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Pawel Janas

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ABSTRACT

Large financial intermediaries are more stable than small ones, and the largest are also the most geographically diversified. Whether that breadth is a source of stability or a byproduct of scale is difficult to establish, since intermediaries diversify by growing large. I examine how the diversified intermediary is assembled, using a newly digitized firm-by-state panel of the near-universe of U.S. life insurers from 1888 to 1940, the largest nonbank institutional investors of the period. Over these decades, the number of insurers per state more than quadrupled and within-state concentration declined by half, yet a small number of geographically extensive insurers retained a stable share of national premiums. I decompose firm-level outcomes into the insurer's underwriting level and the composition of its book. Insurers entered new states before attaining scale, each entry constituting a small and favorably selected position with the convex payoff of a real option. The most successful decile of entries generated half of a cohort's premium. Expansion was costly on two margins: a broad insurer earned less per dollar of coverage and paid 15.1 percent more in claims than an equally large insurer writing in the same state and year. The pricing cost is attributable to the composition of a broad insurer's book, the claims cost to the insurer itself. A comparison across firms understates the claims cost, since the markets a broad insurer adds exhibit favorable claims experience of their own. Stability, by contrast, is attributable to scale, since breadth's advantages in volatility and survival vanish conditional on size. Risk pooling was bounded: approximately nine tenths of an insurer's loss-ratio variance was common to its markets. Diversification was the product of costly expansion, and the stability attributed to it is the scale that expansion produced.

Pawel Janas
California Institute of Technology
Division of Humanities and Social Sciences
and NBER
pawel@caltech.edu

1 Introduction

Financial intermediaries are among the largest and most stable firms in the economy. Their stability may reflect genuine diversification, the pooling of risks across many markets (Diamond, 1984; Boyd and Prescott, 1986), or simply the advantages of size, chief among them the public support extended to the largest institutions during crises (Stern and Feldman, 2004; Gandhi and Lustig, 2015; Acharya et al., 2016), alongside capital buffers, access to external capital markets, and market power. This distinction is contested and matters for policy, because it determines whether the dominance of large intermediaries should be curbed or protected. The question is hard to settle for two reasons. First, the largest firms today are shielded by government guarantees, so their stability may reflect genuine diversification or the subsidy, and the data cannot tell the two apart.[1] Second, and more fundamentally, a firm becomes diversified by growing large, entering new markets as it expands: diversification and size are two outcomes of the same endogenous process. Quantifying the causal effect of diversification, while holding size constant, is therefore difficult to identify (Demsetz and Strahan, 1997; Goetz et al., 2016).

In a departure from this literature, I study the diversification process itself, a phenomenon that unfolds over decades and can be measured only over a long historical horizon, by tracing how some of the most important financial intermediaries became large and diversified. I do so with a newly digitized annual panel that follows the near-universe of U.S. life insurers, firm by firm and state by state, across the five decades from 1888 to 1940, the period over which the industry expanded from geographically concentrated firms into nationwide intermediaries, and before the subsidies that confound the modern debate.[2] To my knowledge, this is the first long-run, firm-level record of a systematically important intermediary's geographic expansion: life insurers were the leading non-bank conduit between household savings and long-term credit markets and the largest non-bank institutional investors in the country during this time period. I find that geographic diversification is built one market at a time through a costly, option-like process of entry in which breadth precedes scale, and that the cost falls on two margins of different origin: an insurer's pricing power proves

[1] For example, federal deposit insurance (introduced in 1934), the too-big-to-fail doctrine crystallized in the 1984 rescue of Continental Illinois, and the extraordinary assistance extended during the 2008 crisis all shield the largest institutions. Acharya et al. (2016) find that bond credit spreads are insensitive to risk for the largest financial institutions but not for others, and Gandhi and Lustig (2015) that the largest bank stocks earn lower risk-adjusted returns than smaller ones despite higher leverage, both consistent with guarantees that let such firms fund themselves more cheaply than their fundamentals alone would warrant.

[2] State life and health insurance guaranty associations, which pay policyholders' claims when an insurer becomes insolvent, spread only after the National Association of Insurance Commissioners adopted a model act around 1970; most states enacted them over the following two decades, and national coverage was complete only by the early 1990s. Federal support for large insurers is more recent still, exemplified by the 2008 rescue of the American International Group and the systemic designations of the largest life insurers after 2010.

to be a local asset that does not travel with its reach, while its underwriting quality deteriorates across its whole book as that reach widens, as Winton (1999) predicts of an intermediary that must monitor across many markets at once. Separating the two requires distinguishing what an insurer does in the markets it holds from which markets it holds, and much of the cost of expansion is invisible in a comparison of firms because the two move in opposite directions. The stability that appears to reward diversification is, in fact, the return to scale. The risk pooling that geographic spread delivers is bounded: a broad insurer's loss-ratio volatility falls by more than half yet stays about four times the level independent markets would imply.

I assemble a newly digitized annual firm-by-state panel covering the near-universe of U.S. life insurers from 1888 to 1940, drawn from the Spectator *Insurance Year Book*. Policies were sold by local agents and recorded where premiums were collected and losses were paid, while underwriting, reserving, and investment were set at the firm level. For each firm, state, and year the data record premiums, losses, new insurance written, and total insurance in force, and a firm's entry into and growth within each state can be observed directly. The panel also records each firm's headquarters, state of incorporation, and the year and channel of its exit, which I observe through 1950. It contains over 150 thousand firm-state-year observations, or roughly 10.5 thousand firm-years across approximately 850 insurers, and its five decades span the full arc of most firms' expansion, from a concentrated founding to a national footprint. I supplement this data with annual balance sheets and income statements for all insurers licensed in New York, which I use to validate coverage and confirm that the geographic cost of expansion is not an artifact of a firm's balance-sheet composition.

Breadth describes how an insurer's business is distributed rather than a property it holds apart from that business, so every outcome it reports aggregates the markets in which it writes. That aggregate splits into two terms: the firm's underwriting level, common to all of its markets in a year, and the composition of its book. Diversification enters through both, and they need not share a sign, so a regression of a firm-level outcome on breadth returns only their sum and can report zero when both terms are large. I identify each with a design that absorbs the other, comparing an insurer's own markets against one another to recover composition and insurers writing in the same state and year to recover the level. The residual that this decomposition leaves aside proves to govern how much risk geographic spread could pool at all.

The paper establishes four results. First, I document the long-run development of the market structure of the industry: between 1888 and 1940 the number of firms per state rose more than fourfold, from about 17 to nearly 80, and within-state premium concentration fell by more than

half, yet firms operating in at least 35 states held between 80 and 90 percent of national premiums throughout, while firms that exited did so chiefly by being absorbed.

Second, I show how these dominant firms were built, since their scale and geographic reach were themselves the product of expansion. An average firm's premium came increasingly from markets it entered rather than from its home market, and each entered market opened about 10 percentage loss-ratio points below the firm's founding markets. Each entry behaved like a real option with convex payoff: about a fifth of entries were abandoned within a decade and a further 13 percent grew more slowly than the rest of the firm, while 23 percent grew more than ten times faster, so that the best 10 percent of entries produced about half of a cohort's premium. Breadth preceded size, predicting a firm's size 5 and 10 years ahead by about 0.10 and 0.12 standard deviations, while size did not predict future breadth.

Third, becoming diversified is costly, and the two costs arise in different terms of the decomposition. The pricing cost is chiefly compositional. Premium yield falls by 0.74 per log-kilometer of distance from headquarters against a mean of 30.29 and rises by 17.6 per unit of a firm's within-state premium share, so pricing power sits at the core of a footprint and weakens toward its edge; a broad insurer earns 5.0 percent less per standard deviation of breadth, of which 3.1 points reflect where it writes rather than how it prices within any market. The claims cost runs the other way and is larger than a comparison of firms reveals. A broad insurer pays 15.1 percent more per dollar of coverage than an equally large insurer writing in the same state and year, against an aggregate gradient of 8.8 percent, because composition offsets it: the distant and recently entered markets that a broad insurer holds in greater proportion carry favorable claims experience, so the geography of its book conceals roughly two fifths of the gap. This difference travels into an insurer's own markets over time. Holding a firm-state fixed and measuring reach excluding the focal state, a standard deviation of expansion elsewhere raises the loss ratio in markets the firm already holds by 0.020 and claims per \$1,000 by 0.523, while leaving the price it charges there unchanged. Insurers whose books had deteriorated entered fewer new states rather than more, so expansion accompanied the growth of an insurer's existing business rather than its deterioration.

Fourth, the benefit of breadth is smaller than a cross-section suggests. Breadth appears to stabilize, lowering five-year loss-ratio volatility by 0.022 and raising ten-year survival by 7.8 percentage points, but conditional on size the survival advantage falls to 0.001 and the volatility advantage to zero, while size carries both. What pooling remains is bounded. A broad insurer's realized loss-ratio volatility falls from 0.21 to 0.08 as it expands but stays about 4 times an independence

benchmark. The implied systematic share is 0.89 in the narrowest breadth quartile and 0.94 in the broadest, so roughly nine tenths of an insurer's loss-ratio variance was common across its markets whatever its reach.

The paper contributes to several literatures. It speaks first to the empirical work on whether the geographic diversification of an intermediary reduces its risk, in which larger and more diversified bank holding companies appear better diversified but no less risky, because the risk reduction is offset by thinner capital and riskier portfolios (Demsetz and Strahan, 1997), while the geographic expansion of bank assets does lower risk, and by more when banks expand into economically dissimilar markets (Goetz et al., 2016). Rather than add another estimate, the paper accounts for the disagreement. Any firm-level regression of an outcome on diversification recovers the sum of a level and a composition term, and in this setting the two carry opposite signs, so the magnitude and even the sign of an aggregate coefficient turn on their relative weight in a given sample rather than on the effect of diversification alone.

The insurance literature has studied line-of-business rather than geographic diversification, finding a performance penalty for diversified property–liability insurers (Liebenberg and Sommer, 2008), greater asset risk-taking among them (Che and Liebenberg, 2017), and determinants of the diversification decision that lie in internal capital markets and barriers to growth rather than in risk pooling (Berry-Stölzle et al., 2012). Geographic diversification appears in that work as a control, and Liebenberg and Sommer (2008) report it entering performance negatively while noting its high correlation with firm size. Work on life-insurer fragility centers on nontraditional liabilities rather than the traditional policy book, whether puttable securities held by institutional investors (Foley-Fisher et al., 2020) or retail variable annuities with minimum return guarantees (Koijen and Yogo, 2022); the closest historical study is a case study of the 1933 resolution of a single surety insurer (Rose, 2017).

The paper contributes to the theory of intermediation (Diamond, 1984; Diamond and Dybvig, 1983) by endogenizing the diversified intermediary those models take as a primitive and documenting the process by which it is assembled, and by characterizing that process as a portfolio of growth options it connects the geographic growth of intermediaries to the theory of investment under uncertainty. It contributes to the geography of finance (Petersen and Rajan, 2002; Coval and Moskowitz, 1999; Lamoreaux, 1994; Snowden, 1995; Goetz et al., 2016) by shifting attention from the geography of an intermediary's assets to that of its liabilities, a distinction Doerr (2024) draws in showing that geographic diversification of a bank's deposit base stabilizes funding through a channel

separate from asset-side diversification, and by showing that an intermediary's pricing power is a local asset that does not extend with its reach. And it contributes to household finance and financial history (North, 1954; Davis, 1965; Murphy, 2010; Arthi et al., 2025) by providing the first systematic firm-level account of a central but understudied intermediary over five decades.

Section 2 develops the conceptual framework. Section 3 describes the institutional setting, data, and measurement. Section 4 documents the persistence of the large national insurers as competition rose. Section 5 sets out the decomposition and the designs that identify its two terms. Section 6 characterizes the formation of the diversified intermediary. Section 7 measures the cost of becoming diversified and shows that its apparent stability is scale. Section 8 examines the limits of geographic pooling. Section 9 concludes.

2 Conceptual framework

I treat the life insurer as a geographically dispersed portfolio of long-dated liabilities, funded by a recurring premium inflow and drained by two kinds of outflow. Each policy can be discharged on the insurer's own schedule, when the insured dies or an endowment matures, or on the policyholder's, through surrender for accumulated cash value, or through a policy loan the contract obliges the insurer to grant at a fixed rate. The insurer thus combines a pool of mortality risk on the claims side with a redeemable, deposit-like liability on the funding side, and both are spread spatially, since premiums, claims, and withdrawals accrue market by market.

A firm becomes diversified by entering markets one at a time. An insurer begins in the state where it is chartered and extends into others through its agent network, appointing agents in a new state, applying for and satisfying the entry requirements, and writing its first policies. A firm's geographic spread at any moment is the cumulative record of these entries, so that two insurers of the same size could hold very different books: one still anchored in a home market and another spread across many, according to how far each had carried its expansion and how much of it had succeeded.

The benefits conventionally attributed to diversification map onto this setting unevenly. Cost and revenue scope economies (Teece, 1980) are available to an insurer that spreads a single charter, actuarial staff, and reserve pool across many states, and an insurer collecting premiums in many markets operates a larger internal capital market, which under information asymmetry may allocate funds more cheaply than external finance (Myers and Majluf, 1984). The third conventional benefit is risk reduction from combining imperfectly correlated revenue streams, which with risk-sensitive

customers should raise the price an insurer can charge (Herring and Santomero, 1990; Cummins and Danzon, 1997). The costs conventionally attributed to diversification are agency costs, which rise with complexity because monitoring becomes harder and divisional performance less observable (Berger and Ofek, 1995), and a dilution of the firm's capacity to screen and monitor across a widening set of markets (Winton, 1999). In an insurer these bear directly on the claims side, since screening applicants is the activity that determines whether a book of policies pays out.

Each entry has the structure of an option. When a firm opens in a new state it writes a small book of freshly underwritten policies. The book is small because the firm begins with no in-force business and grows only as fast as its new agents can sell; it is favorably selected because a firm opens in a state only where it expects a profitable market and, writing from a blank slate, takes only the best risks it is offered, so its freshly screened and still-young book pays out little in early claims. The position is cheap to open, but it is not free. Away from home the firm holds no local standing: it has no seasoned agency force, no reputation among local buyers, and no share of the local market to lend it pricing power, and it must therefore write at a thinner margin than it earns at its core, accepting a lower premium for the same coverage. That foregone pricing power is what the firm pays for the option, and it pays it up front and for as long as it remains a marginal presence in the state.

