is New York. The term α_{it} is a firm-by-benchmark fixed effect and δ_{st} a destination-by-benchmark fixed effect. The firm effect absorbs size. The destination effect absorbs everything about a state that is common to all insurers at a date, including the supply of its securities. The distance elasticity β_t therefore measures how much less a firm held the farther away a state was, relative to what every insurer held there. The home premiums γ_t^{NY} and γ_t^{O} measure how much more the firms of each charter group held in their own state than distance alone predicts.

I estimate equation (1) by Poisson pseudo-maximum likelihood (Santos Silva and Tenreyro 2006), which keeps the zeros. There is one regression for bonds, from 1870 to 1930, and one for mortgage loans, from 1908 to 1940. Because every coefficient and fixed effect varies by benchmark, the estimates equal those of a separate regression at each benchmark. Standard errors are clustered by firm. The home premiums are identified from few head-office states, so I also report standard errors clustered by firm and by destination.

A second specification compares the distance elasticities of the two charter groups. It replaces $\beta_t \ln d_{is}$ with $\beta_t^{NY} \ln d_{is}\, NY_i + \beta_t^{O} \ln d_{is}\, (1 - NY_i)$. The home premium in equation (1) compares the home state with a state that lies as far from the head office as the center of the home state. Table 4 also reports the premium against a state 300 miles away, $\gamma_t^g + \beta_t(\bar{L}_{gt} - \ln 300)$ for charter group g. Here $\bar{L}_{gt}$ is the mean of $\ln d_{ih(i)}$ over the group's firms, weighted by their holdings. It is the log ratio of a firm's holdings in its home state to its holdings in a state 300 miles away with the same destination effect.

Results

The Timing and Extent of the Shift

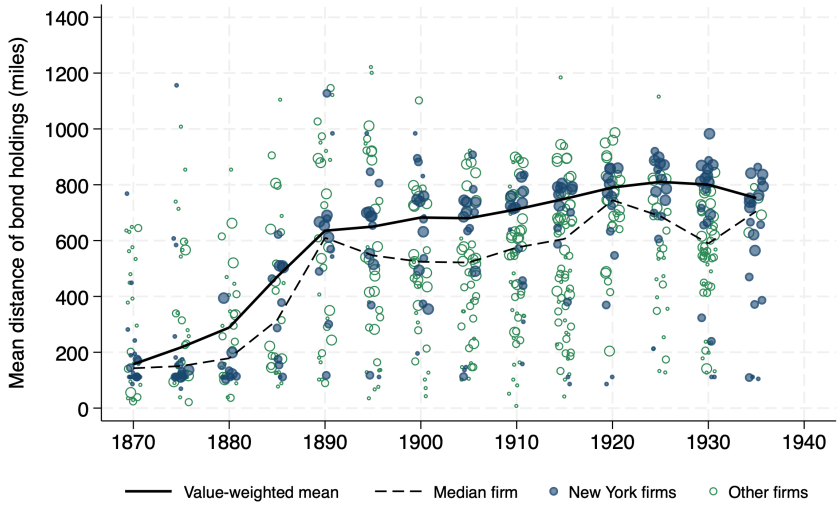
Panel A of Figure 1 plots the mean distance of each firm's bonds from its head office at every benchmark from 1870 to 1935. Marker size indicates the tercile of the firm's holdings, and the value-weighted mean and the median firm are shown alongside. Panel B plots the share of holdings within 300 miles of the head office and the home-state share, the latter against the other insurers' share of the same states.

In 1870 American life insurers held their bonds close to home, and the distance had begun to rise before 1880. The mean distance of holdings from the head office was 157 miles in 1870 and was already rising by 1875. In the full sample it was 288 miles in 1880, when more than half of holdings were in the home state, against 5 percent held in the same states by insurers chartered elsewhere. Between 1880 and 1890 the mean distance more than doubled, to 635 miles, and the home-state share fell to 23 percent. The share within 300 miles of the head office fell by half over the same decade.

Thereafter the pace of change slowed. In 1930 the mean distance was 801 miles, about a quarter above its level in 1890, and the home-state share was 11 percent, against a benchmark of 8 percent.

Most of the shift to a national portfolio was complete by 1890. The mean distance more than doubled between 1880 and 1890, and for each of the three statistics more than two-thirds of the change between 1880 and 1930 had occurred by 1890. The change after 1890 in the mean distance and the home-state share was smaller but statistically distinguishable from zero. The bootstrap intervals in Online Appendix Table A7 exclude zero for both the change from 1880 to 1890 and the change from 1890 to 1930. The data do not date the start of the shift. The aggregate statistics already move between 1870 and 1875. The benchmarks before 1880, however, rest on fewer state reports and exclude federal debt, which was 59 percent of the insurers' securities in 1870 and 33 percent in 1875.

Panel A. Mean Distance from the Head Office, by Firm and Benchmark



Panel B. Share within 300 Miles and in the Home State, against the Other Insurers

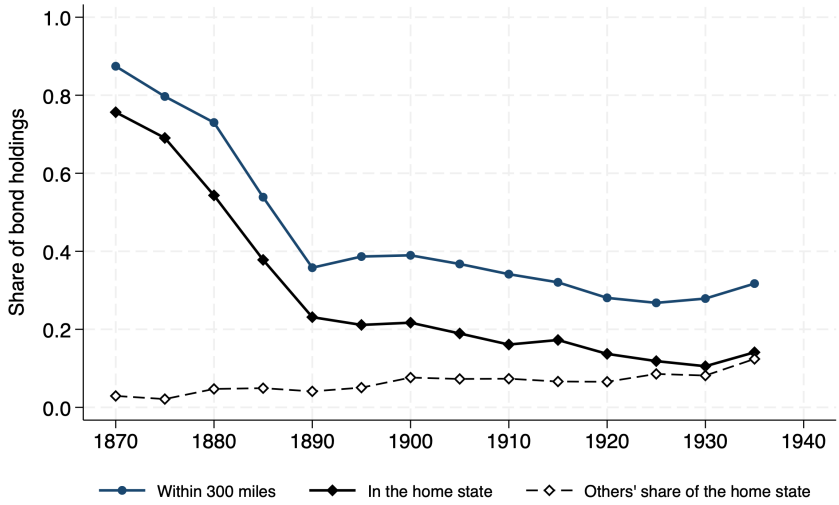


Figure 1. The Nationalization of Bond Holdings, 1870–1935

Sources: The holdings are from the investment schedules printed in the annual reports of the insurance departments of New York, Connecticut, Pennsylvania, Massachusetts, New Jersey and Illinois, 1870–1935. Railroad mileage by state is from the editions of *Poor's Manual of the Railroads of the United States* and Moody's railroad manuals published between 1869 and 1941.

Notes: Bonds exclude federal and foreign securities and are located at the issuer; railroads are divided among states by miles of road. Panel A plots the value-weighted mean distance of each firm's bonds from its head-office city to the geographic center of the destination state, one marker per firm and benchmark. Marker sizes distinguish the bottom, middle and top thirds of bond holdings across firm-benchmarks, and the markers of New York-chartered firms are filled. The solid line is the value-weighted mean across firms and the dashed line the median firm. Firm-benchmarks with a mean distance above 1,400 miles, Pacific-coast head offices holding Eastern bonds, are omitted from the plot but not from the lines. Panel B plots the value-weighted share of bonds within 300 miles of the head office, the value-weighted share in the home state, and the share of the same states in the bonds of firms headquartered elsewhere.

Within-Firm Change across Bond Classes and Charters

The rise in the aggregate between 1880 and 1890 could reflect the entry of firms into the sample, a change in the classes of bonds held, or the behavior of a single group of firms. Table 2 reports the mean distance and the home-state share at each benchmark for the full sample and for the 26 firms that held bonds at every benchmark from 1870 to 1900. It also reports them for the firms chartered in New York and elsewhere, and for railroad and municipal bonds separately. None of the three explanations accounts for the shift.

The balanced firms reproduce the full sample: their mean distance rose from 292 miles in 1880 to 638 in 1890, and their home-state share fell from 54 to 23 percent. Entry into the sample therefore accounts for none of the shift.

Table 2. Mean Distance and Home-State Share of Bond Holdings, by Sample, Charter and Class

	All firms		Present 1870–1900		New York charter		Other charters		Railroad bonds		State and municipal	
	Miles	Home	Miles	Home	Miles	Home	Miles	Home	Miles	Home	Miles	Home
1870	157	76	143	76	147	85	162	71	245	29	145	82
1875	218	69	212	69	129	94	263	57	200	53	221	72
1880	288	54	292	54	235	68	337	42	243	55	294	54
1885	470	38	475	37	490	38	441	38	551	30	342	49
1890	635	23	638	23	655	21	597	28	665	20	591	29
1895	650	21	664	20	683	18	581	27	654	19	696	20
1900	683	22	688	21	733	22	572	21	749	18	626	21
1910	712	16	724	15	752	15	645	17	771	11	531	30
1920	790	14	798	14	827	14	735	13	828	11	806	15
1930	801	11	813	11	833	12	751	9	864	8	747	14
Firms, 1870–1900	48–46		26–26		23–15		25–31		15–42		47–43	

Sources: The holdings are from the investment schedules printed in the annual reports of the insurance departments of New York, Connecticut, Pennsylvania, Massachusetts, New Jersey and Illinois, 1870–1935. Railroad mileage by state is from the editions of *Poor's Manual of the Railroads of the United States* and Moody's railroad manuals published between 1869 and 1941.

Notes: Miles is the value-weighted mean distance of bond holdings from the head office, averaged across firms with weights equal to their bond holdings. Home is the value-weighted share of bonds in the home state, in percent. The columns headed Present 1870–1900 cover the firms holding bonds at every benchmark from 1870 to 1900. The railroad and the state and municipal columns cover all firms and the class alone. The last row gives the number of firms in 1870 and in 1900. Bonds exclude federal and foreign securities.

A change in the composition of the portfolio by bond class does not account for it either. The location of state and municipal bonds is not subject to any allocation rule, because a

city's bond is placed at the city, and each is a claim on a particular public borrower. Their mean distance roughly doubled between 1880 and 1890. Railroad bonds, which account for nearly all of the growth in holdings over the decade, changed in the same way. Their mean distance rose from 243 to 665 miles, and the home-state shares of the two classes fell from 55 to 20 percent and from 54 to 29 percent. The two classes became national at the same time. The aggregate therefore does not reflect a reallocation toward a class that was already held nationally.

