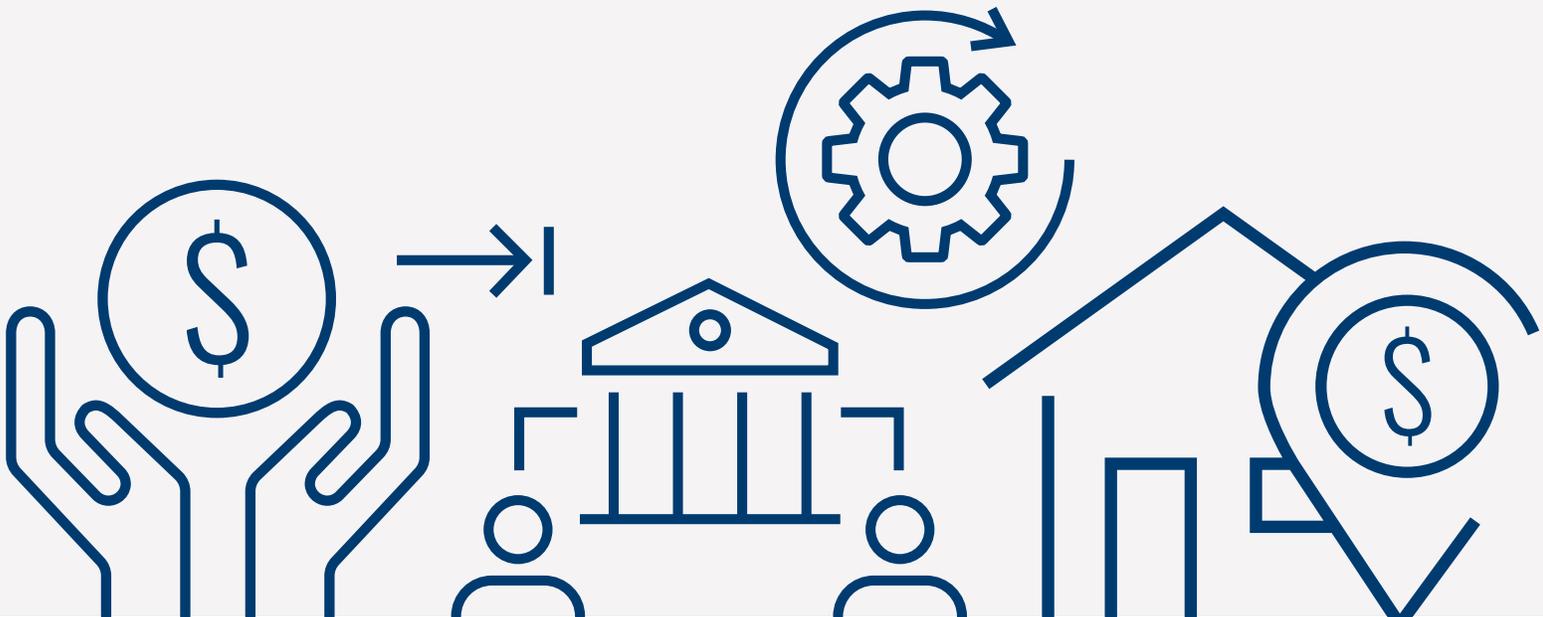


Task Force on Financial Stability

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Glenn Hubbard
Donald Kohn
Laurie Goodman
Kathryn Judge
Anil Kashyap
Ralph Koijen
Blythe Masters
Sandie O'Connor
Kara Stein



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Members of the Task Force on Financial Stability

Co-chair: Glenn Hubbard, dean emeritus and Russell L. Carson Professor of Finance and Economics, Columbia Business School, and a professor of economics in Columbia's Faculty of Arts & Sciences. Hubbard was chair of the White House Council of Economic Advisers in the George W. Bush administration.

Co-chair: Donald Kohn, Robert V. Roosa Chair in International Economics and a senior fellow in the Brookings Hutchins Center. Kohn was at the Federal Reserve Board from 1975 to 2010, the last several years as vice chair. He is a member of the FDIC's Systemic Resolution Advisory Committee and a former member of the Financial Policy Committee of the Bank of England.

Laurie Goodman, co-director, Housing Finance Policy Center, Urban Institute. Goodman spent 30 years as a mortgage-backed securities analyst and research department manager on Wall Street before joining Urban Institute in 2013 to found the Center.

Kathryn Judge, Harvey J. Goldschmid Professor of Law at Columbia Law School. She currently also serves as an editor of the *Journal of Financial Regulation* and as a research member of the European Corporate Governance Institute.

Anil Kashyap, Stevens Distinguished Service Professor of Economics and Finance at the University of Chicago Booth School of Business. He is a member of the Bank of England's Financial Policy Committee.

Ralph Koijen, AQR Capital Management Distinguished Service Professor of Finance at the University of Chicago's Booth School of Business. In 2019, he was awarded the Fischer Black Prize by the American Finance Association given biennially to the top finance economics scholar under 40.

Blythe Masters, Industry Partner at Motive Partners, the fintech specialized private equity firm, and CEO of Motive Capital Corp. Masters previously held several senior management posts at JPMorgan Chase where she was a member of the Firmwide Executive Committee.

Sandie O'Connor, independent, former Chief Regulatory Affairs Officer of JPMorgan Chase and previously held several senior management positions at the firm. She is a member of the FDIC's

Systemic Resolution Advisory Committee and the Financial Research Advisory Committee of the Office of Financial Research.

Kara Stein, Distinguished Policy Fellow and Lecturer-in-Law, University of Pennsylvania Carey Law School and Senior Research Fellow and Director of the AI and Capital Markets Initiative at the Center for Innovation at the University of California Hastings College of Law. She was a member of the Securities and Exchange Commission from 2013 to 2019.

NOTE: Nellie Liang, who was the Miriam K. Carliner Senior Fellow at the Hutchins Center at Brookings, was an original member of the task force, but resigned when she joined the U.S. Treasury in early 2021.

- Staff: David Wessel and Stephanie Cencula
- Editor: David Skidmore
- Project manager: Haowen Chen
- Graphic designer: Roxanne Bradley-Tate

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Introduction

CHAPTER ONE



The Global Financial Crisis of 2007-2009 exposed extraordinary fault lines in the stability of the world's financial system and its linkages with the real economy. In the aftermath of that crisis, the United States, as did other nations, significantly reformed its banking sector. Over the following decade, it built the banking sector's strength and resilience through more demanding capital and liquidity requirements as well as rigorous stress tests of the largest banks.

But the disruptions in financial markets in March 2020 as the COVID-19 pandemic spread, which threatened to make an already sharp contraction in economic activity even worse, showed that the work of protecting financial stability—of making sure the financial system can provide credit and other critical services in bad times as well as good—is far from complete. In particular, much remains to be done on nonbank finance, especially the provision of credit through markets. In addition, it is increasingly evident that interest rates may be at historically low levels for an extended period, and these low interest rates might induce excessive risk taking in markets, contributing to the potential for instability that could adversely affect economic activity and employment. The potential for new threats underlines the inherent challenge for regulation: It must be dynamic (requiring an ongoing assessment process, not just periodic changes) because of innovation, events, and endogenous responses to prior regulation.

The onset of the pandemic led to panic in financial markets that was arrested only by massive and unprecedented interventions by central banks and governments globally, led by the United States. The Task Force on Financial Stability was established before March 2020, but major lessons from that experience have informed our work. The banking sector, reflecting the effects of earlier reforms, remained resilient and met extraordinary demands for credit created when the interruption of economic activity caused by the pandemic sharply cut business cash flows. But, in the nonbank sector, the events of March 2020 revealed significant fragility and market dysfunction that required those central bank and government interventions. We conclude that regulatory gaps and changes in market structure and behavior—driven by new regulations, new technologies, and new market entrants—present continuing risks. This leads us to recommendations to address the evident weaknesses and enhance the ability of the existing regulatory structure to dynamically identify and address new risks to financial stability in the ever-evolving financial landscape.

The Task Force

The task force was formed in October 2019 by the [Hutchins Center on Fiscal & Monetary Policy at the Brookings Institution](#) and the [Initiative on Global Markets at the University of Chicago Booth School of Business](#).^{*1}

* The idea grew from a paper by Anil Kashyap and Caspar Siegart delivered in June 2019 at a Federal Reserve conference on “monetary policy strategies, tools, and communication practices.” The authors noted the potential for financial stability issues to arise from low-for-long interest rates and the lack of an adequate toolset for authorities to deal with these issues. They suggested forming a group to make recommendations that would bolster the government's ability to deal with potential problems in the financial system.

Task force members bring a variety of perspectives and expertise. We also consulted many other individuals with knowledge and experience. The work of the task force has been funded exclusively by Brookings, Chicago Booth, and the [Smith Richardson Foundation](#).

Guiding Principles

First, our focus has been on *the stability of the financial system*—its ability to deliver essential services, like credit intermediation, risk mitigation, and payments, even after it has been hit by an adverse event. We looked for *externalities or spillovers*—circumstances in which private-market decisions under the current regulatory framework could prevent the financial sector from delivering essential services at reasonable prices in bad times as in good times. These externalities mark circumstances in which the financial sector could make a bad situation worse, with the effects spilling over to the economy more broadly, for example by unnecessarily limiting credit to households and businesses. Stability is best achieved through resilience—the ability for intermediaries and markets to withstand unanticipated stressful developments and continue to deliver services, often by drawing on reservoirs of capital and liquidity.

We recognize that, in addition to benefits in reducing risks to stability, added regulation can have costs. It can make services more expensive, constrain the ability to deal with dislocations in liquidity, impede the allocation of capital to its most productive use, and damp growth. We did not do formal cost-benefit analyses of our recommendations, but we approached them with a cost-benefit mindset,

aware of potential costs and looking for the most efficient alternatives to deliver the right amount of resilience.

Each section of this report explains externalities we have identified—the threats to financial stability—for a particular set of institutions or markets that are the focus of that section. We then propose recommendations for regulation or, where needed, legislation to address these externalities.

Second, we concentrate on *nonbank financial intermediation* in our effort to identify threats to financial stability and recommend ways of dealing with them. The Dodd-Frank Act of 2010 and the recommendations of the Basel Committee on Bank Supervision have greatly strengthened the resilience of the banking system since the financial crisis of 2007-09. We are not arguing that the resulting structure of bank regulation and supervision cannot be improved. Indeed, we recommend some changes, especially where bank regulation intersects with the liquidity of securities markets. But our view is that regulations to protect financial stability are far less adequate for nonbank finance.

We recognize that in many respects addressing gaps in nonbank regulations is more difficult than for banking. Nonbank intermediation involves multiple institutions whose activities vary. Regulation is spread over many authorities, including the states. Some players are barely regulated at all, and evolving technologies can directly connect savers and borrowers, bypassing aspects of regulation. And nonbank finance is global, with some activities readily shifting locality to escape the costs of government action. But nonbank intermediation and banking share very similar financial stability risks—contagion across

institutions and markets resulting in runs of short-term funding and associated asset fire sales that impede the delivery of essential services to households and businesses.

Moreover, nonbank finance has been playing an increasingly more important role in credit intermediation, liquidity and maturity transformation, and risk management. This long-established trend, supported by technological innovation and evolving market infrastructure, picked up additional momentum as regulation of bank capital and liquidity tightened after the 2007-09 crisis, increasing the cost of bank intermediation relative to nonbank intermediation, which received limited efforts to correct for the financial stability risks that emerged in the crisis. And the COVID-induced pickup in digital customer engagement with nonbanks likely has further accelerated this shift.

Our decision to focus on nonbank finance was reinforced in March 2020 when fear and uncertainty arising from the onset of the pandemic sparked a huge spike in demand for cash, disrupting a wide variety of credit markets, including markets for U.S. Treasury, corporate, and municipal bonds, mortgage-related securities, and commercial paper. The extraordinary growth in those markets had outgrown the capacity of the private sector to meet this outsized demand to sell securities to get cash. Problems in the Treasury market were particularly worrisome. That market must be able to function as the foundation for other markets and as an effective safe haven during stress. The resulting disruptions threatened to cut off credit to households, businesses, and governments, which would have made an extremely serious economic situation much worse. Only very aggressive central bank intervention in the United States and elsewhere

stabilized markets and restored credit flows.

If market participants come to rely on central bank intervention in stress events, the pricing of risk will be distorted. The market turmoil exposed fault lines in nonbank finance that must be addressed to reduce the need for future central bank or other government intervention that may entail unwelcome side effects.

Third, even if authorities were to mitigate all current risks to financial stability, others would emerge, and it is essential that *regulatory processes and procedures be put in place that can spot future risks and evolve to deal with them*. Indeed, adjustments made today could well promote the growth of risks through regulatory arbitrage as financial market participants seek the least-expensive ways to meet their needs. New processes and procedures will be successful only if the individuals running the offices and agencies are held accountable by Congress and the American people for ensuring that the financial system can support growth and prosperity over the business cycle, even after stress events.

Our recommendations do not directly address the fragmented and overlapping structure of financial regulation in the United States, not because we admire that system—we don't—but because we recognize that political obstacles have thwarted proposals to streamline it. To be sure, this structure can impede decisive action to deal with systemic risks. Coordination is often required across different agencies with disparate legislative objectives. And, despite the multiplicity of regulators, important gaps in oversight persist. Changes in the structure of regulation—reorganizing to reduce overlap, eliminate gaps, and clarify responsibilities—would enhance the ability to preserve financial stability.

Instead, we focused on how to make the current structure work more effectively to identify risks and deal with them. Some of these steps can be taken with no change in the law; others require legislative adjustments to the objectives and functioning of existing agencies to help them gather the necessary information, elevate their attention to financial stability, and collaborate effectively toward that shared goal. We focused especially on the entities and agencies already tasked with working across agencies: the Financial Stability Oversight Council (FSOC) and the Office of Financial Research (OFR), both housed in the Treasury Department.

Fourth, we recognized that *limits on our expertise and time meant that we could not address every threat to financial stability*. For example, the disruption of the delivery of financial services from problems in cybersecurity would be near the top of any list of stability risks. Recommendations to deal with cyberrisks, however, require a high level of knowledge of the cybersystems, their interlinkages and interdependencies, and the organization of existing government and industry efforts to deal with cyberthreats. We leave it to others to evaluate cybersecurity risks and make recommendations to deal with them.

Another example is climate-change risk. The stability of the financial system will depend on the ability of financial institutions to manage the risks to their safety and soundness posed by increasingly severe and unpredictable weather and by the changes in asset valuations that will follow from government policies and stakeholder activism to reduce global warming. Although the Task Force did not make specific recommendations for dealing with climate-change risk, we welcome the increasing focus in financial oversight agencies on transparency

around and management of climate-change risks.

We show in the final chapter of the report, *Putting Reforms to the Test*, how implementing our recommendations for improving regulatory design and process would help agencies to address these and other issues.

Structure of the Report

Our report begins with an explanation of our *framework*. We define financial stability and explain the externalities that have motivated our recommendations. Though most of the externalities identified involve financial markets and institutions, we also recognize that the behavior of heavily indebted borrowers can amplify business cycles.

We then turn to *nonbank financial intermediation*. We begin with an introduction that discusses the factors contributing to greater use of nonbank channels to deliver credit and other financial services and the risks growing from that development. We also review the experience of March 2020 that highlighted these risks. We have separate sections with recommendations to address risks from the following sectors.

- **Treasury market resilience.** The Treasury market is the foundation for other securities markets in the United States and around the world. When it doesn't function properly, risk management and credit flows to households, businesses, and governments can be disrupted with serious consequences for the economy. The events of March 2020 highlighted that the current structure of the Treasury market is not robust enough to permit participants to sell securities in

size at predictable prices when markets are under severe stress, the specific reason they are often held. Indeed, Treasury market dysfunction compromises the efficacy of requirements for banks to hold these securities as high-quality liquid assets—a key post-crisis reform. We offer recommendations that will lessen disruptions by reducing the need to engage in such sales and by increasing the capacity of the private sector and the Federal Reserve to absorb them. We also have recommendations that will build the capacity of regulators to analyze developments and make ongoing reforms in this critical market.

- **Mutual funds, including prime money market funds that invest in short-term privately issued obligations and funds that invest in longer-term private debt securities, such as corporate bonds or loans.** These funds promise same-day redemption, which is typically supported by expected inflows and liquidity buffers, but they hold assets traded in illiquid markets where same-day sales in size can materially reduce prices. The liquidity mismatch creates a first-mover advantage—the edge to investors who redeem their shares early, before a fund exhausts its liquidity—potentially resulting in runs and asset fire sales. We make recommendations to better align the price and liquidity of redemption with the liquidity of the underlying assets.
- **Insurance companies.** Insurance companies are major players in key financial markets, especially for business credit. Addressing potential financial stability risks in insurance is complicated because its oversight rests at the state level. Our recommendations for insurance involve increasing transparency so both private parties and regulators can better

judge risks, standardizing stress testing of companies and state funds—including for their resilience to low-for-long interest rates after they have guaranteed some returns—and strengthening the coordination role of the Federal Insurance Office in the Treasury.

- **Housing finance.** Mortgage markets were at the epicenter of the Global Financial Crisis. Many of the issues behind that meltdown have been addressed, but threats to financial stability in this market remain, and are challenging to address as activities move outside of regulated banks, given the fragmented oversight of many elements of this sector. Our recommendations address borrower resiliency, mortgage-market liquidity, and the oversight and liquidity of the nonbank mortgage servicing sector.
- **Central clearing counterparties (CCPs), a key element of market plumbing.** In derivative markets, CCPs play a vital role in market transactions, in part reflecting the Dodd-Frank Act requirement for central clearing of standardized derivatives. CCPs increase transparency and should facilitate risk management, but they also concentrate risk. We make recommendations to strengthen CCPs' resilience to reduce the odds of problems in one CCP being transmitted to other parts of the financial system. We also offer a recommendation on their margining practices, focused on reducing liquidity stresses in unusual circumstances. Our recommendations also address conflicts of interest between the owners of CCPs and their members, which can be amplified during stress events. The recommendations aim to better ensure continuity of operations of this critical infrastructure by avoiding actions that could potentially amplify stress.

Protecting financial stability on an ongoing basis will depend on *improving regulatory design and process*. Our recommendations on regulatory procedures focus on helping authorities identify and remediate risks to financial stability, increasing their incentives to do so, and creating avenues for holding them accountable. Importantly, the reformed system we envision would be much better able to evolve to keep up

with the stability threats created by changes in the financial system.

