

CAITLIN CONNER

Proposal and Comment Information

Title: Proposed Revisions to the Federal Reserve Policy on Payment System Risk and the Guidelines for Account and Services Requests, OP-1878

Comment ID: FR-2026-0013-01-C26

Submitter Information

Name: Caitlin Conner

Submitted Date: 07/16/2026

I am writing to express my strong opposition to the proposed revisions under Docket No. OP-1878. The Board must not establish a framework granting "Payment Accounts" direct core ledger settlement access—specifically through Fedwire, FedNow, and the National Settlement Service (NSS)—to non-depository, non-federally insured Tier 3 financial institutions, fintech platforms, and stablecoin issuers. Bypassing heavily supervised commercial bank intermediaries exposes the nation's core payment rails to severe run contagion, cyber exploitation, and systemic compliance gaps. Rather than adjusting payment system risk policies to accommodate these structurally volatile entities, the Board must maintain an absolute and unbreakable firewall.

This proposal rewards dangerous regulatory and capital arbitrage, ignoring the fact that financial innovation must occur within established, federally supervised charter frameworks. The risks of bypassing depository firewalls are not theoretical; the catastrophic collapse of fintech middleware provider Synapse Financial Technologies, which locked 100,000 retail consumers out of \$265 million with a \$65 million to \$95 million bank shortfall, proves non-depository fintechs lack the ledger integrity, capital reserves, and crisis-management structures needed to protect user deposits. Furthermore, as detailed in New York Fed Staff Report No. 1196, granting capital-starved nonbank affiliates direct access to the Federal Reserve ledger establishes a direct, unbuffered contagion pipeline where sudden liquidity squeezes can dump liabilities directly onto the Fed's balance sheet.

The Board's proposed guardrails—including the activity-based closing balance cap of up to \$1 billion—are structurally short-sighted and leave the system fully exposed to operational and cyber risks. Connecting opaque, unmonitored Tier 3 platforms to 24/7 instant clearing networks invites severe national security threats, particularly in light of Joint Cybersecurity Advisory AA26-194A warning that state-sponsored actors actively target the financial services sector. Finally, under 12 U.S.C. § 461(b), Reserve Bank services are strictly restricted to depository institutions; bypassing this statutory boundary to create custom "Payment Accounts" for non-depository fintechs is an ultra vires expansion of the Board's authority and constitutes "arbitrary and capricious" rulemaking under the Administrative Procedure Act.

I strongly urge the Board of Governors to reject the proposed revisions under Docket No. OP-1878. A comprehensive, fully cited, and detailed brief detailing these arguments, empirical data, and statutory violations has been uploaded as an attachment to this submission for the Board's formal review.

Respectfully submitted,
Caitlin Conner
Citizen & Taxpayer of the United States of America

July 16, 2026

Benjamin W. McDonough, Secretary Board of Governors of the Federal Reserve
System 20th Street and Constitution Avenue, NW Washington, DC 20551

Re: Public Comment on Proposed Revisions to the Federal Reserve Policy on Payment System Risk and the Guidelines for Account and Services Requests, **Docket No. OP-1878**

Dear Secretary McDonough,

I am writing to express my strong and unequivocal opposition to the proposed revisions under Docket No. OP-1878 (Federal Reserve System, 2026). The Board of Governors must not establish a framework for "Payment Accounts" designed to grant direct core ledger clearing and settlement access—specifically through Fedwire, FedNow, and the National Settlement Service—to non-depository, non-federally insured Tier 3 financial institutions, fintech platforms, and digital asset or stablecoin issuers (Federal Reserve System, 2026). Rather than adjusting payment system risk policies to accommodate these structurally volatile entities, the Board must maintain an absolute and unbreakable firewall. Bypassing heavily supervised commercial bank intermediaries exposes the nation's core financial rails to severe systemic run contagion, cyber exploitation, and catastrophic compliance gaps.

This opposition is not aimed at shielding legacy commercial banks from market competition or technological progress. Innovation in financial services must occur within the established, legally authorized charter frameworks that protect the public. If fintech platforms and digital asset issuers wish to innovate and settle payments directly at the central bank, they are entirely free to apply for a commercial bank or credit union charter, accept comprehensive federal supervision, and compete on a level playing field. What they seek instead is a highly extractive form of regulatory arbitrage: they want the apex privilege of settling transactions directly at the central bank without bearing any of the costly regulatory mandates, capital requirements, or consumer protection frameworks that traditional depository institutions are legally forced to maintain.

Proponents of this proposal and related legislative efforts frequently leverage the argument of "financial inclusion" to justify direct central bank access, claiming that traditional banking intermediaries extract high fees and slow down transactions for underserved consumers. This argument is fundamentally hollow. If these multi-billion-dollar fintech conglomerates and digital coin networks genuinely prioritized protecting and serving marginalized communities, they would adopt a member-owned, democratic, non-profit structure—specifically, the credit union model. Credit unions exist entirely to serve their members, operate under the strict oversight of the National Credit Union Administration, and maintain the necessary regulatory compliance to safely access the payment system.

The severe consumer and system risks of bypassing depository firewalls are not

theoretical. The catastrophic collapse of the fintech middleware provider Synapse Financial Technologies, Inc. serves as a stark warning. When Synapse collapsed, its poorly managed and unreconciled internal payment ledgers left more than 100,000 retail consumers locked out of approximately \$265 million in funds. Bankruptcy trustee Jelena McWilliams and partnering banks subsequently identified a staggering shortfall of between \$60 million and \$90 million between what partner banks held and what Synapse's internal ledger expected. This structural disaster, which prompted the Consumer Financial Protection Bureau to file a Stipulated Final Judgment and Complaint (Consumer Financial Protection Bureau, 2025) and the Financial Industry Regulatory Authority to initiate formal enforcement actions against former executives for total failure of cash management supervision (Financial Industry Regulatory Authority, 2025), proves that non-depository fintech firms systematically lack the basic ledger integrity, capital reserves, and crisis-management structures necessary to guarantee the safety of user deposits. Granting similarly structured, non-federally insured entities direct access to the Federal Reserve's real-time settlement rails is a recipe for automated consumer ruin.

Furthermore, this proposal rewards dangerous capital arbitrage within corporate groups, ignoring how bank holding companies systematically manage risk between their affiliates. As detailed by economists Nicola Cetorelli and Srikant Kundu in the Federal Reserve Bank of New York's Staff Report Number 1196, *Regulatory Arbitrage Within the Firm*, a substantial portion of the shadow banking sector—amounting to approximately one-quarter of all U.S. nonbank financial assets—actually resides directly inside bank holding companies (Cetorelli & Kundu, 2026). This creates an active, hidden channel for internal regulatory arbitrage (Cetorelli & Kundu, 2026). Following the post-crisis implementation of Basel III capital requirements, bank holding companies did not primarily issue expensive external equity to meet stricter rules (Cetorelli & Kundu, 2026). Instead, they utilized internal capital markets to extract equity from their lightly regulated nonbank subsidiaries and redeployed it directly to their heavily regulated depository banks (Cetorelli & Kundu, 2026).

Nonbank subsidiaries act as highly efficient internal reservoirs because they carry disproportionately high equity-to-asset ratios, holding a median of sixty-nine percent equity compared to just ten percent for traditional banks (Cetorelli & Kundu, 2026). By extracting this capital upstream, bank subsidiaries successfully built five to eight percentage points more excess capital (Cetorelli & Kundu, 2026). However, the consolidated organization's overall equity, assets, and lending remained entirely unchanged (Cetorelli & Kundu, 2026). This structural hollowing out has caused a severe divergence in risk and stability within the same corporate umbrella (Cetorelli & Kundu, 2026). While the affiliated banks became safer on paper, their stripped nonbank subsidiaries experienced declining capital ratios, deteriorating credit quality, higher internal funding costs, and rising default risks (Cetorelli & Kundu, 2026). To offset these pressures, these nonbanks shifted aggressively away from equity-intensive activities and into highly leveraged, volatile consumer lending (Cetorelli & Kundu, 2026).

Granting these structurally capital-starved, stripped nonbank affiliates direct access to

the Federal Reserve ledger establishes an unbuffered pipeline for systemic contagion (Cetorelli & Kundu, 2026). Parent organizations remain contractually and reputationally exposed to their nonbank affiliates, maintaining implicit liabilities to rescue them in times of distress (Cetorelli & Kundu, 2026). Under severe stress simulations calibrated to 2008-scale shocks, four to six percent of bank holding companies would completely exhaust their entire capital buffers attempting to recapitalize their failing nonbank subsidiaries (Cetorelli & Kundu, 2026). Allowing these fragile nonbank platforms direct access to the central bank ledger would enable rapid, automated liquidity runs that bypass depository firewalls and dump systemic liabilities directly onto the Federal Reserve's balance sheet (Cetorelli & Kundu, 2026).

The Board may argue that its proposed guardrails within OP-1878, such as denying intraday and overnight overdraft capacity, offering zero interest, and banning participation in Excess Balance Accounts, are sufficient to mitigate these dangers (Federal Reserve System, 2026). Additionally, the Board's companion proposal to amend Regulation A to explicitly bar Payment Account holders from access to discount window credit reveals that the Fed itself recognizes the structural fragility and lack of backstop safety net in these entities (Board of Governors, 2026). However, the proposed activity-based closing balance cap of up to one billion dollars per account completely contradicts the Fed's claim that these accounts are strictly limited or won't act as a systemic hazard (Federal Reserve System, 2026). Replacing the previous asset-based caps with a massive one billion dollar activity-based cap is a dangerous concession that permits an astronomical accumulation of uninsured, highly volatile liabilities directly on the central bank's core ledger (Federal Reserve System, 2026). This structural danger is compounded by the fact that the Federal Reserve must explicitly exclude FedACH services from these accounts because the Fed's batch-processing architecture cannot support automated, real-time overdraft-prevention controls, and restricts Fedwire Securities Service access strictly to transfers free of payment (Federal Reserve System, 2026). Consequently, payment flows will be compressed entirely into ultra-high-velocity rails like FedNow and Fedwire, accelerating run speeds. While these parameters limit credit and liquidity risk for the Reserve Banks themselves, they leave the broader financial system completely exposed to catastrophic operational and fraud risks (Association for Financial Professionals, 2026). A state-sponsored hacker or automated fraud syndicate does not care about a one billion dollar balance cap; they can still use a single compromised fintech endpoint to execute hundreds of rapid-velocity payments that drain downstream participants instantly before operators can manually intervene.

Equally concerning is the proposal's self-imposed target for Reserve Banks to complete reviews of Payment Account access requests within ninety calendar days (Federal Reserve System, 2026). This accelerated review window is a dangerous concession to relentless fintech lobbying that compromises national security and regulatory integrity. To pave the way for this expedited pipeline, the Board has even encouraged Reserve Banks to pause all pending access decisions for Tier 3 institutions under the existing framework, effectively prioritizing this unbuffered alternative over comprehensive traditional reviews (Federal Reserve System, 2026). A ninety-calendar-day timeline is

structurally and operationally insufficient to perform comprehensive Anti-Money Laundering, Bank Secrecy Act, and operational resilience diligence on complex, opaque Tier 3 entities. The Board's belief that its due diligence framework can filter out bad actors within such a rushed timeframe ignores the stark operational realities of the nonbank sector. As the Financial Stability Board detailed in its latest monitoring reports, the Non-Bank Financial Intermediation sector expanded by nine and four-tenths percent in 2024, growing at double the pace of traditional banking, and now represents fifty-one percent of global financial assets (Financial Stability Board, 2025).

Despite its massive scale, the nonbank financial sector is plagued by critical data gaps (Financial Stability Board, 2025). Regulators currently lack the high-quality, standardized data necessary to monitor nonbank leverage, asset positions, and systemic exposures (Financial Stability Board, 2025). The vulnerabilities are so acute that the Financial Stability Board has had to establish a specialized Nonbank Data Task Force to conduct pilot studies just to begin to understand leveraged trading strategies in these markets (Financial Stability Board, 2025). It is operationally impossible for the Federal Reserve to perform rigorous, proactive due diligence within ninety days on entities whose underlying portfolios and transaction flows are fundamentally unmonitored, opaque, and prone to extreme data gaps (Financial Stability Board, 2025).

Connecting these opaque platforms to 24/7 instant clearing networks also creates an intolerable national security threat. Hostile nation-state actors and cybercriminal syndicates systematically target nonbank edge networks because they lack robust, enterprise-grade perimeter defenses. In Joint Cybersecurity Advisory AA26-194A, the Cybersecurity and Infrastructure Security Agency, the National Security Agency, and the Federal Bureau of Investigation explicitly warned that Russian government-sponsored cyber actors are actively exploiting public-facing network devices to target critical sectors, specifically highlighting the financial services sector (Cybersecurity and Infrastructure Security Agency, 2026). By bypassing traditional depository institutions, which act as heavily fortified cybersecurity and fraud firewalls, the Federal Reserve is effectively extending its perimeter to these soft targets. Additionally, North Korea's state-sponsored Lazarus Group continues to carry out highly sophisticated cyber-heists targeting cryptocurrency and fintech providers to generate revenue and bypass global sanctions (Federal Bureau of Investigation, 2026).

Finally, the proposed framework directly conflicts with multiple established federal statutory boundaries. Under the Federal Reserve Act and the Monetary Control Act of 1980, Reserve Bank account services are strictly restricted to depository institutions under 12 U.S.C. Section 461(b). While the Board asserts that this proposal does not expand or change statutory legal eligibility, creating custom "special-purpose" Payment Accounts designed specifically to accommodate non-depository, non-federally insured entities constitutes an *ultra vires* regulatory bypass of the structural safety nets Congress intended to accompany central bank access (Federal Reserve System, 2026). This proposal also violates the Bank Holding Company Act of 1956 by eroding the legal separation between commercial commerce and the federal safety net, allowing non-bank commercial enterprises to establish direct pipelines to the central bank ledger.

Furthermore, it creates severe Bank Secrecy Act compliance loopholes by allowing nonbanks to bypass robust, bank-supervised anti-money laundering and sanctions screening. Ultimately, creating a dual-track system that fast-tracks access for volatile Tier 3 nonbanks while heavily regulating traditional depository institutions constitutes arbitrary and capricious rulemaking under Section 706 of the Administrative Procedure Act.

For these reasons, the Federal Reserve must prioritize safety, compliance, and statutory law over transaction speed. I strongly urge the Board of Governors to reject the proposed revisions under Docket No. OP-1878 and deny direct payment and master account access to all non-depository, non-federally insured institutions.

Respectfully submitted,

Caitlin Conner, Citizen and Taxpayer of the United States of America.

References:

Association for Financial Professionals. (2026). *2026 AFP Payments Fraud and Control Survey Report*. <https://www.financialprofessionals.org/training-resources/resources/survey-research-economic-data/details/payments-fraud>

Board of Governors of the Federal Reserve System. (2026). *Regulation A: Extensions of Credit by Federal Reserve Banks* [Docket No. R-1894, RIN 7100-A112]. <https://www.federalreserve.gov/newsevents/pressreleases/files/other20260520a5.pdf>

Cetorelli, N., & Kundu, S. (2026). *Regulatory Arbitrage Within the Firm*. Federal Reserve Bank of New York Staff Report No. 1196 (Revised June 2026). https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1196.pdf?sc_lang=en

Consumer Financial Protection Bureau. (2025). *Consumer Financial Protection Bureau v. Synapse Financial Technologies, Inc.* (Case No. 25-cv-00912). <https://www.consumerfinance.gov/enforcement/actions/synapse-financial-technologies-inc/>

Cybersecurity and Infrastructure Security Agency. (2026). *Improve Router Hygiene to Protect Against Russian State-Sponsored Targeting* (Joint CSA AA26-194A). <https://www.cisa.gov/news-events/cybersecurity-advisories/aa26-194a>

Federal Reserve System. (2026). *Proposed Revisions to the Federal Reserve Policy on Payment System Risk and the Guidelines for Account and Services Requests* [Docket No. OP-1878]. <https://www.federalreserve.gov/apps/proposals/search?docTypes=Other%20Proposal>

Financial Industry Regulatory Authority. (2025). *Department of Enforcement v. Jeffrey Stanley and Mark Paverman*. <https://www.bankingdive.com/news/finra-charges->

[former-synapse-execs/759801/](#)

Financial Stability Board. (2025). *Global Monitoring Report on Non-Bank Financial Intermediation 2025* (covering 2024 data). <https://www.esrb.europa.eu/pub/nbfi/html/esrb.nbfi202509.en.html>



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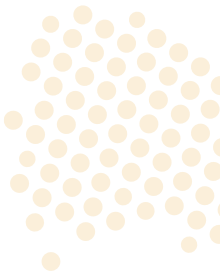
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Chair's foreword

Multilateralism in a shifting landscape

The publication of the Financial Stability Board (FSB) Annual Report – presented this year in an updated format – provides an opportunity to reflect on an eventful year, including my first nine months as Chair.



Andrew Bailey

Chair of the FSB
Governor, Bank of England

A handwritten signature of Andrew Bailey in white ink, written in a cursive style.

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Financial Stability Board

As this Annual Report shows, the FSB continued to deliver on many fronts in 2025. We finalised recommendations to address leverage in nonbank financial intermediation, assessed the implementation of crypto-asset and stablecoin recommendations, and examined vulnerabilities related to the use of AI in the financial sector.

Other questions remain. How can we accelerate progress in cross-border payments? What data do we need to manage cross-border risks and allow regulators and markets to prudently navigate and manage new risks? How can we ensure that our surveillance frameworks are robust enough to keep pace with a rapidly evolving financial system? These and other key questions will guide the next stages of our work.

The strategic review of implementation of G20 reforms that we launched in 2025 has revealed a slowdown in implementation. While cooperation among jurisdictions has strengthened since the GFC, full, timely, and consistent implementation across the broad range of reforms has not yet been achieved.

The next phase of the review will focus on identifying the root causes of this slowdown and finding ways to promote implementation more effectively. Enhancing the FSB's implementation monitoring framework will be a key priority, particularly as member jurisdictions modernise their regulatory and supervisory frameworks to address emerging risks and opportunities.

As we look ahead, we must not be afraid to challenge ourselves. The FSB must remain agile, continually adapting its ways of working to ensure it remains fit for purpose in a rapidly changing world. Encouragingly, despite increased fragmentation and polarisation, FSB members continue to find common ground, displaying their commitment to tackle shared challenges.

This commitment is critical because financial stability is a global public good. The risks we face do not respect borders. Multilateralism remains the only way we can effectively address them.

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Executive summary

Strengthening financial resilience

In 2025, the FSB continued its efforts to strengthen financial systems, enhance the stability of international financial markets and promote consistent and coherent implementation of policy recommendations across sectors and jurisdictions.

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Financial Stability Board

Ongoing surveillance highlights a range of long-standing vulnerabilities in the financial system. Sovereign debt levels have continued to rise and debt servicing costs are projected to increase further. A deterioration in confidence about debt sustainability could amplify volatility in government bond markets, posing risks to financial stability.

High corporate and household debt in some jurisdictions remains a concern, and repayment difficulties could spill over into the financial sector. Nonbank financial intermediation (NBFI) continues to expand at a faster pace than the banking sector, reflecting changes in the provision of financial services.

Complex interlinkages between banks and nonbanks, coupled with opacity, make a comprehensive assessment of vulnerabilities challenging, and private credit remains an area to monitor. Moreover, leverage in certain nonbank investors and liquidity mismatches in open-ended funds warrant continued monitoring.

At the same time, the broad rally in markets since April 2025 has led to elevated asset valuations and compressed risk premia to levels reminiscent of the period before the 2008 global financial crisis (GFC).

This increases the risk of sharp market corrections, with potential spillover effects on the broader financial system. Operational vulnerabilities are also a concern, notably potential outages at critical nodes in the financial system that could lead to widespread disruption. Finally, crypto-asset markets exhibited significant volatility in 2025, but financial system impacts remained limited despite growing interlinkages with the broader financial system.

The FSB, through its membership and cooperation with international standard setting bodies, continues to promote financial stability and respond to emerging vulnerabilities. Work to address the financial stability risks associated with leverage in NBFI was finalised, with recommendations aimed at interlinkages between leveraged nonbanks and systemically important financial institutions providing the leverage.

In carrying out the NBFI work programme, the FSB identified several data challenges that hinder authorities' ability to effectively assess vulnerabilities in the nonbank sectors. To address this, the FSB has established the Nonbank Data Task Force, chaired by the FSB Chair, and work is starting with a test case on leveraged trading strategies in sovereign bond markets.

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Box 1

Implementation monitoring

Since the GFC, the FSB, in collaboration with the SSBs, has been instrumental in identifying vulnerabilities, developing comprehensive recommendations, and enhancing the resilience of the global financial system.

The ultimate success of these efforts depends on the timely and consistent implementation of agreed reforms across jurisdictions.

The Basel III framework remains a cornerstone of global financial stability. While significant progress has been made in adopting the framework, delays and inconsistencies in implementation across jurisdictions could pose material risks to the global financial system.

While most jurisdictions have finalised rules for credit risk, operational risk, and the output floor, gaps remain significant for market risk and credit value adjustment. The Group of Central Bank Governors and Heads of Supervision (the BCBS) unanimously reaffirmed the expectation to implement Basel III in full consistently and as soon as possible.¹

Significant progress has been made in addressing the “too-big-to-fail” issue with the FSB's Key Attributes of Effective Resolution Regimes seeking to ensure that SIFIs can fail without systemic disruptions or taxpayer bailouts. Achievements include implementing total loss-absorbing capacity requirements for global systemically important banks, cross-border resolution protocols, and crisis management groups.

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Section 1

The FSB and its work in 2025

The Financial Stability Board (FSB) seeks to promote global financial stability by coordinating national financial authorities and international standard-setting bodies (SSBs) to develop and implement robust regulatory, supervisory, and financial sector policies.

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Financial Stability Board

Through its members, the FSB works to strengthen financial systems, enhance the stability of international financial markets, and ensure consistent and coherent policy implementation across sectors and jurisdictions. It also engages in outreach to non-member countries to foster international cooperation and a level playing field.

The FSB operates through a structured three-stage framework to identify systemic risks in the financial sector, design policy actions to address these risks, and oversee their implementation. This structure includes the Plenary as the sole decision-making body of the FSB for all matters governed by its charter, making all such decisions by consensus; a Steering Committee to advance operational work between Plenary meetings; and three Standing Committees with specific but complementary roles in supporting this process.³

The FSB's three-stage framework



Assessment of vulnerabilities

The Standing Committee on Assessment of Vulnerabilities (SCAV) is the FSB's main mechanism for identifying and assessing vulnerabilities in the financial system.

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Assessment of vulnerabilities

The Standing Committee on Assessment of Vulnerabilities (SCAV) is the FSB's main mechanism for identifying and assessing vulnerabilities in the financial system.

The Committee focuses on macro-financial related weaknesses in the financial system (such as excessive leverage, liquidity and maturity mismatches, concentrated exposures etc). The SCAV draws extensively on the analytical and monitoring input of its members and focuses on the international aspect of financial system vulnerabilities, which are difficult to cover in a domestic or regional context. When policy actions are deemed to be required to address vulnerabilities, the SCAV communicates these findings to the Plenary. The SCAV also provides input for the Early Warning Exercise (EWE) jointly with the International Monetary Fund (IMF), which considers extreme, but plausible forward-looking risk scenarios.

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The SCAV draws extensively on the analytical and monitoring input of its members and focuses on the international aspect of financial system vulnerabilities.

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Implementation monitoring

The Standing Committee on Standards Implementation (SCSI) monitors the implementation of agreed FSB policy initiatives and international standards, as well as coordinating and overseeing the reporting of financial reform progress to the G20.

This includes tracking members' progress in implementing international financial standards, conducting peer reviews (a membership obligation), and promoting global adherence to regulatory and supervisory standards. Implementation monitoring is conducted under the Coordination Framework for Implementation Monitoring, developed in collaboration with SSBs to enhance coordination and effectiveness. It distinguishes between priority areas, which undergo intensive monitoring and detailed reporting, and other reforms.

Current priority areas include the Basel III framework, policy measures on global systemically important financial institutions (SIFIs), compensation practices, over-the-counter (OTC) derivatives market reforms, resolution frameworks, and nonbank financial intermediation (NBFI).

The FSB and its work in 2025

1.1 Vulnerabilities assessment

Long-standing financial system vulnerabilities remain.

Many of the current vulnerabilities have been present for some time, including high sovereign and private sector debt, leverage in certain nonbank investors, liquidity mismatches in open-ended funds and potential for operational outages at large financial institutions. In addition, asset valuations have elevated to record levels in several markets and may be at risk of correction in the case of a shock.

Asset price valuations are elevated relative to historical metrics, increasing the risk of a sharp, downward adjustment in markets.

The broad rally in asset prices since April 2025 has led to a further increase in valuations and a continued reduction of yields in key global asset markets. The convergence between equity earnings yields and corporate bond yields on the one hand, and government bond yields on the other, has meant that risk premia and spreads (the difference between yields on risk assets and government bonds) are compressed below historical standards (Graph 1). Indeed, the spreads on global equities, corporate bonds and high yield bonds are at similar levels to the period before the 2008 financial crisis.

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There is a risk of a sharp, downward adjustment in markets and a spike in volatility.

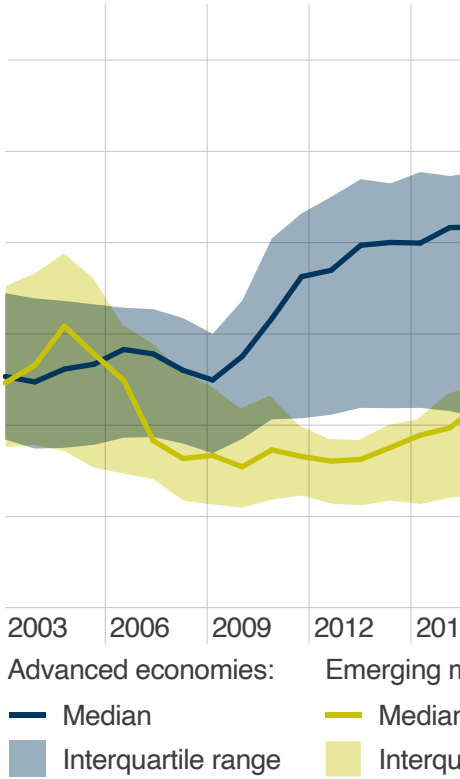
As mentioned above, elevated asset valuations raise the risk of a snap back in asset prices in the event of negative news. The tight risk premia could decompress, leading to sharp adjustments in asset markets and potential spillovers between jurisdictions.

The ensuing volatility could act on existing vulnerabilities among leveraged nonbank investors by inducing fire sales of assets that would further add to volatility. Asset price falls could lead to redemptions from open-ended funds that would need to sell assets to raise liquidity, exacerbating market strains.

There was a sudden and severe spike in market volatility in April 2025, following the announcement of a sharp increase in US tariffs. Markets recovered quickly following the announcement of a pause in the changes to trade policy.

Graph 2: Government debt vul

1. FSB member gross government



* The shaded areas highlight the regions in
Sources: IMF; FSB calculations.

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Globally, high and rising levels of sovereign debt could exacerbate debt financing pressures.

Sovereign debt levels have continued to increase, with the median government debt-to-GDP ratio in advanced economies at just over 100% ([Graph 2, panel 1](#)). Although debt levels vary across jurisdictions, they are forecast to rise further in many countries amid weak economic growth, low tax revenues, increased defence spending in some jurisdictions and rising structural spending needs (e.g. digitalisation and aging populations).⁴

Furthermore, government interest payments are already high in a number of jurisdictions ([Graph 2, panel 2](#)). Debt servicing costs are set to rise as debt levels increase, and as maturing bonds are refinanced at higher rates than when the debt was first issued. Financing costs are already a concern for some smaller developing economy sovereigns that are facing elevated borrowing costs or even a loss of market access.

An increase in investor concerns about debt sustainability could trigger heightened volatility in government bond markets and spill over to other parts of the financial system.

The impact in the financial sector could be affected by the increased presence of nonbank investors employing leverage trading strategies in core sovereign bond markets. Available data show that hedge fund financial leverage (borrowing) and synthetic leverage (obtained through derivatives positions) has grown at several types of hedge funds ([Graph 3, panels 1 and 2](#)). The leverage used in these strategies is often provided in short-term repo markets, and thus requires rollover ([Box 2](#)).

The international nature of the leverage trading strategies also presents the potential for shocks to propagate across borders. Leveraged strategies can involve arbitrage between related securities and derivatives in different jurisdictions. This interconnectedness across markets and across borders could lead to contagion as strains in one market are propagated to other markets. Sudden increases in government bond yields could also affect banks with significant holdings of sovereign debt, as evidenced by the March 2023 banking turmoil and the 2010–12 euro area sovereign debt crisis.

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Box 2

Repo market vulnerabilities

Repo markets are an important source of funding and benefit market participants.⁵

Repo markets simplify liquidity management, provide a low-risk means of deploying and acquiring cash resources and bonds, and facilitate risk hedging. They also increase the utility of sovereign debt to a broad range of investors.

However past episodes of stress have shown how repo markets can either become a source of strains that spill over to other markets, or can be significantly impacted by wider turmoil in the financial system.⁶ Therefore, given the importance of repo markets within the global financial system, it is critical that their functionality is preserved, particularly during times of stress.

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Repo markets simplify liquidity management, provide a low-risk means of deploying and acquiring cash resources and bonds, and facilitate risk hedging.

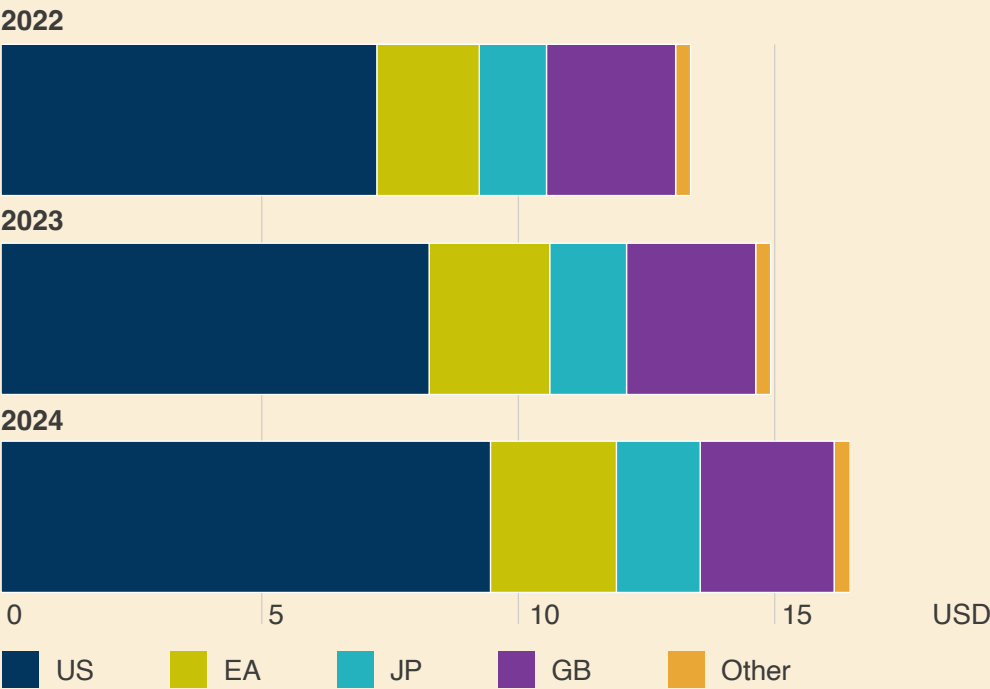
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Box 2 – Repo market vulnerabilities contin

Graph 4: Key features of the repo markets across member jurisdictions

1. Repo markets size



Panel 1 shows repo backed by domestic and foreign government bonds and local currency value in exchange rates on the time series. The data for **panel 2** include Q4:2025 data for one jurisdiction. Sources: FSB member data; FSB calculations.

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Box 2 – Repo market vulnerabilities contin

Repo markets, however, can facilitate a build-up of leverage through low prevailing haircuts and high levels of collateral reuse.

FSB member data suggests the majority of repo market activity takes place in the non-centrally cleared bilateral segment.

Within this segment, approximately 70% of repo market activity operates with zero haircuts (Graph 4, panel 2), though zero haircuts do not imply zero margin, and many repos are portfolio margined. There are also high levels of collateral rehypothecation.

Demand and supply imbalances in repo markets can arise quickly in stress periods.

When strains arise in the financial system, there can be a sudden increase in the demand for liquidity and borrowers may turn to repo markets to obtain the cash.⁷

At the same time, cash lenders in repo markets may be unable or unwilling to provide funding in periods of stress. As a repo is short-term, funding can also be withdrawn very quickly.

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Box 2 – Repo market vulnerabilities contin

Interlinkages in repo markets can also act as a conduit for contagion in several different ways.

Strains in repo and government bond markets could spill over to each other. Disruption in the repo market may imply that some market participants are unable to use repo markets to borrow funds or government bonds.

This may also lead to difficulties for other market participants to obtain liquidity and therefore may need to sell liquid assets, including government bonds, to generate short term cash. Disruption to government bond markets could also create strains in repo markets, potentially leading to higher repo rates, margin calls, higher haircuts and liquidity shortages.

There is also the possibility for an adverse feedback loop to develop between the two markets. The international nature of repo markets, both in terms of currencies and key bank and NBFIs participants, creates the potential for stress to be propagated between jurisdictions. Furthermore, repo market lenders can be exposed to losses if their leveraged counterparties fail, especially if haircuts are insufficient.

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Box 3

Nonbank investors in comm

The CRE market was under substantial pressure in 2022–24, and this highlighted vulnerabilities that may persist.

Certain segments, such as offices (especially in large cities) and retail space, have experienced weak demand since the COVID-19 pandemic due to the shift to home working.

Additionally, the CRE market has faced increased borrowing costs due to the monetary policy tightening that took place in 2022–23 in several jurisdictions, and several nonbank investors in the CRE market are vulnerable to higher rates.¹⁰ This led to strains in the CRE market, though market prices were more stable in 2025.

There was at least \$12 trillion of equity and debt CRE financing from banks and nonbanks as at end 2023.¹¹

While banks continue to be the main source of financing for CRE, in some jurisdictions have a sizeable share of nonbank investor participation, especially property funds (the dominant entity type in the European Union, South Africa and the United Kingdom) and Real Estate Investment Trusts (REITs, mostly in Australia, Hong Kong, Japan and the United States).

These investors reduce dependency on bank financing and provide more financing options, which can be beneficial for overall financial stability. At the same time, many of them are interconnected with banks and with each other via loan and equity and debt securities financing.

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Box 3 – Nonbank investors in commercial real estate markets continued

There is also a broader vulnerability in the complex interlinkages between banks and nonbank CRE investors.

Banks provide significant debt financing to REITs and property funds, invest in these entities, and share common asset exposures.

Shocks to the CRE market could spill over to the banking sector, underscoring the need to monitor banks' lending to nonbank CRE investors alongside their own CRE loan portfolios.

Ongoing monitoring of the CRE market is warranted.

The global financial system has so far withstood the recent developments in the CRE market, aided by factors such as limited poor performance to specific segments, lower loan-to-value levels, and refinancing of distressed borrowers.

However, ongoing monitoring may nonetheless still be warranted given the more volatile performance of CRE exposures compared to other assets and various developments that could impact this market and hence its financing. These developments include continued structural declines in demand for office and retail segments, as well as any adverse effects from extreme weather events or, for some segments and jurisdictions, new energy efficiency standards.

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Operational vulnerabilities are also a concern, notably potential outages at critical nodes in the financial system that could lead to widespread disruption.

Large or prolonged outages can be caused by an operational incident or malicious attack. If one of these events occurs at a large global financial institution or key market infrastructure provider, it could significantly disrupt the workings of the financial system and create liquidity challenges.

While concentration in third-parties providing technology services to a large number of financial institutions can have significant benefits, it does increase the risk of concurrent financial and operational events that could amplify a crisis.

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Despite growth in these markets in recent years, crypto-assets and stablecoins are not widely used in financial services supporting the real economy.
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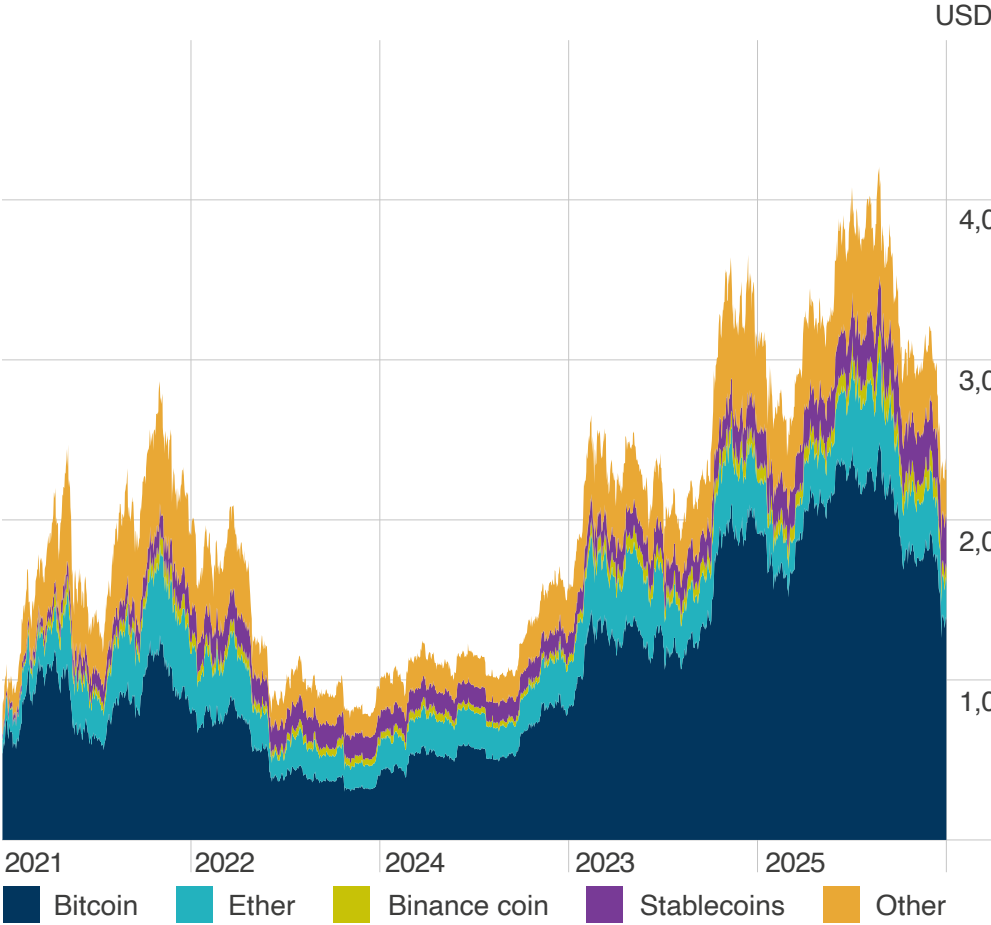
Financial markets continue to assess and reassess the impact of extreme weather events and natural disasters on financial asset values.

Substantial work has been done to develop improved scenario and stress testing analysis to underpin such valuations in a more resilient way. However, there continue to be significant limitations to this analysis. Extreme weather events and natural disasters can be hard to predict, and markets may respond to such events by reassessing valuations.

Public policy, which can also significantly impact valuations, has also been subject to substantial shifts of emphasis. A loss of confidence among market participants arising from any or all of these factors could cause a sudden repricing of certain assets, such as real estate and insurance risk premiums, potentially widening insurance protection gaps. In a worst-case situation, a correlated change of perspective could have impacts across entities, sectors and economies.

Graph 5: Crypto-asset markets were volatile and stablecoin transa

1. Daily crypto-asset market value



Source: CCData, Visa; FSB calculations.

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The FSB and its work in 2025

1.2 FSB initiatives

In line with the FSB’s mission to promote international financial stability, its priorities for 2025 reflected challenges that are global in nature and affect the financial system as a whole. This section describes key FSB work during the year, including related SSB initiatives.

Enhancing the resilience

NBFI continues to expand, growing 9.4% in 2024 (double the pace of the banking sector) and with assets representing 51% of global financial assets.¹⁴

The comprehensive monitoring of global trends, vulnerabilities, and innovations in the NBFI ecosystem is a key part of the FSB’s ongoing efforts to enhance financial system resilience.

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Given the complexity and importance of ongoing NBFI data challenges, in 2025 the FSB set up the Nonbank Data Task Force (NDTF), a small, high-level task force to address these challenges.²⁰

These challenges can be categorised into four areas: (i) data availability and reporting, (ii) data quality, (iii) data use, and (iv) data and information sharing. The NDTF has identified several priority areas (i.e. nonbank entities, activities, or markets) where data challenges hinder the effective assessment of vulnerabilities and associated financial stability risks.

To test how much progress can be made in addressing various nonbank data challenges, the FSB decided to have the NDTF conduct a test case on leveraged trading strategies in sovereign bond markets. Certain nonbanks, such as hedge funds, liability-driven investment funds, and other leveraged investment funds, have become key participants in certain sovereign bond markets – both in the cash market at primary issuance and in secondary markets, as well as in the futures market.²¹

These nonbanks employ a variety of trading strategies, such as sovereign bond cash-futures basis trades, which often rely on high leverage.²² While these leveraged strategies can enhance market functioning and support liquidity, any rapid unwinding²³ has the potential to amplify sharp price movements in core financial markets and propagate stress across the financial system, including across borders.²⁴

Data challenges often prevent the identification of relevant nonbanks taking such positions and the leverage associated with them, especially in the case of cross-border activities. The FSB intends to finalise work on such data challenges in 2026, including ways for authorities to address them. Based on the findings and insights from the work of the test case, the FSB will determine whether further work should be undertaken in other areas.

Improving cross-border payments

While the major policy development initiatives set out in the Roadmap have now been completed,²⁹ these efforts have not yet translated into tangible improvements for end-users at the global level.

The 2025 key performance indicators (KPIs) show only slight advancements since 2023.³⁰ There continues to be significant regional differences in the KPIs. Sub-Saharan Africa and South Asia face challenges in the speed of receiving wholesale cross-border payments, while North America remains the fastest region.

Notable improvements were observed in the Eurozone for wholesale payments and in the Middle East for remittances. Despite high costs, sub-Saharan Africa remains the fastest region for receiving remittances. Meanwhile, Europe and Central Asia continue to lead as the region with the lowest costs for retail cross-border payments.

The FSB coordinates with CPMI, international organisations (IOs) and other SSBs the efforts to implement the Roadmap for enhancing cross-border payments.

Over the past year, several significant milestones have been achieved, marking the end of the major policy developments work under the Roadmap.

This includes the FSB's recommendations to level the playing field between bank and nonbank payment service providers from a regulatory and supervisory perspective and the recommendations to mitigate data-related frictions in cross-border payments,³² as well as the Financial Action Task Force (FATF)'s revision of standards for data in cross-border payments (Recommendation 16 on Payment Transparency).³³

The CPMI has progressed work on interoperability and extension of payment infrastructures, including to support adoption of ISO 20022 data requirements.³⁴

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Improving cross-border payments continued

The FSB, in collaboration with the FATF and Organisation for Economic Co-operation and Development, has advanced work on implementing the FSB’s recommendations on data frameworks.

We established the Forum on Cross-border Payments Data and related private sector Advisory Group to bring together experts in payments, anti-money laundering and countering the financing of terrorism, sanctions, and data privacy to ensure a coordinated approach in taking forward the recommendations.

The Data Forum is reviewing work on harmonising the formatting, sharing, and updating of sanctions lists, with completion targeted for 2026 and work to support authorities that are considering broader use of the Legal Entity Identifier in cross-border payments, focusing on its benefits across the payment chain and sharing insights from pilot projects and jurisdictional experiences.

The FSB will continue to intensify efforts to drive jurisdictional implementation of the policy recommendations issued under the Roadmap and support jurisdictions and regions in overcoming barriers. A thematic peer review in 2025 will review progress in implementing the FSB recommendations.

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Harnessing the benefits of digital innovation

Digitalisation is transforming the functioning of finance and reshaping the structure of the financial industry. Leveraging the opportunities it presents while managing the associated risks is essential for ensuring financial stability and fostering prosperity.

Artificial intelligence (AI) is reshaping the financial sector, driving efficiency and innovation.

AI has the potential to aid regulatory compliance, enable advanced data analytics and produce more personalised financial products. However, the FSB’s 2024 AI report identified several vulnerabilities that the use of AI can amplify, including third-party dependencies, market correlations, cyber risks, and challenges in model risk and governance.³⁶

These vulnerabilities are notable for their potential to impact financial stability. The ability to comprehensively monitor AI developments is essential to address these vulnerabilities. To this end, the FSB surveyed the various monitoring approaches of financial authorities.³⁷ It found that most financial authorities are collecting data on AI adoption, but many are still in the early stages of monitoring the related vulnerabilities.

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AI has the potential to aid regulatory compliance, enable advanced data analytics and produce more personalised financial products.

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Enhancing resolvability of banks, insurers and

Maintaining adequate crisis preparedness requires continued improvements in implementation, operationalisation and rigorous testing.

In its role as the global SSB for standards for resolution of financial institutions, the FSB has advanced work to support bank resolution authorities' operational readiness to respond to failures. In 2025, the FSB supported operationalisation of transfer tools by publishing a practices paper sharing experiences and insights from authorities who have used these tools in the past.⁴¹ The FSB also supported sharing information and experiences among members on funding in resolution.

Work on bail-in execution continues to progress through the formation of a dedicated FSB task force bringing together resolution and market authorities. Finally, the FSB supported sharing experiences from the 2023 bank failures to improve coordination with authorities beyond those participating in firm-specific crisis management groups (CMGs).⁴²

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In its role as the global SSB for standards for resolution of financial institutions, the FSB has advanced work to support bank resolution authorities' operational readiness to respond to failures

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The FSB and its work in 2025

1.3 Implementation monitoring

Building resilient financial institutions

Despite recent progress in adopting the revised Basel III framework issued in 2017, important gaps remain.

Since the start of 2025, implementation of the final elements of the Basel III standards has taken effect in several FSB jurisdictions (Graph 6). For credit risk, operational risk and the output floor, there are only a small number of jurisdictions that are yet to finalise their rules, whereas for market risk and CVA implementation gaps are more widespread.

Graph 6: Adoption of revised 2025 Basel III standards

1. As a percentage of FSB member jurisdictions

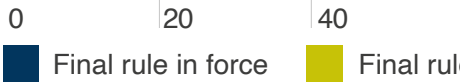
CVA framework

Operational risk

Market Risk

Output floor

Credit risk



* The five EU members of the FSB are present in all categories.
Source: FSB.

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Building resilient financial institutions continued

Recent assessments of consistency of implementation with Basel standards have been relatively positive.

With the publication of its reports on Korea, Türkiye and the UK, the BCBS has completed its jurisdictional assessments related to the net stable funding ratio and large exposures framework. All assessed FSB jurisdictions were found to be compliant or largely compliant with both standards. The BCBS has commenced assessments of the leverage ratio framework and the Basel III revisions to the risk weighted assets.

Following adoption of the Insurance Capital Standard (ICS) at the end of 2024, the International Association of Insurance Supervisors (IAIS) has been developing an assessment methodology.

This will underpin several implementation assessment projects in 2026. These include a self-assessment by IAIS members of their implementation of the ICS alongside developing an IC assessment methodology across jurisdictions. The IAIS will then aim to start in-depth assessments at the jurisdictional level in 2027. In addition, baseline assessment of implementation of the qualitative standards of the Common Framework for the Supervision of Internationally Active Insurance Groups will also be undertaken by the IAIS.⁴⁵

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Enhancing the resilience of NBFIs continued

Implementation of the 2012 IOSCO recommendations to reduce the run risk of money market funds (MMFs) is well-advanced, particularly in the largest MMF markets.

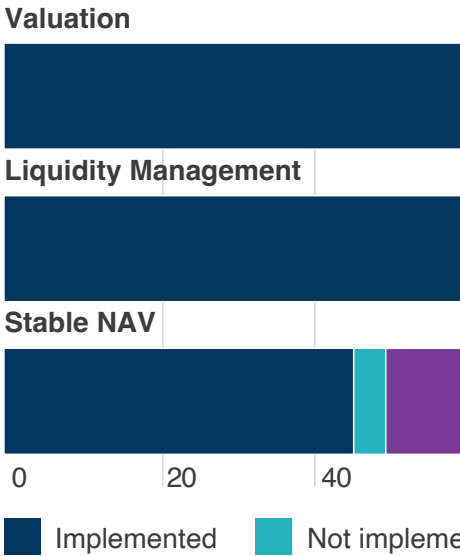
As shown in Graph 7, the fair value approach for valuation of MMF portfolios has been adopted in almost all FSB jurisdictions,⁴⁷ while progress in liquidity management is less advanced, with 20 jurisdictions having reforms in effect (one more than in 2024). Finally, eleven of the twelve FSB jurisdictions that permit MMFs offering a stable NAV have implemented the IOSCO reforms to address the risks and issues that may affect the stability of such MMFs.

Furthermore, the FSB, in collaboration with IOSCO, issued policy proposals in 2021 to enhance MMF resilience. A 2024 FSB peer review found progress in implementing the 2021 FSB proposals was uneven across FSB member jurisdictions and that, given the vulnerabilities reported in individual jurisdictions, further progress would be needed to enhance MMF resilience.⁴⁸

Following from that review, the FSB will launch this year an assessment of the effectiveness of policy measures to enhance MMF resilience.

Graph 7: Implementation is more advanced in the largest MMF markets

1. As a percentage of FSB member jurisdictions



* The five EU members of the FSB are pre

** Market size based on assets under mana

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Implementation of resolution regimes

Foundational resolution frameworks are now mostly in place, and most jurisdictions have aligned their resolution regimes with the FSB’s Key Attributes.

FSB members have efforts underway to enhance their legislative and regulatory frameworks and address remaining gaps. FSB members’ self-assessment of implementation of resolution powers shows some gaps in introducing the full suite of powers across G20 jurisdictions (Graph 8).⁴⁹ Several jurisdictions are undertaking measures to implement insurance resolution regimes, while some jurisdictions are refining their resolution frameworks in response to the lessons learnt from the 2023 bank failures and to support effective resolution of banks beyond global systemically important banks (G-SIBs).

Additionally, resolvability assessments in 2025 show continued progress in operational planning and crisis preparedness for G-SIBs and CCPs that are systemically important in more than one jurisdiction (SI>1 CCP).⁵⁰ In 2025, the CMGs for 29 G-SIBs⁵¹ and 14 SI>1 CCPs⁵² reported continued progress in operational planning and firms’ crisis preparedness.

Graph 8: Implementation of as

1. Bank resolution



Note: Progress is shown as percent of number.
Source: FSB.

Despite the comparatively more developed framework, issues persist in implementation of critical areas for bank resolution, such as funding in resolution and effective bail-in execution, particularly in cross-border contexts. The FSB is working to address these issues.

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Box 4

Implementation of public sector backstop funding mechanisms

The orderly resolution of systemically important banks, particularly G-SIBs, is essential for global financial stability. However, even if bail-in restores sufficient capital, in the face of severe stress a lack of temporary funding could disrupt operations, amplify contagion, and put an orderly resolution at risk, potentially requiring taxpayer support and creating moral hazard.

The Resolution Key Attributes underscore the importance of statutory or other policies in place so that authorities are not constrained to rely on public ownership or bail-out funds as a means of resolving firms.

The FSB's 2016 Guiding Principles and Key Attributes highlight that temporary public sector backstop mechanisms could be necessary as a last resort to maintain market confidence and private sector participation, uphold financial stability during resolution, and ensure their design is subject to strict conditions that minimise the risk of moral hazard.

The implementation of public sector backstop funding mechanisms faces three key challenges. First, determining the potential temporary public funding needs of a G-SIB's orderly resolution is complex and case dependent. The funding needs of a G-SIB in resolution may be larger than previously anticipated, and as a result, the credibility and operational readiness of public sector backstop funding mechanisms is important.

Second, the speed of fund deployment remains an important challenge. Mechanisms with ambiguous governance structures or unclear sequencing between central bank liquidity and resolution funding may delay the provision of temporary funding, increasing market uncertainty.

Making derivatives markets safer and FMIs

Implementation of G20 OTC derivatives reforms has been well advanced in major jurisdictions for several years.

The BCBS and IOSCO recently reviewed implementation of the framework for margin requirements for non-centrally cleared derivatives (NCCDs), whose final implementation phase began in September 2022.⁵³

The analysis found no evidence of material issues with the implementation of the framework, and the framework’s impact has been consistent with the intended functioning of the capital and centrally cleared margin frameworks.

