Looser Rules, Larger Losses: Financial and Real Spillovers of the Savings and Loans Debacle*

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Abstract

We empirically document that regulatory forbearance towards Savings and Loans (S&Ls) institutions spread fragility *across* the financial system. As interest rates rose during the 1970s, S&Ls faced diminishing profits and balance sheet impairment, which was met in the early 1980s with deregulation of their liabilities, net worth, and assets. This regulatory forbearance, coupled with loose supervision, spurred "gambling for resurrection" incentives at S&Ls. Increased risk-taking by S&Ls resulted in their widespread failures, and incentivized less well-capitalized commercial banks to also take more risk, eroding their net interest margins and worsening asset quality, and eventually resulting in bank failures. Employing exogenous spatial variation in the supervision of S&Ls, we causally establish these adverse spillovers of regulatory forbearance towards one class of credit intermediaries across the financial system and to the real economy.

JEL Codes: E44, E52, G21, G28

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1 Introduction

Poor financial sector health has well-documented adverse consequences for the broader economy. Insolvent financial institutions, when kept alive without adequate balance-sheet repair, systematically misallocate credit, undermining economic growth and dynamism. An influential body of work centers on spillovers from unhealthy firms to healthy firms in the non-financial sector.[1] To the best of our knowledge, adverse spillovers operating *within* the financial sector itself, and thereby aggravating consequences for the real economy, remain unexplored. We fill this gap in the literature by exploiting a unique institutional setting — the Savings and Loan (S&L) crisis of the 1980s — to directly identify spillovers from impaired (S&Ls) to healthy financial intermediaries (commercial banks).

The S&L episode features two classes of depository institutions operating in direct competition yet subject to segmented regulatory regimes, with detailed institution-level data available for about 5,500 S&Ls and nearly 19,000 commercial banks. The sharp rise in interest rates at the end of the 1970s disproportionately impaired S&Ls, whose balance sheets were characterized by severe maturity mismatch. Regulatory forbearance was extended to S&Ls — but not to commercial banks — enabling distressed S&Ls to gamble for resurrection by expanding into asset classes previously restricted to commercial banks.[2] This regulatory asymmetry generated a novel competitive externality: newly empowered but financially impaired S&Ls entered into direct competition with commercial banks for assets, borrowers, and funding. This paper traces not only the direct effects of forbearance on S&L balance sheets and failures, but also the resulting distortions imposed on commercial bank balance sheets and failures and, ultimately, the real economy.[3]

As illustrated in Figure 1, the S&L crisis unfolded across three distinct phases prior

[1] Most consequentially, seminal contributions by Caballero et al. (2008) and Peek and Rosengren (2005) demonstrate that such institutions engage in zombie lending, generating congestion externalities in the real economy: distressed firms absorb credit on subsidized terms, crowding out healthy firms and new entrants, and depressing productivity and investment economy-wide (Acharya et al., 2019, 2024; Blattner et al., 2023; Giannetti and Simonov, 2013; McGowan et al., 2018; Schivardi et al., 2022).

[2] Throughout this paper, we use the term "regulatory forbearance" to encompass the full set of deregulatory actions extended to S&Ls during this period. Although some measures may admit an interpretation as conventional deregulation rather than forbearance in the strict sense, our terminological choice reflects the fact that these actions were enacted in direct response to industry-wide (S&L) financial distress.

[3] While the role of regulatory forbearance extended to S&Ls in exacerbating the crisis was highlighted in contemporaneous discussions (most prominently in detailed books by White (1991) and Kane (1989)), resulting adverse spillovers to commercial banks appear to have received little attention both at the time and in subsequent academic work on the episode.

to its eruption into a public emergency. In the first phase, S&L profitability deteriorated sharply: these institutions were confined to holding long-term fixed-rate mortgages while facing dramatically higher short-term funding costs, driving ROAs down to an average of -0.4% by the end of 1982 — a decline markedly more severe than the comparatively stable performance of commercial banks over the same period. In response to these mounting pressures, in the second phase, regulators responded with forbearance: liability competition was liberalized, capital requirements were lowered, and importantly, S&Ls were allowed to invest in more risky types of assets (see Figure 2).[4] S&Ls expanded aggressively during this period; capitalization declined from 6.5% of assets in 1980 to 3.6% in 1984, and the ratio of S&L assets over S&L and bank assets combined increased by 3.9 percentage points. In the third phase, commercial banks faced intensifying competitive pressure, recording failure rates that spiked sixfold, from 0.3% in 1983 to 2.0% by 1988. The crisis ultimately culminated in more than 1,200 and 1,500 failures of S&Ls and commercial banks, respectively, at an estimated public cost of $200 billion (Ely, 2005).

We employ granular, entity-level data for both financial institution types to identify the causal effect of expansion of impaired S&Ls on outcomes for commercial banks. To construct an institution-level S&L dataset that encompasses the mid-1970s to the early-1990s, we map different reporting formats for two distinct periods through crosswalks available in physical historical regulatory documentation held at the National Archives in College Park, Maryland. This is complemented with data for commercial banks from the historical Call Reports, which provide quarterly balance sheet data since 1959, compiled by Correia et al. (2025). We also incorporate granular, county-level data on employment, wages, and establishments from the Census.

Our empirical strategy focuses on the differential impact of unhealthy competition from impaired but empowered S&Ls on commercial banks with incentives to respond by taking on more risk: those with low-capital. The geographic footprint of failures at the time is highly suggestive (see Figure 3). There is a strong spatial correlation between S&L and commercial bank failures that was absent in the pre-crisis period. To establish the mechanism at work, we compare stress across two types of commercial banks — high- and low-capital banks — that were similarly geographically exposed to risk-taking S&Ls, and include a rich set of fixed effects and controls. This approach allows us to isolate the differential impact

[4]Before 1986, only a few specialized commercial banks benefitted from forbearance. After 1987, forbearance was broadened.

of S&L risk-taking on low-capital versus high-capital commercial banks operating in the same local market and time period.[5] Specifically, we include county-by-time fixed effects, which absorb all time-varying local shocks, such as regional business cycles, credit demand fluctuations, or housing market dynamics. This addresses the challenge that deterioration in both S&L and commercial bank health may reflect common underlying shocks, rather than spillovers. Importantly, we also account for the direct impact of differences in commercial bank capitalization, to capture the mechanism that low-capital banks have stronger incentives to respond to competition by taking excessive risks (Keeley, 1990).

Using a specification with these granular county-by-time fixed effects, we find that low-capital commercial banks facing greater exposure to competitively distortionary S&L forbearance experienced meaningfully worse outcomes. Commercial banks with below average capital in counties where S&Ls made particularly risky investments saw declining ROAs and significantly higher failure rates. However, while county-by-time fixed effects absorb all time-varying local factors, an important identification challenge remains. Regulatory forbearance presents endogeneity concerns that could persist even with county-by-time fixed effects: most directly, the extent of forbearance may be related to initial financial health at S&Ls and commercial banks. This could generate a mechanical correlation between forbearance intensity and ex-post performance and bias our OLS estimate in either direction.[6]

To further strengthen identification, we exploit exogenous geographic variation in S&L supervisory oversight (using the sudden, unexpected relocation of a supervisory office) to instrument for S&L risk-taking. Following Kandrac and Schlusche (2021), we argue that the supervisory office relocation of the 9th district Federal Home Loan Bank (FHLB) in September 1983 was both unanticipated and unrelated to local financial conditions, providing a plausibly exogenous source of variation in supervisory intensity. We implement a two-stage instrumental variable approach: in the first stage, we estimate the effect of the supervisory shock on S&L risk-taking; in the second stage, we examine spillovers from S&L risk-taking induced by this exogenous variation in supervisory oversight to commercial banks. We continue to focus on differential effects for commercial banks with low-capitalization relative to well-capitalized commercial banks operating in the same local market and time period.

Results from our two-stage IV approach help us causally trace spillovers from intensified

[5]Given the highly localized nature of making through the late 1980s, we treat counties as local markets.

[6]For example, forbearance aimed at the most impaired S&Ls could generate an upward bias if the weakest S&Ls overlapped geographically with weakest commercial banks or a downward bias if vice-versa.

risk-taking by distressed S&Ls to low-capital commercial banks. We find that S&Ls that made risky investments in response to the supervisory shock exhibited significantly lower profitability and higher subsequent probabilities of default. Crucially, our second-stage results show that incremental risk-taking by S&Ls induced by reduced supervision led to much stronger competitive pressures on commercial banks, leaving low-capital banks gambling for resurrection by increasing risk-taking and experiencing both depressed ROAs (consistent with higher non-performing assets and loan-loss provisions, which we also document) and elevated failure rates.

The spillover to low-capital commercial banks was large and economically meaningful. Commercial banks with below average capital in counties where S&Ls made particularly risky investments saw additional declines in ROAs of nearly 0.8 percentage points after 2 years, which represents a substantial deterioration relative to the sample mean ROA of 0.7% for commercial banks. The probability of failure increased dramatically: failure rates increased by a factor of 10 at a two year horizon. Importantly, we find no evidence of pre-trends in our analysis. The possibility of measurement error—due to our imperfect ability to observe risk-taking by S&Ls—implies that we find large magnitudes despite facing potential attenuation bias.

We conduct a series of robustness checks to assess the sensitivity of our baseline local projection instrumental variable (LP-IV) estimates. We verify that results are not driven by the specific thresholds used to classify undercapitalized banks or risky S&L exposure, or the specific approach used to winsorize outliers. We also show that our asset-side measure of S&L risk-taking is highly correlated with a funding-side alternative based on brokered deposit reliance and that using a liability-based approach to tracing spillovers to commercial banks yields similar results. Across all specifications, estimated effects remain stable in sign, magnitude, and statistical significance.

Our findings reveal that intensified competition – likely for both assets and liabilities – was the channel that propagated S&L risk-taking and led to financial stress for commercial banks. Specifically, low-capital commercial banks operating in counties with more S&L risk-taking offered significantly higher deposit rates to retain funding and significantly lower loan pricing to defend market share against newly aggressive S&Ls. Furthermore, these pressures compromised asset quality, as evidenced by rising loan loss provisions and non-performing loans, indicating a deterioration in underwriting standards amid aggressive competition from forbearance-enabled S&Ls.

Finally, we document that the financial sector spillovers induced by regulatory forbearance had tangible consequences for the real economy. In counties where forbearance-enabled S&Ls competed most aggressively and commercial bank failures were concentrated, we find persistent declines in employment and wages. An increase in failed commercial bank assets by one standard deviation translated to a 2 percentage point additional reduction of employment in counties with high risk-taking by S&Ls induced by exogenous reductions in the intensity of supervision. Importantly, these results are based on specifications that control for the impact of risk-taking by S&Ls alone. These results suggest that regulatory forbearance towards a set of financial intermediaries can generate externalities within the financial sector, which then amplify the macroeconomic costs of overall financial sector distress by disrupting credit supply and weakening local labor markets.

Related Literature. We contribute to the literature in three ways, first and foremost to two decades of work on zombie lending and its real effects. This literature documents the distortions arising when weakly-capitalized institutions extend credit to insolvent borrowers. Peek and Rosengren (2005) and Caballero et al. (2008) establish the zombie lending phenomenon in Japan, showing that subsidized credit to non-viable firms crowds out productive investment. Giannetti and Simonov (2013) show how insufficient bank recapitalization perpetuates zombie lending cycles. The literature has since expanded considerably: Banerjee and Hofmann (2018) characterize zombie firms across OECD economies; McGowan et al. (2018) trace the implications for aggregate productivity; Blattner et al. (2023) provide causal evidence on credit misallocation; and Schivardi et al. (2022) identify real costs using Italian data. Acharya et al. (2019) document the zombie lending channel of unconventional monetary policy in Europe, while Acharya et al. (2024) offer a cross-country synthesis. Hu and Varas (2021) develop a theoretical framework showing how relationship banking generates zombie lending incentives endogenously. Our paper contributes to this literature by shifting focus from spillovers across non-financial firms to spillovers within the financial sector — a phenomenon that has not previously been identified or quantified.

We also speak to the literature on the S&L crisis. The historic event has attracted substantial policy-oriented commentary, e.g., Barth (1991); Curry and Shibut (2000); Darby (2004); Ely (2005); Federal Deposit Insurance Corporation (1997); Kormendi et al. (1989); Robinson (2013), and most prominently two comprehensive books by White (1991) and Kane (1989). While this work focuses on narrating the origins of the crisis, the role of moral hazard related to deposit insurance, and the political economy of forbearance, we highlight the role

of spillovers from S&Ls to commercial banks. Moreover, rigorous academic inquiry on the subject remains sparse. Kroszner and Strahan (1996) and Esty (1997) examine risk-taking by S&Ls, who were encouraged to publicly incorporate and paid out dividends, rather than accumulated capital. Cornett and Tehranian (1990) analyze the performance implications of regulatory changes for stockholders of S&Ls, depending on the institution's size. For commercial banks, Keeley (1990) establishes a foundational link between deposit insurance, market power erosion, and elevated bank risk. Shoven et al. (1992) address the macroeconomic consequences of the crisis. These contributions leave a significant gap: competitive spillovers from impaired S&Ls to commercial banks — the central focus of the present paper.

Finally, we also speak to the broader literature on banking de-regulation and its consequences in the U.S. Most of this literature consists of a well-developed body of empirical work exploiting staggered U.S. branching deregulation as quasi-experimental variation in credit supply and competition. Jayaratne and Strahan (1996) establish that intrastate deregulation accelerated state-level economic growth, while Kroszner and Strahan (1999) examine its political economy. Black and Strahan (2001, 2002) document effects on income distribution and entrepreneurship, and Beck et al. (2010) show that deregulation disproportionately benefited lower-income households. Another strand examines the resulting real effects of banking and capital market integration more broadly, including its consequences for business cycle synchronization, small firm credit access, and long-run growth (Morgan et al., 2004; Rice and Strahan, 2010; D'Amico and Alekseev, 2024). Our paper contributes to this literature by examining a distinct but related episode: the relaxation of restrictions on which asset classes S&Ls could invest in under regulatory forbearance. Unlike branching deregulation — which relaxed geographic restrictions on healthy financial institutions — the episode we study extended new asset-class privileges to financial institutions that were already severely impaired, generating competitive distortions for the commercial banking sector that the existing literature has not considered.

The remainder of this paper is structured as follows. Section 2 explains how we construct institution-level data for both S&Ls and commercial banks during this period. Section 3 explains the institutional setting. Section 4 turns to spillovers from impaired S&Ls to commercial banks, Section 5 traces the implications for the real economy, and Section 6 considers the robustness of our results. Section 7 concludes.

2 Data

We combine institution-level data for S&Ls with call reports data for commercial banks, constructing a comprehensive panel of depository institutions in the United States from 1976 onwards. The S&L data are obtained from the National Archives, where available records span two distinct reporting formats: 1976–1983, available half-yearly, and 1984–1992, available at the quarterly frequency. This break reflects the fact that, although the Federal Home Loan Bank Board (FHLBB) was not formally replaced by the Office of Thrift Supervision (OTS) until 1989, modifications to regulatory reporting forms were retroactively applied by the OTS to historical data going back to 1984. To construct consistent time series across this transition, we manually reviewed historical regulatory documentation held at the National Archives in College Park, Maryland. This process allowed us to reconcile changes in variable definitions and construct harmonized balance sheet and income statement series over the full sample period. We merge this data on S&Ls with historical call reports for commercial banks compiled by Correia et al. (2025), which provide quarterly balance sheet data since 1959. Finally, we link the combined dataset to historical institution-level failure records from the Federal Deposit Insurance Corporation (FDIC), enabling us to identify the timing and incidence of bank and S&L failures throughout the sample.