Finally, the shift was not confined to the firms chartered in New York, whose head offices were in the market center. Between 1880 and 1890 the mean distance of the New York firms nearly tripled and that of the other firms nearly doubled. The two groups' home-state shares fell from 68 and 42 percent to 21 and 28 percent.

Portfolio Reallocation or the Supply of Issuers

Even within continuing firms and bond classes, the rise in the level statistics can reflect either of two sources. The first is a change in the firms' willingness to hold the securities of distant issuers. The second is a change in the geographic distribution of the securities available to them. The 1880s were a decade of Western railroad construction and of rapid growth in the debt of Western cities. A firm that purchased a constant share of each year's new issues would have recorded a rising mean distance without any change in its own investment policy.

Figure 2 addresses this concern by holding the set of issuers fixed. For a base year B, let $\mathcal{I}_B$ be the set of issuers that any sample firm held at benchmark B. At every benchmark I restrict each firm's holdings to issuers in $\mathcal{I}_B$, renormalize the weights, and recompute the three statistics. The distance from a firm to a given issuer is fixed. Within $\mathcal{I}_B$ the mean distance can therefore change only through the weights, that is, only if the firm reallocated across claims that were already held in B. New issuers are excluded by construction. The figure shows the series over all issuers against the series over $\mathcal{I}_{1880}$ and $\mathcal{I}_{1885}$, for the mean distance in Panel A and the home-state share in Panel B.

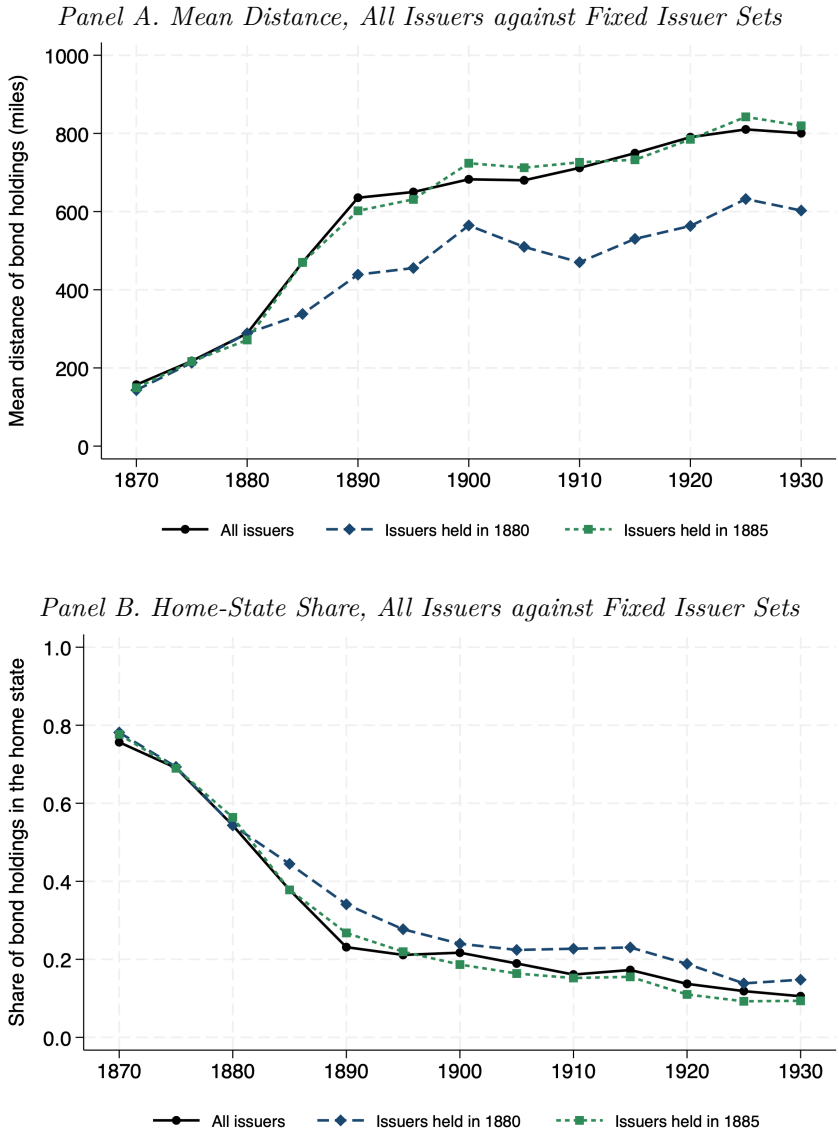


Figure 2. Reallocation across a Fixed Set of Issuers, 1870–1930

Sources: The holdings are from the investment schedules printed in the annual reports of the insurance departments of New York, Connecticut, Pennsylvania, Massachusetts, New Jersey and Illinois, 1870–1935. Railroad mileage by state is from the editions of *Poor's Manual of the Railroads of the United States* and Moody's railroad manuals published between 1869 and 1941.

Notes: For each base year, the issuer set is every issuer that any sample firm held at that benchmark. At each benchmark each firm's bonds are restricted to that set and renormalized, and the statistics are recomputed. Within a fixed set the distance from a firm to every issuer is constant, so only the portfolio weights affect the series. Panel A plots the value-weighted mean distance from the head office in miles, and Panel B the value-weighted home-state share. The series for all issuers is that of Figure 1. The issuers held in 1880 accounted for 50 percent of bond value in 1885, 30 percent in 1890 and 26 percent in 1900; those held in 1885 accounted for 71 percent in 1890 and 52 percent in 1900.

The change between 1880 and 1890 occurred in two stages. Between 1880 and 1885 it occurred mainly through purchases of new issuers. Half of the value held in 1885 was in issuers that no sample firm had held in 1880. Within the 1880 set the mean distance rose only from 288 to 338 miles, against a rise to 470 miles over all issuers. The home-state share shows the same pattern (Figure 2, Panel B). This is the interval in which the Treasury retired the federal debt that had been 37 percent of the insurers' securities in 1880. The funds released, together with the new funds of a rapidly growing industry, were invested in issues that these firms had not previously held.

Between 1885 and 1890 the change occurred mainly through reallocation. The issuers held in 1885 still accounted for 71 percent of value in 1890. Within that set the mean distance rose from 470 to 602 miles and the home-state share fell from 38 to 27 percent, against 635 miles and 23 percent over all issuers. Most of the change after 1885 is therefore reproduced within the set of issuers the firms already held. The reallocation continued at a slower pace into the 1890s. Within the 1880 set alone, which accounted for a quarter of value by 1900, the mean distance nearly doubled between 1880 and 1900. Within the issuers held in 1890 it rose from 635 miles in 1890 to 762 in 1900 (Online Appendix Table A8).

The issuer set is what the sample held, not what existed. An issuer classified as new is therefore new to these firms, and the share of the change attributed to new issuers is an upper bound on the share attributable to supply. Among the bonds of local governments, the shift occurred almost entirely through issuers new to the firms. Within the 1880 set their mean distance changed little, from 294 miles in 1880 to 324 in 1900, while over all municipal issuers it rose to 626.

Table 3 reports where the local-government bonds of the firms chartered in the Northeast were issued. These firms held the bonds of 102 local governments outside the Northeast in 1880 and 519 in 1890. The share of their local-government bonds issued in the Plains states (Iowa, Kansas, Minnesota, Missouri, Nebraska and the Dakotas) rose from 3 to 27 percent over the decade, and the share issued in the South from 2 to 12 percent. In 1880 the

bonds held outside the Northeast were concentrated in a few large cities. By 1890 they were dispersed: the five largest issuers outside the Northeast accounted for 16 percent of the value there, and counties, townships and districts for 28 percent. The change was general across firms. In 1890, 23 of the 33 firms holding such bonds held more than a quarter of them outside the Northeast, against 14 of 31 in 1880. Each of these bonds was a claim on a single local government in a region where interest rates remained above those of the East (Davis 1965). Their purchase shows that the funds of the Eastern insurers reached new local borrowers in distant regions, and not only securities traded in national markets.

Table 3. Local-Government Bonds of the Firms Chartered in the Northeast, by Region of Issue, 1870–1900

		Region of issue (percent of value)					Issuers outside the Northeast			Firms over a
	Value	NE	ENC	WNC	S	W	Number	Top five (percent)	Non-city (percent)	quarter outside
1870	10.0	90	8	1	0	0	24	53	20	7 of 37
1875	29.2	78	17	2	3	0	92	43	16	13 of 39
1880	47.9	74	20	3	2	1	102	59	9	14 of 31
1885	38.3	69	16	9	3	2	241	23	24	14 of 28
1890	42.7	41	17	27	12	3	519	16	28	23 of 33
1895	67.3	40	15	19	16	11	678	15	34	24 of 36
1900	56.9	43	14	16	16	10	634	16	36	21 of 34

Sources: The holdings are from the investment schedules printed in the annual reports of the insurance departments of New York, Connecticut, Pennsylvania, Massachusetts, New Jersey and Illinois, 1870–1935. Railroad mileage by state is from the editions of *Poor's Manual of the Railroads of the United States* and Moody's railroad manuals published between 1869 and 1941.

Notes: The table covers the bonds of cities, counties, townships and school and other districts, excluding state bonds, held by firms chartered in New England, New York, New Jersey and Pennsylvania. Value is in millions of dollars, nominal. Regions are census regions and divisions: NE is the Northeast (New England and the Middle Atlantic states); ENC is the East North Central division (Ohio, Indiana, Illinois, Michigan and Wisconsin); WNC is the West North Central division (Iowa, Kansas, Minnesota, Missouri, Nebraska and the Dakotas); S is the South; and W is the West. Issuers are distinct issuing governments. Top five is the share of the five largest issuers outside the Northeast in the value held outside the Northeast, and non-city is the share of counties, townships and districts in the same value. The last column gives the firms holding more than a quarter of their local-government bonds outside the Northeast, out of all firms holding such bonds.