The amount of margin exchanged for NCCDs has increased significantly since 2012, making the financial system more resilient. BCBS and IOSCO recommend continued monitoring through supervisory information exchange and the sharing of experiences to address evolving market practices. The FSB will prepare its next OTC derivatives reforms progress report this year.

Meanwhile, work continues to strengthen the resilience of financial market infrastructures (FMIs) and monitor implementation of the Principles for Financial Market Infrastructures (PFMI)

CPMI and IOSCO published a report on implementation of PFMI Principle 1 (general business risks) and portions of PFMI Principle 3 (with respect to recovery and orderly wind-down plans that relate to general business risk related loss scenarios) at 34 FMIs from 27 jurisdictions. The findings highlight clear challenges for FMIs’ planning for general business losses and should be addressed with the highest priority.⁵⁴

CPMI-IOSCO also proposed, for public consultation, supplemental guidance for FMIs and relevant authorities on certain principles and key considerations relating to FMIs’ management of general business risks and losses, including in the context of recovery and orderly wind-down.⁵⁵

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Responding to financial and technological i

Implementation gaps and inconsistencies in crypto-asset and stablecoin regulation, as jurisdictions continue to develop and implement their regimes, could pose risks to financial stability and to the development of a resilient digital asset ecosystem.

The rapid evolution of crypto-asset markets (see [section 1.1](#)) underscores the importance of implementing the recommendations in the FSB’s 2023 global regulatory framework for crypto-asset activities (CA) and global stablecoin (GSC) arrangements.⁵⁷

The FSB conducted in 2025 a thematic peer review on the implementation of this framework across 37 jurisdictions including FSB and non-FSB members. The review found that while jurisdictions have made progress toward implementing the recommendations on crypto-asset markets and activities (CA recommendations), few jurisdictions have finalised their regulatory frameworks for GSCs (see [Table 1](#)).

Uneven implementation creates opportunities for regulatory arbitrage and complicates oversight of the inherently global and evolving crypto-asset market. In addition, cross-border cooperation and coordination is fragmented, inconsistent, and insufficient to address the global nature of crypto-asset markets. Accordingly, the review puts forward recommendations to address outstanding issues in terms of implementation progress, comprehensiveness and consistency, and cross-border cooperation and coordination.

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Table 1: Overall implementation status of CA and GSC recommendations

		CA Recommendations	GSC Recommendation
Stages of progress*		Jurisdictions (count)	Jurisdictions (count)
1	No framework in place	6 [^]	11
2	Partial regulations in place	3	
3	Plans for framework under public discussion	4 ^{**}	6
4	Framework proposed but not finalised	4 ^{***}	4 [*]
5	Regulatory framework finalised	11	

* The stages of progress reflect a jurisdiction's overall implementation progress as of August 2025 and are not an assessment of compliance with each CA or GSC recommendation nor of effectiveness. For definitions of each stage, see Annex 1 of the 2025 peer review report.

/ Includes 2/1 jurisdiction where partial regulations are also in place.

[^] Includes 2 jurisdictions where crypto-asset activities are prohibited.

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Box 5

Implementation of the FSB recommendations on third-party risk management and oversight

The FSB’s Toolkit⁵⁹ provides a flexible, risk-based framework to strengthen third-party risk management in the financial sector. It covers the entire life cycle of third-party relationships, from due diligence to exit strategies, and focuses on (i) establishing common definitions for outsourcing and risk management, and (ii) equipping stakeholders with practical tools to manage risks effectively.

The rise in cloud computing-related services underscores the importance of identifying dependencies of supervised entities on information and communications technology providers to be able to manage systemic dependencies, concentration risks, and exit strategies.

In some cases, private cloud services are being built to mitigate these risks. Challenges in accessing information for risk assessments have been observed due to power imbalances between large third parties and smaller firms. Arrangements such as pooled audits and regional collaboration efforts led by authorities can assist small firms.

One approach adopted in some jurisdictions has been to issue supervisory guidance including about outsourcing of cloud services. In some cases this includes the development of inventories of outsourcing arrangements with some extending to nth party providers. As well as identifying concentration risk, such registers can support the ability to respond effectively to incidents like ransomware attacks. However, this is not the only approach that can be taken.

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Looking forward

The FSB's work in 2026 will focus on certain key areas:



Vulnerabilities assessments

The FSB will complete a report on private credit and begin new work on vulnerabilities, possibly including work on foreign exchange derivatives markets or private finance.



Nonbank financial intermediation

The FSB will focus on improving its assessment of vulnerabilities in the nonbank sector by improving the methodologies it uses to assess those vulnerabilities and working on the data issues that have been identified. There will also be work related to the implementation of the FSB's recommendations on MMFs and OEF as well as work on nonbank leverage and OTC derivatives.

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The FSB's work in 2026 will focus on certain key areas:



Cross-border payments

In the coming year, the FSB will promote the development of voluntary, specific and time-bound action plans by jurisdictions and regions to implement the policy recommendations. This will be supported by close liaison with CPMI, the World Bank, FATF and other partner organisations and by additional engagement with the private sector. There will be a particular push to promote regional initiatives in dialogue with the FSB's Regional Consultative Groups (see [page 45](#)).



Crisis preparedness and resolution

In relation to bank resolution, the FSB will conduct a thematic peer review of the implementation of public sector backstop funding mechanisms, facilitate the sharing of practices to enhance operational preparedness for funding in resolution, and support authorities in operationalising cross-border bail-in strategies. Across all three sectors the FSB will continue to support authorities efforts to enhance the operationalisation of resolution tools. The FSB will carry out a strategic review of its crisis preparedness activities to ensure that they remain well aligned with emerging priorities and challenges.

Section 3

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Mandate

The FSB's membership⁶¹ comprises authorities from jurisdictions that are responsible for maintaining financial stability, such as ministries of finance, central banks, supervisory and regulatory authorities; international financial institutions; and international standard-setting regulatory, supervisory and central bank bodies. As a result, FSB members have regulatory and supervisory experience across a wide range of financial sectors.

The FSB Charter governs its policymaking and related activities. It sets out the FSB's objectives, mandate and organisational structure (see Box 6).⁶²

Chart 1: Member jurisdiction



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Box 6

FSB mandate and tasks

As set out in its Charter, the FSB:

 **Assesses vulnerabilities** affecting the global financial system and identifies and reviews, on a timely and ongoing basis within a macroprudential perspective, the regulatory, supervisory and related actions needed to address them and their outcomes.

 Promotes **coordination and information exchange** among authorities responsible for financial stability.

 Monitors and **advises on market developments** and their implications for regulatory policy.

 Advises on and monitors **best practice** in meeting regulatory standards.

 Undertakes joint strategic reviews of and **coordinates the policy development work** of the international SSBs to ensure the work is timely, coordinated, focused on priorities and addressing gaps.

 Sets guidelines for and supports the establishment of **supervisory colleges**.

The Plenary and the Steering

The Plenary is the FSB’s sole decision-making body. It decides by consensus without voting. The Plenary adopts reports, principles, standards, recommendations and guidance developed by the FSB; establishes Standing Committees and working groups; decides on membership of the FSB, assigns seats to members in the Plenary, agrees on the composition of the Committees; and approves the work programme and budget of the FSB.

In 2025, the Plenary met four times, of which two meetings were virtual. The outcomes of physical Plenary meetings are published on the FSB website.⁶³

The FSB Steering Committee provides operational guidance between Plenary meetings, carrying forward the direction of the Plenary. In 2025, the Steering Committee held two in-person meetings and two virtual meetings.



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Standing Committees

The FSB has four Standing Committees⁶⁴ which support the Plenary:



Standing Committee on Assessment of Vulnerabilities

Chaired by **Tiff Macklem**
Governor, Bank of Canada

The SCAV monitors and assesses vulnerabilities in the global financial system and proposes to the Plenary the actions needed to address them.



Standing Committee on Supervisory and Regulatory Cooperation

Chaired by **Michelle Bowman**
Vice Chair for Supervision of the Board of Governors, US Federal Reserve System

The SRC develops policy to address key financial stability risks and coordinates issues that arise among supervisors and regulators to ensure effective consideration of cross-sector implications.

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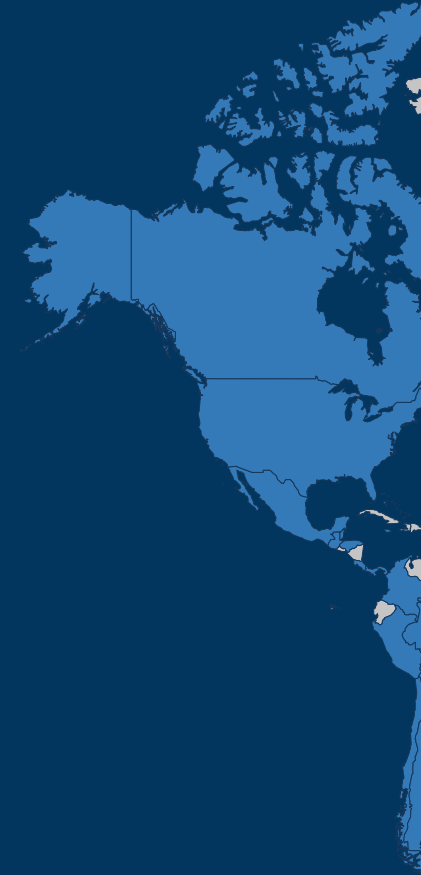
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Regional Consultative Group

The six RCGs⁶⁵ (for the Americas, Asia, the Commonwealth of Independent States, Europe, the Middle East and North Africa, and Sub-Saharan Africa) broaden the circle of countries engaged in the FSB’s work to promote financial stability.

The RCGs bring together financial authorities from FSB members and approximately 70 non-FSB member jurisdictions to exchange views on vulnerabilities affecting financial systems and on initiatives to promote financial stability. Those groups also provide an institutional mechanism for: (i) discussing FSB initiatives underway and planned; (ii) promoting implementation of internationally agreed reforms; and (iii) enabling members of RCGs to share their views amongst themselves and with the FSB, both on FSB initiatives and on other measures that could be taken to promote financial stability. The RCGs held 10 in-person meetings in 2025.

Chart 2: Member jurisdiction



■ Americas ■ Asia ■ Com
■ Middle East and North Africa

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Chair and Secretariat

The Chair of the FSB is the principal spokesperson for the FSB and represents the FSB externally. He convenes and chairs the meetings of the Plenary and of the Steering Committee and acts in accordance with the directions given by the Plenary.

The current Chair is Andrew Bailey (Governor of the Bank of England).

The activities of the FSB, including its Committees, RCGs and working groups, are supported by the Basel-based Secretariat. The composition of the Secretariat broadly represents the diversity of the FSB membership. The Secretariat is directed by the Secretary General, John Schindler.

Members of

Argentina

Ministry of Finance
Central Bank of Argentina

Australia

Department of the Treasury
Reserve Bank of Australia

Brazil

Ministry of Finance
Central Bank of Brazil
Securities and Exchange Commission

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Indonesia



Ministry of Finance
Bank Indonesia

Korea

Bank of Korea
Financial Services Commission

Italy



Ministry of Economy and Finance
Bank of Italy
Commissione Nazionale per le Società e la Borsa (CONSOB)

Mexico



Ministry of Finance and Public Credit
Bank of Mexico

Japan



Ministry of Finance
Bank of Japan
Financial Services Agency

Netherlands



De Nederlandsche Bank
Ministry of Finance

* Russian authorities have agreed not to participate in FSB meetings at present.

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Türkiye

Ministry of Treasury and Finance

Central Bank of the Republic of Türkiye

European Union

European Central Bank

European Commission

United Kingdom

HM Treasury

Bank of England

Financial Conduct Authority

United States

Department of the Treasury

Board of Governors of the Federal Reserve System

Securities and Exchange Commission

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FSB reports published since November 2024

Month	Report
November 2024	The importance of resolution in failure: public statement The Financial Stability Implications of the 2024 Global Financial Markets Review Legal and Regulatory Challenges to Systemic Risk Management Peer Review of Brazil
December	2024 Resolution Report: “From Preparedness to Action” Liquidity Preparedness for Market Stress Peer Review of France Recommendations for Regulatory Frameworks for Systemic Risk Service Providers Offering Critical Services Recommendations to Promote Resilient Financial Frameworks Related to Cross-Border Systemic Risk Global Monitoring Report on Financial Stability Leverage in Non-Bank Financial Institutions
January 2025	The Relevance of Transition Finance for Systemic Risk Evaluation of the Effects of the 2024 Global Financial Markets Review Final report
April	Format for Incident Reporting
June	Vulnerabilities in Non-bank Financial Institutions

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FSB reports published since November 2025

Month	Report
July	• FSB Workplan to Address Nonbank Financial Risks • Enhancing the Resilience of Nonbank Financial Institutions • Leverage in Nonbank Financial Institutions • FSB Roadmap for Addressing Nonbank Financial Risks
October	• G20 Roadmap for Cross-border Cooperation • Monitoring Adoption of Artificial Intelligence in the Financial Sector • G20 Implementation Monitoring Report • Thematic Review on FSB Global Systemically Important Nonbank Financial Institutions
November	• Practices Paper on the Operational Resilience of Nonbank Financial Institutions • Peer Review of Spain • Peer Review of the Netherlands
December	• Global Monitoring Report on Nonbank Financial Risks
January 2026	• 2025 Resolution Report: From Assessment to Action • Good Practices for Crisis Management
February	• Vulnerabilities in Government Securities

Annex 2

Implementation of reforms in priority area

The table provides a snapshot of the status of implementation of reforms in priority areas. The colours and symbols in the table indicate the timeliness of implementation, consistent with the international standard. For trade reporting, letters indicate the sectoral application. For compensation, letters indicate the sectoral application.

Reform Area	BASEL III ^a					COMPENSATION	OVER-THE-COUNTER	
	Risk-based capital	Requirements for SIBs	Large exposures framework	Leverage	Net Stable Funding Ratio (NSFR)		Trade reporting	Central clearing
Phase-in (completed) date	2023	2016 (2019)	2019	2023	2018		end-2012	end-2012
Argentina			C		C	B, I		
Australia			C		C			
Brazil			C		C			
Canada			C		C			
China		C	C		C		R, F	
France		C	LC		LC			
Germany		C	LC		LC			
Hong Kong			C		C	B, I		
India			C		C			
Indonesia			C		C			
Italy		C	LC		LC			
Japan		C	LC		C	B, I		
Korea			LC		C			
Mexico			C		C			
Netherlands		C	LC		LC			
Russia ¹								
Saudi Arabia			C		C	B	R	
Singapore			C		C			
South Africa			C		LC			
Spain		C	LC		LC			
Switzerland		C	LC		LC			
Türkiye			C		C			
United Kingdom		C	LC	#	LC			
United States		C, &	LC		LC	B, I		

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Legend

	Basel III: Final rule published and implemented. Risk-based capital: revised standardised approach for credit risk, revised approach for market risk, and revised approach for operational risk. SFT: Implementation complete for at least one of the four areas described above. OTC derivatives: Legislative framework in force and standards/criteria/requirements (as applicable) in force for all relevant jurisdictions. Resolution: Final rule for external Total Loss-Absorbing Capacity (TLAC) requirement for G-SIBs published and implemented. Recovery planning commenced but CoAg not signed or resolvability assessment not commenced. Compensation: All or almost all (all but 3 or less) FSB Principles and their Implementation Standards for compensation of claimants are applicable in the jurisdiction – see below). Non-bank financial intermediation (NBFI): MMFs – Final implementation measures in force for valuation, liquidity management and disclosure requirements. SFT: Implementation complete for at least one of the four areas described above.
	Basel III: Final rule published but not implemented, or draft regulation published. For risk-based capital: revised standardised approach for credit risk, revised approach for market risk, and revised approach for operational risk. SFT: Implementation complete for at least one of the four areas described above. OTC derivatives: Regulatory framework being implemented. Resolution: Final rule for external TLAC requirement for G-SIBs published but not yet implemented, or draft regulation published for at least one of leverage ratio and G-SIB leverage buffer (as applicable). Compensation: FSB Principles and Standards implemented for some but not all of the applicable banking sectors. NBFI: MMFs – Draft/final implementation measures published or partly in force for valuation, liquidity management and disclosure requirements. SFT: Implementation complete for at least one of the four areas described above.
	Basel III: Draft regulation not published. Resolution: Draft rule for external TLAC requirement for G-SIBs not published. For the powers columns, recovery planning commenced but CoAg not signed or resolvability assessment not commenced. NBFI: MMFs – Draft implementation measures not published for valuation, liquidity management and disclosure requirements. SFT: Implementation not complete for any of the four areas described above.
	Resolution: Minimum TLAC requirements not applicable for jurisdictions that are not home to G-SIBs or for which the minimum TLAC requirements are not applicable.
C / LC	Basel III: Regulatory Consistency Assessment Programme (RCAP) – assessed as “compliant” (C) / “largely compliant” (LC).
A	Basel III: All FSB jurisdictions have implemented the liquidity coverage ratio and were assessed as compliant. Six jurisdictions were assessed as C or LC, while six jurisdictions were assessed as materially non-compliant. Level 1 exposure definition.
&	Basel III: The US does not identify any additional D-SIBs beyond those designated as G-SIBs; its framework for D-SIBs is not applicable.
B / I / A	Compensation: FSB Principles and Standards deemed applicable by the jurisdiction for certain sectors.
R / F	OTC derivatives: Further action required to remove barriers to full trade reporting (R) or to access trade data (F). Mexico issued a regulation in 2020 to allow the direct sharing of Mexican TR data with foreign jurisdictions.
#	Basel III: A few provisions relating to the credit conversion factor will be implemented by the UK in 2026. Resolution: Saudi Arabia issued a resolution law, which came into force in 2021 and will be followed by other jurisdictions.
* / ** / ***	NBFI: Implementation is more advanced than the overall rating in one or more / all elements of at least one of the four areas described above. The 2019 update was undertaken by IOSCO using the assessment methodology in the 2019 update.
1	Russia: The status of implementation in Russia has not been updated and reflects progress only as of October 2020.

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Changes in implementation status from p

The table shows the changes in implementation status January 2026 (right-hand cell).

Reform area / Jurisdiction	Basel III		OTC derivatives
Argentina		Risk-based capital	
Australia			
France		Risk-based capital	
Germany		Risk-based capital	
Italy		Risk-based capital	
Hong Kong		Risk-based capital	
		Leverage	
India		Risk-based capital	
Indonesia			
Netherlands		Risk-based capital	
South Africa		Risk-based capital	
		Leverage	
Switzerland		Risk-based capital	
		Leverage	
Türkiye		Risk-based capital	

+ The 2023 update on MMFs and securitisation was undertaken by IOSCO using the assessment m

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AI	Artificial intelligence
BCBS	Basel Committee on Banking Supervision
CA	Crypto-asset activities
CCPs	Central counterparties
CCR	Counterparty credit risk
CMG	Crisis management group
CPMI	Committee on Payments and Market Infrastructures
CRE	Commercial real estate
CSD	Central securities depositories
EWE	Early warning exercise
FATF	Financial Action Task Force
FIRE	Format for incident reporting exchange
FMI	Financial market infrastructure
FSB	Financial Stability Board
G-SIB	Global systemically important bank

GDP	Gross domestic product
GFC	Global financial crisis (2008)
GSC	Global stablecoin
IAIS	International Association of Insurance Supervisors
ICS	Insurance Capital Standard (IAIS)
IM	Initial margin
IMF	International Monetary Fund
IOs	International organisations
IOSCO	International Organization of Securities Commissions
KPIs	Key performance indicators
MMF	Money market fund
NBFI	Nonbank financial intermediation
NDTF	Nonbank Data Task Force (FSB)
NCCD	Non-centrally cleared derivative

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- 1 FSB (2025) [G20 Implementation Monitoring Review: Interim report](#), October.
- 2 BCBS (2025), [Press release: Governors and Heads of Supervision reaffirm expectation to implement Basel III and discuss work on financial impact of extreme weather events](#) May.
- 3 Additionally there is a Standing Committee on Budget and Resources (SCBR) that is not involved in the process described above. See [section 3](#).
- 4 For a discussion of upcoming government spending needs, see IMF (2025), [Fiscal Monitor](#), October; for a discussion of government spending related to the climate see IMF (2024), [Fiscal Monitor](#), April; and for a discussion on defence spending, see, for example, SIPRI (2025), [Trends in world military expenditure](#), 2024, April.
- 5 FSB (2026), [Vulnerabilities in Government Bond-backed Repo Markets](#), February.
- 6 Past episodes include the September 2019 spike in repo rates in the US repo market, 2020 dash for cash across in the euro area, Japan and United Kingdom, United States 2022 UK LDI episode and 2022 euro area repo market volatility.
- 7 For a discussion of repo markets in the March 2020 “dash for cash” market turmoil see relevant material in: FSB (2020), [Holistic Review of March Market Turmoil](#), November and FSB (2022), [Liquidity in core government bond markets](#), October.
- 8 See FSB (2015), [Standards and Processes for Global Securities Financing Data Collection and Aggregation](#), November, and Bank for International Settlements’ website for reporting guidelines. In 2025, the UK has started submitting repo market data, in addition to the four jurisdictions that have already been submitting the relevant data (Australia, Canada, Japan, Mexico).
- 9 See FSB (2025), [Enhancing the resilience of nonbank financial intermediation: Progress report](#), June.

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- 23 Whether voluntarily by the nonbank based on its risk appetite, or because of external pressure, for example due to collateral/margin calls.
- 24 FSB (2023), [The Financial Stability Implications of Leverage in Non-Bank Financial Intermediation](#), September.
- 25 FSB (2024), [Liquidity preparedness for margin and collateral calls](#), December.
- 26 BCBS-CPMI-IOSCO (2025), [Transparency and responsiveness of initial margin in centrally cleared markets: review and policy proposals](#), January.
- 27 CPMI-IOSCO (2025), [Streamlining variation margin in centrally cleared markets – examples of effective practices](#), January.
- 28 BCBS-IOSCO (2025), [Streamlining VM processes and IM responsiveness of margin models in non-centrally cleared markets](#), January.
- 29 FSB (2020), [Enhancing Cross-border Payments: Stage 3 roadmap](#), October.
- 30 FSB (2025) [G20 Roadmap for Cross-border Payments: Consolidated progress report for 2025](#), October.
- 31 FSB (2024), [Recommendations for Regulating and Supervising Bank and Non-bank Payment Service Providers Offering Cross-border Payment Services: Final report](#), December.
- 32 FSB (2024), [Recommendations to Promote Alignment and Interoperability Across Data Frameworks Related to Cross-border Payments: Final report](#), December.
- 33 FATF (2025), [FATF updates Standards on Recommendation 1 on Payment Transparency](#), June.
- 34 CPMI (2025), [BIS CPMI takes further steps to promote ISO 20022 harmonisation for enhanced cross-border payments](#), January.
- 35 FSB (2025), [FSB Roadmap for Addressing Financial Risks from Climate Change: 2025 update](#), July.
- 36 FSB (2024) [The Financial Stability Implications of Artificial Intelligence](#), November.
- 37 FSB (2025) [Monitoring Adoption of Artificial Intelligence and Related Vulnerabilities in the Financial Sector](#), October.
- 38 FSB (2025), [Format for Incident Reporting Exchange \(FIRE\): Final report](#), April.

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56 CPMI-IOSCO (2025), Implementation monitoring of PFMI: Level 2 assessment report for the European Union – Payment systems, central securities depositories and securities settlement systems, April.

57 FSB (2025) Thematic Review on FSB Global Regulatory Framework for Crypto-asset Activities: Peer review report, October.

58 IOSCO (2025), Thematic Review Assessing the Implementation of IOSCO Recommendations for Crypto and Digital Asset Markets: Final Report, October.

59 FSB (2023), Final Report on Enhancing Third-party Risk Management and Oversight – A Toolkit for Financial Institutions and Financial Authorities, December.

60 The FSB was established in April 2009 as the successor to the Financial Stability Forum. In January 2013, the FSB established itself as an association (“Verein”) under Swiss law with its office at the Bank for International Settlements in Basel, Switzerland.

61 See Members of the FSB.

62 FSB (2012), Charter of the Financial Stability Board, June.

63 See Plenary Meetings – Financial Stability Board.

64 See FSB Organisational Structure and Governance.

65 See FSB Regional Consultative Groups (RCGs).



FINANCIAL
STABILITY
BOARD

The Financial Stability Board (FSB) coordinates at the international level the work of national financial authorities and international standard-setting bodies in order to develop and promote the implementation of effective regulatory, supervisory and other financial sector policies. Its mandate is set out in the FSB Charter, which governs the policymaking and related activities of the FSB. These activities, including any decisions reached in their context, shall not be binding or give rise to any legal rights or obligations.

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Hackers Are Targeting Critical Infrastructure Routers



Carmen Estela Cyber Defense Magazine July 14, 2026

Who Is Affected and Next Steps

The Russian Federal Security Service (FSB)-affiliated cyber outfit Center 16 is actively scanning the internet for vulnerable and poorly configured networking devices, particularly routers using weak or default SNMP community strings, according to the joint advice AA26-194A, which was released on July 13, 2026. Critical industries like healthcare, energy, financial services, defense, and communications are the focus of this initiative. Network administrators must secure their perimeters right away in order to prevent these invasions. The first step is locating any public-facing management interfaces and shutting down external access to high-risk administrative ports like TCP 4786, UDP 69, UDP 161/162 and TCP/UDP 10161/10162. From there, teams should phase out outdated protocols like

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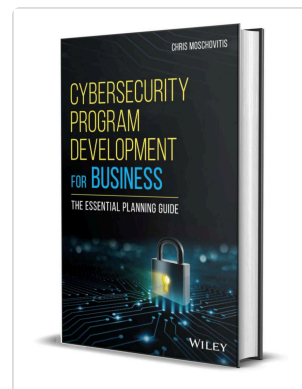
What Should CISOs Do?

This alert draws attention to a recurring weakness for CISOs: basic network hygiene is still a top concern. In order to compromise a network, state-sponsored organizations don't always need complex zero-day exploits. Rather, they often take use of ordinary SNMP functions to download and copy router configuration data covertly. Once attackers possess these configurations, they have a map of the internal network architecture, active credentials, and trusted communication pathways. This access allows them to move laterally and maintain quiet, long-term access. CISOs should view router hardening not as a routine IT chore, but as a critical defense measure to keep state-sponsored actors out of their production environments.

for IT Security and Compliance Information.
https://t.co/748S
TKH6k0.

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Author Notes

Cybersecurity and Infrastructure Security Agency

(CISA) - Joint Advisory AA26-194A (Published July 13, 2026)

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Analyst at Cyber Defense Magazine and a Women in Cybersecurity Award Candidate. She recently

graduated with a Master of Science degree from the University of Central Florida and holds a Bachelor's degree in Criminology from the University of Florida with certifications in Data Analytics and AI Fundamentals. She frequently speaks and volunteers at well-known industry gatherings, such as BSides Orlando and BSides Jax, where she offers her perspectives on emerging cyber trends. Carmen is committed to advancing the standards of governance, risk, and compliance within cybersecurity. She has also served as an adult protective investigator, police dispatcher, and legal intern, applying investigative skills across law enforcement, academic, and public service settings.

in

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f

♡

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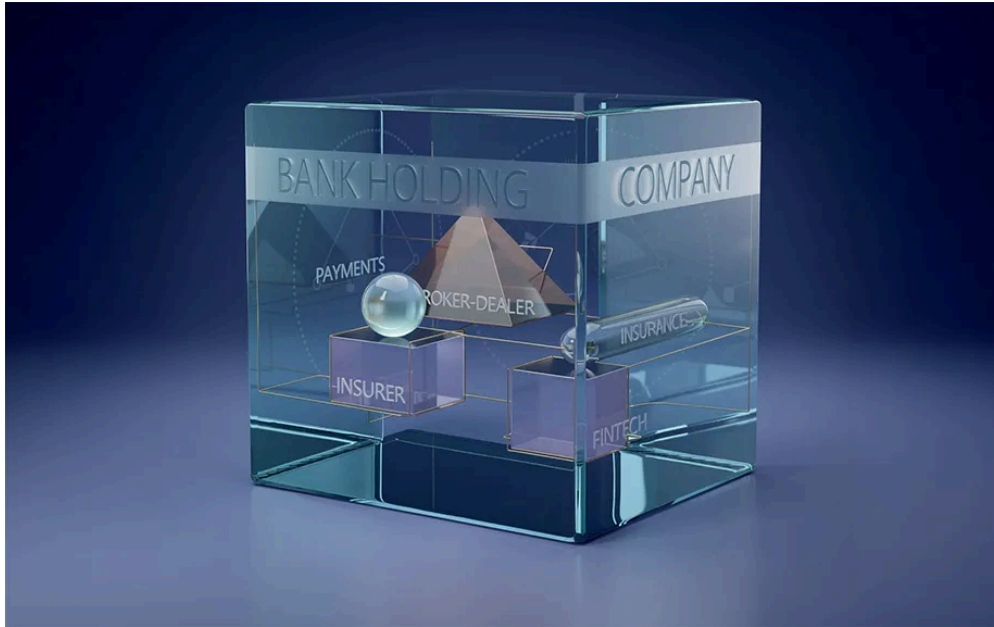
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JULY 15, 2026

Capitalizing on Nonbanks: Regulatory Arbitrage Within Bank Holding Companies

Nicola Cetorelli and Shohini Kundu



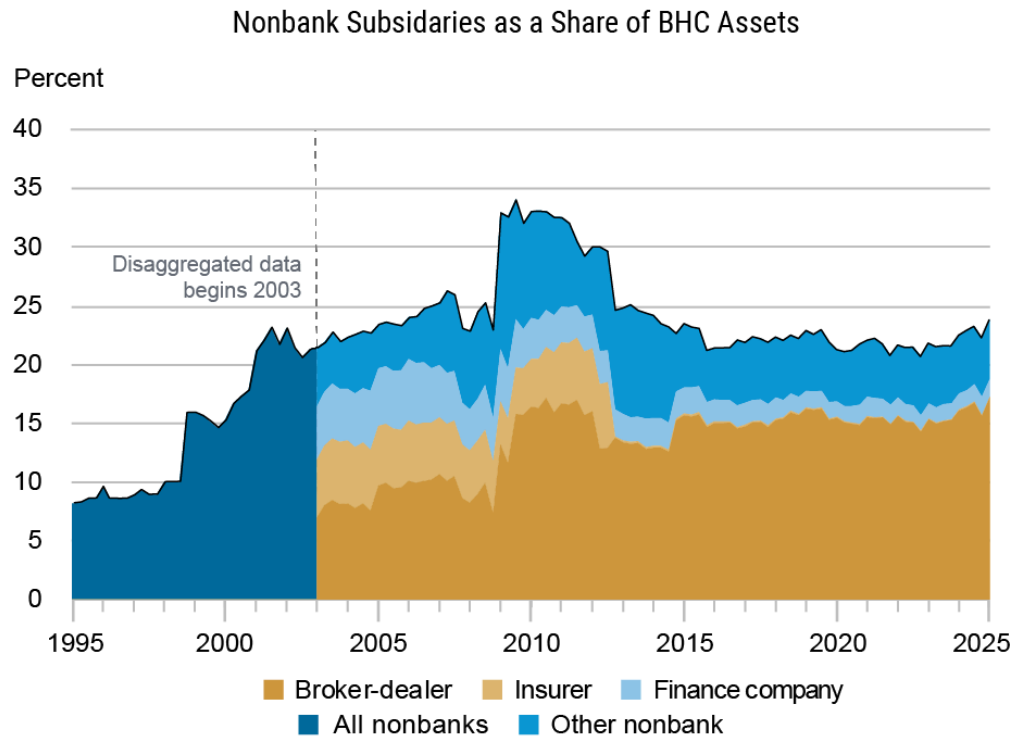
This post is the first in a three-part series on how bank regulation interacts with the organizational structure of banking firms. The series draws on the authors' recent Staff Report, "[Regulatory Arbitrage Within the Firm](#)."

When economists and policymakers talk about nonbank finance, they usually have in mind activity that takes place outside the banking system in institutions that compete with banks for the provision of financial intermediation services, such as fintech lenders, money market funds, private credit vehicles, insurers, and broker-dealers. A substantial share of U.S. nonbank financial activity, however, takes place *inside* bank holding companies (BHCs), conducted by nonbank subsidiaries that operate alongside regulated commercial banks under common ownership and integrated management. In this first post of our three-part series, we document the scale of nonbank activity within BHCs and describe the balance-sheet features that, as the remainder of the series shows, make these subsidiaries a vehicle for regulatory arbitrage.

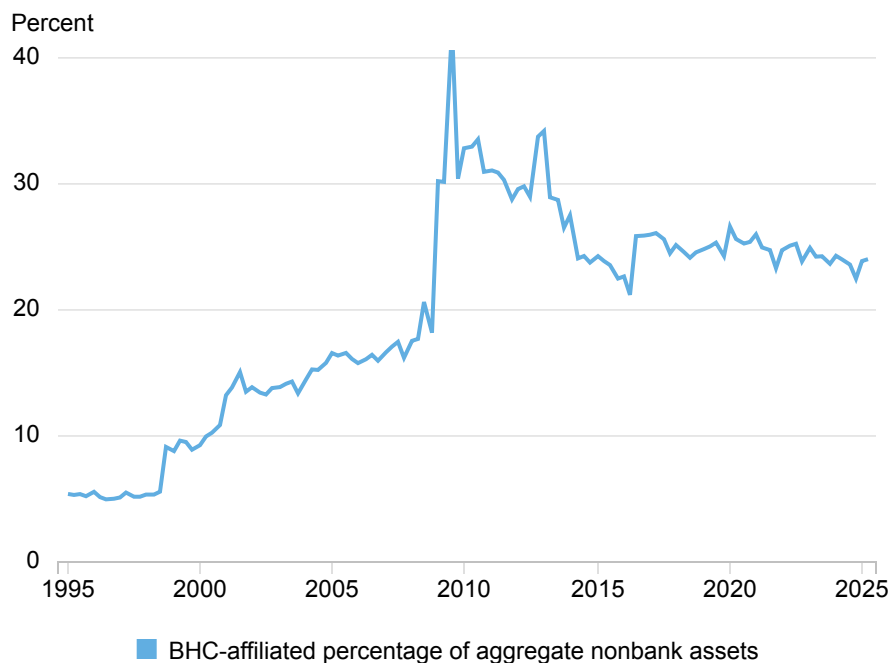
BHCs Account for One in Four Dollars of Nonbank Intermediation

The modern BHC is a complex organization comprising dozens, in some cases hundreds, of legally separate subsidiaries, including depository institutions but also a wide range of nonbank financial entities. Using regulatory filings linked through a comprehensive [database of BHC organizational structure](#), we estimate that nonbank subsidiaries account for roughly 20 to 30 percent of consolidated BHC assets in the post-2010 period, with broker-dealers making up the largest single component (see the chart below). From the perspective of the aggregate U.S. nonbank sector, roughly one in four dollars of nonbank financial intermediation today is conducted by an entity whose parent owns a regulated bank, a share that has grown steadily over the years.

Nonbank Activity Within and Across the BHC Sector



Nonbank Subsidiaries of BHCs as a Share of Aggregate
U.S. Nonbank Financial Assets



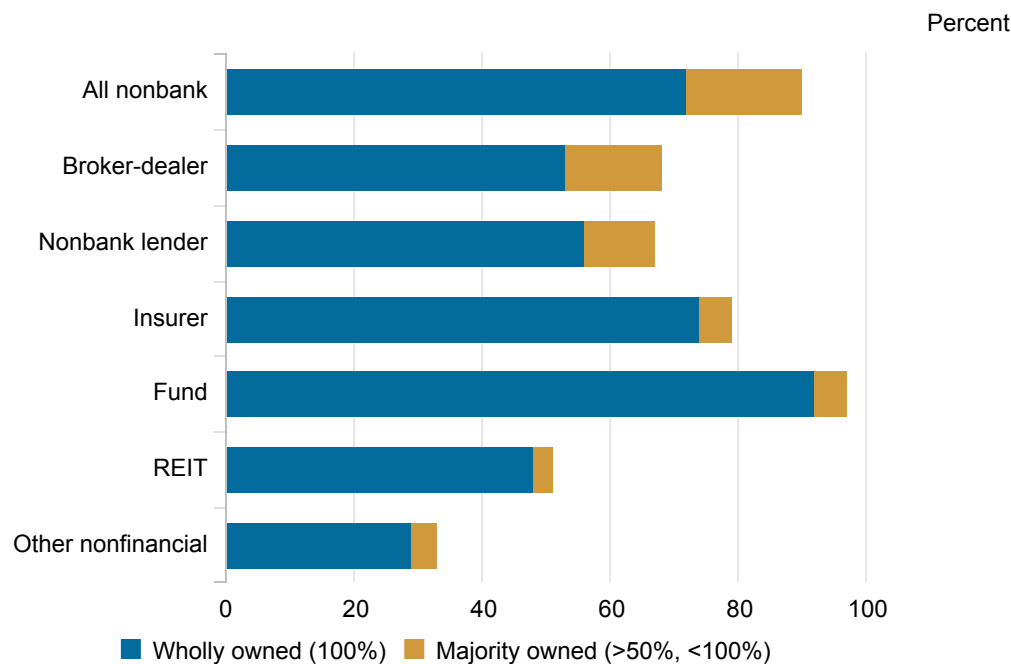
Source: FR Y-9C, FR Y-9LP, and the Financial Accounts of the United States.

Notes: The top panel shows the size of nonbank business lines as a share of consolidated BHC assets from 1995 to 2025. The black line plots the ratio of total nonbank assets to BHC assets, with stacked colored areas decomposing this aggregate into broker-dealers, insurers, finance companies, and other nonbank business lines. The bottom panel presents the percentage of aggregate nonbank assets attributable to BHC subsidiaries from 2005-25. This measure is constructed as the ratio of BHC-affiliated nonbank assets (from the FR Y-9LP) to aggregate nonbank assets (from the Financial Accounts of the United States). The denominator is constructed using asset-level proxies for broker-dealers, ABS, equity REITs, finance companies, life insurers, mortgage REITs, other financial business, P&C insurers, and closed-end funds. Mutual fund and ETF assets under management are excluded from industry totals as they are not included in the FR Y-9LP numerator.

The spike around the financial crisis reflects the conversion of Goldman Sachs and Morgan Stanley to BHC status in 2008. But even absent that episode, the broader trend is unmistakable: nonbank activity has become increasingly embedded within banking organizations. While the largest dollar volumes are concentrated in the biggest and most complex BHCs, roughly two-thirds of BHCs with between \$1 billion and \$10 billion in consolidated assets operate at least one nonbank subsidiary. In other words, having a nonbank footprint is a feature of the modern bank holding company more broadly.

These subsidiaries operate under direct parental control. As shown in the chart below, 73 percent of nonbank subsidiary-quarters in our sample are wholly owned by the parent BHC, and an additional 17 percent are majority-owned, so that 90 percent of nonbank subsidiaries fall under direct parental control.

BHC Ownership of Nonbank Subsidiaries



Source: FR-Y-10.

Notes: This chart shows the share of direct nonbank subsidiaries that are wholly owned by their parent bank holding company (BHC) and the share that are majority owned by their parent BHC. The sample period is 2010-24. Only nonbanks in the BHC's direct ownership chain are considered. Subsidiary types are classified by NAICS code: Broker (523), Nonbank Lender (5222-5223), Insurer (524), Fund (525), and REIT (531).

This ownership structure gives the parent effective authority over subsidiary capital allocation, dividend policy, and financing decisions, the margins through which, as our next post shows, capital is reallocated across the organization.

The Capital Is Not Where the Assets Are

Prudential banking regulation is centered on capital requirements that apply to the depository institution and to the consolidated holding company, but not to nonbank subsidiaries individually. A bank must hold common equity above specified minimums relative to its risk-weighted assets. Many nonbank affiliates within the same organization face substantially lighter capital regulation. As a result, different subsidiaries operating under the same parent can face very different capital constraints.

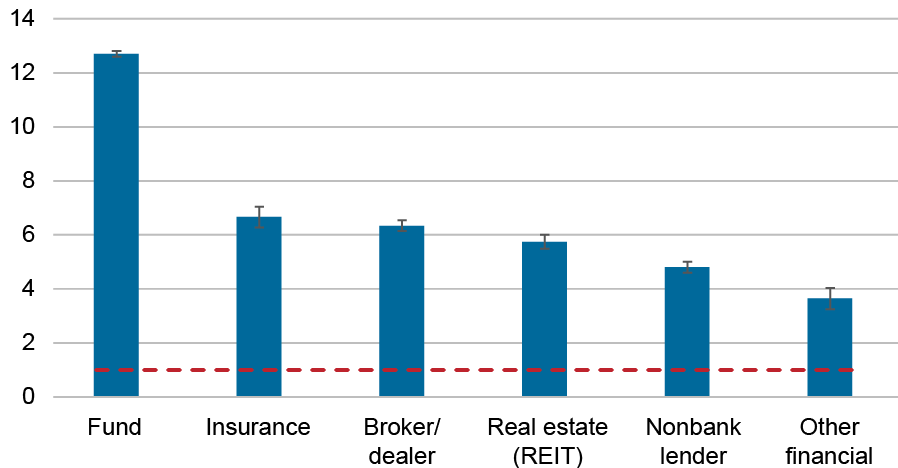
This regulatory asymmetry coincides with an equally striking asymmetry in how the two types of subsidiaries are financed. Banks are highly leveraged institutions. Access to insured deposits allows them to fund a large share of their balance sheets with debt, so equity ratios tend to be relatively low and often cluster near regulatory requirements. The median bank subsidiary holds equity equal to roughly 10 percent of assets. Nonbank affiliates, by contrast, lack access to insured deposits and rely more heavily on equity funding. The median nonbank subsidiary has an equity-to-asset ratio of 69 percent.

As a result, equity within the organization is distributed quite differently from assets, creating what we call the “equity multiplier,” defined as the nonbank share of consolidated equity divided by the nonbank share of consolidated assets. The median nonbank subsidiary

accounts for a little under 2 1/2 percent of consolidated assets but nearly 16 percent of consolidated equity, for a multiplier of 6.5. The ratio is highest for funds and asset managers; even nonbank lenders, the most leveraged category, carry a multiplier near 5 (see chart below). Nonbank affiliates function as equity reservoirs: small balance sheets holding a disproportionate share of the organization's redeployable capital.

Equity Multiplier Varies by Nonbank Subsidiary Type

Equity multiplier



Source: Authors' calculations using the FR Y-11.

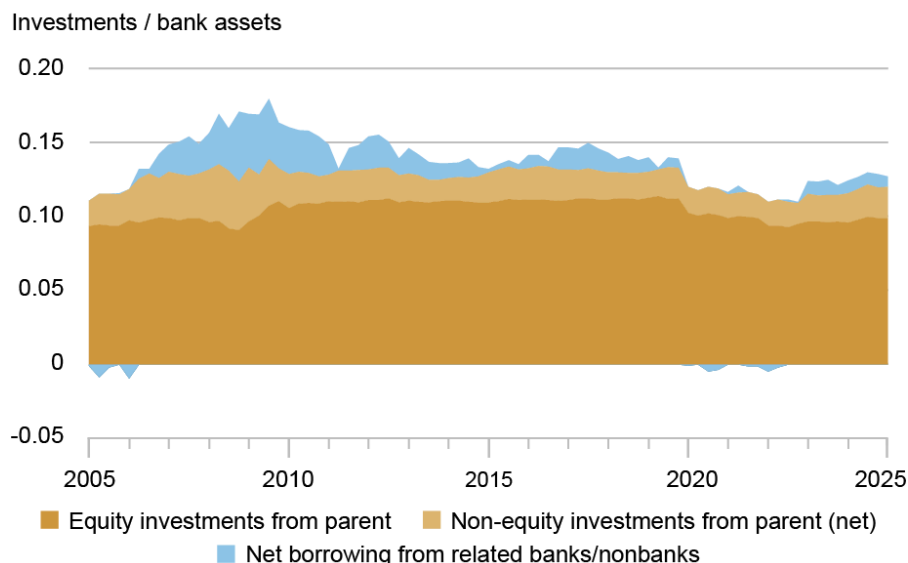
Notes: The chart presents the mean equity multiplier by nonbank subsidiary type with 95 percent confidence intervals. Equity multiplier is constructed as the ratio of subsidiary equity share to subsidiary asset share within bank holding company (BHC), measuring capital intensity. Error bars show 95 percent confidence intervals

How Capital Moves Within the Firm

Whether this stock of nonbank equity matters for the rest of the organization depends on how resources move within BHCs. A growing literature has shown that BHCs actively reallocate liquidity across subsidiaries through internal capital markets, using intra-firm loans, deposits, and other funding arrangements to respond to shocks and funding pressures. [Recent work](#) has emphasized how these [internal liquidity networks](#) connect banks and nonbank affiliates within the same organization.

Our evidence points to an additional channel. Alongside liquidity reallocation, equity reallocation is a quantitatively dominant margin within these organizations. Decomposing parent investments in bank subsidiaries, we find that equity positions exceed non-equity positions by an order of magnitude (see chart below). Parent equity investments in banks average 10–11 percent of bank assets over 2005–24, while non-equity investments such as loans and receivables total just 1–2 percent, and net borrowing among affiliates remains close to zero throughout the sample.

Parent Investments in Bank Subsidiaries: Equity vs. Non-Equity



Source: Authors' calculations using the FR Y-9LP.

Notes: This chart shows parent BHC equity and nonequity investments in bank subsidiaries, as well as net intra-company borrowing, scaled by bank subsidiary assets. Equity investments in bank subsidiaries are defined as the sum of BHC equity investments in common stock, goodwill, and other intangibles. Nonequity investments in bank subsidiaries are defined as the sum of BHC investments in loans and other receivables and net balances due from subsidiaries (balances due from bank subsidiaries minus balances due to bank subsidiaries). Net borrowing from related banks and nonbanks is defined as balances held by subsidiary banks due to related banks and nonbanks minus balances held by subsidiary banks due from related banks and nonbanks. Variables are aggregated across all BHCs in the sample using value-weighted averages.

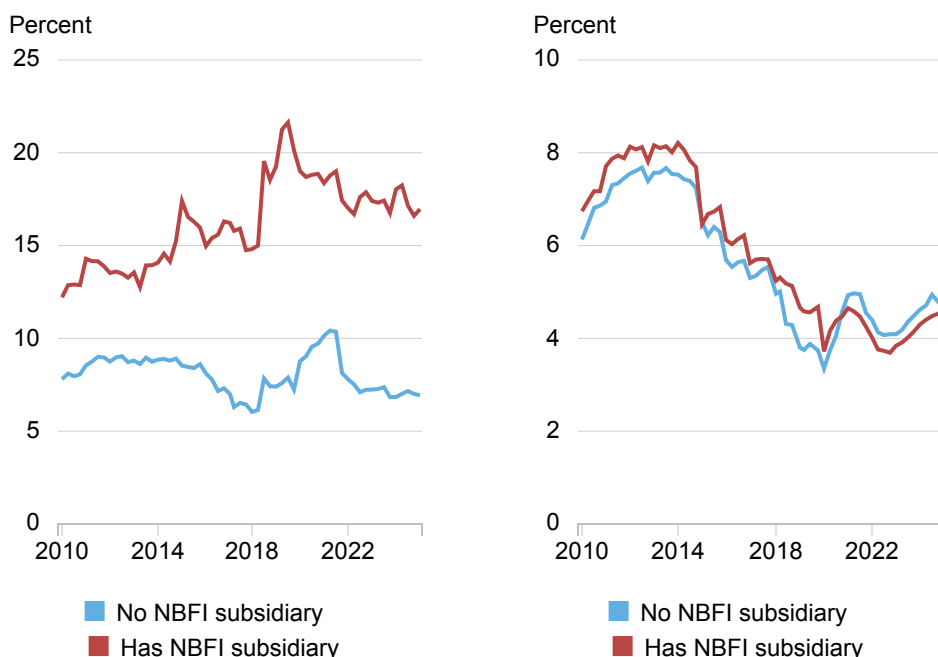
These patterns suggest that when regulation operates through capital requirements, equity transfers become an especially important organizational margin of adjustment.

A Divergence Emerges in 2015

These facts raise a natural question: if nonbank subsidiaries hold a disproportionate share of organizational equity, and equity is the operative internal channel, how do BHCs respond when capital requirements on their bank subsidiaries tighten? The answer begins to emerge in 2015, when Basel III's minimum capital requirements became binding for U.S. banks.

Before 2015, excess capital—capital above all binding regulatory minimums—evolves in parallel for banks inside BHCs with nonbank subsidiaries and banks inside BHCs without them, albeit at different levels. Beginning in 2015, the two series diverge sharply: banks affiliated with nonbank subsidiaries accumulate substantially larger capital buffers, with the gap widening to 8–10 percentage points by 2020. At the consolidated holding company level, by contrast, no comparable divergence appears; excess capital for BHCs both with and without nonbank subsidiaries declines gradually as the new requirements phase in.

Excess Capital: Banks vs BHCs

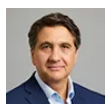


Source: Authors' calculations using FR Y-9C, FR Y-9LP, and Call Reports.

Notes: The chart compares average excess bank and bank holding company (BHC) capital for BHCs with nonbank exposure and those without exposure. The left panel compares average excess bank capital from 2010-24 for BHCs with nonbank exposure to BHCs without nonbank exposure, based on 2005 exposure status, which ensures the classification is pre-determined relative to both the 2013:Q1 baseline used in regressions and the 2015:Q1 treatment date. The right panel presents the corresponding event-study estimates for excess BHC capital over the same period.

Banks become better capitalized; the organizations that own them do not. Where does the additional bank capital come from?

In our next post, we show that the answer lies inside the firm itself. Using historical variation in interstate banking deregulation to identify differences in organizational complexity, we trace how holding companies reallocated capital across subsidiaries after Basel III and show that much of the increase in bank capital came from the equity reservoirs inside the organization and not from outside investors.



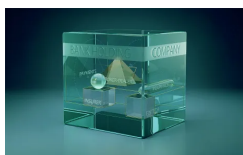
Nicola Cetorelli is head of Financial Intermediation in the Federal Reserve Bank of New York's Research and Statistics Group.

Shohini Kundu is an assistant professor of finance at the UCLA Anderson School of Management and an assistant professor of law (by courtesy) at the UCLA School of Law.

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You may also be interested in:

[How Basel III Changes Where Capital Sits: Nonbank Subsidiaries as Equity Reservoirs](#)



[Nonbank Subsidiaries and the Hidden Fragility of Internal Capital Markets Reallocation \(Post 3: 7/17/26\)](#)



[Regulatory Arbitrage Within the Firm](#)

Disclaimer

The views expressed in this post are those of the author(s) and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System. Any errors or omissions are the responsibility of the author(s).

UNITED STATES BANKRUPTCY COURT
CENTRAL DISTRICT OF CALIFORNIA
SAN FERNANDO VALLEY DIVISION

FILED & ENTERED

SEP 12 2025

CLERK U.S. BANKRUPTCY COURT
Central District of California
BY Cetulio DEPUTY CLERK

In re:

Case No.: 1:24-bk-10646-MB

SYNAPSE FINANCIAL
TECHNOLOGIES, INC.,

Chapter 11 Case

Debtor.

CONSUMER FINANCIAL
PROTECTION BUREAU,

Adv. No. 1:25-ap-01052

Plaintiff,

**STIPULATED FINAL JUDGMENT AND
ORDER**

v.

SYNAPSE FINANCIAL
TECHNOLOGIES, INC.,

Defendant.

The Consumer Financial Protection Bureau (“Bureau”) commenced this adversary proceeding on August 21, 2025 to obtain injunctive and monetary relief and civil penalties from Debtor Synapse Financial Technologies, Inc. (“Synapse” or “Debtor”). The Complaint alleges violations of sections 1031(a) and 1036(a) of the Consumer Financial Protection Act of 2010 (“CFPA”), 12 U.S.C. §§ 5531(a), 5536(a)(1)(B), in connection with Synapse’s provision of material services to entities engaged in deposit-taking activities, the transmission or exchange of funds, otherwise acting as a custodian of funds or any financial instrument for use by or on behalf of a consumer, or providing payments or other financial data processing products or services to a consumer by any technological means.

The Bureau and Synapse through Jelena McWilliams, solely in her capacity as the duly appointed Chapter 11 Trustee (“Trustee”), agree to entry of this Stipulated Final Judgment and

1 Order (“Order”), without adjudication of any issue of fact or law, to settle and resolve all matters
2 in dispute arising from the conduct alleged in the Complaint.

3
4 **FINDINGS**

5 1. On April 22, 2024, before the commencement of the instant adversary
6 proceeding, Synapse filed a voluntary petition for relief under Chapter 11 of the United States
7 Bankruptcy Code, 11 U.S.C. §§ 101 *et seq.*, initiating this bankruptcy proceeding (“Bankruptcy
8 Proceeding”) in the United States Bankruptcy Court for the Central District of California, San
9 Fernando Valley Division.