We conclude with *putting reforms to the test* in which we show how implementation of our recommended regulatory reforms would have helped the authorities to identify and deal with some of the risks we have addressed as well as other risks for which we have not made specific recommendations.

Our Recommendations

CHAPTER 3: MARKET FOR U.S. TREASURY SECURITIES

EXTERNALITIES	RECOMMENDATIONS
<p>U.S. Treasury securities are a benchmark for the global financial system. During periods of stress, Treasury market illiquidity impairs the functioning of a wide array of markets, disrupting market-based finance as an important source of credit to households, businesses, and governments.</p> <p>Banks and nonbank asset managers rely on predictable well-functioning markets for Treasuries to meet their liquidity needs and to manage risk. When Treasury market liquidity dries up, asset managers may have to exit less-liquid positions, such as commercial paper or corporate bonds, driving their prices below fundamental values in a fire sale, and banks may have to reduce their lending, amplifying the effect of any shock to markets and the economy.</p> <p>Dysfunction of Treasury market during stress impairs confidence in the system and could increase the cost of financing the U.S. government deficit.</p>	<p>Adjust bank regulations to enable banks and their dealers to expand their balance sheets to provide market liquidity during stress without materially reducing the overall resilience of those firms.</p> <ul style="list-style-type: none"> • Permanently exclude reserves from the Supplementary Leverage Requirement (SLR) or consider adopting the global leverage capital standard for global systemically important banks (GSIBs) that would more likely serve as a backstop consistent with regulatory intent. • Consider a countercyclical component of the SLR to be released in stress. • Adjust the GSIB calculations, to (i) exclude reserves from the size measure, (ii) use average rather than quarter-end balance-sheet measures, (iii) reduce the cliff effect of moving to the next GSIB bucket, and (iv) revalue the impact of the fixed coefficient component to adjust for economic growth and inflation, to avoid the GSIB surcharge from becoming unnecessarily constraining as banks grow along with the economy.

- Review treatment of short-term wholesale funding within the GSIB calculation, which unduly penalizes Treasuries and Treasury repo and may reduce bank dealers' flexibility to offer repo financing during stress.
- Review the ways in which overlapping liquidity regulations and their interaction with leverage capital calculations affect the willingness of dealers to make markets in Treasury securities and intermediate in Treasury repo markets, especially during stress, and assess whether those regulations could be simplified or made more flexible without adversely affecting the ability of banks to meet funding outflows in stress circumstances or in resolution.

Study the costs and benefits of a central clearing requirement for Treasuries and Treasury repo, including the impact central clearing might have on market liquidity. The study should consider:

- Whether central clearing of Treasuries will substantively increase balance-sheet capacity for dealers that can be used during stress.
- Whether a clearing mandate for proprietary trading funds (and others that are significant Treasury market participants) would improve risk management.
- Whether central clearing of Treasury repo would free balance-sheet capacity and improve risk management, given that elements of the existing market structure already allow netting and central clearing.

Expand data collection by the Office of Financial Research (OFR) or its successor in the Treasury and Treasury repo markets; require the OFR to use those data to better analyze key dimensions of market functioning and to increase transparency

around Treasury and repo markets consistent with protecting privacy and proprietary trading strategies.

Require the Financial Stability Oversight Council (FSOC) to monitor and report on factors affecting Treasury and repo market liquidity on a regular basis.

Require regulatory agencies to consider the effects of their regulations on market liquidity.

Establish a new Federal Reserve standing repo facility to serve as a backstop for the U.S. financial system by providing funding against U.S. Treasury securities to categories of market participants defined below.

Three categories of market participants should have access to the standing repo facility:

- Bank-affiliated dealers and independent dealers that meet a common set of prudential regulations, established by the Federal Reserve in cooperation with the Securities and Exchange Commission (SEC), and that are in sound financial condition.
- Significant nonbank Treasury market participants, including asset managers and PTFs, whose Treasury market activity the Fed in conjunction with the SEC determines to be systemically meaningful and therefore should be mandated to have access to this backstop facility.
- Additional market participants on a voluntary basis.

The latter two categories, nonbank mandatory and voluntary participants, should be required to pay an up-front fee for the liquidity that they would demand in a stress period. An appropriately sized up-front fee would reduce moral hazard and create a framework that more directly links the size of liquidity transformation offered outside regulated banking to what the market can support during stress.

The Fed standing repo facility should be designed so that its use is attractive only as a backstop for market-wide stress situations, avoids stigmatizing users, and meets the core goal of supporting a functioning and resilient Treasury market when private market agents alone cannot.

Therefore, we recommend that financing would be provided at interest rates that are modestly above normal market rates and at pre-established market haircuts that are consistent with expectations for financing the risk-free asset. Those rates might appropriately vary based on the category of market participant accessing the backstop facility. Both the penalty rate and haircuts should be predefined and transparent to avoid amplifying stress when the facility is used.

To fully achieve the intended market stabilizing benefit of this Federal Reserve standing repo facility, the Fed should consider permanently carving out repo financing activity transacted under this facility from SLR and GSIB capital calculations for prudentially regulated banks and dealers.

As a complement to this backstop facility for private holders of Treasuries, the Fed should also make permanent its repo facility for foreign monetary authorities (FIMA), whose sales contributed to the pressure on Treasury markets in March 2020.

CHAPTER 4: INSURANCE COMPANIES

EXTERNALITIES

Credit supply disruptions:

Contraction in credit if insurance companies are capital-constrained and rebalance to safer assets, which can lead to potential fire sales that reduce prices and new issuances of corporate bonds.

RECOMMENDATIONS

Standardized stress tests of operating companies and at the product-group level. Tests should focus primarily on aggregate risks associated with financial market risks and changes in policyholder behavior.

Strengthen the role of the Federal Insurance Office (FIO) by making it a voting FSOC

	<p>member and giving it a financial stability mandate. It should design the standardized stress tests and design and collect information to facilitate increased transparency.</p> <p>Increased transparency should include additional information about the interest-rate exposure of insurance liabilities, ideally by product group; the equity and volatility exposure of liabilities; the sensitivity of different classes of products to policyholder behavior; the market value of liabilities; and the capital relief provided by captive reinsurance companies.</p>
<p>Critical market disruptions:</p> <p>Disruptions of insurance markets via increased prices, changing contract characteristics, and missing insurance markets, thereby distorting risk-sharing possibilities for households and firms.</p>	<ul style="list-style-type: none"> • Stress tests • Strengthen the role of the FIO • Increased transparency
<p>Spillovers via state guaranty associations:</p> <p>Insurers face calls to contribute more capital to guaranty associations at the same time, which may stress other companies.</p>	<p>Stress tests of the state guaranty associations.</p>

CHAPTER 5: OPEN-END FUNDS

EXTERNALITIES	RECOMMENDATIONS
<p>Disruptions in credit supply:</p> <p>Sharp constriction of credit when prime MMFs do not roll over commercial paper and certificates of deposit.</p>	<p>For prime MMFs, adopt swing pricing and redemption fees and eliminate the connection between a fund's liquidity buffer and imposing gates or redemption fees.</p>

Disruptions in credit supply:

Contraction in credit if open-end funds that hold less-liquid assets face large redemptions and potential fire sales that reduce prices and new issuance for long enough to disrupt financing.

The SEC should develop a framework to assess the appropriateness of fund structure and liquidity offering in the context of available market liquidity under stress, including for assets held as liquidity buffers. The SEC and FSOC should regularly review these fund categories to make sure that redemption periods are consistent with ongoing market structure, depth, and size.

Create a new type of fund that permits less frequent withdrawals with longer redemption periods for funds for which offering daily redemptions are deemed inappropriate because daily swing pricing cannot be reliably established; fund should be transitioned to that new form.

Adopt swing pricing for other open-end funds where appropriate.

The SEC and FSOC should conduct periodic reviews to ensure that funds that offer daily redemptions can do so without threatening financial stability.

CHAPTER 6: HOUSING

EXTERNALITIES

Defensive actions taken by highly indebted borrowers. These borrowers can be forced to scramble to make their required payments, even if they do not default. In this case, borrowers are prone to reduce their spending, generating drops in aggregate demand, creating a feedback loop through unemployment, which generates further decreases in spending and aggregate demand.

RECOMMENDATIONS

Ex Ante Actions:

- Loan-to-value caps on investor properties and cash-out refinancings.
- Add residual income tests, in addition to the currently used debt-to-income ratio.

Ex Post Actions:

- Streamlined refinancings if national or regional unemployment reaches a preset level; and a governance structure is in place to approve it.
- Institutionalize forbearance for national emergencies.
- Enhance mortgage modifications for government-guaranteed loans to make it

	<p>easier for delinquent borrowers to keep their home.</p> <ul style="list-style-type: none"> • Allow principal reduction modifications to be non-taxable or tax deferred to the borrower.
<p>Liquidity strains in the securities and loan markets, leading to disruptions in mortgage credit supply.</p>	<p>For government-guaranteed or government-sponsored mortgages, a central liquidity facility that all entities can borrow from, at a penalty rate, if they need liquidity. The terms of this facility should be aligned with those of the Treasury repo facility recommended in chapter 3.</p> <p>Limits on repo leverage derived from a study of changes in the market value of the underlying collateral through an economic cycle.</p>
<p>The failure of the nonbank servicing sector, leading to disruptions in mortgage credit supply.</p>	<p>Ginnie Mae should complete its actions to strengthen counterparty risk management.</p> <p>Establish the Federal Housing Finance Agency (FHFA) as the prudential regulator for nonbank servicers.</p> <p>Allow the nonbanks to establish Federal Home Loan Bank (FHLB) membership after the prudential regulator is in place.</p> <p>Require that the FHFA account for systemic risk in its regulation of Fannie Mae, Freddie Mac, the FHLBs, and potentially the nonbank servicers. This would include stress testing the FHLBs if they take on an expanded role as liquidity providers to both banks and nonbanks.</p>

CHAPTER 7: CENTRAL CLEARING COUNTERPARTIES

EXTERNALITIES	RECOMMENDATIONS
<p>Increased margin calls during stress that lead to cash needs and trigger fire sales.</p>	<p>Implement through-the-cycle margining methodologies and robust collateral standards. Methodologies, including concentration/liquidity charges, portfolio margining credit, haircuts, margin period of risk and look back periods, should be transparent and not at the sole discretion of CCP management. Consider shortening settlement intervals (which would partially offset the impact of through-the-cycle margining in securities CCPs).</p>
<p>Fallout from actions that exchanges might pursue to push losses onto members. The consequences can include fire sales and reduced credit extension.</p>	<p>Implement improved and transparent stress testing with regulatory oversight and uniform design.</p> <p>Impose uniform standards for default funds that properly reflect risks and follow-up auditing.</p> <p>Set appropriate capital levels and bail-in debt that align the interests of the CCP and its members and provide a mechanism for continuity of operations.</p>
<p>Disruptions from actions taken by an impaired CCP to continue operating.</p>	<p>Improve overall CCP resilience.</p> <p>Predefined assessment caps and loss-allocation rules that are approved after accounting for systemic effects and can only be used at the discretion of the resolution authority.</p>
<p>Cross-CCP spillovers whereby trouble at one CCP is transmitted to others, amplifying any of the problems that exist for a single CCP.</p>	<p>Expand Federal Reserve authority and responsibility to deal with systemic risk issues associated with CCPs.</p> <p>Improve cross-border CCP resolution planning, including establishing memoranda of understanding across borders.</p> <p>Ensure that systemically important non-U.S. CCPs have access to dollar funding in times of stress.</p>

CHAPTER 8: REGULATORY STRUCTURE AND PROCESS

RECOMMENDATIONS

Institutionalize systemic stability as a priority for every FSOC member

- Congress should clarify that the mandate of each FSOC member includes using its existing tools and authority to promote financial stability and resilience.
- Every FSOC member should be required to have an internal Office of Financial Stability and Resilience.
- FSOC members should be required to undertake an impact analysis that assesses how a proposed rule or other action may exacerbate or reduce threats to financial stability.

FSOC leadership

- A new position—under secretary for financial stability—should be created within the Treasury Department, supported by sufficient staff. At the discretion of the Treasury secretary, the under secretary would have full authority to take any actions that the Treasury secretary is authorized to take.

FSOC Annual Report

- The process and composition of the report should be revised to enhance accountability and efficacy. The main report would come solely from the Treasury secretary, as head of the FSOC, instead of from the whole committee. Each FSOC member would issue its own report that would become an appendix to the main report.
- A primary aim of the report would be to provide an overview of known or emerging sources of systemic risk and to propose ways to address them. The report would include a lookback that explains how the financial system and flows had changed relative to a snapshot taken three years previously.

Addressing regulatory and data gaps

- The FSOC Annual Report should include a section on regulatory shortcomings, information gaps, and recommendations for how to address them. This section would identify actions FSOC members should take and include recommendations to Congress when new authority is required.

Designation process

- For any financial institution or activity above a given threshold, the Treasury under secretary for financial stability should be required, at least once every three years, to present to the FSOC a balanced case identifying the major considerations for and against designating that entity as systemically important.
- The FSOC could also evaluate whether a financial institution or utility or activities in which such institutions are engaging pose a systemic threat that is best addressed through a mechanism other than designation as systemically important utility or institution.

Transform the Office of Financial Research into the Comptroller for Data and Resilience

- All of the authority and responsibilities of the Office of Financial Research should be vested in a new Comptroller for Data and Resilience. The CDR should be independent and, if it remains within the Treasury Department, have bureau status.
- Congress should require that any action by an FSOC member agency that must be reviewed by the Office of Management and Budget under the Paperwork Reduction Act should simultaneously be submitted to the CDR for review and consultation.
- FSOC members should be expected to comply with any reasonable request by the CDR for access to data or information, other than confidential supervisory information.
- The CDR should issue one of the addenda to the main FSOC Annual Report.

FSOC membership

- The CDR should be a voting, rather than non-voting, member of the FSOC. To reduce the size of the FSOC, the NCUA should cease to be a member. The presidential insurance appointee should be replaced by the head of the Federal Insurance Office as a voting member.
- Each FSOC member should be allowed to send anyone in a voting position to the FSOC meetings.

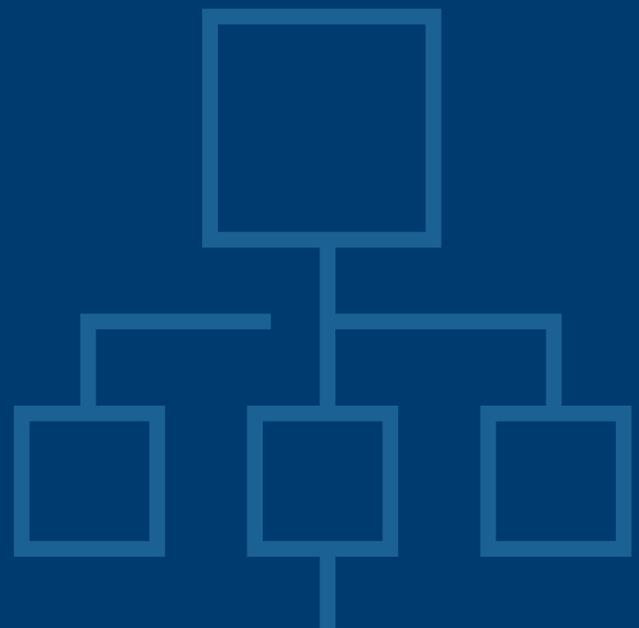
FSOC/CDR working groups

- The FSOC and CDR should have a readily available mechanism to bring together interdisciplinary groups of experts. The FSOC already uses working groups and could expand on their use to good effect.
- There should likely be a combination of temporary working groups to examine specific threats or unknowns and standing working groups dedicated to ongoing areas of concern.
- The FSOC should include an explanation in its annual report anytime a standing working group is dissolved or ceases meeting.

¹ Kashyap and Siegert, 2019.

Framework for Assessing Financial Stability Risks

CHAPTER TWO



Before proceeding to our recommendations, this chapter lays out the guiding principles that we use in reaching our judgments. We begin with some terminology and then identify key types of instability. Next, we describe the conditions that lead to instability. We then describe the generic problems that our recommendations will address.

The Rationale for Macroprudential Policy

Our policy recommendations aim to enhance stability. Such policies have come to be known as *macroprudential* policies. Macroprudential policies are designed to deal with problems emanating from the financial system that affect the real economy and that will not be addressed adequately by *microprudential* regulators (as described below) or corrected naturally by private agents acting in their own interest. We include policy recommendations that are tied directly to participation in market activities, regardless of the regulatory status of the market participants, to support ongoing functioning of markets in an evolving and open system.

Our policy goal is ensuring that financial stability is achieved and that policies are flexible enough to be durable and to evolve as the financial system does.

Financial stability prevails when the financial system reliably supplies credit intermediation and other vital financial services needed for the real economy to continue to grow at a sustainable rate.

- Vital financial services include credit intermediation, risk transfer, liquidity provision, well-functioning financial markets, and payment, clearing, and settlement.
- This definition highlights that stability requires the absence of big disruptions in these financial services from financial institutions, other market participants and infrastructure, and markets. The system must be reliable, meaning that it functions in good times and in bad.
- Sustainable growth means that substantial credit buildups by households and businesses followed by deleveraging that significantly depresses growth would be inconsistent with financial stability.*

Conversely, financial instability can occur when problems, or concerns about potential problems, within the financial system significantly impair credit intermediation and other financial services enough to substantially harm real economic activity. Instability can arise from wide-scale deleveraging following a credit boom.

- The phrase “concerns about potential problems” is essential because even a perception that institutions or markets are fragile can lead to instability. Hence, attending to perceptions is important.

* Deleveraging refers to situations where firms or households divert resources to making debt payments and as a result cut their spending. The absence of spending reduces incomes for others in the economy and, thus, reduces growth.

- Financial instability is a concern because it impairs the performance of the real economy.
- Credit supply shocks must be significant, and deleveraging must be widespread to alter the path of the overall economy; not all disruptions in financial markets rise to this level.

The difference between macroprudential and microprudential

Microprudential policies focus on promoting the safety and soundness of individual financial institutions. Other longstanding aims of financial regulation include protecting investors and consumers, fostering the efficient operation of financial markets, and preventing fraud, market abuse, and the spread of misleading information. In light of the severity of the Global Financial Crisis, a consensus emerged that these policies alone are insufficient to ensure financial stability. Macroprudential policies take a broader perspective and are aimed at the stability of the financial system as a whole and its interaction with the real economy. The primary difference is that macroprudential policies consider externalities, or spillovers, that actions by individual financial institutions, investors, savers, and borrowers can have on the broader system.