Distance and the Home Premium in the Gravity Equation

Table 4 reports the gravity estimates. They date a later change than the level statistics. The distance elasticity for bonds was −1.03 in 1880, −1.06 in 1885 and −1.07 in 1890, so that doubling the distance from the head office reduced holdings by 52 percent. It fell to −0.27

in 1900, a reduction of 17 percent, and lay between −0.28 and −0.45 from 1905 to 1930. Between 1880 and 1890, when the level statistics moved most, holdings therefore declined with distance at an unchanged rate relative to what every insurer held in each state. The shift of the 1880s is therefore absorbed by the destination effects, which are common to all insurers: the firms moved together toward the same distant states. The fall in the elasticity during the 1890s is a separate change, in which each firm's holdings came to depend less on its own distance from the issuer.

In the second specification the elasticities of the two charter groups were −1.03 and −1.28 in 1890, −0.14 and −0.41 in 1900, and −0.24 and −0.36 in 1920. The home premium of the New York firms was 2.89 log points in 1880, 0.59 in 1900 and −0.08 in 1930. The other firms' premium was 1.52 in 1880, 2.23 in 1890, 1.93 in 1900 and 1.73 in 1920. For mortgage loans the elasticity was −1.09 in 1908 and −0.83 in 1940. The New York firms' home premium was 6.39 log points in 1908, against 0.85 for the firms of the other charter states, and 1.56 against 0.55 in 1940.

The Residual Home-State Overweight

The shift to national portfolios did not eliminate the home-state overweight. Figure 3 plots the overweight defined above for the firms headquartered in each of five states from 1870 to 1935.

The New York firms' overweight on New York fell during the 1880s and continued to decline until it disappeared. In 1880 the New York firms held New York at 10.7 times the other insurers' share. By 1930 the two shares were nearly equal, at 12 and 11.4 percent.

The firms chartered elsewhere did not converge in the same way. In 1920 the firms of Connecticut, Massachusetts, New Jersey and Pennsylvania held their home states at between 6.9 and 16.4 times the other insurers' share (Figure 3). They held between 10 and 31 percent of their bonds in their own states, where the other insurers held at most 4.6 percent. The overweight fell in the 1920s for the New Jersey and Pennsylvania firms, to between two and

Table 4. Gravity Estimates, Selected Benchmarks

	Bonds						Mortgage loans			
	1880	1890	1900	1910	1920	1930	1908	1920	1930	1940
Home state, New York firms	2.89	1.10	0.59	0.18	0.20	−0.08	6.39	4.21	1.86	1.56
	(0.53)	(0.32)	(0.22)	(0.16)	(0.16)	(0.06)	(0.51)	(0.79)	(0.46)	(0.31)
	[0.81]	[0.41]	[0.32]	[0.23]	[0.21]	[0.07]	[0.60]	[0.49]	[0.33]	[0.31]
Home state, other firms	1.52	2.23	1.93	1.66	1.73	0.92	0.85	1.11	0.67	0.55
	(0.49)	(0.29)	(0.16)	(0.22)	(0.16)	(0.14)	(0.49)	(0.29)	(0.20)	(0.25)
	[0.84]	[0.43]	[0.30]	[0.34]	[0.26]	[0.14]	[0.51]	[0.43]	[0.23]	[0.26]
Log distance	−1.03	−1.07	−0.27	−0.33	−0.31	−0.42	−1.09	−1.05	−1.03	−0.83
	(0.46)	(0.23)	(0.11)	(0.09)	(0.08)	(0.09)	(0.29)	(0.16)	(0.12)	(0.11)
	[0.48]	[0.22]	[0.14]	[0.12]	[0.09]	[0.12]	[0.33]	[0.11]	[0.12]	[0.12]
Home state against a state 300 miles away										
New York firms	3.91	2.16	0.85	0.50	0.51	0.34	7.47	5.25	2.88	2.38
	(0.94)	(0.43)	(0.24)	(0.17)	(0.18)	(0.12)	(0.58)	(0.79)	(0.48)	(0.33)
Other firms	4.01	4.62	2.46	2.30	2.34	1.82	2.80	3.06	2.63	2.25
	(0.75)	(0.33)	(0.29)	(0.26)	(0.24)	(0.19)	(0.47)	(0.39)	(0.21)	(0.20)
Firms	36	40	46	66	40	68	34	39	52	60
Head-office states	9	11	15	18	13	5	9	13	16	17

Sources: The holdings are from the investment schedules printed in the annual reports of the insurance departments of New York, Connecticut, Pennsylvania, Massachusetts, New Jersey and Illinois, 1870–1935. Railroad mileage by state is from the editions of *Poor's Manual of the Railroads of the United States* and Moody's railroad manuals published between 1869 and 1941. The loans are from the schedules of mortgage loans by state printed in the annual reports of the New York and Connecticut insurance departments, 1908–1940.

Notes: The estimates are Poisson pseudo-maximum-likelihood estimates of equation (1), one regression for bonds and one for mortgage loans, with firm-by-benchmark and destination-by-benchmark fixed effects. The dependent variable is the firm's holdings in a destination state in millions of dollars, zeros included. Standard errors clustered by firm are in parentheses, and standard errors clustered by firm and destination in brackets. The row headed Home state against a state 300 miles away gives the home premium plus the distance elasticity times the gap between the group's value-weighted mean log distance to the center of its own state and the log of 300. Federal and foreign securities are excluded, and railroads are divided among their states by miles of road.

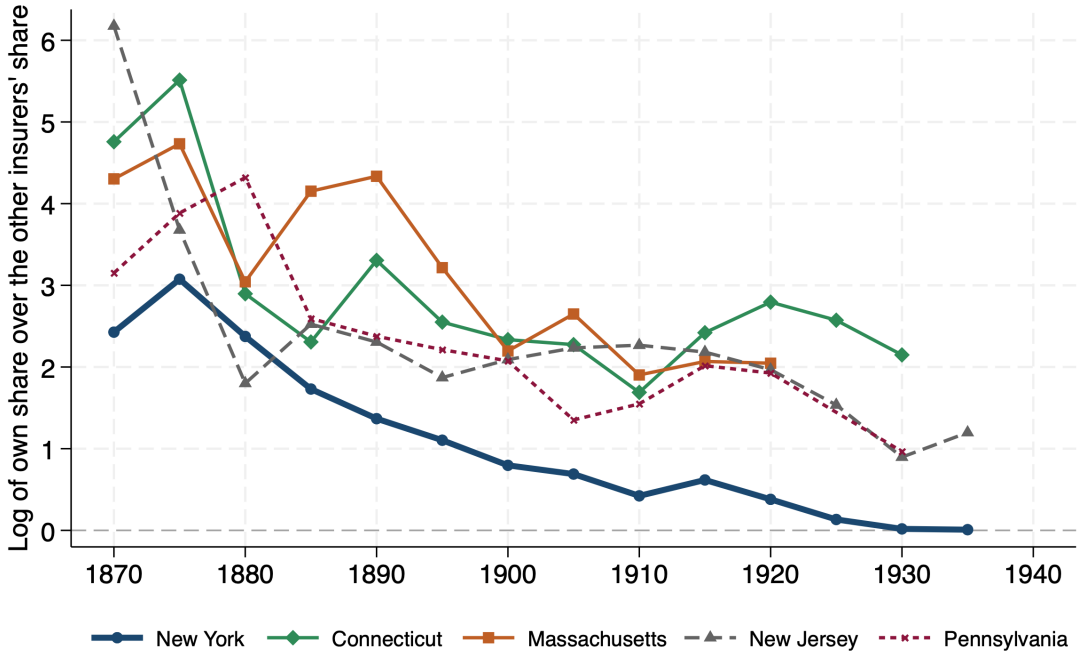


Figure 3. Home-State Holdings against the Other Insurers, by Head-Office State, 1870–1935

Sources: The holdings are from the investment schedules printed in the annual reports of the insurance departments of New York, Connecticut, Pennsylvania, Massachusetts, New Jersey and Illinois, 1870–1935. Railroad mileage by state is from the editions of *Poor's Manual of the Railroads of the United States* and Moody's railroad manuals published between 1869 and 1941.

Notes: For the firms headquartered in each state, the figure plots the log of the share of their bonds located in that state over the share of that state in the bonds of firms headquartered elsewhere. Zero means that the state's firms held it in the same proportion as the other insurers. New Jersey rests on one firm in 1880 and 1885. Massachusetts leaves the sample after 1920, and Pennsylvania has no 1925 benchmark.

three times the other insurers' share in 1930. It fell less for the Connecticut firms, on a sample that by then rests on four head-office states.

For firms outside the market center, the home state still accounted for a tenth or more of the bond portfolio in 1920, a multiple of the share held there by the other insurers. For the New York firms, whose home market largely coincided with the national one, no such excess remained once their portfolios had become national. The gravity estimates show that the other firms' overweight persists after conditioning on distance, so it does not reflect the proximity of the home state. When the home term is interacted with the log of the firm's holdings and evaluated at the New York firms' median size, the premium is between 2.12 and 2.46 log points (Online Appendix Table A10). The overweight therefore does not reflect the smaller size of the other firms.

Mortgage Loans

Mortgage loans, which the schedules locate from 1908, isolate a source of home-state concentration that the bond holdings cannot: a statute confining lending to the home state. Figure 4 reports for them the statistics of Figure 1 for two groups of firms lending at every benchmark from 1908 to 1940: those chartered in New York and those chartered in Connecticut, Massachusetts and New Jersey. New York's life-insurance act of 1853 confined its firms' mortgage loans to real estate in New York. Later acts allowed limited lending near New York City and in adjacent states, and only the insurance law of 1906 that followed the Armstrong investigation permitted loans on improved real estate in any state. Connecticut never restricted where its firms lent, nor did New Jersey from 1902 or Massachusetts for its mutual firms (Halaas 1932). Online Appendix 8 cites the statutes.

