

Creditors, Shareholders, and Losers In Between: A Failed Regulatory Experiment

Law Working Paper N° 753/2024

June 2025

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Abstract

In the aftermath of the 2007-08 Global Financial Crisis, regulators encouraged many of the world's largest banks to hold a new type of regulatory instrument with the goal of improving their safety and soundness. The regulatory instrument was known as a "CoCo," short for contingent convertible bond. CoCos are neither debt nor equity. They are something in between, designed to give the bank a shot in the arm during times of stress. Many of the largest international banks have issued CoCos worth hundreds of billions of dollars. After more than ten years—a decade that includes the collapse of Credit Suisse in Switzerland—this regulatory experiment has failed. We leverage insights from economic theory to show that CoCos were doomed from the beginning for two reasons. First, from a finance perspective, providing more equity only stabilizes a wobbling bank in normal times before the market and depositors ask questions about the bank's health. Once they start asking questions and the bank faces a liquidity crisis (i.e., a bank run), having more equity on the bank's balance sheet becomes meaningless. Only more liquidity can save the bank from complete collapse. Second, from a game theory perspective, controlling the public availability and flow of information is crucial in times of stress. If the market and depositors can ascertain which bank is weak or how much financial trouble that bank is in, a liquidity crisis will ensue, and that bank is as good as gone. The stigma effect is lethal. Ironically, the trigger mechanism built into CoCos can send a public signal that a bank is on its deathbed. It allows the market and depositors to differentiate between the weak and the strong, nearly guaranteeing a bank's failure. Is the regulatory experiment salvageable? We offer a set of reform proposals consistent with our theoretical insights. We argue, foremost, that the trigger mechanism should be used early, well before a liquidity crisis begins. We also recommend that the mechanism should protect a bank in poor financial health by sending as little information to the market as possible. That may require a greater reliance on regulators' discretion and a simultaneous trigger across several banks to prevent the market from identifying which bank(s) may be in trouble. To be sure, we are cleareyed that our proposals come with costs, which we describe at length. If regulators conclude that the costs are too high and our proposals are too difficult to implement in practice, they should end the experiment altogether. The status quo is a regulatory fiction.

Keywords: financial regulation, contingent convertible bonds, CoCos, bailouts

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CREDITORS, SHAREHOLDERS, AND LOSERS IN BETWEEN: A FAILED REGULATORY EXPERIMENT

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In the aftermath of the 2007–08 Global Financial Crisis, regulators encouraged many of the world's largest banks to hold a new type of regulatory instrument with the goal of improving their safety and soundness. The regulatory instrument was known as a "CoCo," short for contingent convertible bond. CoCos are neither debt nor equity. They are something in between, designed to give the bank a shot in the arm during times of stress. Many of the largest international banks have issued CoCos worth hundreds of billions of dollars. After more than ten years—a decade that includes the collapse of Credit Suisse in Switzerland—this regulatory experiment appears to have failed.

We leverage insights from economic theory to show that CoCos were unlikely to be effective for two reasons. First, from a finance perspective, providing more equity only stabilizes a wobbling bank in normal times before the market and depositors ask questions about the bank's health. Once they start asking questions and the bank faces a liquidity crisis (i.e., a bank run), having more equity on the bank's balance sheet becomes meaningless. Only more liquidity can save the bank from collapse. Second, from a game theory perspective, controlling the public availability and flow of information is crucial in times of stress. If the market and depositors can ascertain which bank is weak or how much financial trouble that bank is in, a liquidity crisis will ensue, and that bank is as good as gone. The stigma effect can be lethal. Ironically, the trigger mechanism built into CoCos can send a public signal that a

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bank is on its deathbed. It allows the market and depositors to differentiate between the weak and the strong, precipitating the weak bank's failure.

Is the regulatory experiment salvageable? We offer a set of reform proposals consistent with our theoretical insights. We argue, foremost, that the trigger mechanism should be used early, well before a liquidity crisis begins. We also argue that the mechanism should protect a bank in poor financial health by sending as little information about the bank's identity to the market as possible. That may require a greater reliance on regulators' discretion and a simultaneous trigger across several banks to prevent the market from identifying which bank(s) may be in trouble. To be sure, we are clear-eyed that our proposals come with costs, which we describe at length. If regulators conclude that the costs are too high and our proposals are too difficult to implement in practice, they should end the experiment altogether. The status quo is a regulatory fiction.

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INTRODUCTION

In March 2023, a financial panic that began with runs on Silicon Valley Bank (“SVB”) in California led to three of the four largest bank failures in U.S. history.¹ Regulators had to intervene by invoking break-glass powers to essentially insure the entire banking sector.² The turmoil was not contained within the United States. Jitteriness about the overall health of banks spread to Switzerland and claimed Credit Suisse as a victim³—a global systemically important bank (“GSIB”) as designated by international regulators.⁴ In response, the Swiss government engineered an emergency takeover of Credit Suisse by UBS (another Swiss GSIB) to avoid economic devastation.⁵ Shareholders of Credit Suisse were given 1 UBS share for every 22.48 Credit Suisse shares as part of the emergency deal.⁶ In other words, Credit Suisse was bailed out—the *antithesis* of every regulatory innovation since the 2007–08 Global Financial Crisis. This government intervention wasn’t supposed to happen,

¹ See Jeremy C. Kress & Jeffery Y. Zhang, *The Macprudential Myth*, 112 GEO. L.J. 569 (2024); Lev Menand & Morgan Ricks, *Rebuilding Banking Law: Banks as Public Utilities*, 41 YALE J. REG. 591 (2024); Anna Gelpern, *Silicon Rhymes with Savings and Loan (and It’s a Ratchet)*, YALE J. REG.: NOTICE & COMMENT (Mar. 29, 2023), <https://www.yalejreg.com/nc/silicon-rhymes-with-savings-and-loan-and-its-a-ratchet-by-anna-gelpern/> [https://perma.cc/26N4-HE9E].

² See U.S. GOV’T ACCOUNTABILITY OFF., GAO-23-106834, BANK REGULATION: PRELIMINARY REVIEW OF AGENCY ACTIONS RELATED TO MARCH 2023 BANK FAILURES (2023). See also Kress & Zhang, *supra* note 1; Menand & Ricks, *supra* note 1.

³ See Andrew Metrick & Paul Schmelzing, *The March 2023 Bank Interventions in Long-Run Context—Silicon Valley Bank and Beyond* (Nat’l Bureau of Econ. Rsch., Working Paper No. 31066, 2023); Margot Patrick, Patricia Kowsmann, Drew Hinshaw & Joe Parkinson, *It Wasn’t Just Credit Suisse. Switzerland Itself Needed Rescuing.*, WALL ST. J. (Mar. 24, 2023), <https://www.wsj.com/articles/ubs-credit-suisse-rescue-switzerland-banks-36abe8c4> [https://perma.cc/G6LH-6SRA].

⁴ See FIN. STABILITY BD., 2022 LIST OF GLOBAL SYSTEMICALLY IMPORTANT BANKS (G-SIBs) (2022), <https://www.fsb.org/wp-content/uploads/P211122.pdf> [https://perma.cc/LR2Q-97V5] (listing Credit Suisse).

⁵ See Press Release, Swiss Fed. Council, Safeguarding Financial Market Stability: Federal Council Welcomes and Supports UBS Takeover of Credit Suisse (Mar. 19, 2023), <https://www.admin.ch/gov/en/start/documentation/media-releases.msg-id-93793.html> [https://perma.cc/8T78-LUJL]; Michael J. de la Merced, Maureen Farrell & Andrew Ross Sorkin, *UBS Agrees to Buy Rival Credit Suisse*, N.Y. TIMES (Mar. 19, 2023), <https://www.nytimes.com/2023/03/19/business/ubs-credit-suisse.html> [https://perma.cc/ZWV8-HXBC].

⁶ Press Release, UBS, UBS Completes Credit Suisse Acquisition (June 12, 2023), <https://www.ubs.com/global/en/media/display-page-ndp/en-20230612-ubs-credit-suisse-acquisition.html> [https://perma.cc/JY86-F9BP].

especially because Credit Suisse had “CoCos” on its balance sheet prior to the panic.⁷

What are CoCos and why do they matter for our story? In the aftermath of the Global Financial Crisis, regulators around the world huddled together in Basel, Switzerland—the hometown of Leonhard Euler and Roger Federer—to begin crafting a new financial regulatory framework.⁸ In response to the backlash against the use of public money to rescue financial institutions, their motivation was to realize an aspiration that taxpayers would no longer be left holding the bag during times of crisis.⁹ No more bailouts. This new regulatory framework contained dozens of pieces, but at its core was a unique regulatory experiment—the creation of a new debt instrument that could be converted into equity.

This debt instrument goes by different names such as “AT1 bonds” (short for additional tier-one bonds) and “CoCos” (short for contingent convertible bonds).¹⁰ Despite their unconventional

⁷ Alana Pipe & Nate Rattner, *What Are AT1 Bonds, and Why Are They Risky?*, WALL ST. J. (Mar. 24, 2023), <https://www.wsj.com/articles/at1-bank-bonds-credit-suisse-risky-6785b012> [<https://perma.cc/7YES-LG54>]. We were able to independently verify this \$17 billion figure using data from Bloomberg. Bloomberg L.P. (database updated Jan. 2024). We did this by identifying CoCos from Credit Suisse using the bank’s ticker symbol. We then dropped any bonds considered to be tier 2 regulatory capital, bonds that had already matured, and bonds that hadn’t matured but had reached their first call date. We also deleted duplicate bond entries. Duplicates exist due to bonds having multiple CUSIP identifiers, one for public markets and another for private placement. The figure came out to \$17.2 billion.

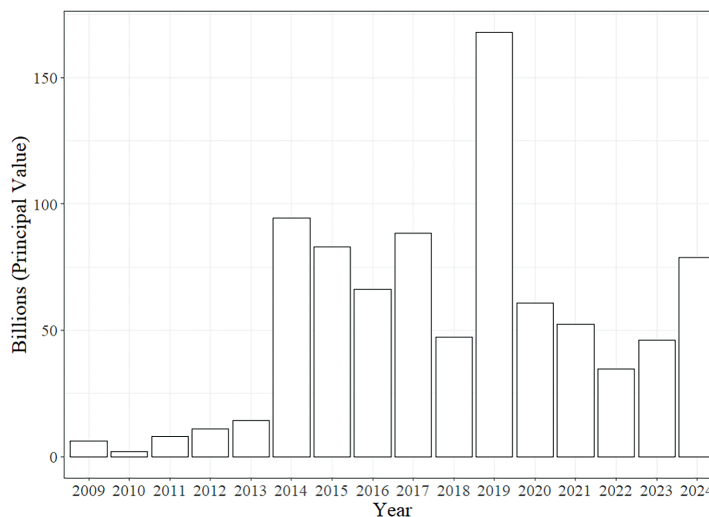
⁸ See *History of the Basel Committee*, BANK FOR INT’L SETTLEMENTS, <https://www.bis.org/bcbs/history.htm> [<https://perma.cc/X6XJ-V45C>] (last visited Jan. 3, 2025) (noting that Basel III was a response to the 2007-09 financial crisis). For the birthplaces of Leonhard Euler and Roger Federer, see CARL B. BOYER, ENCYC. BRITANNICA (2023), <https://www.britannica.com/biography/Leonhard-Euler> [<https://perma.cc/Q3SL-RRH9>] (“born April 15, 1707, Basel, Switzerland”), and THE EDS. OF THE ENCY. BRITANNICA, ENCYC. BRITANNICA (2023), <https://www.britannica.com/biography/Roger-Federer> [<https://perma.cc/M6VT-9C35>] (“born August 8, 1981, Basel, Switzerland”), respectively.

⁹ See BASEL COMM. ON BANKING SUPERVISION, EVALUATION OF THE IMPACT AND EFFICACY OF THE BASEL III REFORMS (2022), <https://www.bis.org/bcbs/publ/d544.pdf> [<https://perma.cc/2N5C-KXKC>] (mentioning the goal of “averting public bailouts”); cf. Saule Omarova, Opinion, *Banks Can’t Be Trusted. A ‘Golden Share’ Might Help.*, N.Y. TIMES (Mar. 23, 2023), <https://www.nytimes.com/2023/03/23/opinion/saule-omarova-bank-regulation-golden-share.html> [<https://perma.cc/S8N7-9V6U>] (“What is already clear is that when things go bad, the American public absorbs private banks’ losses and takes on their liabilities. We are the banking system’s true residual risk holder.”).

¹⁰ See Pipe & Rattner, *supra* note 7 (using the term “AT1 bonds”). We use these “CoCo” and “AT1 bonds” interchangeably in this paper. Tier 1 capital refers to the highest quality capital which can absorb any banks’ losses immediately as they occur. Tier 1 consists of common shares, stock surplus, retained earnings, and other income. *Definition of Capital in Basel III—Executive Summary 1* BANK FOR INT’L SETTLEMENTS, https://www.bis.org/fsi/fsisummaries/defcap_b3.pdf [<https://perma.cc/4ESR-69AB>] (last visited Jan. 3, 2025). Tier 2 capital refers to

names, the underlying idea was conventional from a regulatory perspective.¹¹ Banks would initially issue CoCos to increase their regulatory capital buffers and hold these bonds as liabilities on their balance sheets. If the banks fell into financial trouble, the CoCos would be “triggered” and either converted into equity or written down to zero in order to reduce the banks’ liabilities. In turn, the banks would be pulled back from the brink. And the private CoCo bondholders—neither purely creditors nor purely shareholders—would be the losers holding the bag, not the public.¹² In total, over \$714 billion dollars’ worth of CoCos were issued by over 360 international banks from 2009 through the end of 2022.¹³ (The figure below depicts the substantial annual issuances.) Mission accomplished, or so regulators hoped.

FIGURE 1



a second layer of bank capital that will absorb losses after a bank fails and protect depositors and creditors. *Id.* Tier 2 is composed of term debts, hybrid financial products, undisclosed reserves, and other instruments. *Id.*

¹¹ See in-depth explanation of CoCos in Part II.A *infra*.

¹² See John Crawford, *Credible Losers: A Regulatory Design for Prudential Market Discipline*, 54 AM. BUS. L.J. 107 (2017). In a sense, all debt is contingent capital because debt gets turned into equity through the bankruptcy process. What’s different with CoCos (or “bail-in capital” in general) is that the process occurs outside of the bankruptcy process. See Josh Mitchell & Anna Hirtenstein, *Credit Suisse Write-Off Upends European Bank Capital Bonds*, WALL ST. J. (Mar. 22, 2023), <https://www.wsj.com/articles/credit-suisse-write-off-upends-european-bank-capital-bonds-e01d2010> [<https://perma.cc/9MGV-PXKW>] (stating that “CoCos . . . can be written down or converted to equity in an emergency, depending on the terms . . .”).

¹³ We derived this aggregate statistic using data from Bloomberg L.P. (database updated Jan. 2024). We deleted any bonds designated as tier 2 capital and also deleted duplicate entries, which exist due to bonds having multiple CUSIP identifiers, one for public markets and another for private placement. We also deleted any bonds with maturity dates, which indicates that they are not perpetual bonds. We sum the remaining bond issuance from 2009 through the end of 2022.

Many academic scholars had similar hopes. Within the finance and economics literature, scholars have argued that CoCos could be valuable in recapitalizing banks during times of stress,¹⁴ that they could incentivize banks to improve risk management,¹⁵ and that the interbank network structure is important to using CoCos as a financial stability-enhancing mechanism.¹⁶ Legal scholars made similar claims. Professor John Coffee, Jr., wrote that instruments which convert gradually from debt to equity could help the financial system avoid a reliance on regulatory oversight and future government bailouts.¹⁷ Professors Wulf Kaal and Christoph Henkel expanded on the concept and proposed a system with sequential triggers as both a preventative tool and a reorganization tool.¹⁸ In the same vein, Professor John Crawford noted that holders of CoCos could potentially serve the financial system's need for "credible losers," lenders who bear losses in default events and whose losses can impose greater market discipline on banks.¹⁹ An exception was Professor Hilary Allen's claim that CoCos could result in heightened panic selling, short selling, and the use of instruments such as credit default swaps, leading to

¹⁴ See Mark J. Flannery, *No Pain, No Gain? Effecting Market Discipline via "Reverse Convertible Debentures"*, in CAPITAL ADEQUACY BEYOND BASEL: BANKING, SECURITIES, AND INSURANCE 171 (Hal S. Scott ed., 2005); Christopher L. Culp, *Contingent Capital vs. Contingent Reverse Convertibles for Banks and Insurance Companies*, 21 J. APPLIED CORP. FIN. 17, 17 (2009); Mark J. Flannery, *Stabilizing Large Financial Institutions with Contingent Capital Certificates*, 6 Q. J. FIN. at 3 (2015).

¹⁵ See Patrick Bolton & Frédéric Samama, *Capital Access Bonds: Contingent Capital With an Option to Convert*, 27 ECON. POL'Y 275, 275 (2012); Charles W. Calomiris & Richard J. Herring, *How to Design a Contingent Convertible Debt Requirement That Helps Solve Our Too-Big-to-Fail Problem*, 25 J. APPLIED CORP. FIN. 39, 39 (2013). Some have countered that while CoCos can reduce the risk of bankruptcy or bailout for a bank, banks themselves may be reluctant to issue CoCos for fear of losing a government subsidy and for inducing a debt overhang. See Boris Albul, Dwight M. Jaffee & Alexei Tchisty, *Contingent Convertible Bonds and Capital Structure Decisions* (Coleman Fung Risk Mgmt. Rsch. Ctr., Working Paper No. 2010-01, 2016); Roman Goncharenko, Steven Ongena & Asad Rauf, *The Agency of CoCos: Why Contingent Convertible Bonds Are Not For Everyone*, 48 J. FIN. INTERMEDIATION 1, 1 (2021).

¹⁶ Giovanni Calice, Carlo Sala & Daniele Tantari, *Contingent Convertible Bonds in Financial Networks*, SCI. REPS., Dec. 15, 2023, at 13.

¹⁷ John C. Coffee, Jr., *Systemic Risk after Dodd-Frank: Contingent Capital and the Need for Regulatory Strategies Beyond Oversight*, 111 COLUM. L. REV. 795, 795 (2011).

¹⁸ Wulf A. Kaal & Christoph K. Henkel, *Contingent Capital with Sequential Triggers*, 49 SAN DIEGO L. REV. 221 (2012).

¹⁹ Crawford, *supra* note 12.

further complications for the bank.²⁰ In this Article, we approach the problem from a new angle using economic theory as well as three important case studies. We conclude that the regulatory experiment, in its current form, has failed and that regulators should either try to revamp it or eliminate it altogether. The status quo is untenable.

Why weren't CoCos effective in preventing a bailout? In designing these new convertible debt instruments, regulators operated under a misunderstanding of bank runs. Part I seeks to correct this misunderstanding.