What the firm receives in return is uncertain when the position is opened. Whether an entered market grows is uncertain: whether its agents take root, whether local demand for insurance develops, and whether the firm can build the standing that would let it price as an incumbent does. Most entries resolve to little, staying small or being surrendered within a few years. A minority take hold, their books seasoning and their premiums compounding, until a market entered as a thin foothold is many times its original size a decade on. The loss is bounded by the modest margin the firm forgoes and the position it can close; the gain is convex and open-ended, since a single market that succeeds returns far more than the cost of the many that do not. A firm's expansion is a portfolio of these options, held at once across many states and many stages of maturity, and the breadth it shows once mature is the set of entries that took hold.

The geography a firm assembles is summarized by its *reach*, the number of distinct markets in which it writes. Reach is the running total of a firm's entries, and it rises with size, because the markets a firm enters are, as they mature, what make it large. Breadth and scale are in this sense two products of one expansion rather than independent attributes of the firm: a firm becomes geographically broad only by growing large in the markets it enters, and grows large only through

those same markets, so the two accumulate together and in sequence. The diversified intermediary is the endpoint of this expansion, which runs before the point at which theories of intermediation begin, where the firm is already large enough to pool its idiosyncratic risk and already assembled into a single balance sheet (Diamond, 1984; Diamond and Dybvig, 1983).

3 Institutional Setting, Data, and Measurement

3.1 The life insurance industry, 1888–1940

Life insurance was the largest nonbank conduit between American households and long-term credit markets in the decades around 1900 (Stalson, 1942). The ordinary life policy bundled insurance and saving into a single contract: a household paid fixed premiums in exchange for a payout contingent on death or on survival to maturity, and the policy accumulated a cash value that could be borrowed against or surrendered. For families with little access to banks or securities markets, the policy was above all a saving vehicle, a way to move resources across states of the world, life and death, and across time. Insurers, in turn, took in a steady stream of small, contractually fixed premiums and reinvested them, becoming by the early twentieth century among the largest institutional investors in the country.

The assets those premiums funded were long-term and illiquid. Insurers held mortgages, municipal bonds, and corporate securities, with mortgages alone accounting for roughly a third of assets. Their liabilities were equally long: policy reserves accumulated over decades and, in normal times, ran off slowly. This maturity structure made insurers major suppliers of long-term credit, especially farm and urban mortgage credit, and central participants in the integration of national capital markets (Snowden, 1995; Davis, 1965). Davis (1965) identifies life insurers as the period's most important nonbank intermediaries and documents both the progressive relaxation of state restrictions on out-of-state mortgage lending and the "substantial technical problems in handling distant investments" that persisted once those restrictions lifted, an asset-side counterpart to the liability-side geography this paper measures.

Policies were sold by local agents who collected premiums within their state or local markets, so the geographic origin of an insurer's liabilities was dispersed across the country. But underwriting, reserving, and investment policy were set at the firm level, at headquarters, under a single charter. Two insurers of the same size could therefore hold very different books, one concentrated in a handful of home states, another spread evenly across many, for reasons rooted in the history of their agent

works rather than in their underlying quality.

The industry also expanded well beyond its Northeastern origins. After 1900, entry accelerated in the Midwest and South, and established firms pushed into new markets through agents and branch offices. Yet expansion did not decentralize the business: a large share of premiums in most states was written by firms headquartered elsewhere, and New York remained dominant in firm size and asset holdings. Geographic presence and organizational control diverged: a state could host a large and fast-growing insurance market without domiciling the firms that participated in it.

Regulation reinforced this structure and was itself geographically fragmented. Following the Supreme Court's decision in *Paul v. Virginia* (1869), insurance was regulated by the individual states rather than the federal government throughout the period. States set their own licensing requirements, capital and reserve standards, and lists of permissible investments, and the rules varied widely: some required insurers to hold assets locally or taxed out-of-state firms, often out of concern that local savings were flowing to distant financial centers. The 1905–06 Armstrong investigation in New York, a response to scandals at the largest insurers, tightened oversight, disclosure, and investment rules; because New York firms dominated the industry, its reforms reshaped behavior nationally (North (1954)). Firms weighed these differences in deciding where to incorporate and how to allocate assets, reinforcing the separation between where funds were raised and where they were managed.

3.2 Data

I assemble a newly digitized firm-by-state panel covering the near-universe of U.S. life insurers from 1888 to 1940.[3] The primary source is the *Insurance Year Book*, published annually by the Spectator Company, which reports the premiums collected and losses paid by every life insurer in every state in which it operated, together with each firm's headquarters, state of incorporation, and, for firms that leave the industry, the year and channel of exit.[4] The panel contains $151,882$ firm-state-year observations, which collapse to $10,426$ firm-years across 818 insurers.

I complement the state panel with firm-level accounting data from the *Annual Report of the Superintendent of Insurance of the State of New York* for the same period, which reports detailed

[3]This sample does not include small fraternal organizations that also acted as insurance intermediaries during this time. Data before 1888 exist but are incomplete. Importantly, however, the New York accounting data validate the state panel: for firms observed in both, the sum of a firm's state premiums closely matches its accounting income-statement premium (Figure A.1 in the Online Appendix).

[4]Even though I stop the premium and loss data collection in 1940, I record firm exits through 1950 so that ten-year survival can be measured for every firm-year without right-censoring.

balance sheets and income statements for the roughly 170 insurers licensed to operate in New York. From these I construct firm-level measures of asset allocation and solvency, the mortgage, real-estate, stocks-and-bonds, and policy-loan shares of assets, the ratio of surplus to liabilities, and the investment yield, which enter the analysis as controls that confirm the cost of expansion is not an artifact of a firm's balance-sheet composition (Section 7). Because the sample is limited to New York–licensed firms, it captures mostly large national insurers rather than the small, concentrated firms that make up much of the state panel. To place nominal magnitudes in real and comparative terms, I draw nominal GDP and a price deflator from MeasuringWorth and total commercial-bank assets from *Historical Statistics of the United States*.

(Table I about here)

Table I reports the distribution of the firm-state-year and firm-year panels (Panels A and B) alongside the New York accounting data (Panel C). The data are highly skewed at every level of aggregation. In the firm-state-year panel the mean premium cell is about $469 (2024 adjusted) thousand against a median of $60 thousand, and the typical firm collects only one to two percent of the premiums written in a state. Aggregated to the firm-year, the median insurer collects about $589 thousand in premiums while the mean collects $6.8 million, a gap resulting from a small number of large national firms. The same firms drive the skew in geographic reach. The median insurer operates in 6 states, but its effective (inverse-Herfindahl) number of states is only 2.15, so even multistate firms concentrate most of their premiums in a few home markets. The loss ratio (losses paid over premiums collected) averages 0.27 and its rolling five-year volatility is 0.09.

Firm exit is far more often consolidation than failure. I group departures into three kinds: consolidation, in which a firm's entire in-force block passes to another carrier through reinsurance, merger, or acquisition; outright failure; and voluntary retirement from the business. Within ten years a firm-year is followed by consolidation in 19 percent of cases, of which 13 percent is reinsurance, 4 percent merger, and 2 percent acquisition, against 2 percent through outright failure, with voluntary retirement accounting for the small remainder. Reinsurance, the largest channel, is itself an exit: the firm cedes its block of in-force policies to another insurer, which assumes the obligations and the premiums, and the ceding firm stops writing business. Panel C describes the New York accounting subsample, the roughly 170 insurers licensed in New York for which I observe the balance sheet. These are the large national firms, so the subsample is not representative of the small insurers that make up most of the state panel, and I use it to illustrate firm-level mechanisms.

Their assets are long and illiquid: mortgages average a third of assets and stocks and bonds a further two-fifths, with real estate and policy loans adding another 7 and 8 percent. On the liability side, policy surrenders and lapses run at about 8 percent of in-force in a typical year.

3.3 Measuring diversification and entry

I summarize each insurer's diversification with a single measure, *breadth*, alongside a measure of scale. *Breadth* is the effective number of states, $N_{\text{eff}} = 1/\sum_s w_s^2$, the inverse-Herfindahl count built from the share w_s of a firm's premiums collected in state s; it rises with size, since larger firms sell in more states. *Size* is log total firm premium. *Breadth* and *Size* are produced by a single process of expansion, and I interpret them throughout as the joint outputs that Section 2 describes rather than as independent characteristics of a firm. In my sample, *Breadth* averages 4.46 effective states, with a median of 2.15.

(Figure I about here)

Figure I plots *Breadth* against the logarithm of total firm premium. The effective number of states rises steeply and convexly with size, from about 1 among the smallest firms to roughly 11 among the largest.[5] Reach is tied closely to scale: firm-size deciles explain about 57 percent of the variation in breadth. The median insurer writes in 6 states but has an effective number of 2 (Table I), so raw presence overstates reach, and I measure breadth as the effective count throughout.

The panel's start year complicates the dating of a firm's "founding" and "entry" in each state. For a firm already writing business in 1888 I observe neither its true founding nor when it entered the states it already occupied. I therefore remove each firm's pre-existing book: any firm-state present in 1888 is treated as null throughout, and a firm's founding is reset to the first new markets written in 1889, and entries are all new markets starting in 1890. Firms that enter the industry during the panel are unaffected, since their entire history (up to 1940) is observed. An entry, therefore, is a firm-state's first observed positive-premium year, restricted to genuine new business by two screens: the state's opening book must be mostly newly written (new insurance over in force above one half) and the position a small foothold (entry premium no larger than the firm's median state premium that year), so that blocks assumed through reinsurance and markets a firm was already large in are not counted as entries. A market's tenure is years since this observed entry. This convention

[5] Measures constructed from insurance in force rather than premiums collected yield the same pattern.

discards the mature books of the largest incumbents, so the formation results describe the footprints that firms visibly assemble within the window rather than those they carried into it.

4 Market structure: persistence of large national insurers

(Figure II about here)

Life insurance grew rapidly and its weight in the financial system rose in step. Figure II documents both its premium and asset growth and its rising share of GDP and of bank assets. The number of active legal-reserve insurers rose from roughly 50 in the mid-1880s to a peak above 350 in 1930 (before the Great Depression halted the growth), while real premium income grew more than twentyfold over the same span (Figure II, Panel A). The sector's weight in the wider economy expanded alongside it: premiums increased from about 0.7 percent of GDP in 1890 to a peak near 4.3 percent in the mid-1930s, and life-insurer assets grew from roughly an eighth of total commercial-bank assets in 1890 to nearly two-fifths by the late 1930s (Panel B). By the 1930s these firms constituted among the largest private pools of long-term capital outside the banking system, and a principal channel through which households held financial wealth.

The industry was also in constant, cyclical churn. Panel C plots the annual rate at which active insurers left the industry, a three-year moving average, through any channel and through reinsurance alone. The rate stayed between about 1 and 6 percent, and reinsurance accounted for most of it: departing firms were absorbed by larger rivals. Most insurers, however, were geographically concentrated, operating in only a handful of states. Panel D plots the number of states in which a company wrote premium, as the cross-firm mean, the median, and the premium-weighted mean. The median firm operated in only 6 states and the mean in about 14, yet the premium-weighted mean approached 40: the typical firm wrote in a handful of states, while the typical premium dollar was collected by a firm operating nationwide. The three series diverged after 1905, as small single-state firms entered while premium concentrated among the broad national writers: the established mutual and stock offices of the Northeast (Mutual Life of New York, Equitable, New York Life), that wrote large ordinary policies for the middle class and were the dominant firms of the 1880s and 1890s, and, from the mid-1880s, the industrial insurers (Metropolitan, Prudential), which sold small policies door to door in working-class neighborhoods and collected small weekly premiums.

4.1 Local markets

At first glance, the expansion of life insurance after 1888 looks like a decentralization of the business. The number of insurers grew, their geographic reach widened, and premium collection diffused well beyond the Northeast.

(Figure III about here)

Yet the business did not decentralize (Janas, 2026). Local insurance markets became substantially more competitive while a small number of large, geographically extensive insurers held a stable share of national premiums throughout, and Figure III documents both. The average number of insurers operating in a state rose more than fourfold, from about 17 in the late 1880s to nearly 80 by 1940 (Panel A). As markets matured, premium collection grew markedly less concentrated: the average within-state Herfindahl index fell by more than half, from about 0.24 in the late 1880s to below 0.10 after 1910, and the within-state share of the five largest firms fell from about 80 to 54 percent (Panel B). Most of the deconcentration occurred before 1915, after which the concentration measures held steady even as entry continued and the average number of insurers per state climbed toward 80. By every local measure the industry became substantially more competitive. Competition in numbers did not produce a dispersed national market, because the additional firms were small, as Panel D of Figure II already reported. Panel C of Figure III states the point directly: firms in the top premium decile, and firms operating in at least 25 or at least 35 states, collected between 80 and 90 percent of all national premiums by the early 1910s, up from about 60 percent for the top decile around 1890, and that share held through 1940 even as the count of firms per state rose fourfold and within-state concentration fell by half.

(Table II about here)

Firm-level survival mirrors the aggregate pattern. In Panel A of Table II I estimate, over the firm-year panel,

$$\text{Surv}_{it}^{h} \;=\; \beta_1 \,\text{Breadth}_{it} \;+\; \beta_2 \,\text{Size}_{it} \;+ \alpha_{r(i),t} \;+\; \varepsilon_{it} \tag{4.1}$$

and the same equation with a cubic in size added. The dependent variable Surv_{it}^{h} equals one if firm i records no departure through year $t+h$, at horizons $h = 5$ and $h = 10$. Breadth_{it} is the standardized effective number of states, N_{eff} with $N_{\text{eff}} = 1/\sum_s w_s^2$, and Size_{it}, entered as the cubic in the second specification, is standardized log firm premium; $\alpha_{r(i),t}$ are firm headquarter region-by-year fixed

effects, which absorb region-specific shocks and trends; β is therefore identified by comparing firms that were headquartered in the same region and year, separating a firm's own reach and scale from the conditions of its regional competitors. Both margins predict survival on their own: a one-standard-deviation increase in size raises ten-year survival by 13.2 percentage points (pp), and breadth raises it by 7.8 pp per standard deviation unconditionally. But the two are not separate channels. With the size cubic included, breadth no longer predicts survival at either horizon (0.8 pp at ten years, not significant), while the size term is undiminished. The survival gradient that appears to run with a firm's geographic scope is the scale that comes with reach: persistence is a size effect.