Where no statute confined it, mortgage lending was national from the first observation. The never-restricted firms held their loans 875 miles from the head office in 1908 and only 12 percent in the home state. The farm mortgage was originated and serviced by a correspondent to a standard a distant lender could rely on (Snowden 1995). For these firms it

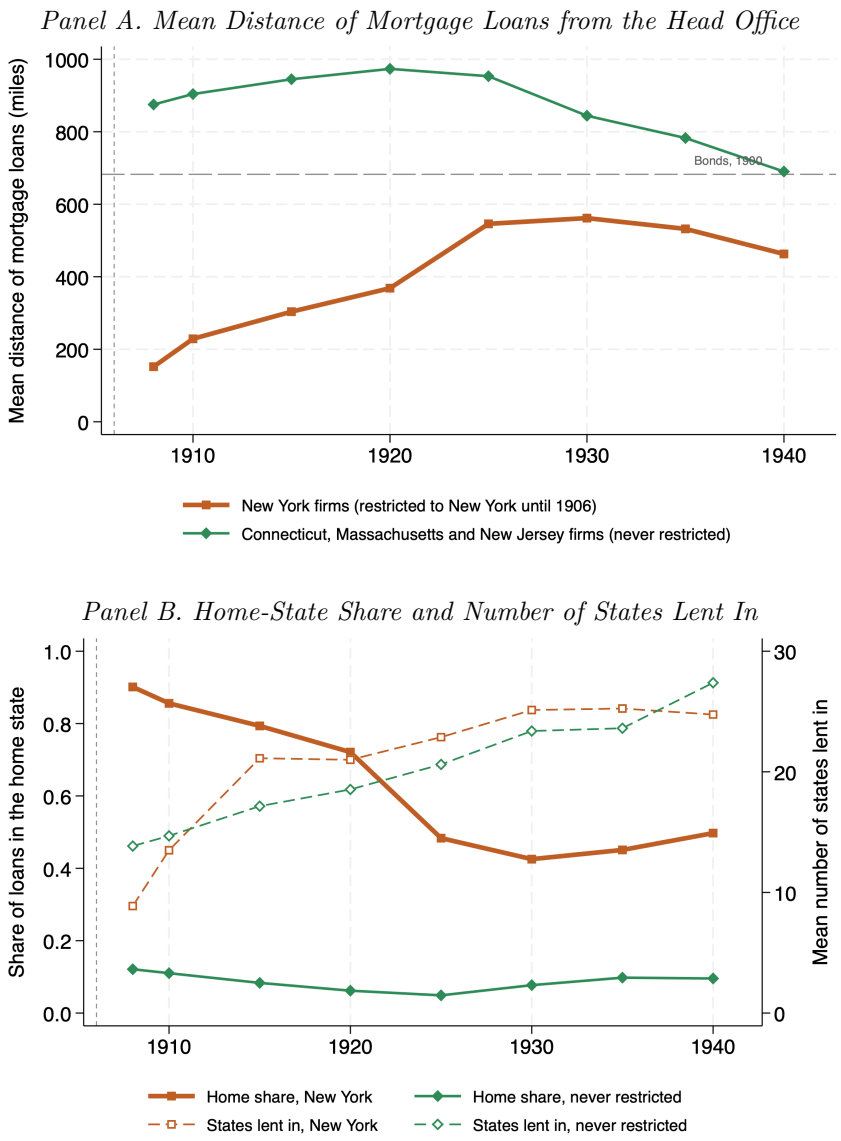


Figure 4. Mortgage Loans: New York Firms against Never-Restricted Firms, 1908–1940

Sources: The loans are from the schedules of mortgage loans by state printed in the annual reports of the New York and Connecticut insurance departments, 1908–1940. The bond reference level is from Figure 1.

Notes: The figure covers the firms with mortgage loans at every benchmark from 1908 to 1940: eight chartered in New York, confined by statute largely to New York and its adjacent states until 1906, and 13 chartered in Connecticut, Massachusetts or New Jersey, which did not restrict where their firms lent. Panel A plots the value-weighted mean distance of mortgage loans from the head office; the horizontal reference line is the 1900 level for bonds. Panel B plots the value-weighted share of loans in the home state on the left axis and the mean number of states, out of 49, in which a firm held loans on the right axis. The tick marks the insurance law of 1906 that followed the Armstrong investigation.

was as readily held at a distance as a railroad bond. The New York firms in 1908, two years after the statute's repeal, held 90 percent of their loans in New York at a mean distance of 152 miles, and they lent in 8.9 states.

The repeal affected first the number of states in which the New York firms lent. By 1915 they lent in 21.1 states, more than the never-restricted firms' 17.2, and the two groups' counts rose in parallel thereafter. The repeal affected the geographic distribution of the stock of loans only as new lending replaced maturing loans. The New York firms' home-state share was 72 percent in 1920 and 43 percent in 1930. Most of the decline thus came in the one decade in which their mortgage lending quadrupled. Table 5 reports the stocks behind these shares. The stock of New York loans never declined faster than maturing loans were repaid, so the portfolio adjusted through new lending rather than sales. Its distribution never converged to that of the never-restricted firms. In 1940 the New York firms still held 50 percent of their loans in New York, against 10 percent for the never-restricted firms. The residual was the urban property of New York that the largest firms had financed for decades; the New York firms held no farm loans in New York (Online Appendix Table A14).

The New York firms eliminated most of their overweight on New York bonds by 1890, in the absence of any statutory restriction (Figure 3). They retained their concentration in New York mortgages until a statute was repealed, and then reduced it at the pace at which a portfolio of long-term loans turns over. In neither asset did distance itself confine the funds to the home state: the never-restricted firms lent on farms a thousand miles away, and the New York firms did so as soon as they were permitted. The effect of the location rule was to preserve the existing stock of home-state loans, which persisted for more than a generation after the rule's repeal.

Robustness

The completion of the shift by 1890 does not depend on how the holdings are valued or located, on which firms and assets are included, or on sampling variation. Online Appendix

Table 5. Mortgage Loans at Home and Outside, Firms Lending at Every Benchmark, 1908–1940

	1908	1910	1915	1920	1925	1930	1935	1940
New York firms (8 lending at every benchmark)								
Loans at home (million dollars)	328	359	482	472	667	1147	1059	969
Loans outside (million dollars)	36	60	125	182	712	1549	1289	979
Home share	0.90	0.86	0.79	0.72	0.48	0.43	0.45	0.50
Growth of home stock, percent a year		4.6	6.0	−0.4	7.2	11.5	−1.6	−1.8
Growth of outside stock, percent a year		29.7	15.7	7.8	31.3	16.8	−3.6	−5.4
Outside share of net new lending		0.44	0.35	1.21	0.73	0.64	0.75	0.78
Massachusetts and Connecticut firms (11 lending at every benchmark)								
Loans at home (million dollars)	15	15	13	18	28	51	44	57
Loans outside (million dollars)	136	155	257	334	597	933	699	722
Home share	0.10	0.09	0.05	0.05	0.04	0.05	0.06	0.07
Growth of home stock, percent a year		0.1	−3.0	7.0	8.7	13.0	−2.8	5.0
Growth of outside stock, percent a year		7.0	10.6	5.4	12.3	9.3	−5.6	0.6
Outside share of net new lending		1.00	1.02	0.94	0.97	0.93	0.97	0.65
Massachusetts firms (6 lending at every benchmark)								
Loans at home (million dollars)	13	13	10	14	17	28	23	28
Loans outside (million dollars)	42	50	113	161	324	584	470	332
Home share	0.24	0.20	0.08	0.08	0.05	0.05	0.05	0.08
Growth of home stock, percent a year		−1.1	−5.0	6.6	5.1	10.4	−3.9	3.6
Growth of outside stock, percent a year		8.8	17.8	7.4	15.0	12.5	−4.2	−6.7
Outside share of net new lending		1.04	1.05	0.93	0.98	0.96	0.96	1.03
Connecticut firms (5 lending at every benchmark)								
Loans at home (million dollars)	2	2	3	5	10	23	21	29
Loans outside (million dollars)	94	106	144	173	273	348	229	390
Home share	0.02	0.02	0.02	0.03	0.04	0.06	0.08	0.07
Growth of home stock, percent a year		7.6	6.0	8.5	17.1	16.9	−1.4	6.4
Growth of outside stock, percent a year		6.2	6.4	3.7	9.5	5.0	−8.0	11.2
Outside share of net new lending		0.97	0.98	0.95	0.95	0.86	0.99	0.95
New Jersey firms (2 lending at every benchmark)								
Loans at home (million dollars)	13	15	25	18	36	122	124	117
Loans outside (million dollars)	67	84	161	212	632	1142	853	918
Home share	0.16	0.15	0.13	0.08	0.05	0.10	0.13	0.11
Growth of home stock, percent a year		6.0	11.5	−6.6	14.8	28.0	0.3	−1.2
Growth of outside stock, percent a year		11.5	13.9	5.7	24.4	12.6	−5.7	1.5
Outside share of net new lending		0.91	0.88	1.16	0.96	0.85	1.01	1.12

Sources: The loans are from the schedules of mortgage loans by state printed in the annual reports of the New York and Connecticut insurance departments, 1908–1940.

Notes: The table covers the firms of each charter group with mortgage loans at every benchmark from 1908 to 1940. It reports loans in the home state and elsewhere in millions of dollars, nominal, the home share, the annual growth of each stock over the interval ending in the column year, and the share of the net increase placed outside the home state.

Table A6 recomputes the statistics of Figure 1 under alternative constructions. These locate railroads by other rules, place single-place issuers at their own coordinates, use par values, vary the samples of firms and holdings, and include federal debt and stocks. In every specification most of the change in the mean distance between 1880 and 1930 took place by 1890. The same holds for the home-state share. Bootstrap intervals for the level statistics show that the rise in mean distance between 1880 and 1890, 347 miles, is about twice the rise over the following four decades, 165 miles (Online Appendix Table A7). The later rise is smaller but distinguishable from zero. The online appendix also relates firm characteristics to the change in their portfolios and reports further evidence on the home-state overweight and on mortgage loans.

What Explains the Timing of the Shift?

The exhibits divide the decade before 1890 into a stage driven by new issuers and a stage driven by reallocation, and they restrict the explanations available for each stage.