Table 1 reports key financial metrics for S&Ls and commercial banks over 1976-1992. The two sectors exhibit strikingly different capitalization profiles: S&Ls held equity equal to only 4.1% of assets on average, compared to 9.0% for commercial banks, reflecting the structural fragility of S&Ls entering the crisis period. S&Ls also recorded a mean ROA of -0.11% against 0.69% for commercial banks, with considerably greater dispersion, consistent with severe and heterogeneous distress across the S&L sector. The quarterly failure rate among S&Ls was approximately five times that of commercial banks (1.1% versus 0.2%), underscoring the acute and asymmetric nature of the crisis. S&L deposit rates averaged 7.9%, nearly 190 basis points above the commercial bank average of 6.1%, pointing to liability-side competition after the end of Regulation Q. Both types of institutions exhibited similar mean asset growth of approximately 10% year-on-year, though with greater heterogeneity for commercial banks.

To provide a broader context for the relative importance of the two sectors, Figure A1 documents the evolution of S&Ls' aggregate footprint within the U.S. depository institution landscape. While S&Ls were smaller than commercial banks at the individual institution level, they nonetheless represented a non-negligible share of total assets over this period,

underscoring the macroeconomic relevance of distress in the S&L sector.

To assess the real economic consequences of spillovers from unhealthy S&Ls supported by forbearance to commercial banks, we further exploit the (somewhat sparse) macroeconomic data available at subnational level for this period. Most importantly, we draw on the Quarterly Census of Employment and Wages (QCEW), provided by the Bureau of Labor Statistics, which records employment levels, wages, and the number of establishments at quarterly frequency for all U.S. counties, allowing us to construct local labor market outcomes at a granular geographic level.

3 Setting and stylized facts

After a prolonged period of stable profitability in the postwar decades, the sharp rise in market interest rates at the end of the 1970s inflicted severe losses on S&Ls, which were structurally confined to holding long-term fixed-rate mortgages funded by rate-capped short-term deposits. S&Ls suffered a double whammy, with losses on their long-dated assets and deposit flight to money market funds and other market instruments that reflected the reality of much higher rates.

Faced with mounting industry-wide distress, policymakers responded with sweeping regulatory forbearance across three key fronts: capital, liabilities, and assets (see overview in Figure 2 and additional details in Table 2). The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980 and the Garn-St Germain Depository Institutions Act of 1982 together constituted the primary legislative response.

On the asset side, DIDMCA endorsed the Bank Board's regulatory authorization of adjustable-rate mortgages (ARMs) and, together with Garn-St Germain, substantially expanded the range of permissible investments for federally chartered S&Ls. This included expanded limits for investments in consumer loans to up to 30 percent of assets, commercial real estate loans to up to 40 percent, and unsecured commercial loans to up to 11 percent — enabling S&Ls to broaden beyond their historically narrow, mortgage-focused mandate.

On the liability side, DIDMCA mandated the phase-out of Regulation Q deposit rate ceilings, a process accelerated by Garn-St Germain and formally completed in March 1986; this liberalization, combined with authorization to offer interest-bearing checking accounts

nationwide, enabled distressed S&Ls to compete aggressively for retail and brokered deposits at market rates. DIDMCA also raised the federal deposit insurance limit from $40,000 to $100,000 for all account types, dramatically expanding S&Ls' capacity to attract large-denomination insured deposits and thereby fund their expanded risk-taking.

Finally, and critically, capital requirements were progressively relaxed. The FHLB Board reduced the minimum net worth requirement from 5 percent of liabilities to 4 percent in 1980, and further to 3 percent in 1982, while simultaneously adopting Regulatory Accounting Principles (RAP) that allowed S&Ls to overstate reported asset values and net worth relative to Generally Accepted Accounting Principles (GAAP), further eroding their capital cushion.

Despite its breadth, this deregulatory effort proved insufficient to stabilize the S&L sector. As shown in Figure 1, S&L failures ultimately materialized on a massive scale, concentrated most acutely in 1988–1990.[7] White (1991) documents how the regulatory forbearance described above, in the absence of commensurate strengthening of safety-and-soundness supervision (quite on the contrary as we will argue below), endowed distressed S&Ls simultaneously with expanded opportunities, enhanced capabilities, and perverse incentives for risk-taking. This combination proved consequential, particularly among S&Ls that pivoted most aggressively into commercial real estate and other non-traditional asset classes. Consistent with this mechanism, a simple probability-of-default regression framework depicted in Table 3 confirms that S&Ls that most actively exploited the deregulated investment powers — and thus took on greater asset risk — were substantially more likely to ultimately fail, potentially suggesting that the lowering of capital standards did not resolve the underlying insolvency problem but instead deferred and amplified it.

Commercial banks also experienced failure rates well above historical norms during this period. Two mechanisms that are not mutually exclusive may account for this. First, commercial banks did not benefit from the same lowering of capital standards extended to S&Ls and may therefore have been resolved earlier as distress materialized. Second, and central to this paper, the expansion of S&Ls into asset classes previously exclusive to commercial banks — facilitated by lower standards and forbearance — subjected banks to

[7]Table 2 notes that towards the end of this period there were policies in place to resolve the crisis. Key measures most relevant for our timeline were the Competitive Equality Banking Act in 1987 and the Financial Institutions Reform, Recovery and Enforcement Act in 1989, which enabled assisted mergers. However, as only 8 assisted mergers are documented during our sample period through 1992, these do not drive the spike in defaults.

intensified competition. Suggestive of this is Table 4, which reveals that the commercial banks most likely to fail were those with more traditional, loan-heavy business models—that is, those whose activities most closely resembled the core business of S&Ls.

A further striking pattern is the geographic co-location of financial distress across the two types of institutions. States that experienced more pronounced S&L risk-taking, and therefore failures, also recorded more elevated commercial bank failure rates. Figure 3 documents that this spatial correlation is significant at a 95% confidence level when estimated over the full period of regulatory loosening and forbearance and its aftermath. Crucially, no such pattern is detectable in the early years, when the analogous correlation is statistically indistinguishable from zero — consistent with the interpretation that the geographic clustering of commercial bank stress was not a pre-existing feature of local financial markets, perhaps emerging endogenously as a consequence of the competitive distortions introduced by S&L lower capital standards and forbearance.

To complement the correlation pattern shown in Figure 3, a simple regression framework investigates whether areas where S&Ls took more risk ultimately showed a higher failure rate for commercial banks:

$$Y_{i,c,t+h} - Y_{i,c,t-1} = \beta_1^h \text{Risky S\&L}_{c,t} + \beta_2^h X_{s,t} + \Phi^h X_{i,t-1} + \gamma_t^h + \epsilon_{i,c,t+h} \tag{1}$$

where $Y_{i,c,t+h}$ is a dummy that takes the value 1 if commercial bank i failed in county c and time $t+h$. Risky S&L$_{c,t}$ is a dummy whether commercial bank i is located in an Risky S&L county, which is defined as a dummy whether the county is in the top quartile of the share of risky assets among S&Ls. Risky assets are defined as the sum of commercial mortgage loans, land loans, construction loans and consumer loans. We run the regression for all quarters 1984-1986, with the LHS variable going out up to $h = 12$ quarters.[8] We apply clean controls following Dube et al. (2025). Standard errors are clustered at the county level.

Panel I in Figure 5 traces the dynamic response of commercial bank returns and failure rates to S&L risk-taking in the same geographic area. The effect on defaults is not contemporaneous: commercial bank failures begin to rise approximately 15 months after the onset of elevated S&L risk-taking, consistent with the idea that it takes time for competitive

[8]Note that our data on risk-taking by S&Ls only starts in 1984. We limit our sample to before 1987 to create a sample that focuses on observations treated early in the sample, while still enabling us to test for pre-trends.

pressures to erode bank profitability and ultimately precipitate failure. Failure, however is preceded by significantly eroded profits. The impact is both economically meaningful and persistent: at its peak, ROA declines by almost 0.3 percentage points, which is large relative to its average of 0.7% of assets. Failure rates more than double their average level for commercial banks in risky S&L counties, with estimated coefficients remaining statistically significant all the way through the five-year horizon, suggesting that the spillovers from S&L risk-taking could have inflicted lasting, not merely transitory, damage on commercial banks in affected areas.

4 Spillovers within the financial sector

The preceding sections argue that regulatory forbearance enabled S&Ls to expand into riskier asset classes, and that exacerbated their fragility. A natural question that arises is whether this expansion had broader implications beyond S&Ls. In particular, we examine whether the deregulation-induced transformation of S&Ls, which granted them access to markets historically dominated by commercial banks, generated competitive pressures that transmitted stress across the financial sectors. Such spillovers could plausibly operate through intensified competition for both funding and lending opportunities, especially in local markets where S&Ls grew most by taking on risky investments. This section investigates the extent and nature of these spillovers, focusing on the differential exposure of commercial banks to S&L risk-taking and the mechanisms through which competition may have propagated distress.

4.1 A fixed effects approach to identify spillovers through competition

A key identification concern is that the geographic correlation between S&L risk-taking and commercial bank failures may not reflect causal spillovers but instead common underlying drivers — most plausibly, local macroeconomic conditions such as a contraction in credit demand or a regional real estate downturn — that simultaneously impaired both types of institution within the same regions. To address this concern, we consider specifications that include county-by-time fixed effects, which absorb all time-varying local demand conditions

and thereby ensure that we focus on variation across institutions within the same county and period, rather than from cross-sectional differences in local economic conditions.

We propose a type of unhealthy competition in the spirit of "gambling for resurrection" as the operative channel through which elevated risk-taking in the S&L sector transmits stress to commercial banks. The central insight is that regulatory forbearance enabled distressed S&Ls to expand aggressively into asset classes that were previously the exclusive domain of commercial banks, generating a novel and asymmetric competitive externality. Not all commercial banks, however, were equally exposed to this competitive pressure: we argue that low-capital banks had the largest incentives to gamble for resurrection, both on the liability- and the asset-side. This would make effects of S&L excessive risk-taking much more noticeable in this group of commercial banks.

We operationalize these two considerations jointly through a local projection framework. The specification interacts a time-invariant indicator of low-capital, Low $\text{Cap}_{i,1983q4}$, defined as an indicator for whether bank i had a below-median equity-to-asset ratio within the county as of end-1983Q4 (therefore *before* the sample period of our outcome variables), with the previously defined dummy for Risky S&L as a time-varying measure of S&L risk-taking in the same county. The coefficient identifies whether low-capital commercial banks — those most incentivized to compete with S&Ls for the same depositors and borrowers — experienced systematically worse outcomes, including depressed profitability and elevated failure rates, in counties where S&Ls took on disproportionate risk. County-by-time fixed effects ($\gamma_{c,t}$) are included throughout, ensuring that the interaction coefficient captures differential outcomes across bank types within the same local market, rather than reflecting geographic variation in macroeconomic developments.

In particular, we run the following specification:

$$\begin{aligned} Y_{i,c,t+h} - Y_{i,c,t-1} = \beta_1^h \left(Y_{i,c,t-1} - Y_{i,c,t-2}\right) + \beta_2^h \left(Y_{i,c,t-2} - Y_{i,c,t-3}\right) + \beta_3^h \text{Low Cap}_{i,83q4} \\ + \beta_4^h \text{Low Cap}_{i,83q4} \times \text{Risky S\&L}_{c,t} + \Phi^h X_{i,t-1} + \gamma_{c,t}^h + \epsilon_{i,c,t+h} \end{aligned} \tag{2}$$

where $Y_{i,c,t}$ are main outcome variables (ROA and a dummy that takes the value 1 when a bank fails) of commercial bank i in county c and time t. To address the possibility that bank-specific characteristics could be correlated with both capital levels and failure probability, bank controls $X_{i,t-1}$ include deposits/liabilities, securities/assets, equity/assets, size (log assets), as well as additional controls drawn from Correia et al. (2025), such as wholesale

funding, time deposits and demand deposits [9]. As before, we run the regression for all quarters 1984-1986 to capture the early period in which S&Ls are taking increasing risk without failing, with the LHS variable going out up to $h = 12$ quarters. We apply clean controls following Dube et al. (2025) and standard errors are clustered at the county level.

Panel II in Figure 5 shows estimates for the coefficients of interest, $\hat{\beta}_4^h$, which capture the difference between a low- and a high-capital bank in an area with risky S&Ls relative to the difference between a low-and a high-capital bank in an area without risky S&Ls. We find lower ROAs and higher failure rates for low-capital banks in risky S&L counties. At its peak, the effect corresponds to a decline in ROA of roughly 12 basis points, while the failure rate roughly doubles compared to its average.

4.2 Causal Inference

4.2.1 An instrumental variable approach

An important identification challenge remains in estimating the causal effect of regulatory forbearance on S&L and commercial bank outcomes even with granular, county-by-time fixed effects. Forbearance might be endogenous to institutional distress by construction: regulators extend leniency precisely to institutions and geographic areas experiencing the most acute financial difficulties. This reverse causality implies that a simple comparison of outcomes across institutions receiving differential forbearance may conflate the effect of forbearance itself with the pre-existing weakness of its recipients, biasing estimates toward finding adverse effects in forbearance-receiving areas even in the absence of any causal mechanism.

To overcome this identification challenge, we instrument for the intensity of regulatory forbearance using the exogenous reduction in supervisory capacity induced by the sudden and unexpected relocation of the ninth district Federal Home Loan Bank (FHLB) from Little Rock, Arkansas, to Dallas, Texas, in September 1983. As documented in detail by Kandrac and Schlusche (2021), the relocation precipitated an abrupt and severe collapse in supervisory capacity: almost all supervisory employees chose to resign rather than relocate, leaving a supervisory vacuum that persisted for approximately two years.

[9] We cannot control for the share of uninsured deposits because the variable is sparsely populated—approximately 20% of the sample. Its distribution may be non-random.

Critical for our identification strategy are two properties of the shock that justify its use as an instrument. First, the relocation was unexpected: it was driven by longstanding political pressures regarding the geographic accessibility of the district headquarters — corroborated by a Comptroller General report confirming that the move was unrelated to S&L health and the many other developments that took place at the same time, as highlighted in Section 3. In fact, the report further attributes the possible relocation to unrelated factors, such as the need for additional office space at headquarters, as well as improved travel convenience and accessibility.[10] Second, the same evidence can be used to test the exclusion restriction. The historical documentation confirms that the shock was orthogonal to the financial condition of affected institutions but driven by logistical considerations.[11] In addition, Figure 6 shows that pre-relocation profitability (as measured by ROA) was statistically indistinguishable between S&Ls in- and outside the Ninth District, further corroborating the validity of the exclusion restriction.

While Kandrac and Schlusche (2021) treat the supervisory shock as uniform across all institutions within the ninth district, we refine this approach by constructing a continuous, state-level measure of supervisory disruption that exploits within-district variation in the intensity of the shock. Specifically, for each state in the ninth district we calculate the change in the share of institutions that received a supervisory examination during the two years immediately following the relocation relative to the pre-move baseline.[12] This measure captures the fact that the remaining field agents were necessarily more constrained in some states than others, generating differential examination rates across state lines that are plausibly exogenous to local financial conditions. Figure 7 illustrates this geographic variation. By exploiting within-district, cross-state variation in supervisory intensity, our instrument offers sharper identification than a binary treatment indicator while maintaining the same exclusion restriction: the differential collapse in examination activity across ninth district states reflects the logistical constraints of an understaffed supervisory apparatus, not the relative financial health of institutions in those states.

[10]While this report ultimately finds the move unwarranted, it offers valuable insight into the arguments and justifications the FHLBB was putting forward at the time.

[11]The full report can be found here: https://www.gao.gov/assets/ggd-81-82.pdf.

[12]We obtain this data from Table 5-14 in White (1991).