Firms exited primarily through consolidation, not outright failure. Panel B of Table II reports the composition of departures. Across the size distribution about 89 percent of exits were consolidations, in which a firm's entire in-force block passed to another carrier through reinsurance, merger, or acquisition, against 9 percent through outright failure and 2 percent through voluntary retirement. Consolidation dominates in every size tercile: outright failure is rare for small and large firms alike, so exit is not the selective collapse of the small but a reallocation of going concerns throughout the industry.[6]

4.2 Top firms

(Figure IV about here)

The stability documented so far is a stability of shares, and it leaves open whether the same firms held them from year to year. A constant top share is compatible with churning membership: the leaders could be replaced one for one while their combined share held steady. Figure IV tracks the identities behind the shares. Panel A follows the insurers in the top premium decile, top quartile, and top half of a given year and plots the share of each group that remain in it as the horizon lengthens to 20 years. Membership was highly persistent, the more so the higher the rank: about 94 percent of top-decile insurers remain in the top decile ten years later, and retention holds near that level at a twenty-year horizon, while the top quartile and top half retain about 85 and 76 percent at twenty years. Panel B weights by premium and plots, for each year, the share of top-

[6]Reinsurance operated as the era's resolution technology. A firm in decline, typically a small single-state office whose book had ceased to grow, ceded its entire block of in-force policies to a larger insurer, which assumed the reserve obligations and the future premiums and compensated the ceding firm for the transfer. The ceding firm's policyholders became the acquirer's policyholders, their coverage uninterrupted, and the ceding firm stopped writing new business. Distress was resolved through the market, transferring a failing intermediary's liabilities to a solvent one before those liabilities could be impaired.

decile premium collected by firms that were already in the top decile a decade earlier. This share settles above 0.9 from the late 1910s and holds there through 1940, after a more volatile early period in which it fell to about two-thirds in the mid-1900s.[7] The ten largest insurers by national premium in 1890 and in 1940 share most of their entries: Mutual Life, Equitable, New York Life, Metropolitan, Prudential, John Hancock, Northwestern Mutual, Aetna, and Penn Mutual appear at or near the top of both lists. The identity of the leading intermediaries changed little across a period that included the Armstrong investigation, the First World War, the influenza pandemic, and the Great Depression. Dominance in this industry was the persistence of particular firms, not the persistence of merely the share.

5 Empirical Framework

Section 4 established that a small number of large and geographically extensive insurers retained a stable share of the national market across five decades. Comparing those firms with the concentrated insurers is a natural way to estimate the impact of diversification, but geographic breadth is not a characteristic an insurer possesses independently of its business. It is a description of how that business is distributed across markets, and every financial outcome a firm reports is an aggregate of the markets in which it writes. For example, when a broad insurer reports a different loss ratio from a narrow one, the difference may arise because the two hold different portfolios of markets, or because they conduct business differently in whatever markets they hold. The first is a portfolio effect operating through the weights a firm places on its markets. The second is a property of the firm itself and would separate the two insurers even if their footprints were identical. For firm i writing in state s in year t, the following decomposition holds:

$$lr_{ist} = \underbrace{\phi_{it}}_{\substack{\text{firm's underwriting} \\ \text{level}}} + \underbrace{\delta(\tau_{ist}, d_{is})}_{\substack{\text{market's position} \\ \text{within the firm's book}}} + \varepsilon_{ist}, \tag{5.1}$$

where ϕ_{it} is common to every market the firm writes in that year and captures how well it selects and prices risk in general, and δ describes how a particular market differs from the rest of that firm's book as a function of its tenure τ_{ist} and its distance d_{is} from headquarters. A firm's aggregate outcome (in this case, the loss ratio) year t, is the premium-weighted average of its markets, $LR_{it} = \sum_s w_{ist}\, lr_{ist}$

[7] In the Online Appendix Table A1, I document that the rank correlation of national premium is 0.92 at a five-year horizon, 0.86 at ten years, and 0.80 at twenty, so a firm's position in the national ordering was highly predictable two decades forward. The ten-year size-quintile transition matrix shows the same stability at the top: eighty-eight percent of top-quintile firm-years remain in the top quintile ten years later and about six percent exit, against a fifty percent exit rate from the bottom quintile.

with w_{ist} the share of the firm's premium collected in state s, so that

$$LR_{it} \;=\; \underbrace{\phi_{it}}_{\text{level}} \;+\; \underbrace{\sum_{s} w_{ist}\,\delta(\tau_{ist}, d_{is})}_{\text{composition}}. \tag{5.2}$$

Diversification enters equation (5.2) through both terms. Composition moves with breadth mechanically, since breadth is itself a function of the weight vector w_{ist}: an insurer cannot become broader without shifting weight away from the markets it was founded in and toward those it entered. If entered markets differ systematically from founding markets, the aggregate therefore changes with breadth even when ϕ_{it} is held fixed, and without any change in how the insurer conducts its business. Through the level, breadth may covary with the quality of a firm's underwriting across its entire book, in which case it alters the aggregate without any change in the composition of that book. A regression of aggregate firm-by-year outcomes on breadth identifies their sum.

Whether breadth and ϕ in fact covary, and with what sign, is the empirical question, and economic theory supplies conflicting predictions. Under what the insurance literature terms the conglomeration view (Liebenberg and Sommer, 2008), breadth raises ϕ: an insurer writing in many states observes a larger and less correlated sample of mortality outcomes, and so classifies applicants and prices risk with greater accuracy than one confined to a few markets, in the spirit of the cost-efficiencies of diversified intermediation emphasized by Diamond (1984) and Boyd and Prescott (1986). Under the focus view, breadth lowers ϕ, because underwriting is administered centrally but executed locally. An insurer operating in thirty states allocates less managerial attention to each than one operating in three, so that expansion strains the firm's span of control; if screening further depends on information that is costly to acquire and imperfectly transferable, an insurer maintaining such information across many markets possesses less of it in each. This is the mechanism Winton (1999) identifies for lenders, where complexity dilutes monitoring capacity, and the one Goetz et al. (2016) test on bank loan quality. Under this view underwriting quality is a local asset and expansion dilutes it, which gives the two hypotheses opposite signs on the same coefficient.[8]

Identification of the two terms therefore requires estimating equations in which one of them is absorbed by construction. A design with firm-by-year fixed effects with firm-state-year data

[8] A third possibility bears on interpretation rather than sign. Agency-based accounts of corporate expansion hold that managers expand to capture the private benefits of running a larger organization even when expansion degrades the quality of what the firm produces (Jensen, 1986; Berger and Ofek, 1995). Under that account a negative covariance between breadth and ϕ is not a technological constraint on how widely underwriting quality can be spread but a symptom of weak managerial discipline, and the two are difficult to separate on outcomes alone. Section 7.6 returns to it.

absorbs ϕ_{it} in full, so the remaining variation is across the markets a single insurer holds in a given year. Such a specification orders a firm's own markets relative to one another and is uninformative about how that firm compares with others writing the same business. A design with state-by-year fixed effects absorbs all determinants common to a market in a year, so the remaining variation is across the insurers writing there and the estimand is the covariance of ϕ_{it} with breadth. In a typical setting with only firm-by-year data, a firm-year specification with region-by-year fixed effects absorbs neither term and recovers their sum. Separating the terms requires observing an insurer market by market.

5.1 A Numerical Illustration

Consider two insurers of the same size writing in Ohio in 1910, both of which entered the state 5 years earlier. The narrow firm is chartered in Indiana and operates in 3 states; the broad firm is chartered in Connecticut and operates in 12. Let the outcome of interest be the loss ratio, claims paid over premiums collected, so a higher value means the insurer pays out more for every dollar of coverage it sells.

The firms differ in two ways. Suppose the broad firm's ϕ is 0.10 *lower* than the narrow firm's, since an insurer observing mortality across 12 states can classify applicants and set rates more accurately than one confined to 3: the broad firm has a true selection advantage driven by diversification. This knowledge is statistical and travels with the firm, so it improves every market it holds. However, since Ohio lies near Indianapolis and far from Hartford, d_{is} differs and the common mapping $\delta(\cdot, \cdot)$ returns a different value for each. Far away from headquarters a firm cannot inspect applicants, relies on agents it supervises loosely and on physicians whose standards it does not know, and accepts *relatively* worse risks as a result. Let an entered market carry the same loss ratio as the firm's founding markets when it is written from nearby and sit 0.20 above when written from a distance.

	Narrow firm (Indiana, 3 states)	Broad firm (Connecticut, 12 states)
Underwriting level ϕ	0.30	0.20
Loss ratio in founding markets	0.30	0.20
Ohio		
distance from headquarters	near	far
years since entry	5	5
market position δ_{ist}	0	+0.20
Aggregate book		
weight on entered markets	0.50	0.50
composition term	0	+0.10
aggregate loss ratio LR	0.30	0.30

The broad firm is the better underwriter by 0.10 and holds the worse portfolio by 0.10, so the two exactly offset and both insurers post an aggregate loss ratio of 0.30. A firm-year regression of the loss ratio on breadth would therefore yield a coefficient of zero and support the inference that geographic diversification is irrelevant, when in fact breadth operates through two channels of equal magnitude and opposing sign.

6 The Formation of the Diversified Intermediary

I begin the analysis by investigating how the weights w_{ist} that determine a firm's aggregate, and the breadth computed from them, are themselves outcomes of a process. An insurer begins in the state (or a small cluster of neighboring states) where it is chartered and adds groups of markets at a time, so the distribution of its premium at any moment is the accumulated record of the entries it has made and of those that have taken hold. The large and geographically extensive insurers of Section 4 each began small and concentrated, and this section documents how they acquired their reach.

Four facts organize what follows: (1) a firm's premium migrates from its founding markets to its entered ones as it ages, so the weights shift toward markets it did not begin with; (2) an entered position opens small and grows as it seasons, and positions opened far from headquarters remain smaller; (3) the entries that succeed are a minority that cannot be identified in advance, so diversification accumulates as the residue of a portfolio of options; and (4) because a firm's scale is

assembled out of the entries that take hold, breadth precedes size in a firm's development.

(Table III about here)

I first establish the importance of new market entry to a firm's growth. Table III decomposes a firm's premium, at successive firm ages, into the states it was founded with and the states it entered afterward, the latter grouped by how many years after founding it entered them. Shares are premium-weighted, so each column gives the composition of every premium dollar written by firms of that age.[9] The founding book gives way to the entered one as a firm ages. Founding states account for 68 percent of premium at firm age 5, 57 percent at 10, 49 percent at 15, and 41 percent at 20, while post-founding entries expand from 32 to 59 percent. By age 20 a firm collects 3 of every 5 premium dollars in markets it entered after founding. The ordering of vintages is monotone in entry age, so that the earlier a market was entered, the larger its share, and the first cohort of entries nearly matches the founding book while the most recent contributes almost nothing.

(Figure V about here)

This ordering follows from the timing of maturation, which Figure V traces directly. Each panel plots the coefficients from a regression, estimated over the firm-state-year panel, of log premium on a set of indicator variables, one for each bin, with indicators for the other argument included as controls and one bin omitted as the reference. Panel A uses two-year bands of tenure, the number of years since entry, with the 0-to-1-year bin as the base and both firm-state and firm-by-year fixed effects, so that each market's average size is removed and the profile follows a single market ageing relative to the rest of the firm's book rather than a cohort effect. Panel B uses bands of distance from headquarters, with the nearest band as the base and firm-by-year fixed effects alone, since distance does not vary within a firm-state and cannot be identified once firm-state effects are absorbed. Standard errors are clustered by firm and the bars are 95 percent confidence intervals.

A position opens small and grows. Conditional on the market surviving in the firm's book, premium reaches nearly three times its opening level within 5 years and roughly four times within a decade, which is why an entry contributes almost nothing in the year it is made and a great deal two decades later. Scale also falls steeply with distance. A market beyond 2,000 kilometers carries roughly a third the premium of one within 250, and the decline is present at every band, so the

[9] Founding is measured after removing each firm's pre-existing book, as described in Section 3.3: for firms already operating when the panel opens the 1888 book is left-censored and is set aside, and founding is reset to the firm's first observed market thereafter.

positions a firm opens at the edge of its reach remain minor components of its book even as they age. Both profiles are estimated only from markets the firm continues to write, since a firm-state leaves the panel when the firm exits the state, so they describe entries that take hold and overstate the path of the average entry. The full distribution of outcomes, including the abandoned states, is the subject of Figure VI.

(Figure VI about here)

The distribution of entry outcomes has the shape of a call option. Figure VI follows each entry for ten years, restricting attention to entries whose firm is still writing at the end of the window so that a market's fate is not confounded with the firm's. An entry the firm has stopped writing within ten years is assigned a payoff of zero. For the rest, the payoff is the market's premium ten years after entry, averaged over years nine through eleven to smooth annual variation, divided by its premium in the year of entry, and then divided again by the firm's own premium multiple over the same window. Normalizing by the firm's growth purges the secular expansion of the industry and of the firm itself, so that 1 denotes a market that kept pace with the rest of the book and a value below 1 a market that grew more slowly.

Entries rarely kept pace. About a fifth were abandoned within the decade and a further 13 percent grew more slowly than the rest of the firm, while the interval that merely kept pace, one to two times the firm's multiple, is the thinnest part of the distribution at 11 percent. The rest sits in the right tail: 20 percent grew two to five times as fast, 13 percent five to ten times, and 23 percent more than ten times. The value of an entry lay in the small chance of a market that would outgrow the firm many times over rather than in the performance of a typical one.

The gains concentrate in a few markets that cannot be distinguished at entry. Panel B plots the cumulative share of a cohort's 10-year premium against entries ranked from best to worst. The curve is sharply convex, and the best 10 percent of entries account for about 50 percent of the premium the cohort's entries produce. Because every entry begins small and favorably selected alike, the winners are not identifiable when the position is opened.