The first stage coincides with two events. One is the retirement of the federal debt, which fell from 37 percent of the insurers' securities in 1880 to 7 percent in 1885 and 4 percent in 1890. The Treasury used its surpluses to redeem the callable 3 percent bonds. Under a circular of April 1888 it also bought back the 4 and 4.5 percent bonds in the open market at substantial premiums (Noyes 1898; U.S. Department of the Treasury 1888). The other is the issuance of Western railroad and municipal bonds. More than 70,000 miles of railroad were built between 1880 and 1889, nearly 13,000 of them in 1887 alone (National Bureau of Economic Research n.d.). The firm-level evidence does not support a mechanism in which the firms with the most federal debt to replace increased their mean distance the most. The share of federal debt in a firm's bonds in 1880 is essentially uncorrelated with the change in its mean distance between 1880 and 1890 (Online Appendix Table A9). Firms with little or no federal debt increased their mean distance as much as those whose portfolios had been largely federal. The retirement accounts for the timing of the aggregate shift by making new

purchases necessary, but not for the allocation of those purchases across firms.

The growth of the industry is the second candidate, and it is partly supported. A firm whose bond holdings tripled in a decade could not have placed the increase in the securities of its own state, whose supply did not triple. Growth beyond the capacity of the local market would therefore produce a shift to national portfolios concentrated in the decade of fastest growth. The largest firms increased their mean distance substantially, but so did small firms whose holdings were a fraction of the local supply. Scale made a national portfolio necessary for the largest firms, but it does not account for its becoming the norm.

The second stage, the reallocation after 1885 across claims already held, is a change in what the same firms were willing to hold at a distance. It coincided with the national marketing of railroad and municipal issues to institutions by the bond houses (Carosso 1970) and with the spread of the published information on distant issuers described above. Yields also fell. The yield on high-grade railroad bonds was 4.6 percent in January 1880, 3.6 percent in January 1890 and 3.1 percent in January 1899 (Macaulay 1938). The decline pressed against the rates the firms assumed in their reserves and would have induced investment committees to purchase more distant securities in every class, much as modern insurers reach for yield within a rating class (Becker and Ivashina 2015). These developments predict the same uniform shift in every class of bond.

Conclusion

Most of the shift in American life insurers' bond holdings toward a national portfolio took place by 1890, and the changes over the following forty years were smaller. Between 1880 and 1890 the mean distance of a firm's bonds from its head office more than doubled, to 635 miles, and the share held in the home state fell from more than half to under a quarter. The shift occurred within the same firms, in every class of bond and under every charter. After 1885 it occurred through reallocation across issuers the firms already held. The firms chartered outside New York still held a tenth or more of their bonds in their home states in

1920, while the New York firms retained no home-state overweight. Mortgage lending was national from the first observation wherever a statute had not confined it. Where one had, its effect persisted for a generation after the repeal, because a stock of loans changes only as fast as new lending replaces maturing loans.

The quantities therefore date the integration of the market for long-term claims, as seen by its largest institutional holders, a generation ahead of the convergence of regional bank rates. The regional differentials that persisted into the twentieth century cannot be attributed, for the most part, to the limited geographic reach of these investors, whose portfolios had become largely national by 1890. Most of those portfolios were railroad bonds traded in a national market. Their allocation across states is therefore related to, but distinct from, the movement of funds toward the regions where rates were highest, through which Davis (1965) expected the differentials to narrow.

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Online Appendix

The Emergence of a National Capital Market, 1870–1940

Online Appendix 1. Sources and Construction

The main text describes the sources, the de-duplication of filings and the valuation of holdings. Table A1 maps every volume to the statement date it reports. Table A2 reports, by benchmark, the number of firm-years filed in more than one state and the value at stake under three alternative rules (value first, New York first, home state first). Table A3 reports the number of firms and the value retained at every stage of the construction, from the filings as printed to the holdings that can be located in a state. Table A4 compares the securities in the New York schedules with the "stocks and bonds" line that New York prints, independently, in each firm's balance sheet in the same volume; Table A5 makes the same comparison for mortgage loans by state.

Table A1. Volumes and the Statement Dates They Report

State	Volume	Statement date	Benchmark	Benchmark date
New York	1870	31 Dec. 1869	1870	31 Dec. 1869
New York	1875	31 Dec. 1874	1875	31 Dec. 1874
New York	1880	31 Dec. 1879	1880	31 Dec. 1879
New York	1885	31 Dec. 1884	1885	31 Dec. 1884
New York	1890	31 Dec. 1889	1890	31 Dec. 1889
New York	1895	31 Dec. 1894	1895	31 Dec. 1894
New York	1900	31 Dec. 1899	1900	31 Dec. 1899
New York	1905	31 Dec. 1904	1905	31 Dec. 1904
New York	1910	31 Dec. 1909	1910	31 Dec. 1909
New York	1915	31 Dec. 1914	1915	31 Dec. 1914
New York	1920	31 Dec. 1919	1920	31 Dec. 1919
New York	1925	31 Dec. 1924	1925	31 Dec. 1924
New York	1930	31 Dec. 1929	1930	31 Dec. 1929
New York	1935	31 Dec. 1934	1935	31 Dec. 1934
Connecticut	1875	31 Dec. 1874	1875	31 Dec. 1874
Connecticut	1880	31 Dec. 1879	1880	31 Dec. 1879
Connecticut	1885	31 Dec. 1884	1885	31 Dec. 1884
Connecticut	1890	31 Dec. 1889	1890	31 Dec. 1889
Connecticut	1895	31 Dec. 1894	1895	31 Dec. 1894
Connecticut	1900	31 Dec. 1899	1900	31 Dec. 1899
Connecticut	1905	31 Dec. 1904	1905	31 Dec. 1904
Connecticut	1910	31 Dec. 1909	1910	31 Dec. 1909
Connecticut	1914	31 Dec. 1914	1915	31 Dec. 1914
Connecticut	1920	31 Dec. 1919	1920	31 Dec. 1919
Connecticut	1925	31 Dec. 1924	1925	31 Dec. 1924
Connecticut	1930	31 Dec. 1929	1930	31 Dec. 1929
Pennsylvania	1875	31 Dec. 1874	1875	31 Dec. 1874
Pennsylvania	1879	31 Dec. 1879	1880	31 Dec. 1879
Pennsylvania	1884	31 Dec. 1884	1885	31 Dec. 1884
Pennsylvania	1889	31 Dec. 1889	1890	31 Dec. 1889
Pennsylvania	1894	31 Dec. 1894	1895	31 Dec. 1894
Pennsylvania	1899	31 Dec. 1899	1900	31 Dec. 1899
Pennsylvania	1905	31 Dec. 1904	1905	31 Dec. 1904
Pennsylvania	1910	31 Dec. 1909	1910	31 Dec. 1909
Pennsylvania	1916	31 Dec. 1914	1915	31 Dec. 1914
Pennsylvania	1929	31 Dec. 1929	1930	31 Dec. 1929
Massachusetts	1870	31 Dec. 1869	1870	31 Dec. 1869
Massachusetts	1875	31 Dec. 1874	1875	31 Dec. 1874
Massachusetts	1880	31 Dec. 1879	1880	31 Dec. 1879
Massachusetts	1885	31 Dec. 1884	1885	31 Dec. 1884
Massachusetts	1890	31 Dec. 1889	1890	31 Dec. 1889
Massachusetts	1894	31 Dec. 1894	1895	31 Dec. 1894
Massachusetts	1899	31 Dec. 1899	1900	31 Dec. 1899
Massachusetts	1904	31 Dec. 1904	1905	31 Dec. 1904
Massachusetts	1909	31 Dec. 1909	1910	31 Dec. 1909
Massachusetts	1914	31 Dec. 1914	1915	31 Dec. 1914
Massachusetts	1919	31 Dec. 1919	1920	31 Dec. 1919
New Jersey	1880	31 Dec. 1879	1880	31 Dec. 1879
New Jersey	1895	31 Dec. 1894	1895	31 Dec. 1894
New Jersey	1925	31 Dec. 1924	1925	31 Dec. 1924
New Jersey	1930	31 Dec. 1929	1930	31 Dec. 1929
New Jersey	1934	31 Dec. 1934	1935	31 Dec. 1934
Illinois	1925	31 Dec. 1924	1925	31 Dec. 1924
Illinois	1929	31 Dec. 1929	1930	31 Dec. 1929

Notes: Each volume used, the statement date it reports, and the benchmark to which it is assigned.

Table A2. De-duplication of Filings

	Firm-	Con-	Candi-	Same	All	Value	Value first		NY first		Home first	
Year	years	tested	dates	date	tie	($m)	Differ	$m	Differ	$m	Differ	$m
1870	68	11	22	1.00	1.00	1.3	6	0.0	4	0.0	3	0.0
1875	57	42	105	1.00	1.00	57.1	12	0.0	35	0.1	21	0.0
1880	39	35	110	1.00	1.00	118.1	5	3.6	29	4.8	15	3.9
1885	37	31	84	1.00	1.00	147.6	10	0.0	22	0.8	11	0.3
1890	43	35	94	1.00	1.00	237.6	11	0.6	22	2.3	13	0.5
1895	53	38	132	1.00	1.00	404.9	6	0.0	24	0.2	14	0.1
1900	51	38	107	1.00	1.00	687.2	8	0.3	32	1.2	19	0.5
1905	61	43	116	1.00	1.00	1198.1	10	0.1	26	4.9	24	1.8
1910	72	35	98	1.00	1.00	1739.5	2	0.1	25	24.7	15	13.6
1915	87	36	98	1.00	1.00	2134.7	3	0.1	26	33.1	11	16.8
1920	42	27	54	1.00	1.00	3355.4	4	1.8	21	178.3	8	150.0
All	756	371	1020	1.00	1.00	10081.4	77	6.6	266	250.4	154	187.5

Notes: By benchmark: firm-years, contested firm-years (filed in more than one state), candidate filings, the share of contests in which every candidate reports the same date and in which every candidate ties, the value in contested firm-years, and, for three alternative rules, the number of firm-years in which the rule selects a different filing and the value at stake.