4.2.2 The effects of regulatory forbearance on S&Ls

Having argued that the supervisory shock is a valid instrument for regulatory forbearance intensity, we now turn to estimating its direct effects within the S&L sector itself. More specifically, we test whether regulatory forbearance, rather than providing a viable path to recovery for distressed institutions, merely postponed inevitable failures of S&Ls. To test this proposition formally, we implement a two-stage least squares IV event-study framework that exploits the exogenous variation in supervisory intensity induced by the ninth district office relocation. The first stage estimates the causal effect of reduced supervisory oversight on S&L risk-taking behaviour, operationalized as the share of non-traditional assets held by each institution as of 1986. The second stage then traces the consequences of this instrumented risk-taking for subsequent institutional failure, allowing us to isolate the component of risk attributable specifically to forbearance-induced gambling for resurrection, purged of confounding variation arising from pre-existing institutional weakness or correlated local economic conditions.

We run the following two-stage institution-level regressions that pool both banks and S&Ls:

$$\begin{aligned}\text{Risk Taking}_{i,c,86\text{Q4}} =& \beta_1 \text{S\&L}_i \times \text{decrease exams}_{s,84-85} + \beta_2 \text{S\&L}_i + \Phi X_{i,\text{pre 84}} \\ &+ \alpha_1 \left(Y_{i,c,86q4} - Y_{i,c,86q3}\right) + \\ &\alpha_2 \left(Y_{i,c,86q3} - Y_{i,c,86q2}\right) + \gamma_c + \epsilon_{i,c,86} \end{aligned} \tag{3}$$

$$\begin{aligned} Y_{i,c,t} - Y_{i,c,86q4} =& \phi_1^t \left(Y_{i,c,86q4} - Y_{i,c,86q3}\right) + \phi_2^t \left(Y_{i,c,86q3} - Y_{i,c,86q2}\right) \\ &+ \delta_1^t \widehat{\text{Risk Taking}_{i,c,86}} + \delta_2^t \text{S\&L}_i + \\ &\Gamma^t X_{i,\text{pre 84}} + \gamma_c^t + \xi_{i,c,t} \text{ for } t > 86\text{Q4} \end{aligned} \tag{4}$$

where $\text{Risk Taking}_{i,c,86}$ is the share of non-traditional assets of institution i in county c at end-1986, and non-traditional assets for banks are defined as Real Estate Loans (% of Assets). $Y_{i,c,t}$ are main outcome variables (failure, ROA). Controls $X_{i,\text{pre 84}}$ include pre-1984 controls: institution type (S&L versus commercial bank), regulatory capital levels as of 1983, the wedge between Regulatory Accounting Principles (RAP) and Generally Accepted Accounting Principles (GAAP) net worth (a measure of the lowering of capital standards for S&Ls, and is thus assumed to be zero for banks), total asset growth over 1980–1983, the deposit rate paid

in 1983, and the logarithm of total assets. γ_c are county FE that absorb all time-invariant geographic heterogeneity. Standard errors are clustered at the state level to account for the fact that the supervisory shock operates at the state level within the ninth district.

The first-stage estimates, reported in Table 5, provide strong confirmation that the supervisory shock induced significant increases in S&L risk-taking. S&Ls located in states that experienced larger decreases in supervisory examination intensity during 1984–1985 held significantly higher shares of non-traditional risky assets as of 1986. We find that the average change in examinations (around 11 percentage points) increased S&L asset-risk-taking in 1986 by 5.88 percentage points, approximately a 50% increase relative to the mean. Even with conservative (state) clustering and the corresponding Kleibergen-Paap test, the F-statistic of 12.88 passes conventional thresholds for instrument strength, mitigating concerns regarding weak-instrument bias. Importantly, the estimated coefficients on the pre-crisis control variables align with theoretical priors and corroborate the gambling-for-resurrection mechanism: S&Ls with lower regulatory capital ratios in 1983 and those exhibiting greater discrepancies between RAP and GAAP accounting —both markers of financial distress and regulatory arbitrage — took on significantly more asset risk. Similarly, institutions paying higher deposit rates in 1983, indicative of greater funding pressures, also had significant exposures to non-traditional assets. These patterns support an interpretation that forbearance enabled already-distressed institutions to double down on risky strategies in a bid for survival.

The second stage results, illustrated in Figure 8, establish that the risk-taking induced by weaker supervision carried severe consequences for institutional survival. First, S&Ls that exploited regulatory forbearance in response to the supervisory shock experienced a dramatic and statistically significant decrease in ROA. Specifically, the point estimates indicate a decrease of over 0.4% of assets after less than two years, which is large considering a mean ROA of -0.1% for our sample. In the right panel, we see that this decrease ultimately resulted also in a significantly higher probability to fail for S&Ls that exploited regulatory forbearance in response to the supervisory shock. For every additional percent of risky assets held by the S&L, the probability of default increased by over 150% and 200% after three and four years, respectively, indicating the large and persistent effects of regulatory forbearance during times of low supervision. The sustained duration of the effect underscores that forbearance-induced risk-taking generated not merely transitory fragility but rather fundamental and long-lasting deterioration in institutional solvency. Taken together, the first- and second-stage estimates provide compelling causal evidence that regulatory forbearance enabled distressed S&Ls to

accumulate additional risks that ultimately manifested in substantially elevated failure rates.

4.2.3 The effects of competition from unhealthy S&Ls on banks

To causally identify competitive spillovers from distressed S&Ls to commercial banks while addressing concerns about the endogeneity of forbearance, we implement a two-stage instrumental variables strategy that combines the supervisory shock described in Section 4.2.1 with the competition framework developed in Section 4.1. In the first stage, we estimate equation 5 during 1984-1986, regressing county-level S&L risk exposure on the state-level decrease in examination intensity, while controlling for pre-1984 variables. This instrumental variable approach yields fitted values of county-time risk exposure that capture only the variation in S&L risk-taking attributable to the exogenous supervisory disruption. In the second stage, we estimate equation 6, a local projections specification similar to that employed in Section 4.1, but replacing the observed measure of risky S&L presence with its instrumented counterpart from the first stage. The coefficient of interest remains the interaction between low pre-crisis capitalization and instrumented S&L risk exposure, which identifies the differential effect of forbearance-induced S&L competition on vulnerable commercial banks within the same county-quarter, thereby purging estimates of confounding variation from unobserved local demand shocks or correlated regional distress.

$$\begin{aligned}\text{Low Cap}_{i,1983q4} \times \text{Risky S\&L}_{c,t} =& \beta \text{Low Cap}_{i,83q4} \times \text{decrease exams}_{s,84-85} \cdot \mathbb{1}[\text{S\&L}_c > 0] + \\ &+ \beta_2 \text{Low Cap}_{i,83q4} + \Omega X_{i,t-1} + \alpha_1 \left(Y_{i,c,t-1} - Y_{i,c,t-2}\right) + \\ &\alpha_2 \left(Y_{i,c,t-2} - Y_{i,c,t-3}\right) + \gamma_{c,t} + \epsilon_{i,c,t} \end{aligned} \tag{5}$$

$$\begin{aligned} Y_{i,c,t+h} - Y_{i,c,t-1} =& \phi_1^h \left(Y_{i,c,t-1} - Y_{i,c,t-2}\right) + \phi_2^h \left(Y_{i,c,t-2} - Y_{i,c,t-3}\right) \\ &+ \delta_1^h \text{Low Cap}_{i,83q4} + \delta_2^h \widehat{\text{Low Cap}_{i,83q4} \times \text{Risky S\&L}_{c,t}} + \\ &\Psi^h X_{i,t-1} + \gamma_{c,t} + \xi_{i,c,t+h} \end{aligned} \tag{6}$$

where t are all quarters of 84-86, all other variables and specifications are as in the previous section: $Y_{i,c,t+h}$ are main outcome variables (failure, ROA) as well as income statement variables (interest income and expenses) and asset risk indicators (loan loss provisions and

non-performing loans) of commercial bank i in county c and time $t+h$. Low $\text{Cap}_{i,1983q4}$ is an indicator for whether a bank shows below median capital *before* the move of the 9th district supervisory office. To address the possibility that bank-specific characteristics could be correlated with both capital levels and failure probability, bank controls $X_{i,t-1}$ include deposits/liabilities, securities/assets, equity/assets, size (log assets), as well as additional controls drawn from Correia et al. (2025), such as wholesale funding, time deposits and demand deposits. $\gamma_{c,t}$ are county by quarter FE to control for the local macroeconomic cycle. We apply clean control groups following Dube et al. (2025). Standard errors are clustered at the state level. Our focus is on δ_2^h, which isolates the difference between a low and a high capitalization bank in a Risky S&L County vs. a non-Risky S&L county.[13] Note that any attenuation bias due to imperfect measurement of S&L risk-taking or bank capitalization, temporal aggregation or choice of threshold, could bias the results downwards towards zero, underestimating the true effect.

The second-stage estimates, presented in Figure 9 provide evidence that the competitive pressures generated by forbearance-induced S&L risk-taking causally impaired commercial bank performance and elevated failure risk. Commercial banks with below-median capitalization as of end-1983 that operated in counties where S&Ls expanded aggressively into non-traditional assets — as instrumented by reduced supervisory oversight — experienced substantially worse outcomes relative to their better-capitalized counterparts in the same local markets. Specifically, the instrumented interaction term indicates that low-capital banks facing intensified 'unhealthy' S&L competition recorded ROA declines of 0.6 percentage points at the two-year horizon, representing an economically meaningful deterioration relative to the sample mean ROA of 0.69% percent for commercial banks. These profitability losses translated into elevated failure probabilities: the point estimates indicate that exposed low-capital banks faced an increase in failure risk up to almost 10 times higher over the subsequent quarters compared to baseline failure rates. The magnitudes of the instrumented estimates substantially exceed those obtained from the non-instrumented specification reported in Section 4, consistent with the concern that OLS estimates might be biased downward due to stronger forbearance for S&Ls in areas where commercial banks were initially in better financial health.

To elucidate the mechanisms through which S&L forbearance transmitted stress to

[13]Our data provides sufficient variation to estimate this differential effect: 17% of the banks in our sample are low capitalization banks in Risky S&L counties.

commercial banks, we extend the second-stage specification to examine granular balance sheet and income statement variables that capture the intensity of liability-side and asset-side competition. The results in the lower graphs in Figure 9 reveal that low-capital commercial banks in high-risk-S&L counties faced a pronounced compression of net interest margins driven by simultaneous pressures on both sides of the balance sheet. On the liability side, these banks were compelled to raise deposit rates by almost 10 basis points more than their better-capitalized counterparts in the same counties, consistent with intensified competition for retail funding as distressed S&Ls bid aggressively for insured deposits to finance their expanded asset portfolios. On the asset side, loan rates charged by exposed commercial banks declined by 10 basis points, suggesting that banks offered subsidized credit terms in an effort to retain market share in the face of encroachment by S&Ls newly authorized to compete in commercial lending markets.

Beyond margin compression, the evidence in Figure 9 further indicates that competitive pressures induced deterioration in commercial bank asset quality. Loan loss provisions as a share of total assets increased by around 0.3 percentage points at the two-year horizon—an increase that accounts for roughly 50% of the total ROA decline. Simultaneously, the stock of non-performing loans as a ratio of total loans rose by around 0.7 percentage points, which corresponds to over 50% of the sample mean. This points to a measurable degradation in underwriting standards as banks competed for borrowers against forbearance-enabled S&Ls willing to extend credit on concessional terms.

A critical concern for any difference-in-differences or event-study design is the validity of the parallel trends assumption: if low-capital banks in high-risk-S&L counties were already on divergent trajectories prior to the supervisory shock, the estimated effects could reflect pre-existing differential trends rather than causal spillovers from forbearance. To assess this threat to identification, we extend the estimation horizon backward to include pre-treatment quarters and test for the presence of differential pre-trends in the outcome variables of interest. As illustrated in the left portions of Figure 9, the interaction coefficients for almost all periods prior to the ninth district office relocation in late 1983 are statistically indistinguishable from zero and economically negligible in magnitude, providing strong support for the parallel trends assumption. The absence of pre-trends is particularly reassuring given the granular nature of the specification: the inclusion of county-by-quarter fixed effects ensures that identification derives exclusively from within-county, across-bank variation in exposure to instrumented S&L risk-taking, such that any remaining confounding would need to operate

at the bank-level in a manner precisely correlated with both pre-crisis capitalization and subsequent supervisory disruptions in the same county. The clean pre-trends, combined with the exclusion restriction arguments advanced in Section 4.2.1, collectively bolster confidence in a causal interpretation of the estimated spillover effects.[14]

5 Spillovers to the Real Economy

5.1 Approach

Ultimately, it is crucial for policymakers to understand the effects of regulatory forbearance and its spillovers on the real economy. In similar spirit to the previous section, we implement a two-stage instrumental variables strategy that extends the identification framework to the macroeconomic domain.

In the first stage, we conceptually run the same regression as in equation 5 but at the county-level. Therefore, we explain whether a county is classified as high-risk — based on being in the top quartile of non-traditional S&L assets, using the decline in supervisory exam intensity at the state level during 1984–1985 for counties where S&Ls where present ($\mathbb{1}[\text{S\&L}_c > 0]$), while controlling for county characteristics before 1984 and including state-by-quarter fixed effects. As before, this specification exploits the exogenous supervisory disruption induced by the ninth district FHLB office relocation to isolate variation in county-level S&L risk exposure that is orthogonal to local economic conditions.

In the second stage, we estimate county-level real outcomes (employment and wages) using a local projections framework that incorporates both the low pre-intervention capitalization of commercial banks and the instrumented risky S&L indicator, crucially interacting these two variables. Specifically, we regress the change in outcome variable $Y_{c,t+h}$ relative to $Y_{c,t-1}$ on the share of assets considered low capitalized in county c in 1983Q4, the instrumented risky S&L indicator ($\widehat{\text{Risky S\&L}_{c,t}}$), and their interaction term. State-by-quarter fixed effects $\gamma_{s,t}$ absorb all common regional shocks, state-specific policy changes, and aggregate macroeconomic conditions, ensuring that identification derives from within-state, cross-county variation in

[14] Figure 9speaks to differences in pre-trends between the groups captured by the interaction effect: the difference in low and high capitalization banks in Risky S&L counties vs. non-Risky S&L counties. Both groups show similar profitability measures up to the supervisory shock.

the joint exposure to commercial bank low capitalization and instrumented S&L risk-taking. Standard errors are clustered to match variation in treatment. We cluster standard errors by county, but group counties with S&Ls in the 9th district by state given that they experienced shared treatment.

$$\begin{aligned}\text{Low Cap}_{c,1983Q4} \times \text{Risky S\&L}_{c,t} =& \gamma_1 \text{Low Cap}_{c,1983Q4} \times \text{decrease exams}_{s,84-85} \cdot \mathbb{1}[\text{S\&L}_c > 0] + \\ & \gamma_2 \text{decrease exams}_{s,84-85} \cdot \mathbb{1}[\text{S\&L}_c > 0] + \alpha_1 \text{Low Cap}_{c,1983Q4} + \\ & \alpha_2 \left(Y_{i,c,t-1} - Y_{i,c,t-2}\right) + \alpha_3 \left(Y_{i,c,t-2} - Y_{i,c,t-3}\right) + \Phi X_{c,t} + \gamma_{s,t} + \epsilon_{c,t}\end{aligned} \tag{7}$$

$$\begin{aligned}\text{Risky S\&L}_{c,t} =& \delta_1 \text{Low Cap}_{c,1983Q4} \times \text{decrease exams}_{s,84-85} \cdot \mathbb{1}[\text{S\&L}_c > 0] + \\ & \delta_2 \text{decrease exams}_{s,84-85} \cdot \mathbb{1}[\text{S\&L}_c > 0] + \alpha_1 \text{Low Cap}_{c,1983Q4} + \\ & \alpha_2 \left(Y_{i,c,t-1} - Y_{i,c,t-2}\right) + \alpha_3 \left(Y_{i,c,t-2} - Y_{i,c,t-3}\right) + \Phi X_{c,t} + \gamma_{s,t} + \epsilon_{c,t}\end{aligned} \tag{8}$$

$$\begin{aligned}Y_{c,t+h} - Y_{c,t-1} =& \phi_1^h \left(Y_{c,t-1} - Y_{c,t-2}\right) + \\ & \phi_1^h \left(Y_{c,t-2} - Y_{c,t-3}\right) + \beta_1^h \text{Low Cap}_{c,1983Q4} + \beta_2^h \widehat{\text{Risky S\&L}_{c,t}} + \\ & \beta_3^h \widehat{\text{Low Cap}_{c,1983Q4} \times \text{Risky S\&L}_{c,t}} + \gamma_{s,t} + \xi_{c,t+h}\end{aligned} \tag{9}$$

The coefficient on the interaction term $\widehat{LowCap_{c,1983Q4} \times \text{Risky S\&L}_{c,t}}$ constitutes our primary estimate of the real economic spillover channel and implements a difference-in-differences identification logic. This specification compares the marginal real effect of low capitalization in counties with high instrumented S&L risk exposure (where forbearance-induced financial sector competition was more intense due to the supervisory shock) relative to counties with low S&L risk exposure, conditional on state-time fixed effects that absorb all common variation within states. It can therefore isolate the incremental changes in local labor market outcomes attributable specifically to the joint occurrence of commercial bank fragility and S&L risk-taking, enabled by forbearance.