(Table IV about here)

If a firm's scale is assembled in this way, from entered markets that only later grow, then a firm's current breadth should forecast its future size, while its size should carry no matching information about its future breadth. Table IV tests this ordering. I regress each variable's value

h years ahead on the current values of both breadth and size, at horizons of 5 and 10 years, with region-by-year fixed effects, which absorb region-specific shocks and trends, and cluster standard errors by firm. Including each variable's own current value absorbs its persistence, so the coefficient on the other measures its predictive content beyond that persistence. Breadth predicts future size, and a firm broader today is larger 5 and 10 years on, by about 0.10 and 0.12 standard deviations, holding its current size fixed. Size does not predict future breadth, and the reverse coefficients are near 0.03 and indistinguishable from zero.

Broad firms become large; large firms do not become broad. The benefit of expansion is therefore directly observable: entry into new markets was the mechanism by which an insurer attained scale, and scale distinguishes the firms that survived. Its cost is not. Because an insurer reports a single set of accounts for a book assembled from many markets, a cost borne in each of those markets may be offset in the aggregate by the composition of the book that expansion itself produced. The following section returns to equation (5.2) and estimates its two terms in turn.

7 Breadth, pricing, and claims

This section estimates the cost of expansion, and I find that it is paid on two margins. Broad insurers charge less for the coverage they write and pay more in claims for every dollar of it, so that their loss ratios exceed those of concentrated insurers of the same size. The two costs are recovered from different terms of equation (5.2). I find the pricing cost to be chiefly compositional, since an insurer earns less in markets distant from its headquarters and a broad insurer holds more of them, a pattern consistent with pricing power being a local asset that does not extend with geographic reach. The claims cost is a level effect, and larger than a comparison of firms reveals, since it is undiminished when broad and narrow insurers are compared within the same market. I find no offsetting stabilizing benefit: the volatility and survival advantages commonly attributed to diversification are the return to the scale that expansion produces rather than a separate effect of breadth.

7.1 Comparing firms in the aggregate

I begin with a comparison across firms of differing reach, which recovers the sum of the two terms in equation (5.2). I regress firm-year outcomes on standardized breadth, with region-by-year fixed effects, first unconditionally and then conditional on a cubic in size, and Table V reports the coefficients. Panel A decomposes the logarithm of the loss ratio into the price (denominator) and

the claims (numerator) it pays. Panel B reports the loss-ratio volatility and survival outcomes.

(Table V about here)

A standard deviation of breadth raises the log loss ratio by 0.169 unconditionally and by 0.138 once size is held fixed, or about 4 points against a mean loss ratio of 0.297. Because the loss ratio is claims per dollar of coverage divided by premium per dollar of coverage, its logarithm is the difference between the two, so this coefficient decomposes exactly into the pricing and claims coefficients reported alongside it. Breadth lowers premium yield by 5.0 percent per standard deviation once size is held fixed, roughly 1.60 against a mean yield of 31.46. Unconditionally the effect is 0.001 and indistinguishable from zero, because size raises yield by 9.3 percent per standard deviation and breadth co-moves with size. The pricing cost of reach is therefore invisible in a raw cross-section and appears only among firms of comparable scale, where reach and scale pull the price of coverage in opposite directions. Broader firms charge less for the coverage they write. Breadth also raises claims by 8.8 percent per standard deviation conditional on size. The two combine to the 0.138 on the loss ratio, so claims account for roughly two thirds of the effect and pricing for one third. The third column conditions in addition on the maturity of a firm's book, namely firm age, the premium-weighted mean tenure of the markets in which it collects, and an indicator for firms already writing in the first sample year, whose age is left-censored. Neither channel is a book-age artifact. Both coefficients grow slightly in magnitude, to 0.095 on claims and -0.056 on yield, which combine to 0.151, and the split between them is unchanged at roughly 63 percent claims and 37 percent pricing.

Panel B applies the same design to the outcomes through which pooling, were it to operate, would appear. The survival regressions repeat those of Table II on this section's estimation sample, which is slightly smaller, so the conditional coefficients differ marginally from the ones reported there. If geographic diversification reduces risk by pooling, the benefit should register in a firm's loss-ratio volatility, which pooling steadies by averaging shocks that strike its markets independently, and in its survival, which a steadier book protects by keeping any single market's losses small relative to the whole. Unconditionally, breadth appears stabilizing. It lowers 5-year loss-ratio volatility by 0.022 against a mean of 0.080 and raises 10-year survival by 7.8 percentage points against a mean of 0.776.[10] Conditional on size, both effects vanish. The volatility coefficient falls to zero and the survival coefficient to 0.001, neither distinguishable from zero, while the size term carries the full

[10] In supplementary results, geographic *balance* (how equally weighted each state is in the firm's book), a size-orthogonal diversification measure, has a small stabilizing effect on the loss-ratio volatility of the smallest firms. That effect is second-order and does not bear on the cost of reach documented here.

effect, lowering volatility by 0.036 and raising survival by 15.6 percentage points. The same column shows that this is not an age effect either, since conditional on size and book maturity breadth's effect on volatility is zero and on survival 0.004, neither distinguishable from zero. The volatility and survival advantages that a cross-section attributes to geographic diversification are, once the scale that comes with breadth is held fixed, absent. They are the return to being large.

7.2 Comparing a firm's own markets

The estimates so far combine the two terms of equation (5.2) and cannot say whether a broad insurer's higher loss ratio comes from which markets it holds or from how it performs within them. I separate them by holding one fixed at a time, beginning with a comparison of the markets a single insurer holds in a given year. I estimate δ in Figure VII and Table VI. The figure traces its two arguments nonparametrically; the table summarizes them linearly and extends the exercise to the price a firm charges, to the two margins on which a loss ratio can move, and to whether these gradients survive into the firm's aggregate book.

(Figure VII about here)

Each panel of Figure VII plots the coefficients from a regression estimated over the firm-state-year panel of the loss ratio on a set of indicator variables, one for each bin of the argument being traced, with indicators for the other argument included as controls. All absorb firm-by-year fixed effects and cluster standard errors by firm, and the bars are 95 percent confidence intervals.

An entry opens favorably. Panel A measures the loss ratio against the firm's founding states, the omitted category, so that markets at a given tenure are compared with the firm's founding markets in the same year. In its first 2 years a newly entered market runs a loss ratio about 10 percentage points below the firm's founding markets. This gap reflects selection on two margins, since the firm enters only markets it expects to be profitable, and within them it underwrites only the best risks it is offered. As the market ages its loss ratio seasons upward toward the founding level, closing about 60 percent of the gap within 5 years and reaching 2 points below it after a decade.

Distance operates differently. Panel B restricts to entered markets and plots the profile across distance bands, holding tenure fixed, with the nearest band as the base. Among entered markets of the same age, claims experience is statistically indistinguishable across the first four bands, and only the most distant markets run lower, by about 2 points and imprecisely estimated. Set against

Figure V, where distance sharply reduces a position's scale, this indicates that reach governs how large a position a firm takes rather than how well the business it writes there performs, which is what a small foothold opened at the edge of a firm's reach would produce.

(Table VI about here)

Table VI imposes a linear form and adds the price margin. Over the firm-state-year panel I estimate

$$y_{ist} \;=\; \beta \ln d_{is} \;+\; \gamma\, \tau_{ist} \;+\; \alpha_{it} \;+\; \varepsilon_{ist}, \tag{7.1}$$

where y_{ist} is the market's loss ratio, its premium yield, or one of the two margins of the loss ratio, the probability of observing no claims and the value of claims conditional on at least one claim; d_{is} is the great-circle distance in kilometers from firm i's headquarters city to the centroid of state s; τ_{ist} is the number of years since the firm entered the state; and α_{it} are firm-by-year fixed effects, which absorb ϕ_{it} together with the firm's size, age, and any conditions common to its book in that year. Standard errors are clustered by firm. Unlike Figure VII, the sample here includes founding as well as entered markets. Panel B replaces $\ln d_{is}$ with m_{ist}, the firm's premium in the state divided by all firms' premium collected there that year, and then includes both alongside their interaction.

Premium yield falls with distance from a firm's headquarters, by 0.74 per log-kilometer against a mean yield of 30.29, so a market ten times farther from home earns about 1.70 less per \$1,000 of coverage. The decline survives a control for how long the firm has operated in the state, falling only to 0.54, and state tenure itself is indistinguishable from zero in the yield regression (Panel A, column 6). The pricing penalty is a feature of reach rather than of a young book. The loss ratio moves the other way. A firm's more distant markets run loss ratios 0.037 lower per log-kilometer against a mean of 0.289, though here the tenure control does absorb half the gradient, leaving 0.018. Columns 3 and 4 separate the two margins on which a loss ratio can move. The probability that a market records no claims at all rises by 8.3 percentage points per log-kilometer against a base rate of 17.7 percent, while the loss ratio among markets that do pay claims falls by only 0.012. Because the loss ratio is the product of the frequency with which claims arrive and their size when they do, the two margins combine to $0.352\times(-0.083)+0.823\times(-0.012) = -0.039$, against a total effect of -0.037. Roughly three quarters of the difference in distant markets operates through whether claims arrive rather than how large they are. Read alongside Panel B of Figure VII, which finds no distance gradient among entries of comparable age, this suggests the loss-ratio gradient rests largely on the contrast between founding and entered markets rather than on distance among

entries, and the tenure control that halves it is consistent with that interpretation.

Panel B locates the other side of the price gradient. Yield rises with a firm's within-state premium share, by 17.6 per unit of share, and the estimate is unchanged at 17.2 when distance is included alongside it. Since the standard deviation of a firm's within-state share is about 0.04, a one-standard-deviation gain in local position raises yield by roughly 0.69, almost exactly what a log-kilometer of distance takes away. The loss ratio again moves favorably, falling by 0.30 per unit of share. The interaction of distance and share is negative but imprecise, so the distance penalty cannot be shown to differ between a locally dominant firm and a marginal entrant. Proximity and local scale enter additively, and pricing power is concentrated at the core of a firm's footprint and weakens toward its edge on both dimensions at once.

Panel C asks how much of this composition term survives into the firm's aggregate book. Weighting each market by its contribution to the firm's totals attenuates the loss-ratio and claims gradients by roughly 60 percent, from 12.8 to 4.5 percent of the mean and from 15.4 to 6.2 percent, while attenuating the yield gradient by only a quarter, from 2.4 to 1.8 percent. The favorable claims experience of distant markets is therefore concentrated in positions too small to move the firm's book, as both the extensive margin and the distance profile of Figure V imply, whereas the pricing penalty holds in markets of every size. Composition therefore accounts for the pricing cost but works against the claims cost, pushing a broad firm's loss ratio down rather than up. The aggregate moves in the opposite direction, so the level term must carry it.

7.3 Comparing firms within a market

Composition alone cannot produce the aggregate gradient of Table V, since it pushes a broad firm's loss ratio down rather than up. By equation (5.2) the level term must therefore be positive and larger. Table VII estimates ϕ_{it}, the firm-level term of equation (5.2). I retain the firm-state-year panel and replace the firm-by-year fixed effects of equation (7.1) with state-by-year fixed effects,

$$y_{ist} \;=\; \theta\,\text{Breadth}_{it} \;+\; f(\text{Size}_{it}) \;+\; \lambda\, m_{ist} \;+\; \gamma\,\tau_{ist} \;+\; \alpha_{st} \;+\; \varepsilon_{ist}, \tag{7.2}$$

where Breadth_{it} is the standardized log effective number of states and Size_{it} the standardized log firm premium, both measured at the firm-year level and therefore constant across the markets a firm holds; $f(\cdot)$ is a cubic; m_{ist} and τ_{ist} are the firm's within-state share and its tenure in the state, as in equation (7.1); and α_{st} are state-by-year fixed effects, which absorb demand, mortality, regulation,

and competitive conditions common to a market in a year. Standard errors are clustered by firm. Because α_{st} removes everything common to a market in a year, θ is identified by comparing insurers of the same size writing in the same state at the same time, and measures how a firm's underwriting level covaries with its reach.

(Table VII about here)

Table VII reports the estimates in two panels. Panel A weights each market equally. Panel B weights each regression by firm premium in each market. Panel A reports that the broader firm fares worse on every margin: it posts a loss ratio 0.033 higher against a mean of 0.285, pays 0.776 more in claims per $1,000 of coverage against a mean of 8.56, and earns 0.674 less in premium against a mean of 30.27, or 11.6, 9.1, and 2.2 percent respectively. Panel B reports substantially larger effects on the first two margins. Weighting each market by its contribution to the firm's book raises the loss-ratio coefficient to 0.069 and the claims coefficient to 1.592, or 21.0 and 15.1 percent of their weighted means, while the yield coefficient falls to −0.621 and is no longer distinguishable from zero.

Level term (% per s.d. of breadth)	Each market equally	Weighted to the book
Loss ratio	+11.6	+21.0
Claims per $1,000	+9.1	+15.1
Premium yield	−2.2	−1.9

The contrast between the two panels is itself informative. Weighting each market by its contribution to the firm's book raises the estimated penalty, so a broad insurer's disadvantage is larger in the markets that carry most of its premium than in the average market it holds, and is therefore not confined to the marginal positions at the edge of its footprint. This is what a constraint on managerial attention binding across the whole of a firm's book would produce, and it is difficult to reconcile with an account in which broad insurers differ from concentrated ones only in the marginal territory they take on.

Each panel also reports the coefficients on the two market characteristics that vary across insurers writing in the same state, and they act on opposite margins of a firm's position. State tenure raises claims by 0.128 per $1,000 each year, about 1.5 percent of the mean, and leaves yield unaffected, so a market's book seasons on the claims side alone, at a rate consistent with the 0.003

per year estimated in Table VI on entirely different variation. Local share raises yield by 15.5 per unit and has no effect on claims, so local scale is a pricing asset rather than an underwriting one. Including both leaves 91 percent of the loss-ratio and claims coefficients intact.

Comparing insurers within the same market therefore isolates a firm-level difference that travels with breadth into every market an insurer holds. Taken with the maturity controls, that difference is not accounted for by firm size, firm age, the maturity of a firm's book, the identity of the markets it holds, its scale within those markets, or how long it has held them.

These patterns favor the focus hypothesis of Section 5 over the conglomeration hypothesis and locate the difference in the monitoring channel. Underwriting quality, like pricing power, behaves as a local asset: an insurer supervising agents and screening applicants across many states selects worse risks in each of them than a concentrated firm of the same size, which is what a binding constraint on the span of control would produce (Winton, 1999). Goetz et al. (2016) conduct the analogous test on bank loan quality and find no improvement from geographic expansion even though expansion lowers overall risk; the estimates here go further, since the insurer's claims experience deteriorates rather than merely failing to improve.