Table A3. Attrition: Firms and Value at Every Stage of the Construction

	As filed		De-duplicated		Life, securities		Placeable		US head office		In the series	
Year	Firms	$m	Firms	$m	Firms	$m	Firms	$m	Firms	$m	Firms	$m
1870	68	47	68	45	68	45	52	19	51	19	51	19
1875	57	163	57	67	56	67	54	45	54	45	54	45
1880	39	433	39	129	39	120	37	76	37	76	37	76
1885	37	420	37	150	37	150	35	138	35	138	35	138
1890	43	686	43	240	43	240	41	225	41	225	41	225
1895	53	1,604	53	422	48	420	47	382	47	382	47	382
1900	51	2,070	51	701	51	699	49	636	46	634	46	634
1905	61	3,572	61	1,219	61	1,215	58	1,094	54	1,084	54	1,084
1910	72	5,241	72	1,825	72	1,816	72	1,649	66	1,626	66	1,626
1915	87	6,373	87	2,249	87	2,237	85	1,992	78	1,962	78	1,962
1920	42	6,572	42	3,397	42	3,289	40	2,285	40	2,285	40	2,285
1925	45	3,093	45	3,093	45	3,089	45	2,290	45	2,290	45	2,290
1930	73	5,105	73	5,105	73	5,104	72	4,377	68	4,348	68	4,348
1935	28	6,029	28	6,029	28	6,029	28	4,514	24	4,475	24	4,475

Notes: Firms and value (million dollars, nominal) as filed, after de-duplication, restricted to life firms' securities, placeable in a U.S. state, with a U.S. head office, and in the analysis sample.

Table A4. Validation: New York Schedules against the Balance Sheets Printed in the Same Volumes

			Value ($m)		Schedule / printed	
Year	Firms	Holdings	Schedule	Printed	Panel rule	Stmt. basis
1880	29	741	111	114	0.968	0.968
1885	28	1,281	143	149	0.962	0.962
1890	28	2,072	230	243	0.946	0.946
1895	32	3,508	394	408	0.966	0.966
1900	35	4,451	668	715	0.934	0.934
1905	37	5,624	1,141	1,196	0.954	0.954
1910	33	7,708	1,677	1,679	0.999	0.999
1915	34	10,941	2,059	2,009	1.025	1.003
1920	34	13,331	3,148	3,114	1.011	1.006
1925	15	4,791	2,107	2,081	1.013	1.010
1930	21	5,894	3,021	3,019	1.001	0.999
1935	22	7,547	4,375	4,245	1.031	1.005

Notes: Firms filing in New York: holdings in the schedules, value in the schedules and on the "stocks and bonds" line of the printed balance sheet (million dollars), and their ratio under the panel's valuation rule and on the statement's own basis.

Table A5. Validation: Mortgage Loans by State against the Printed Totals

			Value ($m)		
Year	Firms	Firm-states	Schedule	Printed	Ratio
1908	33	438	867	867	1.000
1910	33	496	1,002	1,002	1.000
1915	35	598	1,522	1,522	1.000
1920	34	605	1,763	1,763	1.000
1925	35	668	3,465	3,465	1.000
1930	43	748	6,215	6,215	1.000
1935	46	752	5,056	5,026	1.006
1940	47	871	4,699	4,743	0.991

Notes: Firms, firm-state cells, the sum of the state schedule and the printed total (million dollars), and their ratio.

Online Appendix 2. Locating Holdings

Three kinds of value cannot be placed in a state: obligations of the United States, securities of foreign governments and firms, and issuers that could not be identified. Figure A1 plots the three by benchmark. Federal debt is large before 1885 and again after the Liberty Loans, and Table A6 reports the level statistics with federal debt included, placed either in the home state or in the District of Columbia. Unidentified issuers account for at most 0.20 percent of value at any benchmark. Railroads, which crossed state lines, are divided among the states of their routes in proportion to miles of road, from the edition nearest the benchmark among sixteen editions of Poor's and Moody's manuals published between 1869 and 1941. The edition is taken within six years of the benchmark; a road held before 1900 and absent from those editions is read from Poor's 1901. Railroads that the manuals lack are divided equally among their states. Table A6 reports the statistics with every railroad divided equally, placed wholly at its head office, or placed wholly in its first-listed state.

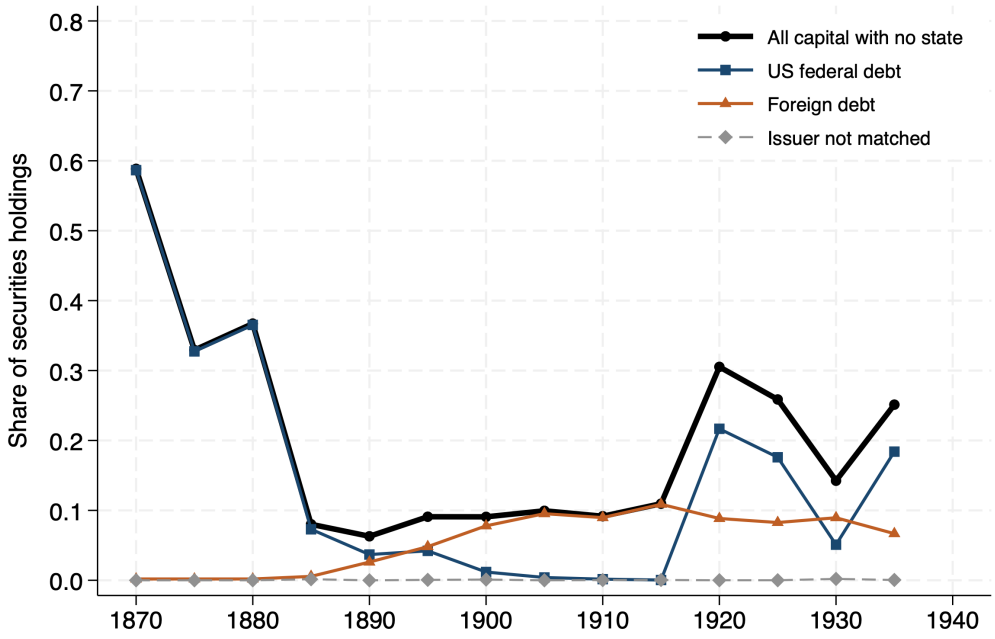


Figure A1. Value That Cannot Be Placed in a State, by Benchmark

Notes: Shares of securities value: obligations of the United States, foreign securities, and issuers that could not be identified.

Online Appendix 3. The Level Statistics under Alternative Constructions

Table A6 recomputes the value-weighted mean distance and the home-state share of Figure 1 and Table 2 under alternative choices of construction, sample and assets. Every specification computed is reported.

Construction (Panel A). Dividing every railroad equally among its states, placing it at its head office or placing it in its first-listed state yields an 1890 mean distance between 605 and 660 miles, against 635 in the base; measuring cities, counties and single-place firms at their own coordinates rather than at the center of their state yields 631; par value yields 638. Excluding the home state

altogether, the mean distance of the remaining holdings was 532 miles in 1880, 800 in 1890 and 883 in 1930, so the shift did not consist solely of a reduction in home-state holdings. Restricting to issuers located in a single state removes most railroads and leaves a portfolio of municipal and utility bonds; it is the least precisely measured specification, but its home-state share falls from 55 to 31 percent between 1880 and 1890.

Sample (Panel B). The firms present at every benchmark from 1870 to 1900, the sample without Northwestern Mutual, without the smallest decile of firms, or without each firm's smallest holdings, reproduce the base. Dropping any one head-office state leaves the 1890 mean distance between 597 and 658 miles. The firms in the two smaller size terciles increased their mean distance by 1890 at least as much as those in the top tercile; their mean distance was lower in 1930 than in 1890, in a period in which the six states' volumes print only their own domestic firms, many of them small. The equal-weighted mean across firms was 257 miles in 1880, 598 in 1890 and 569 in 1930, and the median firm's 179, 610 and 590.

Assets (Panel C). Federal debt was 59 percent of the insurers' securities in 1870 and 37 percent in 1880 and was retired in the following decade. Including it, and placing it in the home state, lowers the 1880 mean distance to 206 miles and raises the 1880 home-state share to 73 percent, so that the change between 1880 and 1890 is larger, not smaller. Placing it instead in the District of Columbia leaves the change in the mean distance concentrated before 1890, but the home-state share then falls by about as much between 1890 and 1930 as between 1880 and 1890. Including stocks changes the levels by a few percent.

Radius (Panel D). The share within 200 miles of the head office was 71, 35 and 26 percent in 1880, 1890 and 1930, and the share within 500 miles 76, 42 and 39.

Online Appendix 4. Sampling Uncertainty in the Level Statistics

Table A7 reports 95 percent intervals for the level statistics from 999 draws in which firms are resampled with replacement within each benchmark. The mean distance rose by 347 miles between 1880 and 1890 (interval 218 to 459) and by 165 miles between 1890 and 1930 (96 to 258); the home-state share fell by 31 percentage points (16 to 46) and by 13 points (6 to 22). In both statistics the change in the decade to 1890 exceeds the change in the four decades after it in the large majority of draws, and the change after 1890, though smaller, is distinguishable from zero. The interval for the change in the share within 300 miles after 1890 includes zero.

Online Appendix 5. Fixed Issuer Sets

Table A8 extends Figure 2 to an issuer set fixed in 1890. Within the issuers held in 1890 the mean distance was 635 miles in 1890, 762 in 1900 and 827 in 1930, and the home-state share 23, 18 and 9 percent, on a set that accounted for 70 percent of value in 1900 and 41 percent in 1930. Reallocation across issuers already held therefore continued after 1890, at a slower pace than before it.