First, from a finance perspective, we observe that bank runs occur because of a liquidity crisis, which means the bank does not have enough liquid assets, such as cash, on hand to meet depositor demands for redemptions.²¹ Once a liquidity crisis is set in motion, only more liquidity can prevent the bank's failure. Increasing the equity on a bank's balance sheet, which is what CoCos are designed to do, will not improve the bank's liquidity position, and will not stop the run. Second, using insights from game theory, we highlight the importance of information opacity during a panic. If investors and depositors are able to identify which bank is experiencing financial trouble or the magnitude of that trouble, this can trigger a liquidity crisis at the identified bank, leading to its failure. Hiding the identity of the bank or the magnitude of its trouble from the public becomes paramount. In that light, triggering CoCos ironically signals to investors and depositors that the bank is in desperate need of help. In other words, a CoCo conversion could precipitate the very death spiral it seeks to avoid.

With our theoretical framework in place, Part II explains why CoCos are flawed by design. We start with a brief overview of the experiment that regulators implemented after the Global Financial Crisis. Regulators believed that the following sequence of events would occur by triggering the bonds' conversion or write-down: (a) the bank would immediately have more equity and fewer liabilities on its balance sheet, thereby making the bank more robust, (b) depositors and market actors would see the increased equity and the improved financial

²⁰ Hilary J. Allen, *CoCos Can Drive Markets Cuckoo*, 16 LEWIS & CLARK L. REV. 125 (2012).

²¹ The definitions of liquidity, equity, and other relevant terms are spelled out in Section I.A *infra*. In short, liquidity refers to the liquid assets (like cash and short-term Treasury securities) on the assets side of the bank's balance sheet. Equity, on the other hand, is the difference between assets and liabilities.

position, and (c) the panic would subside. But, as shown by our theoretical framework and past experience, the combination of (a) and (b) does not imply (c). While depositors care about equity on the bank's balance sheet during normal times, they do not care about equity during a panic; they simply want cash to meet their withdrawal requests because they know the bank does not have enough cash on hand to make every depositor whole. Second, triggering CoCos makes the public even more suspicious of the bank because it sends an adverse signal. It's stigmatizing, and the panic worsens. Not surprisingly, CoCos were not effective in saving either Banco Popular or Credit Suisse, which failed in 2017 and 2023, respectively.²²

Large international banks still have hundreds of billions' worth of CoCos on their books,²³ and over \$108 billion in new CoCos have been issued since the collapse of Credit Suisse.²⁴ In Part III, we leverage our insights to examine if this regulatory experiment is salvageable. If we were to redesign CoCos, what would the new version look like? There are certain design choices that can be altered to make CoCos more effective in preventing bank failures. These design choices run along several dimensions. Foremost, we argue that the trigger should happen early—well before a liquidity crisis has emerged. Once a run is underway, triggering the CoCos will not stop the run. Second, we argue that the trigger mechanism should be designed in such a way to send as little information as possible to the market and depositors. This includes greater reliance on regulators' discretion—as opposed to a trigger mechanism that is based on publicly available market indicators—and possibly a simultaneous conversion across several banks so as to prevent the market from identifying which specific bank(s) may be in trouble. Part III also compares different types of triggers and elaborates upon legal and policy hurdles to our proposed reform.

²² See Section II.B and Section II.C *infra* for detailed analysis of Banco Popular and Credit Suisse.

²³ Zhenyu Wang, *CoCo Bonds: Are They Debt or Equity? Do They Help Financial Stability?—Lessons from Credit Suisse NT1 Bonds*, ECGI: THE ECGI BLOG (Apr. 6, 2023), <https://www.ecgi.global/publications/blog/coco-bonds-are-they-debt-or-equity-do-they-help-financial-stability-lessons-from> [<https://perma.cc/88TG-9QLV>] (noting “[t]he global market for AT1 bonds . . . is valued at \$275 billion.”).

²⁴ This statistic was derived using the Bloomberg data previously mentioned, *supra* note 13. Bloomberg L.P. (database updated Feb. 2024).

To be clear, we do not believe that policymakers must fix the CoCos regime, because there are significant obstacles that are associated with the proposed solution. Instead, our position is that if policymakers decide our proposed changes are too difficult to implement, they should end the regulatory experiment altogether. The current version of the regulatory experiment has failed.

I

THE ECONOMIC THEORY OF BANK RUNS

Bank runs have been a constant feature throughout history, with some of the first recorded bank runs occurring in 17th-century Italy.²⁵ Bank runs were a common occurrence in the United States during the 18th and 19th centuries, especially before the introduction of federal deposit insurance in the 1930s.²⁶ There were a large number of banks that experienced runs and eventually closed during the Free Banking Era in the first part of the 19th century.²⁷ Later, the Great Depression saw a wave of bank runs: according to the FDIC, thousands of banks experienced depositor runs during the 1920s and 1930s, causing over 9,000 banks to fail.²⁸ During the Global Financial Crisis, several of the largest banks in the United States, including Wachovia and Washington Mutual, experienced high deposit outflows that led to their sale to other banks.²⁹ Despite these repeated crises, many scholars and regulators still do not fully comprehend the mechanics and causes of bank runs.³⁰ In this Part, we explain the phenomenon and how to guard

²⁵ See François R. Velde, *Neapolitan Banks in the Context of Early Modern Public Banks*, in FINANCIAL INNOVATION AND RESILIENCE 201 (Lili Costabile & Larry Neal eds., 2018).

²⁶ See Gary Gorton, *Banking Panics and Business Cycles*, 40 OXFORD ECON. PAPERS 751 (1988); Charles W. Calomiris & Gary Gorton, *The Origins of Banking Panics: Models, Facts, and Bank Regulation*, in FINANCIAL MARKETS AND FINANCIAL CRISES 109 (R. Glenn Hubbard ed, 1991); Gary B. Gorton & Jeffery Y. Zhang, *Protecting the Sovereign's Money Monopoly*, 75 ALA. L. REV. 955 (2024).

²⁷ See Iftekhar Hasan & Gerald P. Dwyer, Jr., *Bank Runs in the Free Banking Period*, 25 J. MONEY, CREDIT AND BANKING 271 (1994).

²⁸ See DIV. RSCH. & STRATEGIC PLAN., FEDERAL DEPOSIT INSURANCE CORPORATION: THE FIRST FIFTY YEARS, A HISTORY OF THE FDIC 1933–1983 (1984).

²⁹ See Jonathan D. Rose, *Old Fashioned Deposit Runs*, (Fed. Rsrv. Bd. Fin. and Econ. Discussion Series, Paper No. 2015-111, 2015), <https://www.federalreserve.gov/econresdata/feds/2015/files/2015111pap.pdf> [<https://perma.cc/WQ5M-K25V>].

³⁰ *Id.*; see also GARY B. GORTON, MISUNDERSTANDING FINANCIAL CRISES: WHY WE DON'T SEE THEM COMING (2012).

against it by leveraging insights from economics, specifically finance and game theory.

First, let us briefly preview the finance pieces of the puzzle. A fundamental function of a bank is to take deposits, which become the bank's short-term liabilities, and lend a portion of deposits as loans, which become long-term assets of the bank. By transforming short-term deposits into long-term loans, a bank fuels economic growth. While this "maturity transformation" leaves the bank short on cash (and other liquid assets) to satisfy all of its deposit liabilities, so long as the depositors expect the bank to be financially healthy in the long-term, this mismatch is not problematic. A bank run is therefore a "liquidity crisis" in which the bank faces a heightened withdrawal demand from depositors but does not have enough cash or other liquid assets on hand to satisfy the withdrawal demand.³¹ Because depositors want cash, banks may need assets that they can easily and quickly convert to cash; these assets are classified as liquid assets.³² Such a liquidity crisis differs from a "solvency problem" in which the bank's assets are insufficient compared to its liabilities on the books. Although conceptually distinct, a solvency problem can *precipitate* a liquidity crisis, since the depositors and other liability claimants may predict that the bank will have insufficient (liquid) assets to meet its obligations in the future. But insolvency itself is not a bank run. A bank run is fundamentally about liquidity, not equity. In order for all of this to make sense, we provide a primer on bank assets, liabilities, and equity in section I.A below.

We also need to understand a bit of game theory to demystify bank runs. Specifically, consider depositors' beliefs about their fellow depositors' actions. If depositors A, B, and C believe that depositors D, E, and F will run to the bank to withdraw their money and the bank will not have enough cash on hand to satisfy all withdrawal demands, then depositors A, B, and C will also want to withdraw now. Similarly, if depositors D, E, and F believe that depositors A, B, and C

³¹ See MORGAN RICKS, *THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION* 4 (2016); Gary B. Gorton & Jeffery Y. Zhang, *Bank Runs During Crypto Winter*, 14 HARV. BUS. L. REV. 297 (2024).

³² Examples of liquid assets include bank reserves held at central banks, short-term government debt, and mortgage-backed securities. *FAQs: What is the Difference Between a Bank's Liquidity and its Capital?*, BD. OF GOVERNORS OF THE FED. RESRV. SYS., https://www.federalreserve.gov/faqs/cat_21427.htm [<https://perma.cc/EQU7-PUX5>] (last visited Jan. 3, 2025).

hold that belief, they will also withdraw as soon as possible. Waiting is a bad strategy for everyone. Indeed, by waiting, it is unlikely that any subsequent depositor will be able to withdraw her entire deposited amount. By running to the bank immediately, she would have a much better chance of (at least partially) redeeming her investment in whole. Thus, what is important is a depositor's belief or expectation about what the other depositors will do. With this in mind, we can begin to see why controlling the flow of information during times of economic turbulence can be crucial. Once information is revealed to the public—particularly if the information identifies a weak institution—then the game's unraveling begins. The importance of information is explained further in section I.D below.

A. Primer on Bank Assets, Liabilities, and Equity

To understand the forces at play, we start by explaining a bank balance sheet. Banks, like any other commercial entity, are financed with a combination of equity and debt.³³ An important difference from other companies is that a bank takes deposits from investors, with a guarantee that the depositors will be able to withdraw their investments on demand. The money doesn't sit in the bank, however. The bank lends the money out to borrowers (e.g., companies making investments or individuals buying houses), and the loans are often given on a long-term basis that cannot be quickly recalled (or "liquidated"), at least not without any substantial loss in value. This combination results in a large portion of a bank's liabilities consisting of deposits that can be withdrawn on demand by the depositors, while much of its assets consist of loans that often cannot be recalled on short notice.

³³ See Mark E. Van Der Weide & Jeffery Y. Zhang, *Bank Capital Requirements After the Financial Crisis*, in *THE OXFORD HANDBOOK OF BANKING* 707 (Allen N. Berger, Philip Molyneux & John O.S. Wilson eds., 3d ed. 2019).

See the figure below for a stylized example of a bank's balance sheet. In this hypothetical example, the bank has taken deposits that are worth \$50 and has also borrowed \$30 (e.g., by issuing bonds), both of which show up as liabilities. On the asset side of the balance sheet, the bank has loans that are worth \$60 and has purchased securities that are worth \$30. The bank also has \$10 in reserves—that is, cash on hand for immediate use. In the example, the bank has \$20 in equity for its stockholders (i.e., \$100 in assets minus \$80 in liabilities). To remain solvent, assets must exceed liabilities. The accounting identity can be rearranged to show that equity equals assets minus liabilities.

FIGURE 2: STYLIZED BANK BALANCE SHEET

Assets (\$100)	Liabilities (\$80)
Reserves (\$10)	Deposits (\$50)
Securities (\$30)	Borrowings (\$30)
Loans (\$60)	Equity (\$20)

Holding the liabilities fixed, we see that as the value of a bank's assets change, so does the value of the bank's equity. For example, if the bank's securities holdings fall in value from \$30 to \$20—or if the value of its loans falls from \$60 to \$50 due to bad, “non-performing” loans—and assuming that the bank's liabilities stay the same, the bank's equity falls from \$20 to \$10.³⁴ If a bank's assets decline to the point that the equity value reaches zero or below, then the bank becomes technically insolvent, as the bank's assets are insufficient to

³⁴ Non-performing loans are typically defined in the United States as loans past due more than 90 days and loans where the bank has ceased to accrue interest; definitions vary across jurisdictions. See Walter Yao, *Not All NPLs Are Created Equal*, FED. RESRV. BANK OF S.F.: PAC. EXCH. BLOG (Dec. 18, 2015), <https://www.frbsf.org/research-and-insights/blog/sf-fed-blog/2015/12/18/nonperforming-loan-ratio-asset-quality-measures-in-asia/> [https://perma.cc/8BX6-NQDH].

satisfy its liabilities. For instance, suppose the bank's securities holdings become worthless. In that case, the bank's total assets (\$10 reserves plus \$60 loans) are worth only \$70 while its total liabilities (\$50 deposits plus \$30 borrowings) are worth \$80. Even if the bank were to liquidate all its loans at their full value of \$60, the bank would not be able to satisfy its liabilities.

Therefore, all else equal, a bank with more equity is safer for debtholders and counterparties than a bank with less equity. In banking parlance, that equity cushion is referred to as "bank capital."³⁵ As described by Federal Reserve Vice Chair for Supervision Michael Barr, "[b]anks rely on both debt and capital to fund loans and other assets, but capital is what allows the bank to take a loss and keep on operating."³⁶ And regulators require banks to maintain a minimum amount of capital to maintain and improve bank resiliency—usually written as a percentage of either total assets or a derivative measure of total assets. Indeed, "[t]he beauty of capital is that it doesn't care about the source of the loss. Whatever the vulnerability or the shock, capital is able to help absorb the resulting loss and, if sufficient, allow the bank to keep serving its critical role in the economy."³⁷

Regulators have been in the business of setting minimum capital standards for almost four decades. When the international community of bank regulators first set about to standardize minimum capital requirements, they created the so-called "Basel I" approach in 1988.³⁸ The overarching idea is that if assets held by the bank are more volatile, then more equity is needed to potentially absorb losses in bad times; and if the assets are less volatile, then less equity is required to act as a buffer. Basel I set the minimum ratio of capital to risk-weighted assets ("RWA") at 8%. Though the regulatory apparatus iteratively evolved into Basel III, the overarching idea remains unchanged.

At this point in our discussion, it is crucial to clearly distinguish between "liquidity" and "capital," because these terms are easily confused as simply "having more money." Liquidity

³⁵ Van Der Weide & Zhang, *supra* note 33, at 708.

³⁶ Michael S. Barr, Vice Chair for Supervision, Bd. of Governors of the Fed. Rsrv. Sys., Speech at the Bipartisan Policy Center: Holistic Capital Review, Washington, D.C. (July 10, 2023), <https://www.federalreserve.gov/newsevents/speech/barr20230710a.htm> [<https://perma.cc/H9PM-LN97>].

³⁷ *Id.*

³⁸ Van Der Weide & Zhang, *supra* note 33.

refers to a subset of immediately deployable assets (e.g., the \$10 reserves from the example) on the left-hand side of the balance sheet whereas capital refers to the difference between assets and liabilities (e.g., the \$20 equity buffer) on the right-hand-side of the balance sheet. The Federal Reserve offers the following helpful example from a household's perspective to see the difference between liquidity and capital:

The family's assets can include liquid assets, such as money in a checking account or savings account that can be used to quickly and easily pay bills. So a gauge of the family's liquidity position would include how much money is in the checking account as well as the family's cash on hand and some other investments such as money market funds.

The family's assets include not just liquid assets but also their home and perhaps other investments that are not liquid, meaning they could be sold quickly to realize their value. A measure of the family's capital position would be the difference between the value of their assets (both liquid and non-liquid) and the family's liabilities, or the money it owes, such as a mortgage.³⁹

As we close out this primer, it is important to keep the following in mind: equity is defined as assets minus liabilities and, if equity dips below zero, the bank is insolvent.⁴⁰ This *solvency* channel is why bank regulators focus so heavily on prescribing minimum capital requirements. They want to build up the equity cushion. Yet, as we discuss next, the cause of a bank run is a *liquidity* crisis.

B. What Causes a Bank Run?

A bank run occurs when a bank suffers a liquidity crisis—that is, when depositors are rushing to the bank to ask for withdrawals, and the bank does not have enough cash on hand to meet the sudden spike in withdrawal demands.⁴¹ In the previous figure, the stylized bank balance sheet consists of \$50 in deposits and \$10 in reserves. Imagine if all depositors decided to withdraw their money at the same time. The bank only has \$10 on hand (not \$50) to meet redemption requests. The bank doesn't have enough liquidity. It's short \$40.

³⁹ BD. OF GOVERNORS OF THE FED. RESRV. SYS., *supra* note 32.

⁴⁰ See BASEL COMM. ON BANKING SUPERVISION, BASEL III: THE NET STABLE FUNDING RATIO (2014), <https://www.bis.org/bcbs/publ/d295.pdf> [<https://perma.cc/L66A-53E4>].

⁴¹ Gorton & Zhang, *supra* note 31.

When that liquidity crisis strikes, it is extremely unlikely that the bank will remain financially viable. The bank will be forced to sell its non-liquid assets, possibly at a steep discount in a “fire sale,” to pay depositors.⁴² Using the stylized example presented above, the bank would be forced to liquidate its \$30 securities portfolio at a discount and a portion of its \$60 loan portfolio at a discount—for example, at 70 cents on the dollar. While selling liquid securities may be straightforward, calling and converting long-term loans, even if possible, might be extremely difficult. The bank will fail unless the government steps in with a rescue package of some sort because, at that point, only the government can provide a sufficiently credible supply of liquidity—either through an explicit guarantee of deposits or infusion of liquidity, or by subsidizing the bank’s merger with another larger, healthier bank.⁴³

We have made a big deal about the difference between a solvency problem and a liquidity crisis and have asserted that a liquidity crisis is bad news. But how does such a liquidity crisis materialize? As summarized artfully by Prof. Heidi Schooner, “Bad news incites bank runs. Before federal deposit insurance, a whiff of trouble at a bank sent depositors running.”⁴⁴ In some situations, the crisis can occur out of the blue because of rumors that result in hysteria.⁴⁵ According to economics Nobel laureates Douglas Diamond and Philip Dybvig:

[A bank run] could [result from] a bad earnings report, a commonly observed run at some other bank, a negative government forecast, or even sunspots. It need not be anything fundamental about the bank’s condition. The problem is that once they have deposited, anything that causes [depositors] to anticipate a run will lead to a run.⁴⁶

⁴² See Andrei Shleifer & Robert Vishny, *Fire Sales in Finance and Macroeconomics*, 25 J. ECON. PERSP’S. 29, 29 (2011) (defining fire sales).

⁴³ At this point, one might ask whether banks can simply refuse to pay depositors who are suddenly demanding withdrawals. See the Appendix for a discussion of this issue called “suspension of convertibility.”