5.2 Results

The results presented in Figure 10 provide evidence that spillovers from unhealthy S&Ls propped up by forbearance to commercial banks had adverse real economic consequences. Specifically, we find that the adverse effects of low commercial bank capitalization on local labor markets were significantly more pronounced in counties with high exposure to instrumented S&L risk-taking. In these counties, where forbearance-enabled S&Ls expanded aggressively into non-traditional asset classes, the interaction between low commercial bank capitalization and S&L risk exposure led to a persistent decline in employment and wages. At its peak, employment and wages each declined by roughly 0.05 and 0.1 percentage points, respectively, relative to counties without risky S&L exposure. The number of establishments decreases but insignificantly, in line with a higher threshold to close entire establishments compared to reducing staff and wages in response to negative shocks.

These findings are consistent with a contagion mechanism in which regulatory forbearance, by enabling distressed S&Ls to compete aggressively with commercial banks, undermined the financial health of the latter and thereby disrupted credit supply to the real economy. The results underscore that the costs of 'congestion' within the financial sector extend beyond the financial sector, manifesting in tangible labor market deterioration in counties where the dual presence of failing commercial banks and risk-seeking S&Ls created a perfect storm of financial fragility and credit dislocation.

6 Robustness

In this section, we conduct a series of robustness checks to test the sensitivity of our baseline estimates to alternative sample definitions, measurement of key variables, as well as treatment definitions and thresholds. For brevity, the exercises focus on the main finding for horizon $h = 8$ and key outcomes including ROA, failure probability, loan and deposit rates, non-performing loans (NPLs), loan loss provisions, and balance sheet quantities.

Table 7 includes four types of alternative specifications starting in column 2: (i) a probit specification when considering failures; (ii) stricter and weaker definitions of low-capitalization; (iii) broader and narrower treatment groups; and (iv) an alternative approach to winsorization. Across all variants, the direction and statistical significance of the estimated

effects remain consistent with the main results. In particular, the IV estimates for ROA and failure probability remain large and significant, and the patterns of margin compression and asset quality deterioration persist. These findings confirm that the competitive spillovers from forbearance-enabled S&Ls were economically meaningful and robust to alternative empirical choices.

Our baseline definition of a "Risky S&L" county captures risk-taking on the asset side of the balance sheet. To assess whether our findings are sensitive to this choice, we construct an alternative measure based on funding risk, exploiting variation in the reliance on brokered deposits, a funding source potentially associated with aggressive growth strategies and heightened fragility among thrifts during this period. Specifically, we reclassify a county as exposed to a risky S&L if the local share of brokered deposits falls in the top quartile of the distribution. Figure A3 shows that this alternative classification yields estimates that are remarkably stable relative to the baseline, both in terms of statistical significance and economic magnitude, suggesting that our results are not an artifact of the particular dimension of risk used to classify S&Ls.[15]

The stability of estimates across asset- and liability-based classifications naturally raises the question of whether the competitive distortions transmitted to commercial banks operated primarily through asset markets or deposit markets. We argue the dominant channel is asset-side competition. As shown in Figure 9, the adverse effect of commercial banks gambling for resurrection on their profitability (measured by ROA) is driven predominantly by deterioration in asset quality, while the contribution of elevated deposit rates, which would be the signature of liability-side competition, is negligible in comparison.

As mentioned in Section 3, another fact of consideration is that part of forbearance was reversed within policy action to resolve the crisis (see last three items in Table 2), which is why our baseline estimation stops before the most important resolution action in August 1989. Another consideration is that the Competitive Equality Banking Act in 1987 and the Financial Institutions Reform, Recovery, and Enforcement Act in 1989 enabled assisted and also unassisted mergers, including transactions where commercial banks acquired S&Ls. However, FDIC data only 8 assisted mergers are documented during our sample period until

[15]The similarity in the results stems from the fact that correlation between risk-taking on the asset and liability side is correlated - to each other and also to maturity mismatch (see Figure A4). This confirms that S&Ls most exposed to the original shock (interest rate hike) exploited regulatory forbearance most aggressively.

1992 so we can exclude that this is driving the spike in defaults.

Finally, we re-estimate equation 2 excluding Texas to assess whether our findings are disproportionately driven by a particularly severe crisis there due to the collapse in oil prices and related commercial real estate bust.[16] Nevertheless, Panel III in Figure 5 confirms that our results are robust to this exclusion, with both significance and magnitude remaining unchanged.

7 Conclusion

This paper provides causal evidence that poor health in one part of the financial sector can generate significant adverse spillovers within the financial sector that amplify costs in the real economy. Exploiting the unique institutional setting of the U.S. S&L crisis of the 1980s, we examine two classes of depository institutions that directly competed but were subject to segmented regulatory regimes. We use exogenous spatial variation in supervision of S&Ls to causally establish spillovers within the financial system.

We show that exogenously-induced risk-taking by S&Ls not only undermined their own solvency but also caused financial stress for commercial banks operating in the same local markets. These spillovers were driven by intensified competition on both the liability and asset sides of bank balance sheets, leading to compressed margins, deteriorating asset quality, and elevated failure rates among vulnerable commercial banks. Importantly, we also document that these spillovers within the financial sector had tangible macroeconomic costs. In counties where forbearance-enabled S&Ls competed most aggressively and commercial bank failures were concentrated, we observe persistent declines in employment and wages.

More broadly, our findings add to a growing discussion of the unintended consequences of regulatory forbearance. While forbearance may be motivated by the desire to stabilize distressed institutions, our results highlight the risks of such policies when they incentivize impaired intermediaries to gamble for resurrection. These insights are particularly relevant for contemporary policy debates on crisis management, supervisory discretion, and the design

[16]Note that the baseline LP-IV specification cannot be re-estimated without Texas, since Texas was indeed an important part of the 9th district and its exclusion yields weak identification. Without Texas, there are insufficient observations of undercapitalized banks in risky S&L counties within the 9th district.

of resolution frameworks that minimize contagion within the financial system. Given the well-documented, long-lasting impact of banking crises (Baron et al., 2026), policymakers must weigh the short-term appeal of forbearance against its potential to deepen systemic fragility and prolong recovery.

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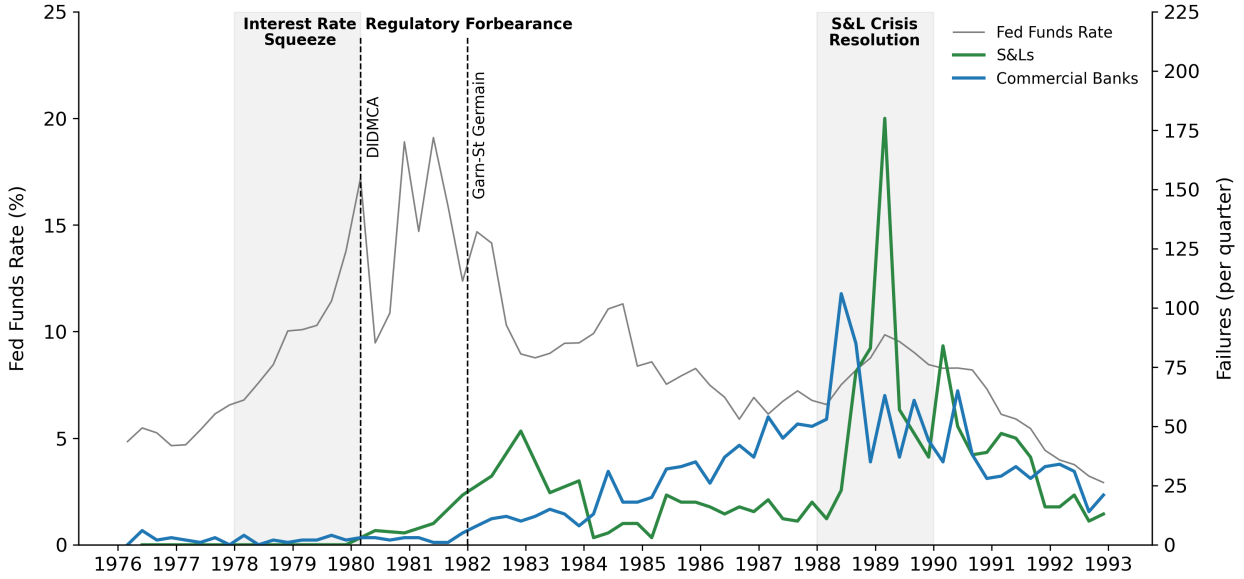
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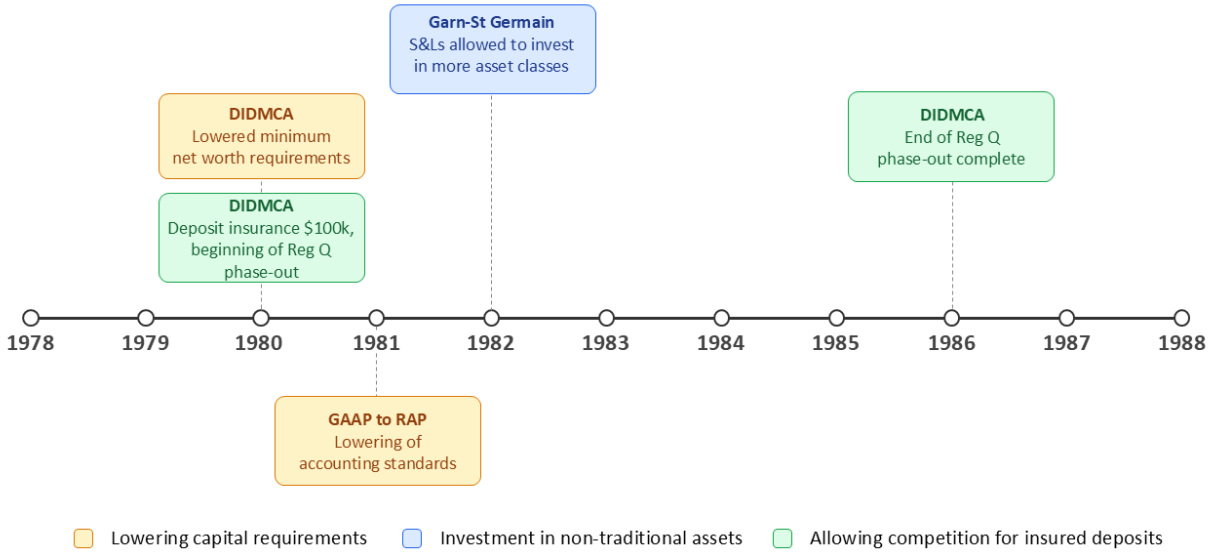
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Figure 1: Regulatory Forbearance, Failures, and the Fed Funds Rate



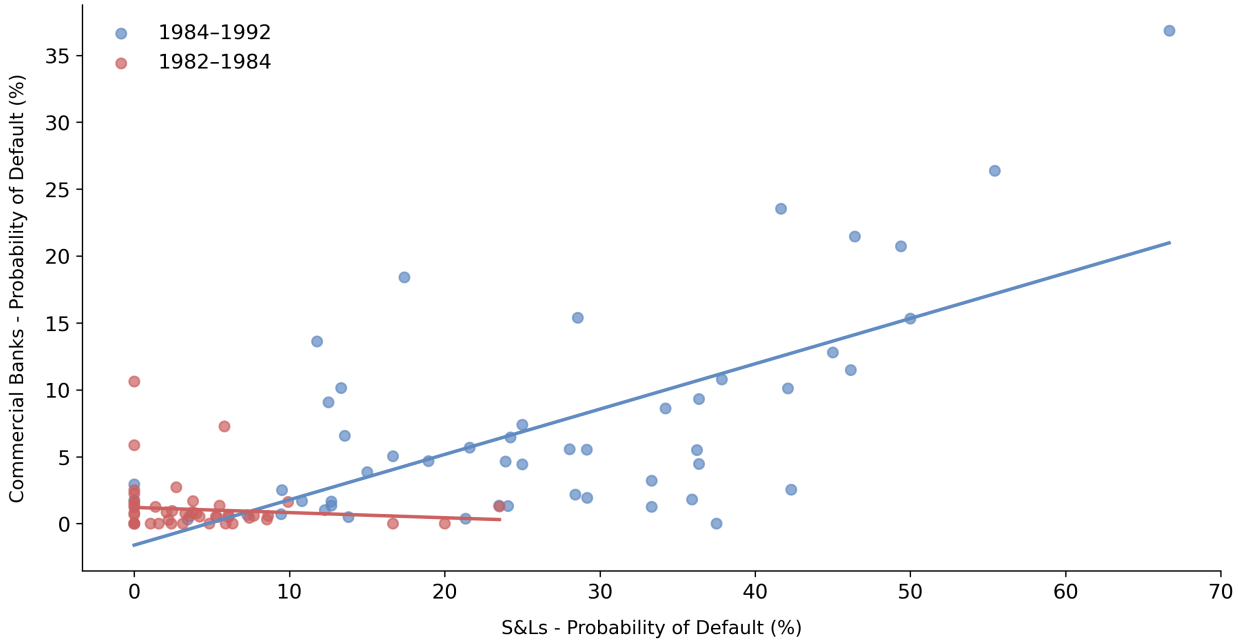
Notes: The figure displays quarterly failure counts by entity type (commercial banks in blue, S&Ls in green) on the left axis and the federal funds rate on the right axis, covering the period from 1976 to 1993. Vertical dashed lines indicate key regulatory episodes: the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980 and the Garn-St Germain Depository Institutions Act of 1982, the latter of which expanded S&L investment authority into broader asset classes. For a detailed regulatory timeline, see Table 2. The figure also highlights three phases of the crisis: the interest rate squeeze, regulatory forbearance, and the S&L crisis resolution.