Online Appendix 6. Firm Characteristics and the Change between 1880 and 1890

The main text considers two aggregate events that coincided with the shift between 1880 and 1890, the retirement of the federal debt and the growth of the industry. Table A9 examines whether the firms more exposed to each increased their mean distance more. For the 32 firms holding bonds in

Table A6. The Level Statistics under Alternative Constructions, Samples and Assets

	Mean distance (miles)					Home-state share (percent)		
	1880	1885	1890	1900	1930	1880	1890	1930
A. Construction								
Base: railroads by mileage, state centroids	288	470	635	683	801	54	23	11
Railroads split equally among their states	291	485	651	696	787	53	21	10
Railroads at the road's head-office state	287	446	605	609	717	55	24	12
Multistate issuers in the first-listed state	288	495	660	749	823	54	19	9
Single-state issuers only	287	381	562	451	649	55	31	18
Single-place issuers at their own coordinates	258	459	631	675	793	54	23	11
Par value where printed	294	480	638	689	805	53	23	11
Home state excluded	532	702	800	845	883	–	–	–
B. Sample								
Firms present 1870–1900	292	475	638	688	813	54	23	11
Mutual, Equitable and New York Life excluded	315	429	594	566	774	46	28	10
Northwestern Mutual excluded	288	471	639	693	801	54	23	11
Smallest decile of firms excluded	288	470	635	683	801	54	23	11
Smallest holdings (10 percent of value) excluded	283	463	623	680	806	56	24	10
Bottom tercile of firms by size	230	423	571	507	452	58	33	42
Middle tercile	216	466	620	648	567	66	31	29
Top tercile	296	471	637	686	803	53	22	10
One head-office state left out (range)	239–337	429–495	597–658	572–694	751–812	42–61	21–28	9–12
C. Assets								
Federal debt included, in the home state	206	438	612	674	757	73	26	16
Federal debt included, in the District of Columbia	258	453	619	677	766	33	22	10
Bonds and stocks	268	463	614	651	775	59	26	12
D. Share within a radius of the head office (percent), base construction								
Within 200 miles	71	53	35	37	26			
Within 300 miles	73	54	36	39	28			
Within 500 miles	76	61	42	46	39			

Notes: Value-weighted mean distance of bond holdings from the head office and value-weighted home-state share, as in Figure 1. Panel A changes how holdings are located; Panel B the firms or holdings included; Panel C the assets included (federal debt, which has no state, placed in the home state or in the District of Columbia). "Home state excluded" recomputes the mean distance over holdings outside the home state. Panel D gives the share of holdings within each radius under the base construction.

Table A7. Bootstrap Intervals for the Level Statistics

	Mean distance (miles)	Within 300 miles (percent)	Home state (percent)
1870	157 [105, 253]	87 [76, 93]	76 [65, 84]
1875	218 [127, 346]	80 [63, 92]	69 [50, 83]
1880	288 [195, 384]	73 [57, 87]	54 [41, 68]
1885	470 [353, 555]	54 [45, 66]	38 [27, 50]
1890	635 [550, 696]	36 [28, 47]	23 [16, 32]
1895	650 [561, 690]	39 [34, 48]	21 [17, 30]
1900	683 [573, 725]	39 [35, 46]	22 [17, 27]
1905	680 [608, 713]	37 [34, 41]	19 [15, 23]
1910	712 [655, 751]	34 [31, 39]	16 [13, 20]
1915	750 [695, 783]	32 [29, 37]	17 [14, 21]
1920	790 [735, 830]	28 [25, 33]	14 [11, 17]
1925	810 [770, 855]	27 [24, 30]	12 [10, 14]
1930	801 [764, 825]	28 [26, 31]	11 [8, 12]
1935	753 [715, 807]	32 [27, 35]	14 [10, 18]
Change, 1880–1890	347 [218, 459]	−37 [−54, −19]	−31 [−46, −16]
Change, 1890–1930	165 [96, 258]	−8 [−19, 1]	−13 [−22, −6]
Share of draws with a larger change in 1880–1890	0.96	0.98	0.95

Notes: Point estimates and, in brackets, the 2.5th and 97.5th percentiles of 999 draws resampling firms with replacement within each benchmark (seed 20261105). Changes pair the draws by replication across benchmarks. The last row gives the share of draws in which the change from 1880 to 1890 exceeds the change from 1890 to 1930 in absolute value.

Table A8. Mean Distance and Home-State Share over Fixed Issuer Sets

	Mean distance (miles)					Home-state share (percent)			Share of value (percent)	
	1880	1885	1890	1900	1930	1880	1890	1930	1900	1930
All issuers	288	470	635	683	801	54	23	11	100	100
Issuers held in 1880	288	338	439	565	603	54	34	15	26	17
Issuers held in 1885	272	470	602	724	819	56	27	9	52	31
Issuers held in 1890	282	472	635	762	827	55	23	9	70	41

Notes: For each base year, the issuer set is every issuer that any sample firm held at that benchmark; each firm's bonds are restricted to the set and renormalized. The last two columns give the share of each benchmark's bond value in issuers belonging to the set.

both 1880 and 1890, it reports correlations and the coefficients of

$$\Delta Y_i \;=\; a + b_1\, \mathit{FedShare}_{i,1880} + b_2 \ln\left(\frac{W_{i,1890}}{W_{i,1880}}\right) + b_3 \ln W_{i,1880} + e_i,$$

where ΔY_i is the change between 1880 and 1890 in firm i's mean distance or home-state share, $\mathit{FedShare}_{i,1880}$ the share of federal debt in its bonds in 1880, W_{it} its placed bond holdings, and standard errors are robust. The correlation between the 1880 federal share and the change in mean distance is 0.06; firms above the median federal share increased their mean distance by 350 miles on average and those below it by 323. The federal share, growth and initial size each fail to predict which firms increased their mean distance more.

Table A9. Firm Characteristics in 1880 and the Change between 1880 and 1890

	Change in mean distance, 1880–1890		Change in home share, 1880–1890	
	Correlation	OLS	Correlation	OLS
Federal share of bonds, 1880	0.06	18.5	−0.26	−0.315
		(251.4)		(0.266)
Log growth of bond holdings, 1880–1890	0.10	26.1	−0.04	0.024
		(66.4)		(0.081)
Log bond holdings, 1880	0.11	16.6	0.16	0.025
		(24.9)		(0.037)
Firms	32			

Notes: Firms holding bonds in 1880 and 1890. Correlations, and coefficients of the equation in the text with robust standard errors in parentheses; the change in mean distance is in miles, the change in home share a fraction.

Online Appendix 7. Home-State Overweight

Table A10 bounds the firms' home-state premium in bonds in the gravity framework of the main text: dropping destinations that few outside firms held, evaluating the premium at the New York firms' median size, and on the firms present in 1920, 1925 and 1930. Table A11 compares the New York firms' premium with the other firms' within each class of bond at equal size. Table A12 reports the New York firms' state and municipal bonds against the clause of the New York statute that named a location for them; most of these holdings were already outside New York before the clause was amended, so the clause does not account for the timing of the shift. Table A13 reports the concentration of railroad bond holdings by issuer; it shows no break at the ban on syndicate participation in the insurance law of 1906 that followed the Armstrong investigation.

Table A10. Bounds on the Home-State Premium

	1890	1900	1910	1920	1930
Home state, other firms: destinations held by at least ten outside firms					
Premium	2.35	1.93	1.66	1.73	0.92
	(0.22)	(0.16)	(0.22)	(0.16)	(0.14)
Destinations kept	32	43	49	49	49
Destinations carrying at least 1 percent of outside firms' value					
Premium	2.42	1.99	1.69	1.76	0.93
	(0.24)	(0.20)	(0.23)	(0.18)	(0.14)
Against a state 300 miles away	3.62	2.25	2.21	2.15	1.41
Destinations kept	21	28	33	33	32
At the New York firms' median size					
Premium	2.38	2.44	2.12	2.46	1.17
	(0.37)	(0.19)	(0.19)	(0.22)	(0.17)
Against a state 300 miles away	4.71	2.96	2.71	2.99	1.99
Home by log size	−0.12	−0.22	−0.17	−0.24	−0.06
Size evaluated at (million dollars)	1.84	1.35	2.44	3.51	3.49
Firms present at 1920, 1925 and 1930					
Premium				2.05	0.95
				(0.15)	(0.25)
				[0.07]	[0.09]
Other firms				9	9

Notes: Re-estimates the home premium (a) with destinations held by fewer than ten outside firms, or carrying under 1 percent of outside firms' value, dropped; (b) with the home term interacted with the log of the firm's holdings and evaluated at the New York firms' median; (c) on the firms present at 1920, 1925 and 1930. Standard errors clustered by firm in parentheses and, for (c), by firm and destination in brackets. Estimates start in 1890.

Table A11. The New York Minus Other Firms' Home Premium at the Median Firm, by Class

Panel A. Bonds									
	1880	1885	1890	1895	1900	1905	1910	1920	1930
Railroad bonds	2.24	−1.60	−1.24	−1.39	−1.35	−0.99	−0.91	−0.95	−0.74
	(1.17)	(0.75)	(0.60)	(0.42)	(0.45)	(0.36)	(0.35)	(0.27)	(0.20)
	[1.44]	[0.72]	[0.44]	[0.35]	[0.41]	[0.39]	[0.33]	[0.28]	[0.13]
Home by log size	−0.29	−0.21	−0.06	−0.18	−0.10	−0.14	−0.09	−0.22	0.04
Firms	22	28	32	34	42	50	56	37	57
State and municipal bonds	2.35	3.24	0.70	1.47	−0.58	1.20	−1.14	−1.60	−0.79
	(1.05)	(1.15)	(1.20)	(0.77)	(0.85)	(0.76)	(0.69)	(0.69)	(0.29)
	[1.28]	[0.69]	[0.60]	[0.41]	[0.58]	[0.61]	[0.73]	[0.66]	[0.27]
Home by log size	−0.60	−0.14	−0.24	−0.34	−0.15	−0.26	−0.16	−0.23	−0.34
Firms	35	32	38	45	43	51	62	39	67
Utility bonds		−7.50	−5.29	−2.05	−1.76	−1.92	−2.68	−1.59	−0.47
		(2.35)	(7.66)	(1.44)	(0.58)	(0.70)	(0.66)	(0.57)	(0.19)
		[2.89]	[9.89]	[1.51]	[0.46]	[0.63]	[0.69]	[0.60]	[0.13]
Home by log size		0.65	3.05	−0.16	−0.31	−0.17	0.04	−0.23	−0.02
Firms		8	15	22	30	37	44	34	59
Other corporate bonds			−2.10	−4.28	−3.80	−1.64	−2.20	−1.11	−1.95
			(1.68)	(1.33)	(1.20)	(0.93)	(1.05)	(1.42)	(0.72)
			[1.53]	[1.00]	[0.83]	[0.67]	[0.73]	[1.36]	[0.64]
Home by log size			−0.03	0.01	0.99	0.28	0.18	0.35	−0.48
Firms			17	26	30	38	37	36	53
All bonds	1.72	−0.60	−0.94	−0.77	−0.89	−0.74	−1.17	−1.19	−0.91
	(0.89)	(0.38)	(0.45)	(0.35)	(0.33)	(0.28)	(0.31)	(0.27)	(0.15)
	[1.08]	[0.37]	[0.38]	[0.27]	[0.32]	[0.30]	[0.36]	[0.30]	[0.05]
Home by log size	−0.51	−0.19	−0.12	−0.17	−0.22	−0.27	−0.17	−0.24	−0.06
Firms	36	35	40	46	46	54	66	40	68
Panel B. Mortgage loans									
	1908	1910	1915	1920	1925	1930	1935	1940	
All mortgage loans	6.43	5.41	3.97	3.28	2.13	1.61	1.43	1.45	
	(0.80)	(0.80)	(0.82)	(1.01)	(0.79)	(0.68)	(0.69)	(0.46)	
	[0.69]	[0.66]	[0.71]	[0.79]	[0.55]	[0.61]	[0.66]	[0.43]	
Home by log size	−0.98	−0.69	−0.31	−0.22	−0.28	−0.35	−0.33	−0.39	
Firms	34	38	39	39	43	52	56	60	
Nonfarm loans				2.30	1.81	1.27	1.11		
				(1.17)	(0.70)	(0.61)	(0.66)		
				[1.08]	[0.60]	[0.57]	[0.66]		
Home by log size				−0.28	−0.40	−0.28	−0.31		
Firms				28	32	46	48		
Farm loans				10.79	11.37	11.09	10.99		
				(1.33)	(1.39)	(1.26)	(1.27)		
				[1.15]	[1.20]	[0.62]	[0.67]		
Home by log size				0.02	0.26	−0.22	0.09		
Firms				25	26	35	37		