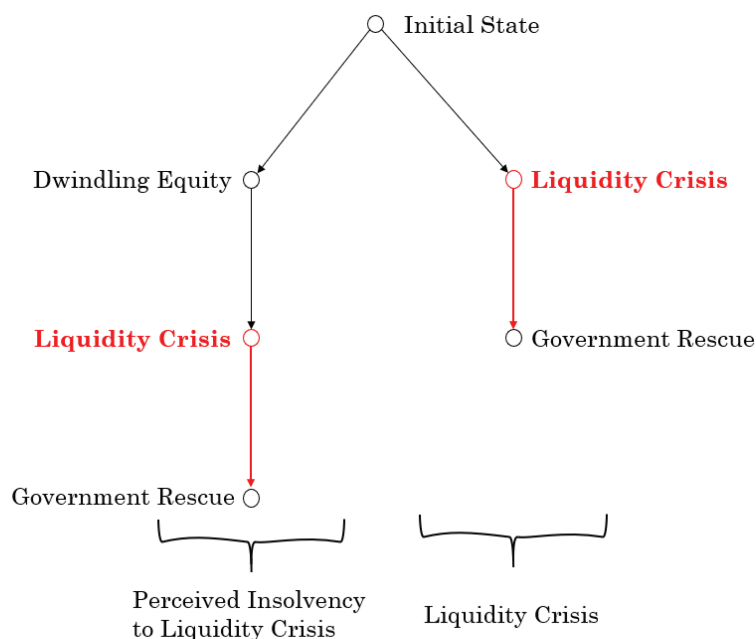
⁴⁴ Heidi Mandanis Schooner, *The Secrets of Bank Regulation: A Reply to Professor Cohen*, 6 GREEN BAG 2D 389, 389 (2003).

⁴⁵ See Douglas W. Diamond & Philip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 J. POL. ECON. 401(1983).

⁴⁶ *Id.* at 410.

Imagine, for example, a newspaper announcing that Bank X was the victim of a massive cyberattack that froze the bank's assets. Depositors of Bank X will likely start withdrawing their money. That leads to a liquidity crisis, which will inevitably lead to the collapse of Bank X.⁴⁷ In the figure below, we depict this chain of events on the right-hand side: a liquidity crisis occurs because of sudden bad news and the government steps in with an emergency rescue package.

FIGURE 3



Alternatively, a liquidity crisis can materialize from longer-term weaknesses in economic fundamentals such as a substantial drop in value of the bank's assets. This is shown on the left-hand side of the diagram, where poor performance over a sustained period of time leads to dwindling equity. As its equity shrinks, the bank risks insolvency, and the perception of insolvency results in a liquidity crisis when depositors realize that the bank has insufficient assets to satisfy its liabilities.

Academic scholarship also lends support to the bank-run channel depicted on the left-hand side of the diagram. Since

⁴⁷ See GORTON, *supra* note 30, at 50–51.

the trailblazing work by Professors Diamond and Dybvig, several prominent scholars have theoretically and empirically examined the conditions under which a bank run takes place.⁴⁸ Professors Goldstein and Pauzner, for instance, have theoretically shown that a bank run will occur when (a) depositors receive an informative signal about the soundness of a bank—say, a steep drop in stock price or mass media coverage that the bank may be in trouble—and (b) when that signal is sufficiently bad.⁴⁹ When the information about the bank's financial health is sufficiently bad, it is rational for depositors to withdraw their deposits. Similarly, Professors Calomiris and Gorton have empirically shown that bank runs are associated with poor bank-specific fundamentals such as insufficient assets or macroeconomic indicators such as a looming economic recession.⁵⁰

Coming back to the bank's balance sheet and the accounting identity (i.e., assets minus liabilities equals equity), when liabilities are fixed in value, a reduction in the value of assets will reduce the amount of equity for the bank. This, in turn, increases the probability that the bank becomes insolvent. Again, note that the reduction in asset value, per se, is not a liquidity problem; the bank still has enough liquidity (e.g., cash and marketable securities) to satisfy an ordinary volume of withdrawals from depositors. However, perceived insolvency can signal that, in the future, the bank will not

⁴⁸ In the Diamond and Dybvig framework, because a bank run can happen for any or no reason (the problem with multiplicity of equilibria), the framework could not easily produce any predictive or descriptive analysis on why bank runs occur. The multiplicity of equilibria was partly based on the assumption that each depositor's belief (about what the other depositors will do) was not anchored on any information or signal about the bank.

⁴⁹ See Itay Goldstein & Ady Pauzner, *Demand-Deposit Contracts and the Probability of Bank Runs*, 60 J. FIN. 1293 (2005); see also Stephen Morris & Hyun Song Shin, *Rethinking Multiple Equilibria in Macroeconomic Modeling*, 15 NBER MACROECON. ANN. 139 (2001); Jean-Charles Rochet & Xavier Vives, *Coordination Failures and the Lender of Last Resort: Was Bagehot Right After All?*, 2 J. EUR. ECON. ASS'N 1116 (2004).

⁵⁰ See Gary Gorton, *Banking Panics and Business Cycles*, 40 OXFORD ECON. PAPERS 751 (1988); Calomiris & Gorton, *supra* note 26. The scholarship also adds color to factors that influence the speed and frequency of a bank run: bank-depositor relationships, the types of information shared about banks, depositors' social networks, and expectations of government responses. Deeper and longer relationships between depositors and their banks can mitigate the speed and severity of bank runs, which means depositors who have been customers for longer or who have borrowed loans from a bank are less likely to withdraw during a crisis. See Rajkamal Iyer & Manju Puri, *Understanding Bank Runs: The Importance of Depositor-Bank Relationships and Networks*, 102 AM. ECON. REV. 1414 (2012).

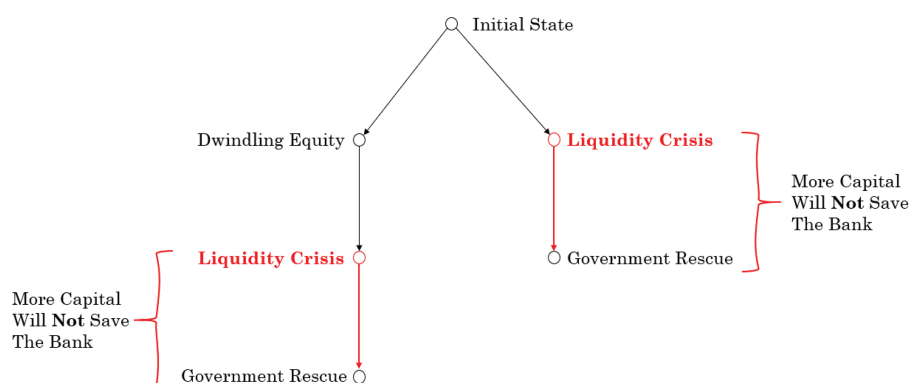
have enough assets to satisfy its liabilities. When depositors see the “writing on the wall,” they will be greatly motivated to withdraw their deposits, which will result in a liquidity crisis. In other words, the left-hand side of the diagram is summarized as follows: If the market (including depositors) perceives an increased insolvency risk due to a reduction in asset values, the market begins to question the bank’s long-term financial viability, which can lead to a liquidity crisis when depositors run on the bank.

In sum, when we discuss bank runs, it is important to keep in mind what a bank run is (a liquidity problem) and what may cause a bank run to occur (a solvency problem, liquidity problem, or information that the bank may be having a solvency or liquidity problem). While the perception that a bank may be facing a solvency issue does not itself cause a bank run, the release of credible information about a bank’s impending insolvency (or its poor financial health) can precipitate a run. This distinction and relationship between insolvency and liquidity will allow us to determine follow-on implications.

C. The Irrelevance of Capital During a Bank Run

The first implication of the theoretical description is that, once depositors become concerned and begin rushing to the bank to withdraw their money, having more capital on the right-hand side of the bank’s balance sheet will *not* ameliorate the liquidity crisis. What matters is whether the bank has enough liquid, short-term assets—cash and marketable securities, which can be easily converted to cash with little loss—to satisfy its short-term liabilities, namely, deposits. Put plainly, banks need “money” to pay their depositors during a run. Regulatory capital, on the other hand, is not money; it is an accounting artifact that is defined as the difference between assets and liabilities. Converting some liabilities into equity or writing down liabilities will not be sufficient to save the bank because it is not giving the bank new money. Thus, when a liquidity crisis occurs, the government may be the only entity that can credibly commit to supply a sufficient level of liquidity. We depict this in the following figure.

FIGURE 4



Thus, our first implication intuitively flows from the definitions of capital and liquidity. During a panic, banks need money to pay depositors, not accounting adjustments that do not produce more money. Our implication also has empirical support.⁵¹ Professor Gary Gorton shows, in his book *Misunderstanding Financial Crises*, that bank runs occur regardless of bank capital ratios.⁵² He concludes that “[e]very generation seems to rediscover” that “[t]here is almost no evidence that links capital to bank failures.”⁵³ Similarly, using data from publicly traded financial institutions during the Global Financial Crisis, Nicholas Tabor (Deputy Assistant Secretary at the U.S. Treasury Department) and Professor Jeffery Zhang show that higher capital did not lead to better outcomes when the market began to panic following the collapse of Lehman Brothers. Somewhat paradoxically, institutions with *higher* levels of regulatory capital experienced *more* funding stress.⁵⁴ Instead of focusing on solvency, the market focused on business model similarities—in particular, the strength of correlations with Lehman Brothers.⁵⁵ Firms that were perceived by the market to be more like Lehman Brothers were hit the hardest, irrespective of their capital cushions.

The same phenomenon appeared during the 2023 banking crisis. In the appendix, we provide a table with the capital ratios

⁵¹ Nicholas K. Tabor & Jeffery Y. Zhang, *Capital, Contagion, and Financial Crises: What Stops a Run from Spreading?*, 2020 COLUM. BUS. L. REV. 575.

⁵² GORTON, *supra* note 30.

⁵³ *Id.* at 157.

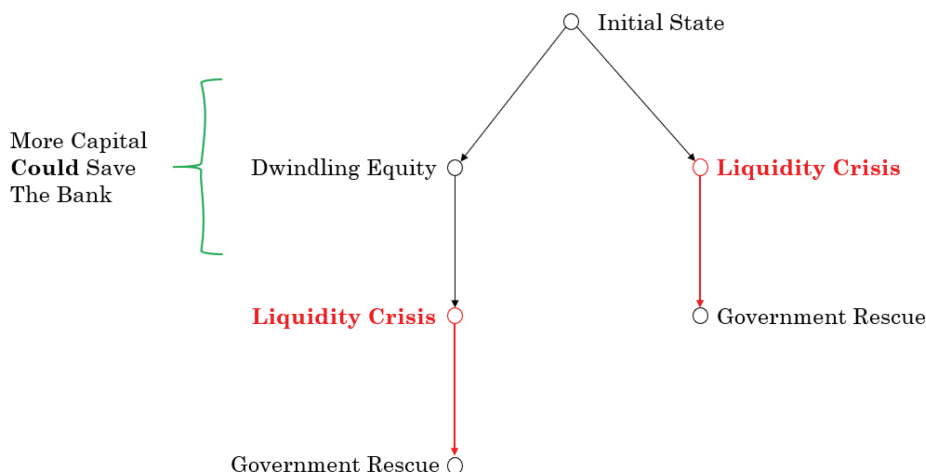
⁵⁴ Tabor & Zhang, *supra* note 51, at 589.

⁵⁵ *Id.* at 638.

of the largest U.S. banking organizations—reported in the fourth quarter of 2022 (i.e., the last quarter prior to the March 2023 panic). The median tier 1 capital ratio reported in that group (excluding SVB) was 11.8% and the median common equity tier 1 ratio in that group (again, exclusive of SVB) was 10.4%. What were SVB’s ratios? They were 15.4% and 12.1%, respectively. In other words, SVB was situated comfortably in the top half of the capital ratio distribution among these large banks. Once a panic begins, having more capital will not save the day.

If bank capital does not matter during a bank run, when does it matter? The only instance in which having more capital could be beneficial is *before* the run begins and things get out of hand (i.e., before the depositors see the writing on the wall). This is depicted in the left-hand side of the diagram below. Having additional capital will improve the imbalance in assets and liabilities so as to improve the bank’s long-term financial health. This, in turn, can prevent the information about the bank’s poor financial health from being released to the public. Stated differently, more capital leads to a lower probability of insolvency, which, all else equal, can reduce depositor jitters. But once depositors become jittery, it is too late.

FIGURE 5



D. The Importance of (Withholding) Information

Now that we have discussed the insights from finance, we pivot to strategic insights from game theory. The key is to understand that controlling the flow of information can potentially

reduce the incidence and severity of a panic. During a panic, bank shareholders and bank depositors are scared. If the market and the depositors can identify which bank is facing financial trouble and if the trouble is sufficiently severe, then investors will start selling the bank's stock and stop lending the bank money while depositors will start withdrawing their deposits and create a liquidity crisis. Investors and depositors are simply and rationally trying to prevent their own losses.⁵⁶

The role of information is represented in the previous diagram. On the left-hand side of the diagram, for example, information plays a role in turning a solvency problem into a liquidity crisis. Indeed, for a bank's solvency problem ("dwindling equity") to become a liquidity crisis, the market (and depositors) must receive information about the bank's solvency issue. Without that information, a liquidity crisis will not emerge on the left-hand side of the diagram.⁵⁷ Thus, as we discuss later, by cutting off this information flow, regulators can better prevent a solvency issue from becoming a liquidity crisis.

Sometimes, banks themselves fail to appreciate the destabilizing role played by information. During the Global Financial Crisis, many banks—including a few of the largest ones—were undercapitalized.⁵⁸ They needed more equity, as shown in the appendix. Indeed, several institutions burned through so much of their capital stack that they either failed outright (e.g., Lehman Brothers) or had to be bought by a healthier competitor under emergency conditions (e.g., Bear Stearns and Merrill Lynch). Naturally, regulators would like to see banks with larger capital buffers, but trying to increase their buffers *during* a crisis can be dangerous. Investors and depositors want to see signs of strength, not weakness. The latter could result in more runs.

U.S. authorities understood this risk during the Global Financial Crisis. On October 13, 2008, "the chief executives

⁵⁶ This is why banking regulators have inside information. When banking supervisors examine a bank, they see confidential information and are not required to disclose the information publicly.

⁵⁷ For more information on how information plays a role in banking, see Anna Gelpern & Erik F. Gerding, *Inside Safe Assets*, 33 YALE J. REG. 363 (2016). The authors describe how safe assets are legally constructed, including labels, guarantees, and political interactions. Safe assets are largely unquestioned until a crisis emerges. *Id.* Kathryn Judge also examines financial information in the context of shadow banking where she argues that "pockets of information that are pertinent and knowable . . . are a byproduct of shadow banking and a meaningful source of systemic risk." Kathryn Judge, *Information Gaps and Shadow Banking*, 103 VA. L. REV. 411, 411 (2017). The article shows that information both escalated and exacerbated the 2008 financial crisis and impeded its resolution. *Id.* at 460–69.

⁵⁸ See Van Der Weide & Zhang, *supra* note 33.

of the nine largest banks in the United States trooped into a gilded conference room at the Treasury Department.”⁵⁹ At that meeting, Treasury Secretary Henry Paulson, Jr., handed each executive a “one-page document that said they agreed to sell shares to the government” and told the executives they were required to sign it before they left.⁶⁰ The Treasury Department was injecting “\$250 billion of capital into thousands of banks—starting with [these nine].”⁶¹ The larger program was “specifically designed to hide borrowers’ identities.”⁶²

Paulson knew that several of these banks were severely undercapitalized and would be in trouble if the economy became shakier in the coming months. The perception of insolvency would have led to a liquidity crisis. Not every bank was pleased by Paulson’s decision. According to the same New York Times report, Wells Fargo was against the proposal and “said the investment could come at the expense of [their] shareholders.”⁶³ But all of the banks had to sign onto the deal. Otherwise, the stigma from differentiation would have burned those banks perceived to be weak. Financial contagion would have emanated from weak banks causing stronger banks to fail. Paulson rightly “pooled” the equilibrium to make sure individual banks could not be singled out, even if it felt unfair to healthier banks. He understood the importance of withholding information during a panic. (Importantly, financiers have known about the impact of stigma for over a century.)⁶⁴

Yet this crucial lesson involving stigma was forgotten by certain bankers in March 2023. Consider the fact that SVB spiraled toward its eventual demise when it publicly announced that it planned to raise more than \$2 billion in capital.⁶⁵

⁵⁹ Mark Landler & Eric Dash, *Drama Behind a \$250 Billion Banking Deal*, N.Y. TIMES (Oct. 14, 2008), <https://www.nytimes.com/2008/10/15/business/economy/15bailout.html> [<https://perma.cc/J2VG-VC4F>].

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² Gary Gorton & Guillermo Ordoñez, *Fighting Crises 1* (Nat’l Bureau of Econ. Rsch., Working Paper No. 22787, 2016), https://www.nber.org/system/files/working_papers/w22787/w22787.pdf [<https://perma.cc/4LK4-WRJD>].

⁶³ Landler & Dash, *supra* note 59.

⁶⁴ See generally Gary Gorton, *The Development of Opacity in U.S. Banking*, 31 YALE J. REG. 825, 836 (2014) (examining U.S. banking history and specifically noting the impact of stigma after the Global Financial Crisis).

⁶⁵ Gillian Tan, Sridhar Natarajan & Crystal Tse, *SVB Abandons Equity Raise, Imperiling Efforts to Restore Calm*, BLOOMBERG (Mar. 10, 2023), <https://www.bloomberg.com/news/articles/2023-03-10/svb-abandons-equity-raise-imperiling-efforts-to-restore-calm> [<https://perma.cc/LKX7-EPBB>].

Earlier that day, SVB sold over \$21 billion of its assets at a \$1.8 billion loss.⁶⁶ The next day, the CEO indicated that customers deposits had come in lower than expected.⁶⁷ All the while, the CEO continued to tell clients to “stay clam” and that the bank was “well positioned.”⁶⁸ Market investors and depositors read that plan as an admission of weakness: “Help! We don’t have enough capital!” SVB sent an adverse signal to the public, and that action was self-defeating because the information allowed the market to separate the weak from the strong.

In sum, this Part contains two key insights. First, from a finance perspective, bank runs are primarily about liquidity, not capital. Thus, having more capital during a panic is unlikely to make any difference, although having insufficient capital can signal a bank’s poor health to the market and can precipitate a run. Second, from a game theory perspective, releasing information about a bank’s poor health can be deadly. Revealing which banks are weak might trigger a run on those banks. With these theoretical building blocks in place, we proceed to discussing the specifics of CoCos. In particular, we argue that CoCos failed along both finance and game theory dimensions.

II

CONTINGENT CONVERTIBLE BONDS IN THEORY AND PRACTICE

In this Part, we dive into the details of contingent convertible bonds, beginning with their innovation in the aftermath of the Global Financial Crisis. After explaining the history and aspirations, we pivot to lived experience—the near-disaster at Deutsche Bank in Germany as well as the collapses of Banco Popular in Spain and Credit Suisse in Switzerland. In all three cases,

⁶⁶ Press Release, Silicon Valley Bank, SVB Financial Group Announces Proposed Offerings of Common Stock and Mandatory Convertible Preferred Stock (Mar. 8, 2023), <https://ir.svb.com/news-and-research/news/news-details/2023/SVB-Financial-Group-Announces-Proposed-Offerings-of-Common-Stock-and-Mandatory-Convertible-Preferred-Stock/default.aspx> [https://perma.cc/72HW-JS8H].