Strong microprudential regulations are necessary for financial stability. Preventing the failure of a large financial institution is consistent with and critical to financial stability. However, in some situations, some actions by an individual financial firm or a microprudential regulator to reduce a firm's stresses might not support the broader financial system and economy. A classic example is a bank shrinking its assets—say, by not rolling over

loans—during an economic downturn to ensure compliance with capital requirements, a microprudential objective. A macroprudential regulator would require the bank to raise equity rather than shrink assets because if all banks were to shrink at the same time, their actions would amplify the downturn, and could lead banks to reduce assets even more. Moreover, a macroprudential regulator would require banks to raise equity preemptively during an expansion rather than in a downturn when an increase in capital requirements could shrink lending.

Another example is a prime money market mutual fund (MMF) that holds highly liquid assets, which it sells to meet redemptions to avoid having to dump its less-liquid holdings at especially depressed prices. If redemption requests are outsized, these funds might temporarily suspend redemptions to protect their remaining investors from outsized drops in the value of the fund. But suspensions can lead investors to run on other MMFs before they lose access to their funds. A widespread run would disrupt short-term funding markets for businesses that use these markets to fund working capital and other short-term expenditures. To prevent these kinds of disruptions, a macroprudential regulator might eliminate a fixed redemption value for MMFs that hold assets with credit risk or material liquidity risk.

In making policy recommendations, it is important to weigh both costs and benefits of potential actions. While avoiding crises is undoubtedly beneficial, regulations that stifle growth and innovation are costly too.

Types of externalities

Three generic types of externalities can create the need for a macroprudential policy response.* Each involves a disruption to the real economy that comes from vulnerabilities in the financial system or among borrowers.

1. One arises from disruptions of credit supply (and other vital financial services) by financial intermediaries. Supply disruptions can occur because an institution fails (despite microprudential regulation). However, even in the absence of a failure, distress at some institutions can lead them to cease lending to reduce their risk exposure. The cutback in credit can spill over to other financial firms, in turn constraining their ability to provide credit. The affected firms will not account for spillovers to other credit providers.

Supply disruptions also can occur if markets become illiquid (that is, unable to execute transactions in a reasonable period with minimal price impact). Both traditional and nontraditional market makers have incentives to protect themselves from risks that arise in illiquid markets. For example, they can increase bid-ask spreads, or reduce trade size, or even withdraw from the market. In illiquid markets, price discovery is impaired and the ability to transfer risks deteriorates. The ultimate effect is that creditworthy borrowers can lose access to debt and short-term funding or borrowing costs can rise substantially.

2. A second externality can occur from defensive actions by highly indebted households and firms. These borrowers

may have to scramble to make required repayments, even if they do not default. In this case, the borrowers are prone to cut their spending to service their debts—deleveraging—and the spending cuts reduce incomes for others in the economy. Deleveraging borrowers will not account for this knock-on effect. The extent of financial stability risks depends on the materiality of borrower leverage for the macroeconomy. Spending deficiencies can often be addressed by easing monetary policy and/or expanding fiscal policy. However, those options at times may be constrained, so a particular concern might be high corporate (or household) debt ratios when interest rates are already low and fiscal policy is constrained.

3. A third externality comes from disruptions of critical infrastructure or the plumbing of the financial system, such as payments and derivative transaction clearing by central clearing counterparties (CCPs). These critical services are the ultimate interconnected network where stress at one node spills over to all others. When critical service providers are under stress for financial or nonfinancial reasons (such as cyberattacks, operational disruptions, or fraud), the loss of services would endanger nearly all services that the financial sector provides to the real economy. Externalities may arise in clearing because multiple CCPs have many of the same major clearing members. For example, if a CCP's default fund falls short, it may not consider the impact of a call on its members (including their ability or willingness to meet it), or how a member's failure would

* Externalities often arise because of frictions or distortions in financial markets, such as asymmetric information, agency problems, institutional nominal target returns, or limited liability (to name a few examples).

affect the resources of multiple CCPs at the same time. The interconnectedness of CCPs through their members, and the increased interconnectedness of members through CCPs, likely will require more coordination to incorporate externalities than exists in the current regulatory framework. In addition, defensive CCP management actions can create unexpected harm for end users. In chapter 7, we elaborate on several other externalities that can arise from other defensive decisions made by an impaired clearing house.

The concentration of services in a single provider or very small set of providers can also lead to externalities. If the service is critical, the individual firm's incentive to build resilience to risks is likely tied to the cost to that firm of becoming impaired (or failing). A macroprudential regulator might conclude that a higher level of resilience is needed because it also takes account of the loss of services to the economy from the service provider's impairment or failure. In the United States, some of these externalities have been addressed by both more stringent microprudential and macroprudential policies for the largest banking firms. But a wide variety of other types of firms and markets provide credit and other vital financial services. The regulated bank macroprudential framework is not applicable and may not be appropriate for them.

As we explain in subsequent chapters, market scale has grown for other reasons, with the same result that the market now is a source of potential instability.

General Sources of Instability

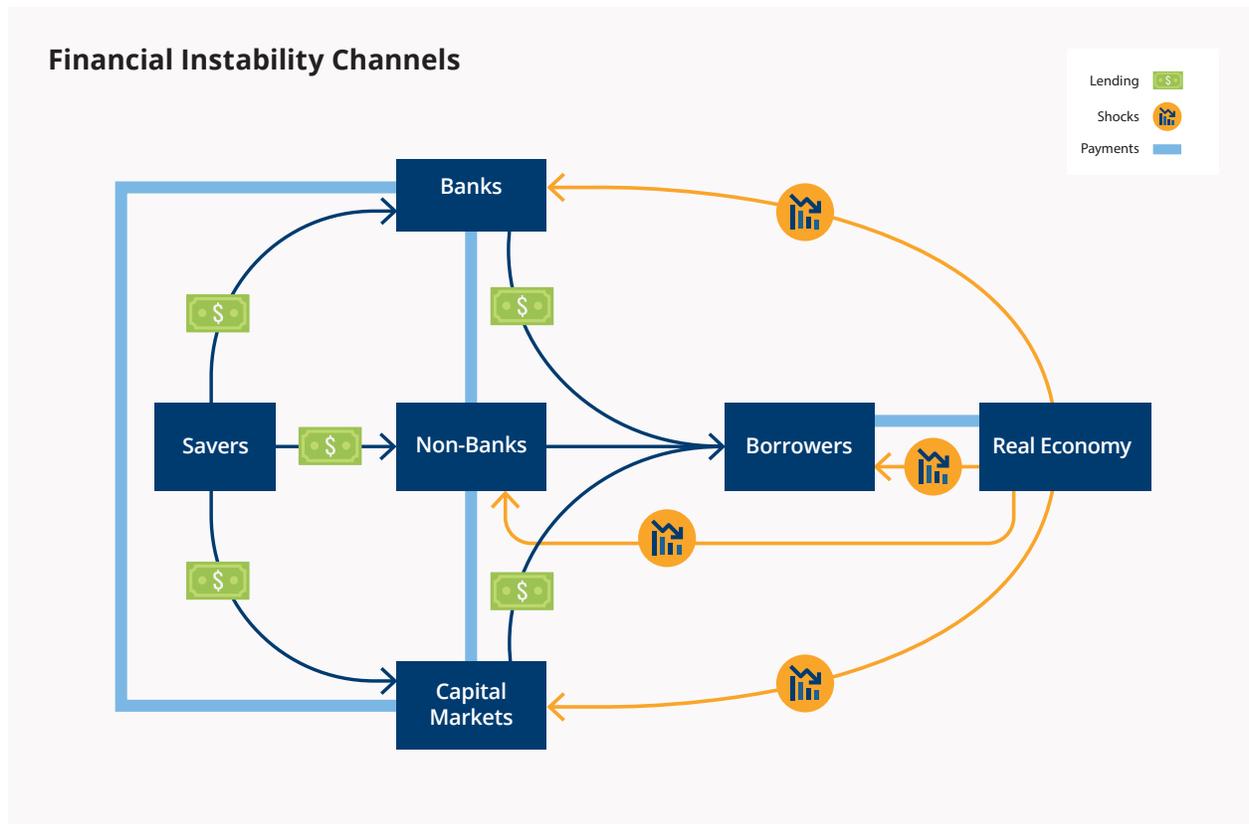
The figure below summarizes this framework and possible sources of instability. The figure supposes that the ultimate job of the financial system is to facilitate the use of savings to support borrowing and spending, which includes investing, and ultimately supports economic growth. In addition, this transformation requires that critical services—payments, clearing, and settlement—can be provided reliably. For simplicity, we concentrate on five fundamental types of linkages within the system. First, savers put their money in the financial system via banks, nonbanks, or through capital markets, directly or indirectly. Next, the money flowing into the financial system is passed on to borrowers (households, businesses, or governments). Third, payments are made between the various actors in the economy and the financial system. Fourth, the borrowers spend on investment and consumption, which supports the real economy. Finally, events in the real economy play out, feeding back to the borrowers and the financial system. During booms, business revenues, household incomes, and spending will be high and asset values can rise, which benefits borrowers and the financial system, thus supporting the economy (and ultimately savers too).^{*} During busts, the opposite is true. A resilient and robust financial system would stop business cycles from being amplified, as well as stop shocks to the financial sector from being amplified and harming the real economy. (This figure abstracts from the infrastructure that is needed to make the system work and omits several interconnections between,

^{*} For simplicity, we omit the arrows that would show the repayments from the borrowers that ultimately flow back through the financial system to the savers. We also abstract from the interconnections among banks, nonbanks, and capital markets in the financial system, which could be represented by another set of connections in the diagram.

among, and within banks, nonbanks, and markets, but it illustrates the fundamental transmission channels.)

Financial stability risks generally are greater when the financial system is highly leveraged, relies heavily on short-term funding, or has

be subject to regulatory constraints such as those that require them to maintain a certain level of capital relative to assets. In this case, investors are unwilling to provide additional funds because they worry that financial intermediaries in the aggregate lack sufficient capital to absorb future losses.



complex direct interconnections or indirect interconnections through common assets, concentrated positions, and infrastructure.

Credit supply disruptions that originate from intermediaries (banks or nonbanks) ultimately occur because the institutions have too little loss-absorbing capital to continue lending following a shock or too little liquidity to ride out problems. When losses occur (or are perceived to be likely), intermediaries may

Problems can also arise when intermediaries cannot roll over their short-term debt funding. The loss of short-term funding will force them to sell assets. If they lack sufficient liquid assets, they will be forced to sell other assets at a price concession.

The losses from these *fire sales* of assets can reinforce the initial concerns and initiate a negative feedback loop.* This type of feedback loop is much more likely when the fire sale is both deep and persistent. In that case, the dislocation of secondary market prices of debt securities can mean that new issuance ceases, thus directly affecting credit supply. Conversely, small or very temporary price dislocations are much less likely to affect credit supply and hence the real economy. Thus, not every fire sale necessarily creates a systemic risk.

Another problem can arise if intermediaries are directly interconnected to other financial firms or have high percentages of assets in common with others in the economy. Direct interconnections can lead to instability if they create large losses for many firms at the same time. In the case of indirect connections through common assets, asset price declines because of a fire sale by one institution will create losses for other holders of those assets. Even if some firms do not have common holdings, if their counterparties fear that they do, they may step back from funding the firms. Either situation can lead to further fire sales.

Credit-supply disruptions can also occur when markets stop functioning well. Well-functioning markets are needed to price assets and risks. They require institutions that can bear the risks of market-making to help provide liquidity so that markets and investors can absorb losses without significant spillovers. Market liquidity can also be vulnerable if investors have common assets and concentrated positions—because of concerns about highly correlated trades and concentrated losses. Even the U.S.

Treasury market was susceptible to these problems in March 2020 when many sellers demanded liquidity at the same time.

Liquidity mismatches of open-end funds can also create credit-supply shocks. Open-end funds typically invest in longer duration assets issued by corporations (for example, bonds or loans), while allowing investors in the fund to withdraw their money on short notice, often daily. If a fund's underlying assets, in this example the corporate debt, cannot be quickly sold, the investors that withdraw soonest may receive a higher repayment than those that wait. This “first-mover advantage” creates an incentive to withdraw quickly when signs of trouble arise. This is an issue even if investors are not promised a fixed value of repayment because early redeemers stand to get more than investors who wait. If withdrawals are sizable and force sales at substantial discounts, investors in other similar funds may also redeem. The funds collectively may stop buying corporate debt, potentially creating a credit crunch.

We can judge these vulnerabilities—leverage, maturity and liquidity mismatches, and interconnections—in different parts of the financial system. It makes sense to look separately at banks, nonbanks, and market-intermediated finance because the types of firms (and institutions) have very different operating models, are at risk for different types of shocks, and continue to evolve because of technology and different regulation.

* A fire sale is a forced sale of an asset at a price that is below the value that could be realized if the seller had more time to locate buyers.

Principles for Addressing Sources of Financial Instability

Macroprudential and microprudential policies can partly offset the risks to aggregate credit supply and other vital financial services.

In general, the main tools for financial intermediaries are capital, liquidity, and disclosures, and the tools for borrowers are standards relative to their capacity to pay.

For financial intermediaries, capital requirements can support loss absorbency. For banks, the systemic risk consequences are addressed by capital surcharges for systemically important banks, by using the countercyclical capital buffer to change capital charges based on the overall risk in the financial system, by stress tests that assess banks' ability to lend during downturns, and by resolution and recovery plans that seek to limit spillovers from the demise of an impaired institution to the rest of the financial system and ensure continuity of operations for critical services like payments and clearing.

A macroprudential framework has not been put in place for nonbank financial firms. The Financial Stability Oversight Council has the authority to designate nonbank financial firms that pose systemic risks for supervision by the Federal Reserve. For market-based intermediation, margin requirements for secured financing transactions or risk retention for securitizations could bolster loss absorbency. However, regulators have limited ability to fully impose these requirements and potentially adjust them depending on market conditions.

Liquidity regulations can help mitigate risks of funding mismatches at financial firms and limit amplification and spillovers from fire sales and

liquidity failures. They also ensure continuity of operations under stress. For nonbanks (like finance companies that rely on short-term funding or asset managers), capital and liquidity requirements are limited, though other reforms can reduce some short-term funding risks.

One broad principle is that when connections among institutions or among borrowers and lenders are complex and opaque, the system is likely to be fragile. Agents in the economy are less able to assess the reliability of counterparties, leading to defensive actions (such as withdrawing funding) in response to bad news. Thus, disclosure to improve transparency and simplicity based on common reporting metrics is generally beneficial.

For deleveraging risk of households and businesses, credit that originates via bank loans can be managed with bank regulations, but it is not clear how market-intermediated debt, such as high-yield bonds and institutional leveraged loans, would be managed. No regulator has the authority to prevent large funding surges in the bond market and it is not obvious what tools would be politically acceptable for doing so. Loan-to-value, loan-to-income, or debt-service-to-income ratios for residential mortgages are a macroprudential tool for household deleveraging risk in many countries, though they are not used for that purpose in the United States.

Introduction to Non-Bank Finance

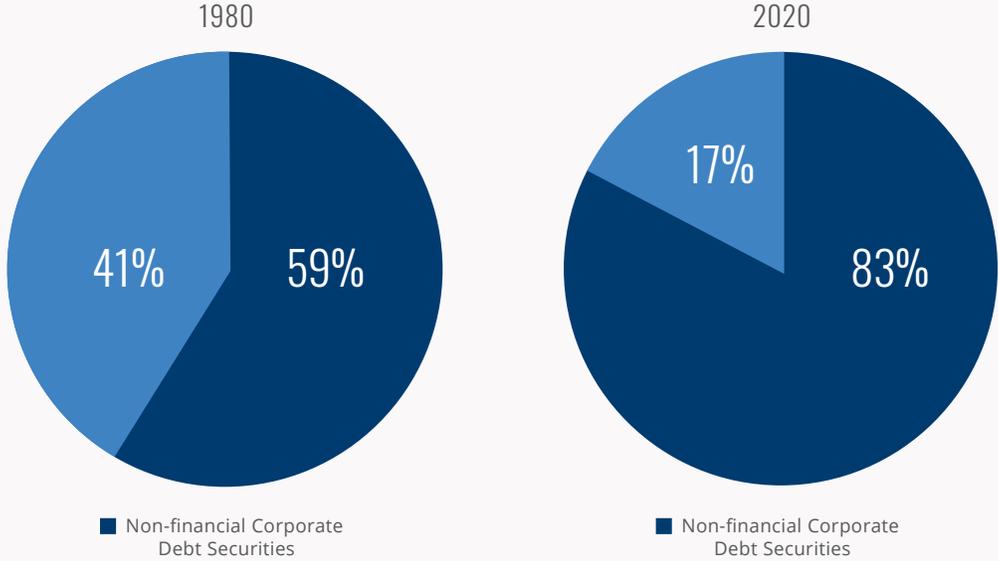


The next several chapters address specific aspects of finance where we see the most important vulnerabilities, all of them outside of the regulated banking system. The shift from bank loans to nonbank sources of credit, and in particular market-based sources of funds, has been occurring over many years, and has picked up steam after the Global Financial Crisis. The chart below shows the growing importance of bonds and commercial paper as a proportion of credit outstanding of nonfinancial corporate businesses.

Credit to households also has come to be more market focused as both consumer credit and mortgages have been originated by banks and other intermediaries and then bundled into securities and sold. And markets have had to finance rapid growth in federal government debt in recent years. The shift to market-based finance for private borrowers has been fueled by several developments. Advances in technology and modeling, for example, have facilitated securitizations and the breaking up of loans bundled in securities into tranches

Banks' Share of Corporate Credit Shrinking

Share of credit to non-financial corporations from banks vs. bond and other markets, 1980 and 2020



Source: Federal Reserve Board

to attract nonbank investors with a variety of risk appetites. The assumptions behind the models have not always proven robust—for example regarding default risks for subprime mortgages—but the technology continues to be used, most recently for leveraged loans originated by banks but sliced and diced into collateralized loan obligations that are traded and held globally. Technological advances have drawn new participants into securities markets who trade very rapidly using algorithms that have changed the character of trading liquidity.