Figure 2: Overview of the Regulatory Environment in the Run-up to the S&L Crisis



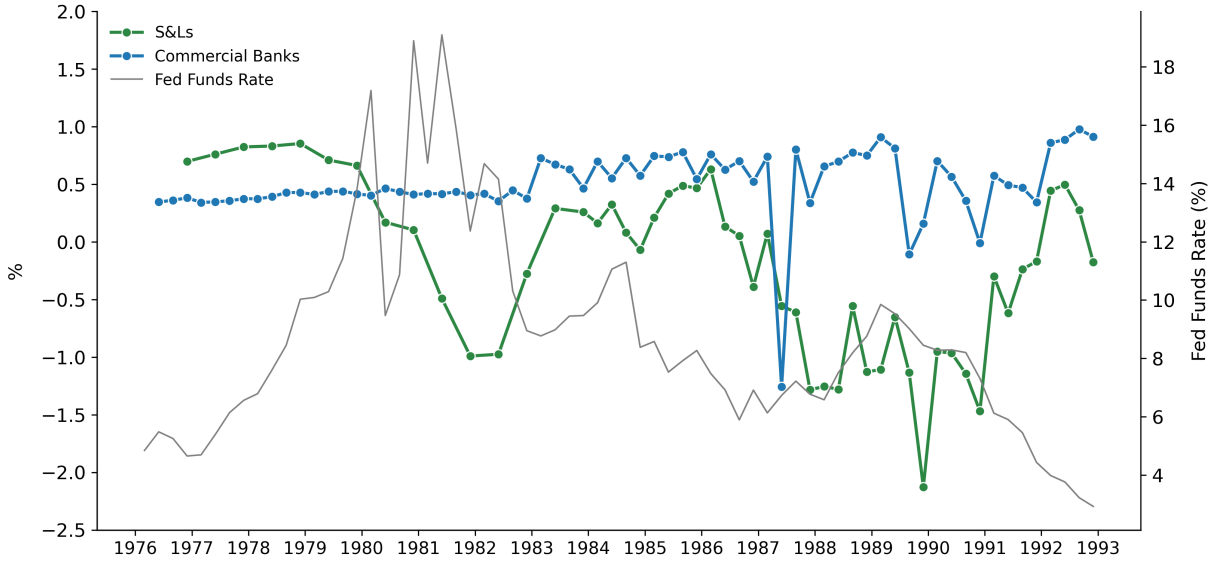
Notes: The figure provides an overview of the regulatory environment from 1978 to 1988, categorizing key regulations into three groups: investment in non-traditional assets (blue), lowering of capital requirements (yellow), and allowing competition for insured deposits (green). The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980 phased out interest rate ceilings and expanded deposit insurance. The Garn-St Germain Depository Institutions Act of 1982 further expanded S&L investment authority into broader asset classes. For a more detailed regulatory timeline, see Table 2.

Figure 3: Geographical Correlation of Probability of Default for Commercial Banks and S&Ls (%)



Notes: The figure plots the state-level probability of default for S&Ls (x-axis) against that of commercial banks (y-axis). Results are shown for the broader sample period 1984–1992 (blue) and the early regulatory forbearance period 1982–1984 (red).

Figure 4: Return on Assets (percentage points)

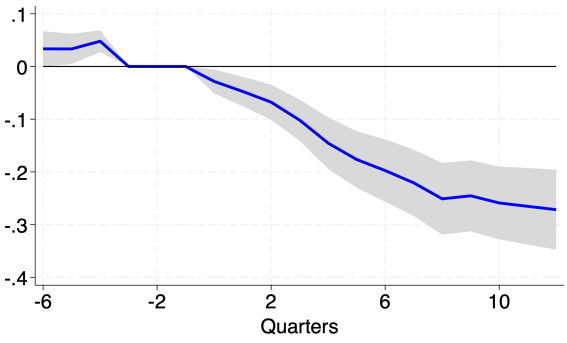


Notes: The figure displays quarterly return on assets by entity type (commercial banks in blue, S&Ls in green) on the left axis and the federal funds rate on the right axis, covering the period from 1976 to 1993. Return on assets is computed as annualized net income scaled by the average of total assets at t and $t-1$. Prior to 1984, S&L data are only available at a semiannual frequency; net income is adjusted to an annualized basis accordingly.

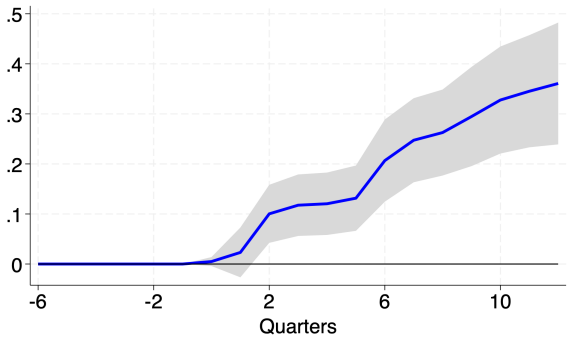
Figure 5: Outcomes for Banks in Counties With Risky S&L Lending

Panel I: County FEs

(a) Return on Assets (percentage points)

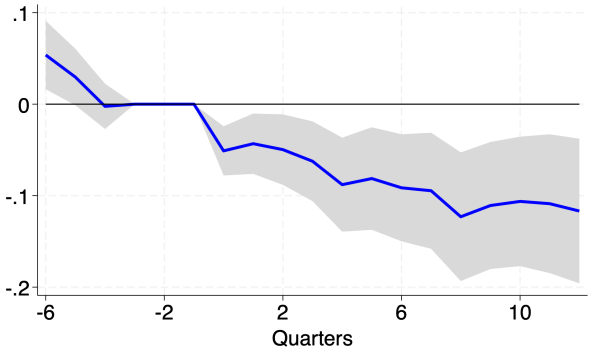


(b) Probability of Default (percentage points)

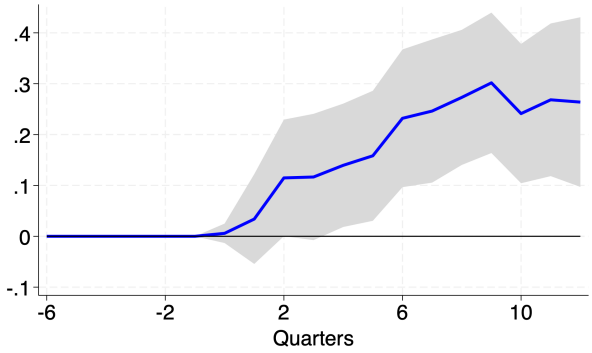


Panel II: County-Time FEs

(c) Return on Assets (percentage points)

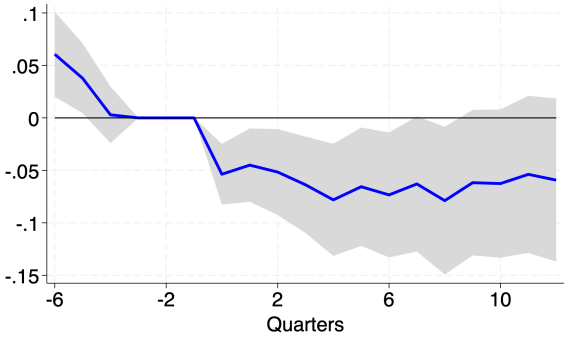


(d) Probability of Default (percentage points)

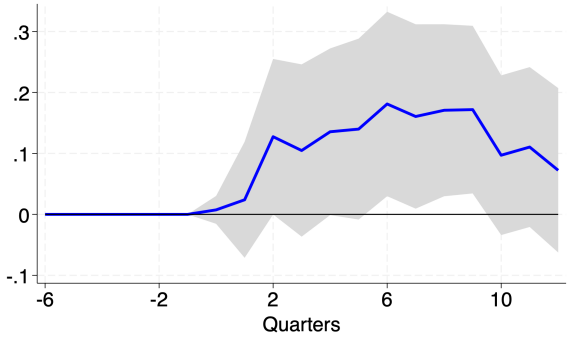


Panel III: Excluding Texas

(e) Return on Assets (percentage points)

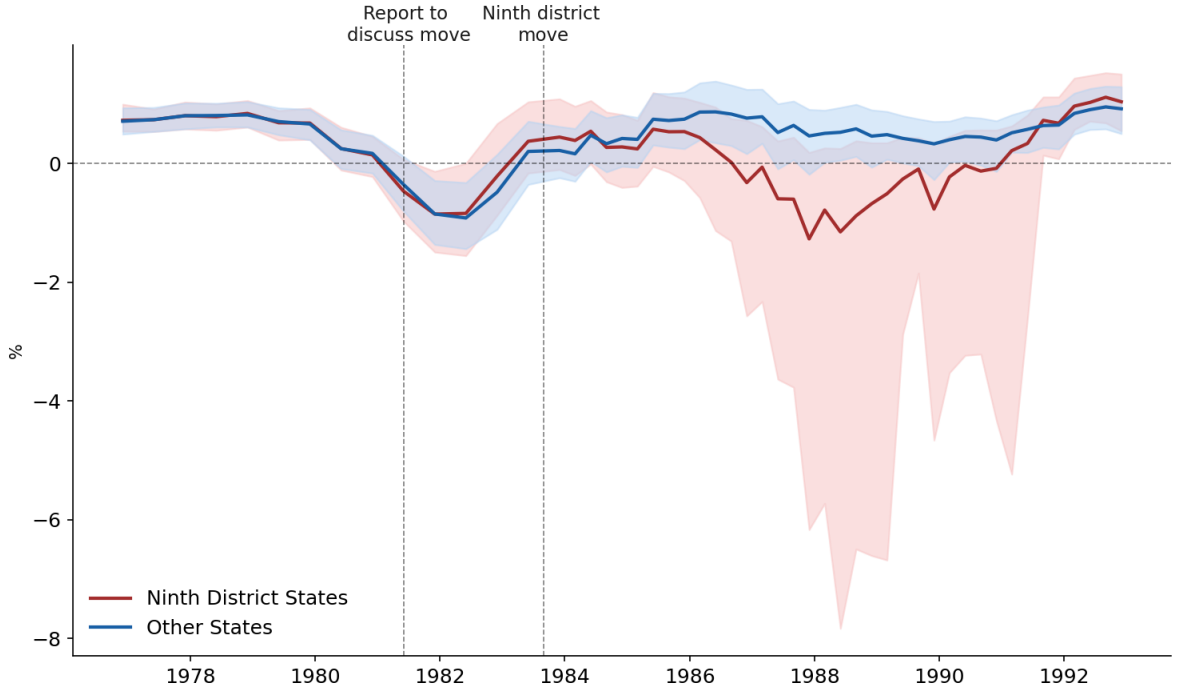


(f) Probability of Default (percentage points)



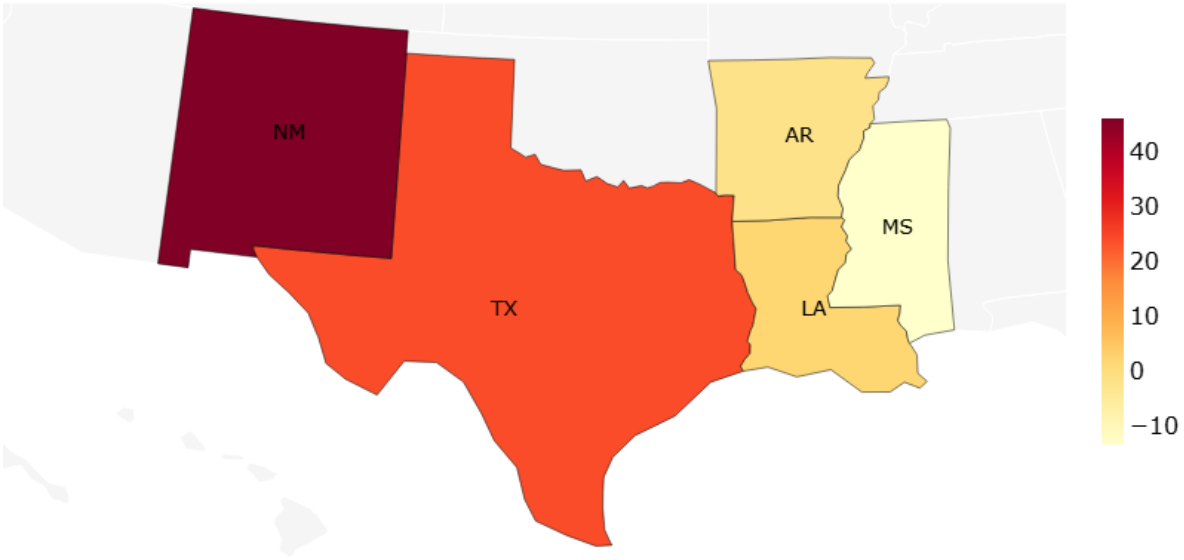
Notes: Panel I plots the marginal effect ($\hat{\beta}_1^h$) of being located in a county with a top quartile share of risky S&L lending on key financial outcomes for up to the least of 12 quarterly horizons or 1989Q2, estimated by the LP in equation 1. Quarter fixed effects and state-level controls, including the state-level unemployment rate, are included in all specifications in Panel I. Panels II and III plot the marginal effect ($\hat{\beta}_2^h$) of being located in a county with a top quartile share of risky S&L lending on low-capital banks, estimated by the LP in equation 2. County x quarter fixed effects are included in all specifications in Panel II and III. Panel III excludes all counties in Texas for robustness purposes. Risky S&L lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. Standard errors are clustered at the county level in all panels. The return on assets at t is defined as annualized net income at t divided by average total assets at t and $t-1$. The probability of default is captured by an indicator for bank failure at t multiplied by 100.

Figure 6: Return on Assets (percentage points)



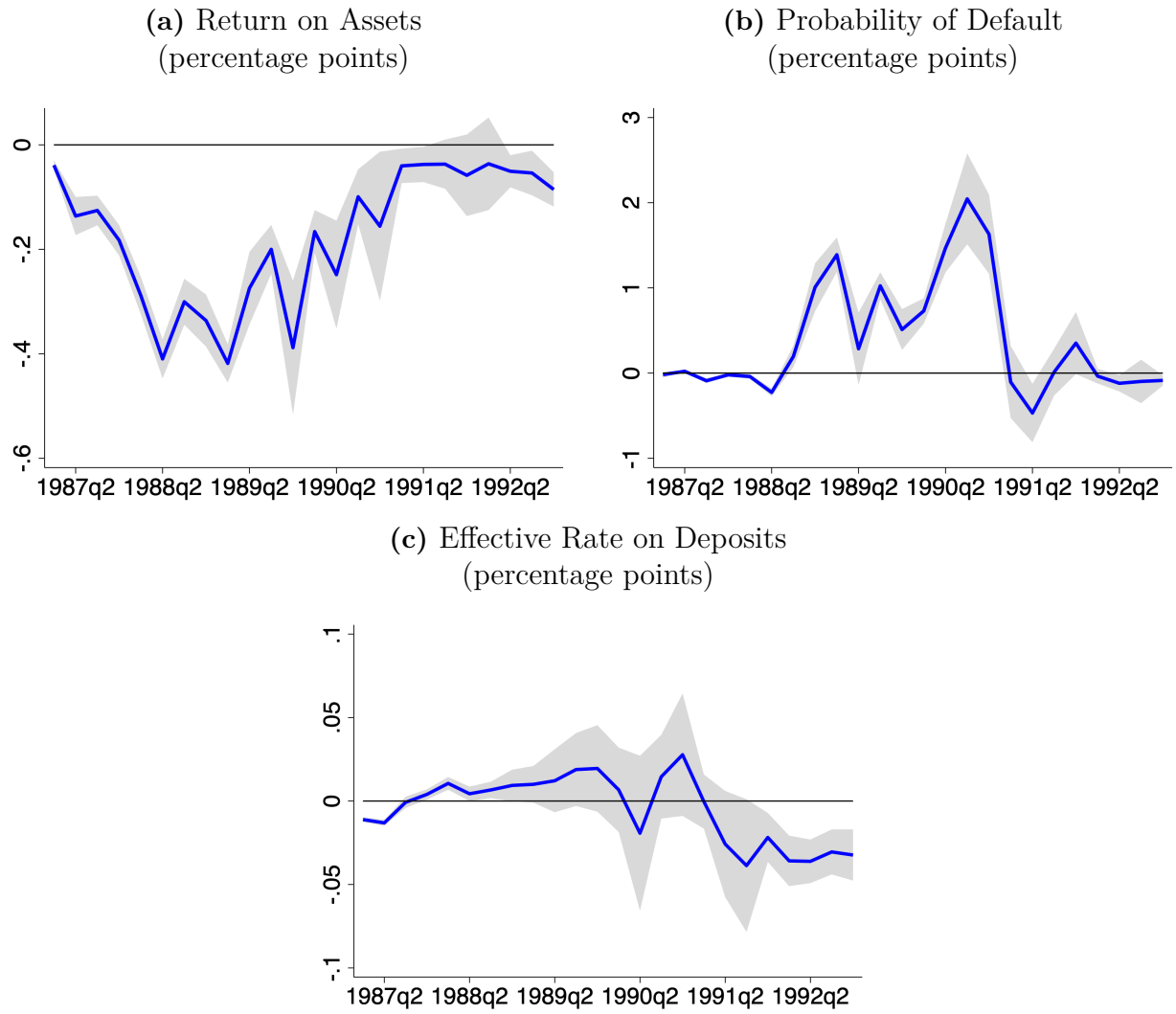
Notes: The figure shows median return on assets (percentage points) of S&Ls split by whether they are in the FHLB Ninth District (red) or not (blue) from 1976 to 1992. Return on assets at t is defined as annualized net income at t divided by average total assets at t and $t-1$. The shaded regions represent the 25th and 75th percentiles. Vertical dashed lines indicate key episodes preceding the headquarters relocation decision: the first marks the U.S. Government Accountability Office report of June 1981 (the full report can be found at https://www.gao.gov/assets/ggd-81-82.pdf.), and the second marks the actual relocation in September 1983.