Notes: For each class and benchmark, the gravity equation with the home term split by charter and interacted with the log of the firm's holdings in the class, centred at the median firm. Standard errors clustered by firm in parentheses and by firm and destination in brackets.

Table A12. The New York Firms' State and Municipal Bonds and the Statute's Clause

Year	Firms	Firms with any out-of-state bond	Value (million dollars)	Share out of state	Share in New York State	Share of all bonds
New York firms						
1870	22	11	4.8	0.07	0.93	0.91
1875	22	12	11.8	0.04	0.96	0.88
1880	11	7	28.1	0.34	0.66	0.89
1885	11	7	15.9	0.42	0.58	0.22
1890	12	10	15.4	0.92	0.08	0.12
1895	13	12	34.8	0.90	0.10	0.15
1900	14	14	30.0	0.84	0.16	0.08
1905	14	12	29.2	0.62	0.38	0.05
1910	14	11	51.5	0.70	0.30	0.06
1915	13	9	93.5	0.85	0.15	0.08
1920	12	8	101.0	0.89	0.11	0.08
1925	11	10	106.3	0.93	0.07	0.07
1930	18	12	159.0	0.93	0.07	0.06
1935	20	17	377.7	0.72	0.28	0.12
Other firms						
1870	25	20	9.1	0.24	0.08	0.86
1875	29	24	21.1	0.41	0.04	0.80
1880	24	19	24.9	0.58	0.05	0.71
1885	21	16	24.9	0.56	0.01	0.51
1890	26	23	33.1	0.61	0.00	0.47
1895	32	27	46.6	0.72	0.00	0.44
1900	29	26	56.1	0.76	0.03	0.31
1905	37	33	54.5	0.71	0.03	0.16
1910	48	44	97.8	0.70	0.12	0.18
1915	61	57	128.6	0.75	0.10	0.17
1920	27	26	158.3	0.82	0.07	0.18
1925	25	24	84.3	0.80	0.00	0.13
1930	49	46	178.1	0.79	0.03	0.11
1935	4	4	197.0	0.70	0.15	0.18

Notes: By benchmark and charter group: firms with state and municipal bonds, firms with any such bond outside the home state, value, the share outside the home state, the share in New York State, and the class's share of the group's bonds.

Table A13. Concentration of Railroad Bond Holdings by Issuer, 1895–1920

	1895	1900	1905	1910	1915	1920
New York firms						
Herfindahl across issuers, mean	0.050	0.199	0.203	0.155	0.117	0.041
Herfindahl, value-weighted	0.029	0.029	0.029	0.023	0.022	0.023
Share in five largest issuers	0.368	0.524	0.523	0.473	0.346	0.305
Share in issues no other firm held, mean	0.118	0.175	0.085	0.026	0.030	0.031
Share in issues no other firm held, value-weighted	0.140	0.086	0.052	0.039	0.042	0.049
Issuers held, median	39	26	30	25	40	77
Firms	10	15	14	15	12	11
Other firms						
Herfindahl across issuers, mean	0.247	0.236	0.235	0.203	0.199	0.067
Herfindahl, value-weighted	0.059	0.063	0.035	0.027	0.024	0.020
Share in five largest issuers	0.574	0.601	0.546	0.496	0.556	0.373
Share in issues no other firm held, mean	0.277	0.322	0.222	0.226	0.190	0.099
Share in issues no other firm held, value-weighted	0.175	0.116	0.120	0.094	0.073	0.043
Issuers held, median	27	17	32	39	25	74
Firms	24	31	40	46	57	26
Mutual Life of New York						
Herfindahl across issuers	0.024	0.033	0.036	0.027	0.023	0.023
Share in five largest issuers	0.261	0.306	0.318	0.242	0.230	0.234
Share in issues no other firm held	0.209	0.112	0.022	0.010	0.025	0.025
Issuers held	106	111	73	101	118	109
Equitable						
Herfindahl across issuers	0.031	0.022	0.032	0.027	0.035	0.041
Share in five largest issuers	0.286	0.240	0.288	0.267	0.315	0.344
Share in issues no other firm held	0.126	0.095	0.050	0.039	0.021	0.009
Issuers held	96	127	72	112	96	81
New York Life						
Herfindahl across issuers	0.027	0.031	0.020	0.017	0.014	0.017
Share in five largest issuers	0.254	0.300	0.224	0.180	0.164	0.185
Share in issues no other firm held	0.115	0.048	0.069	0.058	0.063	0.102
Issuers held	92	116	142	172	182	172

Notes: For each firm and benchmark: the Herfindahl index of its railroad bonds across issuers, the share in its five largest issuers, the number of issuers, and the share in issues no other sample firm held. Group rows are means across firms, unweighted and weighted by railroad-bond value.

Online Appendix 8. Mortgage Loans

The statutes governing where the New York firms could lend are N.Y. Laws 1853 ch. 463 § 8; 1868 ch. 318 § 1; 1875 ch. 423 § 2; 1886 ch. 394; 1892 ch. 690 § 16; and 1906 ch. 326 § 36 (Insurance Law § 100); New Jersey's is N.J. Laws 1902 ch. 134 § 16, which permitted mortgage loans in any state. The act of 1853 confined mortgage loans to New York real estate; that of 1868 added real estate within fifty miles of New York City; and that of 1875 permitted loans in adjacent states, but only of the funds required to meet obligations incurred there. The Insurance Law of 1892 permitted loans in any other state up to half of the premiums collected there, a clause dropped from the law between 1896 and 1906. Davis (1965) dates the New York firms' freedom to lend in any state to the 1880s, and Snowden (1995) writes that they were granted broad lending powers in 1886. The act of 1886 extended the provision of 1875 to foreign countries on the same condition; only the act of 1906 permitted loans in any state without a geographic limit.

Table A14 separates farm from nonfarm loans from 1920, when the New York schedule first distinguishes them: the New York firms held no farm loans in New York, and the home-state concentration that remained in 1940 was in nonfarm, largely urban, lending.

Table A14. Farm and Nonfarm Mortgage Loans, 1920–1940

	New York firms					Other firms				
	1920	1925	1930	1935	1940	1920	1925	1930	1935	1940
Panel A. Shares of all mortgage loans										
Farm loans in the home state	0.00	0.00	0.00	0.00		0.04	0.03	0.03	0.03	0.01
Farm loans outside	0.13	0.26	0.15	0.11		0.61	0.57	0.36	0.28	0.07
Nonfarm loans in the home state	0.72	0.48	0.42	0.45		0.07	0.06	0.10	0.10	0.26
Nonfarm loans outside	0.15	0.26	0.43	0.44		0.29	0.35	0.51	0.59	0.66
Home share within farm loans	0.00	0.00	0.00	0.00		0.06	0.05	0.09	0.10	0.13
Home share within nonfarm loans	0.82	0.65	0.49	0.50		0.19	0.14	0.16	0.15	0.28
Firms	8	9	13	16		22	23	33	32	8
Mortgage loans (million dollars)	648	1369	2717	2364		941	1864	3528	2588	108
Panel B. Gravity home premium by type (New York firms, other firms)										
All mortgage loans: home premium	4.21	2.73	1.86	1.73	1.56	1.11	0.91	0.67	0.74	0.55
	(0.79)	(0.66)	(0.46)	(0.44)	(0.31)	(0.29)	(0.20)	(0.20)	(0.25)	(0.25)
New York minus other	3.10	1.82	1.19	0.99	1.00					
log distance (all firms)	−1.05	−1.10	−1.03	−0.95	−0.83					
Nonfarm loans: home premium	3.44	2.37	1.63	1.54		1.60	1.04	0.72	0.86	
	(0.82)	(0.52)	(0.37)	(0.41)		(0.31)	(0.31)	(0.22)	(0.28)	
New York minus other	1.83	1.33	0.91	0.68						
log distance (all firms)	−1.03	−1.27	−1.05	−0.97						
Farm loans: home premium	11.91	13.14	12.49	12.15		1.41	1.24	1.35	1.36	
	(0.99)	(1.05)	(1.13)	(1.07)		(0.76)	(0.45)	(0.36)	(0.42)	
New York minus other	10.50	11.91	11.14	10.78						
log distance (all firms)	−1.53	−1.00	−0.43	−0.31						

Notes: Panel A: the share of each group's mortgage loans in four cells and the home share within farm and within nonfarm loans. Panel B: the home premium of the gravity equation estimated separately on all, nonfarm and farm loans, with the home term split by charter.

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