A notable development over recent years supporting nonbank finance has been the rapid growth of bond mutual funds—both open-end bond funds and exchange traded funds (ETFs) fueled in part by individuals' defined contribution retirement savings and institutional investors who seek diversification and transaction costs lower than trading individual bond issues. Since the Global Financial Crisis, the persistence of very low interest rates has likely induced some investors to turn from bank deposits to the higher returns on bonds. Banks have not competed actively for deposits because they face potential costs from leverage ratios and liquidity requirements.

For borrowers, low interest rates have enabled businesses to service higher levels of debt and business leverage has greatly increased. As the pricing of bank loans has come to reflect higher capital and liquidity requirements, businesses have found bonds and securitized leveraged loans attractive alternatives.

Nonbank financial intermediation supplies the same types of maturity and liquidity transformation as banks do when they use

deposits to make loans. Savers get the promise of a highly liquid asset—one that can readily be exchanged for a bank deposit on short notice—but that carries a rate of return that reflects the less-liquid, longer-maturity assets held by the nonbank intermediary. As a consequence, *key elements of the nonbank financial system are subject to many of the same financial stability risks as banks, making them vulnerable to runs and forced asset sales, without the offsetting prudential requirements and automatic access to central bank liquidity facilities that are required for banks.* For example, many hedge funds are highly leveraged, relying on short-term borrowing to finance positions in less-liquid or highly speculative assets; the funds therefore are subject to abrupt changes in cash requirements to meet mark-to-market margin calls. This report addresses, in detail, leverage arising from margining in derivatives clearing, but leverage in nonbank finance arises from many other sources, including securities lending and loans from banks as part of their prime brokerage operations.

And, as discussed in chapter 5, open-end mutual funds promise their investors much higher redemption liquidity—daily at today's closing price—than is consistent with the markets in which they would need to sell assets (such as for corporate bonds) to meet those redemptions. This liquidity mismatch offers investors a first-mover advantage in stress situations; it pays an investor to be at the head of the line before sales lower prices, which itself induces rapid redemptions when markets are least prepared to absorb them. These vulnerabilities and more were highlighted by the market events of March 2020.^{*1,2,3}

* Good summaries of the March events have been produced by the Financial Stability Board, Bank of England, and Federal Reserve Board.

The prospect of sharp declines in sales and income as economies shut down for the COVID-19 pandemic, along with extraordinary uncertainty about the size and duration of that shutdown, naturally sparked a sell-off of risky assets and a huge spike in the demand for the safest, most liquid asset—bank deposits. That repricing was amplified, and credit markets began to close entirely, as securities markets—including the market for the safe-haven asset of U.S. Treasury securities—were unable to absorb the large volume of sales in an orderly way.

Institutional investors redeemed prime money market mutual funds holding commercial paper and certificates of deposit, and because the funds met withdrawal requests by selling these securities or allowing them to run off, the ability of banks and businesses to raise short-term funds was threatened. Corporate bond mutual funds suffered major outflows as well, and the sales of corporate and Treasury bonds by those funds drove down prices in those bond markets. Dollar assets, especially Treasury and government agency bonds, are widely held by foreign investors, and their sales to obtain cash put further pressure on government bond markets.

The unexpected movements in the prices of Treasury securities exposed highly leveraged hedge funds, which had taken very large positions betting on the convergence of prices of similar securities in cash and futures markets. When relative prices moved against the funds, they were forced to sell Treasury securities in volume and to meet substantial margin calls in derivatives markets that further escalated the need for cash. More generally, margin requirements in cash and derivatives markets were raised to protect clearing and settlement in a period of extraordinary volatility; they were successful in this

regard, but the procyclical movement in the requirements that some participants had not anticipated added to pressures in markets.

Securities dealers did step in, to some extent, to absorb the securities offered for sale, but their willingness and ability to flex their balance sheets was constrained by not only their own risk appetite and survival instinct, but also by the possibility that they might cross capital and liquidity limits tightened since the Global Financial Crisis.

Under these circumstances, central banks had to intervene with massive and extraordinary actions to restore the functioning of these markets and preserve the access to credit of households, businesses, and governments. The Federal Reserve purchased huge amounts of Treasury and agency securities and agency mortgage-backed securities; it opened special liquidity facilities for securities dealers, for money market funds, for businesses that had lost access to commercial paper markets, and for businesses and state and local governments that encountered problems accessing bond markets.

To meet heightened international demands for dollar liquidity, the Federal Reserve increased the size of its dollar swap lines with foreign central banks and expanded the list of central banks with access. In these facilities, the Fed sends dollars to foreign central banks temporarily and gets foreign currency in return. That enables foreign central banks to meet the dollar needs of their own banks. The Fed also established a repo facility for international monetary authorities, in which it lent for a short period against Treasury collateral so that foreign institutions could avoid selling their Treasury securities outright.

These interventions were successful. Market functioning was restored, and credit resumed flowing freely. In some cases, actual use of the new facilities was quite limited, but having the backstop put a floor under prices. The need for Federal Reserve intervention highlighted how essential nonbank financial intermediation has become to the functioning of the financial system and the economy; and those events pointed to the vulnerabilities in these markets that this report addresses.

¹ Financial Stability Board, 2020.

² Bank of England Financial Policy Committee, 2020.

³ Board of Governors of the Federal Reserve System, 2020.

Liquidity of the U.S. Treasury Market

CHAPTER THREE



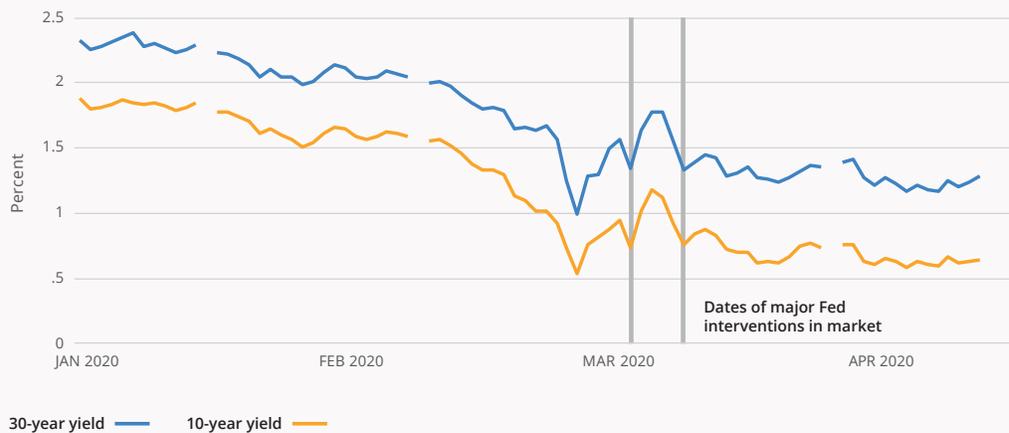
With \$22 trillion outstanding, the market for U.S. Treasury securities is the largest, most liquid, and most important financial market in the world. Yields on U.S. Treasuries serve as a benchmark against which risky assets are priced around the globe. Liquid and resilient markets for Treasury securities are essential not only to financing the U.S. government, but to the strength and stability of the U.S. economy. Robust liquidity allows buyers and sellers to transact normal volumes of U.S. Treasuries in a short period without materially affecting prices even in times of stress. The stability of the Treasury market underpins the provision of credit through both capital markets and banks and reduces the cost of the federal debt.

For markets in U.S. Treasury securities and Treasury repurchase agreements, or repo, (short-term borrowing collateralized by

Treasury securities), March 2020 marked another in a series of episodes of abrupt market adjustments and disrupted trading, highlighting the decline in recent years of the resiliency of the Treasury market. With the onset of the COVID-19 pandemic and related uncertainty, stock prices fell but so did prices of U.S. Treasuries, the opposite of what usually happens at such moments. The yield on 10-year Treasuries rose by a large 0.64 percentage points not due to higher expected inflation or increased U.S. government default risk but because some holders of Treasuries rushed to sell them to raise cash for a variety of reasons. Mutual funds had to meet investor demands for redemption, hedge funds had to meet margin calls, and foreign central banks needed U.S. dollars to lend to banks in their economies that had trouble accessing the usual markets for borrowing dollars.*¹ Depth and liquidity

Yields on U.S. Treasuries Spiked in March 2020

Yield on 10-year, 30-year Treasuries, January - April 2020

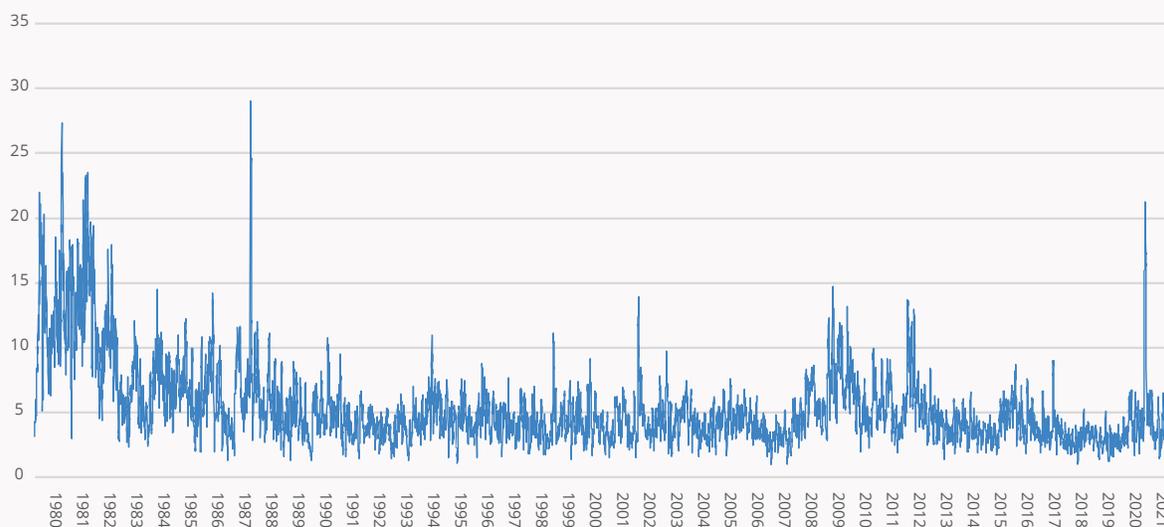


Source: Federal Reserve Board

* Annette Vissing-Jorgensen estimates that foreigners (notably central banks) sold \$287 billion in Treasuries in the first quarter of 2020, mutual funds sold \$266 billion and hedge funds sold \$183 billion. None of these holders sold substantial amounts of Treasuries during the worst of the Global Financial Crisis in the fourth quarter of 2008.

Treasury Yields Were Unusually Volatile at the Onset of the Pandemic

Two-week rolling standard deviation of daily change in yield in 30-year Treasury bonds, basis points per day



Source: Federal Reserve Board

disappeared, with bid-asked spreads jumping higher. Prices became extremely volatile, and sellers had trouble finding ready buyers at a reasonable price. Market participants had difficulty executing even modestly sized transactions and confronted very large increases in transaction costs.²

Securities dealers, especially those designated as primary dealers by the Federal Reserve Bank of New York, have historically stepped in to manage this type of dislocation in market liquidity, using their own balance sheets to purchase or lend against Treasuries in sufficient size to stabilize the market during stress.*

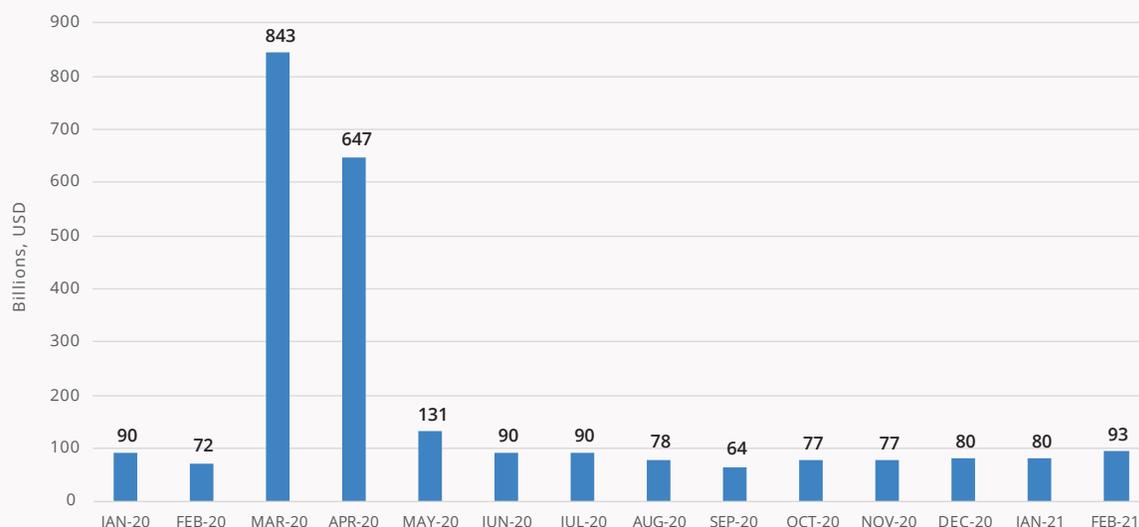
While dealer positions in Treasuries increased more than 40 percent during March 2020, they were unable to fully absorb this global, simultaneous surge in demand to sell Treasury securities.

In response, the Federal Reserve purchased more than \$1.5 trillion in Treasuries in March and April. By contrast, in the quantitative easing program it undertook in 2012 and 2013 to spur economic recovery from the Global Financial Crisis, the Fed was purchasing \$45 billion of Treasury securities each month. The purchases in 2020 were undertaken specifically to “restore market functioning,” the Fed said.

* Primary dealers transact with the Federal Reserve Bank of New York as it executes open market operations for the Federal Open Market Committee; they also are expected to participate in auctions of Treasury securities, which are conducted by the New York Fed. <https://www.newyorkfed.org/markets/primarydealers>

The Fed's Bond Purchases in March & April Were Substantial

Fed purchases of Treasuries and mortgage-backed securities, by month, billions of dollars



Source: JPMorgan Chase

That central bank intervention in such massive size was required for this purpose points to serious deficiencies, which must be addressed, in how institutions interact in this absolutely critical market.

The Liquidity of the U.S. Treasury Market Has Declined

The March 2020 episode highlights significant changes in the functioning of the Treasury and related repo markets under stress. The market for Treasury debt has grown

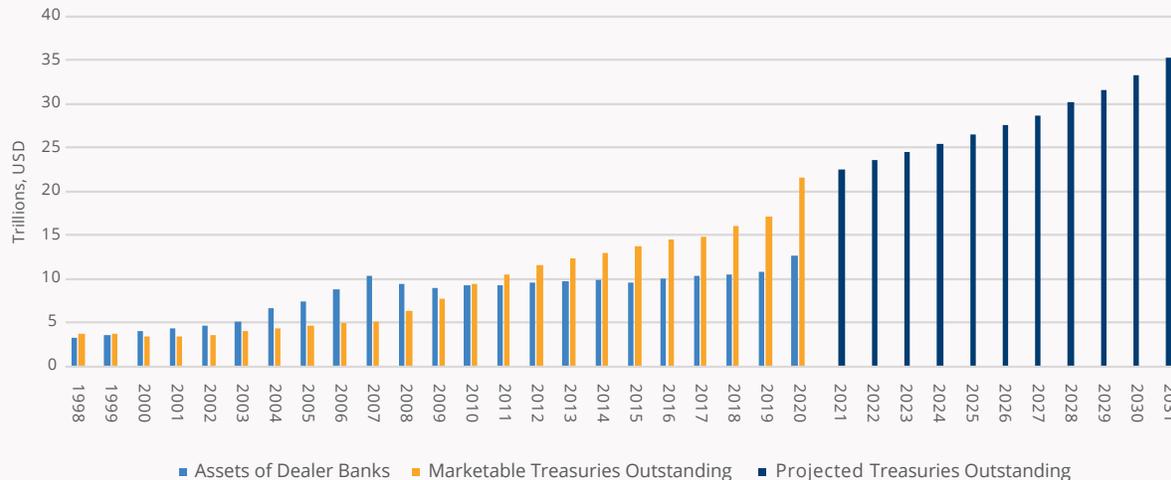
significantly relative to economic activity since the Global Financial Crisis, fueled by a growing government deficit. While total Treasuries outstanding have more than doubled from only a decade ago, daily trading volumes have increased much less.* Similarly, banks and dealers that serve as market makers have not commensurately increased their capacity to intermediate.³

Changes in market structure, market participants, regulations, and risk-management practices have affected the provision of and need for market liquidity in both ordinary and stress conditions.

* The Federal Reserve, levered investors, and asset managers are larger holders of Treasuries than they once were but they trade these securities less actively. As a result, the daily demand for Treasury market making and financing from these major market participants during normal times is lower than implied by the growth of the Treasury market.

Supply of U.S. Treasuries Is Growing Faster than Dealer Bank Balance Sheets

Assets of dealer banks vs. U.S. Treasuries outstanding and CBO projections, trillions of dollars



Source: Darrell Duffie (2020)

- Dealer capacity to intermediate Treasury securities and related Treasury repo/reverse repo activities has not grown with the size of these markets. (A repo is a short-term purchase and then resale of the same security with agreed on date and terms that has the economic substance of loan by the buyer collateralized by Treasuries. A reverse repo is the opposite side of the same transaction: A short-term sale and then repurchase of the same security that has the economic substance of borrowing by the seller collateralized by Treasuries.) New capital and liquidity regulations that apply to the largest banks and dealers have affected their behavior and constrained intermediation capacity. In particular, the leverage ratio—a capital requirement that doesn't differentiate by the riskiness of the assets it is held against—has become a potential constraint for them in the low-risk, low margin Treasury and Treasury repo markets. Bank dealers are already required to hold substantial liquidity buffers, which draw the same capital charges as much riskier assets, reducing their appetite to increase Treasury holdings and reverse repo against Treasuries during stress. These activities, inherently low-risk and low-margin, now attract such high capital and liquidity requirements that they have become, at the margin, economically very expensive.
- Prime money market funds and open-end mutual funds holding corporate bonds are substantial suppliers of credit to businesses, and the bond funds have grown substantially. These funds offer daily liquidity, but most hold less-liquid assets with longer duration. They rely on new inflows and the ability to sell liquid assets to meet surges in redemptions. Some of them—especially

prime money funds and open-end corporate bond funds—have proven vulnerable to large-scale withdrawals during stress, and their reliance on sales of liquid assets, including Treasuries, has increased pressure in the Treasury market, which is no longer able to deliver the required liquidity. In chapter 5, we describe some of the ways that these funds should be reformed to make them less of a threat to financial stability.