⁶⁷ Silicon Valley Bank, Message to Stakeholders Regarding Recent Strategic Actions Taken by SVB (Mar. 8, 2023), https://s201.q4cdn.com/589201576/files/doc_downloads/2023/03/r/Q1-2023-Investor-Letter.FINAL-030823.pdf [https://perma.cc/25FS-GPF3].

⁶⁸ Katie Roof, Hannah Miller, Gillian Tan & Priya Anand, *SVB Races to Prevent a Bank Run as Funds Advise Pulling Cash*, BLOOMBERG (Mar. 10, 2023), <https://www.bloomberg.com/news/articles/2023-03-09/svb-ceo-becker-asks-silicon-valley-bank-clients-to-stay-calm> [https://perma.cc/LVL8-VDW6].

CoCos were ineffective.⁶⁹ In the latter two cases, by the time the bonds were triggered, a liquidity crisis was already underway. The banks still required a government rescue package. CoCos did not improve the banks' financial viability.⁷⁰

A. The Basel Experiment

This regulatory experiment began in the aftermath of the Global Financial Crisis, as regulators convened in Switzerland to create the third edition of the Basel Accords.⁷¹ Their stated objective was to improve the resiliency of banks and prevent taxpayers from having to shoulder the bill the next time a large bank collapsed.⁷² Thus, CoCos were born.⁷³ They are hybrid capital securities that can absorb losses when converted based on a predetermined metric or regulatory discretion. The securities are labeled hybrid because they are neither traditional debts nor traditional equities. According to recent research, over \$250 billion worth of CoCos were outstanding at year-end 2022.⁷⁴ (Approximately \$17 billion were wiped out by Credit Suisse's failure in March 2023.⁷⁵)

⁶⁹ For a detailed discussion of these CoCo case studies, see Edoardo D. Martino, Casimiro A. Nigro, & Tom Vos, *CoCos in Europe: What is Wrong—And How to Fix It?* (Eur. Banking Inst., Working Paper No. 169, 2024).

⁷⁰ Using regulatory language, the conversions did not keep the banks a “going concern.”

⁷¹ *Basel III: International Regulatory Framework for Banks*, BANK FOR INT’L SETTLEMENTS, <https://www.bis.org/bcbs/basel3.htm> [<https://perma.cc/N3XY-MRP3>] (last visited Jan. 3, 2025).

⁷² Ceyla Pazarbasioglu, Jianping Zhou, Vanessa Le Leslé & Michael Moore, *Contingent Capital: Economic Rationale and Design Features*, INT’L MONETARY FUND 4 (Jan. 25, 2011), <https://www.imf.org/external/pubs/ft/sdn/2011/sdn1101.pdf> [<https://perma.cc/5P2N-BH95>].

⁷³ It’s still unclear which person or persons “invented” CoCos in the bank regulatory setting. We know of a few origin stories. First, John Bu proposed the phrasing of “contingent convertible bonds” as a corporate debt-equity mechanism in a Harvard Law Review note published in 1991. John Bu, Note, *Distress-Contingent Convertible Bonds: A Proposed Solution to the Excess Debt Problem*, 104 HARV. L. REV. 1857 (1991). Professor Mark Flannery has conducted seminal research in this area. Flannery, *supra* note 14. Professor Morgan Ricks personally shared with the authors that he devised a version of the idea—what he called “liability softening”—while he worked at the U.S. Treasury Department following the 2008 crash. During the Sixth Conference on Law & Macroeconomics at Tulane Law School, the authors heard that Wilson Ervin and his colleagues at Credit Suisse invented CoCos, though the authors have not been able to independently verify.

⁷⁴ GLOB. FIXED INCOME TEAM, NUVEEN, UNDERSTANDING CONTINGENT CAP. SEC. (CoCos) 3 (Dec. 2023), <https://documents.nuveen.com/Documents/Nuveen/Default.aspx> [<https://perma.cc/LYQ7-MYCX>].

⁷⁵ See Hannah Benjamin-Cook & Tasos Vossos, *What Are CoCos or ATIs And Why Are They Risky?*, BLOOMBERG (June 15, 2023), <https://www.bloomberg.com/>

1. *Differences in Adoption by Jurisdiction*

Adoption of CoCos has occurred in many jurisdictions across the world, but notably not in the United States. Because the Basel Accords are nonbinding international agreements, jurisdictions have discretion in how they treat CoCos for their domestic regulatory (including tax) purposes. Compared to the positive view of CoCos from Asian and European banking regulators, CoCos have been met with a mixed reception in the United States. During the evaluation of new regulatory tools following the financial crisis, some U.S. officials like Federal Reserve Bank of New York President William Dudley expressed interest in promoting CoCos.⁷⁶ Eric Rosengren, President of the Federal Reserve Bank of Boston, went even further by strongly endorsing the idea of requiring banks to hold CoCos.⁷⁷ Other officials, including Treasury Secretary Tim Geithner, were more doubtful.⁷⁸

Importantly, Congress gave the Federal Reserve the authority to require certain banks to maintain a minimum level of capital that could convert to equity in times of crisis, a requirement which could be satisfied by CoCos.⁷⁹ The Federal Reserve could enact this regulation on its own or pursuant to recommendations from the Financial Stability Oversight Council (“FSOC”).⁸⁰ The statute does not mention convertible capital that would be written down, so the wording suggests that the authorization favors converting

news/articles/2023-03-18/why-credit-suisse-coco-bonds-are-causing-anxiety-quicktake [https://perma.cc/5DJL-K2CX] (noting that the “emergency rescue of Credit Suisse by UBS Group AG in March included pulling the pin on \$17 billion of CoCos”).

⁷⁶ See William C. Dudley, President and Chief Exec. Officer, Fed. Rsrv. Bank of N.Y., Remarks at the Int’l Bankers Membership Luncheon: Some Lessons from the Crisis (Oct. 13, 2009), <https://www.bis.org/review/r091014a.pdf> [https://perma.cc/N9BQ-XSDU] (stating that “the introduction of a contingent capital instrument seems likely to hold real promise”).

⁷⁷ Kristina Cooke, *Fed’s Rosengren Endorses Contingent Capital Idea*, REUTERS (Mar. 3, 2010), <https://www.reuters.com/article/usa-fed-rosengren-contingent-idUSWAT01418320100303/> [https://perma.cc/DND5-UBXD].

⁷⁸ See Press Release, Sec’y of the Treasury, Remarks by Treasury Secretary Tim Geithner to the International Monetary Conference (June 6, 2011), <https://home.treasury.gov/news/press-releases/tg1202> [https://perma.cc/8SHE-AYYQ] (“But given the other protections available here, including our resolution authority, we do not need to impose on top of that requirement any of the three other proposed forms of additional capital—convertible, bail in, contingent capital instruments, or counter cyclical capital requirements.”).

⁷⁹ Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1424, § 165(b)(1)(B) (2010).

⁸⁰ § 165(a)(1).

to equity rather than write-downs, and also a preference for regulatory, as opposed to market-based, triggers.⁸¹ Congress also tasked FSOC to “conduct a study of the feasibility, benefits, costs, and structure of a contingent capital requirement.”⁸²

The FSOC report concluded by recommending that CoCos remain a private sector instrument and encouraged additional research by the Federal Reserve and other regulators. The report acknowledged that CoCos could be useful tools for banks during times of financial stress, but it also noted a range of potential issues that could be associated with issuance. For instance, it would be challenging to characterize CoCos as debt for U.S. income tax purposes, banks would be unable to deduct interest on debt paid in equity, and banks would be restricted in their ability to use tax losses following ownership change.⁸³ The FSOC report also noted concerns from regulators regarding the potential for CoCos to increase interconnections between banks and nonbanks as well as between the EU and U.S. financial systems.⁸⁴ The regulators worried that if financial institutions invested in each other’s CoCos, a crisis in one country could quickly cause problems in another if the CoCos were triggered. Although there are no outright U.S. prohibitions on issuing CoCos, two factors ultimately discourage banks from doing so: CoCo interest payments are not tax deductible,⁸⁵ and CoCos are not considered to be AT1 capital by U.S. regulators.⁸⁶

⁸¹ See Allen, *supra* note 20, at 137.

⁸² § 115(c).

⁸³ FIN. STABILITY OVERSIGHT COUNCIL, REPORT TO CONGRESS ON STUDY OF A CONTINGENT CAPITAL REQUIREMENT FOR CERTAIN NONBANK FINANCIAL COMPANIES AND BANK HOLDING COMPANIES 17 (2012).

⁸⁴ *Id.* at 5–6.

⁸⁵ *Id.* at 16–17. An important challenge in the United States, as compared to Europe, is that the U.S. tax system relies on double taxation of corporate income. While interest payments are subject to one level of taxation at the investor level, dividend payments are subject to both corporate and investor taxation. Thus, an important goal for the U.S. tax system is to make sure that corporations and investors do not receive a preferential one-level taxation treatment when they are, in fact, making a dividend payment. While CoCos are similar to more conventional convertible bonds, which do receive debt treatment until conversion, an important difference is that the conversion of CoCos occurs when the issuer’s equity is low (rather than high), which makes the instrument look more equity-like than debt-like. European countries, by contrast, have a more integrated corporate taxation system, under which the treatment of interest payments and dividends are more on an equal footing.

⁸⁶ *Id.* at 3.

While European and Asian banks have been the major issuers of CoCos thus far, as shown in Table 1 below,⁸⁷ the demand for CoCos has largely come from outside Europe. For example, some estimates show that roughly three quarters of European CoCos are held by non-European investors.⁸⁸ These buyers include small banks, retail investors, hedge funds, and investment funds.⁸⁹ It remains to be seen whether this demand will be sustained after the failure of Credit Suisse, with some market participants raising concerns about the future of the market.⁹⁰

Table 1: Top 30 Issuers of CoCos⁹¹

Rank	Bank	Country	Amount Issued (Billions)
1	Bank of China Ltd	China	\$ 39.38
2	HSBC Holdings PLC	United Kingdom	\$ 37.03
3	Industrial & Commercial Bank of China Ltd	China	\$ 34.13
4	Barclays PLC	United Kingdom	\$ 33.17
5	Agricultural Bank of China Ltd	China	\$ 29.87
6	UBS Group AG	Switzerland	\$ 26.01
7	Mitsubishi UFJ Financial Group Inc	Japan	\$ 24.23
8	Mizuho Financial Group Inc	Japan	\$ 23.89
9	Banco Santander SA	Spain	\$ 23.64

⁸⁷ The data on bond issuance was obtained from Bloomberg. Individual bonds were identified using the SRCH@COCO command. Bonds designated as Tier 2 under Basel III and bonds with a maturity date were dropped. We also deleted any bonds with maturity dates, which indicates that they are not perpetual bonds. The amount issued was calculated by summing all bond issuances across all bank subsidiaries using the bank's ticker symbol. Bloomberg L.P. (database updated Jan. 2024).

⁸⁸ See Martijn A. Boermans & Sweder van Wijnbergen, *Contingent Convertible Bonds: Who Invests in European CoCos?*, 25 APPLIED ECON. LETTERS 234, 236 (2018).

⁸⁹ Stefan Avdjiev, Anastasia Kartasheva & Bilyana Bogdanova, *CoCos: A Primer*, BIS Q. REV. 43, 49 (2013).

⁹⁰ Theo Andrew, *Credit Suisse Rescue Deal Will 'Kill Off' CoCo Bond Market*, *Expert Warns*, ETF STREAM (Mar. 21, 2023), <https://www.etfstream.com/articles/credit-suisse-rescue-deal-will-kill-off-coco-bond-market-expert-warns> [https://perma.cc/ADH8-URRE].

⁹¹ Bloomberg L.P. (database updated Feb. 2025).

Rank	Bank	Country	Amount Issued (Billions)
10	Credit Suisse Group AG	Switzerland	\$ 23.35
11	BNP Paribas SA	France	\$ 21.83
12	Societe Generale SA	France	\$ 20.63
13	China Construction Bank Corp	China	\$ 17.92
14	Lloyds Banking Group PLC	United Kingdom	\$ 17.12
15	Deutsche Bank AG	Germany	\$ 15.69
16	Banco Bilbao Vizcaya Argentaria SA	Spain	\$ 15.29
17	Bank of Communications Co Ltd	China	\$ 14.83
18	Credit Agricole SA	France	\$ 14.37
19	Sumitomo Mitsui Financial Group Inc	Japan	\$ 14.22
20	Intesa Sanpaolo SpA	Italy	\$ 13.31
21	Cooperatieve Rabobank UA	Netherlands	\$ 12.79
22	Standard Chartered PLC	United Kingdom	\$ 12.13
23	ING Groep NV	Netherlands	\$ 12.00
24	NatWest Group PLC	United Kingdom	\$ 11.67
25	China CITIC Bank Corp Ltd	China	\$ 10.85
26	UniCredit SpA	Italy	\$ 10.78
27	China Minsheng Banking Corp Ltd	China	\$ 10.05
28	State Bank of India	India	\$ 9.88
29	China Everbright Bank Co Ltd	China	\$ 9.81
30	Shanghai Pudong Development Bank Co Ltd	India	\$ 9.19

2. *Perceived Benefits of CoCos*

The main challenge that regulators had to confront was the glaring fact that investors are generally reluctant to provide additional capital to banks in times of stress.⁹² If one believes that a bank might fail, why invest more money in the bank? Most try to jump off a sinking ship, not get on board. This is typically why taxpayers end up on the hook, as the government

⁹² See discussion, *supra* note 67, on Silicon Valley Bank attempting to raise additional capital when it was under duress. Not only did the operation fail, but depositors started running out the doors even faster.

provides a public-funded injection to bail out banks. Thus, one of the strongest arguments in favor of CoCos is simply that they provide an automatic mechanism for increasing capital and reducing the liabilities of a financial institution in times of stress.⁹³ There is no need to ask for new equity investors. The investors are already locked in via the convertible debt contract. Once the conversion is triggered, the debt would automatically turn into equity.

Regulators also saw a secondary benefit. In theory, the credible “threat of losses due to conversion and [equity] dilution could help reduce” excessive risk taking. Specifically, “[t]he threat of [equity] dilution”—after triggering the conversion mechanism—could encourage shareholders to require more prudent corporate governance and risk-control procedures within a bank.⁹⁴ “Similarly, requiring bond holders to bear part of the cost of a future bank recapitalization would enhance their incentive to exercise greater market discipline.”⁹⁵

Of course, it takes two to tango. Large banks also liked what CoCos could offer. Issuing CoCos to fulfill regulatory capital requirements would be cheaper since CoCos benefitted from interest expense tax deductions in the jurisdictions where they might be used.⁹⁶ Moreover, prior to conversion, CoCos would “be a nondilutive source of capital for existing shareholders, so that their issuance [would] not change corporate control.”⁹⁷ In short, issuing a hybrid instrument to meet capital requirements is much easier than issuing more common equity.

⁹³ Pazarbasioglu, Zhou, Le Leslé & Moore, *supra* note 72, at 6.

⁹⁴ *Id.* at 7.

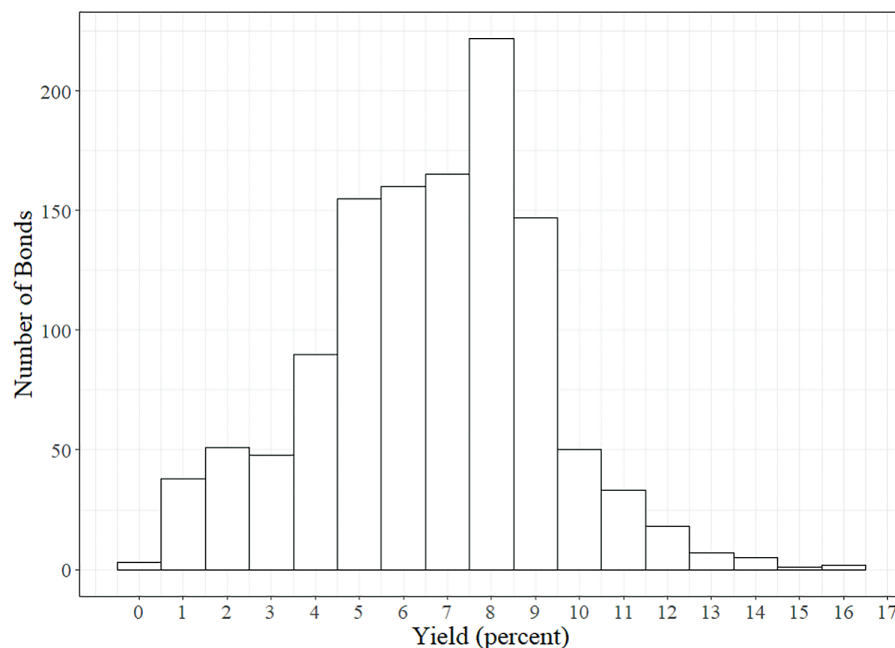
⁹⁵ *Id.*

⁹⁶ *Id.* at 7–8. The banking industry typically balks when regulators ask them to maintain more capital. Why? Because it is an expensive proposition. As an example, regulators are currently trying to implement more stringent capital requirements through a rulemaking process termed “Basel III Endgame.” In response, the industry has responded with a full public counterattack. See *Stop Basel Endgame*, BANK POL’Y INST., <https://stopbaselendgame.com/> [https://perma.cc/CF4L-PNDL] (last visited Jan. 3, 2025) (“The federal government’s Basel Endgame proposal will have real costs for everyday Americans.”). Being able to fulfill capital requirements by issuing debt (e.g., by issuing CoCos) is a cheaper, more attractive proposition.

⁹⁷ Pazarbasioglu, Zhou, Le Leslé & Moore, *supra* note 72, at 7–8.

Besides having willing issuers, CoCos also needed willing buyers who would benefit from including these instruments in their portfolios. The higher yields these bonds offered allowed their holders to achieve greater returns.⁹⁸ Although buyers have a variety of investing strategies, they tend to prefer CoCos with higher returns relative to their given risk, lower trigger levels, and smaller total issuance amounts.⁹⁹ The following figure, constructed using data from Bloomberg, shows the distribution of rates paid by CoCos. The median of the distribution is 7.125%, and the maximum is 16.0%.¹⁰⁰ In comparison, investors who bought U.S. Treasury ten-year bonds during that time window received annual coupon rates of 2.41% on average.¹⁰¹ That is a tremendous difference in the world of bond investments.

FIGURE 6



⁹⁸ See Avdjiev, Kartasheva & Bogdanova, *supra* note 89, at 49.

⁹⁹ Guglielmo Maria Caporale & Woo-Young Kang, *On the Preferences of CoCo Bond Buyers and Sellers*, 72 J. INT'L FIN. MKTS., INSTS. & MONEY 1, 2 (2021).