10 2. On May 24, 2024, this Court appointed Jelena McWilliams as the Chapter 11
11 Trustee for Debtor.

12 3. On August 21, 2025, Plaintiff filed the above-captioned adversary proceeding
13 against Debtor’s estate.

14 4. The automatic stay of the Bankruptcy Code does not stay the affirmative relief
15 sought in this adversary proceeding against Debtor because the action falls within the police and
16 regulatory power exception to the automatic stay set forth in 11 U.S.C. § 362(b)(4).

17 5. The Trustee has sought authority to enter into this Order by a motion pursuant to
18 Fed. R. Bankr. P. 9019.

19 6. The Trustee is an independent fiduciary for Debtor and its bankruptcy estate,
20 having been appointed by the Court. Accordingly, Plaintiff makes no allegations against the
21 Trustee, but only against Debtor.

22 7. The Trustee and Debtor neither admit nor deny the allegations in the Complaint,
23 except as specified in this Order. For purposes of this Order, the Trustee and Debtor admit the
24 facts necessary to establish the Court’s jurisdiction over them and the subject matter of this
25 action.
26

8. Debtor waives all rights to seek judicial review or otherwise challenge or contest the validity of this Order and any claim it may have under the Equal Access to Justice Act, 28 U.S.C. § 2412, concerning the prosecution of this action to the date of this Order. Each Party agrees to bear its own costs and expenses, including, without limitation, attorneys' fees.

9. This Court has jurisdiction over the parties and the subject matter of this action.

10. The Complaint states a claim upon which relief may be granted under the CFPA,
12 U.S.C. §§ 5531(a), 5536(a).

11. The relief provided in this Order is appropriate and available pursuant to the CFPA, 12 U.S.C. §§ 5564, 5565.

12. The acts and practices alleged in the Complaint have resulted in harm to Affected Consumers equal to the sum of: (1) the difference between each Affected Consumer's Account Balance and the sum of all Partner Bank Distributions to that Affected Consumer ("Affected Consumer Shortfall"); and (2) prejudgment interest at a rate equal to the weekly average 1-year constant maturity Treasury yield, as published by the Board of Governors of the Federal Reserve System, for the calendar week preceding the date of the judgment (a) on the Affected Consumer Shortfall between May 17, 2024 and the Effective Date; and (b) for all Affected Consumers, on the amount of each Partner Bank Distribution for the period between May 17, 2024 and the date of that distribution.

13. Entry of this Order is in the public interest.

DEFINITIONS

14. The following definitions apply to this Order:

a. **“Account Balance”** means a consumer’s balance with their FinTech Platform as of May 17, 2024.

- 1 b. “**Affected Consumers**” includes any consumer who had an account with a
2 FinTech Platform as of May 17, 2024.
- 3 c. “**Assisting Others**” includes, but is not limited to:
4 i. consulting in any form whatsoever;
5 ii. providing administrative support services;
6 iii. maintaining transaction data and account balances;
7 iv. processing transactions;
8 v. participating in designing, operating, or maintaining; and
9 vi. acting or serving as an owner, officer, director, manager, or principal
10 of any entity.
- 11 d. “**Debtor**” means Synapse Financial Technologies, Inc., and its successors and
12 assigns.
- 13 e. “**Effective Date**” means the date on which the Order is entered by the Court
14 on the docket.
- 15 f. “**Enforcement Director**” means the Enforcement Director of the
16 Enforcement Division for the Consumer Financial Protection Bureau, or their
17 delegate.
- 18 g. “**FinTech Platform**” means nonbank financial technology entities that
19 offered banking services to consumer end users, for which Synapse was a
20 Service Provider.
- 21 h. “**Partner Bank Distributions**” means any amounts paid to Affected
22 Consumers by Evolve Bank & Trust, AMG National Trust Bank, or Lineage
23 Bank between May 17, 2024 and the Effective Date.
- 24 i. “**Related Consumer Action**” means a private action by or on behalf of one
25 or more consumers or an enforcement action by another governmental agency
26

brought against Synapse based on substantially the same facts as described in the Complaint.

- j. **“Service Provider”** means any person that provides a material service to a covered person, in connection with the offering or provision by such covered person of a consumer financial product or service, including a person that—
- (i) participates in designing, operating, or maintaining the consumer financial product or service; or (ii) processes transactions relating to the consumer financial product or service (other than unknowingly or incidentally transmitting or processing financial data in a manner that such data is undifferentiated from other types of data of the same form as the person transmits or processes). “Service Provider” does not include a person solely by virtue of such person offering or providing to a covered person—(i) a support service of a type provided to businesses generally or a similar ministerial service; or (ii) time or space for an advertisement for a consumer financial product or service through print, newspaper, or electronic media. 12 U.S.C. § 5481(26).
- k. **“Synapse”** means Synapse Financial Technologies, Inc., and its successors and assigns.
- l. **“Trustee”** means Jelena McWilliams solely in her capacity as the duly appointed Chapter 11 Trustee for Debtor, and any successor trustee.

CONDUCT PROVISIONS

I.

Cessation of Business Operations

IT IS ORDERED that:

15. Debtor, whether acting directly or indirectly, is permanently enjoined and restrained from:

- a. Participating in or Assisting Others in advertising, marketing, promoting, offering for sale, selling, or provision of any deposit-taking activities, the transmission or exchange of funds, activities that otherwise involve acting as a custodian of funds, or payments or other financial data processing; or
- b. Receiving any remuneration or other consideration from, holding any ownership interest in, providing services to, or working in any capacity for any person engaged in or assisting in advertising, marketing, promoting, offering for sale, selling, or providing any deposit-taking activities, the transmission or exchange of funds, activities that otherwise involve acting as a custodian of funds, or payments or other financial data processing.

Nothing in this Order shall be read as an exception to this Paragraph.

16. The Trustee will not move the Court pursuant to 11 U.S.C. § 721, or otherwise seek authorization for Debtor to engage, whether directly or indirectly, in any of the prohibited acts described in Paragraph 15 above. This prohibition does not apply to the extent it may relate to recovering avoidable transfers or obtaining turnover or possession of property of the estate.

II.

Customer Information

IT IS FURTHER ORDERED that:

17. Debtor and the Trustee, whether acting directly or indirectly, may not sell customer information, including names, addresses, telephone numbers, email addresses, social security numbers, other identifying information, or any data that enables access to a customer's account that Debtor obtained before the Effective Date.

MONETARY PROVISIONS

III.

Order to Pay Civil Money Penalty

IT IS FURTHER ORDERED that:

18. Under section 1055(c) of the CFPA, 12 U.S.C § 5565(c), by reason of violations of the law alleged in the Complaint and continuing until the Effective Date, and taking into account the factors in 12 U.S.C. § 5565(c)(3), a civil money penalty in favor of the Bureau and against Debtor is ordered in the amount of \$1.00 (One U.S. Dollar) which shall be deemed an allowed general unsecured claim in the Bankruptcy Proceeding and against the estate.

19. The civil money penalty paid under this Order will be deposited in the Civil Penalty Fund of the Bureau as required by Section 1017(d) of the CFPA, 12 U.S.C. § 5497(d).

20. Debtor, for all purposes, must treat the civil money penalty paid under this Order as a penalty paid to the government for all purposes. Regardless of how the Bureau ultimately uses those funds, Debtor may not:

- a. Claim, assert, or apply for a tax deduction, tax credit, or any other tax benefit for any civil money penalty paid under this Order; or
- b. Seek or accept, directly or indirectly, reimbursement or indemnification from any source, including but not limited to payment made under any insurance policy, with regard to any civil money penalty paid under this Order.

21. Subject to 11 U.S.C §§ 507(a) and 726 governing priorities of expenses and claims in the Bankruptcy Proceeding, the Trustee relinquishes all dominion, control, and title to the funds paid under this Order to the fullest extent permitted by law and no part of the funds may be returned to the estate.

22. The facts alleged in the Complaint will be taken as true and be given collateral estoppel effect, without further proof, in any proceeding based on the entry of the Order, or in

1 any subsequent civil litigation by or on behalf of the Bureau, including in a proceeding to enforce
2 its rights to any payment or monetary judgment under this Order.

3 23. Within 30 days of the entry of a final judgment, order, or settlement in a Related
4 Consumer Action, to the extent that such a Related Consumer Action is commenced in the
5 Bankruptcy Proceeding or otherwise on notice to the Trustee while the Bankruptcy Proceeding
6 is pending, then the Trustee must notify the Enforcement Director of the final judgment, order,
7 or settlement in writing. That notification must indicate the amount of redress, if any, that Debtor
8 paid or is required to pay to consumers and describe the consumers or classes of consumers to
9 whom that redress has been or will be paid.

10 **IV.**

11 **Notices**

12 **IT IS FURTHER ORDERED** that:

13 24. Unless otherwise directed in writing by the Bureau, Debtor and the Trustee must
14 provide all submissions, requests, communications, or other documents relating to this Order in
15 writing, with the subject line, “*In re Synapse*, Case No. 24-bk-10646-MB” and send them by
16 email to Enforcement_Compliance@cfpb.gov:

17 ATTN: Enforcement Director

18 Consumer Financial Protection Bureau

19 Enforcement Division

20 **V.**

21 **Cooperation with the Bureau**

22 **IT IS FURTHER ORDERED** that:

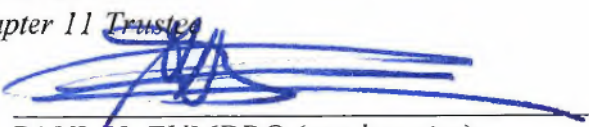
23 25. The Trustee will provide information in its or its agents’ possession or control
24 requested by the Bureau within 14 days of receiving a written request for such information.
25
26

SYNAPSE FINANCIAL TECHNOLOGIES, INC.

Jelena McWilliams

Chapter 11 Trustee

September 11, 2025

By: 

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Synapse Financial Technologies, Inc.*

CONSUMER FINANCIAL PROTECTION BUREAU

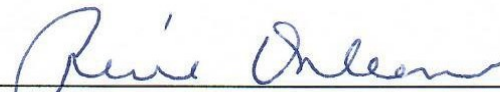
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Sept. 11, 2025

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**UNITED STATES BANKRUPTCY COURT
CENTRAL DISTRICT OF CALIFORNIA
SAN FERNANDO VALLEY DIVISION**

In re:

SYNAPSE FINANCIAL
TECHNOLOGIES, INC.,

Debtor.

CONSUMER FINANCIAL
PROTECTION BUREAU,

Plaintiff,

v.

SYNAPSE FINANCIAL
TECHNOLOGIES, INC.,

Defendant.

Case No.: 1:24-bk-10646-MB

Chapter 11 Case

Adv. No.

**ADVERSARY PROCEEDING
COMPLAINT**

Plaintiff the Consumer Financial Protection Bureau (the Bureau) brings this action against
Synapse Financial Technologies, Inc. (Synapse or Defendant) and alleges as follows:

INTRODUCTION

1. The Bureau consents to entry of a final order by the Court in connection with
this adversary proceeding.

2. Synapse offered and provided proprietary technology and software to nonbank fintech platforms that offered banking services to consumer end users (FinTech Platforms). Synapse's technology acted as a bridge between the FinTech Platforms that interfaced with consumers and the traditional banks that held consumers' money, issued debit cards, and processed ACH and wire transfers and other transactions (Partner Banks), pursuant to agreements between one or more of the banks and Synapse.

3. In 2017, Synapse partnered with only one of the Partner Banks. As early as September 2023, Synapse's records did not match the records maintained by that bank, which was holding less money for the FinTech Platform end users than Synapse's records indicated the bank should be holding.

4. Beginning in mid-2023, Synapse engaged with additional Partner Banks to offer FinTech Platform end users a Cash Management Program. As part of the Cash Management Program, Synapse directed the transfer of consumers' funds from the FinTech Platforms to more than one Partner Bank to hold those funds in an omnibus account held by a Synapse subsidiary for the benefit of the consumers. It also directed the movement of consumers' money to and from those Partner Banks to other Partner Banks that were originating and receiving ACH and wire transfers for consumers. Synapse was responsible for tracking and maintaining records of the movement of consumers' funds across these Partner Banks and ensuring those records matched the records maintained by the Partner Banks.

5. In May 2024, after filing this Chapter 11 Proceeding, Synapse's operations deteriorated and eventually ceased, and it stopped providing data it had regularly provided to at least one Partner Bank and failed to maintain that bank's access to an online dashboard that provided information about consumer balances and transactions.

6. After the Bankruptcy Court appointed a Chapter 11 Trustee, it became apparent that Synapse's records did not match the records maintained by multiple Partner Banks. The Partner Banks held significantly less money than Synapse's records indicated they should

1 collectively be holding. It took some Partner Banks many months to determine how much money
2 they should distribute to each consumer. During that period, thousands of consumers could not
3 withdraw or transfer any of the money they had placed with the FinTech Platforms, inflicting
4 significant hardships on those affected consumers. Consumers reported they were unable to pay
5 their rent or mortgage and feared they would lose their homes. Others reported they were unable
6 to afford food or pay for medical care or other bills.

7 7. Consumers did not have control over how Synapse moved or tracked funds
8 across different Partner Banks that were holding their funds and processing their debit card,
9 ACH, and wire transactions.

10 8. Because the Partner Banks held significantly less money than Synapse's records
11 indicated they should collectively be holding for consumers, many consumers have not received
12 the full amount they had deposited with their FinTech Platform.

13 9. Consumers were substantially injured because Synapse's records did not match
14 the records of its Partner Banks. Consumers did not have any access to their money for weeks
15 or months as Partner Banks reconciled their records with Synapse's records and then distributed
16 funds to consumers. Over a year later, many consumers have not received the full amount of
17 their account balance with their FinTech Platform.

18 10. Synapse engaged in unfair acts or practices by failing to maintain adequate
19 records of the location of consumers' funds and failing to ensure those records matched the
20 records maintained by the Partner Banks.

21 11. The Bureau brings this action under the Consumer Financial Protection Act
22 (CFPA), 12 U.S.C. §§ 5564, 5565, to stop Synapse's unlawful conduct and obtain redress for
23 affected consumers, a penalty, and all other appropriate relief.

24 **JURISDICTION AND VENUE**

25 12. This adversary proceeding relates to the Defendant's Chapter 11 bankruptcy
26 case, pending in the United States Bankruptcy Court for the Central District of California.

1 13. This adversary proceeding is brought pursuant to Rule 7001 of the Federal Rules
2 of Bankruptcy Procedure.

3 14. This Court has jurisdiction over this matter pursuant to 28 U.S.C. §§ 157 and
4 1334. This adversary proceeding is a not a core proceeding but is otherwise related to a case
5 under title 11. 28 U.S.C. § 157(c).

6 15. Venue is proper in this district pursuant to 28 U.S.C. § 1409.

7 **PARTIES**

8 16. The Bureau is an agency of the United States charged with regulating the
9 offering and provision of consumer financial products and services under Federal consumer
10 financial laws. 12 U.S.C. § 5491(a). The Bureau is authorized to initiate civil actions to secure
11 appropriate relief for violations of Federal consumer financial law, including the CFPA. 12
12 U.S.C. § 5564(a)-(b).

13 17. Defendant Synapse is a Delaware corporation with its principal place of business
14 in Woodland Hills, California that provided technology and other services to FinTech Platforms
15 and Partner Banks.

16 18. The FinTech Platforms offered and provided consumers with financial services,
17 including accepting and maintaining deposits accounts, transmitting consumers' funds to financial
18 institutions, offering consumers debit cards and services, direct deposit, bill payment, and wire
19 transfers. The FinTech Platforms are "covered persons" as that term is defined by 12 U.S.C. §
20 5481(6)(A), because they offered or provided a "consumer financial product or service" under the
21 CFPA, by "engaging in deposit-taking activities, transmitting or exchanging funds, or otherwise
22 acting as a custodian of funds or any financial instrument for use by or on behalf of a consumer"
23 and by "providing payments or other financial data processing products or services to a consumer
24 by any technological means." 12 U.S.C. § 5481(5)(A)(i), (15)(A)(iv), (vii).

25 19. At least one of the Partner Banks, Evolve Bank & Trust (Evolve), offered and
26 provided consumers with financial services, including accepting and maintaining deposits

1 accounts, transmitting consumers' funds to financial institutions, offering consumers debit cards
2 and services, direct deposit, bill payment, and wire transfers. Evolve is a "covered person" as that
3 term is defined by 12 U.S.C. § 5481(6)(A), because it offered or provided a "consumer financial
4 product or service" under the CFPA, by "engaging in deposit-taking activities, transmitting or
5 exchanging funds, or otherwise acting as a custodian of funds or any financial instrument for use
6 by or on behalf of a consumer." 12 U.S.C. § 5481(5)(A), (15)(A)(iv).

7 20. Synapse provided the FinTech Platforms and at least one Partner Bank with the
8 technology and software that connected the FinTech Platforms (that interfaced with consumers)
9 with the Partner Banks that accepted and maintained the deposits and provided other financial
10 services. Synapse provided a material service to the FinTech Platforms and Evolve in
11 connection with the FinTech Platforms' and Evolve's offering or provision of a consumer
12 financial product or service by "participat[ing] in designing, operating, or maintaining the
13 consumer financial product or service" and "by process[ing] transactions relating to the
14 consumer financial product or service." 12 U.S.C. § 5481(26). Synapse is a "service provider"
15 within the meaning of the CFPA. *Id.*

16 **FACTUAL ALLEGATIONS**

17 **A. Synapse Provided FinTech Platforms and Partner Banks With Technology and** 18 **Services That Enabled the FinTech Platforms and Partner Banks to Offer** 19 **Consumer Financial Products and Services to Consumers**

20 21. Synapse offered proprietary technology and software to FinTech Platforms and
21 Partner Banks. The FinTech Platforms provided a user interface through which consumers and
22 businesses (End Users) could set up checking accounts and among other things, make deposits,
23 transfer funds to and from other financial institutions, obtain debit cards, set up direct deposit and
24 bill payment, and make wire transfers.

25 22. Synapse's technology and software created the link between the FinTech Platforms
26 and the Partner Banks that held End User funds. Synapse's technology and software communicated
the transactions End Users requested from the FinTech Platforms to the Partner Banks to perform.

1 23. Synapse performed these services for at least one FinTech Platform pursuant to a
2 Master Services Agreement.

3 24. Evolve was a Partner Bank. Synapse executed a Bank Services Agreement with
4 Evolve on or about April 18, 2017, and subsequently executed the Master Bank Services
5 Agreement on or about September 23, 2022. At least until the summer of 2023, when a consumer
6 opened an account with a FinTech Platform, Synapse provided the consumer with a deposit
7 account agreement on behalf of Evolve.

8 25. At least as of September 2023, if not earlier, both Evolve and Synapse were aware
9 that there was a deficit of tens of millions of dollars in funds that Evolve was holding for End
10 Users, which included consumer funds. Evolve and Synapse have publicly blamed each other for
11 the deficit.

12 26. As of the date of the filing of this complaint, Synapse has not resolved its dispute
13 with Evolve regarding the deficit.

14 **B. Beginning in mid-2023, Synapse Offered a Cash Management Program to**
15 **Consumers Through Synapse Brokerage**

16 27. Synapse Brokerage LLC (Synapse Brokerage) is a wholly owned subsidiary of
17 Synapse and a registered broker dealer.

18 28. In 2023, Synapse began to offer a Cash Management Program through FinTech
19 Platforms. Synapse marketed its Cash Management Program as a way for FinTech Platforms to
20 offer their end users increased FDIC deposit insurance through Synapse's sweeps program and
21 partnership with multiple banks. FinTech Platforms with an existing relationship with Synapse
22 could choose whether to participate in Synapse's Cash Management Program. As part of the
23 Cash Management Program, Synapse opened accounts with Synapse Brokerage on End Users'
24 behalf and one or more omnibus accounts at Partner Banks in the name of Synapse Brokerage for
25 the benefit of End Users.
26

1 29. When some End Users deposited funds through the FinTech Platforms, the deposit
2 was initially held in the Synapse Brokerage account and then transferred by Synapse Brokerage to
3 omnibus accounts at the Partner Banks. When End Users sought to withdraw funds, Synapse
4 Brokerage would facilitate the withdrawal of the funds from the omnibus accounts at the Partner
5 Banks.

6 30. Synapse had arrangements with several Partner Banks for the Cash Management
7 Program.

8 31. AMG National Trust Bank (AMG) was one of several Partner Banks for the Cash
9 Management Program. It accepted sweeps deposits from Synapse Brokerage beginning in August
10 2023 and held those deposits in the name of Synapse Brokerage. It also processed ACH and wire
11 transfers for End Users with some FinTech Platforms that chose to participate in the Cash
12 Management Program.

13 32. Evolve was not one of the Partner Banks Synapse engaged to hold funds in the
14 name of Synapse Brokerage on the End User's behalf for the Cash Management Program.
15 Beginning in October 2023, for FinTech Platforms that chose to participate in Synapse's Cash
16 Management Program, Synapse directed the transfer of End Users' funds from Evolve to Synapse
17 Brokerage and then to accounts at other Partner Banks.

18 33. Some FinTech Platforms did not participate in Synapse's Cash Management
19 Program and their End Users' funds remained with Evolve.

20 34. Even for End Users who moved to Synapse's Cash Management Program, and
21 whose funds therefore had moved to Synapse Brokerage accounts at other Partner Banks, Evolve
22 continued to act as a Partner Bank by providing access to certain banking products and services,
23 including by continuing to sponsor debit cards. Evolve also continued to act as the receiving bank
24 for ACH transfers for which consumers had previously been using Evolve's routing number, such
25 as direct deposit. Evolve continued to maintain accounts on behalf of these End Users to provide
26 these services. Synapse would sweep funds from those accounts to Synapse Brokerage.

1 35. Lineage Bank (Lineage) was also a Partner Bank. It primarily provided payment
2 processing services as an originating bank. When End Users in the Cash Management Program
3 sought to make ACH and wire transfers, Lineage processed those transactions based on
4 instructions from Synapse.

5 36. After the introduction of the Cash Management Program, Synapse's technology
6 continued to create the link between the FinTech Platforms and all Partner Banks and to
7 communicate the transactions End Users requested from the FinTech Platforms to the Partner
8 Banks.

9 37. Synapse was also responsible for directing the movement of End User funds from
10 Synapse Brokerage to and from (1) AMG and other Partner Banks that held End User funds in
11 omnibus accounts; (2) Evolve, which continued to process debit card transactions and to act as the
12 receiving bank for ACH transfers; and (3) Lineage, which was originating ACH and wire transfers
13 based on instructions from Synapse.

14 38. Synapse was also responsible for tracking the location of individual End User funds
15 across Synapse Brokerage; AMG and other Partner Banks that held End User funds in omnibus
16 accounts; Evolve; and Lineage. Synapse additionally was responsible for providing the banks
17 access to data and records regarding End User activity.

18 **C. Synapse Files For Chapter 11 Bankruptcy**

19 39. On April 22, 2024, Synapse filed for Chapter 11 Bankruptcy protection as a debtor
20 in possession. At the same time, Synapse sought court approval of an asset purchase agreement
21 with a potential buyer that would have transferred all of Synapse's business operations to the buyer.
22 At that time, Synapse and Evolve had not resolved their dispute about the deficit in the account
23 balances at Evolve. The buyer required Synapse and Evolve to come to an agreement and ensure
24 that the account balances at Evolve were fully funded as a condition of the purchase.

25 40. Synapse and Evolve could not resolve their dispute.
26

1 41. On May 11, 2024, Synapse failed to maintain Evolve's access to an online
2 dashboard it maintained through which Evolve could access certain information about End Users'
3 accounts at Evolve, including current balances and transactions.

4 42. Synapse also stopped providing Evolve general ledger reports, which it had
5 previously provided to Evolve daily.

6 43. On May 11, 2024, Evolve stopped processing transactions and instituted a freeze
7 on any activity for any End User.

8 44. Lineage also stopped processing transactions and instituted a freeze on any activity
9 for End Users.

10 45. As a result, consumer End Users could not use their debit cards, withdraw or
11 transfer their funds, pay bills, or receive deposits, including direct deposits of their wages and
12 salaries.

13 46. On May 15, 2024, the United States Trustee filed an emergency motion to convert
14 the case to a Chapter 7 under 11 U.S.C. § 1112(b) or direct the appointment of a Chapter 11 Trustee
15 under 11 U.S.C. § 1104(a).

16 47. On May 17, 2024, Synapse provided Evolve, AMG, Lineage, and other Partner
17 Banks with Synapse's records regarding the amount each bank was holding for each End User.

18 48. On or about May 17, 2024, Synapse provided Evolve with the general ledger report
19 for May 15, 2024.

20 49. On May 24, 2024, the bankruptcy court appointed a Chapter 11 Trustee.

21 **D. Consumers were Substantially Injured Because Partner Banks' Records Did Not**
22 **Match Synapse's Records**

23 50. With the assistance of the Chapter 11 Trustee, the Partner Banks determined that
24 the total amount of funds all the Partner Banks were holding for End Users was less than the total
25 amount of End User funds reflected in records Synapse provided to the Partner Banks. The Trustee
26 has estimated this shortfall of End User funds is between \$60 and \$90 million.

1 51. Evolve determined that its records for End Users of FinTech Platforms that chose
2 to participate in Synapse's Cash Management Program were not consistent with the records
3 provided by Synapse on May 17, 2024. Evolve engaged a third-party consultant to help it reconcile
4 and confirm account balances using its own records, Federal Reserve Bank records, and
5 information and records made available to it by the Chapter 11 Trustee.

6 52. Upon reviewing the records provided by Synapse on May 17, 2024, Lineage
7 determined that its records were not consistent with Synapse's records. Lineage engaged a former
8 Synapse employee to help it reconcile and confirm account balances using its own records, Federal
9 Reserve Bank records, and information and records made available to it by the Chapter 11 Trustee.

10 53. AMG began to distribute funds to End Users of FinTech Platforms beginning in
11 May 2024. Evolve and Lineage began to distribute funds in June 2024. The Partner Banks most
12 recently reported in March 2025 that they continue to distribute funds, mostly for accounts with
13 very low balances that do not have valid addresses on file and for returned payments.

14 54. To date, distributions from Partner Banks collectively have not provided many
15 consumer End Users the full amount of their account balance with their FinTech Platform as of
16 May 17, 2024.

17 55. Even consumer End Users that did receive distributions from the Partner Banks,
18 could not withdraw, use, or transfer those funds until the Partner Banks had completed their
19 distribution, which took over eight months in some cases.

20 56. Before the distributions were completed, some consumer End Users reported they
21 lost all or most of their life's savings. Many reported they were unable to afford food or pay their
22 rent, mortgage, hospital bills, or other bills without access to their funds. Some consumer End
23 Users were also forced to pay late fees and other penalties because they did not have access to their
24 funds to timely pay bills. These hardships caused certain End Users emotional distress, including
25 some who expressed suicidal ideations.
26

1 57. Consumers did not have control over how Synapse moved or tracked funds
2 across different Partner Banks that were holding their funds and processing their debit card,
3 ACH, and wire transactions. As a result, consumers could not reasonably avoid the harm they
4 suffered.

5
6 **CAUSE OF ACTION**

7 **Count I – Unfair Acts or Practices**

8 58. Plaintiff re-alleges and incorporates by reference the allegations contained in the
9 preceding paragraphs of this Complaint.

10 59. Section 1036(a)(1)(B) of the CFPA prohibits service providers from engaging in
11 “any unfair, deceptive, or abusive act or practice.” 12 U.S.C. § 5536(a)(1)(B).

12 60. An act or practice is unfair under the CFPA if (1) the act or practice causes or is
13 likely to cause substantial injury, (2) which is not reasonably avoidable by consumers, and (3)
14 such substantial injury is not outweighed by countervailing benefits to consumers or to
15 competition. 12 U.S.C. § 5531(c).

16 61. Synapse engaged in unfair acts or practices by failing to maintain adequate
17 records of the location of consumers’ funds and failing to ensure those records matched the
18 records maintained by Partner Banks.

19 62. Consumers were substantially injured by Synapse’s acts. Consumers did not
20 have any access to their money for weeks or months as Partner Banks reconciled their records
21 with Synapse’s records and then distributed funds to consumers. Many consumers have not
22 received the full amount of their account balance with their FinTech Platform.

23 63. Consumers could not reasonably avoid the injury caused by Synapse’s actions
24 as they had no way of knowing that the account balance reflected on their FinTech Platform did
25 not match the balance reflected at Partner Banks, or that they would lose access to their funds
26

1 while the Partner Banks reconciled their records with Synapse's records. There are no
2 countervailing benefits to consumers or competitors from Synapse's actions.

3 64. Thus, Synapse engaged in unfair acts and practices in violation of sections 1031
4 and 1036 of the CFPA, 12 U.S.C. §§ 5531(a), (c), 5536(a)(1)(B).

5
6 **REQUEST FOR RELIEF**

7 Accordingly, the Bureau requests that the Court:

- 8 a. permanently enjoin Defendant from committing future violations of the
9 CFPA;
10
11 b. grant additional injunctive relief against Defendant as the Court deems just
12 and proper;
13
14 c. award such relief as the Court finds necessary to redress injury to consumers
15 including, but not limited to, rescission or reformation of contracts, refund of
16 moneys, restitution, and payment of damages or other monetary relief;
17
18 d. impose on Defendant civil money penalties under 12 U.S.C. § 5565(c); and
19
20 e. award additional relief as this Court deems just and proper.

21
22
23
24
25
26
DATED this 21st day of August, 2025.

Respectfully Submitted,

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FSB annual report flags data gaps as nonbank finance risk rises

Posted on March 29, 2026 by [Editor](#)

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The Financial Stability Board (FSB) published its Annual Report for 2025 in late March 2026, painting a picture of a financial system that has so far held firm against mounting pressures; but one where significant vulnerabilities lurk in the shadows, particularly in the fast-growing world of nonbank financial intermediation (NBFI).

The report, chaired by Bank of England Governor Andrew Bailey, highlights a striking fact: NBFI grew by 9.4% in 2024, double the pace of the banking sector, and now represents 51% of global financial assets. Yet the FSB's own assessment concedes that data challenges mean that understanding nonbank positions and leverage is murky businesses. In response, the FSB has established a new Nonbank Data Task Force to begin tackling the problem, starting with a test case on leveraged trading strategies in sovereign bond markets.

NBFI has been a growing concern for regulators. The sector encompasses hedge funds, money market funds, open-ended property funds and private credit vehicles. All of the above are relatively opaque, growing rapidly, and increasingly interconnected with the traditional banking system.

The FSB's frank acknowledgement of its own data limitations is arguably the most important thread running through this report. High-quality, machine-readable data is exactly what regulators need to monitor these risks effectively. The FSB's new task force is starting from a test case, but it's not (yet) a solution.

Read the full report [here](#).

FSB

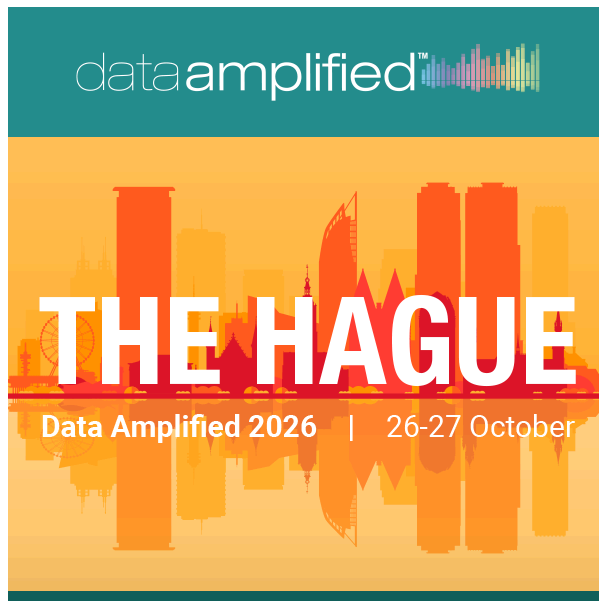
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Regulatory Arbitrage Within the Firm

Nicola Cetorelli | Shohini Kundu

Regulatory Arbitrage Within the Firm

Nicola Cetorelli and Shohini Kundu

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Abstract

Regulation shapes the boundaries of firms. When prudential standards bind asymmetrically across subsidiaries of an integrated organization, internal capital markets become a mechanism for regulatory arbitrage. We study this in U.S. banking, where holding companies encompass both heavily regulated depository institutions and lightly regulated nonbank affiliates. Following Basel III in 2015, holding companies extract equity from nonbank subsidiaries to recapitalize their banks. Bank subsidiaries accumulate 5–8 percentage points more excess capital than banks in otherwise similar organizations, through internal transfers; consolidated equity, assets, and lending are unchanged. In response to the same regulatory shock, nonbank affiliates within these organizations exhibit declining capital ratios, deteriorating credit quality, and expansion into consumer lending. The consolidated organization remains exposed to nonbank distress. We calibrate stress scenarios to 2008-scale losses on nonbank assets. If parents were to recapitalize distressed subsidiaries, 4–6% of holding companies would exhaust their capital buffers. For the most exposed institutions, the apparent improvement in bank safety overstates the consolidated gain once implicit liabilities to nonbank affiliates are netted out. Organizational structure is a fundamental determinant of regulatory outcomes.

JEL classification: G21, G23, G28, G38

Key words: banks, nonbanks, BHCs, regulation, arbitrage, boundaries of the firm

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This paper presents preliminary findings and is being distributed to economists and other interested readers solely to stimulate discussion and elicit comments. The views expressed in this paper are those of the author(s) and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System. Any errors or omissions are the responsibility of the author(s).

To view the authors' disclosure statements, visit
https://www.newyorkfed.org/research/staff_reports/sr1196.html.

1 Introduction

A fundamental question in economics is how organizations allocate resources across internal boundaries. Since [Coase \(1937\)](#), economists have viewed firms as arising when internal coordination economizes on transaction costs relative to market exchange. Subsequent research shows that organizational form shapes resource allocation (e.g., [Williamson, 1975](#); [Grossman and Hart, 1986](#)), capital structure (e.g., [Harris and Raviv, 1991](#); [Stein, 1997](#)), and responses to external shocks (e.g., [Gertner, Scharfstein and Stein, 1994](#); [Scharfstein and Stein, 2000](#)). However, much less is known about how regulation interacts with organizational structure. While regulations constrain the activities firms may undertake, firms can respond by reshaping their internal boundaries, and these endogenous organizational adjustments may blunt or even reverse the regulation’s intended effects.

This interaction is particularly consequential for banking, where the central prudential constraint is capital adequacy. The canonical regulatory framework specifies minimum equity ratios, leverage constraints, and risk-weighted buffers for “the bank” as if it were a standalone entity, a structure that reflects the organizational reality of mid-twentieth-century banking. Modern banking firms, however, are complex holding companies comprising dozens of legally distinct subsidiaries including depository institutions, broker-dealers, consumer lenders, asset managers, and insurers, that face dramatically different regulatory regimes despite operating under common ownership and integrated management. These nonbank affiliates are not peripheral: in our data, they account for roughly 20–30% of consolidated BHC assets, and approximately one-quarter of the aggregate financial assets of nonbanks operating in the United States. This raises a natural question: do tighter capital requirements on bank subsidiaries reduce risk at the organizational level, or do they induce reallocation of risk to lightly regulated nonbank affiliates within the same firm?

The answer depends on how internal capital markets respond. In a frictionless world, reallocating equity across subsidiaries would be neutral; a dollar of capital is a dollar of capital regardless of where it sits in the organizational chart. But when raising external equity is costly ([Myers and Majluf, 1984](#); [Altınkılıç and Hansen, 2000](#)), a profit-maximizing holding company facing tighter requirements on its bank subsidiary has a cheaper alternative: extract equity from lightly regulated nonbank affiliates and redeploy it internally, consistent with broader evidence that organizations expand internal capital markets when external markets are impaired ([Matvos and Seru, 2014](#); [Matvos, Seru and Silva, 2018](#)). This avoids costly external issuance, satisfies regulatory requirements, and raises consolidated profitability. The same reallocation, however, leaves nonbank affiliates with less capital, and risk concentrated on the less regulated side of the firm. This organizational adaptation has broader implications that in fact may undo the efficacy of the

regulation. If the parent recapitalizes a distressed nonbank subsidiary, it draws down the capital buffer that backstops the bank. The bank’s improved capital position is therefore not fully insulated from nonbank risk.

The U.S. banking industry provides an ideal laboratory for studying this interaction. Subsidiary-level financial disclosures, sharply differentiated regulatory regimes across affiliates within the same firm, and well-identified policy shocks make bank holding companies (BHCs) a setting in which organizational responses to regulation can be cleanly identified. The mechanism extends well beyond banking, applicable to any multi-entity organization where regulation, taxation, or supervision binds asymmetrically across affiliates.¹

We exploit the phased implementation of Basel III capital requirements beginning in 2015, which substantially tightened minimum capital ratios for bank subsidiaries while leaving nonbank affiliates formally unregulated. Rather than issuing new equity, BHCs extract equity from nonbank subsidiaries and reallocate it to their banks. BHC profitability rises, external equity issuance falls, and bank capital ratios improve, but in parallel, nonbank affiliates hold less capital, face higher internal funding costs, and shift aggressively into riskier lending. Risk is not eliminated; it is relocated to the less regulated, less protected side of the firm.

These findings reframe a growing literature on regulatory arbitrage. Prior work documents how stricter bank regulation drives credit intermediation outside the banking sector toward fintech lenders, shadow banks, and nonbank financial institutions that compete with regulated depository institutions.² We show that much of the nonbank sector is not outside banking organizations at all: roughly one in four dollars of U.S. nonbank financial assets is held within a bank holding company. We further show that the same migration occurs *within* bank holding companies, as BHCs reallocate capital and risk toward their own nonbank affiliates. Regulatory arbitrage is therefore not only an inter-firm phenomenon but also an intra-firm one, operating under consolidated supervision rather than outside it.

For identification, we exploit cross-sectional variation in organizational complexity generated by the staggered timing of interstate banking deregulation during the 1970s–1990s. Following [Strahan \(2003\)](#), [Jayaratne and Strahan \(1996\)](#), and [Kroszner and Strahan \(1999\)](#), we instrument for organizational complexity using the year in which each BHC’s home state removed geographic restrictions on interstate banking. States that deregulated earlier allowed BHCs more time to expand and build multi-subsidiary structures before the Riegle–Neal Act of 1994 harmonized restrictions nationwide. This historically determined variation, shaped by state-level political economy

¹For example, [Gandhi and Olenski \(2024\)](#) document an analogous mechanism in nursing homes, where operators tunnel profits to commonly-owned real estate and management companies to obscure profitability from price regulators. [Kakani et al. \(2026\)](#) similarly show that vertically integrated insurers respond to profit caps in Medicare Part D by raising prices at their owned pharmacies. [Giroud and Rauh \(2019\)](#) document within-firm reallocation across U.S. states in response to differential taxation.

²See, e.g., [Buchak et al. \(2018\)](#), [Irani et al. \(2021\)](#), and [Buchak et al. \(2024\)](#).

decades before our study period ([Kroszner and Strahan, 1999](#)), generates persistent differences in organizational structure, plausibly orthogonal to factors determining post-2015 regulatory responses. Permutation-based placebo tests confirm that neither random reassignment of the instrument nor random reassignment of the treatment timing produces significant effects.

We establish three core findings. First, BHCs with more complex organizational structures respond to tighter capital requirements by extracting equity from nonbank subsidiaries to recapitalize their bank affiliates. Using a reduced-form specification, we find that banks in BHCs from states deregulating one year earlier accumulate 0.74 percentage points more excess capital post-2015; the median 7-year gap between early and late deregulators implies roughly 5 percentage points more bank capital. The capital accumulation occurs exclusively at the bank subsidiary level; we find no corresponding increase in consolidated holding company capital, total BHC assets, or BHC lending, consistent with internal reallocation rather than external equity issuance or consolidated deleveraging.

We trace the internal reallocation through direct observation of equity investments between parent and subsidiaries: a contribution that addresses an important gap in the literature. While prior research on internal capital markets emphasizes liquidity reallocation through loans and deposits between affiliates ([Cetorelli and Goldberg, 2012a,b](#); [Gilje, Loutskina and Strahan, 2016](#); [Cetorelli and Prazad, 2025](#); [Bai, Campello and Muthukrishnan, 2025](#)), the role of equity transfers, which directly affect risk-bearing capacity and regulatory capital ratios, has received limited attention. We document that equity dominates internal funding by an order of magnitude: equity investments average 10–11% of bank assets while non-equity investments total just 1–2%. This dominance explains why organizational structure, specifically, the presence of nonbank subsidiaries from which equity can be extracted, becomes a fundamental determinant of regulatory responses.

Post-2015, we observe systematic equity reallocation operating through three steps. First, parent equity investments shift from nonbanks toward banks in equal and offsetting amounts, with no change in total investments. Second, nonbanks pay sharply higher dividends upstream to the parent, while bank dividends remain unchanged, providing the cash flows that fund the reallocation. Third, banks retain the additional earnings rather than distributing them upward, accumulating capital internally. Equity injections from the parent, combined with reduced upstream dividend extraction, build the bank capital buffers documented in the headline result. Consistent with this internal substitution mechanism, organizationally complex BHCs sharply reduce external equity issuance rather than turning to external markets to satisfy tighter requirements. Beyond declining to raise new external equity, these BHCs also actively return surplus extracted equity to shareholders through share buybacks, implying that consolidated equity falls below the level it would have reached absent internal reallocation. Parents also charge nonbanks substan-

tially higher internal funding rates while leaving bank rates unchanged, generating a spread of roughly 300 basis points for the median BHC, indicating that internal capital markets operate subject to funding frictions that amplify the real effects of equity extraction.

This reallocation operates through an internal equity multiplier. Nonbank subsidiaries hold dramatically higher equity-to-asset ratios than their affiliated banks (median 69% versus 10%), making them natural “equity reservoirs” despite small asset footprints: the median nonbank subsidiary holds 16% of consolidated equity on just 2% of consolidated assets. We confirm that the reallocation response scales directly with this extractability: BHCs with higher equity multipliers inject disproportionately more equity into banks and reduce external issuance more aggressively post-2015. BHCs with lower multipliers, lacking accessible internal reservoirs, instead rely more heavily on external capital markets.

Our second core finding examines the systemic implications of internal capital reallocation using subsidiary-level stress tests. Internal equity extraction is privately optimal for BHCs because it avoids costly external financing, but it opens two channels for systemic fragility. First, depleted nonbank capital buffers leave subsidiaries more vulnerable to shocks that higher pre-extraction capitalization would have absorbed. Second, nonbank distress can transmit back to the affiliated bank, reflecting two distinct exposures. Parents support distressed nonbanks through implicit lines of credit that cannot be withdrawn costlessly, so recapitalization draws down bank capital. Separately, the parent and its banks hold intercompany claims that lose value when the nonbank does, independent of any recapitalization. Both leave the consolidated organization vulnerable to nonbank distress even as measured bank capital improves. Historical episodes of intra-firm transmission, rating-agency methodology that prices implicit parent support, and our own evidence on bank lending, bond spreads, and parent equity investments around nonbank distress events are consistent with this channel.

We quantify these risks by simulating scenarios comparable to the 2008 financial crisis. Using 2013Q1 balance sheets, we calculate losses of 1%, 5%, 10%, and 15% on nonbank assets, magnitudes consistent with the substantial mark-to-market losses and balance sheet contractions experienced by broker-dealers during 2007–2009 ([Adrian and Shin, 2010](#)), and compute the equity injection needed to restore nonbank capital ratios to targets between 20% and 70%, spanning from well below to approximately the population median of 69%; our baseline of 40% is deliberately conservative.

Under our baseline scenario of a 5% shock requiring recapitalization to 40% capital ratios, the average BHC would need to deploy 18% of its excess capital to recapitalize nonbanks. At the 95th percentile, this rises to 99% of available parent capital, and 4% of BHCs would completely exhaust capital buffers. More severe scenarios generate tail risks exceeding 100% of available BHC capital. Whether these drawdowns undermine the bank’s improved capital position depends

on how much of the loss is transmitted back to the resources that backstop the bank. For the typical BHC, most of the gain survives at any transmission rate, with full transmission eroding roughly 40% of it. For tail-risk BHCs, transmission of just one-half erodes 72% of the gain, and anything higher reverses it, leaving the most exposed organizations worse off than the headline improvement suggests.

Our third core finding is that the same regulatory wedge that drives internal capital reallocation also generates a sharp divergence in risk, performance, and business models across subsidiaries within the same holding company. Bank subsidiaries become both safer and more profitable following the post-2015 tightening of capital requirements, while affiliated nonbanks become more fragile. On the bank side, internal equity injections raise capital buffers and improve performance. Return on assets increases persistently, driven by lower charge-offs and improved asset quality rather than greater risk-taking. Banks reduce exposure to risk-weighted assets, increase holdings of securities and cash, and operate with stronger capital positions relative to risk. Leverage and marginal return on equity remain unchanged, indicating that performance gains stem from improved risk composition and operating efficiency rather than from deploying additional capital into higher-yield activities.

The opposite pattern emerges among nonbank subsidiaries. As capital is extracted upstream, nonbank capital ratios decline, profitability falls, and credit quality deteriorates. Nonbanks shift away from traditionally equity-intensive activities, such as trading, venture capital, and advisory services, toward more leveraged lending businesses, particularly consumer lending, allowing balance sheets to expand despite weaker equity buffers. This strategic reorientation is accompanied by higher income volatility and a pronounced decline in distance-to-default, indicating greater exposure to adverse shocks. Taken together, these results suggest that internal capital markets redistribute risk away from regulated, safety-net-protected banks and toward less regulated, uninsured nonbank affiliates.

Beyond reallocating capital, BHCs also adapt their organizational structure in response to regulatory pressure. Rather than simplifying, they expand the scope of nonbank activity after 2015, increasing the number of distinct nonbank business lines while reshuffling subsidiary portfolios through compositional churn. In particular, BHCs add nonbank lending subsidiaries while shedding high-equity-ratio insurance affiliates. This extensive-margin adjustment, together with the intensive-margin shift in nonbank business models, demonstrates that organizational structure itself responds endogenously to regulation, reshaping where risk resides within the financial conglomerate.

1.1 Related Literature

This paper contributes to three strands of literature. First, we contribute to the literature on internal capital markets by showing how regulation shapes the allocation of capital within organizations and, in turn, how organizational structure determines regulatory incidence. A large literature documents that diversified firms reallocate resources across business units through internal capital markets (Lamont, 1997; Shin and Stulz, 1998; Stein, 1997; Rajan, Servaes and Zingales, 2000; Stein, 2002). Within banking, prior work has focused primarily on the internal reallocation of liquidity through loans, deposits, and other intra-firm funding arrangements (Houston, James and Marcus, 1997; Campello, 2002; Ashcraft and Campello, 2007; Cetorelli and Goldberg, 2012a,b; Gilje, Loutskina and Strahan, 2016; Cetorelli and Prazad, 2025; Bai, Campello and Muthukrishnan, 2025; Bai et al., 2025). We show instead that equity transfers dominate these liquidity flows by an order of magnitude and directly affect both risk-bearing capacity and regulatory capital ratios.

More broadly, firm boundaries shape how resources are allocated and how shocks propagate within organizations (Giroud and Mueller, 2015, 2019). Related work shows that firms rely more heavily on internal capital markets when external financing becomes costly, reallocating resources internally during financial disruptions and expanding organizational scope to facilitate such transfers (Matvos and Seru, 2014; Kuppuswamy and Villalonga, 2016; Almeida, Kim and Kim, 2015; Matvos, Seru and Silva, 2018). We document an analogous response to regulatory frictions. When capital requirements tighten at bank subsidiaries, BHCs reallocate equity from affiliated nonbanks, effectively using nonbank subsidiaries as internal equity reservoirs. Our findings show that the economic effects of regulation depend not only on the regulated entity itself but also on the organizational structure through which internal capital markets operate.

Second, we contribute to understanding the effects of bank capital regulation (Kashyap, Stein and Hanson, 2010; Admati et al., 2013, 2018; Hanson, Kashyap and Stein, 2011; Berger and Bowman, 2013; Gropp et al., 2019; Begenau, 2020). These studies typically treat banks as standalone entities or examine consolidated holding company responses. We show subsidiary-level heterogeneity within firms is important: identical consolidated capital requirements generate divergent outcomes across subsidiaries depending on organizational structure. This challenges the implicit assumption that consolidated oversight fully captures economic risks. Our emphasis on the holding company as the locus of capital allocation is consistent with He, Kelly and Manela (2017), who demonstrate that the equity capital of intermediary holding companies prices risk across asset classes. The divergence we document between banks and BHCs also relates to the puzzle highlighted by Sarin and Summers (2016), who show that market-based measures of bank risk did not improve after the crisis despite increases in book capital. Because equity investors price the consolidated organization, whose excess capital we find remains unchanged, improvements in safety concentrated at bank subsidiaries may not be reflected in holding-company market measures,

complementing their franchise-value interpretation.

Third, we identify a distinct form of regulatory arbitrage operating through internal capital markets within financial conglomerates. Prior work has emphasized cross-border ([Houston, Lin and Ma, 2012](#); [Ongena, Popov and Udell, 2013](#); [Danisewicz, Reinhardt and Sowerbutts, 2017](#)), cross-sector ([Buchak et al., 2018](#); [Irani et al., 2021](#)), and cross-balance-sheet ([Kisin and Manela, 2016](#)) channels. In contrast, we show that regulatory arbitrage can occur within the boundaries of a single consolidated organization and under the oversight of a single regulator. When capital requirements tighten at bank subsidiaries, BHCs respond by reallocating equity and risk-bearing capacity toward affiliated nonbanks, even though both entities remain subject to consolidated supervision. This mechanism differs from existing channels in two important respects. First, the arbitrage occurs through equity rather than liquidity, making it quantitatively large and directly affecting regulatory capital. Second, the resulting risk migration creates a direct contagion channel: distress at nonbank affiliates can transmit back to affiliated banks through the same organizational links that facilitate capital reallocation. Our findings complement work by [Acharya, Schnabl and Suarez \(2013\)](#), [Tarullo \(2019\)](#), and [Bai, Campello and Muthukrishnan \(2025\)](#), which highlights the challenges of regulating complex financial conglomerates. Our paper is particularly related to [Albuquerque et al. \(2026\)](#), who document the reallocation of lending from bank to nonbank subsidiaries following macroprudential tightening. We instead identify an equity channel that is quantitatively dominant and that shifts risk-bearing capacity within the organization, creating the potential for nonbank distress to spill back onto affiliated banks.

We also document substantial growth in lending and risk-taking by nonbank subsidiaries within BHCs, complementing work on nonbank financial intermediation outside the banking sector ([Pozsar et al., 2010](#); [Buchak et al., 2018](#); [Irani et al., 2021](#); [Jiang et al., 2020](#); [Acharya, Cetorelli and Tuckman, 2026, Forthcoming](#)). [Buchak et al. \(2024\)](#) document the secular decline of banks' share of credit intermediation as nonbanks expand. We show that regulatory pressure accelerates this migration even within the boundaries of BHCs: BHCs reallocate lending activity from regulated bank subsidiaries to lightly-regulated nonbank affiliates in response to stricter capital requirements. This organizational channel for regulatory arbitrage operates alongside the cross-sector reallocation emphasized in prior work, and has important implications for measuring and monitoring systemic risk. Many economically important nonbanks operate as wholly owned subsidiaries of BHCs, creating direct channels for risk transmission that are invisible in sector-level data ([Adrian and Ashcraft, 2012](#); [Cetorelli and Prazad, 2025](#)).

The rest of the paper proceeds as follows. Section 2 presents the theoretical framework that organizes our empirical analysis. Section 3 describes data sources and sample construction. Section 4 establishes the stylized facts that motivate the analysis. Section 5 presents the identification strategy. Section 6 documents internal capital reallocation and presents the subsidiary-level stress

tests that quantify the contagion channel. Section 7 documents the divergent consequences for subsidiary outcomes: banks become safer while nonbanks become more fragile. Section 8 presents key robustness tests. Section 9 concludes.

2 A Framework for Internal Capital Reallocation

We develop a stylized two-subsidiary model to organize our empirical analysis and formalize the mechanism. A profit-maximizing BHC owns two subsidiaries: a regulated bank B and an unregulated nonbank N . The bank faces a capital requirement $E_B \geq \kappa_B \cdot A_B$; the nonbank faces none. The BHC can meet a tightening requirement either by raising costly external equity K at convex cost $c(K)$, or by transferring equity internally from the nonbank to the bank at transaction cost τ per dollar. The BHC begins with total equity E^0 ; in the second period each subsidiary draws a shock θ_i with distribution F_i on $[-\bar{\theta}_i, 0]$ and fails if $E_i + \theta_i < 0$. If the marginal cost of external equity issuance at zero exceeds the BHC's shadow value of internal funds, the optimal response to the capital requirement is fully internal.³ Internal reallocation is privately preferred because the BHC avoids costly external issuance and consolidated profitability rises; Section 7 shows that BHC profitability indeed increases following Basel III, consistent with this prediction.