- The increasing participation of certain investors in the Treasury market, such as hedge funds (funds that invest and leverage customers' capital) and proprietary trading funds (PTFs) (funds that deploy market-making algorithms to invest their own capital, typically intraday), has added complexity to market dynamics. While hedge funds provide liquidity through trading and PTFs through intraday market making, they often withdraw from making markets during periods of high volatility, diminishing market liquidity. Moreover, gaps in information about their trading patterns and size mean that regulators and market participants struggle to understand and predict their behavior, making the market more fragile.
- Mandatory clearing of many derivatives through central counterparty clearinghouses (CCPs) (see chapter 7) has increased demand for Treasury collateral as margin. During times of stress, CCP members may increase sales of Treasuries to meet margin calls.
- Post-crisis regulatory requirements to accumulate unencumbered liquid assets across banks, nonbanks, and clearing infrastructures induce institutions to build larger and similar positions that are correlated during stress. These liquid assets are all held with the same expectation—that they can be readily converted into cash during stress.

Externalities

Treasury securities are a safe-haven asset and, ideally, a highly liquid alternative to cash, available to supply funds at predictable prices when needed. The pricing and trading of Treasury securities are fundamental to credit provision, price discovery and risk management in a wide range of markets, both in the United States and abroad. Treasury market illiquidity spills over to aggregate demand in several ways.

During periods of stress, Treasury market illiquidity impairs the functioning of a wide array of markets, disrupting market-based finance as an important source of credit to households, businesses, and governments. Many new securities issues are priced relative to Treasuries and the pricing of some assets is tied directly to a spread to the risk-free asset. When the prices of Treasuries move in unexpected directions or are highly volatile, the issuance of securities to fund economic activity becomes more expensive or is blocked altogether.

Moreover, many market participants, including asset managers offering open-end funds and banks through traditional banking services, engage in liquidity and maturity transformation. Banks intermediate credit and duration risk between borrowers and savers and carry sizable liquidity buffers, as required by their business models and by regulation, to meet demands for unexpected deposit withdrawals or funding challenges so that they can continue lending through the economic cycle. In open-end funds, which offer more liquidity to investors than is embedded in the assets they hold, substantial Treasury positions are held as liquidity buffers. Asset managers count on being able to sell Treasuries

at predictable prices to meet redemptions. When Treasury market liquidity dries up, asset managers may have to exit less-liquid positions, such as commercial paper or corporate bonds, driving their prices below fundamental values in a fire sale. Banks may have to reduce their lending, amplifying the effect of any shock to markets and the economy. Reduced Treasury market liquidity thus impedes market-wide ability to manage liquidity risk and maintain access to funding or cash promised to investors.

Dysfunction of the Treasury market during stress also impairs confidence in the financial system, impairs issuance and distorts pricing across all capital markets, reduces the financial stability benefits of having both bank and market-based systems to extend credit, and could increase the cost of financing the U.S. government deficit.

Recommendations to Enhance U.S. Treasury Market Resiliency

We believe the following recommendations will improve the functioning and resiliency of Treasury and repo markets during stress. In our opinion, any one recommendation, while helpful, will not suffice. Our recommendations target three themes:

1. Enhancing the supply of market liquidity provided by banks and dealers;
2. Reducing the demand for liquidity during stress;
3. Providing a framework for the Federal Reserve to meet surges in market demand for cash that exceeds the capacity of private-market intermediaries to accommodate.

Recommendations made elsewhere in this

report for reform of open-end mutual funds and for less-procyclical CCP margin requirements also will reduce demands to sell Treasuries for cash during stress. Taken together, these reforms should better align the supply of and demand for market liquidity during stress and thus enhance resiliency in this critical foundational market.

1. Adjust bank regulations to enable large banks and dealers to expand their balance sheets to provide market liquidity during stress without materially reducing the overall resiliency of those firms.

Regulations put in place after the financial crisis have made banks and bank holding companies safer and more resilient to shocks, but they have also constrained the extent to which bank-owned dealers can profitably intervene to stabilize cash Treasury or repo markets. Our proposals would relax some of these constraints for low-risk trading and financing activities without materially reducing the overall resiliency of the banking system.

The most consequential constraint is the *leverage ratio requirement*, which imposes the same capital charge on safe assets (Treasuries and deposits at the Federal Reserve) as it does on the riskiest of loans. Regulators, including the Federal Reserve, view leverage requirements as a backstop to protect against miscalculation and gaming of the risk weights that drive the major regulatory capital requirements. But the regulators understood that if the leverage requirement became binding it would adversely affect low-risk, low-margin activities, like owning and trading Treasury securities and repo against those securities, in an outsized way.

In addition to the leverage ratio requirement for banks, the United States imposes a Supplementary Leverage Requirement (SLR) on large bank holding companies and a further enhanced Supplementary Leverage Requirement (eSLR) of an additional 2 percent of global systemically important bank holding companies (GSIBs). The total U.S. leverage requirement for GSIBs (the SLR plus the eSLR) exceeds the global standard. The potential for the leverage ratio to become the binding capital constraint for large banks and their dealers has been increasing rapidly. Bank balance sheets have taken on a huge volume of reserves—that is, deposits at the Fed—as a consequence of Fed purchases of Treasuries and agency securities. (When the Fed engages in quantitative easing, it, essentially, creates reserves in the banking system to pay for the bond purchases.) This program is ongoing, and banks could find themselves with increasing reserves, potentially pushing their leverage ratios lower, absent a carve out for those deposits at the Fed. In May 2021, reserve balances were nearly \$4 trillion and could reach \$5.3 trillion by year-end, predominantly due to ongoing quantitative easing.* Even if leverage ratios are not currently binding, banks will be forced to adjust their activity if they expect the ratios could bind in the future, crowding out low-risk, low-return activities like Treasury market making, repo lending, and deposit taking.

During the pandemic, the Federal Reserve temporarily exempted both deposits held at the Fed and Treasury securities from the SLR, which provided relief to the GSIBs that operate the most important government securities dealers.

The Fed allowed the exemptions to expire on March 31, 2021, and said it would release suggested modifications to the SLR and invite public comment. This leaves major dealer banks considerably uncertain about the capital requirements they will face and makes prompt focus and resolution of SLR rule shortcomings in a rising reserve environment essential.

We recommend permanently restoring the exemption of reserve deposits at the Fed from the supplementary leverage calculation. Exempting reserves will automatically adapt the SLR to whatever level of reserves the Fed deems necessary to achieve its monetary policy goals.

We also recommend coupling restoration of the exemption with an assessment to ensure that excluding reserves but not Treasuries does not materially distort the pricing of Treasury securities. If material distortions are thought possible, alternatives to ensure that the SLR functions as a backstop and remains effective in an environment of higher reserves should be considered. One way would be to also exclude holdings of Treasury securities, as the Federal Reserve did in March 2020, though this would be inconsistent with global standards. Another would be to reduce the U.S. supplementary leverage ratio applied to the largest bank holding companies and their dealers to the international standard. While this approach would add headroom, it may require adjustments over time to account for the accumulation of reserves. If the authorities chose to lower the requirement but leave it above global standards, they should also

* The level of reserves was held down to an extent by a high level of the Treasury General Account at the Fed. That amount in that account is being reduced to a more normal level, which will contribute to the buildup in reserves as the funds are spent.

consider making a portion of the SLR releasable during stress. A countercyclical leverage ratio could be higher in a normal risk environment, as a backup, but lower during stress to encourage dealers to make markets.

However it is done, as reserve levels rise, an enduring solution must be found to ensure that banks and their dealers can perform their systemically valuable function as market makers in Treasuries and Treasury repo and as deposit-takers. If banks fear becoming constrained and choose to shed deposits or resist taking new ones, this cash will likely flow into money market and other open-end mutual funds, or similar alternatives.

Beyond the leverage ratio, GSIBs are required to hold extra capital against risk-weighted assets (the GSIB surcharge) to reflect the externalities their failure would impose on the economy. The amount of added capital they are required to hold rises with their assessed systemic importance as determined by five different metrics. These metrics are based on size, not risk, and some low-risk activities enter several of the metrics. Moreover, the GSIB surcharge rises in 50-basis-point increments, and banks restrain their activity if they get close to the next upward step. Additionally, three of the metrics are calculated only at year-end—which contributes to market dysfunction around that date.

We agree that the more systemically important a bank, the more capital it should hold, but we think the calculation can be adjusted in several ways to make it less inhibiting to the provision of market liquidity. Specifically, the GSIB calculations should be altered to (i) exclude deposits at the Fed from the size measure, (ii) use average rather than quarter-end balance sheet measures, (iii) reduce the cliff effect of moving to the next GSIB bucket

by using a continuous function, and (iv) adjust for economic growth and inflation to prevent the GSIB surcharge from becoming more constraining as banks grow along with the economy.

U.S. GSIBs are also subject to a short-term wholesale funding (STWF) assessment. The score is calculated as the ratio of STWF to risk-weighted assets, rather than total assets. That means that when a bank borrows or takes wholesale deposits to fund low-risk assets, like reserve balances, Treasury securities, or Treasury reverse repo, its score rises by more than when it borrows to fund risky assets. The accumulation of reserves on the asset side of the balance sheet is often accompanied by liabilities that are counted as STWF drawing further capital charges. We recommend that the agencies review treatment of STWF within the GSIB calculation to reduce undue penalization of Treasuries and Treasury repo.

2. Evaluate the possibility of unintended adverse consequences for liquidity provision arising from existing, potentially overlapping liquidity regulations and assumptions embedded in liquidity stress testing.

Banking institutions are subject to multiple liquidity regulations. Together, the requirements have a material impact on the level of aggregate liquidity banks are required to hold, the amount of capital they need to carry against these high-quality liquidity buffers, and their preference for cash over Treasuries, all of which can affect their willingness to make markets in Treasury securities. Facing supervisory subjectivity and potential stress test disapproval, bank management is likely to build liquidity buffers

higher than necessary. To the extent buffers are higher than they need to be, they unnecessarily consume balance sheet capacity, reducing banks' capacity to participate in the Treasury market during periods of stress. Moreover, the administration of some of the requirements can constrain the ability of banks to shift among cash, Treasuries, and repo financing in response to market stresses and distortions. Specifically:

1. The Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) are intended to be complementary, with the LCR ensuring ability of a firm to survive peak outflows over a severe 30-day stress period and the NSFR providing durable funding and liquidity over an extended, one-year period of stress. These liquidity requirements include embedded supervisory assumptions about which liabilities might run and which assets can be sold at reasonably stable market prices during stress. The assumptions affect the composition as well as the amount of high-quality liquid assets (HQLA) that banks are required to hold.
2. The largest U.S. banks are also subject to a Comprehensive Liquidity Assessment Review (CLAR) as well as liquidity requirements associated with resolution and recovery planning.
 - a. CLAR and the firm-specific liquidity assessments are stress tests that analyze the firms' liquidity risk-management practices, assumptions, and resilience under normal and stressed conditions. The comprehensive characterization of both assets and liabilities under different scenarios is subject to supervisory assessment and review.
 - b. Resolution and recovery planning is meant to demonstrate the ability of a

firm to meet an extreme outflow of deposits and other sources of funding in a rapid and orderly way in the event of material financial distress or failure of the firm. Past supervisory guidance implied that these outflows should be covered by the banking organization without relying on the Federal Reserve's discount window for liquidity. As a result, banks preferred holding cash and reserves, rather than Treasuries, to meet extreme, low-probability outflows. While the Fed has recognized this issue, it is important that evolving regulations and ongoing supervisory guidance support the concept of fungibility between cash and Treasuries.

While we strongly agree that ensuring that banks hold adequate liquidity is important, we believe requirements can be simplified or made more flexible to allow greater scope for bank dealers to support market making and repo financing, especially during stress. Therefore, we recommend that authorities examine the cumulative impact of multiple requirements, including the costs and benefits of overlapping liquidity requirements and embedded assumptions and evaluate whether adjustments could enhance banks' capacity for market making without materially reducing their overall resilience.

3. Study the costs and benefits of requiring central clearing for Treasuries and Treasury repo.

Over time, the entry of new participants to the Treasury market results in a smaller proportion of trading in Treasury securities being settled through a CCP. Dealers predominantly settle and clear through a CCP, but proprietary

trading funds and hedge funds, which represent a growing share of trading in this market, do not; their trading is settled bilaterally with a dealer or interdealer broker. As a consequence, well more than half of Treasury trading now is settled and cleared bilaterally, between the dealer and the customer.⁴

Central clearing offers several advantages from a financial stability perspective. Settlement risk is with one counterparty—the CCP—and therefore more transparent and readily understood and, in concept, more easily managed than trades with a wide variety of counterparties. Also, the use of a common counterparty allows increased netting, requiring a smaller capital backstop than for trades that are settled on a gross basis with individual counterparties. The benefits for transparency and risk management led Congress in the Dodd-Frank Act to require centralized clearing for standardized derivatives.

Central clearing comes with costs as well. First, credit and operational risks are concentrated in one place—the CCP—so that problems there can be transmitted through the financial system. The CCP itself creates a new central point of potential systemic failure that needs to be commensurately resilient. As discussed in chapter 7, the Task Force believes that processes for dealing with potential defaults and ensuring resiliency in derivative CCPs should be strengthened to protect financial stability. Therefore, any decision to require central clearing for Treasuries or Treasury repo by a broader array of market participants would need to be accompanied by a careful

analysis of risk management at the CCP and capital requirements of clearing members. Second, using a CCP will raise costs for some participants, who would be required to meet CCP margin requirements. Those costs could discourage trading and hedging by end users.

The Task Force recommends, as others also have, a study of the costs and benefits of requiring central clearing for Treasuries and Treasury repo.⁵ The main benefit those authors have identified comes from netting, which, if material, would save dealer capital, which could then be used to support market making in stress.

Dealers already use central clearing and many trades by PTFs reverse within the day, which may limit capital savings from central clearing, but more than half of Treasury trades are cleared bilaterally between the dealers and their customers, so increased central clearing should allow greater netting, which in turn would free up dealer capital that could be used for market making.⁶ In particular, requiring central clearing by large PTFs and other nondealer market participants above a threshold of activity might realize much of the benefits (standardized and robust risk controls, netting and operational-risk mitigation, and a centralized liquidation mechanism to reduce fire-sale risk) while minimizing adverse effects from raising costs for smaller traders and end users.

Treasury repo trading, the legs of which are settled on a gross basis, may yield greater netting benefits if centrally cleared, freeing dealer capital to support market making. However, an assessment of saving must take

* A staff report published by the Federal Reserve Bank of New York found substantial dealer capital economies from netting if central clearing had been in force in March 2020.

account that mechanisms already exist for dealers to sponsor customer repo business into a CCP when netting and capital savings opportunities exist for dealers to do so. Moreover, some forms of repo—including tri-party repo (in which post-trade processing is outsourced to a third party) and general collateral finance repo (repos executed without designing specific securities as collateral until the end of the trading day)—already are centrally cleared.

Any change to central-clearing mandates must evaluate the implications for safety and soundness of the CCP itself and should not lower minimum capital requirements for clearing members.

4. Expand data collection in the Treasury and Treasury repo markets by the Office of Financial Research (OFR); require the Financial Stability Oversight Council (FSOC) to monitor and regularly report on factors affecting Treasury and repo market liquidity; require regulatory agencies to consider the effects of their regulations on market liquidity.

Data are indispensable for analyzing market functioning and formulating policies that are likely to enhance market liquidity. Data will be needed, for example, to implement our recommendations for studies of Treasury and repo central clearing and intraday trading. Data also are essential to better understand and monitor the changing ownership of Treasuries and their use globally as a safe asset, including by nonbank and non-U.S. investors.

The OFR should have expanded authority to collect data from all significant Treasury and Treasury repo market participants. (Chapter 8 of this report recommends giving

the OFR broader data authority and a new name, the Comptroller for Data and Resilience.) And the OFR should use its authority to deepen understanding of the Treasury and repo markets spanning metrics including market depth, overnight and intraday activity, dealer concentrations, inventory, volume, number of market makers, new participants, market accessibility, and evolving technology. The OFR needs to complete its data initiative on the repo market and collect data on uncleared bilateral repo and the activity of PTFs (or any other emerging significant participants) in Treasury markets.

Those data will be very helpful to regulators, but the OFR also should increase transparency around Treasury and repo markets by publishing as much of the data as is consistent with protecting privacy and proprietary trading strategies and maintaining market liquidity. That would help market participants and other interested observers analyze those key markets.

As referenced more fully in chapter 8, the FSOC should include in its annual reports ongoing monitoring and assessment of Treasury and repo market liquidity. The FSOC and implementing agencies should be required to assess the potential effect of regulatory proposals on market liquidity—especially Treasury market liquidity—and evaluate the effect after regulations are put in place.

5. Establish a new Federal Reserve standing repo facility that would serve as a backstop for the U.S. financial system by providing funding against Treasury securities.*

To sustain a functioning Treasury market, it is vital to enhance the supply of liquidity and add reliable capacity during times of stress. This in turn will better support the U.S. economy's large and growing dependence on market-based financing, which enhances financial stability because it diversifies the supply of credit beyond the banking system. As we note above, the liquidity of the Treasury market is a public good, and its periodic absence causes negative spillovers for the U.S. and global economies.

Because the growing size of the Treasury market relative to limited dealer capacity means dealers can't provide required market liquidity, especially during stress, we recommend that the Federal Reserve establish a standing repo facility available to prudentially regulated bank-affiliated and independent dealers and other market participants.

A repo facility should stabilize the Treasury cash market as well as the Treasury repo market because market participants who need to turn securities into cash will be able to borrow against them in lieu of selling. Arbitrage between the stabilized repo market and the cash market should limit price fluctuations in the cash market.

To be effective, the facility needs to be available to all significant Treasury and Treasury repo market participants, both regulated banks and dealers and less-regulated nonbanks and

others, with the latter required to pay a small, up-front access fee (akin to the insurance premium that deposit-taking institutions pay the Federal Deposit Insurance Corporation).