7.4 Summary

Equation (5.2) decomposes a firm's aggregate into a level and a composition term, and the three designs now supply estimates of each. Table V gives the sum and Table VII gives the level, taken from Panel B because the aggregate is a premium-weighted object and the weighted estimates are the ones that reproduce it. Composition is obtained as the difference. Table VI estimates δ itself, but in the units of its own arguments (per log-kilometer of distance and per year of tenure) and converting those gradients into a response to breadth would require knowing how a firm's distribution of markets over distance and tenure shifts as its reach widens, which the paper does not estimate. The residual requires no such mapping.

	Aggregate (Table V)	Level (Table VII)	Composition (difference)
Loss ratio	+13.8	+21.0	−7.2
Claims per $1,000	+8.8	+15.1	−6.3
Premium yield	−5.0	−1.9	−3.1

All entries are percentage changes per standard deviation of breadth. The composition term is

negative on every margin, which is what Section 7.2 found directly, since a broad firm holds more of the distant and recently entered markets that carry lower claims and lower prices than its core. Composition therefore improves a broad firm's claims experience and worsens its pricing, and on the loss ratio the two work against each other with the claims effect prevailing. The two costs of expansion sit in different terms. The pricing cost is chiefly composition, since -3.1 of the -5.0 arises from where a broad firm writes rather than from how it prices within any market, and the level component of -1.9 is not distinguishable from zero. The claims cost is a level effect and is larger than the aggregate reveals. A broad insurer pays 15.1 percent more per dollar of coverage in the markets that make up its book, against an aggregate gradient of 8.8 percent, so the composition of its markets conceals roughly two fifths of the gap. The same holds for the loss ratio, where a level of 21.0 percent is reduced to 13.8 percent by a composition term of -7.2.

An observer regressing a firm-level outcome on breadth would conclude that broad insurers are somewhat worse underwriters. They are worse by more than that comparison reports, and the composition of their books offsets part of what would otherwise appear. Breadth is costly, and its cost is paid on two margins of unequal size and unequal origin, one arising from the geography of a firm's book and the other from the firm itself. It is not compensated by a stabilizing benefit, since the volatility and survival advantages that accompany breadth belong to the scale that expansion produces rather than to breadth itself.

7.5 Robustness: Alternative Explanations

The estimates face different alternatives depending on which term of equation (5.2) they recover, and Table VIII addresses them in three panels. Panels A and B re-estimate the aggregate regressions of Table V across a ladder of fixed effects, on a regulatory subsample with balance-sheet controls, and across product lines. Panel C returns to the within-market design of Table VII and subjects the level term to three further specifications.

(Table VIII about here)

The first alternative is that the yield decline reflects fixed differences across firms or regions rather than reach itself, if broad firms operate where yields are structurally low or price below the market across all of their business. Region-by-year and then firm fixed effects address each in turn. Under firm fixed effects the cost is identified from within-firm variation in breadth over time, so it cannot be an artifact of time-invariant differences across firms, and the yield dilution is considerably

larger, at −6.78 against −1.97.

The second alternative is that a broad firm earns a lower yield because it holds different assets or carries a different solvency margin, so the gap would reflect balance-sheet composition rather than the price of coverage. On the New York regulatory sample, whose annual statements report the mortgage, real-estate, bond, and policy-loan shares of assets and the ratio of surplus to liabilities, I control for this composition directly, and the yield dilution is stable.

The third alternative is that breadth co-moves with product mix, since broad firms may write proportionally more industrial or group business, which is priced on a different basis than individually underwritten ordinary policies. Estimating ordinary, industrial, and group business separately, and pooling them with product-mix controls, isolates the effect within a line, and the yield dilution holds. The loss-ratio cost, by contrast, is specific to ordinary business, positive and significant on the ordinary and pooled samples and under firm fixed effects but absent for industrial and group business. This pattern is consistent with the pricing-power mechanism, since ordinary coverage is individually underwritten and locally priced, so its loss ratio reflects the premium a firm can command in a market, whereas industrial and group business follow different claims dynamics.

Panel C turns to the level term. Column 2 adds log distance, which varies across insurers writing in the same market because their headquarters differ and which state-by-year fixed effects therefore do not absorb. Since distant markets carry lower claims, omitting it biases the breadth coefficient toward zero, and including it raises the claims coefficient from 0.772 to 0.945 and the loss-ratio coefficient from 0.032 to 0.038. The estimates of Table VII are in this respect conservative. Column 3 adds headquarters-region-by-year fixed effects, which absorb the regulatory regime, the conditions under which a firm recruits agents, and the actuarial practice of its domicile. The claims and loss-ratio coefficients are unaffected, at 0.789 and 0.031 and both significant at the 1 percent level. The within-market yield coefficient falls to −0.330 and is no longer distinguishable from zero once domicile is controlled for, so the pricing cost of expansion rests on the composition term of Section 7.2 rather than on a firm's position within any single market.

Column 4 tests the mechanism directly. Restricting the sample to markets a firm already holds, measuring breadth excluding the focal state, and absorbing firm-state fixed effects, the coefficient asks whether a firm's existing business deteriorates as its reach grows elsewhere. It does. A standard deviation of expansion elsewhere raises the loss ratio in a firm's incumbent markets by 0.020 and claims per $1,000 by 0.523, while leaving the premium it charges there unchanged at −0.115. Two thirds of the within-market level estimate is therefore reproduced within a single

insurer's own market over time, and it appears on the claims margin alone, which is what a dilution of underwriting capacity across a widening footprint would produce.

7.6 Robustness: Expansion and Prior Performance

The level term of equation (5.2) is identified by comparing insurers, and a comparison of insurers cannot distinguish one that underwrites worse because it expanded from one that expanded because it underwrote worse. Under the second interpretation an insurer losing ground in the markets it holds seeks premium in markets it does not, so that reach records prior deterioration rather than causing subsequent deterioration. That reading makes a claim about timing, which the level regressions do not use and which the firm-year panel can test directly.

(Table IX about here)

I estimate, over the firm-year panel,

$$\text{Entry}_{i,t+1} \;=\; \sum_{j=0}^{J} \pi_j \, LR_{i,t-j} \;+\; x_{it}'\beta \;+\; \alpha_i \;+\; \alpha_t \;+\; \varepsilon_{it}, \tag{7.3}$$

where $\text{Entry}_{i,t+1}$ equals 100 if firm i opens at least one new state in year $t+1$ and zero otherwise, LR_{it} is the firm's loss ratio, x_{it} collects firm size, age, reach, new-business intensity, premium yield, premium growth, and the firm's share of its home-state market, and α_i and α_t are firm and year effects. All regressors are standardized, so a coefficient is the change in the probability of entry next year, in percentage points, per standard deviation, against an unconditional entry rate of about 14.8 percent. Standard errors are clustered by firm. Under the hypothesis that expansion responds to a deteriorating book, $\pi_j > 0$. With firm fixed effects the question narrows to whether an insurer opens new markets following its own adverse years, which is the form of the hypothesis a comparison across firms cannot address.

Two regressors would forecast entry mechanically if built on the full book. A newly entered state generates new insurance written, and entry is persistent, so unrestricted new-business intensity would predict entry partly out of the firm's own recent entries. A newly entered state also carries almost no claims, so it depresses the firm-level loss ratio in precisely the years when further entry is likely. Both are therefore constructed on established markets alone, excluding states the firm entered within the previous two years.

Deterioration does not precede expansion, and the estimates run against it. Across insurers

a standard deviation of the loss ratio is followed by 1.26 fewer percentage points of entry, or roughly a twelfth of the entry rate, and by 0.89 fewer once new business and home-market position are held fixed. Under firm fixed effects the contemporaneous term is 0.38 with a standard error of 0.55 and is not distinguishable from zero. Adding three lags, so that an insurer responding to a run of adverse years rather than to a single one would be detected, the terms at $t-1$ and $t-2$ are -1.08 and -1.26, each significant at the 1 percent level, while the contemporaneous and third-lag terms remain indistinguishable from zero. The four terms sum to -1.30, about a tenth of the entry rate in that sample, and are jointly significant at $p = 0.002$. An insurer whose book had deteriorated over the preceding years was not more likely to enter a new state but less so, and the pattern holds within a single insurer over time.

What precedes entry is growth. New-business intensity raises the probability of entry by 2.89 percentage points per standard deviation under firm fixed effects and by 5.01 in the specification with lags, roughly a fifth to a third of the entry rate, and it is the only characteristic to survive the firm effects. Entry falls with age by 5.12 percentage points per standard deviation, about a third of the rate, and within an insurer it falls sharply with reach itself, by 10.66 points, so expansion was concentrated among young firms and slowed markedly as a footprint approached the extent it would eventually hold. Reach enters positively across insurers, at 1.67, and strongly negatively within them: broad insurers were those that had expanded, not those still expanding. Little of entry is predictable from observable conditions: they raise the adjusted R^2 by 1.4 points, from 0.052 to 0.066, while firm fixed effects add a further 7.7, so an insurer's standing propensity to expand accounts for several times as much of the explained variation as the conditions it faced.

8 The Limits of Pooling

The volatility and survival advantages associated with breadth are attributable to scale rather than to breadth itself, so a comparison across insurers identifies no stabilizing benefit conditional on size. Whether geographic spread pools risk *at all* is a property of the residual ε_{ist} of equation (5.1), on which the preceding sections condition: distributing a book across markets reduces its variance only to the extent that the ε_{ist} are independent across the states an insurer occupies. This section quantifies the departure from independence.[11]

[11] This exercise is similar to the portfolio-theoretic decomposition of variance into idiosyncratic and systematic components (Evans and Archer, 1968; Statman, 1987), applied to an intermediary's liability book rather than to a portfolio of securities, and breadth is the effective number of holdings that governs how rapidly the idiosyncratic component falls. The average pairwise correlation of 0.25 is comparable to that reported for U.S. equities (Campbell et al., 2001) and implies, under equal weights across forty markets, a systematic share of 0.91, close to the 0.94

(Figure VIII about here)

Individual state markets are volatile, and the smaller the market the more so: a state's loss-ratio volatility rises as its average premium falls, with a correlation of 0.67 (Panel A). Since the positions an insurer opens as it expands are disproportionately small, as Section 6 documents, the markets at the edge of a footprint are also its most volatile. Since a firm's aggregate loss ratio is the premium-weighted average of its state loss ratios, the extent to which breadth stabilizes the aggregate depends on the covariance structure of those loss ratios. I therefore benchmark realized loss-ratio volatility against $\left(\sum_s w_{ist}^2 v_{st}^2\right)^{1/2}$, the volatility an insurer would exhibit under $\mathrm{Cov}(\varepsilon_{ist}, \varepsilon_{is't}) = 0$ for all $s \neq s'$. This quantity is the lower bound attainable through geographic spread, and the difference between it and realized volatility measures the covariance that spreading cannot eliminate.

Panel B reports, within each breadth quartile, the firm-average realized volatility together with this benchmark. Both decline across quartiles, realized volatility from 0.21 to 0.08 and the benchmark from 0.07 to 0.02, though the decline in the level is the joint movement of breadth and scale that Section 7 decomposes and is not the object here. What the comparison isolates is the distance between the two series, which is invariant to whatever scales both. Realized volatility remains far above the benchmark throughout, exceeding it by a factor of three in the narrowest quartile and four in the broadest, with firm-clustered confidence intervals lying above the benchmark in every quartile. The implied systematic share, $1 - (\text{benchmark}/\text{realized})^2$, is 0.89 in the narrowest quartile and 0.94 in the broadest, so roughly nine tenths of an insurer's loss-ratio variance is common across its markets regardless of how many it holds, and the broadest insurers are if anything the more dominated by it.

State loss ratios covary because common shocks, including epidemics, the business cycle, and regional distress, affect many markets simultaneously. Their average pairwise correlation, computed across the states' annual loss-ratio series, is approximately 0.25. In a regression of state-year loss ratios on year fixed effects the R^2 is 17 percent, which is the share of a typical state's loss-ratio variance attributable to a common national shock in a given year; replacing the year effects with region-by-year fixed effects raises the R^2 to 25 percent, the share attributable to shocks common to a region. Geographic pooling is therefore operative but bounded. It delivers the reduction

the broadest quartile exhibits. Two features distinguish the insurer's problem from the portfolio manager's: (1) the weights are not chosen but accumulated through the entry process of Section 6, and (2) moving along the frontier is costly in the terms Section 7 estimates, so an insurer that spread its book paid for a reduction in variance that the frictionless benchmark would have delivered for free.

in idiosyncratic risk that the theory of intermediation presumes, but not the near-elimination of local shocks that a diversified intermediary is assumed to achieve, because an insurer's shocks are predominantly not local.

9 Concluding remarks

This paper examines the diversification process of a financial intermediary. The evidence is drawn from a newly digitized annual panel covering the near-universe of U.S. life insurers between 1888 and 1940, observed firm by firm and state by state, which constitutes a novel long-run record of a systemically important intermediary's geographic expansion at the level of the individual market. That resolution is what makes the exercise possible: an intermediary's diversification is a statement about how its business is distributed across markets, so neither the process by which a firm becomes diversified nor the consequences of its having done so can be recovered from data that record firm aggregates alone. Observing each insurer market by market permits the assembly of a national footprint to be traced entry by entry, and permits the components of a firm's aggregate performance to be identified separately.

The industry became progressively more competitive over this period without displacing the firms at its center. The number of insurers per state rose more than fourfold and within-state premium concentration declined by more than half, yet insurers writing in at least thirty-five states retained between 80 and 90 percent of national premiums throughout, and insurers that left the industry did so principally through absorption. The footprint sustaining that position was assembled market by market, and the assembly exhibits the structure of a portfolio of growth options: an insurer entered a state with a small and favorably selected book, approximately a fifth of entries were abandoned within a decade, and the best tenth generated roughly half of a cohort's premium.