Proposition 2.1 (Internal Reallocation Equilibrium). *When $c'(0) > \tau$ and regulation binds, the BHC optimally sets $K^* = 0$, $E_B^* = \kappa_B \cdot A_B$, and $E_N^* = E^0 - \kappa_B \cdot A_B$, yielding:*

$$\frac{\partial E_B^*}{\partial \kappa_B} = A_B > 0, \quad \frac{\partial E_N^*}{\partial \kappa_B} = -A_B < 0, \quad \frac{\partial (E_B^* + E_N^*)}{\partial \kappa_B} = 0 \quad (1)$$

*Bank equity rises one-for-one with the regulatory requirement; nonbank equity falls in equal proportion; consolidated BHC equity is unchanged.*⁴

We focus on this corner region because marginal issuance costs at zero are empirically high, consistent with observed reliance on internal capital markets, treating the corner as the analytical benchmark; the proposition below is stated for general private optima and does not require the corner. This prediction reflects the absence of adjustment along other margins (e.g., external issuance, asset growth, or retained earnings), and provides a benchmark for assessing the extent to which BHCs rely on internal capital markets in the data. The model predicts bank equity at exactly the regulatory minimum ($E_B^* = \kappa_B \cdot A_B$), implying zero excess capital. Empirically, banks

³A large literature documents that external equity issuance is costly. See [Myers and Majluf \(1984\)](#); [Altinkılıç and Hansen \(2000\)](#).

⁴The precise condition for the corner solution $K^* = 0$ is $c'(0) \geq \nu^*$, the shadow value of internal funds at the corner allocation (Assumption (A3) in Appendix B); we state $c'(0) > \tau$ as qualitative shorthand for external equity being the costlier marginal instrument. Our numerical parameterization features modest external issuance alongside predominantly internal reallocation.

hold substantial buffers above regulatory minimums. This gap reflects forces outside the model's scope: precautionary motives under uncertainty, time-varying requirements (e.g., stress capital buffer phase-in), the minimum-across-ratios measurement of excess capital, and the fact that multiple regulatory constraints (CET1, leverage, TLAC) bind at different points. The model's key testable prediction is not the level of excess capital but its *differential* change: internal reallocation increases bank capital without increasing consolidated equity, and this differential prediction is what we test.

The systemic implications of this reallocation depend on a second consideration. When a non-bank subsidiary suffers losses, the parent must choose between injecting equity to recapitalize it, liquidating assets at potentially fire-sale prices, or allowing failure. If the parent recapitalizes, it draws down the same capital buffer that backstops the bank. The bank's improved balance sheet may therefore be partially offset by a weakened parent: the additional excess capital accumulated by the bank is implicitly at risk if the nonbank encounters distress and the parent responds by injecting equity.

We capture this through a contagion parameter $\lambda \in [0, 1]$, where $\lambda = 0$ denotes perfect ring-fencing and $\lambda = 1$ denotes full transmission of nonbank distress to the bank. The parameter λ should be interpreted as a reduced-form sufficient statistic summarizing all channels through which nonbank distress depletes resources available to support the bank, including capital transfers, funding pressures, and reputational spillovers. Two features make a nonzero λ difficult to avoid. The parent and its banks hold committed credit lines and intercompany claims on the nonbank, so nonbank losses impair affiliated balance sheets directly; and implicit parent support, while nominally discretionary, cannot be withdrawn without triggering the counterparty flight it is meant to prevent. On both margins, parent and bank resources are at risk before any decision to inject fresh equity.⁵ The probability of bank failure incorporates both direct shocks and contagion:

$$\Pr(\text{Bank Failure}) = F_B(-E_B) + \lambda \cdot \Pr(\theta_N < -E_N \text{ and } \theta_B > -E_B) \quad (2)$$

The second term captures the channel of interest: nonbank distress transmits to the bank even in states where the bank would otherwise survive its own shock, because the parent depletes its buffer to recapitalize the nonbank.

Proposition 2.2 (Contagion Externality). *Let $(E_B^{pre}, E_N^{pre}, K^{pre})$ and $(E_B^{post}, E_N^{post}, K^{post})$ denote the BHC's private optima under the pre- and post-Basel requirements κ_{low} and κ_{high} , and define the reallocation's effect*

⁵In Section 6.4 we argue in more detail why we should expect a nonzero λ .

on failure probabilities:

$$\begin{aligned}
\Delta F_B &\equiv F_B(-E_B^{pre}) - F_B(-E_B^{post}) > 0 && \text{(reduction in the bank's own-shock failure prob.)} \\
\Delta F_N &\equiv F_N(-E_N^{post}) - F_N(-E_N^{pre}) > 0 && \text{(increase in the nonbank's failure prob.)} \\
\Delta \Phi &\equiv F_N(-E_N^{post}) [1 - F_B(-E_B^{post})] - F_N(-E_N^{pre}) [1 - F_B(-E_B^{pre})] > 0 && \text{(increase in the contagion-event prob.)}
\end{aligned}$$

Because the BHC's objective omits the contagion term, its private optimum is independent of λ , while the net social benefit of the reallocation is linear and decreasing in λ :

$$\Delta W(\lambda) = \underbrace{\Delta R + L_B \Delta F_B - L_N \Delta F_N - \Delta c(K) - \Delta \tau}_{\text{net benefit at } \lambda=0} - \lambda L_B \Delta \Phi, \quad (3)$$

where ΔR is the change in subsidiary returns, $\Delta c(K)$ the change in external equity costs, and $\Delta \tau$ the change in internal transfer costs. There exists a critical contagion threshold

$$\lambda^* = \frac{\Delta R + L_B \Delta F_B - L_N \Delta F_N - \Delta c(K) - \Delta \tau}{L_B \Delta \Phi} \quad (4)$$

such that internal reallocation is privately and socially aligned if $\lambda < \lambda^*$ and socially costly if $\lambda > \lambda^*$. If the numerator of (4) is non-positive, that is, if the direct gain in bank safety and returns is exhausted by the increase in nonbank failure costs and financing costs, then $\lambda^* \leq 0$ and the reallocation is socially costly for every $\lambda \in [0, 1]$.

The dominant costs of a contagion-induced bank failure, including credit supply disruption, deposit insurance losses, and fiscal backstop costs, are borne outside the firm. Writing $L_B = L_B^{\text{priv}} + L_B^{\text{ext}}$, the BHC internalizes at most L_B^{priv} of the marginal contagion cost $L_B \Delta \Phi$ per unit of transmission; we adopt the standard simplification that this private component is negligible relative to the systemic component, so the full contagion term enters only the planner's objective and the private optimum is independent of λ . The consequence is excessive internal reallocation whenever contagion is material.

The threshold in (4) is decreasing in L_N and increasing in L_B whenever $L_N \Delta F_N + \Delta c(K) + \Delta \tau > \Delta R$, with $\lambda^* \rightarrow \Delta F_B / \Delta \Phi$ as $L_B / L_N \rightarrow \infty$. The intuition is that bank failure costs scale both sides of the ledger: the contagion exposure, but also the direct safety benefit of recapitalizing the bank. At our parameterization the benefit effect dominates, so societies in which bank failures are relatively costlier tolerate more transmission before reallocation turns socially costly. Appendix Figure B.4b traces this dependence: λ^* ranges from roughly 0.3 when bank failures are twice as costly as nonbank failures to roughly 0.9 when they are twenty times as costly.

The model delivers three testable predictions that organize our empirical analysis. First, tighter bank capital requirements should raise bank excess capital through internal reallocation rather

than external issuance, with no corresponding increase in consolidated BHC equity. Second, nonbank subsidiaries in the same organizations should experience declining capital ratios, higher internal funding costs, and endogenous shifts away from high-equity-ratio activities as equity extraction forces portfolio reoptimization under tighter equity constraints. Third, the systemic implications depend on λ , the degree to which nonbank distress depletes the parent resources that backstop the bank: for the average BHC under static balance sheets and the baseline failure-cost ratio $L_B/L_N = 6$, internal reallocation is socially costly only if transmission exceeds $\lambda^* \approx 0.7$.

This threshold should not be read as implying that systemic risk is limited, for three reasons. First, we do not measure λ , and the exposures documented in Appendix D do not rule out transmission above the threshold even for the average BHC. Second, the threshold characterizes the average BHC at the baseline failure-cost ratio, whereas systemic risk is driven by the upper tail of the distribution and by the correlation of losses across institutions. The institutions of greatest systemic importance occupy the right tail of the equity-at-risk distribution, where the same transmission rate translates into far larger draws on parent capital and the distance to λ^* is substantially smaller. Third, the margin to the threshold has narrowed over time. The mechanism studied in this paper reduces resilience from both directions: post-2015 equity reallocation has diminished the nonbank capital buffers available to absorb losses, while the stock of committed bank-to-nonbank credit lines has expanded steadily over the sample period (Acharya, Cetorelli and Tuckman, 2026). The relevant policy question is therefore not whether internal capital reallocation is efficient for the average BHC under 2013 balance sheets, but whether the distribution of exposures is increasingly approaching the model’s contagion threshold. Complete derivations, proofs, and parameter choices are provided in Appendix B.

3 Data and Institutional Setting

We use regulatory filings to study changes at the BHC, bank, and nonbank levels. Our primary data sources are the FR Y-9C (consolidated BHC financials), FR Y-9LP (unconsolidated BHC financials and inter-entity flows), Call Reports (bank subsidiary financials), and FR Y-11 (nonbank subsidiary financials). We link entities across filings using the organizational structure database introduced in Cetorelli and Stern (2015).

3.1 BHC-Level Data

The FR Y-9C provides quarterly consolidated financial statements for BHCs, including balance sheets, income statements, and regulatory capital measures such as risk-weighted assets and capital ratios. We supplement the FR Y-9C with the FR Y-9LP, which reports quarterly unconsolidated data for the top-tier holding company. We use the FR Y-9LP in two primary ways. First, it provides

information on nonbank activity, including the number of nonbank subsidiaries and their aggregate assets, loans, and revenues, allowing us to distinguish BHCs with and without nonbank financial subsidiary activity. Appendix Figure 1b shows that nonbank assets held within BHC structures represent approximately 25–30% of total nonbank financial assets post-2010.⁶ Second, the FR Y-9LP contains detailed data on equity investments and intercompany lending, allowing us to measure internal equity and non-equity transfers within the BHC’s organizational structure.

3.2 Bank and Nonbank Subsidiary Data

Call Reports (FFIEC 031/041) provide detailed quarterly information on bank balance sheets, income statements, and regulatory capital, allowing us to observe equity and capital positions of depository institution subsidiaries. We also use Call Reports to measure bank-level lending activity across loan categories, charge-offs, and other performance indicators.

The FR Y-11 provides balance sheet information on nonbank subsidiaries, including equity, lending activity, and loss provisions. Top-tier holding companies must submit FR Y-11s for large nonbank subsidiaries at either quarterly or annual frequency. However, only a subset of nonbank subsidiaries are required to file, and reporting frequencies are not uniform across entities.

3.3 BHC Organizational Structure Database

We use a comprehensive database of BHC organizational structures covering 1970 to the present, first documented in [Cetorelli and Stern \(2015\)](#) and described further in [Cetorelli and Prazad \(2025\)](#). This database combines information from FR Y-6 and FR Y-10 filings to construct a quarterly panel of bank and nonbank subsidiary relationships and counts for each top-tier holding company. To our knowledge, this is the only dataset providing time-consistent, comprehensive coverage of organizational structure for the full population of Y-9C filing BHCs.

We use this database in two main ways. First, it allows us to link BHC-level financial data with subsidiary-level filings. Second, it records the primary business activity of each subsidiary using five-digit NAICS codes, enabling us to distinguish between different types of nonbank financial institutions within a BHC’s organizational structure. We supplement this dataset with the FR Y-10 Report data, which records all changes in ownership between a BHC and its subsidiaries. The FR Y-10 notably contains details on the chain of ownership between a BHC and all its subsidiaries, including the percentage ownership, which is rounded down to the nearest whole number.⁷

⁶The sharp increase in 2008–2010 reflects the conversion of large investment banks (e.g., Goldman Sachs, Morgan Stanley) to BHC status following the financial crisis. This indicates our sample captures a substantial share of shadow banking activity.

⁷The FR Y-10 captures voting share ownership when control exceeds 5% of any voting class, and nonvoting equity only when voting control is 5% or less.

3.4 Excess Capital Construction

We construct measures of excess regulatory capital at BHC and depository institution levels using FR Y-9C and Call Report data, respectively. Excess capital is defined as the amount of regulatory capital held by an institution in excess of all binding regulatory requirements, normalized by risk-weighted assets (RWA). For each institution-quarter, we compute observed capital ratios (Common Equity Tier 1, Tier 1, Total Capital, and leverage-based ratios) and compare them to the applicable regulatory minimums in effect at that time. Excess capital is defined as the minimum distance between observed capital ratios and their corresponding regulatory thresholds, ensuring that the most binding constraint determines the measure value.

Our construction accounts for changes in U.S. bank capital regulation over time, including the transition from pre-Basel III to Basel III, the phase-in of the Capital Conservation Buffer (CCB), the introduction of the Stress Capital Buffer (SCB) at the BHC level, G-SIB surcharges, and leverage-based constraints such as the Supplementary Leverage Ratio (SLR). For advanced approaches institutions, capital ratios are defined as the minimum across standardized and advanced approaches calculations. We exclude banks that opt into the Community Bank Leverage Ratio (CBLR) framework, as they do not report RWA. Full details of the regulatory framework and construction procedure are provided in [Appendix C](#).

3.5 Regulatory Environment and Treatment Timing

The Pre-Basel III Regime. Prior to 2015, U.S. BHCs and their depository institution subsidiaries faced three minimum capital requirements: a Tier 1 capital ratio of at least 4% of risk-weighted assets (RWA), a Total Capital ratio of at least 8% of RWA, and a leverage ratio of at least 4% of total assets. These requirements applied symmetrically to both the consolidated BHC and its bank subsidiaries. Nonbank subsidiaries within BHCs faced no analogous capital requirements: their capitalization was governed only by market discipline, counterparty requirements, and in some cases, state-level solvency standards for insurance affiliates.

Basel III Regime. Basel III introduced four changes that are material for our analysis. First, it added a new Common Equity Tier 1 (CET1) ratio requirement of 4.5% of RWA, a constraint that did not exist before and that could not be satisfied with hybrid capital instruments such as trust preferred securities that counted toward pre-Basel III Tier 1. Second, the Tier 1 minimum was raised from 4% to 6% of RWA. Third, a CCB of up to 2.5% of RWA was phased in between 2016 and 2019, raising the effective CET1 minimum to 7% at full implementation. Fourth, the definition of qualifying capital was narrowed: hybrid instruments such as trust-preferred securities, which had counted toward Tier 1 capital before Basel III, were phased out of regulatory capital under

the Collins Amendment. Institutions that had relied on these instruments therefore faced effective capital shortfalls even absent any change in their underlying balance sheets. Table 1 summarizes these changes. See Appendix C for more details.

Table 1: Capital Requirements Before and After Basel III

Requirement	Pre-2015	2015 Minimum	Full Phase-In (2019)
CET1 / RWA	—	4.5%	7.0% (incl. CCB)
Tier 1 / RWA	4.0%	6.0%	8.5% (incl. CCB)
Total Capital / RWA	8.0%	8.0%	10.5% (incl. CCB)
Leverage (Tier 1 / Assets)	4.0%	4.0%	4.0%

Notes: The Capital Conservation Buffer (CCB) was phased in from 0.625% in 2016 to 2.5% in 2019. G-SIB surcharges and the Stress Capital Buffer (post-2020) apply additional requirements at the BHC level only. Nonbank subsidiaries faced none of these requirements.

Although the minimum requirements in Table 1 apply at both the bank and consolidated levels, the economically relevant notion of constraint is the shadow cost of capital rather than the accounting distance to the regulatory minimum. Institutions may hold substantial positive excess capital and still face meaningful costs as they approach a threshold, including heightened supervisory scrutiny, restrictions on activities and payouts, and higher funding and regulatory costs. These consequences are concentrated at the bank subsidiary. “Well-capitalized” status under Prompt Corrective Action (PCA) governs access to brokered deposits, affects deposit insurance assessment costs and supervisory treatment, and determines eligibility for financial holding company (FHC) status, the legal authority under which BHCs conduct many of the nonbank activities central to our analysis.⁸ A bank that breaches its capital conservation buffer also faces automatic restrictions on dividend payments to the parent, the parent’s principal source of cash flow.⁹ Because these consequences attach to the insured depository institution rather than to the holding company, the shadow cost of capital is concentrated at the bank level.

Treatment Timing. We define our treatment period as beginning in 2015Q1, when binding minimum capital ratios first took effect for the majority of banks. While the Basel III framework was initially proposed in 2010 and finalized in the U.S. via rules published in the Federal Register in October 2013, binding minimum capital ratios did not take effect until January 1, 2015. Our

⁸PCA applies only to insured depository institutions. FHC status requires all depository subsidiaries to be well capitalized and well managed. The smallest BHCs in our sample face no consolidated requirement under the Small Bank Holding Company Policy Statement.

⁹The conservation buffer applies at both levels, but a breach has different consequences at each: at the consolidated level it restricts distributions to BHC shareholders, whereas at the bank level it interrupts the flow of dividends from the bank to the parent on which the parent’s own debt service and distributions depend.

pre-treatment controls are measured as of 2013Q1, several quarters before the final rules were published and nearly two years before they became binding, ensuring that neither organizational structure nor BHC characteristics reflect anticipatory responses to the regulatory change. Our sample spans 2010 through 2024, covering the full pre- and post-treatment period for all BHCs filing consolidated financial statements with the Federal Reserve.

3.6 Summary Statistics

Table 2 reports summary statistics for the BHC, bank, and nonbank samples used in the empirical analysis from 2010 to 2024. BHCs are heterogeneous in size, with mean assets of \$35 billion and mean risk-weighted assets of \$21 billion. Within the consolidated organization, bank subsidiaries account for the bulk of assets (mean \$27 billion) relative to nonbank subsidiaries (mean \$8 billion), and 47% of BHCs hold at least one nonbank subsidiary. Commercial banks are typically smaller than their top-tier holding company, with mean assets of \$15 billion, while nonbank subsidiaries are substantially smaller with mean assets of just \$3.8 billion. The two differ sharply in capitalization: nonbanks carry far more capital per dollar of assets than banks, foreshadowing the equity-reservoir mechanism developed in Section 4.3. Balance sheet composition measures indicate that BHCs and banks are primarily deposit-funded and loan-oriented, whereas nonbanks hold relatively low loan shares (median zero) and span a range of subsidiary types, with funds, brokers, and nonbank lenders the most common.

4 Nonbanks Inside Bank Holding Companies

Before describing the identification strategy, we document the setting and the empirical pattern that motivate the analysis. Nonbank financial activity is large and growing, but the feature that matters for this paper is *where* much of it sits: inside bank holding companies, conducted by controlled subsidiaries that face no capital requirement of their own yet are funded and directed by the same parent that owns the regulated bank. This section documents the scale of this footprint, the balance-sheet features that make internal equity reallocation possible, and the divergence between bank and consolidated capital that emerges after 2015.

4.1 Fact #1: Nonbank Activity Occurs Inside Bank Holding Companies

Nonbank financial intermediation is often analyzed as a sector operating outside the regulated banking system (Pozsar et al., 2010; Buchak et al., 2018). In practice, however, a substantial share of nonbank activity takes place within bank holding companies (BHCs) themselves (Cetorelli and Prazad, 2025). Three features are central: nonbank activity inside BHCs is economically large, rep-

resents a meaningful share of the broader nonbank sector, and is conducted through subsidiaries that are overwhelmingly controlled by the parent organization.

Figure 1 illustrates the scale of nonbank activity from two perspectives: its importance within banking organizations and its importance within the nonbank sector as a whole. Panel (a) shows that nonbank subsidiaries account for roughly 20–30% of consolidated BHC assets in the post-2010 period, with broker-dealers representing the largest component. Panel (b) places these activities in the context of the broader financial system. The share of aggregate nonbank financial assets held within BHC structures rises from roughly 5% in the mid-1990s to a peak above 40% during the financial crisis and remains near 25% over the past decade.¹⁰ Thus, roughly one in four dollars of nonbank financial intermediation is conducted by an entity whose parent owns a regulated bank.

These subsidiaries are not arm’s-length affiliates but entities subject to direct parental control. Appendix Figure E.1 shows that 73% of nonbank subsidiary-quarters are wholly owned by the parent BHC and an additional 17% are majority owned, implying that 90% of observations fall under direct parental control. Ownership is especially concentrated among funds, where 92% of subsidiary-quarters are wholly owned, but remains substantial among broker-dealers, insurers, and nonbank lenders as well. This ownership structure gives parent BHCs effective control over subsidiary capital and dividend policies—the margin through which internal capital reallocation operates in the analysis that follows. Appendix Table F.1 reports detailed ownership distributions by subsidiary type.

Nonbank activity also rises with organizational scale on both the extensive and intensive margins, but is not confined to the largest institutions. Appendix Figure E.2 shows that 64% of BHCs with \$1–10 billion in consolidated assets operate at least one nonbank subsidiary.

4.2 Fact #2: Equity Is the Relevant Internal Margin

The banking internal-capital-markets literature has largely emphasized the reallocation of liquidity through loans, deposits, and other intra-firm funding flows as the primary adjustment margin within bank-affiliated organizations (Cetorelli and Goldberg, 2012a,b; Schnabl, 2012; Gilje, Loutskina and Strahan, 2016; Kundu, Park and Vats, 2021). Our evidence points to a different mechanism. A decomposition of parent investments in bank subsidiaries reveals that equity positions exceed non-equity positions by an order of magnitude, making equity, rather than liquidity, the primary channel through which BHCs reallocate capital across subsidiaries.

Figure 2 plots three components of parent investment in bank subsidiaries over 2005–2024, all normalized by bank assets: equity investments (common stock, goodwill, and intangibles), non-equity investments (loans, receivables, and other direct exposures), and net borrowing from

¹⁰The 2008–2010 spike reflects the conversion of large investment banks, including Goldman Sachs and Morgan Stanley, to BHC status during the financial crisis.

related entities. Equity investments average 10–11% of bank assets throughout the sample, an order of magnitude larger than non-equity investments at 1–2%. Net intra-company borrowing hovers near zero throughout.

The dominance of the equity channel implies that organizational structure is central to internal capital allocation. BHCs with nonbank affiliates possess an internal source of equity that can be redeployed across subsidiaries, whereas BHCs without nonbanks must rely more heavily on retained earnings or external capital. The extent of this flexibility, however, depends not only on the presence of nonbanks but also on how much equity they hold.

4.3 Fact #3: Nonbank Subsidiaries Are Equity Reservoirs

Nonbank affiliates are not only the relevant internal source of equity within a BHC, they are equity-intensive relative to their size. A small nonbank footprint can therefore back a disproportionately large share of consolidated equity. We define each BHC’s *equity multiplier* as the nonbank share of consolidated equity divided by the nonbank share of consolidated assets. A value above one indicates that nonbanks hold more than their proportional share of equity relative to their share of consolidated assets.¹¹

Table 3 reports a median equity multiplier of $6.5\times$. This concentration reflects two forces: nonbanks operate with high voluntary capital ratios (median 69% equity-to-assets, versus roughly 10% at banks), and their small balance sheets mean that even modest absolute equity holdings translate into disproportionately large equity shares. The distribution is right-skewed; $12\times$ at the 75th percentile and above $21\times$ at the 95th, with multipliers highest for funds and asset managers and lowest for nonbank lenders, shown in Figure 3. A small nonbank footprint can therefore support a substantial share of the equity available for redeployment into the regulated bank. Appendix Figure E.3 provides additional visualization of the full distribution of equity multipliers across BHC-quarters and across nonbank types.

4.4 Fact #4: Bank Capital Diverges from Consolidated Capital After 2015

These conditions for internal reallocation set up the post-2015 pattern that motivates the rest of the paper. Beginning in 2015, banks within BHCs that hold nonbank subsidiaries accumulate substantially more excess capital, while excess capital at the consolidated BHC level shows no such divergence.

Figure 4 plots excess capital, defined as capital above all binding regulatory minimums, for

¹¹To construct the multiplier, we drop BHC-quarters with non-positive nonbank-asset shares or BHC capital ratios, nonbank-asset shares exceeding 95% (BHCs that operate as non-banks rather than as bank holding companies), and equity multipliers outside $[0, 50]$ (extreme outliers driven by accounting eliminations or financial-distress observations). Results in the body of the paper are robust to alternative thresholds.

BHCs with and without nonbank subsidiaries. Before 2015, the two groups' bank-level series move in parallel: banks in treated BHCs sit at a higher level (approximately 13.9% versus 9.1%), but neither group trends. The pre-treatment level difference is consistent with treated BHCs systematically operating with higher capital buffers, a fact our subsequent difference-in-differences design accounts for through BHC fixed effects. Beginning in 2015Q1, banks in BHCs with nonbank subsidiaries accumulate sharply more excess capital, with the gap widening to 8–10 percentage points by 2018–2020. The consolidated picture is different. Panel (b) shows that BHC-level excess capital does not diverge between the two groups; both decline gradually as Basel III phases in.¹²

Table 4 provides a simple difference-in-differences validation of the mechanism. Relative to BHCs without nonbank subsidiaries, banks in BHCs with nonbank affiliates accumulate significantly more excess capital after 2015. Yet excess capital at the consolidated BHC level does not increase, implying a sharp rise in the share of consolidated capital held within banks. This divergence between the bank and consolidated levels is consistent with an internal reallocation of equity rather than new external capital raising or balance-sheet shrinkage. Appendix Table F.2 reports the full specification.

This divergence is precisely the pattern predicted by the regulatory wedge: an internal transfer of equity raises bank capital while leaving consolidated equity unchanged (see Appendix Figure A.1 for a stylized example). We emphasize, however, that the evidence presented thus far is descriptive rather than causal. BHCs that operate nonbank subsidiaries differ systematically from those that do not along both observable and unobservable dimensions, including size, business model, and geographic footprint, and the decision to maintain nonbank affiliates is itself endogenous. The next section addresses these identification concerns by exploiting predetermined variation in BHC organizational complexity generated by the staggered timing of state-level interstate banking deregulation.

5 Empirical Strategy

Identifying the response to Basel III poses two challenges. First, the regulation applied uniformly to all U.S. BHCs in 2015, so no untreated control group exists. Second, BHC organizational complexity is endogenous: the presence of nonbank subsidiaries reflects deliberate corporate choices that may correlate with unobserved capital management strategies. We address both challenges by exploiting pre-determined variation in organizational complexity arising from

¹²The decline at the BHC level in Panel (b) is not mirrored at the bank level in Panel (a) because excess capital is the minimum buffer across all active regulatory ratios. When Basel III phased in, the new CET1 requirement entered this set; whether it binds depends on the capital stack, specifically, whether Additional Tier 1 plus Tier 2 capital exceeds the gap between the total-capital and CET1 requirements (about 3.5% of RWA). BHCs with less AT1 and T2 capital relative to RWA were more likely to become CET1-constrained after 2015, mechanically lowering measured excess capital.

state-level interstate banking deregulation timing, variation that predates Basel III by decades and is plausibly orthogonal to subsequent capital management decisions.

5.1 Instrumental Variable Strategy

Following [Jayaratne and Strahan \(1996\)](#), [Strahan \(2003\)](#), and [Rice and Strahan \(2010\)](#), we use the timing of interstate branching deregulation across U.S. states as a source of quasi-experimental variation in organizational structure.¹³ States deregulated at different times between the 1970s and 1990s, driven primarily by idiosyncratic political economy factors unrelated to future capital regulation.

We construct the instrument by measuring each BHC’s headquarters state between 1970 and 1981 (before interstate banking was permitted) and calculating:

$$\text{Years from Dereg}_i = 1994 - \text{Interstate Dereg Year}_{\text{HQ state}(i)} \quad (5)$$

where 1994 marks the passage of the Riegle-Neal Interstate Banking and Branching Efficiency Act, which mandated interstate banking nationwide. The instrument measures how many years elapsed between a state’s interstate deregulation and the federal mandate. BHCs in states that deregulated earlier (higher values of the instrument) had more time to develop organizational complexity, including nonbank subsidiaries, before interstate expansion became universal.¹⁴

Reduced-Form Specification. Our baseline empirical approach estimates the reduced-form effect of deregulation timing on capital allocation outcomes:

$$Y_{it} = \alpha + \beta \cdot (\text{Years from Dereg}_i \times \text{Post}_t) + \gamma_i + \delta_t + X'_{i,2013} \theta \cdot \text{Post}_t + \varepsilon_{it} \quad (6)$$

¹³[Matvos, Seru and Silva \(2018\)](#) use a related deregulation index, originally constructed by [Black and Strahan \(2001\)](#), as a contemporaneous shock to external credit supply for non-financial firms, finding that scope contracts as cheaper external credit lowers the demand for internal capital markets. Our setting differs because BHCs are the intermediaries directly governed by interstate deregulation, not non-financial firms responding to changes in credit supply. Pre-1994 geographic restrictions limited BHCs’ ability to grow in scale, and deregulation removed those scale constraints. Cross-state variation in deregulation timing thus generates pre-determined variation in BHCs’ realized organizational complexity by 2013, which we exploit in a setting where Basel III subsequently created the asymmetric capital wedge we study. The two strategies are complementary uses of the same source of regulatory variation, operating through different channels.

¹⁴A natural concern is that our instrument captures organizational complexity generated by Glass-Steagall’s repeal in 1999 rather than by earlier interstate banking deregulation. The timing is mechanical: our instrument measures years elapsed between state-level deregulation and Riegle-Neal (1994), so the variation we exploit was built in the 1980s and early 1990s, predating Glass-Steagall’s repeal. More fundamentally, Glass-Steagall imposed weaker constraints on BHC nonbank activity than the common narrative suggests. [Cetorelli and Prazad \(2025\)](#) document that the Bank Holding Company Act of 1956 granted regulators broad discretion over the permissible boundaries of banking, and that by the mid-1980s regulators were exercising this discretion expansively, inviting banks to become “financial supermarkets” ([Markham, 2009](#)). The Senate voted 94–0 to propose repealing Glass-Steagall as early as 1988. The 1999 legislation therefore ratified an organizational reality that had already emerged.

where Y_{it} is an outcome variable (bank capital ratios, nonbank equity, or BHC equity), $\text{Years from Dereg}_i$ is the instrument defined in equation (5), Post_t indicates periods 2015Q1 and later, γ_i are BHC fixed effects, δ_t are quarter-year fixed effects, and $X_{i,2013}$ includes pre-treatment BHC and bank characteristics interacted with Post_t . At the BHC level, we control for log total assets, leverage, return on assets, asset growth, deposit-to-assets ratio, top-200 BHC indicator, and total subsidiary count. At the bank level, we control for log assets, leverage, return on assets, and asset growth. These controls flexibly absorb differential exposure to concurrent regulations (Dodd-Frank, Volcker Rule, CCAR/DFAST) that might differentially affect BHCs based on size, activities, or regulatory status.¹⁵ The coefficient β captures how much more (or less) BHCs in early-deregulating states adjust capital allocation in response to Basel III, per additional year of deregulation exposure.

This reduced form specification offers a transparent interpretation: the coefficient β directly answers the question of how an additional year of pre-Riegle-Neal deregulation exposure affects capital reallocation after Basel III. Because not all BHCs in early-deregulating states fully exploit the opportunity to build complex structures, β captures intent-to-treat (ITT) effects that are conservative relative to treatment-on-the-treated but do not rely on strong functional form assumptions. As a robustness check, Appendix Table F.18 reports 2SLS estimates that scale the reduced-form effects by the first-stage relationship.

Instrument Validity. Three sets of evidence support the validity of the instrument. First, parallel pre-trends: Figure 5 shows that BHCs in early- versus late-deregulating states exhibit parallel trends in nonbank subsidiary share from 1986 to 1994, before Riegle-Neal harmonized interstate banking nationwide. These parallel pre-trends indicate that deregulation timing is uncorrelated with differential trends in organizational structure or capital management. Appendix Figure E.4 shows the gap remains stable at approximately 8 percentage points through 2014, then widens after 2015 when Basel III capital requirements become binding, precisely the pattern expected if early deregulation creates persistent organizational differences that affect capital allocation only when the regulatory constraint tightens.

Second, balance on observables: Appendix Table F.3 compares pre-treatment characteristics between BHCs headquartered in early- versus late-deregulating states as of 2013Q1. Panel A shows that early deregulators have larger total assets and nonbank assets, reflecting greater organizational complexity developed during the deregulation period. Panel B shows balance sheet

¹⁵We include pre-period return on assets as a control only for capital-management outcomes (e.g., excess capital, parent equity investments in subsidiaries, dividends received from subsidiaries), where it controls for pre-period heterogeneity in BHC profitability that may correlate with the parent's broader approach to capital management. We exclude it for all subsidiary-level outcomes (e.g., operating performance, portfolio composition, credit quality, intra-firm balances, lending), where pre-period profitability is a plausible mediator of post-2015 responses and including it would absorb part of the structural effect we aim to identify.

characteristics. Leverage, portfolio composition, and deposit ratios are statistically indistinguishable between groups. Importantly, the characteristics that do differ (total assets, top 200 BHC status, distinct NAICS codes, and ROA) are directly accounted for in our reduced-form specification through pre-treatment BHC controls interacted with Post. This supports the validity of our instrument: conditional on controls, variation in deregulation timing is orthogonal to factors determining post-2015 regulatory responses.

Third, persistence of organizational structure: Appendix Table F.4 shows NBFI share exhibits high autocorrelation: a BHC with 10 percentage points higher nonbank share in year t has 7.1 percentage points higher share five years later. This means organizational complexity developed in the 1980s–1990s provides pre-determined variation today, almost three decades after Riegle-Neal eliminated regulatory differences.¹⁶

The instrument is strongly relevant in our data. Appendix Table F.17 shows that BHCs headquartered in early-deregulating states are substantially more likely to operate nonbank financial subsidiaries. This first-stage relationship is consistent with prior evidence that interstate banking deregulation facilitated both organizational expansion and diversification. Mian, Sufi and Verner (2020) show that states deregulating before 1983 experienced 42 percentage points greater credit growth between 1982 and 1988 than states deregulating later, with especially pronounced increases in nonbank lending activity. Similarly, Kundu and Vats (2026) document that the share of gross domestic assets owned by out-of-state multi-BHCs rose from 6% to 47% between 1979 and 1994 in early-deregulating states, compared with only 7% to 29% in late-deregulating states. This expansion reflected not only geographic diversification but also broader diversification into nonbank financial activities.

Appendix Table F.5 reports summary statistics for the reduced-form sample, restricted to BHCs active before the 1994 Riegle-Neal Act for which deregulation timing is defined. These institutions are larger and more organizationally complex than the full population: mean assets are \$98 billion (versus \$35 billion in the full sample) and mean risk-weighted assets are \$61 billion, and 57% hold at least one nonbank subsidiary (versus 47%). This is the population for which our identification strategy is relevant, and its skew toward larger, nonbank-active BHCs is precisely the segment of the industry most relevant for the internal-reallocation mechanism we study.

¹⁶Appendix Figure E.4a displays the geographic and temporal variation in deregulation timing and shows that early deregulators maintain consistently higher nonbank shares throughout 1986–2024. This timing was driven by idiosyncratic political factors, including small bank lobby strength and state legislature composition, rather than economic fundamentals, size of local nonbank sector, or business cycle conditions (Kroszner and Strahan, 1999; Rice and Strahan, 2010).

6 Main Results

This section documents the organizational response to the Basel III wedge. We first show that banks in affected BHCs accumulate excess capital without a corresponding increase in consolidated capital and rule out external equity issuance as the source, leaving internal reallocation as the primary mechanism. We then trace that mechanism through equity transfers, nonbank dividend payouts, and bank earnings retention, and show that it is strongest when nonbank affiliates hold more extractable equity. Finally, we quantify the associated contagion channel by stress-testing nonbank subsidiaries and measuring the resulting depletion of parent capital that backstops the bank.

6.1 Identifying Internal Reallocation

Reduced Form Estimates. Table 5 presents estimates of internal capital reallocation at three levels: bank excess capital (column 1), BHC excess capital (column 2), and the ratio of bank to BHC excess capital (column 3). Banks in BHCs from states deregulating earlier accumulate 0.74 percentage points more excess capital per year of pre-Riegle-Neal exposure post-2015 (column 1), with no corresponding effect at the BHC level (column 2). For the median gap of 7 years between early and late deregulators, this implies approximately 5 percentage points more bank capital.¹⁷ The ratio of bank to BHC excess capital rises by 1.78 per year of exposure (column 3), roughly twice the pre-period median ratio of about one.

Large positive effects at the bank level alongside a null at the BHC level imply internal reallocation of existing equity rather than external capital issuance or balance-sheet contraction. Appendix Table F.6 reports the full specification with all intermediate columns.

Ruling Out External Equity Issuance. The bank–BHC divergence is consistent with two explanations: BHCs raise external equity and channel it to bank subsidiaries, or they reallocate existing internal equity from nonbank to bank subsidiaries. The null effect at the consolidated BHC level is indirect evidence against external issuance, which would raise consolidated equity alongside bank equity. We provide direct evidence by examining BHC equity issuance in Appendix Table F.7. Across measures of gross issuance, both direct common-stock issuance in column 1 and preferred stock issuance in column 2 fall significantly with deregulation exposure, with the broader combined measure in column 4 also declining. Column 5 shows that BHCs simultaneously increase share buybacks: per year of deregulation exposure, buybacks rise by 0.09 percentage points of equity per quarter. The net issuance series in column 3 falls by more than gross issuance, reflecting both margins. Rather than accessing external markets to satisfy stricter requirements, organiza-

¹⁷Multiplying the coefficient of 0.74 by the median exposure of 7 years yields $7 \times 0.74 = 5.18$ percentage points.

tionally complex BHCs reduce their reliance on outside investors and actively return the equity they extracted from nonbanks in excess of bank-side capital needs. The combined effect implies that consolidated equity falls below the level it would have reached absent internal reallocation: the subsidiary-level Basel III rule binds the bank, but the firm perimeter remains a margin of arbitrage.

6.2 Tracing Internal Capital Markets

Having established the divergence between bank-level and consolidated capital, we next trace the mechanics of the internal reallocation process. The evidence reveals a three-step adjustment: parent equity investments shift from nonbanks to banks, nonbank dividend payouts to the parent increase while bank dividends remain unchanged, and banks retain the resulting earnings rather than distributing them upstream. To focus on institutions for which this mechanism is economically meaningful, we restrict the analysis to BHCs whose nonbank subsidiaries account for at least 1% of consolidated assets.

Table 6 provides direct evidence of internal equity reallocation. Column 1 shows that parent equity investments in bank subsidiaries, measured as a share of total BHC equity, increase by 2.28 percentage points per year of deregulation exposure after 2015. Column 2 shows a nearly offsetting decline of 2.64 percentage points in parent equity investments in nonbank subsidiaries. Column 3 confirms that this shift reflects reallocation rather than capital raising: total parent equity investments across all subsidiaries remain unchanged. The close symmetry between the increase in bank investments and the decline in nonbank investments, together with the absence of any change in aggregate investments, indicates that BHCs redistribute existing equity within the organization rather than raise new external capital.¹⁸

This reallocation is facilitated by asymmetric dividend and retention policies governing earnings flows between subsidiaries and the parent. Columns 4–5 show that BHCs extract earnings from nonbanks through higher dividend payouts: dividends from nonbank subsidiaries increase by 9.47 percentage points per year of deregulation exposure, while bank subsidiary dividends are unchanged. The asymmetry mirrors the equity-investment result: just as parents reallocate equity investments away from nonbanks and toward banks, they also extract earnings disproportionately from nonbanks while leaving bank earnings unchanged. As a result, earnings generated by the bank are retained within the bank subsidiary and accumulate as regulatory capital. Appendix Figure E.5 illustrates this pattern: banks in BHCs with nonbank affiliates increase retained earnings from 5% to 10% of assets between 2015 and 2020, while banks without nonbank affiliates

¹⁸Appendix Table F.8 presents a robustness test using the share of total BHC equity held directly by bank subsidiaries rather than parent equity investments. The results similarly show a significant increase in bank equity shares after 2015, confirming that equity capital shifts toward banks within the BHC structure.

remain flat near 5%. Appendix Table F.9 confirms the pattern in regressions, with bank retained earnings rising 0.19 percentage points per quarter per year of deregulation exposure.

6.3 Reallocation Scales with the Equity Multiplier

The mechanism traced above operates through the equity held at nonbank affiliates that the parent can redeploy. The size of that reservoir, the equity multiplier documented in Section 4.3, varies considerably across BHCs and generates a cross-sectional prediction. If extractable nonbank equity is what makes internal reallocation feasible, the response to Basel III should scale with the multiplier: BHCs with larger multipliers should reallocate more equity toward bank subsidiaries, while those with smaller multipliers should exhibit little reallocation along this margin. Table 7 tests this prediction by interacting the BHC's 2013Q1 equity multiplier with the post-2015 indicator, and Figure 6 visualizes the same relationship as a BHC-level cross-section of pre-2015 to post-2015 changes plotted against the multiplier.

The results in Table 7 confirm the predicted pattern. In column 1, the share of consolidated BHC equity invested in bank subsidiaries rises by 1.71 percentage points more per unit of equity multiplier post-2015. In column 2, the corresponding share invested in nonbank subsidiaries falls by 1.12 percentage points per unit of multiplier. The bank and nonbank responses are roughly symmetric, consistent with reallocation across the bank-to-nonbank boundary rather than expansion of consolidated invested equity. Column 3 verifies this directly: total parent invested equity, the sum of equity in bank, nonbank, and holding-company subsidiaries scaled by BHC equity, exhibits essentially no relationship with the multiplier. This placebo rules out a level shift in consolidated invested equity.

Figure 6 displays this relationship visually. Each point represents one BHC's pre-2015 to post-2015 change in the share. Panel a shows that BHCs with larger 2013Q1 multipliers exhibit larger post-2015 increases in the share of equity invested at the bank, with a positive fitted slope. Panel b shows the mirror image on the nonbank side: BHCs with higher multipliers reduce the share allocated to nonbanks more steeply.

These results establish that the size of the redeployable nonbank-equity reservoir governs the margin of adjustment within the BHC. The equity multiplier is not merely a descriptive statistic; it is the binding constraint on how much equity a parent can redeploy across the bank-to-nonbank boundary when bank capital regulation tightens. Internal reallocation is therefore not a uniform response to Basel III but scales with the extractable equity available to redeploy. We now turn to the systemic implications. Does the equity extracted from nonbanks leave them too thinly capitalized to absorb shocks without drawing on the parent capital that backstops the bank?

6.4 Stress Testing Nonbank Subsidiaries

We quantify the exposure underlying the contagion channel of Proposition 2.2 by simulating adverse shocks to nonbank portfolios and measuring the implied draw on parent capital buffers.

6.4.1 External Evidence on the Contagion Mechanism

The contagion mechanism in the model does not depend on the parent voluntarily rescuing the nonbank subsidiary. Parent and affiliated-bank resources are exposed before any discretionary support decision for two reasons. First, the parent and its affiliated banks already hold contractual claims on the nonbank including intercompany loans, receivables, and committed funding lines, so losses at the nonbank directly impair their balance sheets (Acharya, Cetorelli and Tuckman, 2026). Section 7.2 later shows that the reallocation itself expands this exposure: as equity is extracted, nonbanks substitute borrowing from the parent and affiliates on their liability side, so the same transactions that raise measured bank capital also enlarge the stock of intercompany claims through which nonbank losses transmit to the resources backstopping the bank.

Second, even nominally implicit support is effectively non-discretionary. Market participants treat parental backstops as credible commitments, and withdrawing support during distress would trigger counterparty flight, funding disruptions, and rating downgrades that amplify losses for the entire organization.¹⁹ Because the exposure is largely contractual, λ captures the degree of effective ring-fencing rather than managerial discretion.

The contagion mechanism is further supported by three sets of evidence. Historical episodes during 2007–2009 illustrate it directly: Citigroup absorbed approximately \$49 billion of structured investment vehicle assets back onto its consolidated balance sheet, and HSBC supported its U.S. consumer-lending subsidiary, HSBC Finance, through years of subprime losses that prompted the group’s first profit warning in 2007, before winding the unit down in 2009. Bear Stearns’s \$1.6 billion rescue loan to its affiliated hedge funds shows the same parent-support mechanism operating outside the BHC perimeter. Major credit rating agencies explicitly price parent support into the ratings of nonbank affiliates, generating large uplifts: S&P rates J.P. Morgan Securities LLC two notches above its parent BHC, and Goldman Sachs & Co. LLC three notches above its parent group.²⁰ Finally, our own data provide direct support: commercial lending at affiliated banks contracts following nonbank-affiliate losses, BHC bond spreads widen relative to non-affiliated

¹⁹For example, SEC Rule 15c3-1 (the Net Capital Rule) requires broker-dealers to maintain minimum net capital; when losses threaten compliance, the parent’s implicit commitment effectively converts from an off-balance-sheet backstop into a binding cash obligation.

²⁰Moody’s, S&P, and Fitch all assign explicit support indicators or strategic-importance categorizations to subsidiary obligations, with up to several notches of uplift above standalone profiles. Appendix Section D discusses methodology and provides additional examples.

peers during stress windows, and parent equity reallocates toward distressed nonbanks and away from affiliated banks. Appendix D reports these empirical tests in detail.

6.4.2 Stress Test Design

We conduct stress tests using 2013Q1 balance sheets, before Basel III implementation. For each BHC, we simulate asset shocks of varying severity (1%, 5%, 10%, 15%) applied to all nonbank subsidiaries. Following each shock, we calculate the capital injection required to restore each subsidiary to a target capital ratio ranging from 20% to 70%.²¹

Specifically, for each nonbank subsidiary i in BHC j , we compute:

$$\text{Loss}_{ij} = \text{shock} \times \text{Assets}_{ij,2013Q1} \quad (7)$$

$$\text{Post-Shock Equity}_{ij} = \text{Equity}_{ij,2013Q1} - \text{Loss}_{ij} \quad (8)$$

$$\text{Capital Shortfall}_{ij} = \max \left(0, \kappa \times \text{Assets}_{ij,2013Q1} - \text{Post-Shock Equity}_{ij} \right) \quad (9)$$

where κ represents the target capital ratio (equity-to-assets) to which the parent must restore the subsidiary. We aggregate shortfalls to the BHC level and express total recapitalization needs as a percentage of the parent BHC's excess capital buffer (capital above regulatory minimums):

$$\text{BHC Equity at Risk}_j = \frac{\sum_i \text{Capital Shortfall}_{ij}}{\text{BHC Excess Capital}_j} \times 100 \quad (10)$$

This metric directly measures the parent's financial capacity to absorb subsidiary losses. Values exceeding 100% indicate scenarios where recapitalization needs exceed available parent buffers, representing potential insolvency if the BHC fully supports its nonbank subsidiaries.

The stress test design captures three key features of the sample. First, nonbank subsidiaries operate with substantially higher capital ratios than banks. Second, while consolidated BHC capital requirements account for nonbank assets in risk-weighted calculations, there are no subsidiary-level capital requirements binding on nonbanks themselves, meaning nonbanks can become severely undercapitalized without triggering regulatory intervention, so long as consolidated ratios remain adequate. Third, when nonbank subsidiaries suffer losses, the parent may inject equity to restore solvency, drawing down its consolidated capital buffer.²² Our stress tests quantify this exposure directly: we simulate adverse shocks to nonbank portfolios and measure the resulting draw on parent capital. Because bank subsidiaries share the same parent buffer, these recapital-

²¹Our recapitalization formula applies the target capital ratio to the pre-shock asset base, a standard fixed-denominator approximation in stress-testing models. Because an equity injection simultaneously increases both equity (numerator) and total assets (denominator), the exact injection required to reach the target ratio is slightly larger than our estimate. This approximation slightly underestimates recapitalization needs but does not affect the qualitative findings.

²²The parent could alternatively liquidate subsidiary assets at depressed prices or allow subsidiaries to fail, but both alternatives carry severe consequences: fire-sale losses, reputational damage, and potential regulatory intervention.

ization needs translate into implicit exposure of bank capital to nonbank losses, a form of intra-organizational contagion that consolidated capital ratios fail to capture.

Baseline Results. Table 8 presents recapitalization needs across shock severity and target capital ratio combinations. Panel A shows mean requirements. Under a baseline scenario of 5% asset shock with 40% target capital ratio, comparable to financial crisis losses for diversified financial institutions, the mean BHC must deploy 17.85% of its excess capital to restore nonbank subsidiaries. This represents a substantial draw on parent resources. Panel B examines tail risk at the 95th percentile. The distribution exhibits significant right skew: under the baseline scenario, tail-risk BHCs face recapitalization needs of 99.45% of excess capital, approaching complete buffer depletion. Under more severe scenarios, defined by either larger asset shocks or higher recapitalization targets, tail-risk BHCs exceed 100% of excess capital (marked with asterisks), implying potential parent insolvency if forced to fully recapitalize subsidiaries. Appendix Figure E.6 shows sensitivity to alternative specifications.

Figure 7 visualizes the nonlinearity in stress test outcomes. Panel (a) plots recapitalization requirements against shock severity, holding the target capital ratio constant at 40%. Mean requirements (solid line) increase roughly linearly from 15.62% under 1% shocks to 23.85% under 15% shocks, but tail risk (dashed line) exhibits pronounced convexity: the 95th percentile rises from 89.36% at 1% shocks to 128.60% at 15% shocks. Panel (b) examines complete buffer exhaustion. We define a BHC as “depleted” if recapitalization needs exceed its entire excess capital buffer, leaving no cushion against further shocks. Under the baseline 5% shock scenario, 4.26% of BHCs experience complete depletion (see Panel E of Table 8). This fraction rises modestly to 5.32% under 10% shocks and 6.38% under 15% shocks. While the majority of BHCs retain some buffer capacity, the 4–6% depletion rate suggests meaningful systemic fragility: during crisis episodes when correlated shocks affect multiple BHCs simultaneously, many large financial institutions may be forced to liquidate assets, cut credit, or raise emergency capital under adverse market conditions.

The sensitivity to target capital ratios highlights a fundamental policy tension. While higher nonbank capital requirements would reduce subsidiary vulnerability to initial losses, they also increase the capital injection needed to restore solvency following shocks, potentially exceeding parent capacity.

Concentration of Risk and Implications. Three additional findings merit emphasis. First, the concentration of risk within organizational structures amplifies systemic concerns. While Panel A of Table 8 shows that only 17.85% of BHC equity is at risk on average under baseline scenarios, Panel D shows that at the 95th percentile, 38.20% of individual nonbank subsidiaries require recapitalization. This heterogeneity indicates that some BHCs operate highly concentrated port-

folios where multiple subsidiaries experience simultaneous distress following correlated shocks, similar to the scenario observed during 2008 when broker-dealers, mortgage lenders, and structured investment vehicles experienced losses simultaneously.

Second, our stress tests use 2013Q1 balance sheets, before equity extraction accelerated post-2015. As nonbank capital ratios decline in subsequent years, contemporary recapitalization needs exceed our estimates, and the 4.26% buffer depletion rate understates current vulnerability: a shock comparable to 2008 losses would today likely deplete capital buffers for a larger percentage of BHCs.

Third, the same reallocation that thins nonbank buffers also expands the channel through which their losses transmit. As equity is extracted, nonbanks substitute borrowing from the parent and affiliates on the liability side of their balance sheets (Section 7.2), converting loss-absorbing capital at the nonbank into intercompany claims held by the parent and its banks: claims that are impaired precisely in the states in which the nonbank is distressed. The stress tests hold this transmission mechanism fixed and measure only the size of the potential draw; because the stock of intra-family exposure grows with the treatment itself, the effective transmission of a given nonbank loss to the resources backstopping the bank is higher today than on the pre-extraction balance sheets we use.

Netting the Drawdown Against the Capital Gain. The recapitalization needs quantified above can be set against the bank-level capital gain documented in Table 5. We define the net gain as the gross gain (0.74 percentage points per year of exposure, approximately 5.2 percentage points at the median seven-year gap) minus λ times the drawdown implied by the baseline scenario, where the drawdown is each BHC’s recapitalization shortfall expressed in percentage points of risk-weighted assets; the top row uses the mean across BHCs and the bottom row uses the 95th percentile.