Specifically, we recommend that the facility be open to:

- Bank-affiliated dealers and independent dealers that are subject to prudential regulations established by the Federal Reserve in cooperation with the Securities and Exchange Commission (SEC) and are in sound financial condition. They would not pay any fee for access to the new facility, though they would still be charged a penalty rate to borrow.
- Other market participants (including asset managers and PTFs) whose activities are systemically meaningful to the Treasury or repo markets, as determined by the Fed and the SEC. Particular focus should be on the size of their daily trading and Treasury holdings in support of money market and other open-end mutual fund structures. These systemically important market participants should be required to pay an up-front fee to have access to the facility.
- Additional market participants on a voluntary basis, provided they are subject to an up-front fee and appropriate haircuts.

Such a facility could be established by the Federal Reserve itself and offered directly to counterparties and on the terms it deems appropriate. Alternatively, the Federal Reserve could become a member of the Fixed Income Clearing Corporation (FICC). This approach

* Chapter 6 on housing discusses the possibility of a Fed repo facility for the securities of government-sponsored agencies active in the mortgage market.

(provided repo is centrally cleared) may offer operational simplicity and minimization of counterparty risk. The FICC is a subsidiary of the Depository Trust and Clearing Corporation (DTCC), the central clearing entity that provides clearing services for U.S. government securities and repos. By joining the FICC, the Federal Reserve could effectively offer access to its facility to counterparties and, on terms it deems eligible, to counterparties who are members in good standing of the FICC, while the Fed itself would directly face only the AAA-rated entity, the FICC. An assessment of whether the FICC membership would encompass a sufficient target audience for the facility to be effective would be required, but we note the DTCC's Sponsored Membership program, an important expansion [approved by the Securities and Exchange Commission \(SEC\) in March 2019](#), now admits a broader set of participants.

A repo facility could create moral hazard (an incentive to take unwarranted risks) by skewing the risk-taking incentives of market participants who have access. The regulation of entities in the first category already substantially addresses this issue. For entities in the second and third categories, having them pay an up-front fee, tied to their potential demand for repo borrowing, should align risk-taking with the value of access to the liquidity. In addition, we recommend that financing be provided at interest rates modestly above normal market rates and at pre-established market haircuts that are consistent with expectations for financing the risk-free asset. Such a penalty rate for lending will ensure that the facility is only used as a backstop during market stress. The Federal Reserve Board would set the rate, as it does for discount rates offered to banks.

We recommend that the Federal Reserve commission a study to determine the

appropriate fee for backstop access for lending against Treasury collateral, the appropriate penalty rate, and haircuts, and whether the fee should vary based on category of market participant accessing the facility. Both the penalty rate and haircuts should be predefined and transparent to avoid amplifying stress when the facility is used.

To fully achieve the intended market stabilizing benefit of this standing repo facility, we recommend that the Federal Reserve permanently exempt financing activity transacted under this facility from SLR and GSIB capital calculations.

In March 2020, the Federal Reserve established a repo facility for foreign central bank holders of Treasury securities who wanted to convert them into cash—the Temporary Foreign and International Monetary Authorities Repo Facility (FIMA) which has been extended through September 2021. We recommend that this facility be made permanent. This is particularly important given that a substantial share of the sales of Treasuries in the first quarter of 2020 were by foreigners, particularly foreign official holders.

EXTERNALITIES

U.S. Treasury securities are a benchmark for the global financial system. During periods of stress, Treasury market illiquidity impairs the functioning of a wide array of markets, disrupting market-based finance as an important source of credit to households, businesses, and governments.

Banks and nonbank asset managers rely on predictable well-functioning markets for Treasuries to meet their liquidity needs and to manage risk. When Treasury market liquidity dries up, asset managers may have to exit less-liquid positions, such as commercial paper or corporate bonds, driving their prices below fundamental values in a fire sale, and banks may have to reduce their lending, amplifying the effect of any shock to markets and the economy.

Dysfunction of Treasury market during stress impairs confidence in the system and could increase the cost of financing the U.S. government deficit.

RECOMMENDATIONS

Adjust bank regulations to enable banks and their dealers to expand their balance sheets to provide market liquidity during stress without materially reducing the overall resilience of those firms.

- Permanently exclude reserves from the Supplementary Leverage Requirement (SLR) or consider adopting the global leverage capital standard for global systemically important banks (GSIBs) that would more likely serve as a backstop consistent with regulatory intent.
- Consider a countercyclical component of the SLR to be released in stress.
- Adjust the GSIB calculations, to (i) exclude reserves from the size measure, (ii) use average rather than quarter-end balance-sheet measures, (iii) reduce the cliff effect of moving to the next GSIB bucket, and (iv) revalue the impact of the fixed coefficient component to adjust for economic growth and inflation, to avoid the GSIB surcharge from becoming unnecessarily constraining as banks grow along with the economy.
- Review treatment of short-term wholesale funding within the GSIB calculation, which unduly penalizes Treasuries and Treasury repo and may reduce bank dealers' flexibility to offer repo financing during stress.
- Review the ways in which overlapping liquidity regulations and their interaction with leverage capital calculations affect the willingness of dealers to make markets in Treasury securities and intermediate in Treasury repo markets, especially during stress, and assess whether those regulations could be simplified or made more flexible without adversely affecting the ability of banks to meet funding outflows in stress circumstances or in resolution.

Study the costs and benefits of a central clearing requirement for Treasuries and Treasury repo, including the impact central clearing might have on market liquidity. The study should consider:

- Whether central clearing of Treasuries will substantively increase balance sheet capacity for dealers that can be used during stress.
- Whether a clearing mandate for proprietary trading funds (and others that are significant Treasury market participants) would improve risk management.
- Whether central clearing of Treasury repo would free balance sheet capacity and improve risk management, given that elements of the existing market structure already allow netting and central clearing.

Expand data collection by the Office of Financial Research (OFR) or its successor in the Treasury and Treasury repo markets; require the OFR to use those data to better analyze key dimensions of market functioning and to increase transparency around Treasury and repo markets consistent with protecting privacy and proprietary trading strategies.

Require the Financial Stability Oversight Council (FSOC) to monitor and report on factors affecting Treasury and repo market liquidity on a regular basis.

Require regulatory agencies to consider the effects of their regulations on market liquidity.

Establish a new Federal Reserve standing repo facility to serve as a backstop for the U.S. financial system by providing funding against U.S. Treasury securities to categories of market participants defined below.

Three categories of market participants should have access to the standing repo facility:

- Bank-affiliated dealers and independent dealers that meet a common set of prudential regulations, established by the Federal Reserve in cooperation with the Securities and Exchange Commission (SEC), and that are in sound financial condition.
- Significant nonbank Treasury market participants, including asset managers and PTFs, whose Treasury market activity the Fed in conjunction with the SEC determines to be systemically meaningful and therefore should be mandated to have access to this backstop facility.
- Additional market participants on a voluntary basis.

The latter two categories, nonbank mandatory and voluntary participants, should be required to pay an up-front fee for the liquidity that they would demand in a stress period. An appropriately sized up-front fee would reduce moral hazard and create a framework that more directly links the size of liquidity transformation offered outside regulated banking to what the market can support during stress.

The Fed standing repo facility should be designed so that its use is attractive only as a backstop for market-wide stress situations, avoids stigmatizing users, and meets the core goal of supporting a functioning and resilient Treasury market when private market agents alone cannot.

Therefore, we recommend that financing would be provided at interest rates that are modestly above normal market rates and at pre-established market haircuts that are consistent with expectations for financing the risk-free asset. Those rates might appropriately vary based on the category of market participant accessing the backstop facility. Both the penalty rate and haircuts should be predefined and transparent to avoid amplifying stress when the facility is used.

To fully achieve the intended market stabilizing benefit of this Federal Reserve standing repo facility, the Fed should consider permanently carving out repo financing activity transacted under this facility from SLR and GSIB capital calculations for prudentially regulated banks and dealers.

As a complement to this backstop facility for private holders of Treasuries, the Fed should also make permanent its repo facility for foreign monetary authorities (FIMA), whose sales contributed to the pressure on Treasury markets in March 2020.

¹ Vissing-Jorgensen, 2021.

² Cheng, Wessel and Younger, 2020.

³ Duffie, 2020.

⁴ Treasury Market Practices Group, 2019.

⁵ Liang and Parkinson, 2020.

⁶ Fleming and Keane, 2021.

Insurance Companies

CHAPTER FOUR



Background: Risk factors, risk exposures, and lack of transparency

Property and casualty (P&C) and life insurance play a vital role in the economy by allowing households and firms to share idiosyncratic risks. In addition, because insurance premiums are paid up front, insurance companies manage a large pool of assets and are among the largest investors in corporate bond and other fixed-income markets. Since life insurance and annuity contracts are long-term, life insurers manage a much larger pool of assets than P&C companies.

Total assets of the life insurance industry totaled \$9.3 trillion in the fourth quarter of 2020.* Total assets of the property and casualty industry were \$2.9 trillion. These totals compare with \$19.4 trillion in assets held by U.S.-chartered depository institutions in the same quarter (of which \$2.2 trillion were reserves at the Federal Reserve). Unlike for banks, there is generally no federal oversight of insurance companies; regulation is done at the state level. Regulatory oversight is coordinated via the National Association of Insurance Commissioners (NAIC), which was created by and is governed by state insurance regulators.

If insurance companies' capital positions weaken following adverse shocks to their assets or liabilities, they adjust in several ways. They modify insurance prices, redesign their products, or change their asset allocation. For example, following a severe natural disaster, a P&C company tends to increase premiums and write fewer policies, with the response

going beyond a perceived change in risk exposure in a particular area.¹ Such insurance cycles interfere with households' and firms' risk-management decisions by increasing the price of insurance.

The life insurance sector, while safe and quite boring in the past, has changed meaningfully during the past two decades from a financial stability perspective. The Global Financial Crisis showed that the life insurance industry has become fragile. This fragility was not limited to AIG. Some other companies received Troubled Asset Relief Program (TARP) support (for example, Hartford Financial Services Group received \$3.4 billion in TARP equity). Several others applied but subsequently withdrew their applications as the crisis waned. Although the industry and its regulators responded to some extent to the problems that became evident in 2008, the fragility of the life insurance sector appears to persist.

The first important factor is a change in the composition of liabilities. Leading up to the crisis, life insurers transitioned from traditional life and annuity products toward variable annuities, long-term savings products that combine mutual funds with long-dated minimum-return guarantees. As an example, insurers guarantee the maximum of (a) the return on a mutual fund, typically with equity and fixed-income exposures, or (b) a fixed rate of return of, say, 5 percent. The rapid growth of variable annuities (they were the largest liability for life insurers heading into the financial crisis) reflects strong demand by households, in part to fill the void left by the decline of defined-benefit pension plans. And variable annuities

* \$6.3 trillion of all assets was in general accounts, where insurance companies deposit premiums, and \$3.0 trillion in separate accounts, segregated to support specific products.

can therefore potentially play a valuable role in the broader financial system. Responding to the demand for these products, insurers have continued to issue them in size, although changes have been made to the design, pricing, and risk management of variable annuity contracts.

At the same time, variable annuities pose a risk-management challenge. They are long-dated contracts, primarily used to safeguard retirement income, and no exchange-traded products exist that insurers can use to replicate the payoffs of these contracts. To compute the value of the liabilities and the risks, insurers therefore rely on models. This exposes insurance companies to model risk and potentially a mismatch in equity and interest rate exposures between assets and liabilities. Insurance companies are particularly vulnerable to a decline in interest rates (and hence to the low-for-long rate environment) and to a fall in equity prices. The stress in the sector in 2008 was, at least in part, caused by imperfect hedging of variable annuity portfolios.

An important implication is that life insurers are not just exposed to idiosyncratic risks. The reserves (that is, liabilities) associated with the minimum-return guarantees are now correlated with interest rate, equity, and volatility risks.

To illustrate the vulnerability of the sector to equity risks and low rates, we look at the exposure of insurers' equity prices to interest rate and equity market risks. We compute the return on a portfolio of variable annuity insurers, which includes many of the large insurance companies, as we illustrate below. In the first two columns, we measure the sensitivity of insurers' equity returns to the market, both pre- and post-financial crisis. There is a large shift in Capital Asset Pricing Model (CAPM) beta from 0.6 to 1.4, more than

doubling their sensitivity to equity markets. This implies that a 1 percent change in the value of the stock market is now associated with a 1.4 percent change in the value of insurers' equity prices, where it used to be only 0.6 percent.

How stock and bond markets affect insurers' stock prices

	'99-'07	'10-'17	'99-'07	'10-'17
Excess market return	0.601 (4.99)	1.411 (15.72)	0.546 (3.87)	1.134 (14.43)
Excess 10y bond return			-0.367 (-1.36)	-1.121 (-7.39)
Constant (%)	0.263 (0.56)	-0.381 (-1.23)	0.324 (0.71)	0.329 (1.19)
Observations	108	96	108	96
R²	0.210	0.758	0.226	0.839

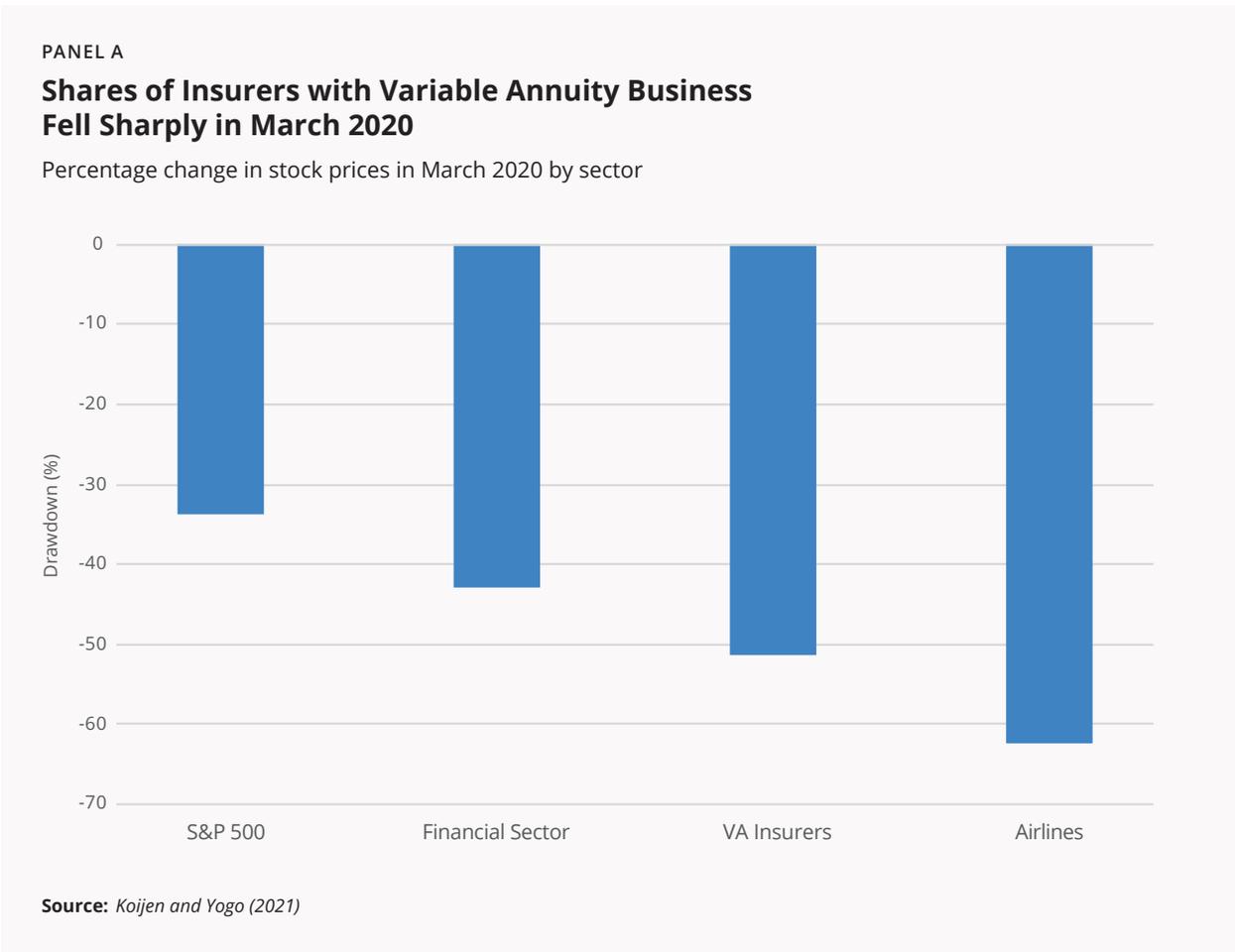
t statistics in parentheses

Source: Kojien and Yogo (2021)

In the last two columns, we measure the sensitivity to market risk and the return on a 10-year bond. The market beta still more than doubles from 0.5 to 1.1. The sensitivity to 10-year bond returns declines from an insignificant minus 0.37 to a highly significant minus 1.12. This implies that a 1 percent parallel decline in the yield curve results approximately in a 10 percent decline in equity prices of insurance companies. This large sensitivity highlights the vulnerability of the sector, and in particular the exposure to the low-for-long interest rate environment and declining equity prices.

To assess the ongoing sensitivity, we computed the decline in equity prices during the COVID-19 pandemic. In Panel A, we compare the returns on the portfolio of variable annuity insurers to the S&P 500, the financial sector more broadly including banks, and airlines. The decline in life insurers' equity prices is apparent, and much larger than for the S&P 500 and banks, and in fact closer to airlines. In Panel B, we break down the industry's decline by company. Some of the largest companies are among

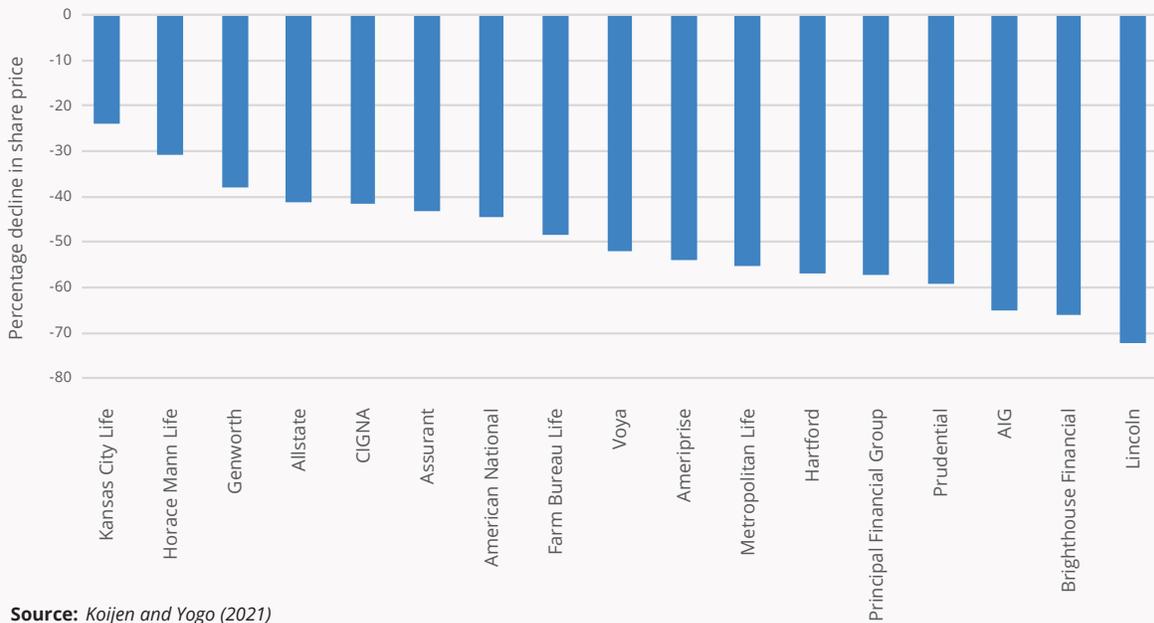
those experiencing declines in excess of the hit to the S&P or the financial sector. In Panel C, we compare the price declines during March 2020 to the price declines during the Global Financial Crisis in 2008. There is a strong correlation (64 percent) between the declines across insurers, illustrating the persistent vulnerability due to the long-dated nature of life insurance and annuity products.