Figure 7: Distribution of Exogenous Shock to Supervision Intensity (percentage points)



Notes: The figure maps the Ninth District Federal Home Loan Bank states, shaded by the intensity of the exogenous shock to examination intensity. The instrument exploits the relocation of the Ninth District headquarters as an exogenous shock to examination intensity, as described in Section 4.2.1. Darker shades (red) indicate states with the largest decline in examinations, corresponding to the strongest deregulatory shock.

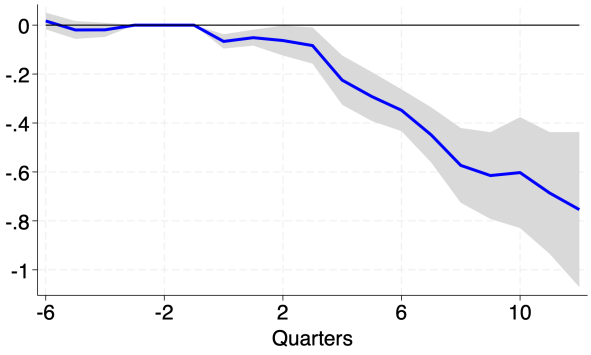
Figure 8: Impact of Exogenous Change in Supervision Intensity on S&Ls



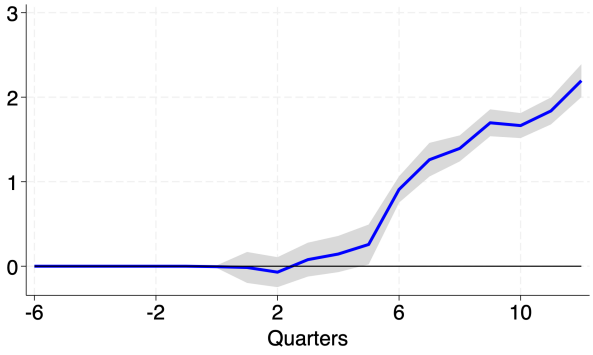
Notes: The figure plots the marginal effect of S&L risk-taking ($\hat{\delta}_1^t$) on key financial outcomes from 1987Q1 to 1992Q4, as outlined in equation 4. The first stage, described in equation 3, instruments for S&L risk-taking in 1986 using the interaction between S&L status and the decline in examinations following the relocation of the Ninth District Federal Home Loan Bank headquarters (see Section 4.2.1). The second stage, described in equation 4, estimates the effect of instrumented risk-taking on S&L outcomes. Risky S&L lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. County fixed effects are included in all specifications. Standard errors are clustered at the state level. The return on assets at t is defined as annualized net income at t divided by average total assets at t and $t-1$. The probability of default is captured by an indicator for S&L failure at t multiplied by 100.

Figure 9: Impact of Exogenously-Induced Competitive Pressure from S&Ls on Commercial Banks

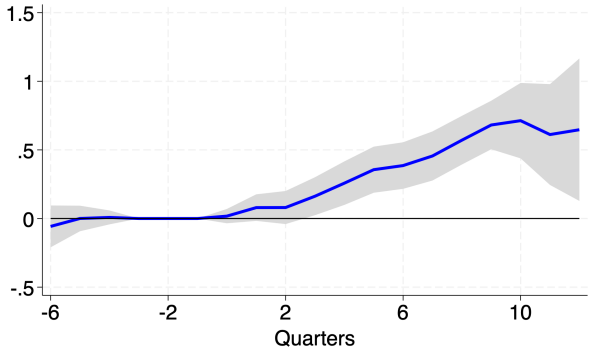
(a) Return on Assets
(percentage points)



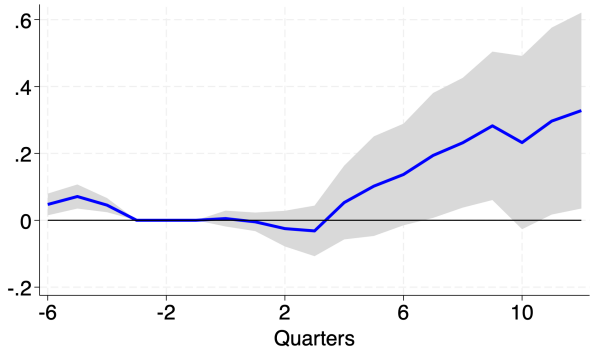
(b) Probability of Default
(percentage points)



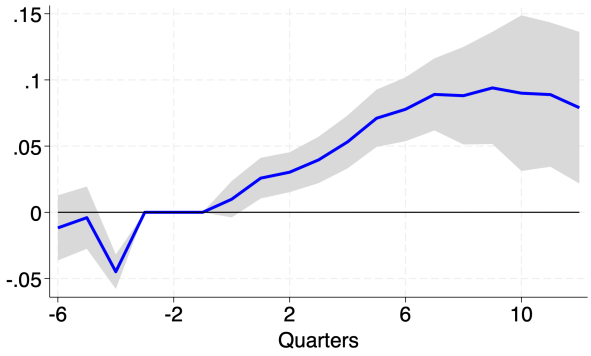
(c) Non-Performing Loans
(% Assets)



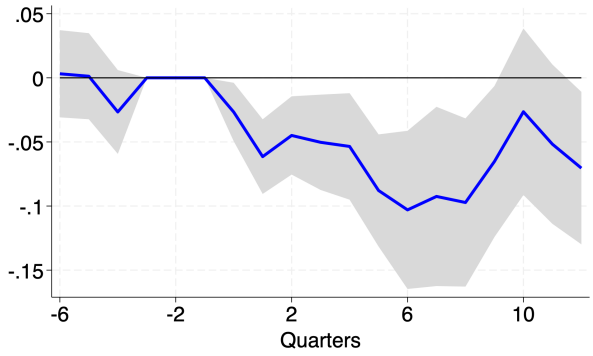
(d) Loan Loss Provisions
(% Assets)



(e) Effective Rate on Deposits
(percentage points)

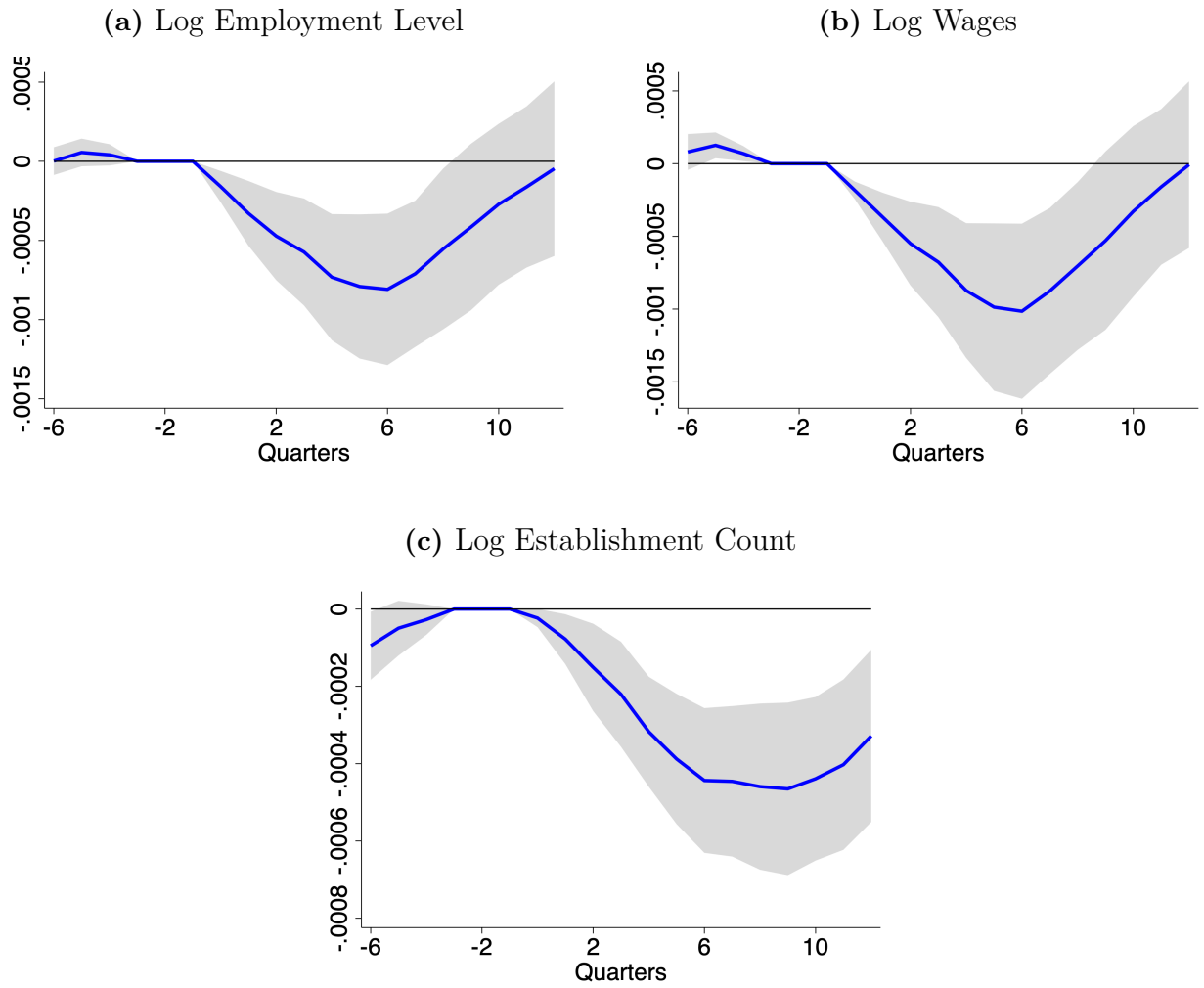


(f) Effective Rate on Loans
(percentage points)



Notes: The figure plots the marginal effect of S&L risk-taking on low-capital banks ($\hat{\delta}_2^h$) for key financial outcomes and additional asset quality outcomes for up to 12 quarterly horizons, estimated by the LP-IV in equation 6. The first stage exploits the relocation of the Ninth District Federal Home Loan Bank headquarters as an exogenous shock to examination intensity (see Section 4.2.1). The change in examinations is used to instrument for the county-level share of risky S&L lending being in the top quartile of the distribution, as described in equation 5. Risky S&L lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. County $\times$ quarter fixed effects are used in all specifications. Standard errors are clustered at the state level. The return on assets at t is defined as annualized net income at t divided by average total assets at t and $t-1$. The probability of default is captured by an indicator for bank failure at t multiplied by 100. Non-performing loans are measured as a share of total assets at t. The loan loss provision at t is computed as annualized loan loss provisions at t divided by average total assets at t and $t-1$. Effective rates on loans (deposits) at t are computed analogously as annualized interest income (expense) divided by the average stock of loans (deposits) at t and $t-1$.

Figure 10: Amplification of Real Effects due to Spillovers within the Financial Sector



Notes: The figure plots the marginal effect of the interaction between failed commercial banks and instrumented S&L risk-taking ($\hat{\beta}_3^h$) on county-level real outcomes (employment, wages, establishment counts) for up to 12 quarterly horizons, estimated by the LP-IV in equations 7, 8 and 9. The first stage instruments for the county-level share of risky S&L lending being in the top quartile of the distribution using the interaction between the pre-determined county-level share of low-capitalized banks and the decline in supervisory exam intensity at the state level during 1984–1985, as described in equation 7. As before, this exploits the relocation of the Ninth District Federal Home Loan Bank headquarters as an exogenous shock to examination intensity (see Section 4.2.1). The second stage regresses the change in outcome $Y_{c,t+h}$ relative to $Y_{c,t-1}$ on failed commercial banks, instrumented S&L risk-taking, and their interaction, with state × quarter fixed effects absorbing common regional shocks. Risky S&L lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. The share of low-capitalized banks is the county-level asset share of banks with below-median equity-to-assets ratios in 1983Q4. Standard errors are clustered to match variation in treatment, i.e. we cluster standard errors by county, but group counties with S&Ls in the 9th district by state given that they experienced shared treatment.

Table 1: Descriptive Statistics

	S&Ls			Commercial Banks		
	Mean	Median	SD	Mean	Median	SD
Total Assets (USD MN)	343.95	89.33	1457.44	217.32	40.40	2296.57
Return on Assets (%)	-0.11	0.51	3.41	0.69	0.98	1.71
Probability of Default (%)	1.07	0.00	10.29	0.23	0.00	4.75
Equity (% Assets)	4.05	4.89	8.00	8.97	8.23	3.49
Deposits (% Liabilities)	92.23	96.21	9.13	96.90	98.44	4.53
Asset Growth (%), YoY	10.12	4.63	43.92	10.62	6.07	73.48
Effective Rate on Deposits(%)	7.88	7.57	1.58	6.05	5.94	1.34
Risky Assets (% Assets)	11.33	7.58	11.85	.	.	.
Non-Performing Loans (% Assets)	.	.	.	1.37	0.84	1.66
Loan Loss Provisions (% Assets)	.	.	.	0.70	0.23	1.76
Loan-to-Deposit ratio	0.06	0.04	0.07	0.61	0.62	0.18
Securities (% Assets)	.	.	.	28.74	27.42	15.49
Real Estate Loans (% Total Loans)	.	.	.	42.82	42.08	19.92
Observations	85,543			399,179		

Notes: The table reports descriptive statistics for S&Ls and commercial banks over the sample period. Total assets are expressed in millions of USD. The return on assets at t is computed as annualized net income at t divided by average total assets at t and $t-1$. The probability of default is captured by an indicator for bank failure multiplied by 100. Equity is measured as a share of total assets. Deposits are measured as a share of total liabilities. Asset growth is computed year-over-year. The effective rate on deposits at t is computed as annualized interest expense at t divided by the average stock of deposits at t and $t-1$. Risky assets are defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets, and are only available for S&Ls. Non-performing loans, loan loss provisions, securities holdings, and real estate loan shares are only available for commercial banks. The loan-to-deposit ratio is computed as total loans divided by total deposits.