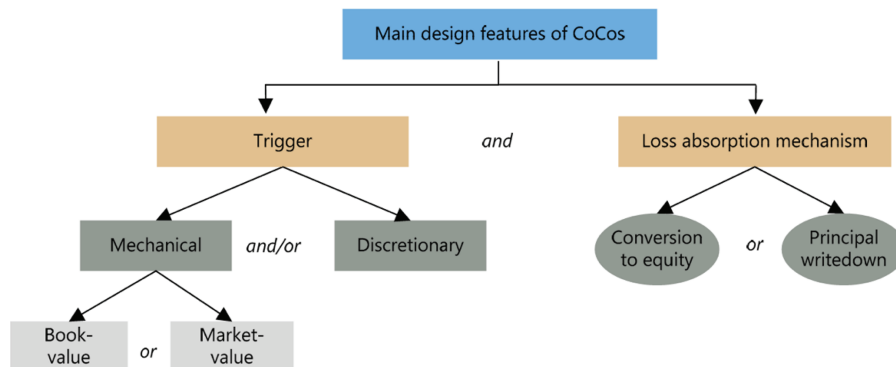
¹⁰⁰ We obtained bond coupon rates from Bloomberg and used the full universe of all CoCo bonds except for bonds designated as Tier 2, "duplicate" bonds, and bonds with a maturity date. Seventy-three bonds did not have available coupon rates. Bloomberg L.P. (database updated Jan. 2024).

¹⁰¹ The data was obtained at *10 Year Treasury Rate—54 Year Historical Chart*, MACROTRENDS, <https://www.macrotrends.net/2016/10-year-treasury-bond-rate-yield-chart> [<https://perma.cc/RQW8-UC9F>] (last visited Jan. 3, 2025).

3. Design Choices

Having explained why regulators wanted to create CoCos in Basel III, we now explore the decisions that regulators made in designing these hybrid instruments. The following diagram provides a succinct summary of the main design features of CoCos.¹⁰² We analyze each design choice below.

FIGURE 7



Loss Absorption Mechanism. Without loss absorption capabilities, the Basel framework would not have counted CoCos as Tier 1 regulatory capital. The whole point of the regulatory experiment was to create an instrument that would force private investors to absorb losses so that taxpayers didn't have to foot the bill. Tier 1 capital includes Common Equity Tier 1 ("CET1") as well as Additional Tier 1 ("AT1"). The former consists of common stock and retained earnings. CoCos fall within AT1, which is why they are sometimes referred to as "AT1 bonds." CoCos are capable of absorbing losses because, once they are triggered, they convert to equity at a pre-defined conversion rate or are written down. Regardless of conversion or write-down, the bank's liability stack decreases, and the bank's debt-to-equity ratio improves. That is loss absorption in action.

Trigger Mechanism. In bank regulatory lingo, the trigger is designed to keep the bank a "going concern."¹⁰³ The idea is that the debt will convert *prior* to the bank's insolvency

¹⁰² This figure is reproduced from Avdjiev, Kartasheva & Bogdanova, *supra* note 89, at 45.

¹⁰³ See Natalya Martynova & Enrico Perotti, *Convertible Bonds and Bank Risk-Taking*, 35 J. FIN. INTERMEDIATION 61, 61 (2018) (noting the difference between long-term debt that converts into equity only when the bank is insolvent versus going-concern contingent capital, where debt may convert ahead of distress).

when the bank itself is still a going concern and, by triggering the CoCos, regulators aim to help the bank avoid insolvency. (There is another type of long-term debt that provides “gone concern” contingent capital—converting only when the bank becomes insolvent.¹⁰⁴) Regulators keep the bank a going concern using a mechanical or discretionary trigger. If the trigger is mechanical, it can be based on the bank’s book value (e.g., based on regulatory capital levels) or market value (e.g., based on stock price or CDS spread). If the trigger is discretionary, the regulators have the authority to decide when conversion (or write-down) would be most appropriate. A discretionary trigger event, also referred to as the Point-of-Nonviability (PONV), gives regulators the ability to bypass issues arising from the timeliness or unreliability of market-based measures.¹⁰⁵

Mechanical triggers, whether based on book value or market value, can be set at either high or low levels. Setting a high trigger would activate in advance of bank stress. Alternatively, a low trigger would require the bank to be in a worse financial position before activating. In theory, high triggers could prevent a bank from entering a period of significant stress, whereas low triggers could make resolution easier or allow a bank to recover.¹⁰⁶ Finally, nothing restricts CoCos from having more than one trigger or from having triggers that utilize a mixture of mechanical and discretionary features. CoCos can theoretically contain multiple triggers that can be activated under different circumstances. For instance, the first trigger could convert the bond to equity, and the second trigger could impose a change in governance structure or voting rights.¹⁰⁷

4. *Additional Differences*

CoCos are different in other respects from regular bonds issued by banks. By design, most CoCos have no maturity

¹⁰⁴ For example, global systemically important banks are subject to the TLAC rule, which stands for total loss-absorbing capacity. TLAC is long-term debt that can be written down or converted into equity to recapitalize the entity as it goes through resolution. But note that the trigger occurs after the entity is insolvent, that is, when it is a gone concern. *TLAC—Executive Summary*, BANK FOR INT’L SETTLEMENTS (June 24, 2017), <https://www.bis.org/fsi/fsisummaries/tlac.pdf> [<https://perma.cc/BS7C-AXHF>].

¹⁰⁵ Avdjiev, Kartasheva & Bogdanova, *supra* note 89, at 45.

¹⁰⁶ FIN. STABILITY OVERSIGHT COUNCIL, *supra* note 83, at 11.

¹⁰⁷ Kaal & Henkel, *supra* note 18, at 230–31.

date, as they are perpetual bonds.¹⁰⁸ This feature minimizes any legal and financial risks that can arise when banks re-issue new bonds.¹⁰⁹ The perpetual nature of CoCos makes them more similar to equity, which also has no maturity date, in contrast to typical bonds. In times of stress, perpetual instruments can absorb losses without the need to weigh how close a bond might be to its maturity date. To be sure, banks that issue CoCos can “exercise a call option to repurchase the bonds, but not without prior supervisory approval, and only after a minimum of five years.”¹¹⁰ In addition, “unlike typical bonds,” the stipulated interest payments “are contingent on the bank’s ability to maintain its capital above required levels.” If the bank’s capital falls “below that threshold, the bank can exercise the option not to make the coupon payment.” If an interest payment is missed, it is not repaid at a later date (i.e., interest payments are “non-cumulative”).¹¹¹ This is another way in which CoCos can “absorb” losses.

B. Deutsche Bank (2016)

First designated as a global systemically important financial institution in 2011, Deutsche Bank experienced its own CoCos-related crisis in 2016.¹¹² This was primarily tied to “confusion around a technical point in regulations . . . where the European Union’s Capital Requirements Directive” demanded that banks subject to the regulations meet common equity Tier 1 capital requirements before paying dividends or discretionary coupons.¹¹³ Because CoCo coupons qualify as discretionary coupons, markets became concerned that Deutsche Bank

¹⁰⁸ See Avdjiev, Kartasheva & Bogdanova, *supra* note 89, at 48 (noting that “[i]n the Basel III framework, all AT1 instruments must be perpetual,” so the CoCos that fall under the AT1 category must be perpetual bonds).

¹⁰⁹ See BANK FOR INT’L SETTLEMENTS, *supra* note 10.

¹¹⁰ Joanne Wu, *Investors’ Trash, Taxpayers’ Treasure: The Banco Popular Wipeout and Contingent Convertible Bonds*, 22 N.C. BANKING INST. 405, 417 (2018).

¹¹¹ *Id.* at 418.

¹¹² *Policy Measures to Address Systemically Important Financial Institutions*, FIN. STABILITY BD. (Nov. 4, 2011), <https://www.fsb.org/wp-content/uploads/Policy-Measures-to-Address-Systemically-Important-Financial-Institutions.pdf> [<https://perma.cc/J7BL-EBZE>]; Jamie McGeever, *Deutsche Bank CoCo Bonds Trading Surges as Crisis Deepens*, REUTERS (Sept. 28, 2016), <https://www.reuters.com/article/us-deutsche-bank-bonds/deutsche-bank-coco-bonds-trading-surges-as-crisis-deepens-idUSKCN11Y1RQ/> [<https://perma.cc/M9NW-55KT>].

¹¹³ PAUL GLASSERMAN & ENRICO PEROTTI, WORLD SCI. STUD. IN INT’L ECON., ACHIEVING FIN. STABILITY: THE UNCONVERTIBLE CoCo BONDS 320 (2017).

might not make its CoCo coupon payment when it reported an unexpectedly large loss in January 2016.

Deutsche Bank shares hit then-record lows in September 2016 after fines from the U.S. Justice Department and reports that the German government would not be stepping in to help threw even more doubt onto the bank's capital reserve position. To put it in perspective, the bank erased 65% of its market value, falling from \$50 billion to \$16 billion.¹¹⁴ Deutsche Bank did this on its own. After a "string of scandals—including a £1.7 billion fine for rigging [the London Interbank Offered Rate],"¹¹⁵ co-CEO John Cryan announced a new initiative to exit ten countries, suspend dividends, and cut jobs.¹¹⁶ But when the United States fined Deutsche Bank \$14 billion, concerns began to mount regarding its capital reserves and ability to pay coupons.¹¹⁷

Analysts believed "any fine topping €5 billion would force it to raise fresh funds . . . by tapping shareholders for cash."¹¹⁸ In fact, asset managers stated that "[Deutsche Bank was] just too close to the wire. They said they were going to pay [CoCo coupons] today, but they could just as easily have said they were going to skip. It's not worth the risk."¹¹⁹ In terms of actual conversion or write-down, though, Deutsche Bank was never in danger of being forced to do so. "Deutsche Bank's CoCos trigger[ed] at a common equity Tier 1 (CET1) capital ratio of 5.125%, and the bank's ratio" during the first quarter was "10.7%, staying well above the trigger."¹²⁰

This episode shows the cold reality of publicly available information, regulatory triggers, and the CoCos market. When analysts saw the bank start to falter, CoCo volatility skyrocketed

¹¹⁴ Evelyn Cheng, *Deutsche Bank Crisis: How We Got Here, and Where We Are*, CNBC, (Sept. 28, 2016), <https://www.cnbc.com/2016/09/28/deutsche-bank-crisis-explained.html> [<https://perma.cc/4DC9-W4K3>].

¹¹⁵ Jill Treanor, *Deutsche Bank: How Did a Beast of the Banking World Get into this Mess?*, THE GUARDIAN (Sept. 27, 2016), <https://www.theguardian.com/business/2016/sep/27/deutsche-bank-how-did-a-beast-of-the-banking-world-get-into-this-mess> [<https://perma.cc/Q3CQ-YR3Q>].

¹¹⁶ Cheng, *supra* note 114.

¹¹⁷ Jill Treanor, *The \$14bn Deutsche Bank Fine—All You Need to Know*, THE GUARDIAN, (Sept. 16, 2016), <https://www.theguardian.com/business/2016/sep/16/deutsche-bank-14bn-dollar-fine-doj-q-and-a> [<https://perma.cc/P5HH-XFA7>].

¹¹⁸ *Id.*

¹¹⁹ John Glover, *Deutsche Bank CoCo Bonds Have Bumpy Ride as Lenders Struggle*, BLOOMBERG, (Jan. 29, 2016), <https://www.bloomberg.com/news/articles/2016-01-28/deutsche-bank-coco-investors-have-bumpy-ride-as-lender-struggles> [<https://perma.cc/BQ37-B3YQ>].

¹²⁰ GLASSERMAN & PEROTTI, *supra* note 113.

because it was not clear that the bank would make coupon payments.¹²¹ Markets could see the entire playbook. Even though risk of conversion was relatively low, Deutsche Bank was in trouble because its CET1 ratio crept closer to the CoCo automatic conversion threshold, meaning it would have to conserve capital by skipping coupon payments. If regulators act with transparency, markets make decisions for them. In this instance, having opacity in bank and regulator decisions concerning CoCos would have mitigated the extremity of market concerns regarding Deutsche Bank.

C. Banco Popular (2017)

Banco Popular was Spain's sixth largest bank, and at the end of the first quarter in 2017, the bank had assets of €147 billion and equity book value of about €11 billion. The bank made a discretionary coupon payment on its CoCos in April 2017, which indicated that the bank had not breached its minimum capital ratio.¹²² Unfortunately, however, the bank had loan losses and non-performing assets that required increased provisions.¹²³ In early 2017, Banco Popular's management tried to sell the bank (in a private sale) so that a new buyer could stabilize the situation, but no buyer emerged.¹²⁴ Depositors became increasingly concerned with the situation at the bank and began withdrawing their deposits, leading to a worsened liquidity position.¹²⁵ In May 2017, several press articles reported on those worsening financial positions and the potential liquidity crisis that the bank faced.¹²⁶ More deposit withdrawals followed, forcing the bank to request emergency liquidity assistance from the Bank of Spain (the Spanish central bank) on June 5, 2017.¹²⁷

¹²¹ Katherine Gleason, Steve Bright, Francis Martinez & Charles Taylor, *Europe's CoCos Provide a Lesson on Uncertainty 2* (Off. of Fin. Rsch., Working Paper No. 17-02, Apr. 5, 2017).

¹²² Tom Beardsworth, *How Spain's Zombie Bank Rescue Snares Bondholders: QuickTake Q&A*, BLOOMBERG (June 7, 2017), <https://www.bloomberg.com/news/articles/2017-06-07/how-spain-s-zombie-bank-rescue-snares-bondholders-quicktake-q-a> [<https://perma.cc/9ASY-TS29>].

¹²³ *Id.*

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ See, e.g., Jeannette Neumann & Giovanni Legorano, *Southern Europe's Most Troubled Lenders Stumble Toward Solutions*, WALL ST. J. (Jun. 5, 2017), <https://www.wsj.com/articles/southern-europes-most-troubled-lenders-stumble-toward-solutions-1496684613> [<https://perma.cc/2EDE-S2T4>].

¹²⁷ Beardsworth, *supra* note 122.

On June 6, 2017, the European Central Bank (“ECB”) deemed the bank “failing or likely to fail” based on the deterioration of the bank’s liquidity position.¹²⁸ Specifically, the ECB deemed Banco Popular to be at the point of non-viability (“PONV”)—the point when a bank is insolvent and unable to pay at least a part of its debts—put the bank into resolution, and triggered its CoCos.¹²⁹ Based on the terms of the CoCos, the holders of the CoCos were wiped out, all Tier 2 capital was converted into stock, and the bank was acquired by Banco Santander for a single Euro.¹³⁰

Prior to the sale in 2017, the highest market values of the two issuances of CoCo bonds were at 105% and 92% of face value; and immediately before the news of the Santander takeover, the bank’s CoCos were still trading at around 50% of face value. The combined face value of the CoCos was €1.25 billion.¹³¹ Converting the CoCos prior to the liquidity crisis could have made a difference in preserving the financial health of Banco Popular, given that in early 2017, the bank (and possibly the regulators) became aware of the loan losses and potential insolvency, but a liquidity crisis had not yet begun. The bank could have roughly doubled its capital ratio, giving it additional room to absorb the loan losses and prepare for the risk of the non-performing assets. A healthier balance sheet could have made it a more attractive bank to purchase, and the bank might have avoided the negative press about its financial position. But, as demonstrated by theory and lived experience, converting the CoCos after the bank was in financial trouble made little difference.

D. Credit Suisse (2023)

Credit Suisse was one of the largest banks in Switzerland and was designated a globally important financial institution.¹³² During the Global Financial Crisis, Credit Suisse was

¹²⁸ *Id.*

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ Robert Smith & Mehreen Khan, *Banco Popular CoCo Bonds Wiped Out After Santander Takeover*, FIN. TIMES (Jun. 7, 2017), <https://www.ft.com/content/791c89b3-065e-32aa-84b0-80e2ab25c062> [<https://perma.cc/Y9TU-JTX5>].

¹³² CREDIT SUISSE GROUP, G-SIB INDICATORS (Dec. 31, 2022) (available at <https://www.credit-suisse.com/about-us/en/investor-relations/financial-regulatory-disclosures/regulatory-disclosures/g-sib-indicators.html> [<https://perma.cc/V3KG-2Z6Q>]).

less affected than its peers: while the Swiss National Bank, the central bank of Switzerland, rescued rival UBS by purchasing \$60 billion of UBS's toxic assets and \$5.3 billion in stock, Credit Suisse privately raised only \$9 billion from investors to successfully weather the crisis.¹³³ However, from 2008 through 2023, Credit Suisse's investment banking arm incurred significant losses for the institution.¹³⁴ It also experienced a series of scandals, including losses in its investment arm due to the collapses of Archegos Capital and Greensill Capital in 2021.¹³⁵ Social media rumors about the bank's precarious position contributed to 111 billion Swiss francs (\$121 billion) leaving its wealth management business in late 2022.¹³⁶

In early 2023, stemming from the banking crisis in the United States, there was much speculation about the financial viability of Credit Suisse, and depositors began asking questions and demanding withdrawals.¹³⁷ The failure of three banks over the course of five days in the United States had caused bank stocks around the world to take a sharp dive.¹³⁸ Investors, depositors, and regulators appeared to have been caught off-guard and began to question which bank would fail next. Instead of projecting confidence at a crucial moment, Credit Suisse admitted on March 14, 2023, in its annual report that it had "found material weaknesses in its financial reporting."¹³⁹ The next day, Credit Suisse's

¹³³ Elena Logutenkova & Warren Giles, *Switzerland Bails Out UBS; Credit Suisse Raises Funds*, BLOOMBERG (Oct. 16, 2008), <https://www.bloomberg.com/news/articles/2008-10-16/switzerland-gives-ubs-a-bailout-credit-suisse-raises-funds> [https://perma.cc/7YBD-2NC3].

¹³⁴ Anshuman Daga, *What Happened at Credit Suisse and How Did It Reach Crisis Point?*, REUTERS (Mar. 18, 2023), <https://www.reuters.com/business/finance/credit-suisse-how-did-it-get-crisis-point-2023-03-16/> [https://perma.cc/F2H4-9LHC].

¹³⁵ Julia Kollewe, *Credit Suisse 'Seriously Breached' Obligations on Greensill, Says Regulator*, THE GUARDIAN (Feb. 28, 2023), <https://www.theguardian.com/business/2023/feb/28/credit-suisse-greensill-swiss-bank-finma> [https://perma.cc/P6A3-GCWV].

¹³⁶ Johann Scholtz, *Credit Suisse Hit by Massive Outflows*, MORNINGSTAR (Apr. 24, 2023), <https://www.morningstar.co.uk/uk/news/234400/credit-suisse-hit-by-massive-outflows.aspx> [https://perma.cc/8MRW-A9AW].

¹³⁷ Daga, *supra* note 134.

¹³⁸ Jesse Pound, *Financial Shares Fall as Credit Suisse Becomes Latest Crisis for the Sector*, CNBC (Mar. 15, 2023), <https://www.cnbc.com/2023/03/15/financial-shares-fall-as-credit-suisse-becomes-latest-crisis-for-the-sector.html> [https://perma.cc/P94F-Z66Z].