Expansion was costly, and its two costs originate in different terms of the decomposition. The price an insurer could command was a local asset that did not extend with reach, so that a broad insurer earned less per dollar of coverage, and the greater part of that shortfall is attributable to the composition of its book rather than to its pricing within any market. The claims cost operates in the opposite direction. A broad insurer paid 15.1 percent more per dollar of coverage than a concentrated insurer of comparable size writing in the same state and year, against an aggregate gradient of 8.8 percent, so that the composition of its markets conceals approximately two fifths of the difference. An observer holding firm aggregates alone would understate the cost of reach and

would attribute to the firm what belongs to the geography of its book.

These costs were not incurred in response to adverse performance. Insurers whose books had deteriorated entered fewer new states rather than more, and within a given insurer neither a single adverse year nor a sequence of them raised the propensity to expand. Entry was instead associated with the growth of an insurer's existing business, was concentrated among young firms, and decelerated as a footprint approached its eventual extent. The timing of entry is largely unrecoverable from observable conditions, which is consistent with a decision whose return was not ascertainable at the time it was undertaken.

What expansion purchased was less than the theory of intermediation presumes. Breadth does stabilize an insurer's loss ratio, but through the scale it produces, and conditional on size the volatility and survival advantages are absent. The pooling that remains is bounded. A broad insurer's realized loss-ratio volatility declines from 0.21 to 0.08 over the range of breadth but remains approximately four times the level independence would imply, leaving roughly 90 percent of its loss-ratio variance common to its markets. The limit binds in the residual of the decomposition, the term on which the cost estimates condition: an insurer's shocks are predominantly not local, and geographic spread cannot diversify what geography does not separate.

The models that treat the diversified intermediary as their unit of analysis take its diversification as a primitive. Delegated monitoring presumes a portfolio already large enough to diversify away idiosyncratic risk (Diamond, 1984), and the theory of runnable liabilities presumes an intermediary already assembled (Diamond and Dybvig, 1983). The contemporary concern with nonbank fragility is a concern about large, diversified, runnable intermediaries. This paper accounts for how one such institution was constructed, at what cost, and with how much of the risk it was assembled to pool remaining at its conclusion.

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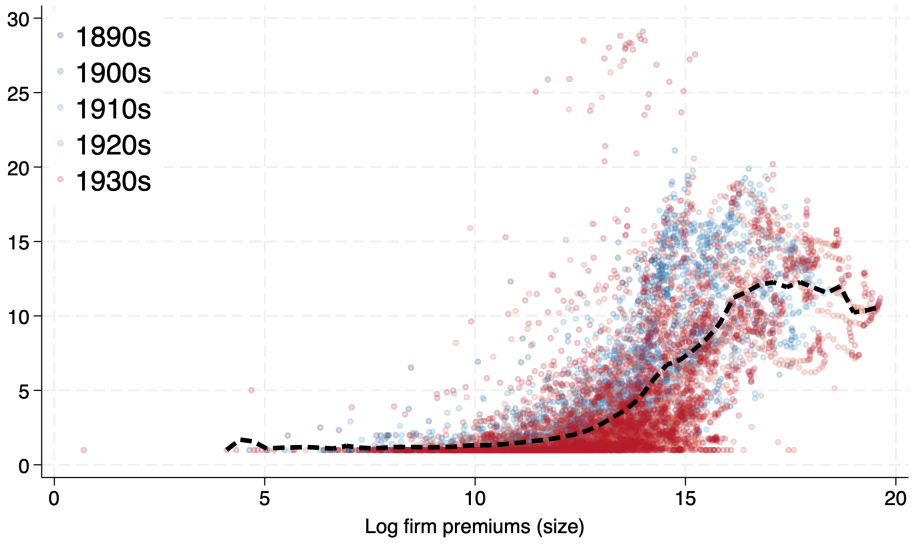
10 Figures

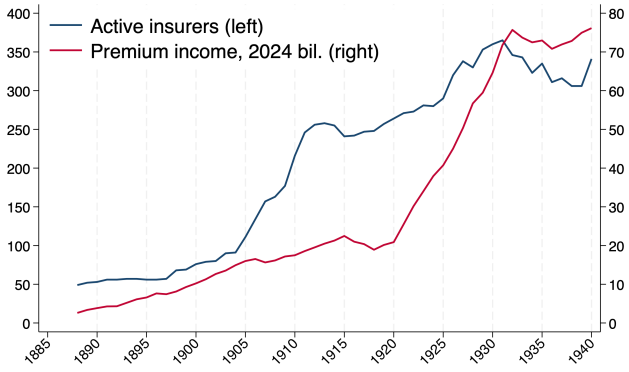
Figure I: Geographic Diversification and Firm Size



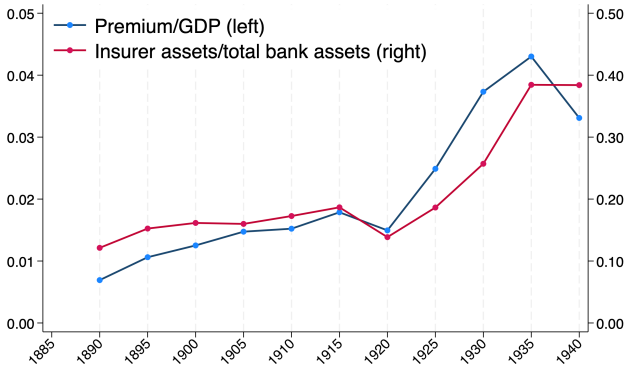
Notes. This figure plots the effective number of states $N_{\text{eff}} = 1/\sum_s w_s^2$ (the inverse Herfindahl) against log firm premium. Each firm-year is colored by decade.

Figure II: Life Insurance Industry, 1888–1940

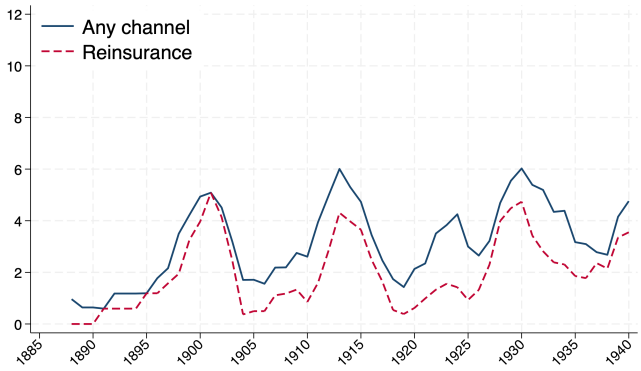
Panel A. Number of insurers and premium income



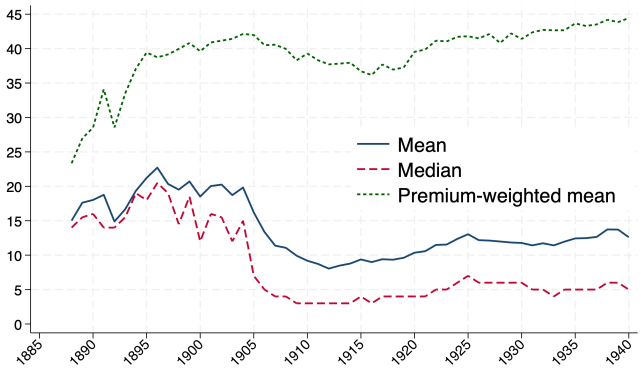
Panel B. Assets and premium shares



Panel C. Exit rates, % (three-year average)



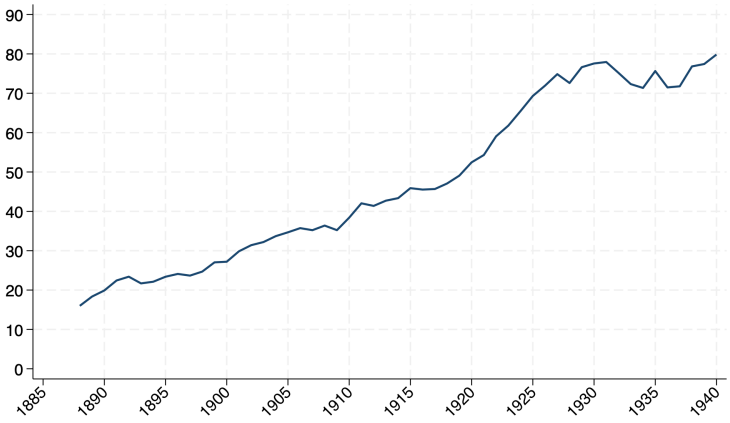
Panel D. States per company



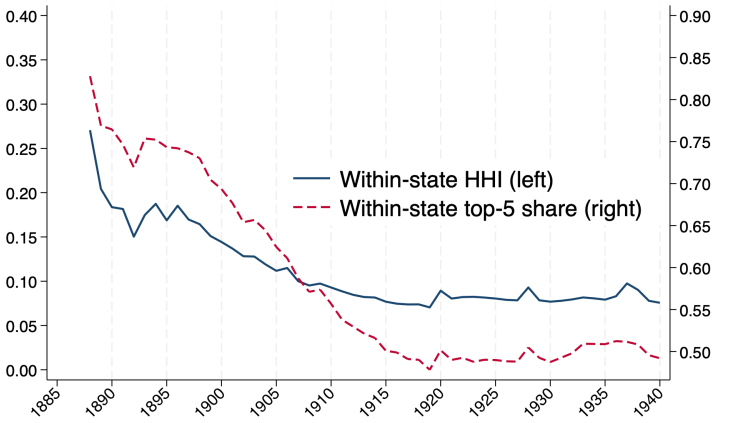
Notes. Nominal GDP and the price deflator are from MeasuringWorth (Williamson (2026); Johnston and Williamson (2026)) and commercial-bank assets from *Historical Statistics of the United States* (Carter et al., eds, 2006). Panel A plots the number of active legal-reserve life insurers (left axis) and aggregate premium income in 2024 dollars (right axis). Panel B plots premium income as a share of GDP (left axis) and life-insurer assets as a share of total commercial-bank assets (right axis). Panel C plots the annual rate at which active insurers exit, as a three-year moving average (t-1, t, t+1), through any channel and through reinsurance alone. Panel D plots the number of states in which a firm writes premium, as the cross-firm mean, the median, and the premium-weighted mean.

Figure III: Market Structure, 1888–1940

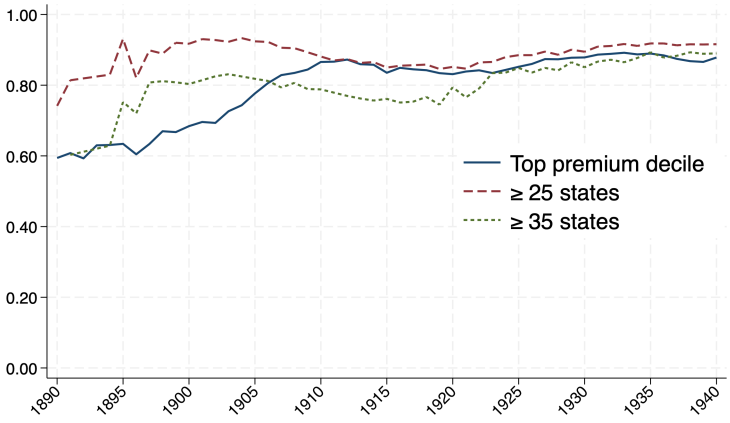
Panel A. Mean insurers per state



Panel B. Local concentration



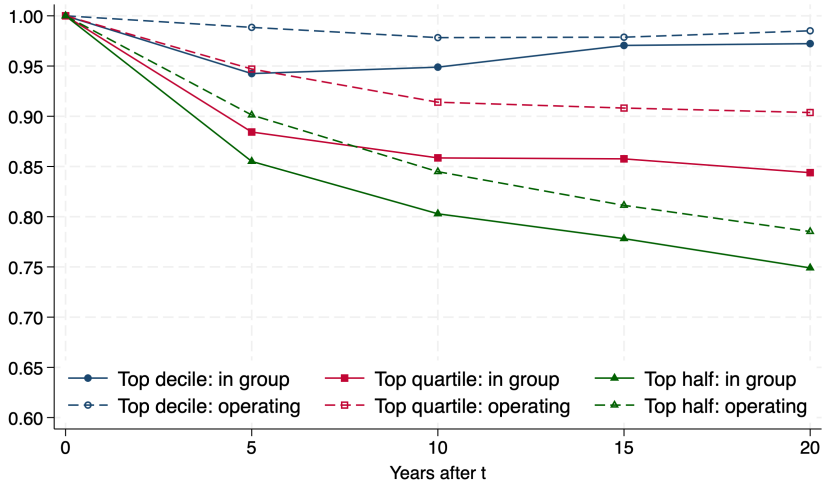
Panel C. National premium share of broad-scope insurers



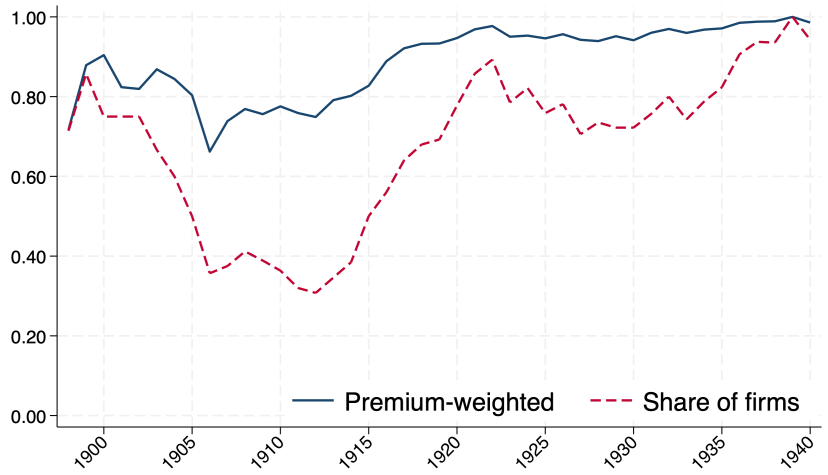
Notes. Panel A plots the average number of insurers operating in a state. Panel B plots the within-state Herfindahl index of premiums (left axis) and the premium share of the five largest firms in a state (right axis). Panel C plots the share of national premiums collected by firms operating in at least twenty-five states, in at least thirty-five states, and in the top decile of the premium distribution.