Table 2: Regulatory Timeline

Date	**Changes**
1974 and 1976	NOW accounts allowed in MA & NH and all of New England, respectively
1978	CDs above 10,000 exempted from Reg Q (banks and thrifts)
1979	The Federal Home Loan Bank Board (FHLBB) allowed S&Ls to invest up to 5% of their assets in commercial real estate loans and allowed ARMs for federally chartered thrifts
1980	The Depository Institutions Deregulation and Monetary Control Act (DIDMCA): – Phased out Reg Q over next 5 years – NOW accounts allowed nationwide – Raised deposit insurance to 100k for all accounts – Lowered minimum net worth requirement from 5 to range 3-6%
1981	DIDMCA: removal of interest rate ceilings on time deposits with maturities of 2.5 years or more.
1981	RAP-563c.14: allowed S&Ls to elect RAP instead of GAAP.
1982	Bank board lowered net worth requirement to 3%.
1982	The Garn-St Germain Depository Institutions Act: – Permitted S&Ls to invest in more asset classes, incl. ARMs – Allowed banks board to issue promissory notes to failing thrifts for a 'net worth certificate'
1983	DIDMCA: removal of interest rate ceilings on time deposits with maturities of 1.5 years or more.
1983	DIDMCA: removal of interest rate ceilings on time deposits with maturities of 1 year or more.
1984	DIDMCA: removal of interest rate ceilings on time deposits with maturities of 6 months or more.
1984	The Secondary Mortgage Market Enhancement Act: allowed S&Ls to sell mortgage-backed securities.
1985	DIDMCA: removal of interest rate ceilings on time deposits with maturities of 3 months or more.
1986	DIDMCA: removal of interest rate ceilings on all accounts
1987	Competitive Equality Banking Act (CEBA): provided $10.8bn to re-capitalize FSLIC, imposed capital standards but allowed continued regulatory forbearance.
1989	The Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA): – Restructured the regulatory framework for S&Ls, incl stricter capital requirements – Established the Resolution Trust Corporation (RTC)
1991	FDIC Improvement Act (FDICIA) – Introduced Prompt Corrective Action (PCA), least-cost resolution, risk-based insurance premiums, and stricter exam frequency.

Table 3: S&Ls Probability of Default, 1987-1992

	(1)	(2)	(3)	(4)	(5)	(6)
Asset Risk (%), 1986	0.0161***	0.0162***	0.0156***	0.0149***	0.0143***	0.0143***
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0008)	(0.0008)
Regulatory Capital (% Dep), 1983		-0.0061***	-0.0067***	-0.0087***	-0.0147***	-0.0145***
		(0.0019)	(0.0021)	(0.0021)	(0.0020)	(0.0020)
RAP-GAAP (% Dep), 1983			0.0343***	0.0350***	0.0347***	0.0345***
			(0.0040)	(0.0039)	(0.0038)	(0.0038)
Asset Growth (%), 1980-1983				0.0002***	0.0001***	0.0001***
				(0.0000)	(0.0000)	(0.0000)
Deposits Rate, 1983					0.0117**	0.0117**
					(0.0046)	(0.0046)
Log Total Assets, 1980						0.0020
						(0.0068)
Constant	0.0990***	0.1368***	0.1096***	0.1163***	0.0372	0.0142
	(0.0100)	(0.0164)	(0.0167)	(0.0167)	(0.0466)	(0.1028)
County FE	No	No	No	No	No	No
Observations	2684	2684	2684	2684	2684	2684
R-squared	0.180	0.184	0.217	0.231	0.251	0.251

Notes: The table reports OLS estimates of the probability of default for S&Ls, defined as failure in any quarter between 1987 and 1992. Risky assets is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. Regulatory capital is defined as capital under RAP accounting, following the regulatory changes introduced by 563c.1 in 1981 (see Table 2), expressed as a share of the stock of deposits. RAP-GAAP is defined as the difference between capital computed under RAP and GAAP accounting, also expressed as a share of the stock of deposits. Asset growth is defined as the growth in total assets from end-of-year 1980 to end-of-year 1983. The effective deposit rate is defined as annualized interest expense on deposits at t as a share of the average stock of deposits at t and $t-1$. Robust standard errors in parentheses. Significance: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table 4: Commercial Banks Probability of Default, 1985–1992

	(1)	(2)	(3)	(4)	(5)	(6)
Loan-to-Deposit Ratio, 1984	0.2740***	0.2699***	0.2633***	0.2504***	0.2480***	0.2630***
	(0.0149)	(0.0152)	(0.0151)	(0.0154)	(0.0154)	(0.0157)
Equity (% Assets), 1984		-0.0013	-0.0015*	-0.0059***	-0.0065***	-0.0084***
		(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0009)
Effective Rate on Deposits, 1984			0.0060***	0.0033**	0.0055***	0.0057***
			(0.0014)	(0.0014)	(0.0014)	(0.0014)
Asset Growth (YoY), 1984				0.0003**	0.0003**	0.0003**
				(0.0001)	(0.0001)	(0.0001)
Real Estate Loans (% Assets), 1984					-0.0009***	-0.0007***
					(0.0001)	(0.0001)
Log Total Assets, 1984						-0.0136***
						(0.0022)
Constant	-0.1033***	-0.0889***	-0.1307***	-0.0696***	-0.0510***	0.0949***
	(0.0081)	(0.0121)	(0.0164)	(0.0178)	(0.0183)	(0.0306)
Observations	12,754	12,754	12,754	12,410	12,410	12,410
R-squared	0.030	0.030	0.033	0.038	0.042	0.046
County FE	No	No	No	No	No	No

Notes: The table reports OLS estimates of the probability of default for commercial banks, defined as failure in any quarter between 1985 and 1992. The loan-to-deposit ratio is defined as the stock of loans over the stock of deposits. Equity is expressed as a share of total assets. The effective deposit rate is defined as annualized interest expense on deposits at t as a share of the average stock of deposits at t and $t-1$. Asset growth is defined as the year-on-year growth in total assets. Real estate loans are expressed as a share of the stock of total assets. Robust standard errors in parentheses. Significance: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Table 5: First Stage: Change in Supervision Intensity and Risk-Taking of S&Ls

	(1) Asset Risk (%), 1986
Change in Exams (pp.) x S&L	0.534***
	(0.149)
S&L	-13.09***
	(1.027)
LD.ROA (%)	0.0282
	(0.0633)
LD2.ROA (%)	-0.0407
	(0.0642)
Regulatory Capital (% Dep), 1983	-0.165
	(0.105)
RAP-GAAP (% Dep), 1983	0.301***
	(0.100)
Asset Growth (%), 1980-1983	0.00216*
	(0.00110)
Deposits Rate, 1983	0.169*
	(0.0885)
Log Total Assets, 1980	-0.231
	(0.177)
Unemployment Rate, 1984	0.756**
	(0.302)
Constant	17.71***
	(1.089)
County FE	Yes
Observations	13,452
F-Stat	12.88

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The table reports the first stage estimate ($\hat{\beta}_1$) from equation 3. The change in examinations follows the instrument described in Section 4.2.1, exploiting the relocation of the Ninth District Federal Home Loan Bank headquarters as an exogenous shock to examination intensity. Risky assets is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. Regulatory capital is defined as capital under RAP accounting, following the regulatory changes introduced by 563c.1 in 1981 (see Table 2), expressed as a share of the stock of deposits. RAP-GAAP is defined as the difference between capital computed under RAP and GAAP accounting, also expressed as a share of the stock of deposits. Asset growth is defined as the growth in total assets from end-of-year 1980 to end-of-year 1983. The effective rate on deposits is defined as annualized interest expense on deposits at t as a share of the average stock of deposits at t and $t-1$. County fixed effects are included in this specification. Standard errors are clustered at the state level.

Table 6: Spillover Effects at Horizons 4 and 8

	h = 4		h = 8	
	Non-IV	IV	Non-IV	IV
Return on Assets (%)	-0.088***	-0.225***	-0.123***	-0.573***
	(0.031)	(0.060)	(0.043)	(0.086)
Probability of Default (%)	0.140*	0.144	0.273***	1.394***
	(0.074)	(0.147)	(0.081)	(0.129)
Loans Rate (%)	-0.010	-0.054	-0.070**	-0.097*
	(0.023)	(0.034)	(0.028)	(0.049)
Effective Rate on Deposits (%)	0.015	0.053***	0.015	0.088***
	(0.010)	(0.012)	(0.013)	(0.023)
NPL (% Loans)	0.066	0.258**	0.173*	0.571***
	(0.080)	(0.121)	(0.101)	(0.137)
Loan Loss Provisions (% Assets)	0.039	0.053	0.044	0.232**
	(0.030)	(0.067)	(0.040)	(0.115)

Notes: Non-IV columns report $\hat{\beta}_4$ from equation 2; IV columns report $\hat{\delta}_2^h$ from equation 6. The first stage, described in equation 5, exploits the relocation of the Ninth District Federal Home Loan Bank headquarters as an exogenous shock to examination intensity (see Section 4.2.1). The change in examinations is used to instrument for the interaction between low-capitalization and the county-level share of risky S&L lending. Risky S&L lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. Return on assets at t is defined as annualized net income at t divided by average total assets at t and $t-1$. Effective rates on loans (deposits) at t are computed analogously as annualized interest income (expense) divided by the average stock of loans (deposits) at t and $t-1$. Non-performing loans is computed as a share of the stock of assets. Loan loss provisions at t is also defined as annualized flow divided by average stock of assets at t and $t-1$. First-stage F-statistics are all above 20 (range: 22.46 to 26.13). Non-IV columns cluster at the county level; IV columns cluster at the state level. All regressions absorb county-quarter fixed effects. Significance: *** p <0.01, ** p <0.05, * p <0.10.

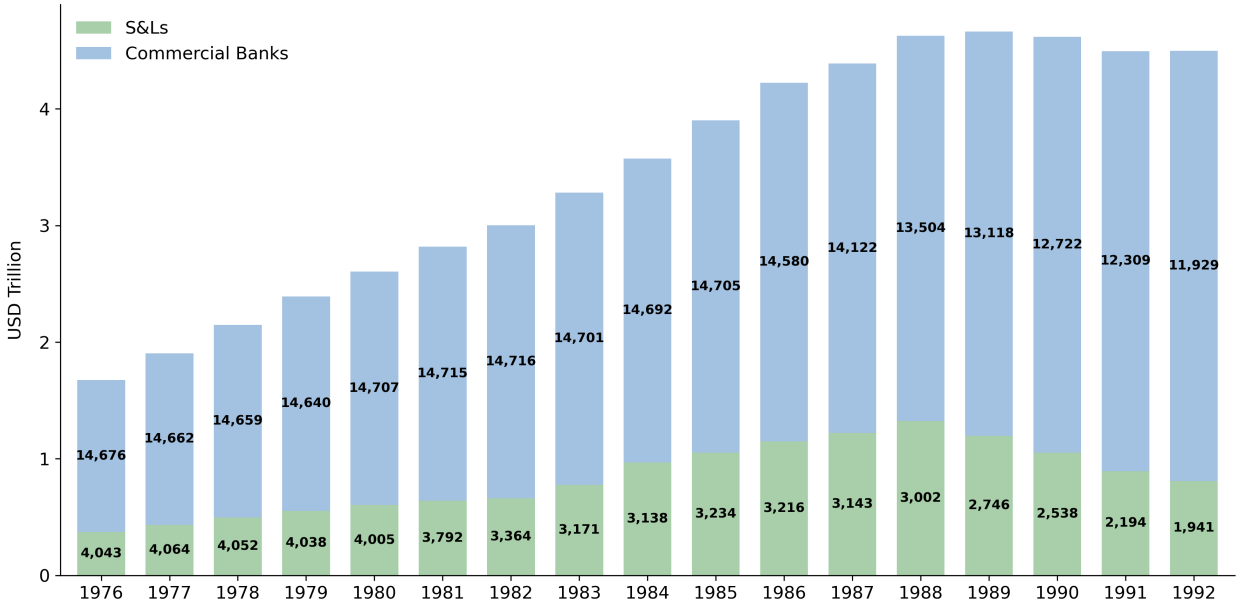
Table 7: Spillover Effects – Robustness (Horizon 8, IV Only)

	Baseline	Probit	Capital Threshold +10%	Capital Threshold -10%	Risky S&L Threshold +10%	Risky S&L Threshold -10%	Alt. Winsorization
Return on Assets (%)	-0.573***	.	-0.729***	-0.847***	-0.492***	-0.724***	-0.408***
	(0.086)	(.)	(0.117)	(0.087)	(0.075)	(0.115)	(0.061)
Probability of Default (%)	1.394***	0.439**	1.553***	2.039***	1.093***	1.757***	1.393***
	(0.129)	(0.200)	(0.115)	(0.174)	(0.084)	(0.179)	(0.130)
Loans Rate (%)	-0.097*	.	-0.163***	-0.212***	-0.092**	-0.116**	-0.049
	(0.049)	(.)	(0.044)	(0.045)	(0.043)	(0.056)	(0.034)
Effective Rate on Deposits (%)	0.088***	.	0.093***	0.147***	0.070***	0.109***	0.059***
	(0.023)	(.)	(0.021)	(0.024)	(0.019)	(0.025)	(0.019)
NPL (% Loans)	0.571***	.	0.891***	1.039***	0.469***	0.745***	0.487***
	(0.137)	(.)	(0.131)	(0.153)	(0.114)	(0.159)	(0.126)
Loan Loss Provisions (% Assets)	0.232**	.	0.373***	0.525***	0.209**	0.299**	0.189**
	(0.115)	(.)	(0.134)	(0.104)	(0.095)	(0.149)	(0.091)
Liab. Rate (%)	0.063**	.	0.063**	0.118***	0.048**	0.080***	0.044**
	(0.024)	(.)	(0.025)	(0.027)	(0.020)	(0.027)	(0.021)
Int Inc (% Assets)	-0.098*	.	-0.147***	-0.170***	-0.093**	-0.125*	-0.086**
	(0.051)	(.)	(0.049)	(0.058)	(0.042)	(0.065)	(0.036)

Notes: The table reports $\hat{\delta}_2^h$ from equation 6. The first stage, described in equation 5, exploits the relocation of the Ninth District Federal Home Loan Bank headquarters as an exogenous shock to examination intensity (see Section 4.2.1). The change in examinations is used to instrument for the interaction between low-capitalization and the county-level share of risky S&L lending. Risky S&L lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. Return on assets at t is defined as annualized net income at t divided by average total assets at t and $t-1$. Effective rates on loans (deposits) at t are computed analogously as annualized interest income (expense) divided by the average stock of loans (deposits) at t and $t-1$. Non-performing loans is computed as a share of the stock of assets. Loan loss provisions at t is also defined as annualized flow divided by average stock of assets at t and $t-1$. All regressions cluster at the state level and absorb county-quarter fixed effects. Significance: *** p <0.01, ** p <0.05, * p <0.10.