	$\lambda = 0$	$\lambda = 0.25$	$\lambda = 0.5$	$\lambda = 0.75$	$\lambda = 1$
Typical BHC	100%	90%	81%	71%	62%
95th percentile BHC	100%	64%	28%	−8%	−44%

The offset is linear in λ , so intermediate values can be read directly; negative entries indicate that the drawdown exceeds the gross gain. For the typical BHC, the majority of the gain survives at any transmission rate, though full transmission erodes roughly 38% of it. For the most exposed institutions, more than a third of the apparent gain is offset at transmission of one-quarter and 72% at transmission of one-half; at $\lambda = 0.75$, just above the threshold $\lambda^* \approx 0.7$, the drawdown exceeds the gross gain, and at full transmission the reallocation leaves the exposed BHC worse off by nearly half the gain.

The stress tests reveal a fundamental tension between subsidiary-level and consolidated-level safety: tighter bank capital requirements strengthen the bank but draw down the nonbank buffers that contribute to consolidated loss-absorbing capacity. The magnitude of this tension depends on subsidiary-level outcomes, how much safer banks actually become, and how much more fragile nonbanks become as a result. We now examine each in turn.

7 Consequences of Internal Capital Reallocation

Internal equity reallocation reshapes the organization at every level. We begin at the top. From the perspective of the holding company, internal reallocation is the profit-maximizing response to tighter regulation. Rather than tapping costly external equity markets, the BHC exploits an internal margin by extracting equity from lightly regulated nonbank affiliates and redeploying it where regulation binds. This strategy satisfies regulatory requirements while avoiding the issuance costs that would otherwise depress consolidated profitability.

Table 9 provides evidence consistent with this interpretation: consolidated return on assets (ROA) and return on equity (ROE) rise following Basel III, while charge-offs decline. Importantly, these gains are not accompanied by meaningful changes in consolidated portfolio composition or capital structure. Appendix Table F.10 shows that both remain largely unchanged, with the exception of a modest decline in the ratio of risk-weighted to total assets. This pattern rules out the interpretation that profitability improvements reflect a shift toward riskier consolidated assets, and instead indicates that BHCs achieve higher returns by arbitraging the regulatory wedge between subsidiaries rather than by expanding overall risk-taking. The simultaneous decline in external issuance and rise in share buybacks, shown in Appendix Table F.7, imply that complex BHCs end the post-Basel III period with less consolidated equity than they would have absent internal reallocation.

Below the consolidated level, however, the consequences are asymmetric. At bank subsidiaries, capital ratios improve, asset risk declines, and profitability rises. At nonbank subsidiaries, equity ratios fall, internal funding rates rise, lending shifts toward riskier consumer segments, and fragility rises. We document these divergent patterns in turn. Throughout, the relevant comparison is across subsidiaries within organizations facing the same Basel III requirement but differing in their parents' capacity to reallocate equity internally; the uniform component of the regulatory shock is differenced out by the quarter-year fixed effects.

7.1 Consequences for Bank Safety

We document two key findings. First, banks become substantially safer along multiple dimensions: profitability increases, credit quality improves, and insolvency risk declines. Second,

safety improvements operate primarily through asset reallocation rather than leverage expansion. Banks shift portfolios toward lower-risk securities and cash, reducing risk-weighted assets relative to total assets, rather than expanding balance sheets to restore ROE through scale. Appendix Figure E.7 provides event-study evidence of these patterns.

Bank Performance and Portfolio Composition. Table 10 presents reduced-form estimates of bank safety improvements. Panel A documents performance gains. Column 1 shows that post-2015 ROA rises with deregulation exposure, and column 2 shows that ROE is 12 basis points higher for each additional year of exposure. The divergence between large ROA effects and modest ROE effects is consistent with the equity-injection mechanism: as parent equity flows into banks, ROE denominators rise, dampening the increase in returns to equity even as profitability on assets improves. Column 3 shows that charge-offs as a share of loans decline by 0.02 percentage points per year of exposure, indicating that ROA gains reflect improved asset quality rather than increased risk-taking.

Panel B examines portfolio composition. Column 1 shows that the loan share of assets declines by 0.60 percentage points per year of deregulation exposure, while columns 2–3 show that securities and cash shares increase by 0.33 and 0.52 percentage points, respectively. This shift toward liquid, safe assets reduces balance sheet risk without requiring asset sales or deleveraging. Columns 4–6 demonstrate that these compositional changes are driven by differential rates of expansion rather than contraction of risky assets. The pattern of growth, i.e., cash expanding fastest, followed by securities, then loans, indicates that banks deploy additional capital conservatively rather than using higher capital ratios to support greater risk-taking.²³ What distinguishes our setting is that the lending slowdown does not translate into reduced credit supply at the consolidated BHC level: nonbank affiliates within the same organizations sharply expand lending, shown next. These findings speak to a longstanding concern that higher capital requirements may reduce bank profitability and induce risk-shifting behavior at the bank level. Instead, we find that when banks build capital through internal equity injection rather than deleveraging, safety strengthens without a corresponding rise in risk-taking, consistent with [Admati and Hellwig \(2024\)](#).

Panel C of Table 10 examines the balance-sheet channels through which equity injections affect bank capital ratios. Columns 1 and 2 show that total assets and total equity grow at near-identical rates of 0.08 percentage points per quarter per year of deregulation exposure on each, so the bank neither delevers nor levers up. Consistent with this, column 3 shows that bank leverage is essentially unchanged. The capital ratio nonetheless improves: column 4 shows equity relative to risk-weighted assets rises, while column 5 shows risk-weighted assets as a share of total assets

²³The modest expansion of bank loans is consistent with the well-documented direct effect of tighter capital requirements on bank lending growth ([Gropp et al., 2019](#)).

fall. Equity flows in and assets grow with it, leaving the raw leverage ratio flat. As Panel B shows, the incremental assets are tilted toward low-risk-weight holdings, so the risk-weighted ratio improves. Banks thus build capital buffers and reduce balance-sheet risk simultaneously, with both effects contributing to higher capital quality.

This pattern of safer banks rather than risk-shifting reflects the distinct nature of internal versus external equity injections. When banks raise external equity, new shareholders require returns commensurate with their cost of capital, generating ROE pressure that can incentivize risk-taking to restore returns to pre-issuance levels. Internal injections from the parent face no comparable pressure: the parent optimizes across the entire holding company, with no separate bank-level ROE target on the marginal dollar of equity. Column 6 of Panel C tests this directly by examining marginal ROE, the return on the incremental dollar of injected equity. A positive coefficient would indicate banks deployed new capital toward especially profitable opportunities, mechanically raising average ROE through portfolio reallocation. The null result rules out this channel. Combined with the modest positive coefficient on average ROE in Panel A and the absence of any increase in off-balance-sheet commitments (column 7 of Panel C), the evidence points to a different source of the ROE gains: reduced charge-offs and improved asset quality.

7.2 Consequences for Nonbank Risk

We now examine how stricter bank capital regulation reshapes nonbank operations. Nonbank subsidiaries exhibit substantial changes along several dimensions post-2015: equity ratios fall, credit quality worsens, and earnings become more volatile as thinner capital buffers amplify the effect of operating shocks.

Figure 8 provides event-study evidence. All coefficients represent the marginal effect per additional year of deregulation exposure. The synchronized breaks at 2015Q1 are striking: equity-to-assets ratios fall, dividends spike, and net balances to parent surge. As nonbank capital buffers erode, their business models and performance deteriorate. Nonbanks expand lending activity, increasing the share of assets devoted to loans. However, this expansion is accompanied by higher levels of past-due and nonaccrual loans and a decline in return on equity by the end of the sample. These breaks coincide precisely with the improvements in capital observed at affiliated banks, indicating that the same regulatory shock that strengthens banks does so by drawing resources from nonbank subsidiaries.

Capital Extraction. Table 11 quantifies the capital extraction documented visually. Column 1 shows that equity as a share of assets declines by 7.71 percentage points per year of deregulation exposure. Column 4 shows that net balances due to the parent and affiliates rise by 13.60 percentage points, indicating that nonbanks increasingly borrow from, or reduce lending to, affiliated

entities. Column 5 shows that dividend payments as a share of equity rise by 0.96 percentage points, the channel through which capital is drained upstream to satisfy bank regulatory requirements. Column 6 shows that total assets are statistically unchanged: the nonbank does not shrink its balance sheet as equity is withdrawn, but instead substitutes intra-firm funding for the equity extracted, consistent with evidence in [Acharya, Cetorelli and Tuckman \(2026\)](#) that banks remain exposed to nonbanks through credit lines. This substitution is the balance-sheet counterpart of the contagion channel in Section 6.4: extracted equity is replaced with intra-family credit, converting loss-absorbing capital at the nonbank into a claim held by the parent and affiliates, a claim impaired precisely in the states in which the nonbank is distressed. The reallocation thus not only thins the nonbank’s buffer but tightens the contractual link through which its distress draws on the resources backstopping the bank; the exposure underlying a nonzero λ is not hypothetical but expands with the treatment itself.

Two considerations govern the interpretation of these magnitudes. First, they are drawn from the selected FR Y-11 filer universe rather than the comprehensive Call Reports underlying our bank estimates. Second, they combine intensive extraction with compositional turnover, as BHCs shed high-equity affiliates and add thin-equity lenders. We therefore do not scale the nonbank-side coefficients to the median seven-year gap as we do for bank excess capital: the per-year differentials are cross-cohort intent-to-treat contrasts rather than cumulative within-entity changes.

This capital extraction creates funding stress that extends beyond simple balance sheet effects. We construct implied interest rates on internal funding by dividing interest income received by parents from subsidiaries by the stock of non-equity investments, revealing the shadow cost of capital across differently-regulated entities. Appendix Table F.11 shows nonbank internal funding rates increase 0.52 percentage points per year of deregulation exposure post-2015, while bank rates show no significant change. The spread widens by 0.44 percentage points per year. Thus, capital-depleted entities face sharply higher marginal funding costs precisely when their balance sheets are weakest.

Operational Restructuring toward Lending. Faced with reduced equity capital and higher internal funding costs, we find that nonbank subsidiaries fundamentally restructure operations toward lending. Table 12 documents that quarterly nonbank lending (aggregated to the BHC level) grows 7.20% per year of deregulation exposure, while bank lending shows no significant change at 0.09%. The large differential between nonbank and bank lending growth confirms that aggressive lending expansion occurs specifically within lightly-regulated nonbank subsidiaries. This migration of credit provision from banks to nonbanks within the same holding company parallels the broader secular decline in bank market share documented by [Buchak et al. \(2024\)](#), but

occurs through internal organizational reallocation rather than competitive displacement across independent institutions.

The composition of this lending expansion is equally informative. At the portfolio level, nonbank subsidiaries reallocate toward consumer lending while reducing their exposure to commercial and real estate lending, as shown in Appendix Table F.12. The shift is particularly pronounced among specialized nonbank lenders, whose quarterly consumer-loan growth is 7.5 percentage points higher per year of deregulation exposure, compared with 1.3 percentage points across all nonbanks. The reorientation thus concentrates the new credit risk in the household sector, where it is largest: consumer credit is typically unsecured and carries charge-off rates well above those on commercial and real estate portfolios, and the deterioration in loan performance documented below is consistent with the arrival of exactly this risk. The response extends beyond portfolio composition to business-model and organizational recomposition. At the business-model level, equity-constrained nonbanks retreat from capital-intensive activities, including trading, advisory, and venture capital, while reliance on interest-generating lending rises sharply, as shown in Appendix Table F.13. At the organizational level, BHCs increase additions of nonbank lending subsidiaries while reducing high-equity-ratio insurance affiliates, as shown in Appendix Table F.14. Although the total number of nonbank lenders changes little, the number of distinct nonbank activity types increases, indicating strategic organizational recomposition rather than simple expansion, as shown in Appendix Table F.15.

Credit Quality Deterioration and Increased Fragility. The aggressive lending expansion comes at substantial cost to credit quality. Table 13 traces the deterioration from loan performance through profitability to insolvency risk. Columns 1–3 document loan performance: loans 90+ days past due rise by 2.66 percentage points per year of deregulation exposure, all past-due loans by 3.08 percentage points, and loss provisions as a share of loans by 9.37 percentage points, conditional on nonzero provisioning.

Columns 4 and 5 show how the deterioration in loan performance passes through to returns: ROE declines by a statistically significant 1.87 percentage points per year of exposure; the ROA decline of 0.39 percentage points is statistically indistinguishable from zero. This asymmetry is the mechanical footprint of the capital extraction documented above. As equity is withdrawn, the equity denominator shrinks while operating performance per dollar of assets remains roughly stable, so returns to equity holders fall even absent measurable operating deterioration: thinner buffers amplify the same asset-side performance into weaker equity returns.

The combination of reduced capital, rapid lending growth, and deteriorating credit quality culminates in the fragility measures of columns 6–8. The probability of negative earnings rises by 15.19 percentage points per year of exposure, Z-scores decline by 8.61 points, and the im-

plied probability of default rises by 1.68 percentage points.²⁴ Appendix Table F.16 shows that the underlying rise in earnings instability is concentrated in interest income: interest income volatility increases by 19.69 percentage points while non-interest income volatility is unchanged. This concentration is consistent with the reallocation toward lending, as loan portfolios carry greater earnings variability than fee-based services.²⁵

These fragility measures are the empirical counterpart to the stress tests of Section 6.4. The thinly capitalized, lending-concentrated, higher-volatility nonbank that emerges after 2015 is precisely the entity whose recapitalization needs generate the tail exposure quantified there: the gains in bank capitalization following Basel III are matched by lower buffers and higher risk on the nonbank side of the same organization.

8 Robustness

This section presents additional evidence supporting our identification strategy and examines the robustness of our main findings. We provide three sets of results. First, we verify the first-stage relationship between our instrument and organizational complexity, documenting strong predictive power. Second, we present traditional two-stage least squares (2SLS) estimates as an alternative to our baseline reduced-form approach, which rescale the reduced-form effects by the first-stage relationship. Third, we conduct placebo tests that randomly permute either the treatment timing or the geographic variation in our instrument, confirming that our results do not arise from spurious correlations.

First Stage Relationship. Appendix Table F.17 verifies that our instrument predicts organizational complexity.

The dependent variable in the first stage is nonbank asset share interacted with the post-2015 indicator, capturing the presence and scale of nonbank operations in the period when capital requirements become binding. Column 1 presents the unconditional correlation: each additional year of pre-Riegle-Neal deregulation exposure increases nonbank share by 0.29 percentage points post-2015. Column 2 adds quarter-year fixed effects to control for aggregate time trends, increasing the coefficient to 0.51 percentage points. Column 3 adds bank fixed effects to absorb time-invariant heterogeneity across banks, with the coefficient remaining at 0.53 percentage points.

²⁴The Z-score is a standard measure of distance to default, calculated as $(\text{equity}/\text{assets} + \text{ROA}) / \text{standard deviation of ROA}$; the probability of default is the normal CDF of the negative Z-score.

²⁵Sample sizes differ across columns by data availability: past-due measures are observed only for nonbanks with lending activity, loss provisions are conditional on nonzero provisioning, and the fragility measures require sufficient history to compute the volatility of ROA. Results are robust to estimating the profitability and fragility outcomes on the lending subsample of columns 1–2.

Column 4 adds our full set of differential trends controls, yielding a coefficient of 0.35 percentage points. The first-stage F-statistics exceed conventional thresholds for weak instrument concerns.²⁶

Two-Stage Least Squares Estimates. Appendix Table F.18 reports conventional 2SLS estimates as a complement to our baseline reduced-form specification. We instrument the endogenous regressor (nonbank asset share interacted with post-2015) using the interaction of years since deregulation interacted with post-2015.

Column 1 presents the unconditional 2SLS estimate: a one-percentage-point increase in nonbank share raises bank excess capital by 9.41 percentage points. Columns 2–4 introduce progressively richer sets of fixed effects and controls. Across all specifications, the estimates remain statistically significant and economically large.

The 2SLS estimates rescale the reduced form by the first stage: dividing the reduced-form coefficient of 0.74 by the first-stage coefficient of 0.35 yields approximately 2.1, close to the 2SLS estimate of 1.96 in the fully specified column. In economic terms, a one-percentage-point increase in post-2015 nonbank share raises bank excess capital by roughly 2 percentage points among BHCs whose complexity responds to deregulation timing, the treatment-on-the-treated counterpart of the intent-to-treat reduced form.

Placebo Tests. Appendix Figures E.8 and E.9 present permutation-based placebo tests that validate our identification strategy. Appendix Figure E.8 randomly reassigns the deregulation instrument 1,000 times while maintaining the true post-2015 treatment period. If our results reflect spurious geographic correlations rather than the effect of organizational complexity, we would observe similar effects under random instrument assignment. Instead, the placebo distribution is tightly centered at zero, and none of the 1,000 permutations yields coefficients exceeding our true estimate of 0.74. The permutation p-value of 0.000 strongly rejects that our results arise by chance from random geographic variation.

Appendix Figure E.9 randomly reassigns the post-2015 treatment timing 1,000 times, while preserving each BHC’s actual years-to-deregulation. If our results reflect pre-existing differential trends between early and late deregulators rather than a response to Basel III, we would observe similar effects when falsely assigning treatment to other years. The placebo distribution is centered at zero, and none of the 1,000 permutations yields coefficients approaching our true estimate. The permutation p-value of 0.000 confirms that the effect operates specifically through the 2015 regulatory change, not through spurious time-series patterns or pre-trends.

²⁶The Kleibergen-Paap Wald F-statistic ranges from 9.8 to 19.6 across specifications, near or above the rule-of-thumb threshold of 10. The Cragg-Donald Wald F-statistic exceeds 500 in all specifications, indicating very strong instruments. These statistics confirm that deregulation timing provides powerful variation in organizational complexity, validating the relevance condition for our instrumental variables approach.

Together, these placebo tests provide strong evidence against alternative explanations based on omitted geographic factors or differential trends. The fact that random permutations of either the instrument or the timing produce null results, while the true specification produces large and significant effects, indicates that both dimensions of variation, cross-sectional differences in deregulation timing and the 2015 Basel III implementation, are essential to our identification.

9 Conclusion

This paper shows that subsidiary-level capital regulation within multi-entity financial firms can reallocate risk across organizational boundaries rather than eliminate it. When capital requirements bind more tightly at regulated bank subsidiaries than at affiliated nonbanks, parent firms optimally reallocate equity toward the regulated entities, reducing the measured risk of the bank. However, the organizational linkages that facilitate this reallocation including intercompany equity transfers, committed funding arrangements, and implicit parental support, also transmit losses from the nonbank back to the regulated bank. As a result, the reduction in measured bank risk overstates the reduction in the economic risk borne by the banking organization: risk is displaced to the affiliated nonbank but remains within the consolidated organization through internal financial linkages. Because these transmission channels operate within the firm, they are not readily captured by regulatory frameworks that evaluate regulated entities in isolation or rely primarily on subsidiary-level capital ratios.

These changes have real economic consequences. Stricter bank capital regulation reshapes the consolidated organization beyond the bank: nonbank balance sheets become thinner, internal funding becomes more expensive, and portfolio choices shift toward higher-yield, riskier activities. Credit quality and profitability deteriorate alongside these shifts. Capital regulation that targets only the bank, therefore, induces real changes in risk-taking and solvency at affiliated nonbanks, not merely accounting movements of capital across affiliates. Stress tests calibrated to 2008-scale shocks show that for the typical BHC, most of the bank capital gain survives even if nonbank distress transmits fully back to the bank, though full transmission erodes nearly 40% of it. For tail-risk institutions, transmission of one-half erodes 72% of the gain, and transmission above roughly seven-tenths reverses it: the apparent improvement in bank safety is substantially overstated once implicit exposure to nonbank subsidiaries is accounted for.

The regulatory architecture creates an inconsistency. Entity-level capital requirements successfully improve bank subsidiary safety, but simultaneously incentivize the migration of traditional lending activities to nonbank affiliates within the same holding company. These nonbank lenders now originate and hold consumer credit, performing bank functions, yet operate without deposit insurance, Federal Reserve discount window access, or the comprehensive prudential oversight

applied to depository institutions. The resulting migration of lending activity shifts credit provision toward entities with lower capital buffers and fewer protections against distress. This shift is particularly consequential because it is concentrated in consumer lending, where disruptions have the most direct effects on households and generate the strongest pressure for public intervention. As a result, losses that originate in lightly regulated nonbank subsidiaries may ultimately be borne by the parent organization's capital buffer and, in severe cases, create demands for public support. The migration of consumer lending from banks to nonbanks within the same holding company therefore does not simply relocate risk across legal entities; it changes where losses are absorbed and who ultimately bears them.

The broader implication is that consolidated capital requirements alone are unlikely to eliminate regulatory arbitrage when regulatory stringency differs across subsidiaries within the same holding company. Even well-capitalized groups will optimally concentrate where constraints bind most tightly, leaving lightly regulated affiliates to absorb risk. Preventing offsetting vulnerabilities elsewhere in the organization may require extending prudential standards to material nonbank subsidiaries, constraining equity extraction, and monitoring internal capital and funding flows. More generally, effective financial regulation must treat organizational structure as a fundamental determinant of regulatory incidence and systemic risk. The narrative of credit migrating from banks to nonbanks understates that much of the migration occurs within the very holding companies that consolidated supervision was designed to oversee.

While our analysis focuses on banking, the mechanism is general. Any multi-entity organization facing asymmetric regulation, taxation, or supervision across affiliates has reason to use internal capital markets to relocate activity toward less constrained units. Banking provides an unusually clean setting because subsidiary-level financials are disclosed and regulatory wedges are sharp, but the lesson that organizational structure shapes the incidence of policy applies wherever firm boundaries cross regulatory boundaries.

References

- Acharya, Viral V., Nicola Cetorelli, and Bruce Tuckman. 2026. "Where do banks end and NBFIs begin?" *Review of Corporate Finance Studies*.
- Acharya, Viral V., Nicola Cetorelli, and Bruce Tuckman. Forthcoming. "Transformed Intermediation: Credit Risk to NBFIs, Liquidity Risk to Banks." *Journal of Finance: Insights and Perspectives*.
- Acharya, Viral V., Philipp Schnabl, and Gustavo Suarez. 2013. "Securitization without risk transfer." *Journal of Financial Economics*, 107(3): 515–536.
- Admati, Anat, and Martin Hellwig. 2024. "The Bankers' New Clothes: What's Wrong with Banking and What to Do about It-New and Expanded Edition." In *The Bankers' New Clothes*. Princeton University Press.
- Admati, Anat R, Peter M DeMarzo, Martin F Hellwig, and Paul Pfleiderer. 2018. "The leverage ratchet effect." *The Journal of Finance*, 73(1): 145–198.
- Admati, Anat R, Peter M DeMarzo, Martin Hellwig, and Paul Pfleiderer. 2013. "Fallacies, irrelevant facts, and myths in the discussion of capital regulation: Why bank equity is not socially expensive." Max Planck Institute for Research on Collective Goods Preprint.
- Adrian, Tobias, and Adam B Ashcraft. 2012. "Shadow banking regulation." *Annual Review of Financial Economics*, 4(1): 99–140.
- Adrian, Tobias, and Hyun Song Shin. 2010. "Liquidity and leverage." *Journal of Financial Intermediation*, 19(3): 418–437.
- Albuquerque, Bruno, Eugenio Cerutti, Melih Firat, and Benedikt Kagerer. 2026. "Banking on Nonbanks." International Monetary Fund Working Paper 2026, 023.
- Almeida, Heitor, Chang-Soo Kim, and Hwanki Brian Kim. 2015. "Internal capital markets in business groups: Evidence from the Asian financial crisis." *The Journal of Finance*, 70(6): 2539–2586.
- Altınkılıç, Oya, and Robert S Hansen. 2000. "Are there economies of scale in underwriting fees? Evidence of rising external financing costs." *The Review of Financial Studies*, 13(1): 191–218.
- Ashcraft, Adam B, and Murillo Campello. 2007. "Firm balance sheets and monetary policy transmission." *Journal of Monetary Economics*, 54(6): 1515–1528.
- Bai, Jennie, Erik Bostrom, Sebastian Infante, and Victoria Ivashina. 2025. "Liquidity Flows to Bank-Affiliated Broker Dealers: Insights from Volumes and Prices." National Bureau of Economic Research, Working Paper No. 34844.

- Bai, Jennie, Murillo Campello, and Pradeep Muthukrishnan.** 2025. "Loan-funded Loans: Equity-like Liabilities inside Bank Holding Companies." Georgetown McDonough School of Business Research Paper, No. 5260219.
- Begenau, Juliane.** 2020. "Capital requirements, risk choice, and liquidity provision in a business-cycle model." *Journal of Financial Economics*, 136(2): 355–378.
- Berger, Allen N, and Christa HS Bouwman.** 2013. "How does capital affect bank performance during financial crises?" *Journal of Financial Economics*, 109(1): 146–176.
- Black, Sandra E, and Philip E Strahan.** 2001. "The division of spoils: rent-sharing and discrimination in a regulated industry." *American Economic Review*, 91(4): 814–831.
- Buchak, Greg, Gregor Matvos, Tomasz Piskorski, and Amit Seru.** 2018. "Fintech, regulatory arbitrage, and the rise of shadow banks." *Journal of Financial Economics*, 130(3): 453–483.
- Buchak, Greg, Gregor Matvos, Tomasz Piskorski, and Amit Seru.** 2024. "The secular decline of bank balance sheet lending." National Bureau of Economic Research, Working Paper No. 32176.
- Campello, Murillo.** 2002. "Internal capital markets in financial conglomerates: Evidence from small bank responses to monetary policy." *The Journal of Finance*, 57(6): 2773–2805.
- Cetorelli, Nicola, and Linda S Goldberg.** 2012a. "Banking globalization and monetary transmission." *The Journal of Finance*, 67(5): 1811–1843.
- Cetorelli, Nicola, and Linda S Goldberg.** 2012b. "Liquidity management of US global banks: Internal capital markets in the great recession." *Journal of International Economics*, 88(2): 299–311.
- Cetorelli, Nicola, and Saketh Prazad.** 2025. "The Nonbank Footprint of Banks." *Federal Reserve Bank of New York Staff Report*, 1118.
- Cetorelli, Nicola, and Samuel Stern.** 2015. "Same Name, New Businesses: Evolution in the Bank Holding Company." Liberty Street Economics.
- Coase, Ronald H.** 1937. "The Nature of the Firm." *Economica*, 4(16): 386–405.
- Congressional Research Service.** 2023. "Bank Capital Requirements: A Primer and Policy Issues." Available at https://www.congress.gov/crs_external_products/R/PDF/R47447/R47447.1.pdf.
- Danisewicz, Piotr, Dennis Reinhardt, and Rhiannon Sowerbutts.** 2017. "On a tight leash: Does bank organizational structure matter for macroprudential spillovers?" *Journal of International Economics*, 109: 174–194.

- Fazzari, Steven, R Glenn Hubbard, and Bruce Petersen.** 1988. "Investment, financing decisions, and tax policy." *The American Economic Review*, 78(2): 200–205.
- Federal Reserve Bank of Cleveland.** 2024. "The Evolution of US Bank Capital around the Implementation of Basel 3." Available at <https://www.clevelandfed.org/publications/economic-commentary/2024/ec-202407-evolution-of-us-bank-capital>.
- Gandhi, Ashvin, and Andrew Olenski.** 2024. "Tunneling and hidden profits in health care." National Bureau of Economic Research, Working Paper No. 32258.
- Gertner, Robert H, David S Scharfstein, and Jeremy C Stein.** 1994. "Internal versus external capital markets." *The Quarterly Journal of Economics*, 109(4): 1211–1230.
- Gilje, Erik P, Elena Loutskina, and Philip E Strahan.** 2016. "Exporting liquidity: Branch banking and financial integration." *The Journal of Finance*, 71(3): 1159–1184.
- Giroud, Xavier, and Holger M Mueller.** 2015. "Capital and labor reallocation within firms." *The Journal of Finance*, 70(4): 1767–1804.
- Giroud, Xavier, and Holger M Mueller.** 2019. "Firms' internal networks and local economic shocks." *American Economic Review*, 109(10): 3617–3649.
- Giroud, Xavier, and Joshua Rauh.** 2019. "State taxation and the reallocation of business activity: Evidence from establishment-level data." *Journal of Political Economy*, 127(3): 1262–1316.
- Gropp, Reint, Thomas Mosk, Steven Ongena, and Carlo Wix.** 2019. "Banks response to higher capital requirements: Evidence from a quasi-natural experiment." *The Review of Financial Studies*, 32(1): 266–299.
- Grossman, Sanford J, and Oliver D Hart.** 1986. "The costs and benefits of ownership: A theory of vertical and lateral integration." *Journal of Political Economy*, 94(4): 691–719.
- Hanson, Samuel G, Anil K Kashyap, and Jeremy C Stein.** 2011. "A macroprudential approach to financial regulation." *Journal of Economic Perspectives*, 25(1): 3–28.
- Harris, Milton, and Artur Raviv.** 1991. "The theory of capital structure." *The Journal of Finance*, 46(1): 297–355.
- He, Zhiguo, Bryan Kelly, and Asaf Manela.** 2017. "Intermediary asset pricing: New evidence from many asset classes." *Journal of Financial Economics*, 126(1): 1–35.
- Houston, Joel, Christopher James, and David Marcus.** 1997. "Capital market frictions and the role of internal capital markets in banking." *Journal of Financial Economics*, 46(2): 135–164.

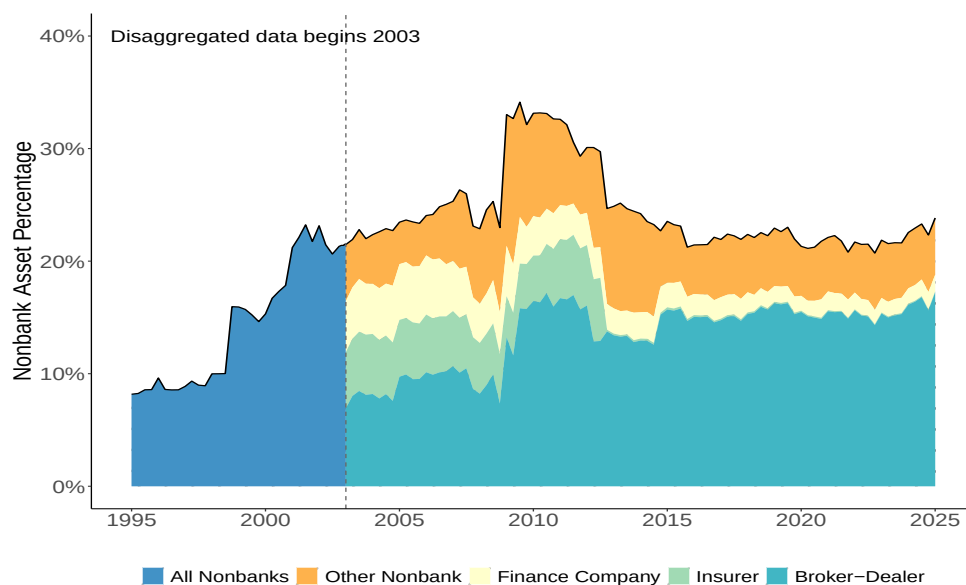
- Houston, Joel F, Chen Lin, and Yue Ma.** 2012. "Regulatory arbitrage and international bank flows." *The Journal of Finance*, 67(5): 1845–1895.
- Irani, Rustom M, Rajkamal Iyer, Ralf R Meisenzahl, and Jose-Luis Peydro.** 2021. "The rise of shadow banking: Evidence from capital regulation." *The Review of Financial Studies*, 34(5): 2181–2235.
- Jayarathne, Jith, and Philip E Strahan.** 1996. "The finance-growth nexus: Evidence from bank branch deregulation." *The Quarterly Journal of Economics*, 111(3): 639–670.
- Jiang, Erica, Gregor Matvos, Tomasz Piskorski, and Amit Seru.** 2020. *Banking without deposits: Evidence from shadow bank call reports*.
- Kakani, Pragya, Eric Yde, Genevieve P Kanter, Richard G Frank, and Amelia M Bond.** 2026. "Profit Regulation and Strategic Transfer Pricing by Vertically Integrated Firms: Evidence from Health Care." National Bureau of Economic Research, Working Paper No. 35042.
- Kashyap, Anil K, Jeremy C Stein, and Samuel Hanson.** 2010. "An analysis of the impact of 'substantially heightened' capital requirements on large financial institutions." Harvard Working Paper, Mimeo.
- Kisin, Roni, and Asaf Manela.** 2016. "The shadow cost of bank capital requirements." *The Review of Financial Studies*, 29(7): 1780–1820.
- Kroszner, Randall S, and Philip E Strahan.** 1999. "What drives deregulation? Economics and politics of the relaxation of bank branching restrictions." *The Quarterly Journal of Economics*, 114(4): 1437–1467.
- Kundu, Shohini, and Nishant Vats.** 2026. "Banking networks and economic growth: From idiosyncratic shocks to aggregate fluctuations." *American Economic Journal: Macroeconomics*, 18(2): 332–377.
- Kundu, Shohini, Seongjin Park, and Nishant Vats.** 2021. "The geography of bank deposits and the origins of aggregate fluctuations." *Available at SSRN 3883605*.
- Kuppuswamy, Venkat, and Belén Villalonga.** 2016. "Does diversification create value in the presence of external financing constraints? Evidence from the 2007–2009 financial crisis." *Management Science*, 62(4): 905–923.
- Lamont, Owen.** 1997. "Cash flow and investment: Evidence from internal capital markets." *The Journal of Finance*, 52(1): 83–109.

- Markham, Jerry W.** 2009. "The Subprime Crisis-A Test Match for the Bankers: Glas-Steagall vs. Gramm-Leach-Bliley." *University of Pennsylvania Journal of Business Law*, 12: 1081.
- Matvos, Gregor, Amit Seru, and Rui C Silva.** 2018. "Financial market frictions and diversification." *Journal of Financial Economics*, 127(1): 21–50.
- Matvos, Gregor, and Amit Seru.** 2014. "Resource allocation within firms and financial market dislocation: Evidence from diversified conglomerates." *The Review of Financial Studies*, 27(4): 1143–1189.
- Mian, Atif, Amir Sufi, and Emil Verner.** 2020. "How does credit supply expansion affect the real economy? The productive capacity and household demand channels." *The Journal of Finance*, 75(2): 949–994.
- Myers, Stewart C, and Nicholas S Majluf.** 1984. "Corporate financing and investment decisions when firms have information that investors do not have." *Journal of Financial Economics*, 13(2): 187–221.
- Ongena, Steven, Alexander Popov, and Gregory F Udell.** 2013. "'When the cat's away the mice will play': Does regulation at home affect bank risk-taking abroad?" *Journal of Financial Economics*, 108(3): 727–750.
- Pozsar, Zoltan, Tobias Adrian, Adam Ashcraft, and Hayley Boesky.** 2010. "Shadow banking." *Federal Reserve Bank of New York Staff Report*, 458.
- Rajan, Raghuram, Henri Servaes, and Luigi Zingales.** 2000. "The cost of diversity: The diversification discount and inefficient investment." *The Journal of Finance*, 55(1): 35–80.
- Rice, Tara, and Philip E Strahan.** 2010. "Does credit competition affect small-firm finance?" *The Journal of Finance*, 65(3): 861–889.
- Sarin, Natasha, and Lawrence H Summers.** 2016. "Understanding bank risk through market measures." *Brookings papers on economic activity*, 2016(2): 57–127.
- Scharfstein, David S, and Jeremy C Stein.** 2000. "The dark side of internal capital markets: Divisional rent-seeking and inefficient investment." *The Journal of Finance*, 55(6): 2537–2564.
- Schnabl, Philipp.** 2012. "The international transmission of bank liquidity shocks: Evidence from an emerging market." *The Journal of Finance*, 67(3): 897–932.
- Shin, Hyun-Han, and René M Stulz.** 1998. "Are internal capital markets efficient?" *The Quarterly Journal of Economics*, 113(2): 531–552.

- Stein, Jeremy C.** 1997. "Internal capital markets and the competition for corporate resources." *The Journal of Finance*, 52(1): 111–133.
- Stein, Jeremy C.** 2002. "Information production and capital allocation: Decentralized versus hierarchical firms." *The Journal of Finance*, 57(5): 1891–1921.
- Strahan, Philip.** 2003. "The real effects of US banking deregulation." *Review-Federal Reserve Bank Of Saint Louis*, 85(4): 111–128.
- Tarullo, Daniel K.** 2019. "Financial regulation: Still unsettled a decade after the crisis." *Journal of Economic Perspectives*, 33(1): 61–80.
- Williamson, Oliver E.** 1975. "Markets and hierarchies: analysis and antitrust implications: a study in the economics of internal organization." *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.

Figure 1: Nonbank Activity Within and Across the BHC Sector

(a) Nonbank Subsidiaries as a Share of BHC Assets

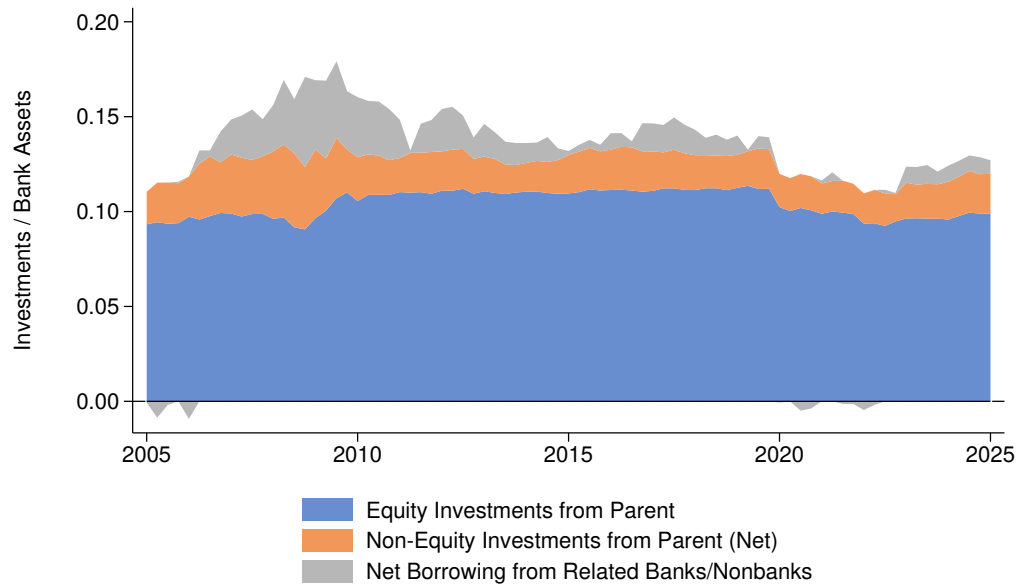


(b) Nonbank Subsidiaries of BHCs as a Share of Aggregate U.S. Nonbank Financial Assets



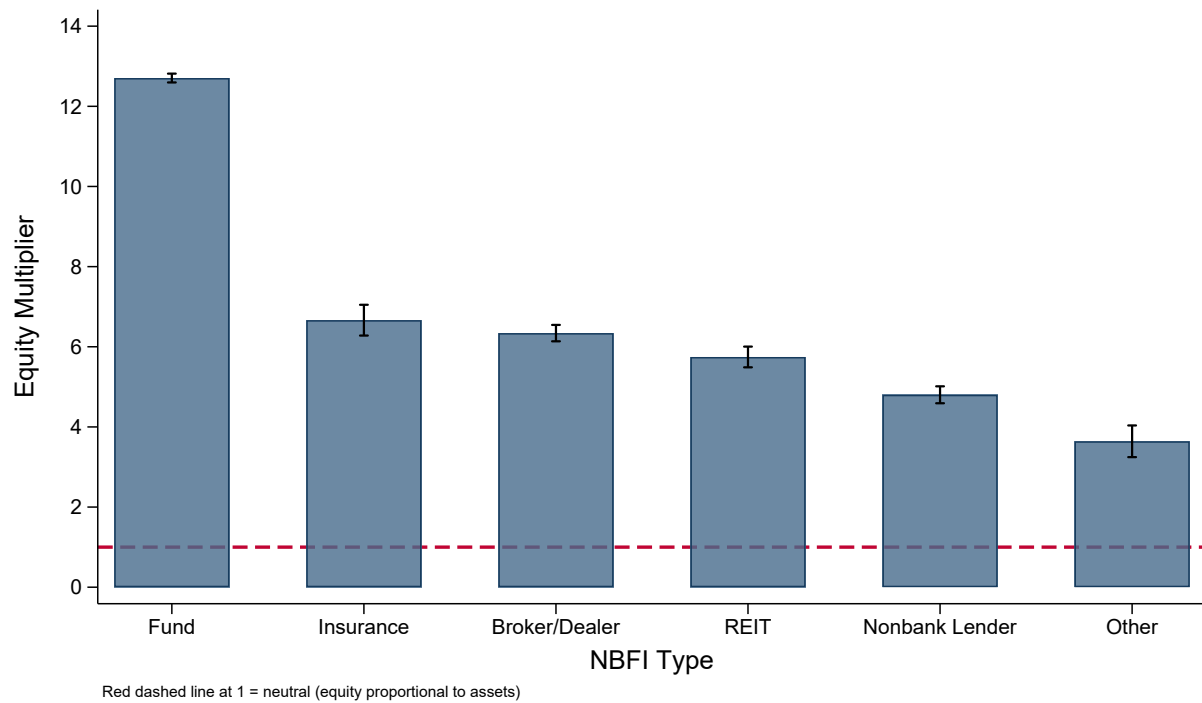
Notes: Panel (a) shows the size of nonbank business lines as a share of consolidated BHC assets from 1995 to 2025. The black line plots the ratio of total nonbank assets to BHC assets, with stacked colored areas decomposing this aggregate into broker-dealers, insurers, finance companies, and other nonbank business lines. Panel (b) presents the percent of aggregate nonbank assets attributable to BHC subsidiaries from 2005 through 2025. This measure is constructed as the ratio of BHC-affiliated nonbank assets (from the FR Y-9LP) to aggregate nonbank assets (from the Financial Accounts of the United States). The denominator is constructed using asset-level proxies for broker-dealers, ABS, equity REITs, finance companies, life insurers, mortgage REITs, other financial business, P&C insurers, and closed-end funds. Mutual fund and ETF assets under management are excluded from industry totals as they are not included in the FR Y-9LP numerator. Source: FR Y-9C, FR Y-9LP, and the Financial Accounts of the United States.

Figure 2: Parent Investments in Bank Subsidiaries: Equity vs. Non-Equity



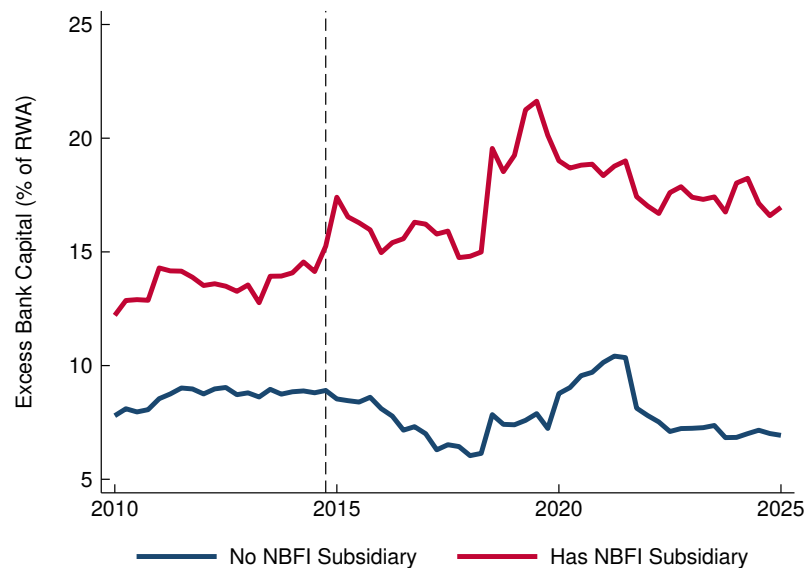
Notes: This figure shows parent BHC equity and nonequity investments in bank subsidiaries, as well as net intra-company borrowing, scaled by bank subsidiary assets. Equity investments in bank subsidiaries are defined as the sum of BHC equity investments in common stock, goodwill, and other intangibles. Nonequity investments in bank subsidiaries are defined as the sum of BHC investments in loans and other receivables and net balances due from subsidiaries (balances due from bank subsidiaries minus balances due to bank subsidiaries). Net borrowing from related banks and nonbanks is defined as balances held by subsidiary banks due to related banks and nonbanks minus balances held by subsidiary banks due from related banks and nonbanks. Variables are aggregated across all BHCs in the sample using value-weighted averages. Source: FR Y-9LP.

Figure 3: Equity Multiplier Varies by Nonbank Subsidiary Type

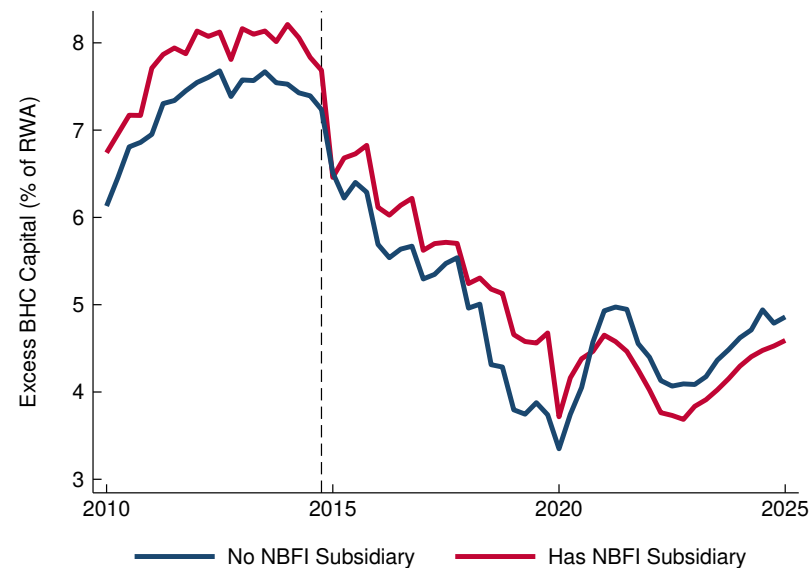


Notes: The figure presents the mean equity multiplier by nonbank subsidiary type. The equity multiplier is the ratio of a subsidiary's share of consolidated BHC equity to its share of consolidated BHC assets: values above one indicate that a subsidiary holds a larger share of the organization's equity than of its assets. Error bars show 95% confidence intervals around the means. Table 3 provides distributional statistics by type. Source: Authors' calculations using the FR Y-11.

Figure 4: Excess Capital: Banks vs BHCs



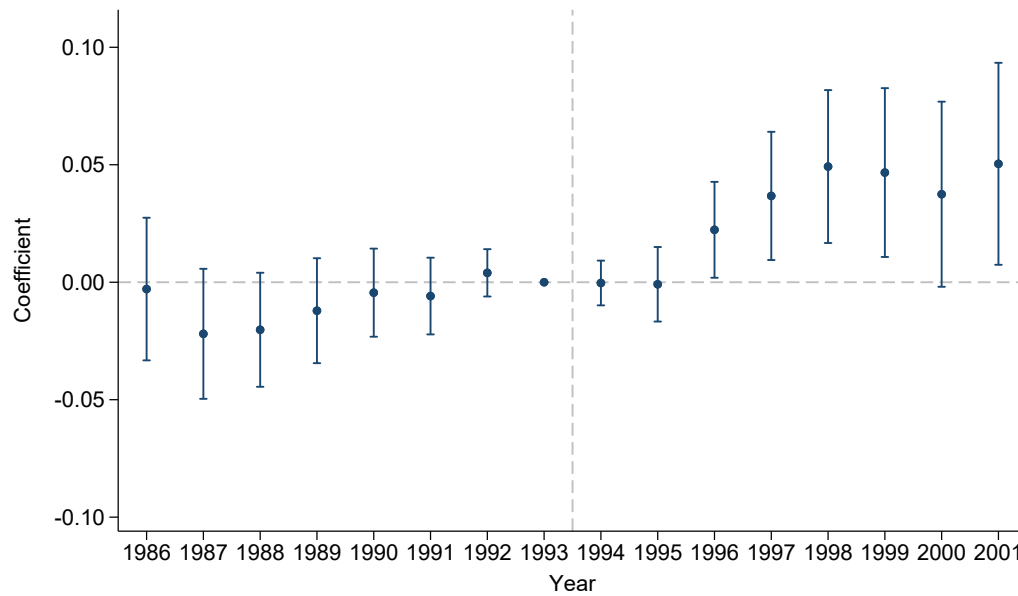
(a) Bank Excess Capital



(b) BHC Excess Capital

Notes: The figure compares average excess bank and BHC capital for BHCs with nonbank exposure and those without exposure. Panel (a) compares average excess bank capital from 2010 through 2024 for BHCs with nonbank exposure to BHCs without nonbank exposure, based on 2005 exposure status, which ensures the classification is pre-determined relative to both the 2013Q1 baseline used in regressions and the 2015Q1 treatment date. Panel (b) presents the corresponding comparison for excess BHC capital over the same period. Source: Authors' calculations using FR Y-9C, FR Y-9LP, and Call Reports.

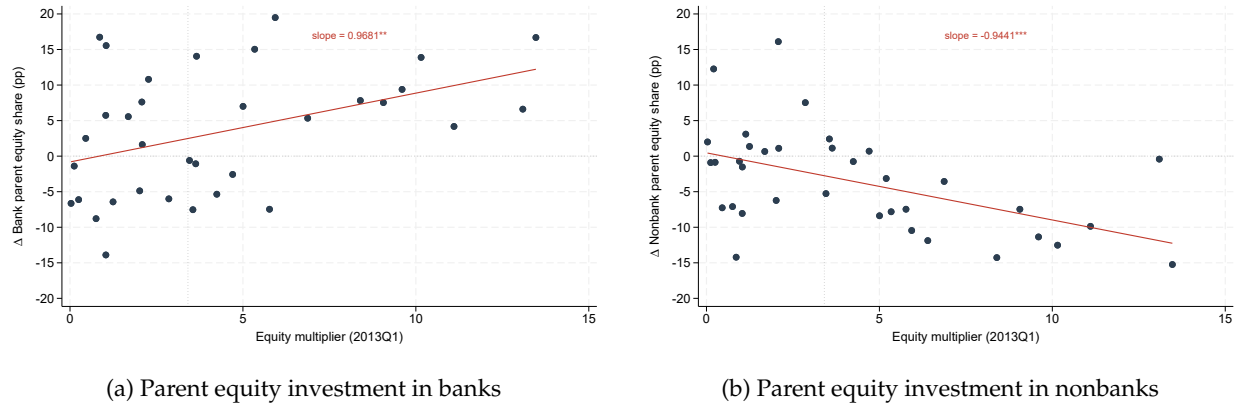
Figure 5: Deregulation Timing as an Instrument for Organizational Complexity



(a) Parallel Pre-Trends (1986–1994)

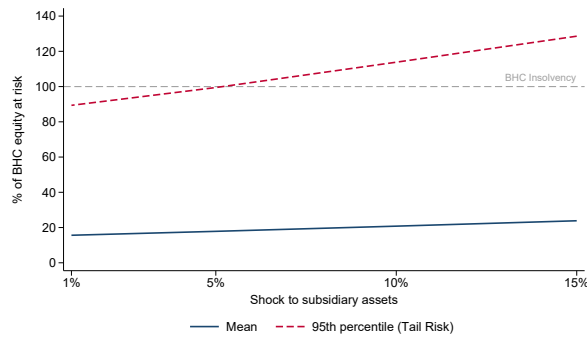
Notes: The figure shows the trends in nonbank financial subsidiary share from 1986–1994, between BHCs headquartered in early-deregulating states and late-deregulating states. Early deregulators are defined as states with median interstate deregulation year before 1986. Source: BHC Organizational Structure Database described in Section 3.