Figure IV: Persistence of Top Firms

Panel A. Retention by top-group definition

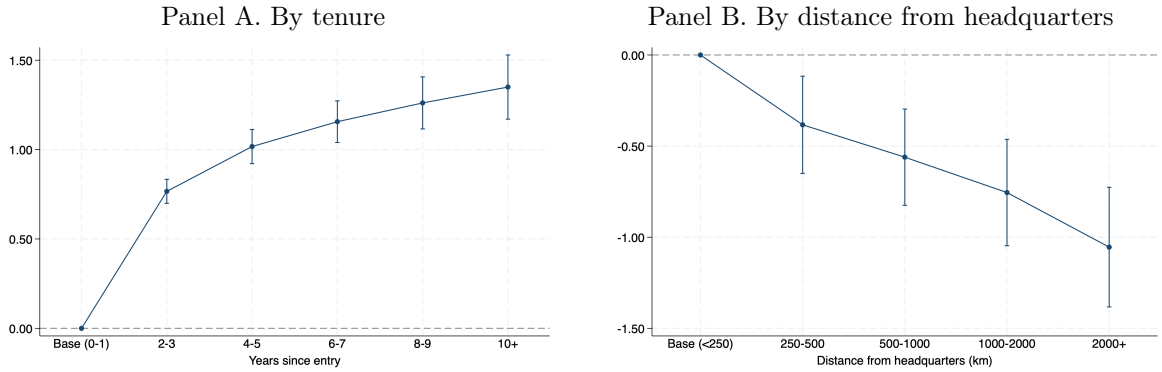


Panel B. Incumbent share



Notes. Panel A plots retention curves for firms in the top premium decile in year t: the share still in the top decile and the share still operating, as a function of the horizon h. Panel B plots the incumbent share of the top decile over time, where an incumbent is a current top-decile firm that was also in the top decile ten years earlier; the share is reported both premium-weighted and as a share of firms. Base years for Panel B are restricted to those with a full ten-year lookback.

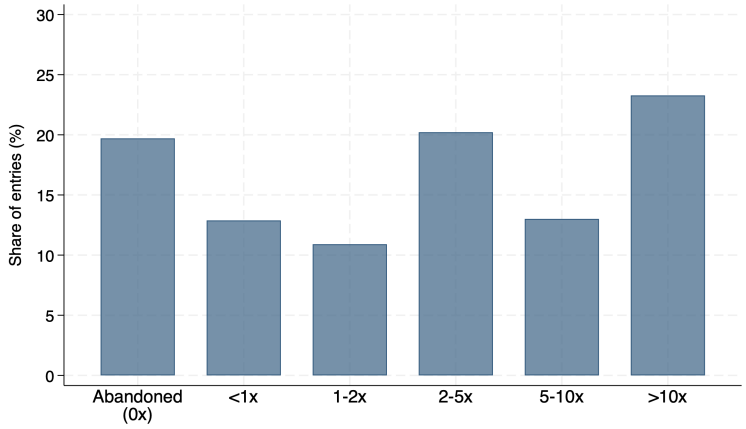
Figure V: The Scale of an Entered Market



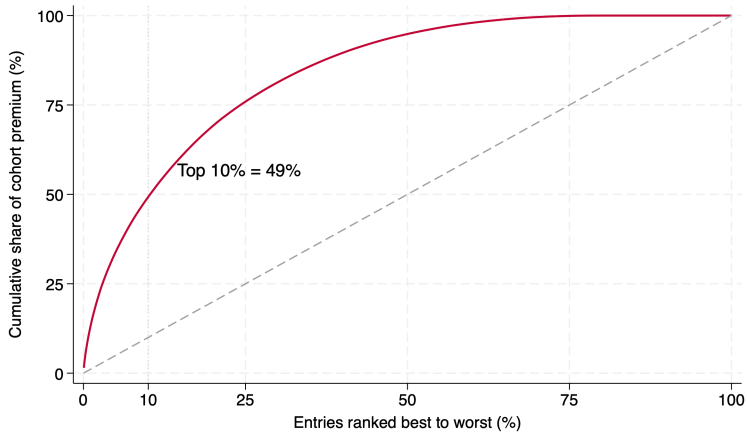
Notes. Ordinary insurance, 1888–1940. Each panel plots the coefficients from a regression of log premium on indicator variables for bins of the argument shown, with indicators for the other argument included as controls and one bin omitted as the reference. Panel A uses two-year bands of tenure with the 0–1 year bin as the base and firm-state and firm × year fixed effects, so that each market's average size is removed and the profile follows a single market ageing rather than a cohort effect. Panel B restricts to entered markets, uses distance bands with the nearest as the base, and absorbs firm × year fixed effects alone, since distance does not vary within a firm-state. Standard errors are clustered by firm and bars are 95 percent confidence intervals.

Figure VI: Market Entry Payoffs

Panel A. Outcome distribution

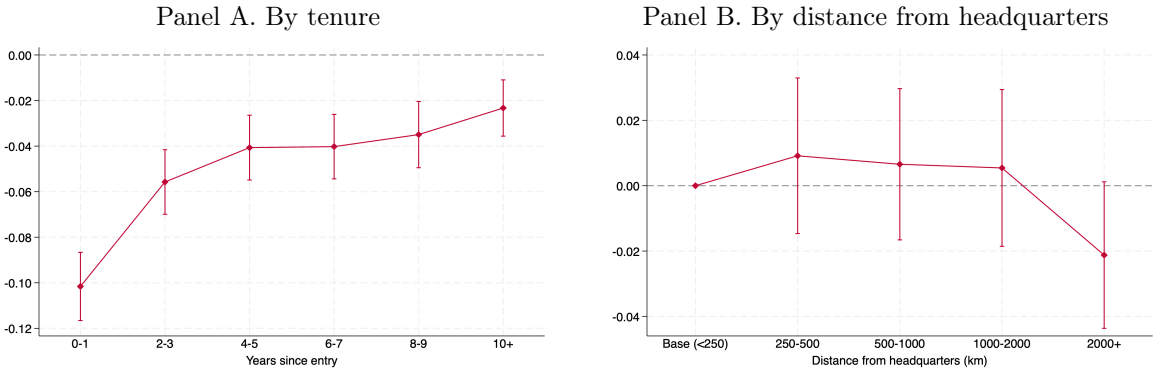


Panel B. Lorenz Curve



Notes. The figure describes the ten-year outcomes of true market entries, ordinary insurance, 1888–1940. The sample is restricted to entries whose firm survives at least ten years past entry. An entry is *abandoned* if the firm stops writing in that state within ten years while still operating; its payoff is zero. For surviving entries the payoff multiple is the market's premium about ten years after entry (averaged over years nine through eleven) relative to its entry premium, divided by the firm's own total-premium multiple over the same window. Panel A groups entries by this multiple. Panel B plots the cumulative share of the cohort's year-ten premium against entries ranked from best to worst.

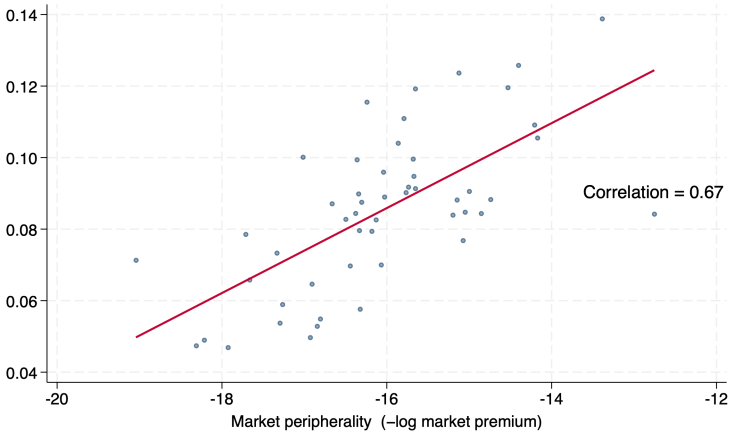
Figure VII: The Market-Position Term δ



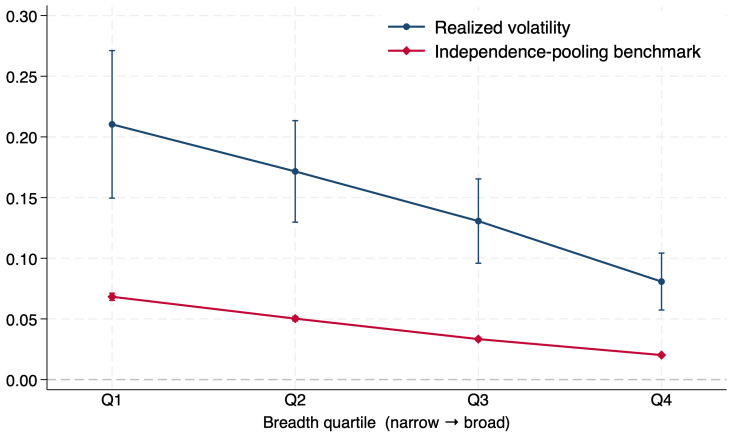
Notes. Ordinary insurance, 1888–1940. Each panel plots the coefficients from a regression of the loss ratio, claims over premiums, on indicator variables for bins of the argument shown, with indicators for the other argument included as controls. Panel A uses two-year bands of tenure measured against the firm's founding states, the omitted category. Panel B restricts to entered markets and uses distance bands with the nearest as the base. No-claim state-years are retained and the top percentile is trimmed; standard errors are clustered by firm and bars are 95 percent confidence intervals.

Figure VIII: The Limits of Geographic Pooling

Panel A. Loss volatility vs market size



Panel B. Benchmarked pooling benefits



Notes. The sample is ordinary-insurance business, 1888–1940. Panel A plots each state's loss-ratio volatility (the standard deviation of its premium-weighted loss ratio across years, for states observed at least five years) against market peripherality, measured as the negative log of average state premium, with an ordinary-least-squares fit. Panel B compares, within firm-size–breadth quartiles (narrow to broad), the realized forward five-year volatility of a firm's aggregate loss ratio to the independence-pooling benchmark $\left(\sum_s w_s^2\, v_s^2\right)^{1/2}$, the volatility a firm would have if its state loss ratios were independent, where w_s is the firm's premium share in state s and v_s is that state's loss-ratio volatility.

11 Tables

Table I: Summary Statistics

	Mean	SD	p25	p50	p75	N
Panel A: Firm-state-year						
Premiums (k)	469.03	2282.10	12.14	59.86	251.90	151882
Losses (k)	161.24	768.64	2.00	16.46	81.11	151882
Insurance written (k)	2654.52	11171.05	97.52	469.76	1706.07	151881
Firm-state market share	0.02	0.04	0.00	0.00	0.02	151882
Firm-state exit	0.03	0.18	0.00	0.00	0.00	151882
Panel B: Firm-year						
Total premiums (k)	6829.88	37199.50	168.75	589.05	2085.44	10426
Total losses (k)	2348.83	12193.63	28.59	133.05	648.00	10426
Insurance written (k)	38622.35	201032.44	1864.00	5442.71	17032.37	10426
Number of states	14.48	19.45	2.00	6.00	20.00	10426
Breadth	4.46	4.81	1.10	2.15	6.01	10426
Loss ratio	0.27	0.21	0.14	0.23	0.34	10217
Loss-ratio volatility (5-yr)	0.09	0.12	0.03	0.05	0.10	9573
Exit: failure (10y)	0.02	0.14	0.00	0.00	0.00	10426
Exit: merger (10y)	0.04	0.19	0.00	0.00	0.00	10426
Exit: reinsurance (10y)	0.13	0.34	0.00	0.00	0.00	10426
Exit: acquisition (10y)	0.02	0.13	0.00	0.00	0.00	10426
Panel C: NY accounting sample, firm-year						
Surplus / total liabilities	0.12	0.12	0.05	0.08	0.15	2261
Mortgages / assets	0.32	0.19	0.18	0.31	0.45	2390
Real estate / assets	0.07	0.08	0.01	0.04	0.10	2390
(Stocks + bonds) / assets	0.41	0.21	0.27	0.39	0.54	2390
Policy loans / assets	0.08	0.07	0.01	0.08	0.14	2342
(Surrenders + lapses) / in-force	0.08	0.06	0.04	0.06	0.09	2253
Bond interest income / assets	0.04	0.01	0.04	0.04	0.05	2294
Accounting loss ratio	0.41	0.19	0.30	0.38	0.50	2385

Notes. Panel A reports firm-state-year observations for the near-universe of U.S. life insurers in the Spectator *Insurance Year Book*, 1888–1940; Panel B reports firm-year observations from the same source; Panel C reports firm-year observations from the financial statements of the New York sample. Premiums, losses, and insurance written are in thousands of dollars. The firm-year exit rows report the share of firm-years followed within ten years by an exit through the indicated channel.

Table II: Persistence and the Channel of Exit, by Size and Scope

Panel A. Survival

Survival horizon	Breadth coefficient: Unconditional	Breadth coefficient: Conditional on size	Size (cond.)	N
Five-year survival	0.052***	0.003	0.090***	10,455
	(0.008)	(0.010)	(0.015)	
Ten-year survival	0.078***	0.008	0.132***	10,455
	(0.012)	(0.016)	(0.021)	

Panel B. Exit

Size group at exit (% of exits)	Consolidation	Failure	Withdrawal	N
Bottom third	82	12	5	129
Middle third	93	5	2	129
Top third	91	9	0	129
All exits	89	9	2	387

Notes. The sample is ordinary-insurance firm-years, 1888–1940. Breadth is standardized log effective number of states ($N_{\text{eff}} = 1/\text{HHI}$) and size is standardized log premium. Panel A regresses an indicator for the firm surviving five (ten) more years on breadth, first alone and then adding a cubic in log size, with region × year fixed effects and standard errors clustered by firm; the size column reports the first-order term of the cubic. Panel B describes how firms exit. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table III: Firm Growth: Book by Market Vintage

	Firm age (years)			
Market vintage	5	10	15	20
Founding states	68	57	49	41
Entered 1–5 yrs after	32	34	36	40
Entered 6–10 yrs after	—	9	8	10
Entered 11–15 yrs after	—	—	7	6
Entered 16–20 yrs after	—	—	—	2
Post-founding entries (all)	32	43	51	59

Notes. The table reports the share of a firm's ordinary premium, at a given firm age, coming from the states it was founded with versus the states it entered afterward, grouped by how many years after founding it entered them. Shares are premium-weighted. A market's vintage is its entry age, the year the firm first wrote the state minus the firm's founding year. To measure founding cleanly for firms already operating when the panel opens, each firm's pre-existing book is removed: any firm-state present in the first sample year is treated as null throughout, and founding is reset to the firm's first market observed thereafter; firms formed during the panel are unaffected.