PANEL B

Insurers Shares Declined Significantly in March 2020

Percentage decline in share price in March 2020, by company

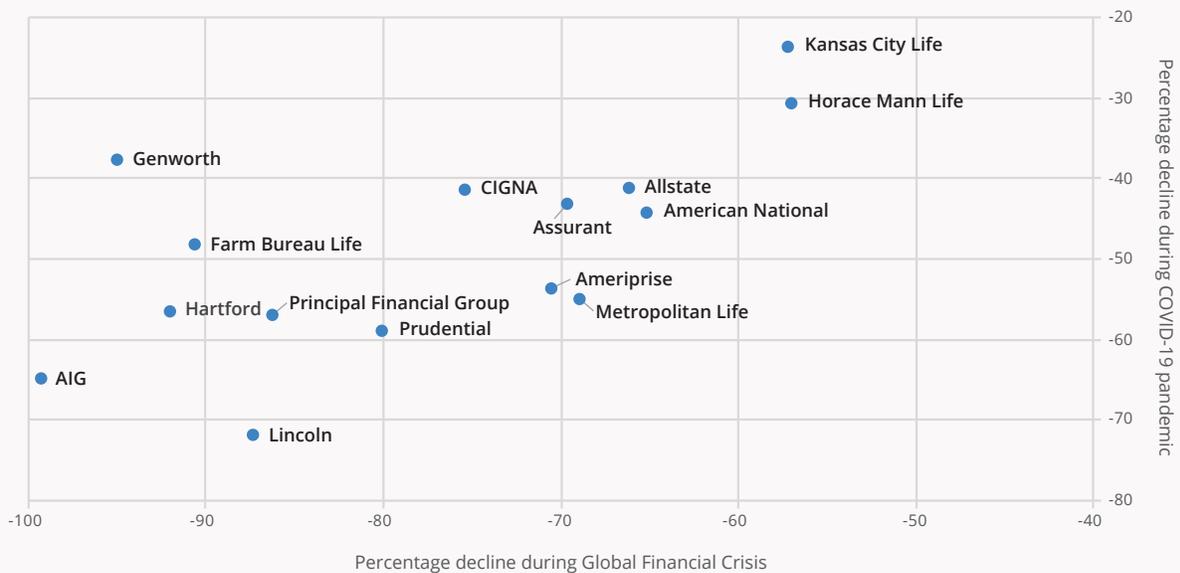


Source: Kojien and Yogo (2021)

PANEL C

Life Insurer Shares Hit in Global Financial Crisis Also Hit in COVID Pandemic

Decline in insurers' stock prices: Global Financial Crisis vs. March 2020



Source: Kojien and Yogo (2021)

Insurers' Stock Prices Fell Sharply in March 2020

To be sure, the sensitivity to interest rates may not be due to variable annuities alone, and imperfect hedging of traditional annuities may contribute to the risk mismatch as well.

It may also be the case that hedging traditional products is more challenging in a low-rate environment if policyholder behavior changes unexpectedly. For instance, policyholders may decide to hold on to generous insurance policies instead of letting them lapse.

Beyond equity, interest rate, and volatility risk, insurance companies are exposed to turmoil in credit markets. While their liabilities are generally not exposed to credit risk, insurers do invest most of their assets in credit-sensitive securities. Thus, they are exposed to the risks of large-scale credit losses or credit migration when a large number of bonds are downgraded.^{*2,3,4} (Credit migration refers to moving a security issuer from one class of risk to another. Insurers' capital requirements go up as their bond holdings are downgraded.)

Pervasive lack of transparency makes accurately measuring the risk mismatch in the insurance industry difficult. Two areas in particular lack transparency, namely the liability structure of insurers' balance sheets and the use of captive reinsurance, which we discuss below. The asset and derivatives holdings are an important exception; from them, insurers disclose security-level holdings. In addition,

following AIG's failure, the National Association of Insurance Commissioners (NAIC) improved the reporting of securities lending.

Insurance companies take risks via both their assets and liabilities, by underwriting risky variable annuity policies or traditional policies with embedded options. The information reported on the liabilities is too limited to accurately compute even basic statistics such as the duration and equity market mismatch between assets and liabilities, or to assess the adequacy of hedging programs.

Captive reinsurance, or "shadow insurance," has also increased the opacity of the industry. Shadow insurance developed in response to regulatory changes in 2000 and 2003 for term and universal life insurance, known as "Regulations XXX and AXXX."^{**} These regulations tightened the regulatory capital requirements for these traditional products—for operating companies, which sell directly to consumers, but not for reinsurance companies. Some states, such as Vermont and South Carolina, subsequently allowed insurance companies to establish their own reinsurance companies (captive reinsurers or captives) and then transfer risks to them. These transactions leave the total risk for the overall firm unchanged but nevertheless reduce its capital requirements.

Captives provide several other benefits beyond regulatory capital relief. First, captives face fewer restrictions on asset allocation and

* See Ellul, Jotikasthira and Lundblad (2011), Becker and Ivashina (2015), and Becker, Opp and Saidi (2021) for the importance of capital requirements on asset allocation decisions of insurance companies.

** Term life insurance covers a fixed period of time for a pre-agreed premium; it offers no savings component to the customer. Universal policies cover a person until death and combine a death benefit with an investment savings element.

may implement riskier investment strategies, including derivatives use, than operating companies. Second, the funding structure is more flexible. For instance, captives can use letters of credit to fund liabilities, sometimes with guarantees by the holding company. Third, captives do not provide information on asset and derivatives holdings.^{5,6}

The use of captive reinsurers increased rapidly since their introduction about 15 years ago, leading the Financial Stability Oversight Council (FSOC) to flag them as a potential concern in its 2014 annual report. Reserve requirements for life insurance have been modified in recent years, which reduced the incentives to use captive reinsurance. However, these rules do not apply retroactively and so the legacy policies are still tied up in captives, with limited transparency. By increasing leverage, captives can result in increased risk exposure.

The growth of shadow insurance, which in part arbitrages differences in regulation across states, highlights the ongoing challenges with the fragmented regulatory landscape for insurers that is coordinated imperfectly by the NAIC.

Evidence on the Importance of Constraints and Associated Company Actions

The externalities and transmission mechanisms discussed below will be active when the response of insurance companies to market events or regulations is amplified by capital or other financial constraints. Here, we briefly highlight some of the key insights on this from the recent academic literature. While regulation intends to restrict behavior, we emphasize the

interaction of that behavior with the insurer's capital position; indeed, constrained insurance companies are more likely to sell downgraded securities, potentially leading to fire sales, and are more likely to distort insurance prices (both up and down). The main takeaway is that the channels discussed in the next section are not merely theoretical possibilities; the amplification transmission via financial markets and product markets has been established in the literature. This leads us to our recommendations in the final section to better ensure the resiliency of the insurance sector.

Insurance companies that are relatively more constrained by regulation, such as those with low risk-based capital ratios, are more likely to sell downgraded bonds.⁷ While prices of downgraded bonds naturally fall, weakly-capitalized insurers can amplify the price decline beyond fundamentals. Bonds subject to a high probability of regulatory-induced selling exhibit price declines and subsequent reversals. These price effects appear larger when the insurance industry is relatively distressed and other potential buyers' capital is scarce.

The NAIC lowered the risk weights of mortgage-backed securities in 2009, but not of other fixed-income securities. After the reform, insurance companies are much more likely to retain downgraded mortgage-backed securities (MBS) compared to other downgraded assets.⁸ Again, this pattern is more pronounced for financially constrained insurers. Constrained insurance companies modify the prices of life insurance and annuity contracts; in particular, they identify a set of contracts for which reserve requirements are too low.⁹ This provides an incentive for insurance companies to discount policies. These effects are larger for companies that are more weakly capitalized.

The effects also are found for variable annuity contracts, which are capital intensive.¹⁰ By the same logic, insurers increased the prices of such contracts following the shock in 2008. Companies experiencing larger shocks also moved a larger fraction of their variable annuity portfolio to their shadow insurance companies, which again connects to an insurers' capital position, and removed or lowered the embedded guarantees.*

When P&C divisions experience losses, for instance, due to adverse weather events, life insurers reduce premiums for life policies that immediately increase their financial resources and increase premiums for policies that decrease their financial resources.¹¹ Life divisions change premiums by a larger magnitude if they belong to insurance groups that are ex ante more financially constrained. This illustrates how shocks can spill over from P&C markets to life markets and points again to binding constraints that can lead to amplification and spillovers across markets.

Taken together, a growing literature shows that regulatory constraints at times bind and that such episodes result in distorted insurance prices, shadow reinsurance activity, portfolio rebalancing, and distorted asset prices beyond fundamentals.

Externalities and Transmission Mechanisms

With the insurance sector's responses to constraints in mind, we discuss how the responses may amplify shocks that pose threats to insurance company capital. We also discuss other externalities.

1. Amplification and transmission via financial markets

A key regulatory ratio for insurance companies is the risk-based capital (RBC) ratio—the ratio of accounting equity to required capital, where the required capital reflects the riskiness of the assets and the liabilities.

As a result, a safer portfolio of assets requires less capital than a riskier portfolio. However, this system may encourage insurance companies to rebalance to a safer portfolio to improve their RBC ratio if their capital position weakens. While desirable from a single company's perspective, this rebalancing may reduce the demand for corporate bonds and result in wider credit spreads.

The long-term nature of insurance policies adds a unique dimension. The same companies that became capital-constrained during the financial crisis were stressed again in March 2020—more than a decade later. Hence, once insurers are constrained, their demand for corporate debt may shift persistently with a longer-lasting effect on the economy.

By the same mechanism, it is clear that insurance companies may amplify the price

* Obviously, the rise of shadow insurance itself is evidence that insurers try to minimize regulatory capital requirements (Kojien and Yogo, 2016). If life insurers had abundant capital, then there would be no need for shadow insurance in the first place.

effects of large-scale credit migration, in particular when bonds are downgraded from investment to speculative grade. Capital charges increase sharply if this happens, and insurers have a strong incentive to rebalance their portfolios, or not roll over a downgraded bond once it matures. If other investors cannot step in quickly to replace undercapitalized insurers, borrowing costs rise for firms seeking to issue debt.

2. Transmission via the insurance product market to households and firms

Once insurance companies are constrained, they can also improve their RBC ratio by underwriting insurance products that require less capital. In some cases, insurance companies may move away from entire lines of business, leading to missing insurance markets not due to informational frictions but instead due to regulatory and financial frictions. Unless new firms enter quickly, the customers that are dropped will suffer.

Alternatively, insurers may adjust the prices of their policies as their marginal costs increase in response to regulatory capital constraint.¹² This in turn limits the risk-sharing opportunities for households and businesses. This feature is well known for P&C companies following catastrophes, but now also applies to modern life insurance companies in response to shocks to interest rates, credit risk, equity prices, and volatility.

3. Transmission via state guaranty associations

After an insurance company fails, policyholders receive payments from a state guaranty association—up to a limit. Other insurance companies operating in the state finance the state guaranty association, thereby providing a natural spillover to other companies.

How important is this risk? Historically, large spillovers have not happened via guaranty associations. However, history may be a poor guide in this case. First, as we have emphasized throughout this section, the nature of the risks has changed, from idiosyncratic to aggregate risks. This can lead to larger, common losses to insurance companies. Second, AIG and Hartford received federal government support in 2008, which suggests that the guaranty associations may provide less resilience than occasionally argued.

Recommendations for Insurance

We conclude by providing three recommendations for the insurance sector.

1. Increased transparency

To provide accurate measurement of mismatch risk in the industry, more disclosure is required. We provide several concrete suggestions:

- Transparency on the interest rate exposure of the liabilities by reporting the duration and convexity (an additional measure of interest rate risk) of the liabilities, ideally by product groups (such as universal life, term life, and annuities).
- Transparency on the equity and volatility exposure of the liabilities, which is particularly relevant for variable annuities and life products with embedded equity exposure.
- Transparency on the sensitivity of different classes of products to changes in policyholder behavior. For instance, insurers can report, for different types of products, the impact of a large shift in policyholders surrendering their policies or allowing them to lapse. The

same reasoning can be extended to other options embedded in insurance products.

- Transparency on the market value of the liabilities.
- Transparency on captive reinsurance companies in terms of the capital relief they provide, their funding, and asset holdings. Even if one argues that captives are justified because reserves required by Regulations XXX and AXXX are “uneconomical,” there is no reason why this capital relief should go hand-in-hand with more opacity. In the context of captives, our first recommendation is to report the change in the RBC ratio if the policies would move back on the balance sheet of the ceding company. Second, captives should disclose the same information on assets and derivatives as operating companies. Third, captives should provide transparency on their funding structure and in particular on the use of letters of credit.

Market participants and rating agencies recognize that increased transparency will better position them to assess the riskiness of the sector and safeguard its stability.

2. Standardized stress tests

Next, we recommend standardized stress tests of operating companies, of companies at the group level, and of state guaranty associations. Tests should focus primarily on aggregate risks associated with financial market risks (for example, interest rate risk, credit risk including large-scale ratings migration, equity market risks, and volatility) and changes in policyholder behavior (for example, a slowdown in policy lapses in a low-for-long interest-rate environment). If stress tests reveal fragility, insurance companies can be required to increase their equity position.

Stress tests can help identify activities that require higher capital, but they may also reveal overly restrictive regulation. Well-designed stress tests can spot trends and risk developments earlier. In hindsight, this would have potentially helped with variable annuities and shadow insurance. At the same time, stress tests can reveal uneconomical reserving, which some argue has motivated the rise of shadow insurance. Also, if it is indeed correct that no risk is associated with captives or that spillovers via guaranty associations are limited, stress tests at the group level or at the level of the state guaranty association will show that.

Summary data on the results of stress tests for individual companies should be made public to bolster market discipline.

3. Harmonize and coordinate regulatory oversight

While the NAIC puts in lots of effort to harmonize and coordinate regulation, important gaps remain, and new rules move slowly. While many promising initiatives have been taken since the financial crisis, few have led to significant changes. The mission of the NAIC is to “establish standards and best practices, conduct peer review, and coordinate their regulatory oversight.”

The NAIC does not have a financial stability mandate or regulatory powers. Therefore, we recommend strengthening the Treasury Department’s Federal Insurance Office (FIO) so it can exert more leadership and facilitate coordination to fulfill a financial stability mandate. Its current mandate is “to monitor all aspects of the insurance sector, monitor the extent to which traditionally underserved communities and consumers have access to affordable non-health insurance products, and to represent the United States on prudential

aspects of international insurance matters” and advise the Treasury secretary “on important national and international insurance matters.”

We provide several suggestions to strengthen the role of the FIO:

- The FIO should design and collect information on the new risk measures of liabilities and provide aggregate measures of risk mismatch, in addition to company-level mismatch measures. In addition, it should collect and disseminate information on captive insurance companies.
- The FIO should design the standardized stress tests. It can collaborate with the Federal Reserve Board so that the stress scenarios for banks and insurance companies align,

in particular for risks that apply to both, such as the low-for-long environment and in case of credit-sensitive assets.

- The FIO should be given a financial stability mandate.
- The FIO should be made a voting member on FSOC.

The FIO is currently quite small and does not have the capacity to take up all these important tasks. We therefore recommend increasing the resources available to the FIO so it can staff both a research and a financial stability department that can collaborate with the Federal Reserve to learn best practices from bank regulators and to extend or adjust them for the insurance sector.

EXTERNALITIES

Credit supply disruptions:

Contraction in credit if insurance companies are capital-constrained and rebalance to safer assets, which can lead to potential fire sales that reduce prices and new issuances of corporate bonds.

RECOMMENDATIONS

Standardized stress tests of operating companies and at the product-group level. Tests should focus primarily on aggregate risks associated with financial market risks and changes in policyholder behavior.

Strengthen the role of the Federal Insurance Office (FIO) by making it a voting FSOC member and giving it a financial stability mandate. It should design the standardized stress tests and design and collect information to facilitate increased transparency.

Increased transparency should include additional information about the interest-rate exposure of insurance liabilities, ideally by product group; the equity and volatility exposure of liabilities; the sensitivity of different classes of products to policyholder behavior; the market value of liabilities; and the capital relief provided by captive reinsurance companies.

Critical market disruptions:

Disruptions of insurance markets via increased prices, changing contract characteristics, and missing insurance markets, thereby distorting risk-sharing possibilities for households and firms.

- Stress tests
- Strengthen the role of the FIO
- Increased transparency

Spillovers via state guaranty associations:

Insurers face calls to contribute more capital to guaranty associations at the same time, which may stress other companies.

Stress tests of the state guaranty associations.

¹ Froot and O’Connell, 1999.

² Ellul, Jotikasthira and Lundblad, 2011.

³ Becker and Ivashina, 2015.

⁴ Becker, Opp and Saidi, 2021.

⁵ Kojien and Yogo, 2016.

⁶ Lawsky, 2013.

⁷ Ellul, Jotikasthira and Lundblad, 2011.