Figure 6: Reallocation of Parent Equity Investments Scales with the Equity Multiplier

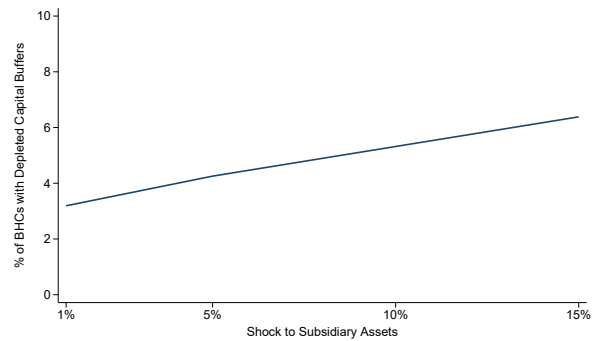


Notes: The figure plots each BHC's pre-post mean difference in the outcome variable against the BHC's 2013Q1 equity multiplier. Panel (a) shows the change in parent equity invested in bank subsidiaries as a share of consolidated BHC equity. Panel (b) shows the change in parent equity invested in nonbank subsidiaries as a share of consolidated BHC equity. Both outcomes are expressed in percentage points. The sample consists of BHCs with at least 1% nonbank asset share in 2013Q1. For visual clarity, the scatter is restricted to BHCs whose pre-post change is within ± 20 percentage points; the fitted line and the slope reported in each panel are simple OLS estimates on this restricted cross-section. The vertical dotted line marks the median equity multiplier across BHCs. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 7: Nonbank Stress Tests: Recapitalization Needs and Buffer Exhaustion



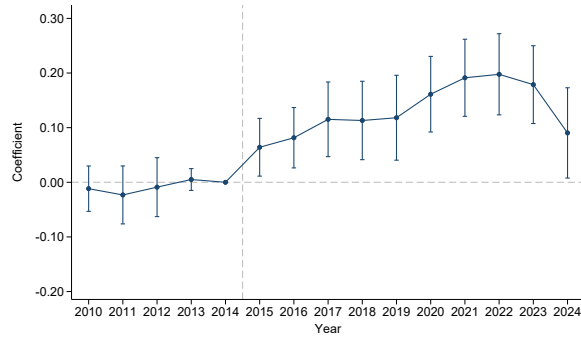
(a) Recapitalization Needs by Shock Severity



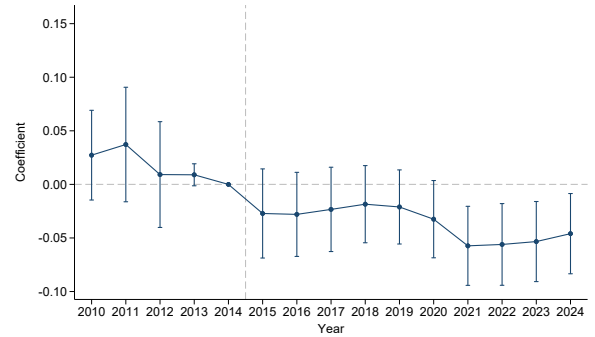
(b) Capital Buffer Depletion

Notes: The figure presents the nonbank stress test results. Panel (a) shows percentage of BHC excess capital required for recapitalization. Solid line: mean across BHCs. Dashed line: 95th percentile (tail risk). Horizontal dashed line at 100% indicates potential parent insolvency. Panel (b) shows percentage of BHCs with completely depleted capital buffers (recapitalization needs exceed available excess capital). Both panels assume nonbank subsidiaries target 40% capital ratio following asset shocks. Appendix Figures E.6a and E.6b show sensitivity to alternative target capital ratios.

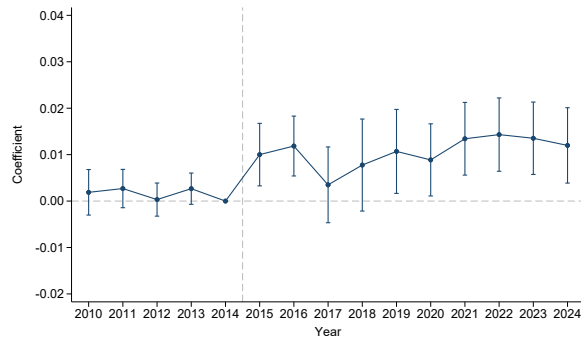
Figure 8: Nonbank Event Study around Basel III Implementation



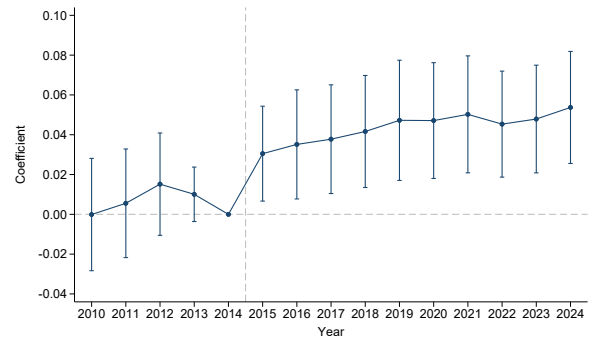
(a) Net Balance to Parent/Subs



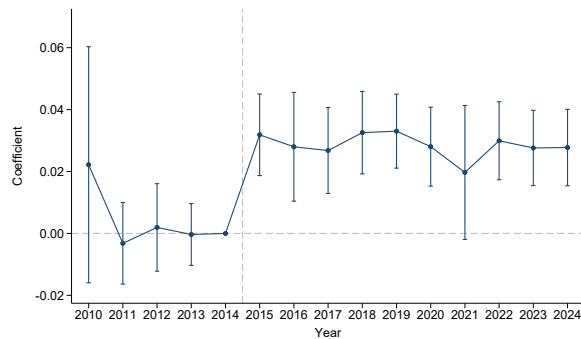
(b) Equity/Assets



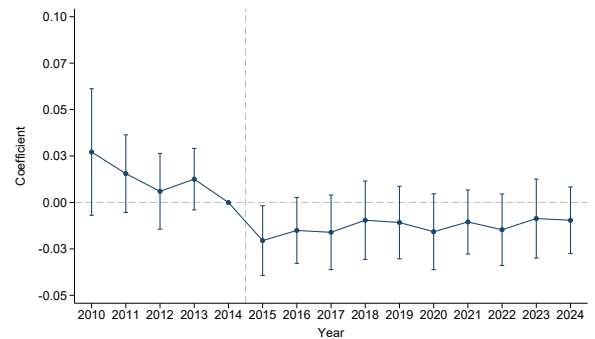
(c) Dividends



(d) Loan Share



(e) Past Due & Nonaccrual



(f) ROE

Notes: The figure presents event study estimates of nonbank outcomes relative to 2014 baseline. Panel (a) shows net balances to parent and other subsidiaries, Panel (b) shows equity-to-assets ratios, Panel (c) shows dividends/equity, Panel (d) shows loan shares, Panel (e) shows past-due and nonaccrual loans, and Panel (f) shows return on equity. Coefficients estimated from specification including nonbank subsidiary fixed effects, industry-quarter-year fixed effects, and BHC controls (top 200 BHC indicator, log assets, leverage, deposits/assets, asset growth, subsidiary count measured 2013Q1) interacted with post-2015 indicator. Standard errors clustered at BHC level. Error bars indicate 90% confidence intervals.

Table 2: Summary Statistics

	N	Mean	SD	p5	p25	p50	p75	p95
Panel A: BHCs								
2013 Controls								
2013 BHC Assets (Billions)	29,921	28.287	189.400	0.503	0.774	1.312	3.282	44.512
2013 BHC Leverage	29,921	9.847	6.248	5.423	7.539	9.081	10.768	15.528
2013 BHC Deposit Share	29,921	0.805	0.107	0.663	0.782	0.827	0.863	0.899
2013 BHC Asset Growth	29,294	0.038	0.090	-0.098	-0.007	0.031	0.072	0.195
2013 BHC Subsidiary Count	29,921	48.197	301.781	1.000	3.000	5.000	10.000	66.000
Has Nonbank Subsidiary	29,921	0.467	0.499	0.000	0.000	0.000	1.000	1.000
Time-Varying Variables								
BHC Assets (Billions)	29,921	34.817	225.200	0.511	0.833	1.664	5.476	64.695
BHC RWA (Billions)	29,804	21.223	126.400	0.321	0.574	1.187	4.038	47.965
BHC Capital (Billions)	29,921	3.493	21.410	0.037	0.078	0.162	0.567	7.117
Excess BHC Capital (%)	29,804	6.402	4.615	1.178	3.650	5.533	7.928	14.190
BHC Net Income (Billions)	29,921	0.083	0.583	-0.001	0.001	0.004	0.014	0.170
BHC Leverage	29,921	0.102	0.048	0.056	0.084	0.099	0.116	0.152
BHC Deposit Share	29,921	0.805	0.482	0.664	0.778	0.822	0.858	0.896
BHC Loan Share	29,921	0.648	0.139	0.392	0.578	0.668	0.744	0.832
BHC Securities Share	29,921	0.210	0.118	0.046	0.125	0.193	0.277	0.428
BHC Nonbank Assets (Billions)	29,903	8.300	75.393	0.000	0.000	0.000	0.011	0.685
BHC Bank Assets (Billions)	29,921	27.420	179.900	0.497	0.819	1.622	5.274	53.484
BHC Direct Issuance	29,921	0.008	0.042	0.000	0.000	0.000	0.001	0.030
BHC Net Issuance	29,921	0.008	0.051	-0.021	0.000	0.000	0.000	0.055
BHC External Equity	29,921	0.012	0.050	0.000	0.000	0.000	0.002	0.066
BHC Equity Inv. Bank Share	29,903	1.072	0.324	0.784	0.972	1.033	1.151	1.468
BHC Equity Inv. Nonbank Share	29,903	0.035	0.106	0.000	0.000	0.005	0.017	0.156
BHC Equity Inv. Total Share	29,903	1.177	0.425	0.893	0.993	1.066	1.205	2.054
BHC Div. Yield Bank	28,872	0.012	0.017	0.000	0.000	0.007	0.016	0.043
BHC Div. Yield Nonbank	21,405	0.016	0.071	0.000	0.000	0.000	0.007	0.064
Panel B: Banks								
Bank Assets (Billions)	57,188	14.549	127.400	0.101	0.534	0.976	2.281	21.357
Bank RWA (Billions)	55,056	10.103	80.413	0.056	0.346	0.691	1.710	15.892
Bank Capital (Billions)	57,188	1.520	12.584	0.013	0.054	0.102	0.240	2.565
Excess Bank Capital (%)	57,156	15.948	56.318	1.175	3.462	5.380	8.150	23.326
Excess Bank to BHC Capital Ratio (%)	39,250	4.997	32.758	0.538	0.829	0.963	1.121	10.914
Bank Net Income (Billions)	57,188	0.040	0.364	-0.000	0.001	0.002	0.006	0.062
Bank Leverage	57,187	0.866	0.149	0.812	0.879	0.896	0.909	0.929
Bank Deposit Share	57,187	0.802	0.166	0.640	0.795	0.840	0.873	0.907
Bank Loan Share	57,187	0.625	0.185	0.234	0.556	0.665	0.746	0.837
Bank Securities Share	57,187	0.214	0.143	0.018	0.116	0.191	0.286	0.476
Panel C: Nonbanks								
Nonbank Assets (Billions)	25,666	3.806	10.285	0.010	0.286	1.071	2.748	16.108
Nonbank Capital (Billions)	25,666	1.938	4.885	0.000	0.072	0.448	1.499	9.718
Nonbank Net Income (Billions)	25,664	0.043	0.212	-0.038	0.000	0.008	0.043	0.249
Nonbank Leverage	21,412	0.415	1.779	0.000	0.005	0.193	0.758	0.999
Nonbank Loans Share	20,378	0.118	0.290	0.000	0.000	0.000	0.000	0.949
Nonbank Securities Share	25,666	0.017	0.093	0.000	0.000	0.000	0.000	0.036
Broker (NAICS 523)	25,667	0.191	0.393	0.000	0.000	0.000	0.000	1.000
Nonbank Lender (NAICS 5222, 5223)	25,667	0.119	0.324	0.000	0.000	0.000	0.000	1.000
Insurer (NAICS 524)	25,667	0.003	0.058	0.000	0.000	0.000	0.000	0.000
Fund (NAICS 525)	25,667	0.346	0.476	0.000	0.000	0.000	1.000	1.000
Real Estate (NAICS 531)	25,667	0.029	0.169	0.000	0.000	0.000	0.000	0.000

Notes: Percentiles are computed at the 5th, 25th, 50th, 75th, and 95th levels. The sample period ranges from 2010 to 2024. Only BHCs that filed an FR Y-9C in 2013Q1 and their bank/nonbank subsidiaries are included in the samples. Sources: FR Y-9C and FR Y-9LP for BHC Panel, Call Reports for Bank Panel, FR Y-11 for Nonbank Panel.

Table 3: Nonbank Capital Structure and Equity Multiplier

<i>Panel A: Summary Statistics (All BHCs)</i>								
	N	Mean	SD	5%	25%	50%	75%	95%
NBFI Asset Share	6,596	0.07	0.13	0.00	0.01	0.02	0.05	0.32
NBFI Equity Share	6,596	0.21	0.21	0.01	0.06	0.16	0.30	0.68
NBFI Capital Ratio	6,596	0.69	0.59	0.04	0.26	0.69	0.99	1.40
BHC Capital Ratio	6,596	0.11	0.07	0.05	0.08	0.09	0.11	0.17
Equity Multiplier	6,596	8.24	7.68	0.30	2.33	6.46	11.95	21.56

<i>Panel B: Equity Multiplier by Nonbank Type</i>								
NBFI Type	Mean Mult	Median Mult	SD	25th Pct	75th Pct	Capital Ratio	Equity Share	N
Fund	12.71	12.83	4.68	10.59	15.28	0.931	0.289	6,924
Management	7.78	7.67	3.68	5.52	9.96	0.787	0.242	1,809
Insurance	6.66	6.31	2.81	5.34	8.10	0.702	0.060	206
Broker/Dealer	6.34	6.05	4.01	3.18	9.35	0.607	0.108	1,476
Real Estate (REIT)	5.75	5.23	3.63	2.76	8.47	0.642	0.054	758
Nonbank Lender	4.80	2.89	5.02	1.66	6.73	0.493	0.162	2,172
Other Financial	3.64	3.08	2.05	2.07	5.01	0.442	0.103	103

Notes: The table documents capital structure asymmetry between bank and nonbank subsidiaries within BHCs. Panel A shows summary statistics for all BHC-quarter observations from 2010–2024 with nonbank subsidiaries. “NBFI Asset Share” is nonbank assets divided by total BHC assets. “NBFI Equity Share” is nonbank equity divided by total BHC equity. “NBFI Capital Ratio” is nonbank equity divided by nonbank assets. The Equity Multiplier is constructed as the “NBFI Equity Share” divided by “NBFI Asset Share” and measures capital intensity. Values above one indicate that nonbanks hold disproportionately large equity relative to their asset footprint. Appendix Figure E.3 shows full distributions by type. Sources: FR Y-9LP, FR Y-9C, FR Y-11.

Table 4: Internal Capital Reallocation: Difference-in-Differences Estimates

	Bank Excess Capital (1)	BHC Excess Capital (2)	Bank/BHC Excess Ratio (3)
$\mathbb{1}[\text{NBFI Sub}] \times \text{Post}$	2.0646** (0.8277)	0.4333 (0.2931)	2.9060*** (0.9498)
Observations	54,814	29,267	39,052
R^2	0.9401	0.7838	0.4185
Bank FE	✓		✓
BHC FE		✓	
Quarter-Year FE	✓	✓	✓
Controls $\times$ Post	✓	✓	✓

Notes: The table presents difference-in-differences estimates of internal capital reallocation within BHCs, comparing BHCs that held any nonbank financial subsidiary as of 2013Q1 (treated) to those that did not (control). Dependent variable in column 1 is bank excess capital (equity relative to regulatory minimum). Column 2 is BHC excess capital. Column 3 is the ratio of bank to BHC excess capital. $\mathbb{1}[\text{NBFI Sub}] \times \text{Post}$ indicates BHCs with nonbank financial subsidiaries as of 2013Q1 interacted with the Post indicator. Post indicates 2015Q1 and later. All specifications include entity fixed effects (bank or BHC) and quarter-year fixed effects. Controls measured 2013Q1 and interacted with Post. Columns 1 and 3 control for bank size, leverage, ROA, and asset growth. Column 2 controls for BHC top 200 indicator, size, leverage, ROA, asset growth, deposits/assets, and subsidiary count. Standard errors clustered at bank level (columns 1, 3) or BHC level (column 2). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Internal Capital Reallocation: Reduced-Form Estimates

	Bank Excess Capital (1)	BHC Excess Capital (2)	Bank/BHC Excess Ratio (3)
Years from Dereg $\times$ Post	0.7395* (0.3992)	0.0058 (0.0721)	1.7766*** (0.6211)
Observations	12,558	6,079	9,873
R^2	0.9502	0.7913	0.6934
Bank FE	✓		✓
BHC FE		✓	
Quarter-Year FE	✓	✓	✓
Controls $\times$ Post	✓	✓	✓

Notes: The table presents reduced-form estimates of internal capital reallocation within BHCs, exploiting variation in deregulation timing. Dependent variable in column 1 is bank excess capital (equity relative to regulatory minimum). Column 2 is BHC excess capital. Column 3 is the ratio of bank to BHC excess capital. Years from Dereg measures years between a BHC's headquarters state interstate branching deregulation and the 1994 Riegle-Neal Act (headquarters state measured as of 1981). Post indicates 2015Q1 and later. All specifications include entity fixed effects (bank or BHC) and quarter-year fixed effects. Controls measured 2013Q1 and interacted with Post. Columns 1 and 3 control for bank size, leverage, ROA, and asset growth. Column 2 controls for BHC top 200 indicator, size, leverage, ROA, asset growth, deposits/assets, and subsidiary count. Standard errors clustered at bank level (columns 1, 3) or BHC level (column 2).

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Internal Equity Reallocation: Parent Investments and Subsidiary Dividends

	Parent Equity Investments			Dividends/Equity	
	Bank Share (1)	Nonbank Share (2)	Total Share (3)	Bank Div./ Equity (4)	Nonbank Div./ Equity (5)
Years from Dereg $\times$ Post	0.0228** (0.0093)	-0.0264** (0.0114)	0.0045 (0.0104)	0.0000 (0.0005)	0.0947** (0.0459)
Observations	1,334	1,334	1,334	1,334	1,334
R ²	0.8101	0.6687	0.9115	0.1638	0.0698
BHC FE	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓

Notes: The table presents reduced-form estimates of internal equity reallocation within BHCs. Dependent variable in column 1 is equity investments in bank subsidiaries divided by total BHC equity. Column 2 is equity investments in nonbank subsidiaries divided by BHC equity. Column 3 is total equity investments in all subsidiaries divided by BHC equity. Equity investments include common stock, preferred stock, goodwill, and other intangibles. Column 4 is quarterly dividends received by parent from bank subsidiaries divided by lagged equity investment in banks. Column 5 is dividends from nonbank subsidiaries divided by lagged equity investment in nonbanks. Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. All specifications include BHC fixed effects and quarter-year fixed effects. BHC controls include top 200 BHC indicator, log assets, leverage, ROA, deposits/assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors clustered at BHC level. Sample restricted to BHCs with nonbank asset share exceeding 1%. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Reallocation of Parent Equity Investments Scales with the Equity Multiplier

	Bank Equity Share (1)	Nonbank Equity Share (2)	Total Parent Investment (3)
Equity Multiplier $\times$ Post	1.7127** (0.6583)	-1.1234* (0.5610)	0.0053 (0.0063)
Observations	2,171	2,171	2,171
R ²	0.9176	0.8544	0.9459
BHC FE	✓	✓	✓
Quarter-Year FE	✓	✓	✓
Controls $\times$ Post	✓	✓	✓

Notes: The table presents reduced-form estimates of how the cross-sectional response of parent equity investments to Basel III scales with the BHC's 2013Q1 equity multiplier. Dependent variable in column 1 is parent equity investments in bank subsidiaries divided by total BHC equity. Column 2 is parent equity investments in nonbank subsidiaries divided by BHC equity. Column 3 is total parent equity investments (in bank, nonbank, and holding-company subsidiaries) divided by BHC equity. The outcomes in columns 1 and 2 are expressed in percentage points; the placebo measure in column 3 is expressed as a decimal proportion. Equity Multiplier is the BHC's 2013Q1 equity multiplier, constructed as the nonbank share of consolidated equity divided by the nonbank share of consolidated assets. Post indicates 2015Q1 and later. All specifications include BHC fixed effects and quarter-year fixed effects. BHC controls include top 200 BHC indicator, log assets, leverage, ROA, deposits/assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors clustered at BHC level. Sample restricted to BHCs with nonbank asset share exceeding 1%. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Stress Test Results: BHC Equity at Risk and Nonbank Recapitalization Needs

Panel A: Mean BHC Equity at Risk (%)

Shock to Assets	Target Capital Ratio					
	20%	30%	40%	50%	60%	70%
1%	6.86	10.81	15.62	21.40	27.66	34.89
5%	8.40	12.67	17.85	23.85	30.47	38.07
10%	10.40	15.10	20.79	26.99	34.12	42.29
15%	12.67	17.85	23.85	30.47	38.07	46.80

Panel B: 95th Percentile BHC Equity at Risk (%)

Shock to Assets	Target Capital Ratio					
	20%	30%	40%	50%	60%	70%
1%	42.52	65.59	89.36	116.79*	146.30*	175.81*
5%	51.75	74.82	99.45	128.60*	158.11*	194.28*
10%	63.28	86.84	113.84*	143.35*	172.86*	233.94*
15%	74.82	99.45	128.60*	158.11*	194.28*	274.64*

Panel C: Mean Percentage of Nonbank Subsidiaries Requiring Recapitalization

Shock to Assets	Target Capital Ratio					
	20%	30%	40%	50%	60%	70%
1%	2.93	4.44	6.53	9.10	12.05	15.53
5%	3.47	5.21	7.53	10.23	13.34	17.09
10%	4.27	6.28	8.83	11.73	15.15	19.28
15%	5.21	7.53	10.23	13.34	17.09	21.68

Panel D: 95th Percentile of Nonbank Subsidiaries Requiring Recapitalization

Shock to Assets	Target Capital Ratio					
	20%	30%	40%	50%	60%	70%
1%	17.06	27.06	36.78	44.20	54.20	64.20
5%	21.06	31.06	38.20	48.20	58.20	68.20
10%	26.06	36.06	43.20	53.20	63.20	73.20
15%	31.06	38.20	48.20	58.20	68.20	78.20

Panel E: BHCs with Completely Depleted Capital Buffers (%)

Shock to Assets	Target Capital Ratio					
	20%	30%	40%	50%	60%	70%
1%	2.13	3.19	3.19	5.32	7.45	9.57
5%	3.19	3.19	4.26	6.38	9.57	10.64
10%	3.19	3.19	5.32	7.45	9.57	10.64
15%	3.19	4.26	6.38	9.57	10.64	10.64

Notes: The table presents stress test results using 2013Q1 balance sheets (FR Y-9C and FR Y-9LP). Panels A–B show percentage of BHC excess capital required to recapitalize nonbank subsidiaries following asset shocks (rows) to restore target capital ratios (columns). Panel A shows the mean across BHCs. Panel B shows the 95th percentile (tail risk), with asterisks (*) indicating scenarios where recapitalization exceeds 100% of parent excess capital. Panels C–D show the percentage of nonbank subsidiaries falling below the target capital ratio following shocks. Panel C reports the mean; Panel D reports the 95th percentile, highlighting concentration of risk. Panel E shows percentage of BHCs with completely depleted capital buffers (recapitalization needs exceed available excess capital). Calculations assume full BHC ownership and 100% loss recognition.

Table 9: Internal Reallocation and BHC Profitability

	ROA (1)	ROE (2)	Charge-Offs (3)
Years from Dereg $\times$ Post	0.0001** (0.0000)	0.0011** (0.0005)	-0.0001** (0.0000)
Observations	5,896	5,896	5,896
R^2	0.4774	0.3293	0.4848
BHC FE	✓	✓	✓
Quarter-Year FE	✓	✓	✓
Controls $\times$ Post	✓	✓	✓

Notes: The table presents reduced-form estimates of BHC-level profitability. Dependent variable in column 1 is quarterly net income divided by lagged total assets (ROA). Column 2 is quarterly net income divided by lagged equity (ROE). Column 3 is quarterly charge-offs divided by lagged total loans. All dependent variables are measured at the consolidated BHC level. Years from Dereg measures the number of years between the interstate branching deregulation of the BHC headquarters state and the 1994 Riegle–Neal Act. Post is an indicator equal to one for 2015Q1 and later. All specifications include BHC fixed effects and quarter-year fixed effects. BHC controls include an indicator for top 200 BHCs, log total assets, leverage, deposits-to-assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors are clustered at the BHC level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Bank Performance, Portfolio Composition, and Capital Quality

Panel A: Performance

	ROA (1)	ROE (2)	Charge-Offs (3)
Years from Dereg $\times$ Post	0.0001*** (0.0000)	0.0012*** (0.0003)	-0.0002*** (0.0000)
Observations	12,054	12,054	12,054
R^2	0.2769	0.3752	0.3504
Bank FE	✓	✓	✓
Quarter-Year FE	✓	✓	✓
Controls $\times$ Post	✓	✓	✓

Panel B: Portfolio Composition and Growth

	Shares			Growth Rates		
	Loan Share (1)	Securities Share (2)	Cash Share (3)	$\Delta \ln(\text{Loans})$ (4)	$\Delta \ln(\text{Sec})$ (5)	$\Delta \ln(\text{Cash})$ (6)
Years from Dereg $\times$ Post	-0.0060*** (0.0021)	0.0033* (0.0019)	0.0052** (0.0024)	0.0008* (0.0005)	0.0023** (0.0011)	0.0046** (0.0021)
Observations	13,333	13,333	13,333	11,774	11,774	11,774
R^2	0.9185	0.8830	0.8769	0.1318	0.1002	0.0760
Bank FE	✓	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓	✓

Panel C: Capital Quality

	$\Delta \ln(\text{Assets})$ (1)	$\Delta \ln(\text{Equity})$ (2)	Leverage (3)	Equity/RWA (4)	RWA/Assets (5)	Marginal ROE (6)	Off-BS (7)
Years from Dereg $\times$ Post	0.0008** (0.0004)	0.0008** (0.0004)	-0.0011 (0.0007)	0.0113*** (0.0039)	-0.0067*** (0.0016)	0.0085 (0.0090)	-0.0017 (0.0018)
Observations	11,442	11,442	11,442	11,442	11,442	11,442	11,442
R^2	0.1103	0.2004	0.9725	0.9582	0.8961	0.0472	0.8282
Bank FE	✓	✓	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓	✓	✓

Notes: Panel A shows bank performance measures. Dependent variable in column 1 is quarterly net income divided by lagged total assets (ROA). Column 2 is quarterly net income divided by lagged equity (ROE). Column 3 is quarterly charge-offs divided by lagged total loans. Panel B shows portfolio composition and growth. Columns 1–3 show asset shares (loans, securities, and cash as shares of total assets). Columns 4–6 show quarter-on-quarter growth rates (log changes in loans, securities, and cash holdings). Panel C examines the balance-sheet channels through which equity injections affect bank capital ratios. Columns 1–2 are quarter-on-quarter growth rates (log changes in total assets and total equity); columns 3–7 are levels. Column 1 is the growth rate of total assets. Column 2 is the growth rate of total equity. Column 3 is total liabilities divided by equity (leverage). Column 4 is equity divided by risk-weighted assets. Column 5 is risk-weighted assets divided by total assets. Column 6 is marginal return on equity, calculated as the change in net income over the past four quarters divided by the change in equity over the same period. Column 7 is unused loan commitments divided by total assets. Years from Dereg measures years between the BHC headquarters state's interstate branching deregulation and the 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. Bank controls include log assets, leverage, and asset growth, all measured as of 2013Q1 and interacted with Post. Standard errors clustered at bank level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: Nonbank Capital Extraction and Funding Constraints

	Equity/ Assets (1)	Bal From Subs (2)	Bal To Subs (3)	Net Bal to Subs (4)	Dividends /Equity (5)	ln(Assets) (6)
Years from Dereg $\times$ Post	-0.0771** (0.0363)	-0.0667* (0.0374)	0.0693** (0.0324)	0.1360*** (0.0439)	0.0096** (0.0037)	0.0454 (0.1539)
Observations	4,697	4,697	4,697	4,697	4,697	4,697
R^2	0.8548	0.8902	0.8083	0.8669	0.2994	0.9294
Nonbank FE	✓	✓	✓	✓	✓	✓
Industry-Qtr-Year FE	✓	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓	✓

Notes: The table documents capital extraction from nonbank subsidiaries. Dependent variable in column 1 is equity divided by lagged assets. Column 2 is balances due from subsidiaries (amounts nonbanks are owed from parents/affiliates) divided by lagged assets. Column 3 is balances due to subsidiaries (amounts parents/affiliates are owed from nonbanks) divided by lagged assets. Column 4 is net balances to parent and subsidiaries, calculated as (balances due to subs - balances due from subs) divided by lagged assets; positive values indicate net borrowing from or reduced lending to affiliates. Column 5 is cash dividends declared divided by lagged equity. Column 6 is log total assets. Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. All specifications include nonbank subsidiary fixed effects and industry-quarter-year fixed effects (NAICS code $\times$ quarter-year). BHC controls include top 200 BHC indicator, log assets, leverage, deposits/assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors clustered at BHC level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: Lending Growth: Nonbank vs Bank Subsidiaries

$\Delta \ln(\text{Lending})$	Nonbank Lending (1)	Bank Lending (2)
Years from Dereg $\times$ Post	0.0720*** (0.0151)	0.0009 (0.0019)
Observations	760	760
R^2	0.1067	0.1716
BHC FE	✓	✓
Quarter-Year FE	✓	✓
Controls $\times$ Post	✓	✓

Notes: The table compares lending growth between nonbank and bank subsidiaries at the BHC level. Dependent variable is quarter-on-quarter log change in total lending aggregated across all nonbank subsidiaries (column 1) or all bank subsidiaries (column 2) within each BHC. Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. Both specifications include BHC fixed effects and quarter-year fixed effects. BHC controls include top 200 BHC indicator, log assets, leverage, deposits/assets, ROA, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors clustered at BHC level. Sample restricted to BHC-quarters with non-missing lending data for both nonbank and bank subsidiaries. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Nonbank Credit Quality, Profitability, and Fragility

	Credit Quality			Profitability		Fragility		
	90+ Days Past Due (1)	All Past Due (2)	Loss Provisions (3)	ROA (4)	ROE (5)	Negative Earnings (6)	Z-Score (7)	Prob (Default) (8)
Years from Dereg $\times$ Post	0.0266*** (0.0069)	0.0308*** (0.0085)	0.0937*** (0.0142)	-0.0039 (0.0054)	-0.0187* (0.0464)	0.1519*** (0.0341)	-8.6147*** (2.4028)	0.0168** (0.0058)
Observations	1,548	1,548	571	4,711	4,711	2,714	2,714	2,714
R ²	0.6761	0.6851	0.7656	0.4024	0.3678	0.4349	0.9767	0.0661
Nonbank FE	✓	✓	✓	✓	✓	✓	✓	✓
Industry-Qtr-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓	✓	✓	✓

Notes: The table documents nonbank credit quality deterioration, profitability decline, and increased fragility. Column 1 is loans 90+ days past due divided by lagged loans. Column 2 is all past-due loans (30+ days) divided by lagged loans. Column 3 is loan loss provisions divided by lagged loans, conditional on nonzero provisioning. Column 4 is quarterly net income divided by lagged assets (ROA). Column 5 is quarterly net income divided by lagged equity (ROE). Column 6 is an indicator equal to one if quarterly net income is negative. Column 7 is the Z-score, calculated as (equity/assets + ROA) / standard deviation of ROA; higher values indicate lower default risk. Column 8 is the probability of default, calculated using the Merton model as the normal CDF of the negative Z-score. Sample sizes differ across columns by data availability: past-due measures are reported only for nonbanks with lending activity, loss provisions are conditional on nonzero provisioning, and the Z-score and derived measures require a rolling window of ROA observations. Years from Dereg measures years between the BHC headquarters state's interstate branching deregulation and the 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. All specifications include nonbank subsidiary fixed effects, industry-quarter-year fixed effects, and BHC controls (top 200 BHC indicator, log assets, leverage, deposits/assets, asset growth, subsidiary count, measured as of 2013Q1) interacted with Post. Standard errors clustered at BHC level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix for:
“Regulatory Arbitrage within the Firm”

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Appendix A Example of Internal Capital Reallocation

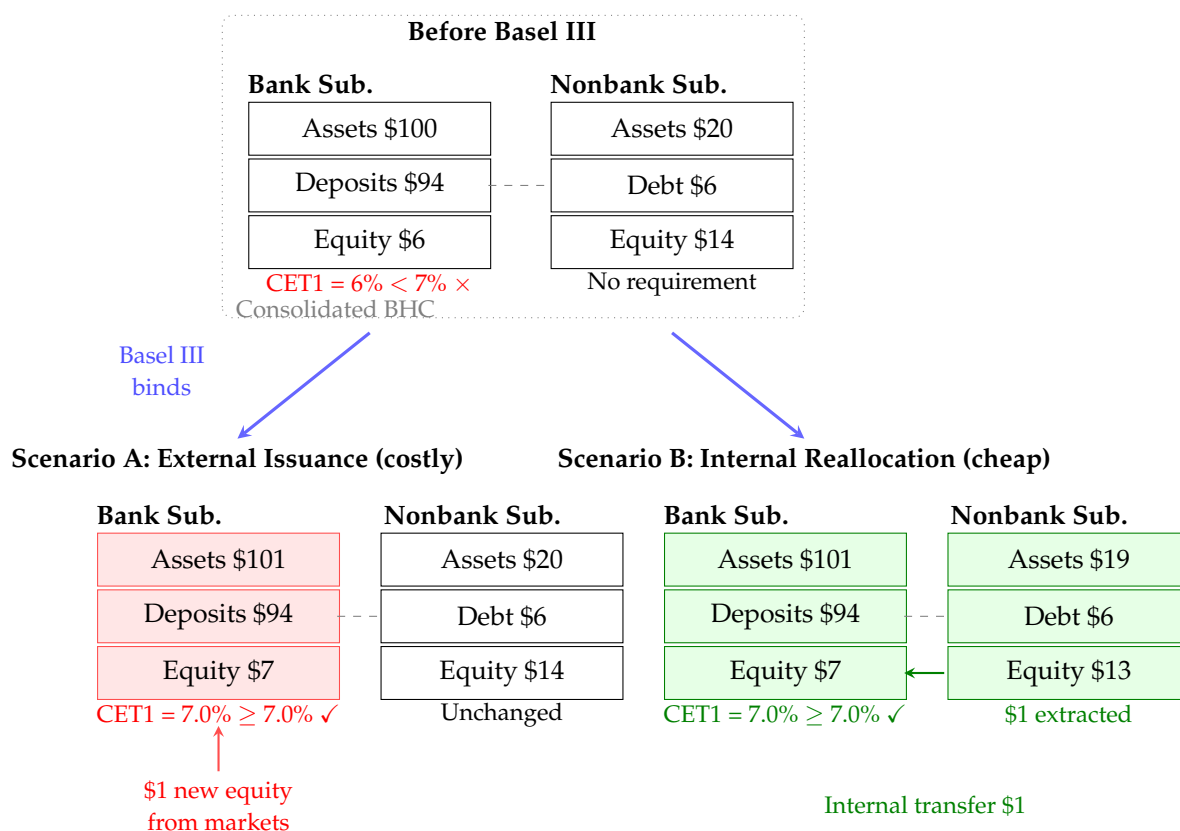


Figure A.1: Internal Capital Reallocation in Response to Basel III. The top panel shows a stylized BHC before Basel III. The bank subsidiary holds \$6 in equity against \$100 in assets ($\text{CET1} = 6\%$), which falls short of the new 7% minimum (inclusive of the Capital Conservation Buffer) introduced by Basel III. Importantly, the requirement applies at both the bank and consolidated BHC level; here the consolidated BHC is already compliant, so the binding constraint is at the bank subsidiary level alone. At the consolidated level, the BHC already holds \$20 in total equity (\$6 in the bank sub and \$14 in the nonbank sub), which is more than sufficient to cover the \$1 shortfall. The problem is not a lack of capital, but that the capital is sitting in the wrong entity. When the 7% CET1 minimum becomes binding, the BHC faces two options. Scenario A: raise \$1 in costly external equity from markets, expanding consolidated assets. Scenario B: transfer \$1 in equity from the nonbank subsidiary, which faces no capital requirement, to the bank subsidiary, satisfying the CET1 constraint without external issuance and without changing consolidated equity or assets. Both scenarios achieve identical bank-level capital ratios (for expositional simplicity, the displayed ratios abstract from the mechanical effect of the injected dollar on the asset denominator, which is second order at these magnitudes); the difference lies entirely in whether the BHC exploits its internal capital market (Scenario B) or turns to external markets (Scenario A).

Appendix B Theoretical Framework: Complete Derivations

This appendix provides complete derivations and proofs for the propositions stated in Section 2, along with comparative statics, calibration details, and model figures. The notation follows Section 2 throughout. We use E_B^{unc} for the unconstrained optimal bank equity and reserve starred variables (E_B^* , E_N^* , K^*) for the constrained optimum.

B.1 Model Setup

Consider a BHC that owns two subsidiaries: a regulated bank (B) and an unregulated nonbank financial institution (N). The BHC operates over two periods, $t \in \{1, 2\}$.

Assets and Equity. Each subsidiary $i \in \{B, N\}$ operates with exogenous assets $A_i > 0$ and chooses equity level $E_i \geq 0$ in period 1. Total BHC equity is $E = E_B + E_N$. Subsidiaries generate returns $R_i(E_i)$, where we suppress the dependence on the fixed A_i , with standard properties:

$$\frac{\partial R_i}{\partial E_i} > 0, \quad \frac{\partial^2 R_i}{\partial E_i^2} < 0 \quad (\text{B.1})$$

Higher equity increases returns by reducing expected distress costs, but with diminishing marginal benefits.

Regulation. The bank faces a capital requirement

$$E_B \geq \kappa_B \cdot A_B \quad (\text{B.2})$$

where κ_B is the regulatory minimum capital ratio. The nonbank faces no binding capital requirement ($\kappa_N = 0$), consistent with the institutional setting where Basel III applies only to depository institutions.

Financing. The BHC can raise external equity $K \geq 0$ at convex cost $c(K)$ with $c(0) = 0$, $c'(K) > 0$, and $c''(K) > 0$. This captures well-established pecking order preferences: internal funds are cheaper than external equity due to issuance costs, asymmetric information, and market timing considerations (Myers and Majluf, 1984; Fazzari, Hubbard and Petersen, 1988).

Internal equity transfers from nonbank to bank incur a small transaction cost $\tau \geq 0$ per dollar transferred, reflecting administrative frictions and potential tax considerations.²⁷

Shocks and Failure. In period 2, each subsidiary faces an idiosyncratic shock $\theta_i \sim F_i(\theta)$ with support $[-\bar{\theta}_i, 0]$. Each F_i is continuously differentiable with density f_i , and we restrict attention to allocations with $0 < E_i < \bar{\theta}_i$, so failure probabilities are interior and the first-order conditions below are well defined; the parameterization in Section B.6 satisfies this restriction at both the pre- and post-Basel optima. Subsidiary i fails if its equity cushion is insufficient:

$$E_i + \theta_i < 0 \quad (\text{B.3})$$

Failure of subsidiary i generates a deadweight social loss $L_i > 0$, where $L_B > L_N$ reflects the greater systemic importance of regulated depository institutions. For the bank, we decompose

²⁷In practice, τ is small relative to external equity costs.

$L_B = L_B^{\text{priv}} + L_B^{\text{ext}}$, where L_B^{priv} is the private loss internalized by the BHC and $L_B^{\text{ext}} \geq 0$ captures the externality component (deposit insurance fund exposure, payment-system disruption, fire-sale, and interbank contagion costs) that the BHC does not internalize. The nonbank loss L_N is internalized in full. The BHC internalizes the direct failure costs of its subsidiaries and at most the private component L_B^{priv} of the contagion channel introduced below; we adopt the simplification $L_B^{\text{priv}} \approx 0$ throughout, so the contagion term enters only the planner's objective. This convention is innocuous on the direct margin in the region we study: bank equity is pinned by the binding requirement, so the private allocation is invariant to the internalized share of the direct bank failure cost.

We assume shocks are independent across subsidiaries: $\theta_B \perp \theta_N$.

Contagion. We model contagion through spillover parameter $\lambda \in [0, 1]$:

- $\lambda = 0$: Perfect ring-fencing (nonbank failure fully contained)
- $\lambda = 1$: Full contagion (nonbank failure triggers bank failure)

Let $\Phi(E_B, E_N) \equiv \Pr(\theta_N < -E_N \text{ and } \theta_B > -E_B)$ denote the joint probability of nonbank distress and bank survival. Under independence, $\Phi(E_B, E_N) = F_N(-E_N) \cdot [1 - F_B(-E_B)]$. Note that $\partial\Phi/\partial E_B = F_N(-E_N) \cdot f_B(-E_B) > 0$: higher bank equity expands the set of states in which the bank survives its own shock, raising the probability that nonbank distress coincides with bank survival and thus the exposure to contagion. Conversely, $\partial\Phi/\partial E_N = -f_N(-E_N) \cdot [1 - F_B(-E_B)] < 0$.

The total probability of bank failure incorporates both direct shocks and contagion:

$$\Pr(\theta_B < -E_B \text{ or contagion}) = F_B(-E_B) + \lambda \cdot \Phi(E_B, E_N) \quad (\text{B.4})$$

The probability of nonbank failure is:

$$\Pr(\theta_N < -E_N) = F_N(-E_N) \quad (\text{B.5})$$

This captures that nonbank distress can transmit to the bank even when the bank would otherwise survive its own shock, consistent with channels including funding pressure, reputation damage, and consolidated capital depletion.

B.2 BHC Optimization

The BHC chooses equity allocations (E_B, E_N) and external equity K to maximize expected value:

$$\begin{aligned} \max_{E_B, E_N, K} \quad & R_B(E_B) + R_N(E_N) - \left[F_B(-E_B) + \lambda \cdot \Phi(E_B, E_N) \cdot \frac{L_B^{\text{priv}}}{L_B} \right] \cdot L_B \\ & - F_N(-E_N) \cdot L_N - c(K) - \tau \cdot \max\{0, E_B - E_B^0\} \end{aligned} \quad (\text{B.6})$$

Under the maintained simplification $L_B^{\text{priv}} \approx 0$, the contagion term drops from the private problem, which becomes:

$$\max_{E_B, E_N, K} \quad R_B(E_B) + R_N(E_N) - F_B(-E_B) \cdot L_B - F_N(-E_N) \cdot L_N - c(K) - \tau \cdot \max\{0, E_B - E_B^0\} \quad (\text{B.7})$$

subject to:

$$E_B \geq \kappa_B \cdot A_B \quad (\text{regulatory constraint}) \quad (\text{B.8})$$

$$E_B + E_N \leq E^0 + K \quad (\text{resource constraint}) \quad (\text{B.9})$$

$$E_B, E_N, K \geq 0 \quad (\text{non-negativity}) \quad (\text{B.10})$$

where E^0 denotes initial BHC equity and $E_B^0 \equiv E^0 \cdot A_B / (A_B + A_N)$ denotes the proportional asset-weighted allocation of initial BHC equity to the bank. This baseline represents the unconstrained equity split when capital requirements are slack and serves as the reference point for measuring internal reallocation. The transfer cost $\tau \cdot \max\{0, E_B - E_B^0\}$ applies to equity injected into the bank above this baseline; the one-sided specification captures that upward reallocation into the regulated entity is the costly administrative action of interest, and implies the cost is inactive when the binding requirement lies below the proportional baseline, as under our baseline parameterization (see the Transfer-Cost Baseline paragraph in Section B.6).

B.3 Optimal Capital Allocation

We characterize the solution through three cases. Cases 2 and 3 describe the two corner solutions; the optimization also permits interior solutions in which both margins are active. Proposition B.1 characterizes the Case 3 corner analytically. The numerical parameterization in Section B.6 does not satisfy Assumption (A3) below and its optimum is interior, with modest external issuance alongside predominantly internal reallocation; the model figures report this interior solution, for which the qualitative comparative statics of the proposition continue to hold.

Case 1: Slack Regulation. When $\kappa_B \cdot A_B < E_B^{unc}$ (where E_B^{unc} is the unconstrained optimum), the constraint does not bind and the BHC allocates equity to equate marginal risk-adjusted returns. Because $\Pr(\theta_i < -E_i) = F_i(-E_i)$, increasing E_i by one unit reduces the failure probability by $f_i(-E_i)$, so the marginal value of equity at subsidiary i is $R'_i(E_i) + L_i \cdot f_i(-E_i)$. Equating across subsidiaries:

$$R'_B(E_B) + L_B \cdot f_B(-E_B) = R'_N(E_N) + L_N \cdot f_N(-E_N) \quad (\text{B.11})$$

This represents standard portfolio allocation with no regulatory distortion.

Case 2: External Equity. When regulation binds ($\kappa_B \cdot A_B > E_B^{unc}$) but external equity is relatively cheap, the BHC raises external capital: $K^* > 0$. The regulatory constraint binds with $E_B = \kappa_B \cdot A_B$, and minimal internal reallocation occurs. Appendix Figure B.1 shows that satisfying the 10.5% Basel III requirement would require external equity equal to approximately 1.8% of total BHC assets under this scenario, rising to 3.2% at a 16% requirement.

Case 3: Internal Reallocation. When external equity is sufficiently costly relative to the shadow value of internal funds (formalized in Assumption (A3) below), the BHC meets the regulatory requirement through internal reallocation: $K^* = 0$ and $E_B = \kappa_B \cdot A_B$.

Assumptions. The following conditions are maintained for Proposition B.1:

- (A1) *Strict concavity and monotone shadow value.* The objective in (B.7) is strictly concave in (E_B, E_N, K) , and the shadow value $v(E) \equiv R'_N(E) + L_N \cdot f_N(-E)$ is strictly decreasing in E . Under

the uniform shock specification of Section B.6, both properties follow from strict concavity of R_i and convexity of c , since the densities f_i are constant; more generally, monotonicity of ν holds whenever the density f_N is non-decreasing on its support, since $\nu'(E) = R_N''(E) - L_N \cdot f_N'(-E)$.

(A2) *Feasibility.* $E^0 > \kappa_B \cdot A_B$, so the corner allocation leaves the nonbank with positive equity.

(A3) *Costly external finance.* $c'(0) \geq \nu^*$, where

$$\nu^* \equiv R_N'(E^0 - \kappa_B A_B) + L_N \cdot f_N(-(E^0 - \kappa_B A_B)) \quad (\text{B.12})$$

is the shadow value of internal funds evaluated at the corner allocation.

Condition (A3) is the formal requirement for the corner: external equity must be costlier at the margin than the nonbank's marginal value of funds at the corner allocation. The main text's shorthand $c'(0) > \tau$ conveys the qualitative feature that external equity is the costlier marginal instrument, but is weaker than (A3); the two conditions coincide when the nonbank's marginal value of funds at the corner is small.

Proposition B.1 (Internal Reallocation Equilibrium). *Under (A1)–(A3), when regulation binds ($\kappa_B \cdot A_B > E_B^{unc}$), the BHC optimally chooses:*

$$E_B^* = \kappa_B \cdot A_B \quad (\text{B.13})$$

$$E_N^* = E^0 - \kappa_B \cdot A_B \quad (\text{B.14})$$

$$K^* = 0 \quad (\text{B.15})$$

with comparative statics:

$$\frac{\partial E_B^*}{\partial \kappa_B} = A_B > 0 \quad (\text{bank equity increases with requirements}) \quad (\text{B.16})$$

$$\frac{\partial E_N^*}{\partial \kappa_B} = -A_B < 0 \quad (\text{nonbank equity decreases one-for-one}) \quad (\text{B.17})$$

$$\frac{\partial (E_B^* + E_N^*)}{\partial \kappa_B} = 0 \quad (\text{consolidated BHC equity unchanged}) \quad (\text{B.18})$$

Proof of Proposition B.1. Form the Lagrangian of the simplified private problem (B.7). We derive first-order conditions in the region $E_B > E_B^0$, where the transfer cost is differentiable with derivative τ ; when $\kappa_B A_B \leq E_B^0$, the transfer term is inactive at the constrained optimum and the argument below holds with $\tau = 0$:

$$\begin{aligned} \mathcal{L} = & R_B(E_B) + R_N(E_N) - F_B(-E_B) \cdot L_B - F_N(-E_N) \cdot L_N \\ & - c(K) - \tau \cdot (E_B - E_B^0) + \mu \cdot (E_B - \kappa_B \cdot A_B) + \nu \cdot (E^0 + K - E_B - E_N) \end{aligned} \quad (\text{B.19})$$

where $\mu \geq 0$ is the multiplier on the regulatory constraint (B.8) and $\nu \geq 0$ is the multiplier on the resource constraint (B.9).

The first-order conditions (using $\partial F_i(-E_i)/\partial E_i = -f_i(-E_i)$, so that the marginal failure-cost

reduction from higher equity enters with a positive sign) are:

$$\frac{\partial \mathcal{L}}{\partial E_B} = R'_B(E_B) + L_B \cdot f_B(-E_B) - \tau + \mu - \nu = 0 \quad (\text{B.20})$$

$$\frac{\partial \mathcal{L}}{\partial E_N} = R'_N(E_N) + L_N \cdot f_N(-E_N) - \nu = 0 \quad (\text{B.21})$$

$$\frac{\partial \mathcal{L}}{\partial K} = -c'(K) + \nu = 0 \quad (\text{B.22})$$

Step 1: Show $K^* = 0$. From (B.21), the shadow value of internal funds at any candidate optimum is

$$\nu(E_N) = R'_N(E_N) + L_N \cdot f_N(-E_N), \quad (\text{B.23})$$

which is strictly decreasing in E_N by (A1). Suppose, toward a contradiction, that $K^* > 0$. Then the resource constraint gives $E_N = E^0 + K^* - \kappa_B A_B > E^0 - \kappa_B A_B$, so by monotonicity $\nu(E_N) < \nu(E^0 - \kappa_B A_B) = \nu^*$. But (B.22) requires $\nu(E_N) = c'(K^*) > c'(0) \geq \nu^*$ by convexity of c and (A3), a contradiction. Hence $K^* = 0$; the KKT condition at the corner is $\nu \leq c'(0)$.

Step 2: Show the regulatory constraint binds. Since the objective is strictly concave by (A1), the unconstrained solution E_B^{unc} , characterized by (B.11) with $\mu = 0$, exists and is unique. By hypothesis $\kappa_B \cdot A_B > E_B^{unc}$, so the unconstrained optimum is infeasible; strict concavity then implies the constrained optimum lies on the boundary of the feasible set, $E_B^* = \kappa_B \cdot A_B$, with $\mu > 0$.

Step 3: Solve for E_N^* . The multiplier $\nu = R'_N(E_N) + L_N f_N(-E_N) > 0$, so the resource constraint binds. With $K^* = 0$ and $E_B^* = \kappa_B \cdot A_B$, (B.9) gives:

$$E_N^* = E^0 - E_B^* = E^0 - \kappa_B \cdot A_B \geq 0 \quad (\text{B.24})$$

where non-negativity follows from (A2).

Step 4: Comparative statics. Differentiating (B.13)–(B.14) with respect to κ_B :

$$\frac{\partial E_B^*}{\partial \kappa_B} = A_B > 0 \quad (\text{B.25})$$

$$\frac{\partial E_N^*}{\partial \kappa_B} = -A_B < 0 \quad (\text{B.26})$$

$$\frac{\partial (E_B^* + E_N^*)}{\partial \kappa_B} = A_B - A_B = 0 \quad (\text{B.27})$$

These hold for any $A_B > 0$. □

These predictions match our empirical findings: banks accumulate equity (column 1 of Table 5), nonbanks lose equity (column 1 of Table 11), and BHCs do not raise external capital (column 2 of Table 5). Appendix Figure B.2 visualizes these comparative statics. As the bank capital requirement rises from 6% to 16%, the bank's capital ratio (blue line) rises one for one with the requirement, while the nonbank's capital ratio (red line) declines from 33% to 8%: the “waterbed effect,” in which regulatory pressure on one subsidiary drains capital from another. The two ratios do not offset point for point for two reasons: each transferred dollar moves them by $1/A_B$ and $1/A_N$ respectively, and modest external issuance absorbs part of the tightening. Appendix Figure B.1 presents the corresponding counterfactual: the external equity that would be required if internal reallocation were unavailable rises only modestly with the requirement, consistent with the empirical finding that BHCs rely primarily on internal reallocation rather than external capital

markets.

B.4 Systemic Implications and Externalities

While internal reallocation is privately optimal for BHCs (economizing on costly external equity), it may be socially suboptimal due to a contagion externality. The planner evaluates allocations with the full bank failure cost and the contagion channel:

$$W(E_B, E_N, K; \lambda) = R_B(E_B) + R_N(E_N) - [F_B(-E_B) + \lambda \Phi(E_B, E_N)] L_B - F_N(-E_N) L_N - c(K) - \tau \cdot \max\{0, E_B - E_B^0\} \quad (\text{B.28})$$

where $\Phi(E_B, E_N) = F_N(-E_N) [1 - F_B(-E_B)]$ under independence. Evaluating W at the private optima under the pre- and post-Basel requirements and differencing yields the net social benefit of the reallocation, equation (3) in Proposition 2.2.