¹³⁹ Margot Patrick, *Credit Suisse Finds Material Weaknesses in Financial Reporting*, WALL ST. J. (Mar. 14, 2023), <https://www.wsj.com/articles/>

largest investor declined to offer additional financial support to the struggling bank, causing its share price to decline by 24%.¹⁴⁰

To stem the outflow and to improve Credit Suisse's financial position, on March 15, 2023, the Swiss National Bank provided an emergency line of credit of 50 billion Swiss francs (\$55 billion).¹⁴¹ Despite the emergency funding, daily deposit withdrawals continued to grow.¹⁴² At the same time, one-year credit default swaps tied to Credit Suisse spiked to a level unseen since the Global Financial Crisis.¹⁴³ Of note, credit default swaps (CDS) act as a form of insurance that protect the CDS holder against the default by the underlying financial entity. An increase in the CDS spread, or the difference between the CDS price and the yield on a risk-free asset, signifies an increase in the likelihood of a default. In Credit Suisse's case, creditors and investors began preparing for a scenario where the bank might be unable to pay its debts.

Due to the public outrage against the Swiss authorities' 2008 rescue of UBS with government funding, the Swiss government was unwilling to commit a large amount of public money to rescue Credit Suisse and, instead, ordered UBS to plan an emergency acquisition.¹⁴⁴ The acquisition negotiations were led by the Federal Department of Finance, Swiss National Bank, and the Swiss Financial Market Supervisory Authority (FINMA).¹⁴⁵ On March 19, 2023, the Swiss Federal Council exercised emergency powers to allow the merger to take place without the approval of Credit Suisse's shareholders

credit-suisse-finds-material-weaknesses-in-financial-reporting-f14b2ce9 [https://perma.cc/MX9L-XW2A].

¹⁴⁰ Johanna Englundh, *Credit Suisse's Demise: A Timeline of Scandal and Failures*, MORNINGSTAR (Mar. 21, 2023), <https://www.morningstar.hk/hk/news/233221/credit-suisse-demise-a-timeline-of-scandal-and-failures.aspx> [https://perma.cc/MSF5-BHX9].

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ Tasos Vossos, *Credit Suisse Default Swaps Are 18 Times UBS, 9 Times Deutsche Bank*, BLOOMBERG (Mar. 15, 2023), <https://www.bloomberg.com/news/articles/2023-03-15/credit-suisse-one-year-default-swaps-near-1-000-basis-points> [https://perma.cc/XC7B-7LAJ].

¹⁴⁴ Noele Illien, *UBS Completes Credit Suisse Takeover to Become Wealth Management Behemoth*, REUTERS (Jun. 12, 2023), <https://www.reuters.com/markets/europe/ubs-completes-swiss-mega-merger-gains-clout-global-wealth-player-2023-06-12/> [https://perma.cc/6S5C-BE4C].

¹⁴⁵ *Id.*

and also to provide Credit Suisse with additional liquidity assistance.¹⁴⁶

During the acquisition negotiation, the three largest shareholders of Credit Suisse—the Saudi National Bank’s Public Investment Fund, Olayan Group, and Qatar Investment Authority, together owning about a quarter of the outstanding stock of the company—made a strong push to increase the valuation of the bank and, hence, a higher return for the shareholders.¹⁴⁷ The final price of the acquisition was agreed upon immediately before the opening of the market on March 20, 2023, and valued the bank at 3 billion Swiss francs (\$3.2 billion).¹⁴⁸ The transaction was an all-stock deal, with Credit Suisse shareholders receiving 1 UBS share for 22.48 shares of Credit Suisse.¹⁴⁹ As part of the deal, however, 16 billion Swiss francs (\$17.2 billion) of CoCos were written down to zero on FINMA’s authorization. Recall that CoCos can have multiple types of triggers. Credit Suisse’s bonds could be written down either when its capital fell below a certain rate, or by regulatory discretion. Prior to the point where Credit Suisse could lose enough capital to activate the mechanical trigger, FINMA stepped in and wrote down Credit Suisse’s CoCos.¹⁵⁰

¹⁴⁶ *Id.*

¹⁴⁷ Summer Said, Julie Steinberg, Margot Patrick & Stephen Kalin, *Credit Suisse Collapse Burns Saudi Investors*, WALL ST. J. (Mar. 20, 2023), <https://www.wsj.com/articles/credit-suisse-collapse-burns-saudi-investors-3f096a07> [<https://perma.cc/E87N-FSNC>].

¹⁴⁸ Press Release, Credit Suisse, *Credit Suisse and UBS to Merge* (Mar. 19, 2023), <https://www.credit-suisse.com/about-us-news/en/articles/media-releases/credit-suisse-and-ubs-to-merge-202303.html> [<https://perma.cc/FTV5-55QG>].

¹⁴⁹ *Id.*

¹⁵⁰ FINMA, *FINMA Provides Information About the Basis for Writing Down AT1 Capital Instruments* (Mar. 23, 2023), <https://www.finma.ch/en/news/2023/03/20230323-mm-at1-kapitalinstrumente/> [<https://perma.cc/2YKL-9M9N>].

This constituted the largest write-down of CoCos in history and imposed a larger loss on the CoCo bondholders than on the shareholders of the bank.¹⁵¹ Because Credit Suisse's CoCos were prohibited from being sold to retail investors in the European Union, a large amount of loss was inflicted on foreign investors, particularly those from Asia, who are now suing.¹⁵² The following table shows the breakdown of the CoCo bonds that were on Credit Suisse's books prior to its failure in March 2023.¹⁵³

Table 2: Credit Suisse CoCos in March 2023

Issue Date	Coupon Rate	Consequence	CoCo Trigger (Capital Ratio)	Amount Issued (Millions)
6/23/22	9.75%	Write Down	7%	\$1,650
12/9/20	4.5%	Write Down	7%	\$1,500
8/11/20	5.25%	Write Down	7%	\$1,500
1/24/20	5.1%	Write Down	7%	\$1,000
9/11/19	3%	Write Down	7%	\$529
8/21/19	6.375%	Write Down	7%	\$1,750
6/6/19	5.625%	Write Down	7%	\$550
9/12/18	7.25%	Write Down	7%	\$1,500
9/4/18	3.5%	Write Down	7%	\$308
7/16/18	7.5%	Write Down	7%	\$2,000
3/22/17	3.875%	Write Down	7%	\$202
6/18/14	6.25%	Write Down	5.125%	\$2,500
12/11/13	7.5%	Write Down	5.125%	\$2,250

Again, we see that the CoCos were triggered quite late in the process—when Credit Suisse was already experiencing a liquidity crisis. In that moment, it is liquidity that matters, not capital.

¹⁵¹ *Id.*

¹⁵² Rebecca Feng, *Credit Suisse's Risky-Bond Wipeout Hurts Asia's Rich*, WALL ST. J. (Apr. 11, 2023), <https://www.wsj.com/articles/credit-suisse-risky-bond-wipeout-hurts-asias-rich-a502ce> [<https://perma.cc/XBZ5-835F>].

¹⁵³ We obtained information on these CoCos from Bloomberg and identified Credit Suisse's bonds using its ticker symbol "CS." We dropped any bonds labeled as Tier 2, matured bonds, bonds which had already reached their first call date, and any duplicates which arose from having separate CUSIPS for privately traded versions of the same bond. Bloomberg L.P. (database updated Jan. 2024).

E. The Experiment Has Failed

Given the experiences of the past decade, one would be hard-pressed to argue that CoCos have succeeded in their original mission of pulling banks back from the brink. Instead, they have caused greater panic, as in the case of Deutsche Bank; and they have failed to prevent the collapses of Banco Popular and Credit Suisse. We believe that CoCos, at least in their current form, are a failed regulatory experiment, and we offer a path forward for improvement in the next Part.

To play devil's advocate, some may argue that CoCos (and other forms of contingent bail-in capital) *have* succeeded—just in a different way. Take the Credit Suisse scenario as an example. It is true that contingent capital couldn't resolve the liquidity crisis and rescue the bank, but that's why central banks exist. Central banks can rain money down from the heavens to ensure that troubled banks can survive a liquidity crisis. While CoCos cannot mitigate a liquidity crisis, they can be used to facilitate the sale of troubled banks (e.g., Credit Suisse) to a healthier bank (e.g., UBS) during a panic, and the absorption of the troubled bank by the healthier bank prevents the panic from transforming into a system-wide crisis.

We do not dispute that CoCos can potentially work for that purpose. When a buyer like UBS ponders whether to buy a distressed bank like Credit Suisse, Credit Suisse shareholders are more likely to approve, or at least less likely to resist, the acquisition when authorities trigger CoCos and wipe out billions of dollars' worth of Credit Suisse debt. By writing down CoCos, existing shareholders get to retain a larger portion of the bank's equity and, subsequently, realize a larger return from a buyout. CoCos can sweeten the deal. However, what we just described is antithetical to the original motivation of having CoCos. In the aftermath of the Global Financial Crisis, lawmakers and regulators were concerned about bailouts and wanted to create a regulatory instrument that prevented bailouts and had private investors take the loss. CoCos are now ironically used to *facilitate* bailouts. Indeed, there is no doubt that Credit Suisse's shareholders were bailed out by the Swiss government with the aid of CoCos. This reality is far removed from the original intent of giving a troubled bank a shot in the arm (of contingent capital) to keep the bank going strong.

III

IS THE REGULATORY EXPERIMENT SALVAGEABLE?

As noted in the introduction, many of the world's largest and most important banks hold billions of dollars' worth of CoCos on their balance sheets. Yet, these bonds are unlikely to make any substantive difference in calming a panic when a liquidity crisis materializes. Can global regulators, including those in the United States, create an improved version of these convertible bonds that can achieve the original goal? The answer may be "yes," at least in limited circumstances. However, for CoCos to work properly, two important conditions must be satisfied: (a) an early intervention and (b) information obfuscation. In this Part, we discuss these conditions in detail and then map out various legal and policy challenges to successful implementation.

To be clear, we are not suggesting that CoCos must be salvaged. Indeed, the reader might find many of the legal and policy challenges to be overwhelming (i.e., the costs outweigh the benefits). What we are arguing is that, if the CoCos regulatory regime is to be redeemed, the new version should incorporate an early intervention and information obfuscation. Otherwise, CoCos will continue to be a failed regulatory experiment.

A. Early Intervention and Information Obfuscation

To stave off a liquidity crisis, regulators need to intervene early (i.e., before liquidity issues arise) and focus on information obfuscation (i.e., make sure that the bank subject to regulatory intervention is not identifiable by the public). Especially with respect to the latter, by creating a regulatory mechanism that reduces information outflow, regulators will prevent the market from learning which institution is nearing failure and thereby reduce the incidence of a bank run occurring in the first place.

We offer three concrete proposals: (1) regulators should trigger the conversion as early as possible; (2) CoCos should not be converted or written down based on a publicly available market measure such as the bank's stock price; and (3) regulators should seek to trigger CoCos at as many banks as possible to create a "pooling" equilibrium.

1. *Regulators Should Trigger CoCos Early*

As we described earlier, there is a clear distinction between a liquidity crisis and insolvency. Once a liquidity crisis

materializes, simply replenishing the equity side of the balance sheet (without a liquidity injection) would be insufficient. It does nothing in terms of allowing the bank to satisfy all the withdrawal demands.

At the same time, an insolvency issue (e.g., due to a reduction in asset value) is often a harbinger of a future liquidity crisis. When investors (including depositors) realize that a bank may not have sufficient assets to satisfy its liabilities, the realization could lead to a liquidity crisis and a run. What this implies is that, for CoCos to be effective in preventing a liquidity crisis, regulators should provide the equity injection as early as possible. Improving the solvency of a bank early on would minimize the chances of a bank run starting and then getting out of hand.

The experiences of Banco Popular and Credit Suisse are exemplary. Both banks suffered from holding bad (depreciating) assets, either in the form of bad loans or bad investments, that substantially reduced the amount of equity outstanding. When market participants became aware of the balance sheet problem, they began speculating, and this ultimately led to a run on the banks. By the time the runs began, writing down the outstanding CoCos (and reducing the banks' overall liabilities) were of little to no help. Regulatory authorities still had to engineer a merger with a healthier bank to avoid a complete liquidation. One has to wonder what would have happened to Banco Popular and Credit Suisse had the conversions occurred earlier in the timeline. Had the equity been replenished earlier, the banks might have had a better chance to survive on their own without having to rely on a drastic intervention.

An important point to note here is that triggering CoCos early is only possible if regulatory agencies have broad supervisory and discretionary powers over financial institutions. More specifically, bank supervisors have access to a more accurate view of a bank's financial health sufficiently ahead of the public. Furthermore, bank supervisors are *not* required to disclose the information to the public. Bank supervisory examinations are notoriously secret; many critics have argued that they are too secretive.¹⁵⁴ Regardless, bank examiners have the equivalent of inside information about a bank's financial

¹⁵⁴ See Peter Conti-Brown, *The Curse of Confidential Supervisory Information*, BROOKINGS (Dec. 20, 2019), <https://www.brookings.edu/articles/the-curse-of-confidential-supervisory-information/> [<https://perma.cc/KQ6F-AJSP>] (taking a critical view of confidential supervisory information); Schooner, *supra* note 44 at 389–90 (noting that some believe bank regulators are too secretive).

position much earlier than what the public can discern. In this context, that means injecting equity when they see an asset-liability imbalance that is significant enough to cause trouble in the not-too-distant future. Regulators should use their “inside information” to their advantage before it becomes public and destabilizing.

2. *Challenges of Using a Market-Based Trigger*

Relatedly, regulators must be cautious about allowing for market-based conversion triggers like in the Deutsche Bank example. Recall that Deutsche Bank’s CoCos experienced extreme price volatility, and its share price fell based on fears that its capital would fall below the market-based trigger. Despite the bank’s capital remaining high above the trigger level, investors could envision a scenario playing out where losses and fines would force the CoCos to trigger. There are at least two issues related to using market-based triggers. The first is how high (or low) the threshold should be set, and the other is whether CoCos should have a market-based trigger at all.

Assuming that a market-based trigger is to be used, as other commentators have noted,¹⁵⁵ and consistent with our earlier point about regulators injecting equity sufficiently early, it seems clear that the threshold should be set at a relatively high level so that equity injection can occur well in advance of any potential liquidity crisis. More importantly, however, with respect to the second point, we argue that utilizing a market-based trigger can potentially create a self-fulfilling liquidity crisis (a “death spiral” of sorts) and could result in additional uncertainty.

To see why, imagine a scenario where the conversion were to occur when the ratio of the bank’s equity to assets falls below 10%. Setting the trigger point at 10% signals to the market that a bank with an equity-to-asset ratio of 10% or less may be facing a crisis and requires an equity injection. As the bank’s asset values start declining and the ratio converges to 10%, the market will infer that the bank may be nearing the (pre-set) crisis point. As more and more market participants expect the bank to fall below that threshold, their actions will cause the stock price to react adversely and possibly result in the crisis itself.

Optimistically, converting the CoCos may restore the bank’s equity and forestall a liquidity crisis. This is the “good

¹⁵⁵ See GLASSERMAN & PEROTTI, *supra* note 113.

equilibrium.” However, to the extent that a pre-set, market-based trigger can send an adverse signal to the market and potentially create a liquidity crisis—the “bad equilibrium”—using market-based triggers is a bad idea. By relying (almost) exclusively on regulators’ discretion for converting CoCos, we could reduce the chances of creating a self-fulfilling liquidity crisis.

3. *Signal Jamming*

Perhaps the most difficult challenge in designing a more effective bail-in mechanism is ensuring that the conversion itself does not cause an adverse market reaction and a possible liquidity crisis. Although banking agencies do not have to publicly disclose what they find during their examinations, they cannot keep everything a secret. Once they decide to trigger the CoCos at a bank, news will spread quickly. In fact, given that most CoCos are publicly traded, the trigger event becoming public news is inevitable. First, the holders of those bonds will be notified that their bonds are being converted or written down. The financial world will find out minutes later—maybe even seconds later. Upon learning this news, the market will have a natural response: “Wait, what did the regulators just do? Is there something wrong with the bank or even in the banking sector? Do they know something that we don’t? Should we be worried?” Once an adverse market reaction is created, it may be a short hop, skip, and a jump away from a full-blown liquidity crisis.

How do we create a system in which triggering CoCos can take place for a specific bank without creating a broader market panic? This is where information obfuscation comes into play again. Although regulators cannot keep the conversion a secret, they may be able to keep secret which individual bank is experiencing weakness. One way is to *force a conversion at other banks simultaneously*. That is, instead of converting or writing down CoCos only at Bank A—the bank that is experiencing financial problems—regulators can also convert CoCos at Banks B and C, which may look similar to Bank A (but without the financial troubles). By pulling the trigger at all three banks, regulators make it much more difficult for the market participants to draw an adverse inference on any particular bank. If the concern is that such a coordinated trigger can bring down all three banks, the regulators can possibly draw an even wider circle. For example, if there is weakness at one or two regional banks, regulators could trigger CoCos at every

regional bank (i.e., draw a circle around the bank's entire peer group).¹⁵⁶

While the idea of converting CoCos at financially healthy banks may seem radical, this is analogous to what occurred during the Global Financial Crisis when U.S. authorities forced the largest banks to all accept the same equity infusion at the same time. Some of those banks were "just fine" and did not want the additional equity while other banks truly needed the equity. The authorities made the right call—from an information obfuscation perspective—by subjecting the largest banks to the same equity injection. Once all banks "agreed" to take the equity injection from the authorities, the market had a much more difficult time identifying which bank may be the most vulnerable and triggering a liquidity crisis.

The actions of pre-Federal Reserve private bank clearing houses that "acted as lenders-of-last-resort" show that information obfuscation is a lesson that banking systems have relied on for generations.¹⁵⁷ To stem bank runs, the clearing houses created clearing house loan certificates, a "form of private money that could be used in the clearing process instead of cash" that was a "joint liability of clearing house members."¹⁵⁸ Once a crisis began, clearing houses would stop publication of bank-specific information, and a bank financial health committee would conduct special examinations of certain banks, then issue certificates of financial health "even if privately the Clearing House Committee had reservations about the bank's solvency."¹⁵⁹ These actions served to change depositors' beliefs by "focus[ing] their attention on the solvency of the banking system . . . rather than individual banks."¹⁶⁰ Information obfuscation of individual banks was key to maintaining the stability of the entire system.

¹⁵⁶ An implicit assumption is that the market is not already targeting one specific weak bank. For example, if everyone knows that Credit Suisse is spiraling out of control, then there is no point for the authorities to signal jam by triggering CoCos at peer institutions. By then, Credit Suisse is doomed because everyone has that information. The point of signal jamming is to prevent everyone from obtaining the information in the first place.

¹⁵⁷ Gorton, *supra* note 64, at 836.

¹⁵⁸ *Id.* at 837.

¹⁵⁹ *Id.* at 838.