Table IV: Breadth and Size

	+5 years		+10 years	
	Size	Breadth	Size	Breadth
Breadth (t)	0.101^{***}	0.895^{***}	0.123^{***}	0.825^{***}
	(0.014)	(0.015)	(0.025)	(0.027)
Size (t)	0.736^{***}	0.026	0.651^{***}	0.033
	(0.020)	(0.017)	(0.037)	(0.030)
Observations	7025	7025	5003	5003
R2	0.83	0.86	0.78	0.78

Notes. Size is the standardized log of firm premium; breadth is the standardized log of the effective number of states ($N_{\text{eff}} = 1/\text{HHI}$). The sample is ordinary-insurance firm-years, 1888–1940. Each column regresses one variable's value h years ahead on the current values of both variables, so every column includes the lagged dependent variable and the cross term; columns 1 and 3 are the size equation, columns 2 and 4 the breadth equation, at horizons of five and ten years, with region × year fixed effects and standard errors clustered by firm. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table V: The Cost of Expansion: Breadth, Unconditional and Conditional on Size

Outcome	Breadth coefficient			Size (cond.)	$E[Y]$	N
	Unconditional	Conditional on size	Conditional on size and maturity			
Panel A. The cost of expansion: decomposing the loss ratio						
Log loss ratio	0.169***	0.138***	0.151***	0.133***	0.297	9,370
	(0.020)	(0.027)	(0.025)	(0.036)		
Log claims per $1,000 in force	0.170***	0.088***	0.095***	0.225***	9.061	9,370
	(0.020)	(0.026)	(0.024)	(0.035)		
Log premium per $1,000 in force	0.001	-0.050***	-0.056***	0.093***	31.464	9,370
	(0.007)	(0.010)	(0.010)	(0.015)		
Panel B. Stability is scale, not breadth						
Loss-ratio volatility (5-yr)	-0.022***	0.000	-0.000	-0.036***	0.080	9,200
	(0.002)	(0.002)	(0.003)	(0.004)		
Survival to 10 years	0.078***	0.001	0.004	0.156***	0.776	10,132
	(0.012)	(0.016)	(0.016)	(0.021)		

Notes. Each cell reports the coefficient on standardized breadth (the log effective number of states, $N_{\text{eff}} = 1/\text{HHI}$) from a firm-year regression of the row outcome, with region × year fixed effects and standard errors clustered by firm (in parentheses); the sample is ordinary insurance, 1888–1940. The *unconditional* column includes breadth alone; the *conditional on size* column adds a cubic in standardized log premium, and the *size* column reports the first-order term of that cubic. Outcomes are the loss ratio (claims over premiums), premium yield (premiums per $1,000 of insurance in force), claims per $1,000 in force, the forward five-year standard deviation of the loss ratio, and an indicator for the firm surviving ten more years. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table VI: Distance and Local Pricing Power

Panel A. The distance penalty and the margins of the loss ratio

	Loss ratio		Loss-ratio margins		Premium yield	
	(1)	(2)	Pr(no claims)	Loss ratio > 0	(5)	(6)
Log distance	-0.037***	-0.018***	0.083***	-0.012***	-0.739***	-0.537***
	(0.004)	(0.003)	(0.006)	(0.004)	(0.086)	(0.114)
State tenure		0.003***				0.017
		(0.000)				(0.018)
$E[Y]$	0.289	0.250	0.177	0.352	30.292	29.598
Observations	118733	88991	118733	96914	115362	86827
R2	0.28	0.26	0.33	0.27	0.42	0.42

Panel B. Local pricing power

	Premium yield	Loss ratio	Premium yield
Within-state share	17.62**	-0.30***	17.23***
	(7.79)	(0.07)	(3.69)
Log distance			-0.65***
			(0.09)
Log distance × share			-2.74
			(2.51)
$E[Y]$	30.301	0.287	30.292
Observations	116396	119851	115362
R2	0.41	0.27	0.42

Panel C. Does the gradient survive into the firm's book?

	Loss ratio		Claims per 1,000		Premium yield	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Log distance	-0.037***	-0.015***	-1.336***	-0.661***	-0.739***	-0.585***
	(0.004)	(0.004)	(0.126)	(0.155)	(0.086)	(0.110)
$E[Y]$	0.289	0.331	8.656	10.607	30.292	31.949
Observations	118733	118733	116448	116448	115362	115362
R2	0.28	0.44	0.30	0.47	0.42	0.60

Notes. The unit of observation is the firm-state-year, ordinary insurance, 1888–1940. All columns include firm × year fixed effects and standard errors are clustered by firm. Distance is the great-circle distance in kilometers from the firm's headquarters city to the state's centroid in logs; within-state share is the firm's premium in a state divided by all firms' premium in that state that year; and state tenure is years since the firm entered the state. The loss ratio is claims over premiums, premium yield is premiums per $1,000 of insurance in force, and claims per $1,000 is claims over insurance in force. $E[Y]$ reports the mean of each column's outcome on that column's own estimation sample. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table VII: Within-Market Performance

Outcome	Breadth coefficient				Controls		$E[Y]$	N
	Base	Adding share	Adding tenure	Adding both	Within-state share	State tenure		
Panel A. Each market weighted equally								
Loss ratio	0.033***	0.032***	0.030***	0.030***	-0.108	0.0040***	0.285	122,460
	(0.009)	(0.009)	(0.008)	(0.008)	(0.121)	(0.0007)		
Claims per 1,000 in force	0.776***	0.777***	0.691***	0.708***	3.400	0.1284***	8.560	120,132
	(0.258)	(0.259)	(0.212)	(0.214)	(3.139)	(0.0186)		
Premium yield	-0.674***	-0.604**	-0.694***	-0.618***	15.465***	0.0185	30.271	118,895
	(0.239)	(0.242)	(0.237)	(0.238)	(4.101)	(0.0248)		
Panel B. Weighted to reproduce the firm aggregate								
Loss ratio	0.069***	0.059***	0.067***	0.056***	-0.399***	0.0010	0.329	122,460
	(0.011)	(0.011)	(0.011)	(0.011)	(0.065)	(0.0008)		
Claims per 1,000 in force	1.592***	1.467***	1.484***	1.339***	-7.704***	0.0315	10.552	120,132
	(0.298)	(0.298)	(0.275)	(0.271)	(2.113)	(0.0207)		
Premium yield	-0.621	-0.425	-0.884	-0.695	9.987**	0.0144	31.914	118,895
	(0.801)	(0.858)	(0.623)	(0.679)	(4.809)	(0.0327)		

Notes. The unit of observation is the firm-state-year, ordinary insurance, 1888–1940. All columns include state × year fixed effects and a cubic in standardized log firm premium, with standard errors clustered by firm. Breadth is the standardized log effective number of states, $N_{\text{eff}} = 1/\text{HHI}$, measured at the firm-year level and constant across a firm's markets. Within-state share is the firm's premium in a state divided by all firms' premium in that state that year. $E[Y]$ reports the mean of each row's outcome on its own estimation sample. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table VIII: Robustness: Cost of Expansion

Panel A. Fixed effects and New York controls

	Region-by-year FE (1)	Firm FE (2)	NY sample (3)	NY + controls (4)
Premium yield	-1.967***	-6.783***	-2.651***	-2.268**
	(0.370)	(0.994)	(0.926)	(0.885)
Loss ratio	0.040***	0.047***	0.038	0.045*
	(0.008)	(0.011)	(0.029)	(0.027)
Observations	7,683	7,639	1,866	1,763

Panel B. By insurance type and product-mix controls

	Ordinary (1)	Industrial (2)	Group (3)	Pooled + mix (4)
Premium yield	-1.967***	-7.338***	-1.387**	-1.904***
	(0.370)	(2.276)	(0.693)	(0.411)
Loss ratio	0.040***	0.025	-0.028	0.038***
	(0.008)	(0.021)	(0.040)	(0.008)
Observations	7,683	1,284	813	7,884

Panel C. The level term, within markets

	Baseline (1)	Adding log distance (2)	HQ region × year FE (3)	Expansion elsewhere (4)
Premium yield	-0.587**	-0.462*	-0.330	-0.115
	(0.245)	(0.261)	(0.263)	(0.300)
Loss ratio	0.032***	0.038***	0.031***	0.020**
	(0.008)	(0.008)	(0.008)	(0.009)
Claims per 1,000 in force	0.772***	0.945***	0.789***	0.523*
	(0.219)	(0.227)	(0.224)	(0.268)
Observations	119,909	118,792	118,792	111,710

Notes. Each cell reports the coefficient on standardized breadth, the log effective number of states $N_{\text{eff}} = 1/\text{HHI}$, from a separate regression of the row outcome conditional on a cubic in standardized log firm premium, with the standard error below it. Standard errors are clustered by firm throughout and single-state firm-years are excluded. Premium yield is premiums per $1,000 of insurance in force, the loss ratio is claims over premiums, and claims per $1,000 is claims over insurance in force. Zero-claim observations are retained and outcomes are trimmed at the top, with premium yield trimmed at both tails. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table IX: Robustness: Timing of Entry and Book Deterioration

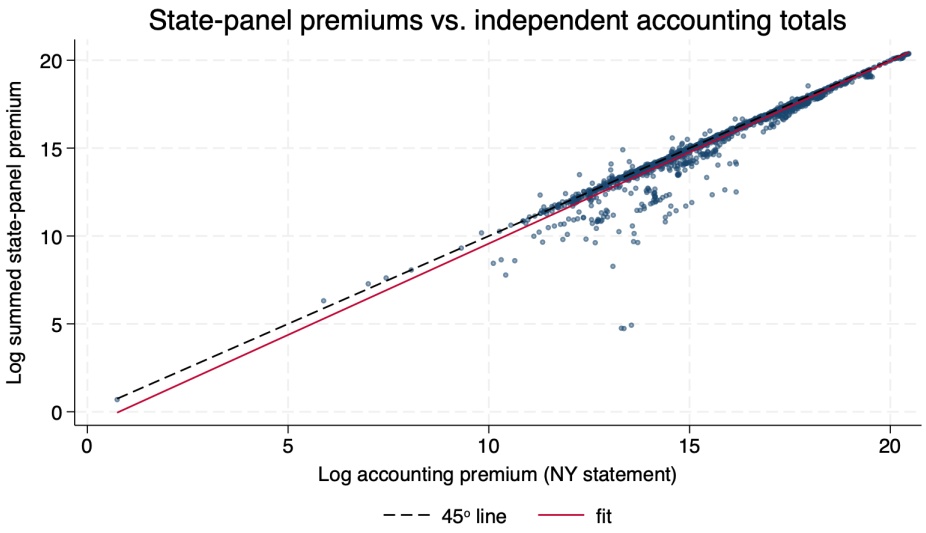
	(1)	(2)	(3)	(4)
Loss ratio, year t	-1.26***	-0.89*	0.38	0.70
	(0.47)	(0.50)	(0.55)	(0.54)
one year earlier				-1.08***
				(0.31)
two years earlier				-1.26***
				(0.35)
three years earlier				0.34
				(0.58)
New business / in force		4.32***	2.89***	5.01***
		(0.69)	(0.93)	(1.11)
Log effective states	1.67*	1.13	-10.66***	-10.44***
	(0.91)	(0.94)	(1.81)	(1.83)
Share of home-state market		0.97		
		(0.77)		
Log firm premium	1.93	2.89**	2.53	2.08
	(1.23)	(1.40)	(3.13)	(3.58)
Firm age	-6.54***	-5.12***		
	(0.86)	(0.84)		
Firm fixed effects	No	No	Yes	Yes
Sum of loss-ratio terms				-1.30
p-value, loss-ratio terms jointly				0.002
Mean of dependent variable	14.76	14.87	14.75	13.27
Observations	7,479	6,989	7,070	5,531
Adjusted R-squared	0.052	0.066	0.143	0.142

Notes. This table estimates an insurer's entry into a new state on its characteristics in preceding years. The dependent variable equals 100 if the firm opens at least one new state in year $t+1$ and zero otherwise, where an entry is a firm-state observation in its first year with positive premium, new insurance written exceeding half of insurance in force, and entry premium no greater than the firm's median state premium that year. The unit of observation is the firm-year. Every regressor is standardized to zero mean and unit variance over the firm-year panel, so a coefficient is the change in the probability of entry next year, in percentage points, per standard deviation of the regressor. Standard errors, in parentheses, are clustered by firm. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Online Appendix

A Online Appendix

Figure A.1: Firm-by-state premiums versus NY accounting totals



Sources: author's calculations from the Spectator *Insurance Year Book* state pages and the New York Superintendent's annual-statement accounting data. Each point is a firm-year for a firm appearing in both sources. The horizontal axis is the log of the firm's accounting income-statement premium; the vertical axis is the log of the firm-year total of its state-panel premiums (placed in dollars). The dashed line is the 45-degree line and the solid line is the ordinary-least-squares fit. Points cluster tightly along the 45-degree line, indicating that the independently digitized state panel reproduces the firms' total premiums.

Table A1: Rank persistence and mobility

Panel A. Rank persistence: Spearman correlation of national premium (survivors)

Horizon	5 years	10 years	20 years
Spearman correlation	0.92	0.86	0.80

Panel B. Ten-year size-quintile transition matrix (row %)

	Exit	Q1	Q2	Q3	Q4	Q5 (top)
Q1	50.2	12.7	15.5	12.7	7.6	1.3
Q2	41.0	2.7	18.9	23.5	11.1	2.8
Q3	24.5	1.2	6.0	31.3	29.9	7.1
Q4	14.6	1.0	0.7	7.2	46.6	30.0
Q5 (top)	5.9	0.2	0.2	0.6	4.9	88.1

Notes. The ordering of firms by national premium is highly stable. Panel A reports the Spearman correlation of national premium income between year t and year $t+h$ across surviving firms. Panel B reports the ten-year transition matrix across within-year size quintiles (Q1 smallest, Q5 largest), with an absorbing "Exit" column for firms no longer observed after ten years. Base years are restricted to those with an observable $t+10$ outcome, and firms alive but temporarily unobserved at $t+10$ are dropped rather than coded as exits.