Proof of Proposition 2.2. Substituting $(E_B^{pre}, E_N^{pre}, K^{pre})$ and $(E_B^{post}, E_N^{post}, K^{post})$ into (B.28) and differencing:

$$\Delta W(\lambda) = \Delta R + L_B \Delta F_B - L_N \Delta F_N - \Delta c(K) - \Delta \tau - \lambda L_B \Delta \Phi,$$

which is equation (3): ΔW is linear in λ with slope $-L_B \Delta \Phi < 0$, since the reallocation thins the nonbank and thickens the bank, so $\Delta \Phi > 0$. Because the private optima do not depend on λ , the reallocation occurs for all λ , while $\Delta W(\lambda)$ crosses zero exactly once, at the λ^* in (4); the degenerate case $\lambda^* \leq 0$ follows when the numerator is non-positive. For the comparative statics, write $\lambda^* = (a + L_B \Delta F_B) / (L_B \Delta \Phi)$ with $a \equiv \Delta R - L_N \Delta F_N - \Delta c(K) - \Delta \tau$. Then $\partial \lambda^* / \partial L_N = -\Delta F_N / (L_B \Delta \Phi) < 0$ and $\partial \lambda^* / \partial L_B = -a / (L_B^2 \Delta \Phi)$, which is positive if and only if $a < 0$, that is, whenever $L_N \Delta F_N + \Delta c(K) + \Delta \tau > \Delta R$. As $L_B / L_N \rightarrow \infty$, $\lambda^* \rightarrow \Delta F_B / \Delta \Phi$. $\square$

Numerical Check. Under the parameter values in Appendix Table B.1, the shocks are uniform, so $\Delta F_B = (E_B^{post} - E_B^{pre}) / \bar{\theta}_B = 2.5/20 = 0.125$ and $\Delta F_N = (E_N^{pre} - E_N^{post}) / \bar{\theta}_N = 2.11/15 = 0.141$. The components of (4) are $\Delta R = 0.55$, $L_B \Delta F_B = 7.50$, $L_N \Delta F_N = 1.41$, $\Delta c(K) = 0.84$, and $\Delta \tau = 0$ (the post-Basel binding requirement lies just below the proportional baseline E_B^0 , so the one-sided transfer cost is inactive in both regimes), giving a numerator of 5.80 against $L_B \Delta \Phi = 7.83$ and hence $\lambda^* = 0.74$, the threshold shown in Appendix Figure B.4a. The bank-safety term $L_B \Delta F_B$ exceeds the entire numerator: absent the direct gain in bank safety, the reallocation would be socially costly at every λ , which is why λ^* rises with L_B / L_N in Appendix Figure B.4b.

Interpretation. When ring-fencing is effective (λ small), internal reallocation is both privately and socially optimal. BHCs meet regulatory requirements while economizing on costly external equity, and contagion costs are contained. However, when contagion risk is material ($\lambda > \lambda^*$), the social cost of increased systemic fragility outweighs the private benefit of avoided issuance costs.

Empirical Calibration. Our stress test analysis provides empirical discipline for the model. Appendix Figure B.3 presents heatmaps showing BHC equity at risk under various shock scenarios. The three panels show: (i) mean equity required as a percentage of BHC excess capital to recapitalize nonbank subsidiaries, (ii) 95th percentile equity at risk, and (iii) the fraction of BHCs experiencing complete buffer depletion. At our baseline scenario of a 5% shock to nonbank assets (consistent with 2008-level losses) combined with a 40% target recapitalization ratio, the average

BHC requires 17.85% of excess capital to restore nonbank solvency, while the 95th percentile BHC requires 99.45% of excess capital. If nonbanks were perfectly ring-fenced ($\lambda = 0$), this BHC-level vulnerability would not exist; the evidence in Appendix D indicates transmission is material.

Appendix Figure B.4a plots the net social benefit of internal reallocation as a function of λ , expressed as a percentage of total BHC assets. When contagion is negligible ($\lambda = 0$), reallocation is unambiguously beneficial, yielding a net social benefit of approximately 4% of assets. The gain reflects the direct improvement in bank safety and subsidiary returns, net of higher nonbank failure risk and issuance costs. The net benefit declines linearly in λ , crosses zero at $\lambda^* \approx 0.74$, and becomes increasingly negative thereafter, reaching approximately -1.5% of assets at complete contagion ($\lambda = 1$). We do not take a stand on where λ lies; the figure characterizes the full mapping. We stress, moreover, that the threshold is computed for the average BHC. The systemically relevant institutions occupy the right tail of the equity-at-risk distribution, where the same transmission rate implies far larger draws on parent capital, so the net social benefit of reallocation turns negative at lower λ than the average-based threshold suggests.

The externality threshold λ^* is sensitive to assumptions about relative failure costs. Appendix Figure B.4b explores how λ^* varies with the ratio L_B/L_N , holding L_N fixed at its baseline value. When bank failures are only twice as costly as nonbank failures ($L_B/L_N = 2$), $\lambda^* \approx 0.3$, and reallocation becomes socially costly even at modest contagion. At the baseline ratio of $L_B/L_N = 6$, the threshold rises to $\lambda^* \approx 0.7$, and at very high systemic cost ratios ($L_B/L_N = 20$) to approximately 0.9. The threshold thus spans most of the unit interval over plausible failure-cost ratios: because λ is not estimated, the figure should be read as characterizing which combinations of transmission and relative failure costs make reallocation socially costly, not as locating the economy on either side of the threshold.

B.5 Comparative Statics and Additional Predictions

The model generates several additional predictions that align with our empirical findings.

Effect of Stricter Regulation. Define system-wide expected failure costs as:

$$S \equiv F_B(-E_B) \cdot L_B + F_N(-E_N) \cdot L_N + \lambda \cdot F_N(-E_N) \cdot [1 - F_B(-E_B)] \cdot L_B \quad (\text{B.29})$$

The first two terms capture direct failure costs; the third captures contagion, the probability that the nonbank fails while the bank survives its own shock, triggering bank failure.

Using $E_B^* = \kappa_B \cdot A_B$ and $E_N^* = E^0 - \kappa_B \cdot A_B$ from Proposition B.1, and applying the chain rule (including the product rule on the contagion term):

$$\frac{\partial S}{\partial \kappa_B} = A_B \left[\underbrace{-f_B \cdot L_B}_{<0 \text{ (banks safer)}} + \underbrace{f_N \cdot [L_N + \lambda \cdot L_B(1 - F_B)] + \lambda \cdot F_N \cdot f_B \cdot L_B}_{>0 \text{ (nonbank risk, contagion, exposure)}} \right] \quad (\text{B.30})$$

The net effect on system-wide risk is ambiguous and depends on the magnitude of contagion and nonbank failure costs relative to direct bank safety improvements.

B.6 Model Parameterization

Parameter Values. Table B.1 summarizes the baseline parameter values. The model is a stylized framework intended to illustrate the internal reallocation mechanism and derive qualitative com-

parative statics; it is not a structural estimation. Parameters are chosen to be broadly consistent with the data and existing literature where possible, and assumed otherwise.

Regulatory Parameters. $\kappa_{\text{low}} = 0.08$ and $\kappa_{\text{high}} = 0.105$ match pre- and post-Basel III total capital requirements exactly, including the 2.5% capital conservation buffer.

External Equity Cost ($c'(0)$). Altinkılıç and Hansen (2000) estimates direct costs of 4–7% for seasoned equity offerings, with additional indirect costs from dilution and adverse selection. We set $c'(0) = 0.07$, consistent with this range.

Transaction Cost (τ). Internal equity transfers incur administrative and tax frictions. We set $\tau = 0.02$, consistent with the assumption that internal transfer costs are small relative to external equity costs. The condition $c'(0) = 0.07 > \tau = 0.02$ ensures that internal transfers are the cheaper marginal source of funds; at the baseline parameterization the optimum features modest external issuance alongside predominantly internal reallocation, close to the Case 3 corner; the transfer cost itself is inactive in the Basel experiment (see the Transfer-Cost Baseline paragraph below).

Contagion Parameter (λ). We do not estimate λ , and no baseline value is assigned. The stress tests in Section 6.4 involve no assumption about λ : they measure the potential draw on parent capital from recapitalizing shocked nonbanks unconditionally, whereas λ governs how much of that draw depletes the resources backstopping the bank, which the exercise does not identify. All λ -dependent results (the net social benefit in Appendix Figure B.4a and the netting exercise in Section 6.4) are reported as functions of λ over $[0, 1]$.

Failure Costs and Remaining Parameters. $L_B/L_N = 6$ is assumed as a baseline reflecting the greater systemic importance of regulated depository institutions. Appendix Figure B.4b reports how the externality threshold λ^* varies across a wide range of L_B/L_N ratios. Asset parameters (A_B, A_N), return parameters (α_B, α_N), and shock parameters ($\bar{\theta}_B, \bar{\theta}_N$) are chosen to produce capital ratios and failure probabilities broadly consistent with the data, and are not calibrated to specific empirical moments.

Transfer-Cost Baseline (E_B^0). The transfer cost in (B.7) is measured relative to the proportional asset-weighted baseline $E_B^0 = E^0 \cdot A_B / (A_B + A_N)$, which represents the unconstrained equity split when capital requirements are slack. At our parameterization ($E^0 = 0.11 \cdot 130 = 14.3$, $A_B = 100$, $A_N = 30$), this yields $E_B^0 = 11$. The post-Basel binding capital $\kappa_{\text{high}} \cdot A_B = 10.5$ falls slightly below this baseline, so the transfer cost is inactive in the Basel experiment, consistent with $\Delta\tau = 0$ in the Numerical Check; it activates for tighter requirements ($\kappa_B > 0.11$), which is the relevant region for the upper range of the comparative statics in Appendix Figure B.2.

Table B.1: Model Calibration

Parameter	Description	Value	Source
<i>Assets and Initial Equity</i>			
A_B	Bank assets (normalized)	100	—
A_N	Nonbank assets	30	Illustrative; see notes
$E^0 / (A_B + A_N)$	Initial consolidated equity ratio	11%	Sample mean, pre-2015
<i>Regulatory Parameters</i>			
κ_{low}	Pre-Basel III capital requirement	8%	Basel I/II
κ_{high}	Post-Basel III capital requirement	10.5%	Basel III + CCB
<i>Return Function: $R_i(E_i) = \alpha_i \log(1 + E_i)$</i>			
α_B	Bank return parameter	15	Chosen to produce qualitatively reasonable capital ratios
α_N	Nonbank return parameter	12	Chosen to produce qualitatively reasonable capital ratios
<i>Frictions and Costs: $c(K) = c'(0) \cdot K + 0.5 \cdot K^2$</i>			
τ	Internal transfer cost per dollar	0.02	Assumed small; $\tau \in [0, 0.05]$
$c'(0)$	Marginal cost of external equity	0.07	Altınkılıç and Hansen (2000) ; range $[0.05, 0.10]$
<i>Failure Costs and Shock Distribution: $\theta_i \sim \text{Uniform}[-\bar{\theta}_i, 0]$</i>			
L_B	Social cost of bank failure	60	Assumed; $L_B / L_N = 6$ baseline
L_N	Social cost of nonbank failure	10	Normalized
$\bar{\theta}_B$	Maximum bank shock magnitude	20	Assumed
$\bar{\theta}_N$	Maximum nonbank shock magnitude	15	Assumed
<i>Contagion</i>			
λ	Contagion parameter	—	Not assigned; results reported as a function of λ

Notes: The model is a stylized framework intended to illustrate the internal reallocation mechanism and derive qualitative comparative statics; it is not a structural estimation. Assets are normalized so $A_B = 100$. $A_N = 30$ is chosen to produce economically meaningful nonbank operations and is not calibrated to a specific sample moment. Return parameters α_B and α_N are chosen so the model produces capital ratios broadly consistent with the data (pre-period bank capital ratios of approximately 8% and nonbank capital ratios substantially higher). Regulatory parameters κ_{low} and κ_{high} match Basel I/II and Basel III total capital requirements exactly. The contagion parameter λ is not assigned. The condition $c'(0) = 0.07 > \tau = 0.02$ ensures that internal transfers are the cheaper marginal source of funds; the baseline optimum features modest external issuance alongside predominantly internal reallocation. Appendix Figure B.4b reports sensitivity of the externality threshold λ^* to L_B / L_N .

B.7 Model Figures

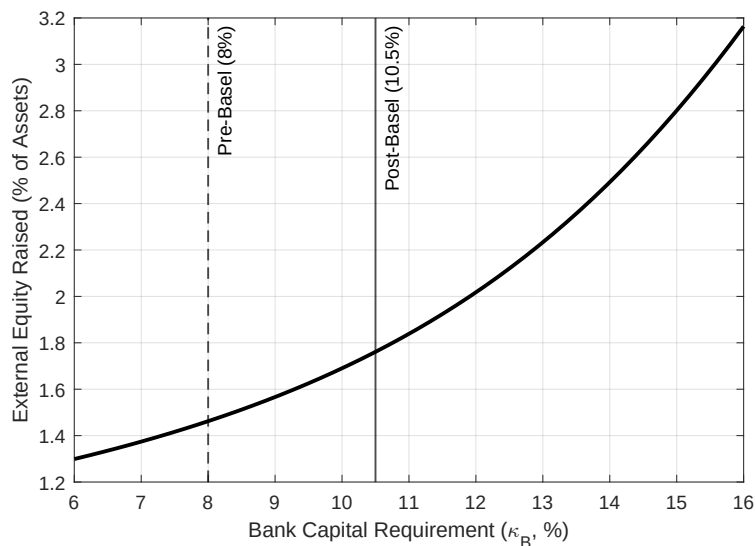


Figure B.1: External Equity Counterfactual

Notes: The figure shows external equity that would be required to satisfy bank capital requirements if internal reallocation were not available, expressed as a percentage of total BHC assets. The line plots external equity raised as a function of the bank capital requirement κ_B . The slope represents the marginal external equity cost avoided through internal capital markets.

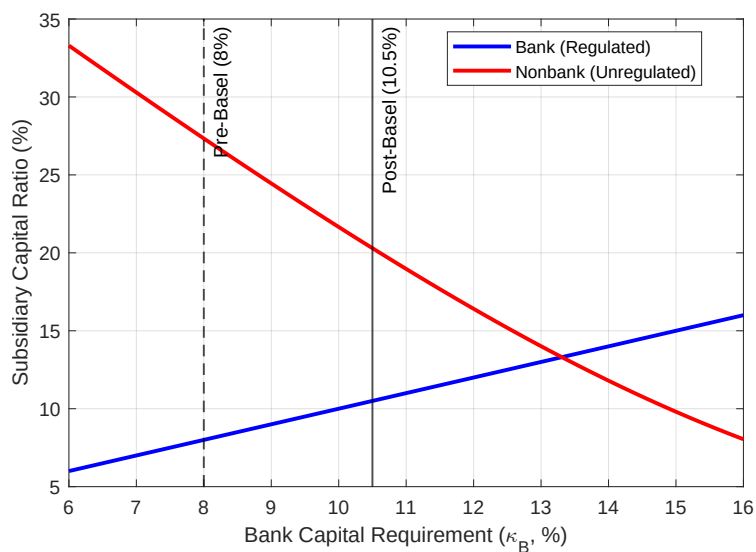


Figure B.2: The “Waterbed Effect” of Entity-Level Regulation

Notes: The figure compares the subsidiary capital ratio for bank and nonbank subsidiaries as a function of the bank capital requirement. The two ratios do not offset point for point; see the discussion following the proof of Proposition B.1.

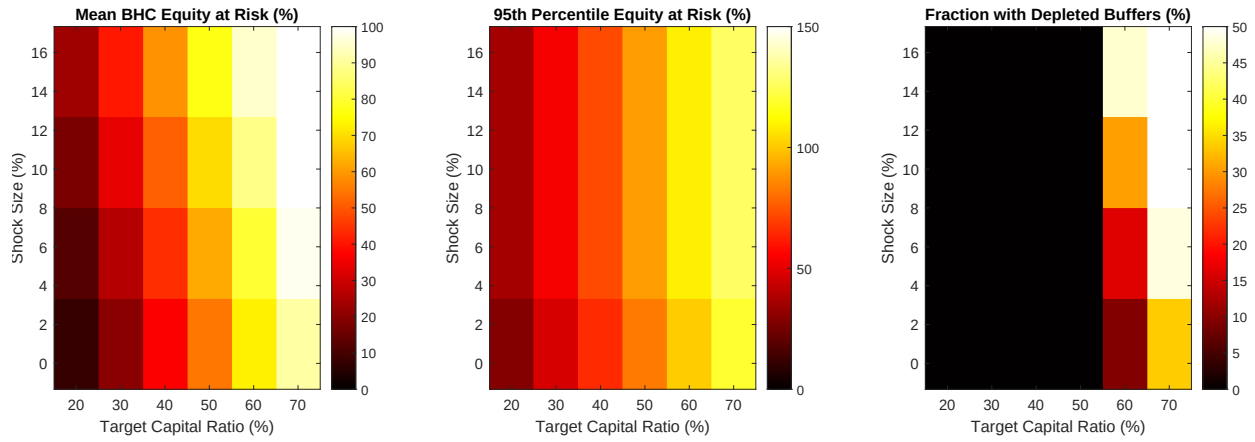


Figure B.3: Stress Test: BHC Equity at Risk

Notes: The three heatmaps display (left to right): mean equity required as a percentage of BHC excess capital to recapitalize nonbank subsidiaries, the 95th percentile (tail risk), and the fraction of BHCs with completely depleted capital buffers.

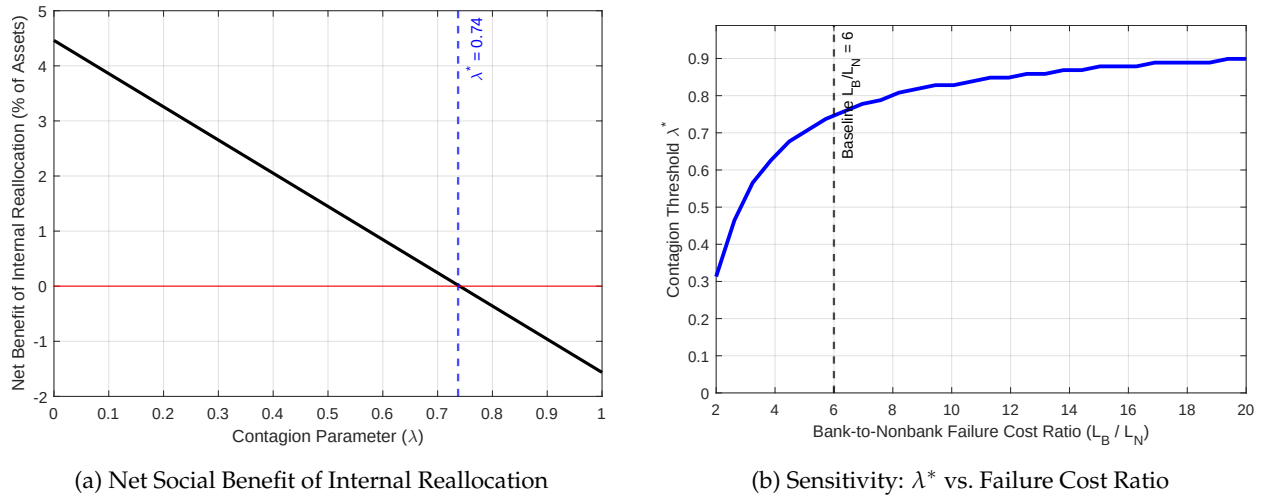


Figure B.4: Net Social Benefit and Threshold Sensitivity

Notes: Panel (a) plots the net social benefit of internal reallocation as a function of the contagion parameter λ , expressed as a percentage of total BHC assets. The net benefit is positive for $\lambda < 0.74$, where the direct gains in bank safety and subsidiary returns exceed the nonbank and contagion costs, crosses zero at $\lambda^* \approx 0.74$, and is negative for $\lambda > 0.74$. Panel (b) shows how the externality threshold λ^* varies with the ratio of bank-to-nonbank failure costs (L_B / L_N), holding L_N fixed at its baseline value.

Appendix C Data Construction

This section describes the construction of the excess capital measure used in the analysis for both BHCs and depository institution (DI) subsidiaries. Excess capital is computed separately at the BHC-quarter level using FR Y-9C data and at the DI-quarter level using Call Report data, applying the regulatory requirements relevant to each institutional level.

Definition

Excess capital is defined as the amount of regulatory capital held by an institution (either a BHC or a depository institution) in excess of all binding regulatory requirements, normalized by that institution's risk-weighted assets (RWA). Formally, for institution i in quarter t , excess capital is constructed as the minimum distance between the institution's observed capital ratios and the applicable regulatory minimums across different capital categories.

Regulatory Capital Framework

Over the sample period, U.S. bank capital regulation is characterized by two main periods ([Federal Reserve Bank of Cleveland, 2024](#)).

Pre-Basel III (1992–2014). Banks (both holding companies and depository institution subsidiaries) were subject to three minimum capital requirements:

- Tier 1 Capital Ratio: Tier 1 Capital $\geq$ 4% of RWA;
- Total Capital Ratio: Total Capital $\geq$ 8% of RWA;
- Leverage Ratio: Tier 1 Capital $\geq$ 4% of Total Consolidated Assets.

Basel III (2015–present). Beginning in 2015, banks are subject to:

- Common Equity Tier 1 (CET1) Capital Ratio: CET1 Capital $\geq$ 4.5% of RWA;
- Tier 1 Capital Ratio: Tier 1 Capital $\geq$ 6% of RWA;
- Total Capital Ratio: Total Capital $\geq$ 8% of RWA;
- Leverage Ratio: Tier 1 Capital $\geq$ 4% of Total Consolidated Assets.

In addition, banks must satisfy the Capital Conservation Buffer (CCB), which is added to the minimum CET1, Tier 1, and Total capital ratios. The CCB was phased in between 2016 and 2019, reaching its full value of 2.5% of RWA in 2019. Banks must maintain these buffers to avoid limitations on capital distributions and discretionary payments.²⁸

For most institutions, the CCB was phased in as follows:

- 2015: CCB = 0% of RWA
- 2016: CCB = 0.625% of RWA
- 2017: CCB = 1.25% of RWA
- 2018: CCB = 1.875% of RWA

²⁸The countercyclical capital buffer is also in principle included in regulatory capital requirements, but remains zero throughout the sample.

TABLE 5—REGULATORY CAPITAL LEVELS FOR ADVANCED APPROACHES BANKING ORGANIZATIONS

	Jan. 1, 2014 (percent)	Jan. 1, 2015 (percent)	Jan. 1, 2016 (percent)	Jan. 1, 2017 (percent)	Jan. 1, 2018 (percent)	Jan. 1, 2019 (percent)
Capital conservation buffer			0.625	1.25	1.875	2.5
Minimum common equity tier 1 capital ratio + capital conservation buffer	4.0	4.5	5.125	5.75	6.375	7.0
Minimum tier 1 capital ratio + capital conservation buffer	5.5	6.0	6.625	7.25	7.875	8.5
Minimum total capital ratio + capital conservation buffer	8.0	8.0	8.625	9.25	9.875	10.5
Maximum potential countercyclical capital buffer			0.625	1.25	1.875	2.5

TABLE 6—REGULATORY CAPITAL LEVELS FOR NON-ADVANCED APPROACHES BANKING ORGANIZATIONS

	Jan. 1, 2015 (percent)	Jan. 1, 2016 (percent)	Jan. 1, 2017 (percent)	Jan. 1, 2018 (percent)	Jan. 1, 2019 (percent)
Capital conservation buffer		0.625	1.25	1.875	2.5
Minimum common equity tier 1 capital ratio + capital conservation buffer	4.5	5.125	5.75	6.375	7.0
Minimum tier 1 capital ratio + capital conservation buffer	6.0	6.625	7.25	7.875	8.5
Minimum total capital ratio + capital conservation buffer	8.0	8.625	9.25	9.875	10.5

Figure C.1: Regulatory Requirements for AA and Non-AA Banking Organizations

- 2019-Present: CCB = 2.5% of RWA

In 2020, the Fed implemented the stress capital buffer (SCB) which replaces the CCB at the BHC level. The SCB is floored at the CCB of 2.5% but additionally requires BHCs to hold enough capital to cover stress test losses and four quarters of dividends. Global Systemically Important Banks (G-SIBs) face an additional capital surcharge applied at the holding company level, on top of the CCB (or SCB post-2020).

Advanced Approaches Institutions

Advanced Approaches (AA) institutions are required to compute risk-weighted assets under both standardized and internal-risk rating (AA) models ([Congressional Research Service, 2023](#)). Large, complex banking organizations²⁹ and their depository institution subsidiaries must use advanced approaches framework. For these banks, regulatory compliance is assessed using the lower of the capital ratios calculated under the standardized and advanced approaches. Accordingly, for each AA institution, CET1, Tier 1, and Total capital ratios are defined as the minimum across standardized and AA calculations in each quarter. This procedure is applied symmetrically at the BHC and depository institution levels, using the relevant standardized and advanced approach calculations reported for each entity.

Leverage Constraints and the Supplementary Leverage Ratio

Beginning in 2018, large banks are additionally subject to the Supplementary Leverage Ratio (SLR), defined as Tier 1 capital divided by total leverage exposure, which includes off-balance-sheet items. Advanced approaches banks must meet a 3% SLR at the BHC and depository subsidiary levels. G-SIBs and their depository institution subsidiaries are subject to an enhanced SLR (ESLR) of 5% at the BHC level and 6% at the depository subsidiary level.

²⁹Until 2019, all banks that had at least \$250 billion in total consolidated assets or at least \$10 billion in total on-balance sheet foreign exposure were required to use the AA framework. After 2019, only Category I and II banks are required to use the AA framework, though other banks can elect to if they wish ([Congressional Research Service, 2023](#)).

Community Bank Leverage Ratio (CBLR) Framework

Beginning in 2020, qualifying community banks may opt into the Community Bank Leverage Ratio (CBLR) framework. Electing banks are exempt from all risk-based capital requirements and are instead subject only to a Tier 1 leverage ratio requirement of at least 9%. These banks do not report RWA while in the CBLR regime, and are hence dropped from the sample.

Construction Procedure

Excess bank capital is constructed in four steps:

1. *Observed capital ratios.* For each institution-quarter, CET1 (post-2015), Tier 1, Total Capital, and Leverage Ratios are computed from FR Y-9C (for BHCs) or Call Report (for depository institution subsidiaries) data. For AA institutions, capital ratios reflect the minimum across standardized and advanced approaches.
2. *Applicable regulatory minimums.* Regulatory minimum capital ratios (inclusive of the CCB, GSIB-surcharge, or SCB for BHCs when applicable) are assigned based on the regulatory regime in place in quarter t .
3. *Accounting for the leverage ratio.* To account for potentially binding leverage constraints, for each institution-quarter, we compute the minimum amount of Tier 1 capital required to satisfy their applicable leverage ratio (Tier 1 leverage ratio, SLR, or ESLR). If this implied Tier 1 requirement exceeds the Tier 1 capital implied by risk-based requirements, the leverage-based requirement is treated as binding. The implied minimum Tier 1 capital is then expressed as a ratio of the institution's RWA, allowing leverage-based and risk-based constraints to be compared on a common scale.
4. *Excess capital.* Excess CET1, Tier 1, and Total capital are defined as the difference between observed ratios and their respective regulatory minimums. Excess capital is the minimum of these three values.

Appendix D Empirical Tests of Contagion

D.1 External Evidence

Historical episodes. Several well-documented cases illustrate how distress at non-depository affiliates can deplete parent capital and indirectly weaken the affiliated bank. In 2007–2008, Citigroup absorbed approximately \$49 billion of structured investment vehicle assets back onto its consolidated balance sheet, depleting parent capital and contributing to its eventual reliance on TARP support (Pozsar et al., 2010). In mid-2007, Bear Stearns extended a \$1.6 billion rescue loan to its affiliated hedge funds when they collapsed, with parent funding pressures culminating in the firm’s 2008 failure; Bear Stearns was not a bank holding company, so the episode illustrates the parent-support mechanism rather than transmission to an affiliated bank. HSBC’s 2003 acquisition of Household International created HSBC Finance, a consumer-lending subsidiary whose subprime losses beginning in 2007 prompted the group’s first profit warning, absorbed parent capital support for years, and led to the unit’s wind-down in 2009. In each episode, losses at nominally separate non-depository entities drew on the parent’s resources, impairing the consolidated capital position that backstops the affiliated bank.

Rating-agency methodology and observed uplift. Major credit rating agencies explicitly incorporate expected parent support into their ratings of nonbank affiliates of bank holding companies.³⁰ The economic significance of implicit parent support has also been litigated: in *General Electric Capital Canada, Inc. v. The Queen* (2009), the court accepted that implicit parent support is a meaningful economic phenomenon and based the valuation of an explicit guarantee fee on the incremental benefit above implicit support that markets already priced in. This methodology produces observable rating differentials. As of late 2024, S&P rated J.P. Morgan Securities LLC, JPMorgan Chase & Co.’s broker-dealer subsidiary, at AA-, two notches above the parent BHC’s A rating. The differential is even larger at Goldman Sachs: S&P rated Goldman Sachs & Co. LLC, the broker-dealer subsidiary, at A+, three notches above the parent group’s BBB+ rating.³¹ These differentials reflect rating agencies’ assessments that the broker-dealer affiliates would be supported by their parent BHCs in distress, precisely the contagion-direction transmission the model formalizes.

D.2 Empirical Approach

The model predicts that nonbank-affiliate losses transmit to the affiliated bank through depletion of the parent’s equity buffer. This section tests the prediction directly using three outcomes at the affiliated bank: commercial lending growth, the credit spread on outstanding bond debt, and the parent’s internal equity-flow response. The lending test identifies off nonbank-loss events directly and does not depend on calendar stress windows; the bond and equity-flow tests use a common pair of stress windows, defined next.

³⁰Moody’s Banks Methodology incorporates affiliate support through joint default analysis; S&P’s Group Rating Methodology categorizes subsidiaries on a five-tier scale of strategic importance, with “Core” subsidiaries effectively rated at the group credit profile and others receiving up to several notches of uplift; Fitch’s bank holding company criteria distinguish “Support-Driven” from “Standalone” ratings on the same logic.

³¹Ratings as of late 2024 from S&P Global Ratings. Goldman Sachs & Co. LLC and J.P. Morgan Securities LLC are the SEC-registered broker-dealer subsidiaries through which their parent BHCs conduct U.S. securities and trading activities. Both are non-depository affiliates and would carry lower standalone credit profiles absent expected parent support.

Stress windows. We define stress as the union of two episodes of system-wide intermediary distress: COVID 2020Q1–Q3 and the 2023–24 intermediary-stress window, 2023Q1–2024Q4. The first is a pandemic-driven shock affecting both bank and nonbank intermediaries: mortgage REIT margin calls, money-market fund outflows, BDC NAV declines, and securities lending dislocations. The second, while widely associated with the March 2023 regional bank failures (Silicon Valley Bank, Signature Bank, First Republic), is more accurately understood as a system-wide intermediary stress episode that affected bank and nonbank entities throughout the period. Nonbank-specific manifestations include sustained commercial real estate writedowns at office-heavy nonbank lenders and CMBS-related vehicles, redemption gates at open-end real estate funds, declining mortgage origination volumes at nonbank originators, distress at fixed-income asset managers exposed to duration risk, and elevated default rates in private credit and middle-market lending. Bank-specific manifestations include the regional bank failures themselves, the Bank Term Funding Program, persistent deposit-pricing pressure, AOCI realization at affiliated BHCs, and the New York Community Bancorp episode in early 2024. Both windows therefore capture stress affecting bank- and nonbank-affiliated intermediaries simultaneously; the 2023–24 window is not a bank-specific event but a sustained period of intermediary fragility with parallel bank and nonbank channels.

Affiliation indicator. The affiliation indicator AFFILIATION_j is a pre-determined cross-sectional measure equal to one if BHC j had a nonbank financial subsidiary as of 2013, zero otherwise. Fixing affiliation in 2013 mirrors the identification strategy used elsewhere in the paper and rules out endogenous changes in BHC structure during the sample window (2010–2024).

D.3 Lending Contagion

We test whether commercial lending growth at affiliated banks contracts following nonbank-affiliate loss events at the parent BHC. The unit of observation is the bank-quarter; the outcome is the quarterly change in log total loans, $\Delta \ln(\text{LOANS})_{i,t}$. Treatment is $\text{NB Loss}_{j(i),t-1}$, an indicator equal to one if BHC $j(i)$ had a nonbank-loss event in the prior quarter. The estimating equation is

$$\Delta \ln(\text{LOANS})_{i,t} = \beta \cdot \text{NB Loss}_{j(i),t-1} + \gamma' (X_i \times \text{Post}_t) + \alpha_i + \alpha_t + \varepsilon_{i,t}, \quad (\text{D.1})$$

where α_i and α_t are bank and quarter fixed effects, X_i is a vector of 2013 bank controls (log assets, leverage, asset growth, ROA) interacted with a post-2015 indicator, and standard errors are clustered at the BHC level. The sample is restricted to BHCs with nonbank affiliates, so that β identifies the within-affiliated-BHC response.

Appendix Table D.1 reports five specifications: NB-loss alone (column 1), bank-loss (column 2), horse-race against bank-side loss (column 3), the clean subset where the bank itself did not also have a loss in the same quarter (column 4), and the clean-window restriction excluding bank-quarters with overlapping prior NB events (column 5). The point estimate is stable across specifications. In the horse-race column, lending growth contracts by 0.56 percentage points in the quarter following a nonbank-affiliate loss, controlling for the bank’s own loss history. The clean-window restriction yields a similar point estimate (0.64 percentage points), estimated less precisely in the smaller sample, indicating that the result is not driven by overlapping prior episodes at the same BHC. Notably, the lending result does not depend on stress-window definitions. It identifies off any nonbank-loss event at the parent BHC and is therefore robust to alternative stress framings used in subsequent tests.

Appendix Figure D.1 reports a non-parametric event study using a first-spell event indicator

(the BHC’s first NB-loss quarter following at least four quarters of non-distress), with the omitted base period at $t = -1$. We use the first nonbank-loss event to avoid mechanical pre-trends from clustered prior events at the same BHC, following the convention in event-study designs with recurring treatments. The contraction is concentrated in the immediate post-event quarters. This pattern provides direct event-study evidence that nonbank distress at the BHC transmits to bank lending in subsequent quarters, consistent with the contagion mechanism we model.

D.4 Bond Market Contagion

We test whether the credit spreads on outstanding bonds of affiliated BHCs widen in stress periods relative to non-affiliated BHC bonds. The outcome is the change in credit spread (in basis points), measured as the corporate yield less the duration-matched Svensson-fitted Treasury yield. We estimate

$$\Delta s_{c,t} = \beta \cdot \text{AFFILIATION}_{j(c)} \times \text{STRESS}_t + \delta \cdot \text{AFFILIATION}_{j(c)} + \alpha_t + \alpha_b + \alpha_s + \varepsilon_{c,t}, \quad (\text{D.2})$$

where $j(c)$ is the issuing BHC of cusip c , α_t is the month fixed effect, α_b is the bond-type fixed effect, α_s is the security-level fixed effect, and STRESS_t takes one of three definitions across columns: COVID only, the 2023–24 intermediary-stress window only, and their union. Standard errors are clustered at the BHC level.

Appendix Figure D.2 reports the three specifications. The interaction Affiliation $\times$ Stress identifies the differential widening in spreads at affiliated bonds during stress, relative to non-affiliated bonds in the same months. The COVID-only window produces a 25 basis-point differential widening, statistically significant at the 1% level. The 2023–24 intermediary-stress window alone produces a nearly identical point estimate of 24 basis points, though the cluster-robust standard errors are wide given the heterogeneity of BHC-level exposure during the window. The union of the two windows recovers a 27 basis-point widening, short of statistical significance at conventional levels ($p = 0.13$). The stability of the point estimate across the three definitions, at 24 to 27 basis points, indicates that the differential repricing of affiliated bonds is a general feature of intermediary stress rather than an artifact of the COVID episode, with the statistical precision concentrated in the sharper COVID window.

D.5 Stress-Window Event Study: Parent Equity Investment

To document the mechanism directly, we examine the parent’s internal equity-investment response. Restricting to BHCs whose nonbank-loss event $t = 0$ falls in a stress window (COVID 2020Q1–Q3 or the 2023–24 intermediary-stress window, 2023Q1–2024Q4), we estimate event-study regressions of two affiliate-level investment outcomes around the event quarter: the change in the parent’s equity investment in the nonbank affiliate, and the change in the parent’s equity investment in the bank affiliate, both normalized by lagged BHC equity.

Appendix Figure D.3 reports the leads and lags. Pre-event coefficients at $t = -4$ through $t = -2$ are not statistically distinguishable from zero on either panel, ruling out pre-trends in either nonbank or bank-affiliate investment ahead of the loss event. Beginning at $t = +1$, the offsetting reallocation pattern emerges and is the central evidence of this subsection: equity investment into the distressed nonbank affiliate rises to approximately 1.1 to 1.4 percent of lagged BHC equity over $t = +2$ through $t = +4$, while parent equity investment in the bank affiliate moves in the opposite direction over the same window, with the largest negative coefficient at $t = +2$ of roughly -2 percent of lagged BHC equity. The equity evidence pairs with the lending result in Appendix

Section D.3: as the parent shifts equity from the bank to the distressed nonbank, commercial lending growth at the bank contracts by 0.56 percentage points in the following quarter, providing the precisely identified estimate of the downstream cost at the bank.

Table D.1: Lending Contagion: Bank Loan Growth on Lag-1 Nonbank Loss Event

	(1)	(2)	(3)	(4)	(5)
	NB only	Bank only	Horse race	NB w/o bank loss	Clean window
NB Loss _{<i>t</i>-1}	-0.0058** (0.0024)		-0.0056** (0.0024)		-0.0064 (0.0042)
Bank Loss _{<i>t</i>-1}		-0.0156*** (0.0056)	-0.0154*** (0.0056)		-0.0150** (0.0059)
Loss _{<i>t</i>-1}				-0.0050** (0.0024)	
Observations	23,848	23,848	23,848	23,848	22,102
<i>R</i> ²	0.1906	0.1912	0.1915	0.1905	0.1966
Bank FE	✓	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓	✓
Controls × Post	✓	✓	✓	✓	✓

Notes: The dependent variable is the quarterly change in log total loans, $\Delta \ln(\text{loans})$, at the bank-quarter level. The sample comprises bank-quarters between 2010Q1 and 2024Q4 at bank holding companies (BHCs) with at least one nonbank financial subsidiary. NB Loss_{*t*-1} is an indicator equal to one if the BHC's nonbank affiliate(s) experienced a loss event in the prior quarter. Bank Loss_{*t*-1} is an indicator equal to one if the bank itself recorded a loss in the prior quarter. Loss_{*t*-1} equals one if NB Loss_{*t*-1} = 1 and Bank Loss_{*t*-1} = 0. Column 3 is the horse-race specification, identifying the contagion effect controlling for the bank's own loss history. Column 4 restricts the sample to bank-quarters where the BHC's nonbank had a loss at *t*-1 but the bank itself did not. Column 5 restricts to bank-quarters with no nonbank-loss event at *t*-2, *t*-3, or *t*-4, isolating focal events from overlapping prior episodes. All specifications include bank and quarter fixed effects and 2013 bank-level controls (log assets, leverage, asset growth, return on assets) interacted with a post-2015 indicator. Standard errors, in parentheses, are clustered at the BHC level. * *p* < 0.1, ** *p* < 0.05, *** *p* < 0.01.

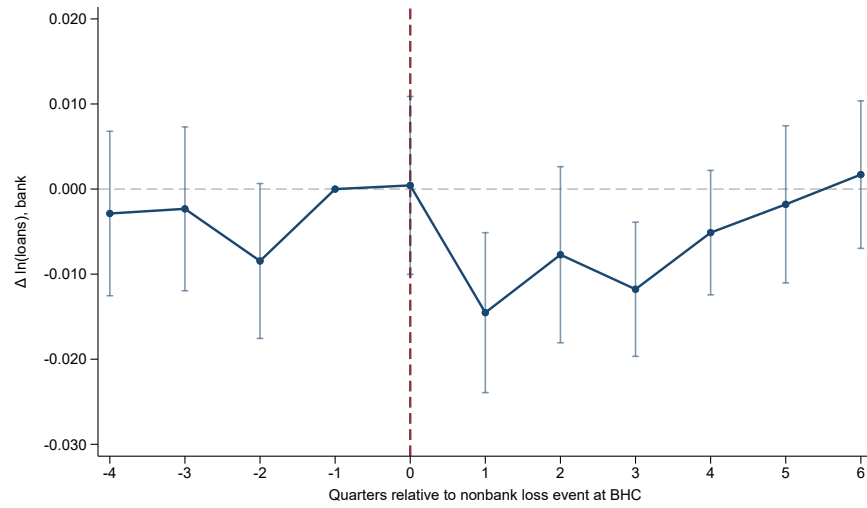


Figure D.1: Lending event study around nonbank-loss events at the BHC. Two-way fixed effects estimator on first-spell events. Base period $t = -1$. 90% confidence intervals clustered at the BHC level.

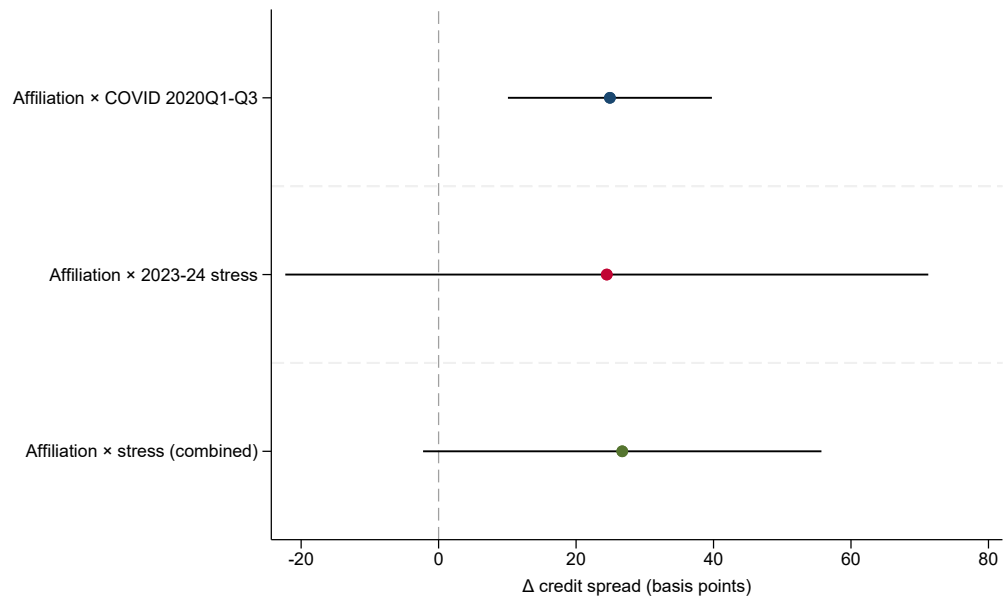


Figure D.2: Bond contagion: differential spread reaction at affiliated bonds during stress. Each marker is the affiliation $\times$ stress coefficient with 90% confidence interval.

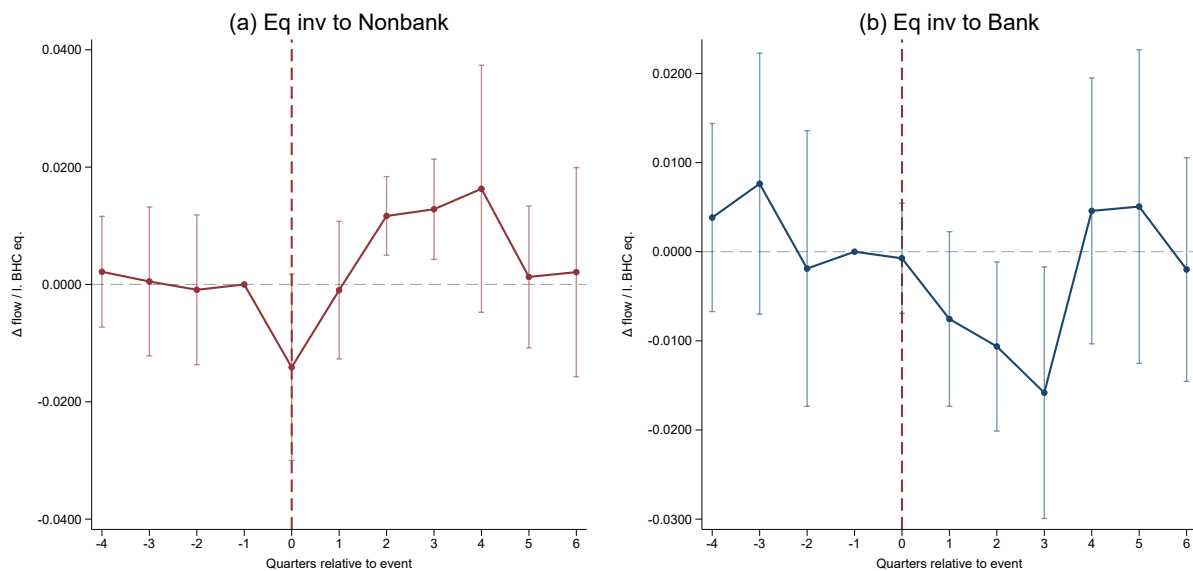
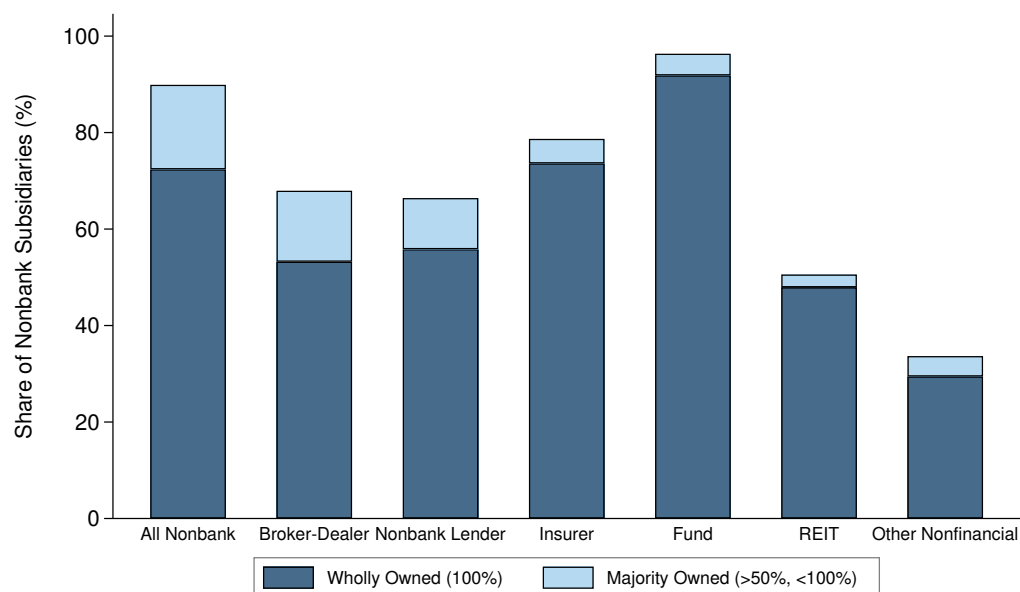


Figure D.3: Parent equity investment: nonbank recapitalization vs. bank drain. Sample restricted to BHCs with nonbank-loss events whose $t = 0$ falls in COVID 2020Q1–Q3 or the 2023–24 intermediary-stress window (2023Q1–2024Q4). Base $t = -1$, 90% CI clustered at BHC level.

Appendix E Additional Empirical Figures

E.1 BHC Ownership of Nonbank Subsidiaries

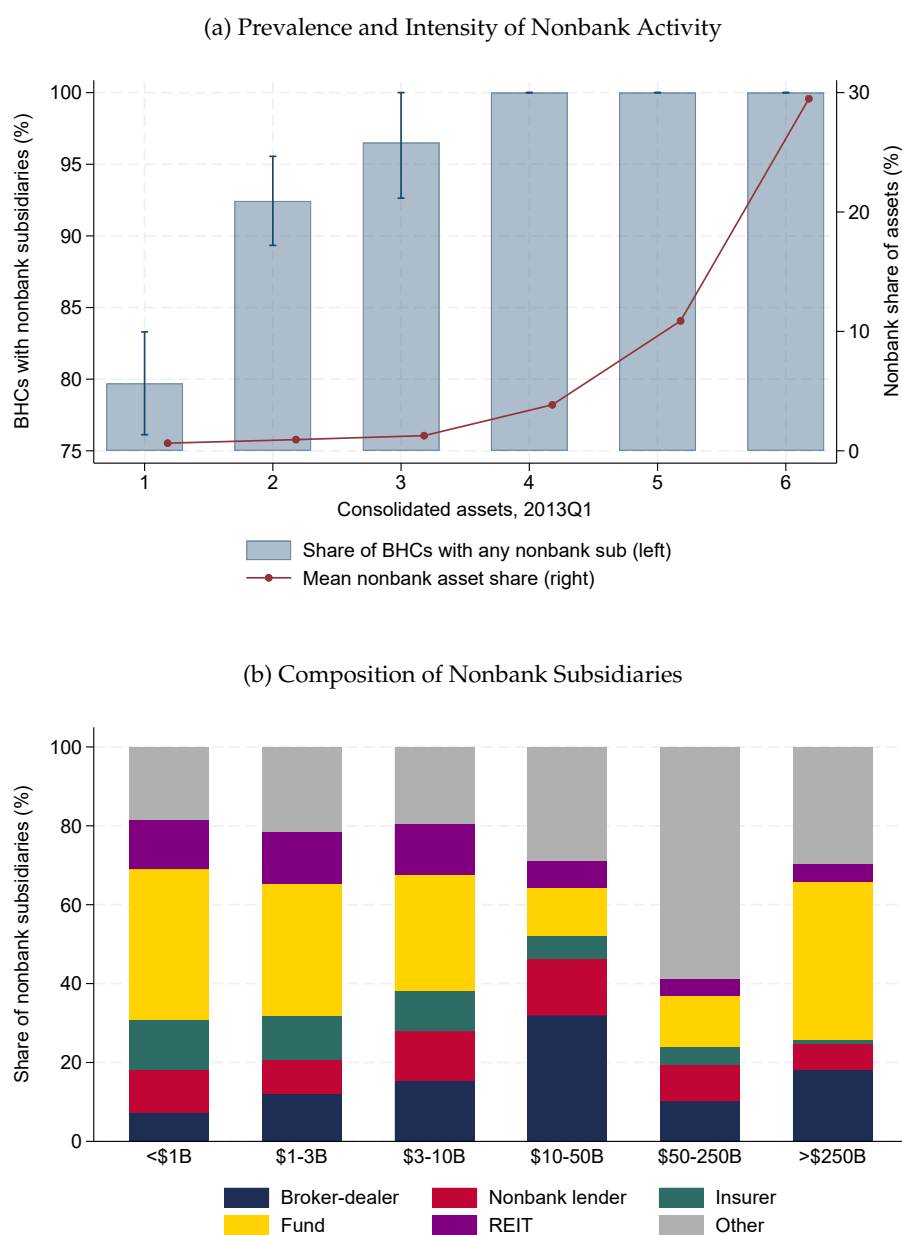
Figure E.1: BHC Ownership of Nonbank Subsidiaries



Notes: This figure shows the share of direct nonbank subsidiaries that are wholly owned by their parent BHC and the share that are majority owned by their parent BHC. The sample period is 2010-2024. Only nonbanks in the BHC's direct ownership chain are considered. Subsidiary types are classified by NAICS codes: Broker (523), Nonbank Lender (5222-5223), Insurer (524), Fund (525), and REIT (531). For additional summary statistics on BHC ownership shares in nonbank subsidiaries, see Appendix Table F.1. Source: FR Y-10.