¹⁶⁰ Gary Gorton & Ellis W. Tallman, *How Did Pre-Fed Banking Panics End?* 29 (Nat'l Bureau of Econ. Rsch., Working Paper No. 22036, Feb. 2016), https://www.nber.org/system/files/working_papers/w22036 [<https://perma.cc/SC3P-DWHB>] (emphasis added).

In short, surviving a financial panic requires navigating a game of “who knows what?” Information is the most valuable and potent commodity in such times, and regulators should make the public’s acquisition of information as difficult as possible. While this suggestion may appear counterintuitive—as we are all taught to be pro-transparency—it will prevent a panic at a set of institutions from metastasizing into a full-blown financial crisis.

B. Equity Conversion v. Write-down

Before we examine the obstacles to our proposed reforms, another aspect of CoCos is worth discussing—whether CoCos should convert into equity or be written down to zero.¹⁶¹ First, we observe that, from the perspective of improving the bank’s balance sheet, either a conversion or a write-down mechanism can work equally well. The reason is that, in either case, the same amount of CoCos (i.e., the same amount of debt) will disappear from the liability side of the bank’s balance sheet. If the bank’s total assets remain the same, this will lead to a corresponding increase in the bank’s equity, thereby improving the bank’s overall solvency.

To see this magical disappearing act numerically, consider a bank with \$100 in assets, \$80 in liabilities, and \$20 in equity (or “capital”). Within the \$80 of liabilities, suppose \$60 are in the form of deposits and \$20 are from the issuance of CoCos. If the CoCos are converted into equity, then liabilities fall from \$80 to \$60, and equity increases from \$20 to \$40. That’s straightforward. If the CoCos are instead written down to zero, then liabilities again fall from \$80 to \$60. Since assets are unchanged at \$100, we see that the equity stack still increases from \$20 to \$40 (because \$100 assets minus \$60 liabilities is \$40 in equity). Regardless of which option is picked, the bank’s *aggregate* equity stack rises from \$20 to \$40, which improves the solvency of the bank.

Although the aggregate impact on the bank’s solvency is the same, the *distributional* impact is not equal. How much of the equity will go to the CoCo bondholders as opposed to the shareholders? An equity conversion allows the bondholders to convert their CoCos into equity—possibly of equal market value—while a write-down mechanism simply eliminates the outstanding bonds, preventing the bondholders from capturing

¹⁶¹ Recall that CoCos can be designed to (a) transform its holders from debt-holders to shareholders or (b) wipe out its holders’ positions entirely.

any of the bank's equity. We can think of these two options along a spectrum. At one end of the spectrum, we can set the conversion ratio to be such that the market value of the CoCos is fully protected after the conversion, and the bondholders receive equity that is of equal market value.¹⁶² For instance, suppose the market value of a single CoCo bond share is \$100 while the market value for each share of common stock is \$25. In order to fully protect the CoCo bondholders, we need to set the conversion ratio at 4. That is, for each share of CoCo bond, the bondholder will receive 4 shares of common stock. As we decrease the conversion ratio, the bondholders will receive the amount of equity that is less than the value of the bond. And when we reach the other end of the spectrum, we set the conversion ratio to zero, in effect, creating a write-down bond. Using the same market value numbers, when the conversion ratio is set at 2, for instance, \$100 of CoCos will convert to 2 shares of common stock, which is worth \$50. If the conversion ratio is set at zero, CoCo bondholders will not receive anything and "conversion" will effectively be subject to a write-down.

At a high level, this problem appears to have a simple solution: from a financial incentive perspective, the mere presence of moral hazard suggests that regulators should prefer equity conversions (that fully or partially protect CoCo bondholders) over write-downs. When existing shareholders realize that their ownership positions could be diluted in the future, they will be more risk averse and elect more prudent managers of the institution. If CoCos were written down to zero instead, shareholders would not have the same fear of dilution and might not behave as carefully. Indeed, write-down CoCos could be seen as yet another handout to shareholders.

This solution, however, isn't as simple as it appears. There are two additional issues to consider. First, we are mindful of the ease (or difficulty) of implementation. Writing down CoCos to zero is easy, but converting CoCos into equity—especially when trying to value the outstanding bonds and equity—can be quite challenging. Writing down a bond is as simple as it sounds: the bondholders will not be entitled to any of the bank's future cash flows, whether as a bondholder or as a shareholder. They lose all of their claims on the bank's assets, as the bonds become null and void. On the other hand, if we

¹⁶² In fact, we can be even more generous to the bondholders by allowing them to hold onto equity that is of higher value than the CoCos and reduce the amount of equity held by the shareholders.

were to allow the bondholders to receive equity that is of equal value, this would require valuations of both the CoCos and the bank's equity. To the extent that the market may be already taking into consideration the various attributes of CoCos and the bank's equity—particularly when the bank is nearing the trigger point—naively looking at the market prices could be misleading. To estimate the value (and the conversion ratio) more accurately, regulators would need to engage in the cumbersome task of finding the right discount rate and discounting future cash flows.¹⁶³

Second, consider the division of equity. Assuming that we can accurately estimate the value of CoCos and the bank's equity, bondholders will simply receive equity of equal value to the outstanding CoCos. Since this translates to conversion of the bank's liability to equity, both of equal amount, the bank's existing shareholders and the bank's stock price will not be affected (setting aside a possible increase in value emanating from preventing a liquidity crisis). On the other hand, when CoCos are written down—since a chunk of the bank's liability is simply disappearing—the additional equity will accrue (mostly) to the bank's shareholders. In other words, while market-value-based conversion will make both the bondholders and shareholders fully protected and indifferent to a trigger, a write-down makes bondholders “losers” while allowing the bank's shareholders to receive a “windfall.”

¹⁶³ The discussion so far assumes that the regulator will either write down the bonds or attempt to convert the bonds at a ratio to fully protect the market value of the bonds. Another possibility, of course, is to rely on a pre-set (i.e., contractually determined) conversion formula. The indenture (bond contract) can contractually stipulate that the bonds will be converted at a certain (conversion) ratio. This is the convention utilized in convertible bonds. The indenture sets a “conversion price,” and the “conversion ratio” is determined by dividing the principal by the conversion price. See ABA Revised Model Simplified Indenture, Article 10 Conversion. The conversion ratio (or conversion price) can be adjusted to certain corporate actions, such as extraordinary distributions, stock dividends, reverse stock splits, etc. If we were to rely on such a pre-set conversion formula (subject to adjustments), at the time of the conversion, to the extent that the conversion ratio does not exactly track the market values of the bonds and the shares, the bondholders can be either over- or under-compensated. Compared to conventional convertible bonds, two additional points are worth briefly discussing here. First, in a conventional convertible bond, the decision to convert is given to the bondholders. By contrast, for CoCos, the conversion event is being decided by the regulator (or relies on a market-based trigger). Second, in a conventional convertible bond, conversion becomes more attractive (and more bondholders will convert to equity) when the share price is relatively high. By contrast, for CoCos, given that the purpose of conversion is to shore up the bank's solvency position, (involuntary) conversion takes place when the share price is relatively low.

This “robbing Peter to pay Paul” approach creates both *ex ante* and *ex post* challenges. From the *ex ante* perspective, when a bank initially issues CoCos to improve its future financial health and stability, the market is likely to discount a write-down bond (versus a conversion bond). When such market discount is in place, the bank will not be able to raise as much capital through the issuance of a write-down bond. Furthermore, as the bank’s financial position deteriorates, when the bondholders expect a possible write-down event, a write-down bond will trade at a steeper discount compared to a conversion bond. From the market-value (not accounting-value) perspective, a write-down event may create a smaller equity boost compared to a conversion event.

In addition, when regulatory authorities need to engineer and implement a rescue plan—such as a merger or a creation of new equity—a write-down bond, by allowing the existing shareholders to capture a larger value, can facilitate the implementation. In a forced merger, in particular, regulators may be dealing with two unhappy players: the buyer on the one hand and the existing bank shareholders on the other. To the extent that the financially troubled bank is not insolvent or bankrupt, the existing shareholders are still in control (e.g., through voting rights) of making the fundamental decisions with respect to the bank, such as a merger or a creation and issuance of new equity. When the shareholders are required to take a large haircut on their investment, they may become quite resistant against any plan that the regulatory authority would want to implement. On the other side of the transaction, a purchasing bank may also resist acquiring a financially unhealthy bank unless the bank receives assurance that it will make a positive return and minimize the downside going forward. When CoCos are written down, this creates an equity buffer that can be shared by both the recalcitrant target’s shareholders and the resistant buyer.

In fact, one can argue that this was what happened in the forced merger between UBS and Credit Suisse. Credit Suisse shareholders, led by sovereign institutional investors, expressed strong dislike over the initially proposed acquisition terms by UBS and the Swiss authorities. Although formal approval by Credit Suisse shareholders was not required, there is evidence to suggest that Credit Suisse shareholders exerted indirect pressure on regulatory authorities to increase their returns from the proposed merger. At the same time, the fact that the Swiss authorities were strong-arming UBS to acquire Credit Suisse could not have made UBS a happy and

willing partner, either.¹⁶⁴ It is possible that writing down Credit Suisse's CoCos provided the equity boost that could be shared by both the recalcitrant target's (Credit Suisse's) shareholders and the resistant buyer (UBS). This all came at the cost of Credit Suisse's bondholders, of course, who are now suing.

C. Implementation Challenges

There are, to be sure, obstacles to achieving our proposed reform package, especially if the reform package were enacted in the United States. First, there is a tension between sound banking regulation and securities law. Securities law requires affirmative disclosures of all material information—literally the opposite of information obfuscation—and the disclosure requirement would apply to all large, publicly traded financial institutions. Second, suppose that regulators convert or write down CoCos at all banking organizations, including the healthy ones. There would be angry bondholders who feel like their valuation was wiped out or diluted by the government's action. Legal challenges would follow. Third, there also is a policy question of whether regulators would be “bold enough” or “smart enough” to properly wield the powers given to them. While there may be many other issues, we focus on these three in this section.

1. Securities Law Disclosure Requirements

Securities law is built around disclosures. For any company with a publicly traded security, including stocks and bonds, the law requires the company to not make any materially misleading statements to the public and to disclose all material information. In particular, a bank with a publicly traded security in

¹⁶⁴ Another factor that could have played a role is the fact that the CoCos issued by Credit Suisse (and other Swiss financial institutions) were prohibited from being sold to retail investors within the European Economic Area (EEA), which includes both the European Union (EU) states and the European Free Trade Association (EFTA) States. See *Legal Documents*, UBS, <https://keyinvest-eu.ubs.com/legal-documents> [<https://perma.cc/29KG-X2E9>] (last visited Mar. 5, 2025) (Legacy CS and UBS registration documents). At least according to anecdotal evidence, a large fraction of the bonds was purchased by retail investors outside of EEA, particularly in Asia. See Tham Yuen-C, *Credit Suisse Bond Holders in Singapore Seek to Sue Swiss Government Over Worthless Investments* (Apr. 17, 2023), <https://www.straitstimes.com/business/credit-suisse-bond-holders-in-singapore-seek-to-sue-swiss-government-over-worthless-investments> [<https://perma.cc/FLH2-UXCN>]. It seems less likely that the Asian retail investors could have exerted any coordinated direct or indirect pressure against the Swiss regulatory authorities not to exercise their regulatory discretion.

the United States will be subject to periodic disclosure obligations, including having to file annual reports (Form 10-K) and quarterly reports (Form 10-Q) with the SEC.¹⁶⁵ Within each form, the bank will have to disclose detailed information on its operations and financial status, including various accounting measures. Such periodic disclosures will inform the investors about the financial health of the bank. In addition, the bank will also be subject to disclosure via Form 8-K of any material development within 4 business days after the relevant event.¹⁶⁶ Presumably, if a bank's CoCos have been triggered, this will require a disclosure on Form 8-K.

When a company fails to do so, it will be subject to potential sanctions by the SEC and will also be liable to investors who have relied on either the material misstatement or material non-disclosure.¹⁶⁷ The current lawsuit—based in particular on rule 10b-5 of the Exchange Act—against Credit Suisse by the investors who bought the bank's ADRs (short for American depository receipts) that are listed on U.S. securities markets serves as a good example.¹⁶⁸ According to the plaintiffs, the bank executives knowingly made false statements to the public when they represented that the bank was financially healthy

¹⁶⁵ *Exchange Act Reporting and Registration*, U.S.S.E.C., <https://www.sec.gov/resources-small-businesses/going-public/exchange-act-reporting-registration> [<https://perma.cc/2MNU-AAR7>] (last visited Jan. 3, 2025).

¹⁶⁶ The main statutory section for the periodic disclosure requirement is in Sec. Exchange Act of 1934 § 13A, 15 U.S.C. § 78m (2022). Each of the disclosure forms comes with detailed disclosure instructions that are contained in Regulations S-K and S-X. 17 C.F.R. § 229 (2020); 17 C.F.R. § 210 (2023). Form 8-K requires, among others, material operational, financial, or securities-related events. In addition to the periodic disclosures, there are also other filing requirements, including the requirement to file an annual proxy (using Form DEF14A), which also include detailed information on the firm's operations and finances. 17 C.F.R. § 240.14a-101 (2023).

¹⁶⁷ Sec. Exchange Act of 1934 § 18(a), 15 U.S.C. (2022) creates an express private cause of action against any person who makes a false or misleading file under the Exchange Act. However, for plaintiffs to prevail, they must show that they purchased or sold securities in reliance on a defective filing, the securities price was affected by the defective filing, and causation. Defendants can avoid liability by showing that they acted in good faith and without knowledge that the filing was defective. Due largely to such hurdles, plaintiffs have instead utilized section 10(b) of the Exchange Act and Rule 10b-5, which are considered to be less demanding, to bring claims. For instance, under a 10b-5 lawsuit, the fraud-on-the-market theory creates a presumption of reliance and plaintiffs can base their claims on other sources of information, such as false press releases, statements by corporate executives, and even silence in the presence of a duty to correct or update information. 17 C.F.R. § 240.10b-5.

¹⁶⁸ *Diabat v. Credit Suisse Grp. AG*, 23 Civ. 5874 (CM), 23 Civ. 6023 (CM), 23 Civ. 6039 (CM), 2024 WL 4252502, at *1 (S.D.N.Y. Sept. 19, 2024) (granting in part and denying in part motion to dismiss brought by Credit Suisse).

in late 2022 and early 2023.¹⁶⁹ Presumably, such misleading statements would have inflated the price of the security—in this case, Credit Suisse’s ADRs—leading to a loss for the investors when the “correct” information finally came out.

The disclosure obligations under securities laws impose a challenge not only because it requires the company not to make any misleading statement but also because it imposes an affirmative obligation on the companies to disclose all material information. Making a false statement—as alleged by the plaintiffs in the Credit Suisse ADR case—is one thing. But, under the law, if bank executives are aware of any adverse financial information that is material to outside investors, presumably they are under an *affirmative* obligation to disclose such information to the public. When they do so, of course, the information could trigger a liquidity crisis at the bank.

While the regulatory hurdle imposed by securities laws can be significant, we believe that our proposed reforms are still feasible and compatible.¹⁷⁰ Foremost, while public companies are subject to numerous disclosure requirements, Congress has also given the SEC the authority to exempt certain companies or securities from the registration requirement and subsequent disclosure obligations.¹⁷¹ Given the broad exemption authority given to the SEC, one possibility is to exempt financial institutions or CoCos issued by them from the disclosure obligations or, more narrowly, grant a temporary suspension from reporting obligations, possibly in coordination with bank regulators.

Second, even if a broad or temporary exemption is not feasible, under our proposal, bank regulators would act on *confidential information supplied by bank examiners*. These supervisory outputs are confidential by design. They are not disclosed to the public, and there is no expectation of disclosure.¹⁷² To be sure, once it comes time to file a quarterly

¹⁶⁹ *Id.* at *3–4.

¹⁷⁰ One straightforward solution is to exempt financial institutions (that are under the supervision of banking authorities) from the disclosure requirements through regulation. Setting such a regulatory solution aside, we focus in this section on how our regulatory proposal can work within the existing securities law framework.

¹⁷¹ In 1996, Congress added Sec. Exchange Act of 1934 Act § 36, 15 U.S.C. § 78mm (1996), which provides that the SEC may exempt persons, transactions, or securities from disclosure requirements if doing so is in the public interest and also consistent with investor protection. The exemption may be granted by rule, regulation, or order.

¹⁷² See Schooner, *supra* note 44, at 390 (observing that bank supervisors “assign CAMELS ratings on a scale of one to five; one being the highest. Current

disclosure of its latest balance sheet (using form 10-Q), the bank must comply with existing securities law but that disclosure still buys the regulators several weeks, if not months, to act in advance—and does not contain many facets of bank supervisory information. This lead time is what regulators need to address the asset-liability mismatch before it turns into a full-blown liquidity crisis. Further, we have argued that regulators should intervene as early as possible to stave off a liquidity crisis. Acting early can also mitigate disclosure conflicts under securities law since it becomes less likely that the financial issue with the bank has crossed the materiality threshold.

Securities law also poses a second obstacle for CoCos that are designed to convert into equity. Under U.S. law, all offers and sales of securities need to be either registered or exempt from registration. The conversion of CoCos to equity would constitute a sale, thus requiring registration or an exemption.¹⁷³ The SEC, however, does not confirm or grant exemptions (from the registration requirement) on an *ex ante* basis, which makes it difficult to have bail-in instruments like CoCos.¹⁷⁴ Said differently, banks will encounter legal headwinds at the SEC if their debt instruments convert into equity.¹⁷⁵ In short, it appears that the SEC does not even appreciate how the *current* bail-in capital regime is supposed to operate. This obstacle, by itself, lends support to using write-downs instead of equity conversions (or declaring the entire CoCos regime as a failed regulatory experiment not worth salvaging).

2. *Litigation by Bondholders at “Healthy” Banks*

Another hurdle is whether it is legally permissible for banks to issue CoCos in which the government has the *unilateral* discretion to trigger the conversion of all CoCos across

and prospective bank depositors, not to mention equity investors, would be very interested in learning the CAMELS rating of the bank—especially if the CAMELS rating is a four or five. Borrowing a concept from the federal securities law, the CAMELS rating of a bank is *material* information. Still, CAMELS ratings are non-public and always have been”).

¹⁷³ 17 C.F.R. § 230 (2023).

¹⁷⁴ See FIN. STABILITY BD., 2023 BANK FAILURES: PRELIMINARY LESSONS LEARNT FOR RESOLUTION 17 (2023), <https://www.fsb.org/2023/10/2023-bank-failures-preliminary-lessons-learnt-for-resolution/> [<https://perma.cc/J2Y6-7VU9>] (describing the difficulties).