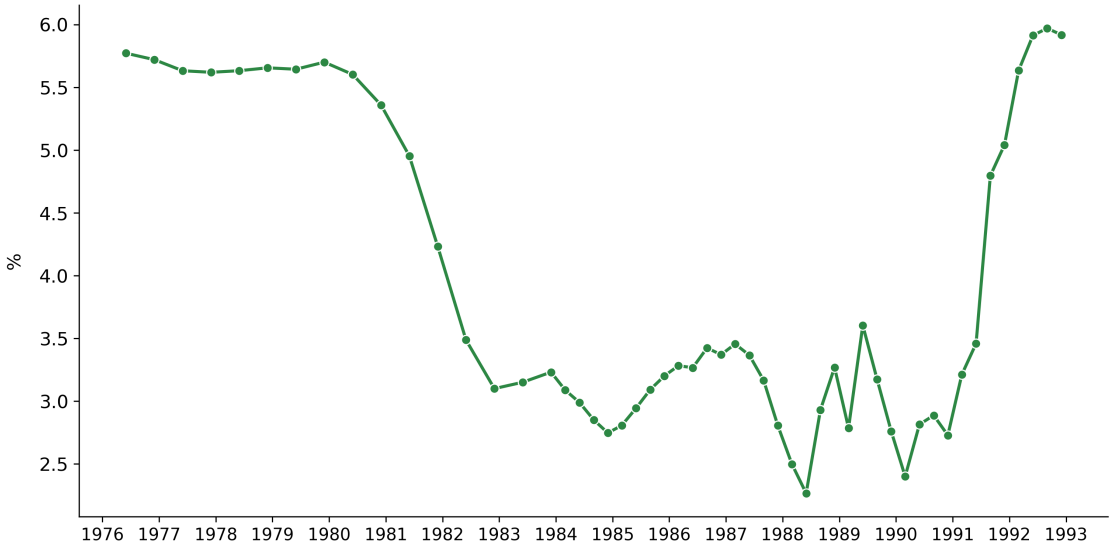
Appendix: Additional Figures and Tables

Figure A1: Total Assets of Commercial Banks and S&Ls



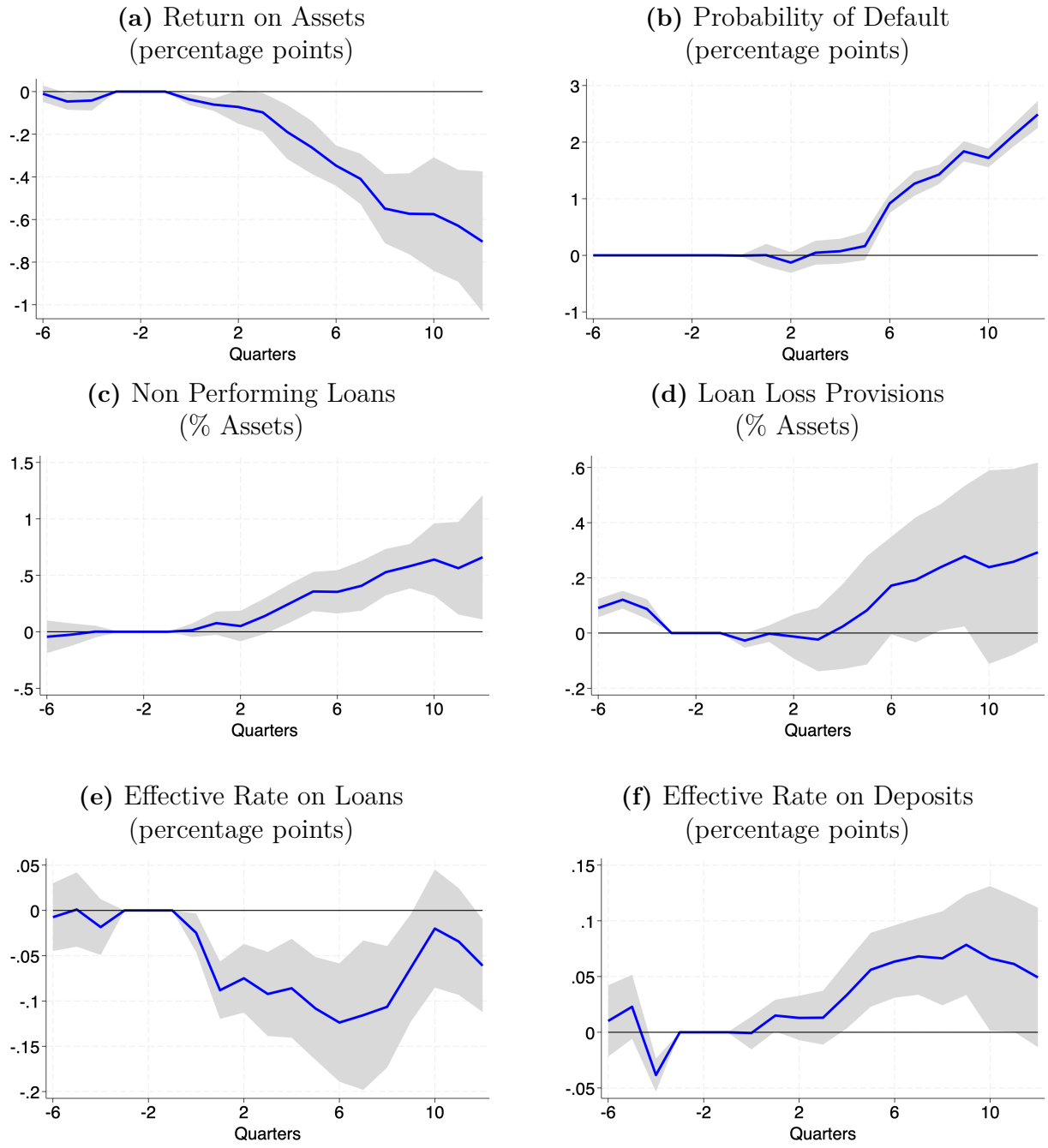
Notes: The figure shows the market size of commercial banks (blue) and S&Ls (green), measured by total assets (USD trillions) on the left axis, covering the period from 1976 to 1992. The numbers displayed within each bar indicate the count of institutions of that entity type in that year.

Figure A2: Capital (% Assets) - S&Ls



Notes: The figure displays quarterly regulatory capital as a share of total assets for S&Ls, covering the period from 1976–1993. Regulatory capital is measured as GAAP net worth, for which data are available throughout the entire sample period. Note that following 563c.1 regulatory changes in 1981, some institutions were permitted to also report capital under the more lenient Regulatory Accounting Principles (RAP), which allowed for higher reported net worth relative to GAAP. See Table 2 for a full regulatory timeline.

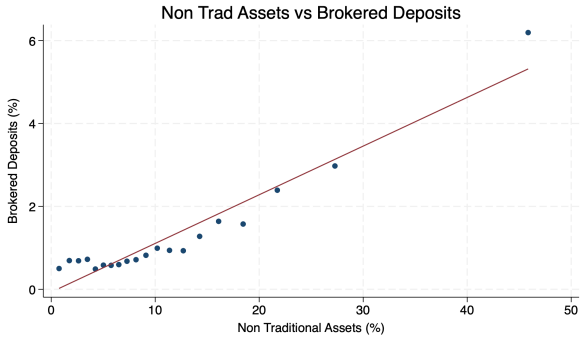
Figure A3: Impact of Exogenously-Induced Liability-Side Competitive Pressure from S&Ls on Commercial Banks



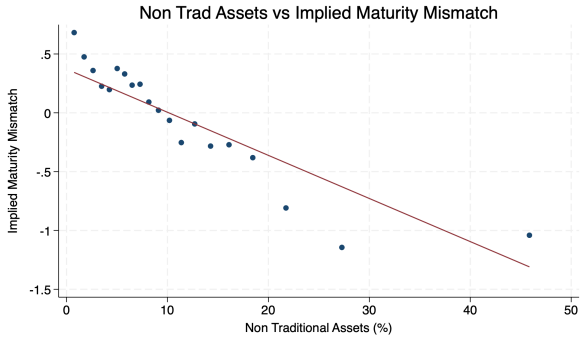
Notes: The figure plots the marginal effect of S&L liability-side risk-taking on low-capital banks ($\hat{\delta}_2^h$) for additional asset quality outcomes up to 12 quarterly horizons, estimated by the LP-IV in equation 6. The instrument exploits the relocation of the Ninth District Federal Home Loan Bank headquarters as an exogenous shock to examination intensity (Section 4.2.1), instrumenting for whether county-level S&L brokered deposits as a share of total assets falls in the top quartile (equation 5). All specifications include county × quarter fixed effects; standard errors are clustered at the state level. Return on assets, effective loan rates, and effective deposit rates are computed as annualized income or expense flows divided by the average stock at t and $t-1$. The probability of default is an indicator for bank failure multiplied by 100. Non-performing loans and loan loss provisions are measured as shares of total assets, with provisions annualized.

Figure A4: Relationship Between S&L Asset-Side Risk and Alternative Risk Measures

(a) Brokered Deposits

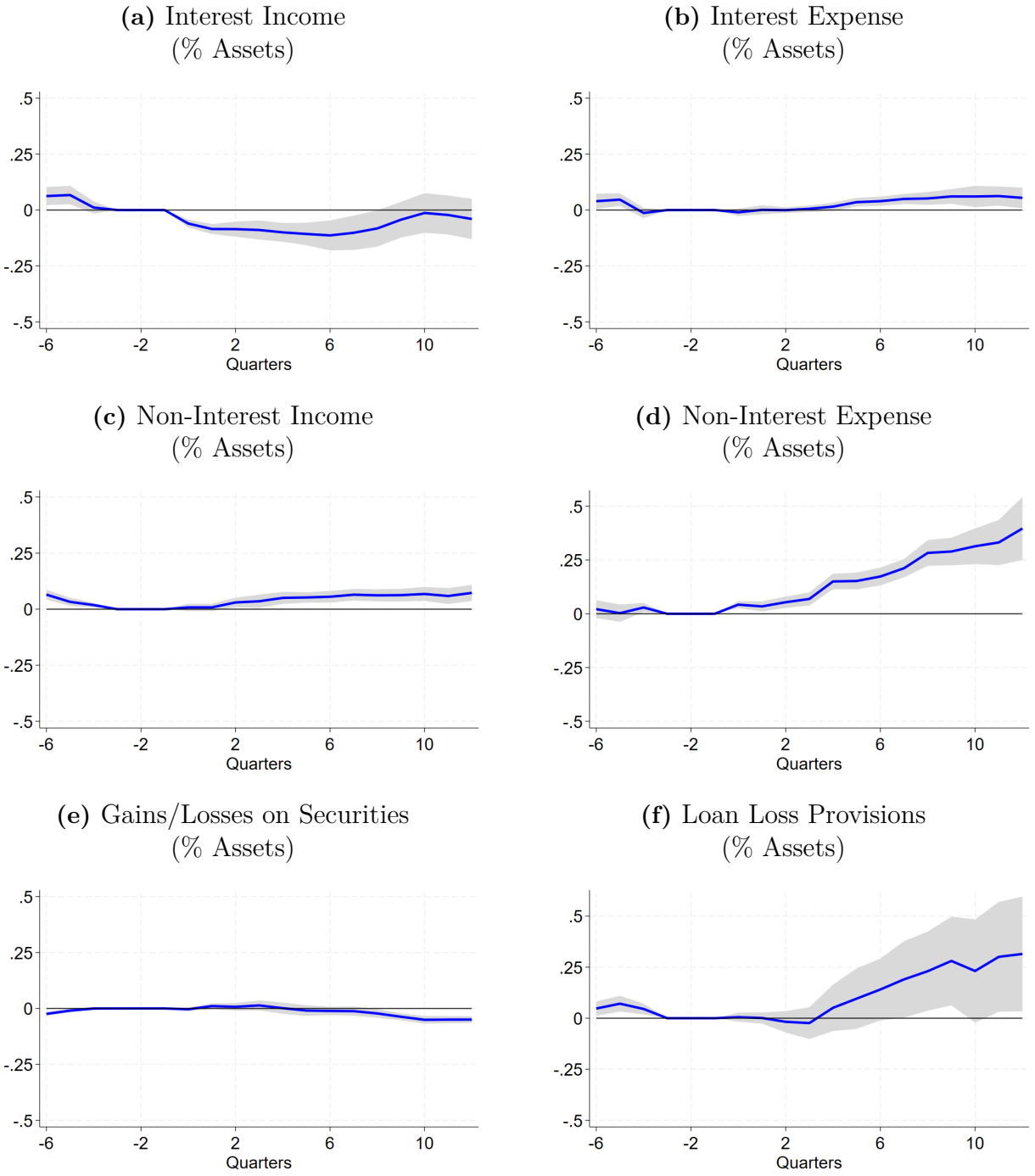


(b) Implied Maturity Mismatch



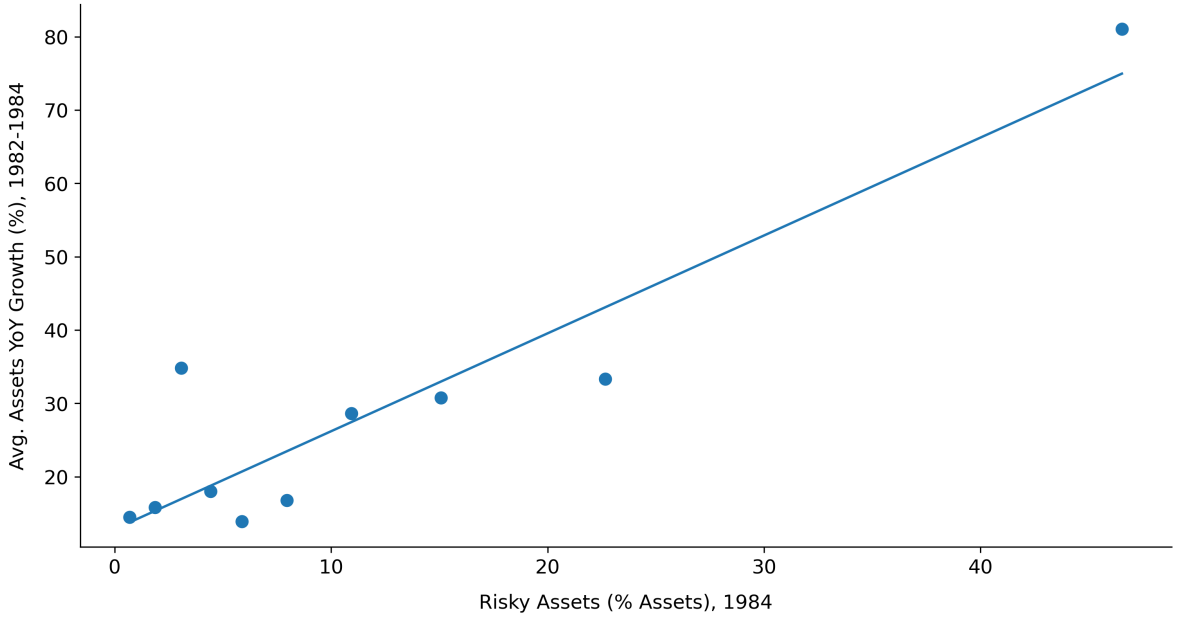
Notes: The figure shows binscatter plots of county-level risky S&L behavior, partitioning observations into 20 equal-sized bins along the x-axis and plotting the mean of each variable within each bin. *Risky Assets* is measured as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. *Brokered Deposits* (left) is measured as brokered deposits as a share of total assets. *Implied Maturity Mismatch* (right) is county-level return on assets, computed as annualized income flows divided by the average stock at t and $t-1$.

Figure A5: Decomposition of Return on Assets



Notes: The figure plots the marginal effect of S&L risk-taking on low-capital banks ($\hat{\delta}_2^h$) across subcategories of the return on assets for up to 20 quarterly horizons, estimated by the LP-IV in equation 6. The decomposition includes interest income, interest expense, non-interest income, non-interest expense, gains and losses on securities, and loan loss provisions. All rates at t are computed as annualized flow at t as a share of the average stock of assets at t and $t-1$. The first stage exploits the relocation of the Ninth District Federal Home Loan Bank headquarters as an exogenous shock to examination intensity (see Section 4.2.1), using the resulting change in examinations to instrument for the county-level share of risky S&L lending being in the top quartile of the distribution, as described in equation 5. Risky S&L lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets. County × quarter fixed effects are used in all specifications. Standard errors are clustered at the state level.

Figure A6: Asset Growth, YoY vs Risky Assets



Notes: The figure displays a binscatter of average year-over-year asset growth over 1982–1984 (y-axis) against risky lending (x-axis) in 1984 for S&Ls, with 10 equal-sized bins. Risky lending is defined as construction loans, land loans, consumer loans, and commercial mortgages as a share of total assets.