E.2 Nonbank Activity Across the BHC Size Distribution

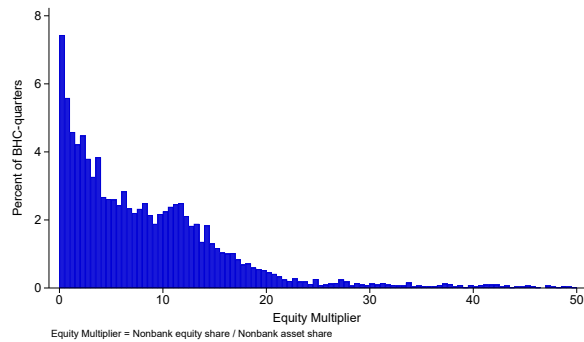
Figure E.2: Nonbank Activity Across the BHC Size Distribution



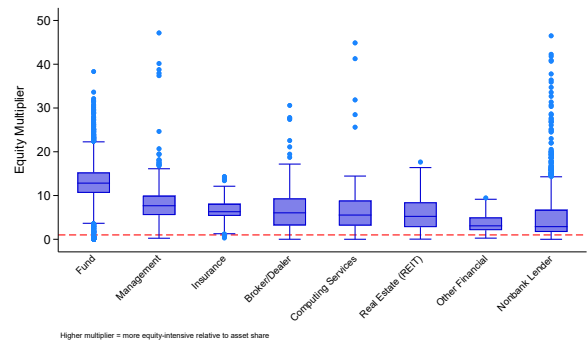
Notes: The figure presents the prevalence and intensity of nonbank activity, using the 2013Q1 cross-section of Y-9C filing BHCs, sorted into six consolidated-asset buckets. In Panel (a), bars (left axis) report the share of BHCs operating at least one nonbank financial subsidiary, measured from the FR Y-10 organizational structure database; the connected line (right axis) reports the mean nonbank share of consolidated assets from the FR Y-9LP. Panel (b) reports the composition of nonbank subsidiaries by type within each size bucket, weighted by subsidiary counts; “Other” comprises nonbank subsidiaries outside the five classified categories. Mean subsidiary counts per BHC are reported below the figure. Source: FR Y-9C, FR Y-9LP, BHC Organizational Structure Database.

E.3 Equity Multiplier

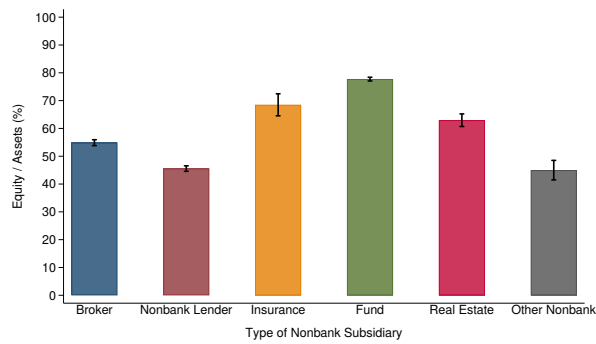
Figure E.3: Equity Multiplier: Distributions and Dynamics



(a) Overall Distribution



(b) Distribution by Type



(c) Capital Ratios by Type

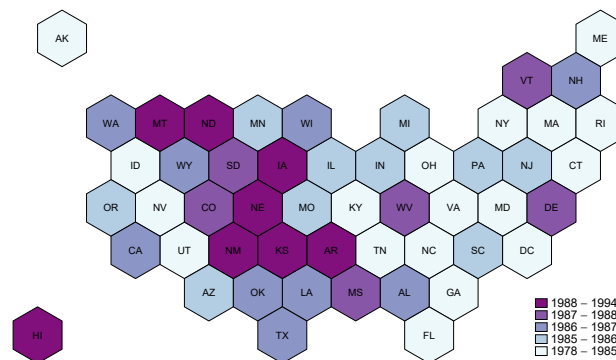


(d) Multiplier Over Time

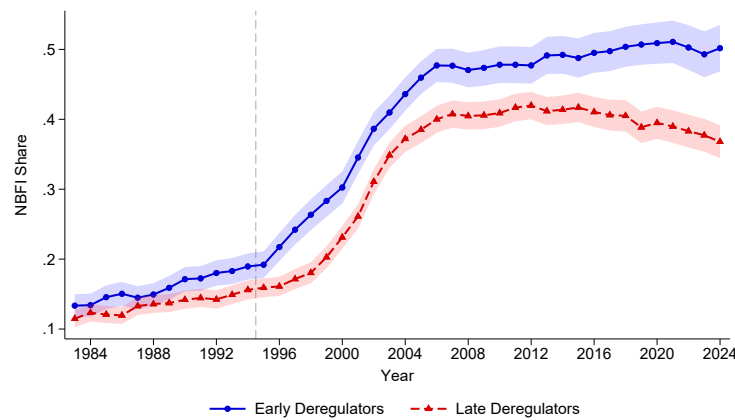
Notes: The figure provides shows the distribution and dynamics of the equity multiplier. Panel (a) shows a histogram of equity multiplier across all BHC-quarters. Panel (b) shows box plots by subsidiary type (see heterogeneity documented in Table 3) Panel (c) shows the average equity-to-assets percentage by type. Panel (d) shows time-series of aggregate equity multiplier. Shaded region shows 90% confidence interval. Source: Authors' calculations using FR Y-11.

E.4 Interstate Banking Deregulation and Nonbank Financial Exposure

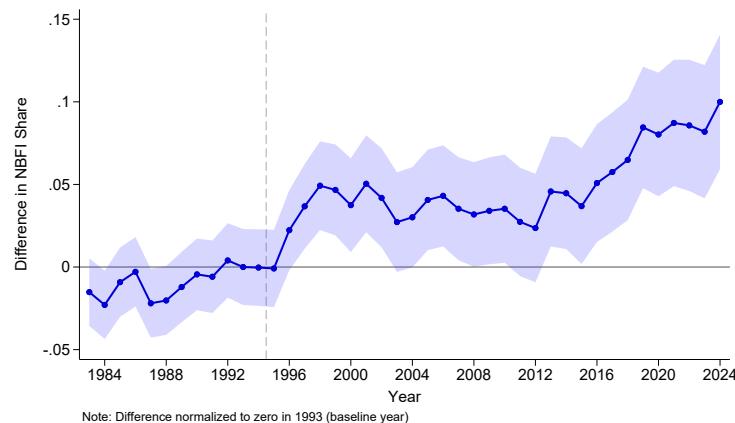
Figure E.4: Interstate Banking Deregulation and Nonbank Financial Exposure



(a) Interstate Deregulation Timing by State



(b) Nonbank Share: Early vs Late Deregulators

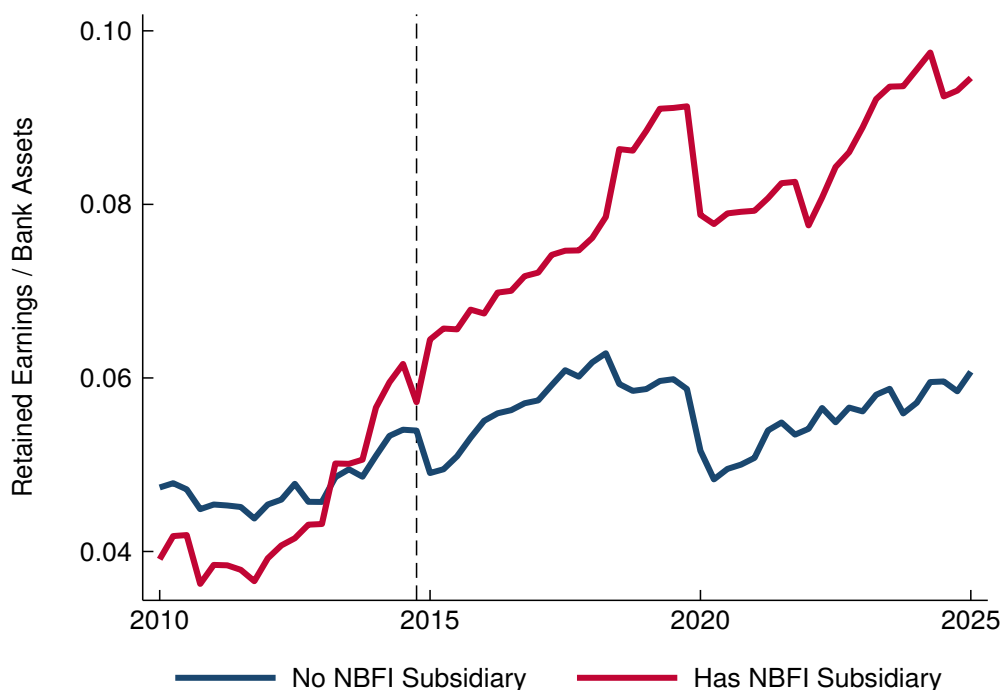


(c) Difference-in-Differences: Early - Late

Notes: Panel (a) displays the year each state removed restrictions on interstate banking. Lighter shading indicates earlier deregulation while darker shading indicates later deregulation. Panel (b) shows compares the nonbank share between BHCs headquartered in early-deregulating states and BHCs in late deregulating states. Panel (c) plots the difference in nonbank share between early and late deregulators.

E.5 Retained Earnings by BHC Nonbank Status

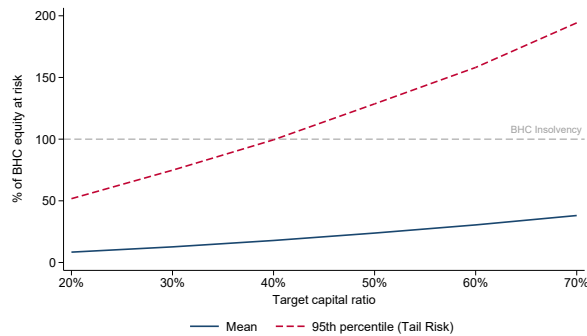
Figure E.5: Bank Retained Earnings as a Share of Bank Assets by BHC Nonbank Status



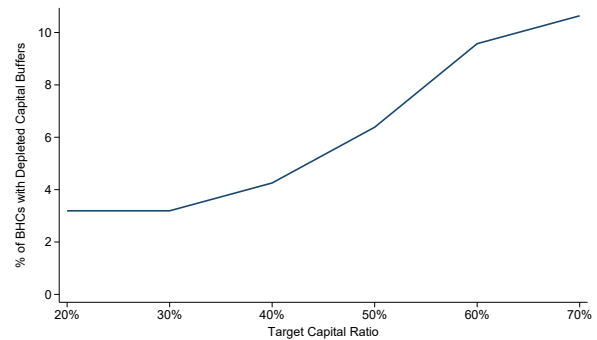
Notes: The figure shows average bank retained earnings as share of bank assets over time, comparing banks in BHCs with nonbank subsidiaries as of 2005 (red line) versus banks in BHCs without nonbank affiliates (blue line). Retained earnings measured as quarterly undistributed subsidiary income scaled by bank assets in that quarter. The scaled retained earnings are averaged across banks in BHCs with nonbank subsidiaries as of 2005 and banks in BHCs without nonbank affiliates by quarter. Vertical dashed line indicates 2015Q1 (Basel III implementation). Source: Call Reports, FR Y-9LP.

E.6 Assets and Equity at Risk

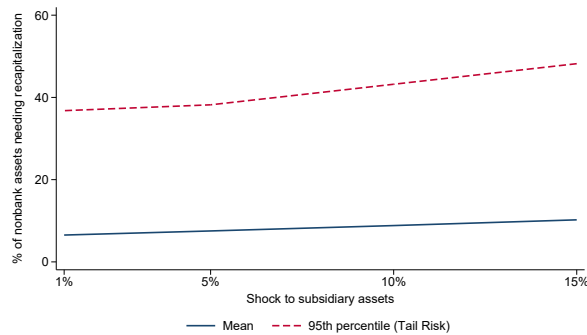
Figure E.6: Stress Test Sensitivity Analysis



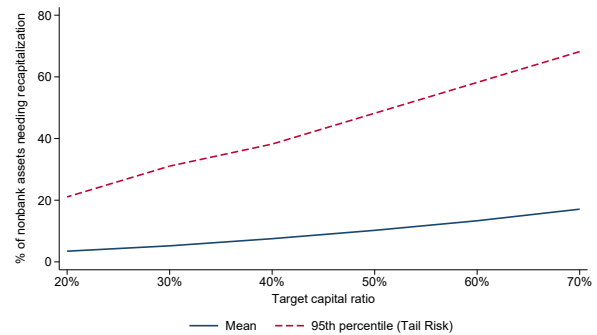
(a) BHC Equity at Risk by Capital Target



(b) Buffer Depletion by Capital Target



(c) Nonbank Assets at Risk by Shock

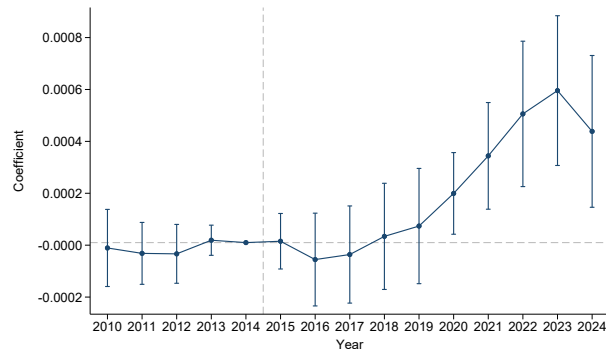


(d) Nonbank Assets at Risk by Target

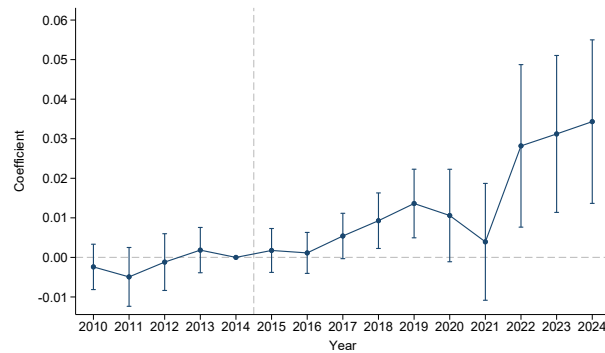
Notes: The table presents the stress test sensitivity analysis. Panel (a) shows percentage of BHC excess capital required to restore nonbanks to varying capital ratio targets following a 5% asset shock. Panel (b) shows percentage of BHCs with completely depleted capital buffers under varying target capital ratios (5% shock). Panel (c) shows percentage of nonbank assets requiring recapitalization by shock severity (40% target). Panel (d) shows nonbank assets at risk across target capital ratios (5% shock). Solid line: mean. Dashed line: 95th percentile. Horizontal dashed line at 100% marks potential parent insolvency. All panels use 2013Q1 balance sheets.

E.7 Bank Event Studies

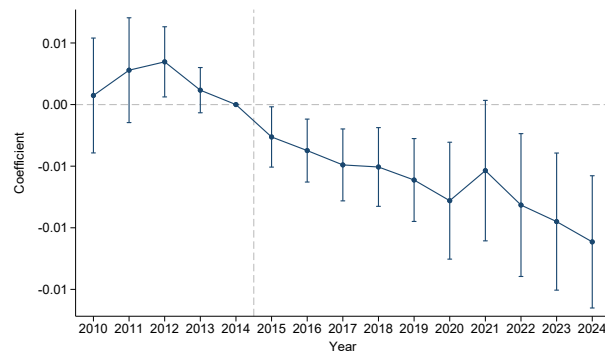
Figure E.7: Bank Event Studies: Safety and Profitability Improvements



(a) ROA



(b) Equity/RWA

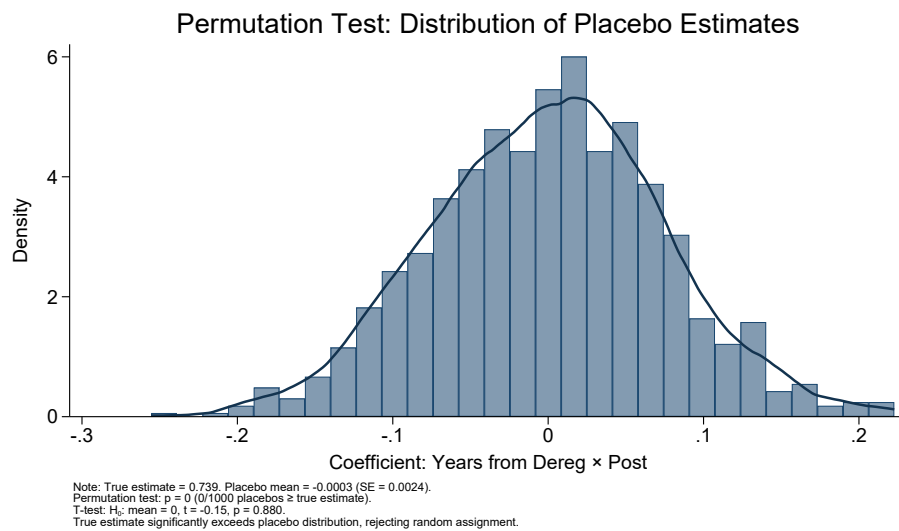


(c) RWA/Assets

Notes: The figure presents event study estimates of bank outcomes relative to 2014 baseline. Panel (a) shows return on assets, Panel (b) shows equity-to-RWA ratios, and Panel (c) shows RWA-to-assets ratio. Coefficients estimated from specification including bank fixed effects, quarter-year fixed effects, and bank controls (log assets, leverage, asset growth measured as of 2013Q1) interacted with post-2015 indicator. Standard errors clustered at bank level. Error bars indicate 90% confidence intervals. Source: Call Reports.

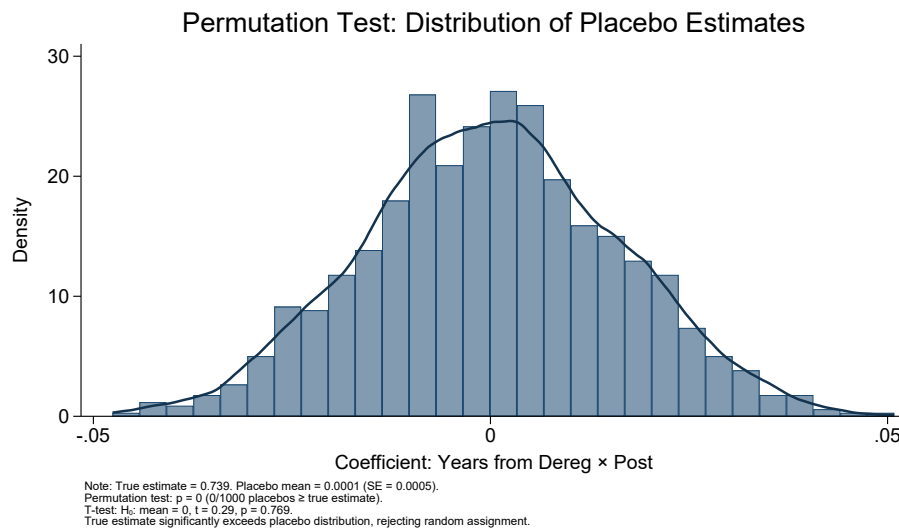
E.8 Placebo Tests

Figure E.8: Placebo Test: Randomized Deregulation Timing



Notes: The figure presents permutation-based placebo test. Distribution shows coefficients from 1,000 regressions where years from deregulation (instrument) is randomly reassigned to BHCs. Specification uses bank fixed effects, quarter-year fixed effects, and differential trends controls matching column 1 in Table 5. Placebo distribution tightly centered at zero: mean = -0.0003, standard error = 0.0024, t-statistic = -0.15, p-value = 0.880. True estimate of 0.74 percentage points (not shown to preserve scale) falls far in right tail.

Figure E.9: Placebo Test: Randomized Treatment Timing



Notes: The figure presents permutation-based placebo test validating the temporal variation in our identification strategy. Distribution shows coefficients from 1,000 regressions where post-period indicator is randomly assigned to years 2010-2024. Specification uses bank fixed effects, quarter-year fixed effects, and differential trends controls matching column 1 in Table 5. Placebo distribution centered at zero: mean = 0.0001, standard error = 0.0005, t-statistic = 0.29, p-value = 0.769. True estimate of 0.74 percentage points (not shown to preserve scale) falls far in right tail.

Appendix F Additional Empirical Tables

F.1 BHC Ownership Stakes in Nonbank Subsidiaries

Table F.1: BHC Ownership Stakes in Nonbank Subsidiaries

	N	Mean	SD	P5	P25	Median	P75	P95
Panel A: All BHCs, 2010-2024								
All Nonbanks	22631	88.33	24.26	26.67	88.89	100.00	100.00	100.00
Brokers	5503	69.28	39.52	0.00	45.25	100.00	100.00	100.00
Funds	19192	96.31	15.50	80.00	100.00	100.00	100.00	100.00
Insurers	5562	79.85	37.24	0.00	85.00	100.00	100.00	100.00
Nonbank Lenders	4072	67.40	42.78	0.00	6.67	100.00	100.00	100.00
REITs	3051	55.24	46.20	0.00	0.00	66.67	100.00	100.00
Other Nonbanks	496	32.82	46.28	0.00	0.00	0.00	100.00	100.00
Panel B: IV Sample of BHCs, 2010-2024								
All Nonbanks	4672	83.61	26.53	14.29	71.43	100.00	100.00	100.00
Brokers	1838	67.88	37.33	0.00	50.00	80.00	100.00	100.00
Funds	3635	92.66	20.35	33.33	100.00	100.00	100.00	100.00
Insurers	1759	80.70	37.65	0.00	100.00	100.00	100.00	100.00
Nonbank Lenders	1236	68.07	39.92	0.00	50.00	88.89	100.00	100.00
REITs	1057	71.64	39.50	0.00	50.00	100.00	100.00	100.00
Other Nonbanks	195	50.26	50.13	0.00	0.00	100.00	100.00	100.00

Notes: This table reports summary statistics on the ownership share (percentage of equity owned) of nonbank subsidiaries by all BHCs. For BHCs with multiple subsidiaries of the same type in a given quarter, we report the mean ownership share across those subsidiaries. Panel A shows the full sample of BHCs, Panel B shows the subset of BHCs used in the instrumental variable analysis. Subsidiary types are classified by NAICS codes: Broker (523), Nonbank Lender (5222-5223), Insurer (524), Fund (525), and REIT (531). Source: FR Y-10 Relationships Table, FR Y-9LP, BHC Organizational Structure Database.

F.2 Internal Capital Reallocation: NBFI Presence

Table F.2: Internal Capital Reallocation and Organizational Complexity

<i>Panel A: Bank Excess Capital</i>				
	(1)	(2)	(3)	(4)
$\mathbb{1}[\text{NBFI Sub}] \times \text{Post}$	4.8312** (2.3535)	4.8349** (2.3377)	2.0532* (1.0553)	2.0646** (0.8277)
$\mathbb{1}[\text{NBFI Sub}]$	15.2740*** (3.0533)	15.2727*** (3.0547)		
Post	-1.7105*** (0.5685)			
Constant	9.1104*** (0.8462)			
Observations	54,814	54,814	54,814	54,814
R^2	0.0248	0.0251	0.9395	0.9401
<i>Panel B: BHC Excess Capital</i>				
	(1)	(2)	(3)	(4)
$\mathbb{1}[\text{NBFI Sub}] \times \text{Post}$	-0.1793 (0.3183)	-0.0362 (0.3121)	-0.0066 (0.2679)	0.4333 (0.2931)
$\mathbb{1}[\text{NBFI Sub}]$	0.6165* (0.3202)	0.6231* (0.3201)		
Post	-2.5508*** (0.2017)			
Constant	7.2883*** (0.1927)			
Observations	29,267	29,267	29,267	29,267
R^2	0.0791	0.1003	0.7722	0.7838
<i>Panel C: Bank-to-BHC Excess Capital Ratio</i>				
	(1)	(2)	(3)	(4)
$\mathbb{1}[\text{NBFI Sub}] \times \text{Post}$	7.0730*** (2.1569)	6.2445*** (1.9833)	4.4044*** (1.3521)	2.9060*** (0.9498)
$\mathbb{1}[\text{NBFI Sub}]$	2.3452*** (0.5541)	2.3505*** (0.5558)		
Post	0.9603 (0.7678)			
Constant	1.4776*** (0.1621)			
Observations	39,052	39,052	39,052	39,052
R^2	0.0163	0.0254	0.4031	0.4185
Bank FE			✓	✓
Quarter-Year FE		✓	✓	✓
Controls $\times$ Post				✓

Notes: The dependent variable is bank excess capital (Panel A), BHC excess capital (Panel B), and the ratio of bank to BHC excess capital (Panel C). $\mathbb{1}[\text{NBFI Sub}]$ indicates BHCs with nonbank financial subsidiaries as of 2013Q1. Post equals one for 2015Q1 and later. Controls are measured in 2013Q1 and interacted with Post. Panel A and C controls include 2013Q1 bank size, leverage, ROA, and asset growth. Panel B controls include 2013Q1 BHC top 200 indicator, size, leverage, ROA, asset growth, deposits/assets, and subsidiary count. Standard errors are clustered at the bank level (Panels A and C) or BHC level (Panel B). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.3 Balanced Panel Analysis

Table F.3: Balance Table: Pre-Treatment Characteristics as of 2013Q1

	Early Dereg	Late Dereg	Difference
Number of BHCs	75	89	14
Panel A: Size and Organizational Complexity			
Log(Total Assets)	15.188	14.211	0.976***
Asset Growth	0.021	0.040	−0.019
Top 200 BHC	0.347	0.191	0.156**
Log(Nonbank Assets)	11.514	8.252	3.262***
Nonbank # Distinct NAICS	0.348	0.421	−0.074**
ROA	0.002	0.003	−0.001**
Panel B: Balance Sheet Characteristics			
Leverage	9.852	9.760	0.092
Loan Share	0.599	0.594	0.005
Securities Share	0.233	0.265	−0.032
Deposits/Assets	0.807	0.821	−0.014
Cash Share	0.083	0.081	0.002

Notes: The table compares pre-treatment characteristics of BHCs headquartered in early-deregulating states (those that removed interstate branching restrictions by 1986 or earlier) versus late-deregulating states. The fraction of observations in the Early Dereg sample does not significantly differ from the Late Dereg sample (difference in proportions test, $p = 0.27$.) All variables are measured as of 2013Q1, before the publication of final Basel III rules (July 2013) and approximately two years before they became binding in 2015Q1. Panel A reports size and organizational complexity measures. Panel B reports balance sheet composition measures. The “Difference” column reports differences in means. Statistical significance is indicated by asterisks based on t-test equality of means. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

F.4 Persistence of Nonbank Exposure

Table F.4: Persistence of Nonbank Financial Subsidiary Exposure

	Dependent Variable: NBFI Share _t (% of Total Assets)				
	1-Year Lag (1)	2-Year Lag (2)	3-Year Lag (3)	4-Year Lag (4)	5-Year Lag (5)
NBFI Share _{t-1}	0.8999*** (0.0246)				
NBFI Share _{t-2}		0.8575*** (0.0278)			
NBFI Share _{t-3}			0.8047*** (0.0357)		
NBFI Share _{t-4}				0.7575*** (0.0441)	
NBFI Share _{t-5}					0.7087*** (0.0530)
Observations	44308	39029	34510	30585	26957
R ²	0.9221	0.8846	0.8460	0.8177	0.7896
Quarter FE	✓	✓	✓	✓	✓

Notes: The table examines the persistence of nonbank financial subsidiary (NBFI) exposure over time by regressing current NBFI share on lagged values at 1-, 2-, 3-, 4- and 5-year horizons. The dependent variable in all columns is the share of nonbank financial assets as a percentage of total BHC assets in quarter t . Each column includes quarter fixed effects to control for aggregate time trends. Standard errors are clustered at the BHC level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

F.5 Summary Statistics: BHCs in Reduced-Form Sample (Active Pre-1994)

Table F.5: Summary Statistics: BHCs in Reduced-Form Sample (Active Pre-1994)

	N	Mean	SD	p5	p25	p50	p75	p95
Panel A: BHCs								
2013 Controls								
2013 BHC Assets (Billions)	6,086	78.950	347.246	0.532	1.027	2.415	11.520	217.853
2013 BHC Leverage	6,086	0.098	0.053	0.060	0.076	0.087	0.110	0.165
2013 BHC Deposit Share	6,086	0.805	0.089	0.673	0.781	0.822	0.853	0.901
2013 BHC Asset Growth	6,067	0.036	0.072	-0.091	-0.001	0.036	0.074	0.141
2013 BHC Subsidiary Count	6,086	103.919	409.576	1.000	4.000	7.000	18.000	628.000
Has Nonbank Subsidiary	6,086	0.568	0.495	0.000	0.000	1.000	1.000	1.000
Time-Varying Variables								
BHC Assets (Billions)	6,086	97.842	421.591	0.529	1.061	3.268	15.884	323.587
BHC RWA (Billions)	6,086	60.949	239.729	0.330	0.713	2.286	10.548	257.297
BHC Capital (Billions)	6,086	9.667	40.060	0.041	0.101	0.299	1.652	35.045
Excess BHC Capital (%)	6,086	6.184	3.977	1.298	3.632	5.500	7.920	13.146
BHC Net Income (Billions)	6,086	0.237	1.114	-0.000	0.002	0.008	0.040	0.823
BHC Leverage	6,086	0.100	0.031	0.057	0.083	0.100	0.116	0.148
BHC Deposit Share	6,086	0.801	0.080	0.676	0.767	0.814	0.853	0.896
BHC Loan Share	6,086	0.616	0.149	0.351	0.537	0.637	0.719	0.820
BHC Securities Share	6,086	0.239	0.130	0.054	0.145	0.221	0.316	0.489
BHC Nonbank Assets (Billions)	6,086	14.594	90.103	0.000	0.000	0.000	0.036	9.600
BHC Bank Assets (Billions)	6,086	86.695	358.393	0.521	1.057	3.271	15.556	319.482
BHC Direct Issuance	6,086	0.005	0.032	0.000	0.000	0.000	0.000	0.010
BHC Net Issuance	6,086	0.002	0.039	-0.033	-0.001	0.000	0.000	0.025
BHC External Equity	6,086	0.009	0.038	0.000	0.000	0.000	0.003	0.044
BHC Equity Inv. Bank Share	6,086	1.051	0.352	0.803	0.954	1.009	1.125	1.509
BHC Equity Inv. Nonbank Share	6,086	0.031	0.066	0.000	0.000	0.006	0.026	0.148
BHC Equity Inv. Total Share	6,086	1.215	0.557	0.881	0.986	1.056	1.239	2.189
BHC Div. Yield Bank	5,913	0.015	0.019	0.000	0.000	0.012	0.021	0.045
BHC Div. Yield Nonbank	4,533	0.025	0.180	0.000	0.000	0.000	0.011	0.094
Panel B: Banks								
Bank Assets (Billions)	10,086	52.167	274.008	0.046	0.374	1.141	6.180	157.290
Bank RWA (Billions)	10,085	34.172	167.106	0.012	0.214	0.768	4.263	111.788
Bank Capital (Billions)	10,086	5.314	26.754	0.013	0.050	0.132	0.728	17.937
Excess Bank Capital (%)	10,085	37.350	100.365	1.823	4.085	6.190	10.097	330.314
Excess Bank to BHC Capital Ratio (%)	9,962	9.910	36.370	0.476	0.801	0.961	1.263	64.406
Bank Net Income (Billions)	10,086	0.143	0.787	0.000	0.001	0.003	0.019	0.482
Bank Leverage	10,086	0.195	0.255	0.074	0.093	0.107	0.132	0.973
Bank Deposit Share	10,086	0.727	0.265	0.000	0.759	0.819	0.860	0.902
Bank Loan Share	10,086	0.551	0.241	0.000	0.463	0.613	0.718	0.836
Bank Securities Share	10,086	0.223	0.164	0.000	0.101	0.208	0.314	0.529
Panel C: Nonbanks								
Nonbank Assets (Billions)	6,738	4.474	10.522	0.011	0.380	1.419	3.809	17.761
Nonbank Capital (Billions)	6,738	2.514	5.942	0.000	0.078	0.570	1.920	13.112
Nonbank Net Income (Billions)	6,738	0.054	0.289	-0.067	-0.000	0.008	0.056	0.364
Nonbank Leverage	6,738	0.569	0.568	0.001	0.235	0.698	0.976	1.000
Nonbank Loans Share	5,762	0.119	0.292	0.000	0.000	0.000	0.007	0.983
Nonbank Securities Share	6,738	0.013	0.070	0.000	0.000	0.000	0.000	0.049
Broker	6,738	0.255	0.436	0.000	0.000	0.000	1.000	1.000
Nonbank Lender	6,738	0.182	0.386	0.000	0.000	0.000	0.000	1.000
Insurer	6,738	0.009	0.094	0.000	0.000	0.000	0.000	0.000
Fund	6,738	0.115	0.319	0.000	0.000	0.000	0.000	1.000
Real Estate	6,738	0.037	0.189	0.000	0.000	0.000	0.000	0.000

Notes: Percentiles are computed at the 5th, 25th, 50th, 75th, and 95th levels. The sample period ranges from 2010 to 2024. Only BHCs alive prior to the year 1994 (Deregulation year) and that filed an FR Y-9C in 2013Q1 and their bank/nonbank subsidiaries are included in the samples. Sources: FR Y-9C and FR Y-9LP for BHC Panel, Call Reports for Bank Panel, FR Y-11 for Nonbank Panel. Broker refers to NAICS 523, Nonbank Lender refers to NAICS 5222 and 5223, Insurer refers to NAICS 524, Fund refers to NAICS 525, Real Estate refers to NAICS 531.

F.6 Internal Capital Reallocation: Deregulation Timing

Table F.6: Internal Capital Reallocation and Deregulation Timing

<i>Panel A: Bank Excess Capital</i>				
	(1)	(2)	(3)	(4)
Years from Dereg $\times$ Post	2.6967* (1.4094)	2.6954* (1.4062)	0.7634* (0.4225)	0.7395* (0.3992)
Years from Dereg	6.0085*** (1.7622)	6.0063*** (1.7659)		
Post	-13.3012* (7.0483)			
Constant	-12.0218 (8.6498)			
Observations	12,558	12,558	12,558	12,558
R^2	0.0474	0.0490	0.9500	0.9502
<i>Panel B: BHC Excess Capital</i>				
	(1)	(2)	(3)	(4)
Years from Dereg $\times$ Post	0.0061 (0.1028)	0.0157 (0.0988)	-0.0583 (0.0680)	0.0058 (0.0721)
Years from Dereg	-0.1331 (0.0986)	-0.1310 (0.0989)		
Post	-2.4567*** (0.8104)			
Constant	8.2797*** (0.7489)			
Observations	6,079	6,079	6,079	6,079
R^2	0.1009	0.1428	0.7860	0.7913
<i>Panel C: Bank-to-BHC Excess Capital Ratio</i>				
	(1)	(2)	(3)	(4)
Years from Dereg $\times$ Post	3.3797** (1.3785)	3.1142** (1.3162)	2.0478** (0.8339)	1.7766*** (0.6211)
Years from Dereg	1.0960*** (0.2996)	1.0989*** (0.3008)		
Post	-13.3325* (7.9656)			
Constant	-2.7111* (1.4704)			
Observations	9,873	9,873	9,873	9,873
R^2	0.0712	0.0993	0.6697	0.6934
Bank FE			✓	✓
Quarter-Year FE		✓	✓	✓
Controls $\times$ Post				✓

Notes: The table presents reduced-form difference-in-differences estimates relating excess capital to deregulation timing. The dependent variable is bank excess capital (Panel A), BHC excess capital (Panel B), and the ratio of bank to BHC excess capital (Panel C). Years from Dereg measures the number of years between a BHC's headquarters state interstate branching deregulation and the 1994 Riegle-Neal Act; headquarters state is measured as of 1981. Post equals one for 2015Q1 and later. Controls are measured in 2013Q1 and interacted with Post. Panel A and C controls include 2013Q1 bank size, leverage, ROA, and asset growth. Panel B controls include 2013Q1 BHC top 200 indicator, size, leverage, ROA, asset growth, deposits/assets, and subsidiary count. Standard errors are clustered at the bank level (Panels A and C) or BHC level (Panel B). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.7 External Equity Issuance Following Basel III

Table F.7: External Equity Issuance and Share Buybacks Following Basel III

	Direct Issuance (1)	Preferred Issuance (2)	Net Issuance (3)	External Equity (4)	Buybacks (5)
Years from Dereg $\times$ Post	−0.0011*** (0.0004)	−0.0005* (0.0003)	−0.0026*** (0.0006)	−0.0015*** (0.0005)	0.0009*** (0.0003)
Observations	6,155	6,155	6,155	6,155	6,155
R^2	0.1710	0.1297	0.2174	0.1861	0.3836
BHC FE	✓	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓

Notes: This table presents reduced-form estimates of the effect of organizational complexity on external equity activity following Basel III implementation. The dependent variables are: direct common stock issuance normalized by lagged equity (column 1), preferred stock issuance normalized by lagged equity (column 2), net equity issuance equal to gross issuance minus buybacks normalized by lagged equity (column 3), total external equity equal to the sum of common stock, preferred stock, and treasury stock issuance normalized by lagged equity (column 4), and share buybacks defined as treasury stock repurchases normalized by lagged equity (column 5). Years from Dereg measures years between a BHC's headquarters state interstate branching deregulation and the 1994 Riegle-Neal Act, with headquarters state measured as of 1981. Post indicates 2015Q1 and later. BHC controls include top 200 BHC indicator, log assets, leverage, ROA, deposits/assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors clustered at the BHC level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.8 Bank/BHC Equity Share

Table F.8: Bank Equity as Share of BHC Equity

Bank Equity Share	(1)	(2)
Years from Dereg $\times$ Post	0.0199* (0.0100)	0.0194** (0.0075)
Observations	1,400	1,400
R^2	0.7667	0.7997
BHC FE	✓	✓
Quarter-Year FE	✓	✓
Controls $\times$ Post		✓

Notes: The table presents alternative measure of internal equity reallocation using bank equity stock rather than parent equity investments. Dependent variable is bank subsidiary equity divided by total BHC equity. This measures equity held by bank subsidiaries as share of consolidated BHC equity, complementing the parent equity investment measures in Table 6. Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. Column 2 includes BHC controls (top 200 BHC indicator, log assets, leverage, ROA, deposits/assets, asset growth, subsidiary count) measured as of 2013Q1 and interacted with Post. Standard errors clustered at BHC level. Sample restricted to BHCs with nonbank asset share exceeding 1%. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.9 Bank Retained Earnings

Table F.9: Bank Retained Earnings

Bank Retained Earnings	(1)	(2)	(3)	(4)
Years from Dereg $\times$ Post	0.0054** (0.0021)	0.0054** (0.0021)	0.0020** (0.0008)	0.0019** (0.0009)
Years from Dereg	0.0035 (0.0032)	0.0035 (0.0032)		
Post	-0.0130 (0.0106)			
Constant	0.0525*** (0.0157)			
Observations	12,558	12,558	12,558	12,558
R^2	0.0190	0.0209	0.9500	0.9529
Bank FE			✓	✓
Qtr-Year FE		✓	✓	✓
Controls				✓

Notes: The table presents the bank-level regression of retained earnings on organizational complexity. Dependent variable is bank retained earnings as share of bank assets, measured as quarterly undistributed subsidiary income scaled by beginning-of-quarter assets. Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. Specification includes bank fixed effects, quarter-year fixed effects, and bank controls (log assets, leverage, ROA, asset growth) all measured as of 2013Q1 and interacted with Post. Standard errors clustered at bank level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.10 BHC Balance Sheet

Table F.10: BHC-Level Balance Sheet: Consolidated Effects

<i>Panel A: Portfolio Composition</i>					
	Loan Share (1)	Securities Share (2)	Cash Share (3)		
Years from Dereg $\times$ Post	-0.0019 (0.0028)	0.0016 (0.0031)	0.0010 (0.0010)		
Observations	6,067	6,067	6,067		
R^2	0.9157	0.8934	0.7750		
BHC FE	✓	✓	✓		
Quarter-Year FE	✓	✓	✓		
Controls $\times$ Post	✓	✓	✓		
<i>Panel B: Capital Structure</i>					
	Leverage (1)	Equity/RWA (2)	RWA/Assets (3)	Marginal ROE (4)	Off-BS (5)
Years from Dereg $\times$ Post	0.0363 (0.0568)	0.0003 (0.0010)	-0.0054** (0.0026)	0.0179 (0.0260)	-0.0009 (0.0015)
Observations	5,388	5,388	5,388	5,388	5,388
R^2	0.7180	0.8713	0.8802	0.0393	0.8760
BHC FE	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓
<i>Panel C: Consolidated Scale</i>					
	Log Assets (1)	Asset Growth (2)			
Years from Dereg $\times$ Post	0.0114 (0.0097)	0.0003 (0.0004)			
Observations	5,388	5,387			
R^2	0.9939	0.1336			
BHC FE	✓	✓			
Quarter-Year FE	✓	✓			
Controls $\times$ Post	✓	✓			

Notes: The table reports estimates using BHC-level (consolidated) balance sheet data. Panel A presents portfolio composition measures: loan share, securities share, and cash share. Panel B presents capital structure measures: leverage, equity-to-risk-weighted-assets, risk-weighted-assets-to-assets, marginal ROE, and off-balance-sheet loan commitments. Panel C presents consolidated scale measures: log total assets and quarterly asset growth. Controls in Panel C exclude log total assets from the control interactions to avoid controlling for the pre-period level of the dependent variable. BHC profitability results are reported separately in Table 9. Years from Dereg measures the number of years between the interstate branching deregulation of the BHC headquarters state and the 1994 Riegle–Neal Act. Post is an indicator equal to one for 2015Q1 and later. All specifications include BHC fixed effects and quarter-year fixed effects. BHC controls include an indicator for top 200 BHCs, log total assets, leverage, deposits-to-assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post, except where noted. Standard errors are clustered at the BHC level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.11 BHC Internal Funding Rates

Table F.11: BHC Internal Funding Rates: Banks and Nonbanks

	Nonbank Rate (1)	Bank Rate (2)	Spread Rate (NB - Bank) (3)
Years from Dereg $\times$ Post	0.0052** (0.0024)	0.0008 (0.0008)	0.0044* (0.0025)
Observations	992	992	992
R^2	0.5304	0.5480	0.5187
BHC FE	✓	✓	✓
Quarter-Year FE	✓	✓	✓
Controls $\times$ Post	✓	✓	✓

Notes: The table reports regression estimates of internal funding rate differentials. The dependent variable in column 1 is the annualized interest rate on internal funding to nonbank subsidiaries following the construction of [Cetorelli and Prazad \(2025\)](#), calculated as quarterly interest income from nonbank subsidiaries multiplied by four and divided by the stock of nonequity internal funding to nonbank subsidiaries (the sum of internal loans, parent affiliate deposits, and net balances due from nonbank subsidiaries). Column 2 reports the corresponding annualized interest rate on internal funding to bank subsidiaries, calculated analogously using interest income from bank subsidiaries and the stock of nonequity internal funding to bank subsidiaries. Column 3 reports the internal funding spread, defined as the nonbank funding rate minus the bank funding rate. Years from Dereg measures the number of years between the interstate branching deregulation of the BHC headquarters state and the 1994 Riegle–Neal Act. Post is an indicator equal to one for 2015Q1 and later. All specifications include BHC fixed effects and quarter-year fixed effects. BHC control variables include top 200 BHC indicator, log total assets, leverage, deposits-to-assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors are clustered at the BHC level. The sample is restricted to BHCs with non-missing internal funding rate measures for both bank and nonbank subsidiaries. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.12 Nonbank Shift to Consumer Lending

Table F.12: Loan Composition: Shift Toward Consumer Lending

<i>Panel A: All Nonbank Subsidiaries</i>				
	Real Estate Growth (1)	C&I Growth (2)	Consumer Growth (3)	Non-US Growth (4)
Years from Dereg $\times$ Post	-0.0114 (0.0125)	-0.0932** (0.0354)	0.0133*** (0.0042)	0.0054 (0.0092)
Observations	4,932	4,932	4,932	4,912
R^2	0.0320	0.0512	0.0980	0.0458
Nonbank FE	✓	✓	✓	✓
Industry-Qtr-Year FE	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓
<i>Panel B: Nonbank Lenders Only</i>				
	Real Estate Growth (1)	C&I Growth (2)	Consumer Growth (3)	Non-US Growth (4)
Years from Dereg $\times$ Post	-0.0290 (0.0166)	0.0230 (0.0400)	0.0746*** (0.0067)	-0.0471 (0.0554)
Observations	851	851	851	851
R^2	0.0631	0.0845	0.4349	0.0825
Nonbank FE	✓	✓	✓	✓
Industry-Qtr-Year FE	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓

Notes: The table reports regression estimates of loan growth by loan category for nonbank subsidiaries. The dependent variables are quarter-on-quarter log changes in loans by type: real estate (column 1), commercial and industrial (column 2), consumer (column 3), and loans to non-U.S. borrowers (column 4). Panel A includes all nonbank subsidiaries with lending activity. Panel B restricts the sample to subsidiaries classified as nonbank lenders, including finance companies, mortgage companies, and other specialized lending entities. Years from Dereg measures the number of years between the interstate branching deregulation of the BHC headquarters state and the 1994 Riegle–Neal Act. Post is an indicator equal to one for 2015Q1 and later. All specifications include nonbank subsidiary fixed effects and industry–quarter–year fixed effects. BHC control variables include an indicator for top 200 BHCs, log total assets, leverage, deposits-to-assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors are clustered at the BHC level. Source: FR Y-11. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.13 Nonbank Business Model Changes

Table F.13: Business Model Changes: Shift from Fees to Interest Income

Panel A: Decline in High-Equity-Ratio Activities

	Trading Revenue (1)	Advisory/Fiduciary (2)	Venture Capital (3)
Years from Dereg $\times$ Post	-0.0005*** (0.0002)	-0.0066* (0.0037)	-0.0005* (0.0003)
Observations	4,496	4,496	4,496
R^2	0.2787	0.9186	0.2539
Nonbank FE	✓	✓	✓
Industry-Qtr-Year FE	✓	✓	✓
Controls $\times$ Post	✓	✓	✓

Panel B: Shift to Interest Income

	ln(Interest Income) (1)	ln(Non-Interest Income) (2)
Years from Dereg $\times$ Post	0.9351*** (0.3125)	-0.2755 (0.2310)
Observations	2,387	2,387
R^2	0.7753	0.8091
Nonbank FE	✓	✓
Industry-Qtr-Year FE	✓	✓
Controls $\times$ Post	✓	✓

Notes: The table reports regression estimates of changes in nonbank subsidiary business model composition. Panel A presents measures of fee-based and investment-related activities. The dependent variables, all scaled by lagged assets, are trading revenue (column 1), advisory and fiduciary revenue (column 2), and venture capital revenue (column 3). Panel B presents measures of income composition. The dependent variables are log interest income (column 1) and log non-interest income (column 2). Years from Dereg measures the number of years between the interstate branching deregulation of the BHC headquarters state and the 1994 Riegle–Neal Act. Post is an indicator equal to one for 2015Q1 and later. All specifications include nonbank subsidiary fixed effects and industry–quarter–year fixed effects. BHC control variables include an indicator for top 200 BHCs, log total assets, leverage, deposits-to-assets, asset growth, and subsidiary count, all measured as of 2013Q1 and interacted with Post. Standard errors are clustered at the BHC level.
 * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table F.14: Extensive Margin: Changes in Subsidiary Composition

Panel A: Net Change in Subsidiary Count

	Broker (1)	Lender (2)	Insurer (3)	Fund (4)	REIT (5)
Years from Dereg $\times$ Post	0.1222 (0.1025)	-0.0107 (0.0224)	-0.0113** (0.0053)	0.0670 (0.0999)	0.0160 (0.0175)
Observations	5,982	5,982	5,982	5,982	5,982
R^2	0.0434	0.2345	0.0310	0.0523	0.2124

Panel B: Additions (Increase from Prior Quarter)

	Broker (1)	Lender (2)	Insurer (3)	Fund (4)	REIT (5)
Years from Dereg $\times$ Post	-0.0637 (0.0452)	0.0067** (0.0030)	0.0025 (0.0022)	0.0018 (0.0262)	0.0014 (0.0036)
Observations	5,982	5,982	5,982	5,982	5,982
R^2	0.0685	0.0662	0.0931	0.2459	0.0546

Panel C: Removals (Decrease from Prior Quarter)

	Broker (1)	Lender (2)	Insurer (3)	Fund (4)	REIT (5)
Years from Dereg $\times$ Post	-0.1858 (0.1440)	0.0174 (0.0225)	0.0138** (0.0061)	-0.0651 (0.0805)	-0.0145 (0.0154)
Observations	5,982	5,982	5,982	5,982	5,982
R^2	0.0945	0.2563	0.0805	0.0733	0.2568
BHC FE	✓	✓	✓	✓	✓
Quarter-Year FE	✓	✓	✓	✓	✓
Controls $\times$ Post	✓	✓	✓	✓	✓

Notes: This table examines changes in subsidiary composition at the extensive margin. Dependent variables measure quarter-to-quarter changes in subsidiary counts by type. Panel A shows net changes (current count minus prior quarter count, which equals additions minus removals). Panel B shows additions only (maximum of zero and the change, capturing only increases). Panel C shows removals only (maximum of zero and negative change, capturing only decreases). Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. All specifications include BHC fixed effects, quarter-year fixed effects, and BHC controls (top 200 BHC indicator, log assets, leverage, deposits/assets, asset growth, total subsidiary count measured as of 2013Q1) interacted with Post. Standard errors clustered at BHC level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table F.15: Organizational Complexity: Number of Distinct NBFI Types

ln(NBFI Types)	(1)	(2)
Years from Dereg $\times$ Post	0.0821*** (0.0107)	0.0270* (0.0157)
Observations	5,558	5,558
R^2	0.1084	0.9636
BHC FE		✓
Quarter-Year FE		✓
Controls $\times$ Post		✓

Notes: The table examines changes in organizational complexity measured by number of distinct non-bank activity types within BHC. Dependent variable is log of number of distinct NAICS-based nonbank subsidiary types. Column 1 shows pooled OLS. Column 2 includes BHC fixed effects, quarter-year fixed effects, and BHC controls (top 200 BHC indicator, log assets, leverage, deposits/assets, asset growth, subsidiary count) measured as of 2013Q1 and interacted with Post. Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. Standard errors clustered at BHC level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.14 Nonbank Income Volatility

Table F.16: Nonbank Income Volatility

	$\sigma(\text{Int Inc})$ (1)	$\sigma(\text{Non-Int})$ (2)
Years from Dereg $\times$ Post	0.1969*** (0.0660)	0.0422 (0.1030)
Observations	2,714	2,714
R^2	0.6934	0.5513
Nonbank FE	✓	✓
Industry-Qtr-Year FE	✓	✓
Controls $\times$ Post	✓	✓

Notes: The table presents rolling income volatility measures. Column 1 is the rolling 8-quarter standard deviation of log interest income. Column 2 is the rolling 8-quarter standard deviation of log non-interest income. Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Post indicates 2015Q1 and later. All specifications include nonbank subsidiary fixed effects, industry-quarter-year fixed effects, and BHC controls (top 200 BHC indicator, log assets, leverage, deposits/assets, asset growth, subsidiary count measured as of 2013Q1) interacted with Post. Standard errors clustered at BHC level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

F.15 2SLS Design

Table F.17: First-Stage Relationship: Deregulation Timing and Organizational Complexity

NBFI Share $\times$ Post	(1)	(2)	(3)	(4)
Years from Dereg $\times$ Post	0.2877*** (0.0649)	0.5105*** (0.1419)	0.5269*** (0.1389)	0.3461*** (0.1044)
Observations	12,558	12,558	12,558	12,558
R^2	0.1083	0.1300	0.6360	0.6861
Bank FE			✓	✓
Quarter-Year FE		✓	✓	✓
Controls $\times$ Post				✓

Notes: The table presents first-stage estimates verifying that deregulation timing predicts organizational complexity. Dependent variable is nonbank asset share (nonbank assets / total BHC assets) interacted with Post indicator (2015Q1 and later). Years from Dereg measures years between BHC headquarters state's interstate branching deregulation and 1994 Riegle-Neal Act. Column 1 presents unconditional correlation. Column 2 adds quarter-year fixed effects. Column 3 adds bank fixed effects. Column 4 adds differential trends controls at the bank level: log assets, leverage, ROA, and asset growth measured as of 2013Q1 and interacted with Post. Standard errors clustered at bank level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table F.18: Two-Stage Least Squares Estimates

Excess Bank Capital	(1)	(2)	(3)	(4)
NBFI Share $\times$ Post	9.4067*** (3.4466)	5.2805* (2.7473)	1.4489* (0.8095)	1.9582* (1.0279)
Observations	12,558	12,558	12,558	12,558
<i>First-Stage Diagnostics:</i>				
Kleibergen-Paap LM Statistic	16.458	11.385	12.257	8.894
Cragg-Donald Wald F Statistic	1524.187	534.417	1161.075	505.361
Kleibergen-Paap Wald F Statistic	19.635	12.940	14.384	9.784
Bank FE			✓	✓
Quarter-Year FE		✓	✓	✓
Controls $\times$ Post				✓

Notes: The table presents two-stage least squares (2SLS) estimates using deregulation timing as instrument for organizational complexity. Dependent variable is excess bank capital, defined as bank equity capital ratio minus regulatory minimum. Endogenous regressor is nonbank asset share interacted with Post (2015Q1 and later). Instrument is years from state deregulation to Riegle-Neal interacted with Post. Column 1 presents unconditional 2SLS. Column 2 adds quarter-year fixed effects. Column 3 adds bank fixed effects. Column 4 adds differential trends controls (log assets, leverage, ROA, asset growth measured as of 2013Q1 interacted with Post). Standard errors clustered at bank level in parentheses. First-stage diagnostics reported at bottom. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.