¹⁷⁵ See Robin Wigglesworth, *The Regulatory Nightmare of TLAC*, FIN. TIMES (Oct. 12, 2023), <https://www.ft.com/content/cdb336b6-07ff-4775-b21e-45998cb539a4> [<https://perma.cc/B325-VYAM>] (further describing the securities law challenges).

banks at the same time—even though some banks could be financially healthy. Presumably, the bondholders of CoCos at healthy banks would argue that the conversion of their CoCos was unnecessary and possibly sue the regulatory authorities for the loss. Indeed, one possible claim can be based on the bond contract itself—that the conversion constitutes a breach of contract. However, so long as the contract expressly grants wide discretion to bank authorities in exercising the trigger, and so long as the authorities exercise that discretion in “good faith,” it appears unlikely that such a breach-of-contract claim could succeed in court.¹⁷⁶

Angry bondholders could also argue that a regulatory taking has occurred without proper compensation: the government, through regulation, has taken away private property. There are at least two defenses against such an argument. The first defense is based on contract law. When the contract *expressly* allows authorities to trigger the conversion or write-down, it may be quite difficult to argue that a “taking” has occurred. The second defense comes from the design of CoCos. Regulators can simply deploy CoCos that convert to equity instead of CoCos that are written down to zero. Through a conversion, the bondholders’ value can be better protected, and any takings-based claim would also become weaker.

3. *Erosion of Market Discipline*

Another issue associated with promoting information obfuscation is the erosion of market discipline. Suppose regulators do convert a group of CoCos simultaneously—CoCos at both “weak” and “healthy” banks—to hide the identity of the weak bank from the public (and to prevent a run). This can create a problem of moral hazard, which, in turn, can erode market discipline.

Moral hazard operates through two channels. First, the executives of a bank do not internalize the full cost of their poor decisions. By design, the consequences of their poor decisions are spread among peer banks, even though the bank’s healthy peers may have acted more prudently. Knowing this,

¹⁷⁶ Under U.S. contract law, all contracts impose a mandatory obligation of “good faith,” especially when one party is exercising its discretion granted under the contract. See RESTATEMENT (SECOND) OF CONTRACTS § 205 (Am. L. Inst. 2010). From the CoCo design perspective, having a conversion to equity trigger, rather than a write-down trigger, would presumably make it easier for the bondholders to accept the discretionary trigger and also reduce the chances of having to face a lawsuit.

bank executives may have weaker incentives to act prudently because they are not facing the full impact of their (bad) decisions. The government will “circle the wagons” and hide their identities in order to preserve financial stability in bad economic times.

Second, bondholders themselves may have a weaker incentive to “monitor” the bank. This channel is also present with deposit insurance, which improves financial stability but also reduces incentives for depositors to monitor. If banks are making poor choices, depositors should withdraw their money and move their money to a better bank. However, in a world with FDIC deposit insurance, depositors have a much weaker incentive to monitor because they know the government will always be there to secure their money if the situation turns south. Similarly, with CoCos, if bondholders know that their CoCos will be converted regardless of whether their bank is healthy or weak, they will not put in the same effort to monitor.

The rise of moral hazard is a legitimate concern that must be offset should policymakers decide to revamp CoCos in this direction. This “offset” could come in the form of more stringent supervision, tougher regulatory minimums, or compensation penalties (such as claw backs) for executives. For instance, when triggering the CoCos, bank regulators can impose “punishment” on bank executives (while hiding that fact from the public) to provide better incentives. In the case of deposit insurance, the offset came in the form of more rigorous bank supervision.¹⁷⁷

4. *Regulatory Discretion*

Finally, we touch upon regulatory discretion. Even if the previous two hurdles were overcome, would regulators be bold enough and prescient enough to properly wield the power given to them? Under our proposed framework, for CoCos to work well, regulators must be able to obtain the necessary information early enough on the trigger decision and be willing to apply the trigger not just to the unhealthy bank but to other closely situated healthy banks.¹⁷⁸

¹⁷⁷ See GORTON, *supra* note 30.

¹⁷⁸ Although the discussion assumes that the regulator will either convert or write-down the entire value of the CoCo bonds, at least in theory, this does not have to be the case. For instance, instead of writing down the entire bond, the regulator can be given the discretion to reduce the total principal amount (and the corresponding interest amount) by 50% (or any other fraction between 0% and 100%). This could add another dimension to the regulatory discretion. In

There is evidence to suggest that regulators might sit on their hands. After the Global Financial Crisis, regulators in the United States were given the power to use a tool called the countercyclical capital buffer, or “CCyB” for short.¹⁷⁹ The tool is designed to increase the amount of capital held by regulated banking organizations in good times and then draw down the amount in bad times—hence, countercyclical. The capital increase would affect *all* regulated banks at the same time. In the United States, the Federal Reserve can use notice-and-comment rulemaking to “activate” the CCyB but has never done so.¹⁸⁰ It lies dormant as an unused tool. Some have argued that it is difficult to use such a discretionary tool because it is impossible to get the timing right.¹⁸¹ Uncertainty-averse regulators do not want to be responsible for pulling the trigger, which is why others have argued for automating the CCyB.¹⁸²

While the dormancy of the CCyB is a strong argument for why regulators might not use this new tool given to them, we believe that using CoCos to combat bank failures is a significantly different game. Regulators are more willing to act when they believe financial contagion is about to emerge. In March of 2023, as U.S. authorities were facing the SVB fallout, they activated the “systemic risk” backstop built into the FDIC’s authorities to insure all depositors at SVB, even the previously uninsured depositors. The environment in which authorities acted was one of extreme uncertainty, but we see time and time again that a looming banking crisis tends to bring about action, not inaction.

Another way of saying this is that the CCyB powers are “more academic” from a regulatory perspective. Decision makers have to decide *in normal times* whether or not to use the CCyB. There is no urgency. Regulators are more acutely aware of inadvertently making a mistake. But the situation changes once regulators are immediately faced with a weakening bank whose failure could lead to a financial crisis. Then the aversion flips in the other direction: instead of doing too little, regulators would rather do too much. For this reason, we believe that

fact, to the extent that triggering the bonds at healthy banks may seem undesirable, allowing the regulator to “partially” trigger the bonds could alleviate such resistance.

¹⁷⁹ See Jeremy C. Kress & Matthew C. Turk, *Rethinking Countercyclical Financial Regulation*, 56 GA. L. REV. 495, 514 (2022) (defining the CCyB).

¹⁸⁰ *Id.* at 502.

¹⁸¹ Kress & Zhang, *supra* note 1.

¹⁸² Kress & Turk, *supra* note 179, at 553.

regulators would be likely to use such an instrument if it were available.

CONCLUSION

Today, many of the largest international banks hold billions of dollars' worth of CoCos on their balance sheets and many are issuing billions more. Since Credit Suisse's failure in March 2023, these banks have issued over \$108 billion of CoCos.¹⁸³ Regulators are still allowing their issuance, banks still find them beneficial to fill regulatory capital requirements, and investors still like their high yields.

We leverage economic theory and the experience of the past fifteen years to show that this regulatory experiment was problematic from the beginning. We then propose ways to salvage the experiment. First and foremost, we argue that CoCos were designed to strengthen a bank's balance sheet—and, hence, its solvency position—not its liquidity position. Thus, triggering CoCos should occur early, well before a liquidity crisis has begun. Once a liquidity crisis has begun, triggering CoCos will not save the bank and will only create winners and losers among investors. We also argue that the triggering mechanism should be designed in such a way to send as little information about the bank's poor financial health to the market as possible because information obfuscation is crucial during economic turbulence. This includes more reliance on regulators' discretion and possibly a simultaneous trigger across several banks in order to prevent the market from identifying which bank may be facing financial trouble.

To be clear, we do *not* conclude that policymakers must fix the CoCos regime, because there are significant obstacles that are associated with the proposed solution. If policymakers decide that the proposed changes are too difficult to implement, they should eliminate the regulatory regime altogether. The status quo seems to be an arbitrage in which banks are issuing an ineffective regulatory instrument to allegedly make themselves safer. Banks that have issued billions of dollars' worth of CoCos are still being bailed out. The experiment, in its current form, has failed.

¹⁸³ This craving for CoCos brings to mind the old advertisement line: “cuckoo for Cocoa Puffs.” *Commercials Ads, Cocoa Puffs Commercials Compilation Cuckoo Bird*, YouTube (Sep. 23, 2017), <https://www.youtube.com/watch?v=gZaVpv5p2CM> [<https://perma.cc/3TTC-C6PK>].

APPENDIX

On the suspension of convertibility. Historically, banks have sometimes refused to pay depositors during a panic—an act known in the literature as “suspending convertibility.”¹⁸⁴ Suspension of convertibility by banks was previously considered illegal in the United States, and a bank could lose its charter if it did not honor depositors’ requests for cash. Despite the prohibition against suspending convertibility, banks, depositors, and the legal system have all recognized that it can be used prevent bank panics under certain circumstances. Professor Gary Gorton argues that suspension can be a mutually beneficial arrangement for banks and their depositors. If depositors lack complete information about the health of a bank and trigger a run, suspending convertibility can signal that continuation of investments can benefit all investors.¹⁸⁵ Professors Jason Roderick Donaldson and Giorgia Piacentino show that besides halting a bank run, suspending convertibility can help restart the circulation of bank debt, which increases a bank’s ability to borrow.¹⁸⁶ In contrast, Professor Merwan Engineer argues that suspending convertibility is theoretically less effective at preventing bank runs on a longer time horizon.¹⁸⁷ Despite knowing that other depositors cannot withdraw immediately, depositors might still wait to withdraw in the future.

Nevertheless, the government has at times recognized the need for banks to prevent depositors from withdrawing their deposits. During the Great Depression, for example, President Roosevelt declared a “bank holiday” so that banks would not be open and hence would not have to pay out cash.¹⁸⁸ Nowadays, the bank’s regulator will promptly shut down the bank to protect depositors.¹⁸⁹

¹⁸⁴ Gorton & Zhang, *supra* note 31.

¹⁸⁵ Gary B. Gorton, *Bank Suspension of Convertibility*, 15 J. MONETARY ECON. 177 (1985).

¹⁸⁶ Jason Roderick Donaldson & Giorgia Piacentino, *Money Runs*, 126 J. MONETARY ECON. 35 (2022).

¹⁸⁷ Merwan Engineer, *Bank Runs and the Suspension of Deposit Convertibility*, 24 J. MONETARY ECON. 443 (1989).

¹⁸⁸ William L. Silber, *Why Did FDR’s Bank Holiday Succeed?*, FRBNY ECON. POLICY REVIEW (July 2009), <https://www.newyorkfed.org/medialibrary/media/research/epr/09v15n1/0907silb.pdf> [<https://perma.cc/MA7Y-ZQ5S>].

¹⁸⁹ See, e.g., Press Release, Fed. Deposit Ins. Corp., FDIC Creates a Deposit Ins. Nat’l Bank of Santa Clara to Protect Insured Depositors of Silicon Valley Bank, Santa Clara, California (Mar. 10, 2023), <https://www.fdic.gov/news/press-releases/2023/pr23016.html> [<https://perma.cc/QCX9-KVSG>] (“Silicon Valley

On bank capital ratios. The following table shows the tier 1 capital ratios and common equity tier 1 capital ratios for the largest US bank holding companies (i.e., excluding foreign banking organizations and intermediate holding companies). We define “large” using total assets and set the cut-off threshold at \$50 billion in the fourth quarter of 2022. Excluding SVB, the median tier 1 capital ratio and median common equity tier 1 capital ratio were 11.8 percent and 10.4 percent respectively. SVB sits comfortably in the top half of the distribution, which made little difference when depositors began to panic.

Table: Large Bank Capital Ratios Prior to the March 2023 Panic¹⁹⁰

Name	Total Assets (Billions)	Tier 1 Capital Ratio	CET1 Capital Ratio
JPMORGAN CHASE & CO.	\$ 3,666	14.9	13.2
BANK OF AMERICA CORPORATION	\$ 3,051	13.0	11.2
CITIGROUP INC.	\$ 2,417	14.7	13.0
WELLS FARGO & COMPANY	\$ 1,881	12.1	10.6
GOLDMAN SACHS GROUP, INC., THE	\$ 1,442	16.6	15.0
MORGAN STANLEY	\$ 1,180	17.2	15.3
U.S. BANCORP	\$ 675	9.8	8.4
PNC FINANCIAL SERVICES GROUP, INC., THE	\$ 557	10.4	9.1
TRUIST FINANCIAL CORPORATION	\$ 555	10.5	9.0
CHARLES SCHWAB CORPORATION, THE	\$ 552	28.9	21.9
CAPITAL ONE FINANCIAL CORPORATION	\$ 455	13.9	12.5

Bank, Santa Clara, California, was closed today by the California Department of Financial Protection and Innovation, which appointed the Federal Deposit Insurance Corporation (FDIC) as receiver. To protect insured depositors, the FDIC created the Deposit Insurance National Bank of Santa Clara (DINB). At the time of closing, the FDIC as receiver immediately transferred to the DINB all insured deposits of Silicon Valley Bank.”). *See generally* FDIC, *When a Bank Fails - Facts for Depositors, Creditors, and Borrowers* <https://www.fdic.gov/consumers/banking/facts/payment.html> [<https://perma.cc/RR6D-PF4L>] (last visited Dec. 23, 2023).

¹⁹⁰ This table is sourced from these financial institutions Federal Reserve Y-9C reporting forms and their corresponding database. To review, visit NAT’L INFO. CENTER FIN. DATA DOWNLOAD, *Historical Co. Fin. Data* (2022), <https://www.ffiec.gov/npw/FinancialReport/FinancialDataDownload?selectedyear=2022> [<https://perma.cc/HS86-S6DS>].

Name	Total Assets (Billions)	Tier 1 Capital Ratio	CET1 Capital Ratio
BANK OF NEW YORK MELLON CORPORATION, THE	\$ 406	14.4	11.3
STATE STREET CORPORATION	\$ 301	15.4	13.6
AMERICAN EXPRESS COMPANY	\$ 228	11.1	10.3
CITIZENS FINANCIAL GROUP, INC.	\$ 227	11.1	10.0
SVB FINANCIAL GROUP	\$ 212	15.4	12.1
FIFTH THIRD BANCORP	\$ 207	10.5	9.3
M&T BANK CORPORATION	\$ 201	11.8	10.4
ALLY FINANCIAL INC.	\$ 192	10.7	9.3
KEYCORP	\$ 190	10.6	9.1
HUNTINGTON BANCSHARES INCORPORATED	\$ 183	10.9	9.4
REGIONS FINANCIAL CORPORATION	\$ 156	10.9	9.6
NORTHERN TRUST CORPORATION	\$ 155	11.8	10.8
DISCOVER FINANCIAL SERVICES	\$ 132	14.3	13.3
FIRST CITIZENS BANCSHARES, INC.	\$ 109	11.1	10.1
SYNCHRONY FINANCIAL	\$ 105	13.6	12.8
NEW YORK COMMUNITY BANCORP, INC.	\$ 90	9.8	9.1
COMERICA INCORPORATED	\$ 86	10.5	10.0
FIRST HORIZON CORPORATION	\$ 79	11.9	10.2
RAYMOND JAMES FINANCIAL, INC.	\$ 77	20.3	20.0
WEBSTER FINANCIAL CORPORATION	\$ 71	11.2	10.7
WESTERN ALLIANCE BANCORPORATION	\$ 68	10.0	9.3
POPULAR, INC.	\$ 68	16.5	16.4
EAST WEST BANCORP, INC.	\$ 64	12.7	12.7
SYNOVUS FINANCIAL CORP.	\$ 60	10.7	9.6
VALLEY NATIONAL BANCORP	\$ 57	9.5	9.0
WINTRUST FINANCIAL CORPORATION	\$ 53	10.0	9.1
CULLEN/FROST BANKERS, INC.	\$ 53	13.4	12.9

On bank capital erosion. The following table shows capital erosion during the 2007-08 Global Financial Crisis, courtesy of the Federal Reserve Bank of Boston.¹⁹¹ The table specifically shows capital erosion as measured by a bank's "tier 1 common equity capital ratio," which is calculated by dividing its tier 1 common equity (the highest quality form of capital) by a risk-weighted measure of its total assets. Capital erosion is measured using basis points (i.e., one-one hundredths of a percent). For example, Washington Mutual experienced a decline of 1202 basis points (i.e., 12.02 percentage points) in its capital ratio between late 2007 and September 2008. Although the overall banking sector endured a crisis period over several years, individual banks experienced peak capital erosion at different times. Individual bank crisis periods varied from a single quarter to over two years.

Table: Capital Erosion at Large US Financial Institutions¹⁹²

Financial Institution	Crisis Period	Capital Erosion (Basis Points)
Washington Mutual, Inc.	4Q07 - 9/25/08	-1202
Countrywide Financial Corp.	3Q07 - 7/1/08	-769
Merrill Lynch & Co., Inc.	6/30/07 - 12/31/08	-756
National City Corp.	4Q07 - 12/31/08	-751
Ally Financial Inc.	3Q07 - 4Q09	-636
Lehman Brothers Holdings Inc.	3/1/08 - 9/14/08	-610
Wachovia Corp.	1Q08 - 12/31/08	-590
State Street Corp.	4Q07 - 2Q09	-527

¹⁹¹ See Eric S. Rosengren, President and Chief Exec. Officer of the Fed. Reserve Bank of Boston, Speech at the Bank for Int'l Settlement Forum on Key Regulatory and Supervisory Issues in a Basel III World, Bank Capital: Lessons from the U.S. Financial Crisis (Feb. 25, 2013), <https://www.bostonfed.org/news-and-events/speeches/bank-capital-lessons-from-the-us-financial-crisis.aspx> [<https://perma.cc/B5F9-N2UV>].

¹⁹² This table is sourced from Scott Strah, Jennifer Hynes, and Sanders Shaffer, *The Impact of the Recent Financial Crisis on the Capital Positions of Large U.S. Financial Institutions: An Empirical Analysis*, Fed. Reserve Bank of Boston 1, 17 (2013) (creating the table using data from Form FR Y-9C data and Securities and Exchange Commission financial report filings and detailing the formulas used for calculating bank capital).

Financial Institution	Crisis Period	Capital Erosion (Basis Points)
Citigroup Inc.	4Q07 - 4Q08	-380
Bear Stearns Companies Inc.	9/1/07 - 5/30/08	-358
Capital One Financial Corp.	1Q10	-327
MetLife, Inc.	1Q08 - 1Q09	-315
KeyCorp	2Q08 - 1Q10	-242
Morgan Stanley	9/1/07 - 12/31/08	-145
Regions Financial Corp.	4Q08 - 1Q11	-140
American Express Co.	1Q10	-96
Fifth Third Bancorp	2Q08 - 4Q08	-93
Bank of New York Mellon Corp.	1Q08 - 4Q08	-90
PNC Financial Services Group, Inc	1Q08 - 4Q08	-87
Wells Fargo & Co.	3Q08 - 4Q08	-81
SunTrust Banks, Inc.	2Q08 - 1Q10	-69
Bank of America Corp.	4Q10 - 3Q11	-66
Goldman Sachs Group, Inc.	8/30/08 - 12/26/08	-36
BB&T Corp.	4Q10	-10
JPMorgan Chase & Co.	3Q08	-4
U.S. Bancorp	--	0

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