⁸ Becker, Opp and Saidi, 2021.

⁹ Kojien and Yogo, 2015.

¹⁰ Kojien and Yogo, 2021.

¹¹ Ge, 2020.

¹² Ibid.

Open-End Funds

CHAPTER FIVE



Open-end mutual funds—which offer and redeem shares daily at the net asset value of the portfolio and can issue an unlimited number of shares—pose a particular risk when they promise daily liquidity, but hold assets (for example, corporate bonds) that are not traded in deep liquid markets (unlike, for instance, many equities). These structures often rely on the ability to sell their most-liquid assets, including U.S. Treasuries, which are held as liquidity buffers, to meet unexpected surges in investor requests for immediate redemption during market stress. Assets under management in these funds have grown significantly over the past several years. Moreover, the stakes for mitigating the risks associated with open-end funds have risen as a result of the Federal

Reserve’s decision to end its exemption of reserves in the calculation of large banks’ supplementary leverage ratios, a key measure of capital adequacy. The end of the exemption may limit these banks’ appetite for expanding deposits. If banks discourage deposits, say by imposing fees, institutional customers may steer more savings into these kinds of funds.

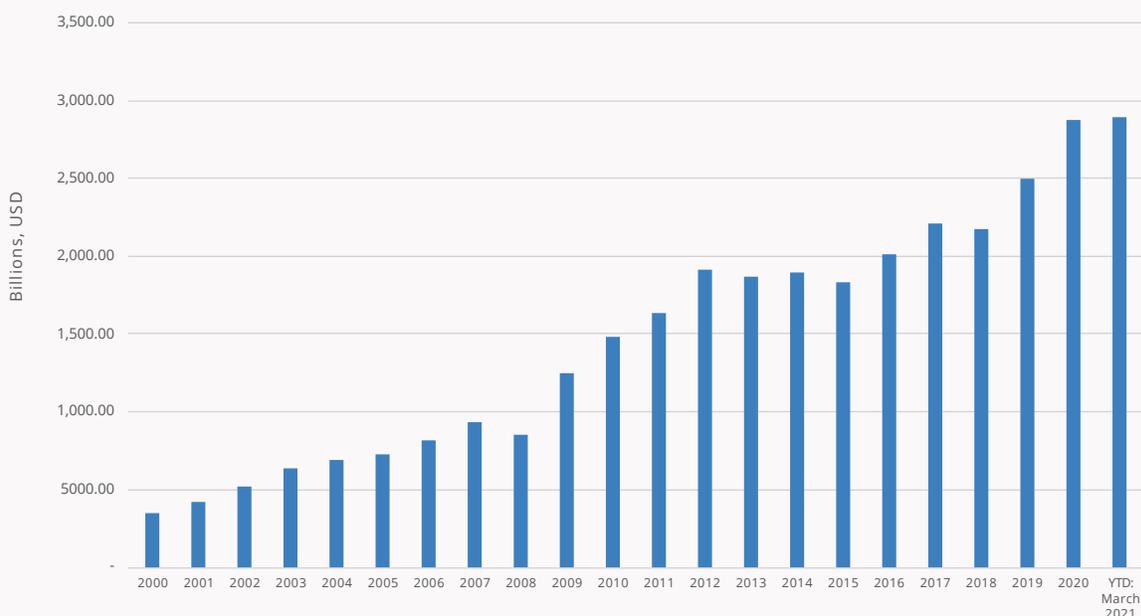
FINANCIAL STABILITY RISK DIAGNOSIS

Some open-end funds can contribute to two types of financial stability risk:

- In periods of stress, open-end funds can sell Treasury or other highly liquid securities held as liquidity buffers. As we explain in chapter 3,

Open-End Bond Mutual Funds Have Grown Over Past Couple Decades

Holdings of U.S. open-end investment-grade and high-yield bond funds



Note: Totals include the funds’ holdings of U.S. Treasury securities.

Source: ICI

this selling can disrupt the Treasury market and create separate financial stability risks. Our recommendations in chapter 3 aim to address those problems, so here we focus only on the threats to credit supply that arise from money market and other open-end funds.

- In periods of stress (such as March 2020), funds may be forced to rapidly sell private-sector assets at fire-sale prices to meet an outsized surge in daily investor redemptions after exhausting their liquidity buffers. Alternatively, to build cash in anticipation of outflows, funds may choose not to roll over maturing private-sector assets or short-term investments in repurchase agreements (repo).

If the fire sales by open-end bond or loan funds (and other market participants) are large and persistent, they may disrupt credit supply

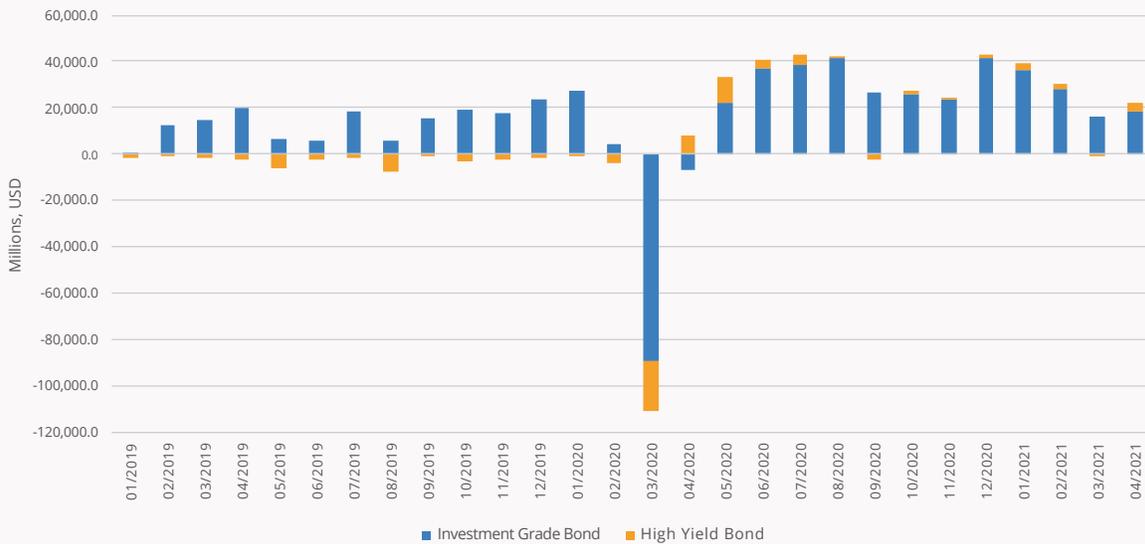
because the primary market may shut down for long enough to affect broader credit conditions in the economy.

Additionally, the drop in prices and corresponding increase in yields caused by fire sales can potentially affect investors more broadly because the price declines will depress the valuations of similar assets. If the secondary market becomes less reliable, the cost of corporate bonds and other debt instruments may increase over the longer term.

If commercial paper, certificates of deposit, or repo are not rolled over, a credit crunch may result if borrowers cannot replace them with other short-term financing. If they do find other financing, it will likely be at an increased cost.

Open-End Bond Funds Saw Huge Outflow at Onset of Pandemic

Net cash flow of investment-grade and high-yield open end U.S. bond funds, by month



Source: ICI

Fire-sale externalities are more likely to arise from sales by funds that engage in significant maturity and liquidity transformation, offering daily liquidity against underlying assets that have significantly longer maturities and significantly less liquidity, such as open-end loan and bond funds. Early in the COVID-19 pandemic, institutional prime money market funds (which invest in short-term debt of corporations, U.S. government agencies, and government-sponsored enterprises—in contrast to funds that invest exclusively in U.S. Treasury debt) were most prone to fail to roll over funding. These funds typically are used by more-sophisticated investors who tend to move more quickly to reposition into cash. By contrast, money market funds that are almost exclusively limited to holding only short-term government debt do not seem to contribute to these problems, so we do not judge that they need to be reformed. However, some short-term and ultra-short bond funds (those investing in non-government debt) are comparable to prime money market funds in that they are viewed by investors as cash-like and are subject to runs. We do not include any recommendations for exchange-traded funds (ETFs) organized as open-end funds, nor do these recommendations relate to equity funds.

RECOMMENDATIONS FOR OPEN-END FUNDS

The problems caused by prime money market funds and certain other open-end funds stem from a liquidity mismatch between the assets that they hold and the offer of daily redemption to investors, which results in a first-mover advantage. The first-mover advantage is the entirely rational decision by an investor to pull money from a fund before others do since typically the most-liquid assets are sold

first—leaving behind the least-liquid assets—or before gates (a temporary suspension of investors' ability to withdraw their money) or other restrictions bind. The first-mover advantage can adversely affect other investors and the market as a whole. A move by some investors to withdraw funds to exploit the first-mover advantage creates an incentive for others to do the same so that their redemptions can be met with the sale of the more-liquid assets. This pattern may spread to other funds, causing contagion. However, because different types of funds are used for different investor needs, the way we suggest solving the first-mover advantage varies.

Institutional Prime Money Market Funds

Prime money market fund rules were significantly amended after the Global Financial Crisis. However, we believe additional changes are needed so that they can continue to offer daily liquidity at relatively stable prices. To more effectively mitigate the first-mover advantage, we propose two changes:

- Remove the current rule that required fees or gates tied to the fund's liquidity buffer. The current linkage between gates and liquidity buffers only gives investors an additional incentive to withdraw early.
- Institute mandatory *always on* swing pricing, which imposes exit costs on those exiting and therefore mitigates the first-mover advantage as well as a reflexive “dash for cash” even if cash is not needed. Swing pricing should be adopted to supplement the existing floating net asset value (NAV) requirements.

What is ‘swing pricing’?

Swing pricing refers to adjusting a mutual fund’s net asset value to pass trading costs along to shareholders who are buying or selling shares. It discourages shareholders from rushing to be the first to sell their shares in a crisis because they receive a price that reflects the impact of their decision to sell. Absent the swing price, the early redeemers could be advantaged because the fund may be selling assets that are more liquid first. If so, their withdrawals would occur at favorable prices, and once a fire sale of more-illiquid assets begins the remaining investors’ shares will be valued at the fire-sale prices. Swing pricing therefore protects longer-term shareholders from suffering a decline in the value of their holdings because of the actions of others.

A mutual fund could disclose in advance that if the fund experiences selling above some threshold, say 4 percent of the total value of its portfolio, it will adjust the price for those redeeming shares downward by 1 percent (and, symmetrically, a 4 percent inflow would push up the price for purchases by 1 percent).

Although the Securities and Exchange Commission permits swing pricing in the United States, it is more commonly used in the Europe and the United Kingdom.^{1,2}

With this change in how the NAV is calculated, and by removing the incentive to run before a gate comes down or a fee is assessed, the perception and expectation that these structures are the same as cash is effectively removed. Investors may still use them as an alternative to cash but should now be aware of the inherent investment and liquidity risk.

(Bank deposits generally offer liquidity on demand, of course, but in contrast to open-end funds, banks are prudentially regulated, face stringent liquidity requirements, and have access to the Federal Reserve’s discount window if they confront a wave of withdrawals.)

Other Open-End Funds

Some open-end funds, such as certain corporate bond and loan funds, hold securities that are generally less liquid than equities in normal times and can become extremely illiquid during stress. As a result, these securities cannot be sold without a significant price concession during periods of severe stress to pay sizable withdrawals by large numbers of exiting shareholders. Alternatively, the funds’ only way to reliably honor a promise of daily redemptions in times of stress may depend on government or other undesirable interventions.

There are various ways to align the funds’ promised liquidity (seven days being the general legal requirement) and their practiced liquidity (overnight being the general market practice) with their ability to deliver it. Some of these ways are possible within the existing current open-end mutual fund legal structure and others would require changes to it.

We considered, but ultimately discarded, several options (see the appendix to this chapter). These included: (1) mandating much larger liquidity buffers; (2) instituting swing pricing and limiting immediate redemptions to a percentage appropriate to the funds’ ability to liquidate immediately, with the balance being paid over the remaining seven days; or (3) limiting immediate redemptions to proceeds from the sale of assets held as liquidity buffers

and relaxing the NAV redemption requirement as currently calculated to reflect only the *realized* liquidation value of the underlying portfolio over the remaining seven days. Each of these could potentially improve the current situation, but for reasons we explain in the appendix, would either deliver an incomplete solution or would be much more complicated to implement than our preferred options.

With a new systemic risk mandate, as recommended in chapter 8, the Securities and Exchange Commission (SEC) would be responsible for making sure that all funds offering daily redemptions can do so in a way that is consistent with existing market depth and size, including for the assets held as a liquidity buffer. It would be required to come up with a framework for making this determination. This framework would need to be shared with the Financial Stability Oversight Council (FSOC) and reviewed periodically. Through this new regulatory assessment, swing pricing may prove sufficient to maintain the current structure for some types of open-end funds.

However, we expect that swing prices cannot be reliably estimated for other open-end funds, likely certain corporate bond or loan funds whose underlying assets may trade infrequently and in markets with little depth. Additionally, the SEC may deem the liquidity mismatch in certain funds as too large for the market (even given their liquidity buffers) and inconsistent with the liquidity offered to investors. The SEC and FSOC would be expected to identify funds with this problem and promote an alternative structure.

For these types of funds, we suggest that Congress create a new category of fund that would offer more limited liquidity to investors.

For example, this could include funds that offer shares continuously or weekly, combined with bi-weekly, monthly, or quarterly redemptions. It could also include funds that promise payment of proceeds within 14 or 21 days, instead of seven, and that actually use that extended period to meet redemptions. The payout on the redemption could reflect the price that is realized from selling the shares, which means that redeeming investors do not have any advantage over others who remain in the fund. The funds would occupy a product space in between existing open- and closed-end funds. In addition to the legislative creation of a new fund class, the SEC would need to develop an assessment framework to determine the appropriateness of the new fund structure and underlying assets. Furthermore, the SEC and FSOC would need to regularly review the evolution of these markets to make sure that the redemption periods and fund structures remain consistent over time with evolving market structure and size.

For some asset classes, we would expect that funds that are currently organized as open-end funds would switch to this new fund structure. The combination of less-frequent redemption opportunities and a longer period to meet redemptions would better align the underlying asset liquidity with the promises made to investors. The regulatory assessment approach would be an essential catalyst for change, and ongoing review will ensure that the new structure remains fit for its purpose.

Collectively, we believe these reforms will:

- Reduce the first-mover advantage so that daily liquidity promises are consistent with the characteristics of underlying asset class.
- Likely reduce the prevalence of open-end funds with extreme liquidity mismatches.

- Reduce the likelihood of fire sales during periods of stress, both of underlying assets and of Treasuries or other high-quality assets held as liquidity buffers.

These changes will transform this part of the financial system. To ensure that the changes do enhance stability it will be necessary to monitor how investors respond to the reforms. This will require tracking the flows of the most

run-prone and volatile funds and checking that these funds are being operated in the appropriate form.

Even if these reforms achieve their aims, they do not guarantee that the Treasury market will be robust enough to avoid instability, so we see them as complementing the suggestions in chapter 3.

EXTERNALITIES	RECOMMENDATIONS
<p>Disruptions in credit supply: Sharp constriction of credit when prime MMFs do not roll over commercial paper and certificates of deposit.</p>	<p>For prime MMFs, adopt swing pricing and redemption fees and eliminate the connection between a fund’s liquidity buffer and imposing gates or redemption fees.</p>
<p>Disruptions in credit supply: Contraction in credit if open-end funds that hold less-liquid assets face large redemptions and potential fire sales that reduce prices and new issuance for long enough to disrupt financing.</p>	<p>The SEC should develop a framework to assess the appropriateness of fund structure and liquidity offering in the context of available market liquidity under stress, including for assets held as liquidity buffers. The SEC and FSOC should regularly review these fund categories to make sure that redemption periods are consistent with ongoing market structure, depth, and size.</p> <p>Create a new type of fund that permits less frequent withdrawals with longer redemption periods for funds for which offering daily redemptions are deemed inappropriate because daily swing pricing cannot be reliably established; fund should be transitioned to that new form.</p> <p>Adopt swing pricing for other open-end funds where appropriate.</p> <p>The SEC and FSOC should conduct periodic reviews to ensure that funds that offer daily redemptions can do so without threatening financial stability.</p>

Appendix: Alternative Mitigants Considered but Not Recommended

Our preferred recommendations are designed to maintain as much of the existing system as possible, with the modifications of more-widespread swing pricing and the creation of a new class of funds. It is possible to partially address some of the problems we identified in other ways. Those that we considered include:

1. Mandating larger liquidity buffers. If a large percentage of a fund's assets were Treasuries or equivalents, then the fund could meet redemptions by selling those assets and retaining illiquid ones. This change would make meeting large daily redemptions more manageable, but at the cost of reducing the investor's ability to gain full exposure to the less-liquid asset class. For example, a bond fund that held, say, 50 percent Treasuries and 50 percent corporate bonds, should be able to meet large daily redemptions, but the investor would not be earning the same return as a fully invested corporate bond portfolio. This alternative would likely serve only to exacerbate the existing selling pressure on Treasury markets during stress.
2. Institute swing pricing for certain types of bond and loan funds and limit the amount of redemption proceeds that would be paid immediately. A limit would provide a fund with more time to sell assets in an orderly fashion. Such funds would disclose that when investors submit a redemption request, in all market conditions, they will only receive proceeds representing a certain percentage (x) of that request within the fund's normal payment procedures. The remainder of the proceeds (1-x) would be paid within the seven days statutorily

required of an open-end mutual fund. This option allows the investor to have more exposure to their selected asset class (for example, corporate bonds). However, to get this type of exposure, the investor must give up full and immediate liquidity. While logically possible, this approach runs into several operational challenges. The percentage x should be calibrated to the liquidity of the fund's portfolio in stressed market conditions, which should reflect both the depth of the market for the fund's securities as well as the aggregate holdings of these securities held by similar funds that would also be selling during stress. This calibration is difficult and would need to be updated regularly as markets evolve. In addition, the (1-x) percentage that would be paid out would be difficult to calculate because it would be based on a swing price and take into account that the fund has seven days to execute a sale. In this arrangement, funds that hold more-liquid assets would be able to offer a higher x. It is possible that for an asset class like corporate bonds, the percentage of liquidity would be based almost entirely on the percentage of the portfolio that is invested in Treasury and Treasury-like securities, because the corporate bonds cannot be reliably sold without price concessions.

3. Transform these funds so that they continue to meet all redemptions within seven days, but without calculating or disclosing the amount that ultimately would be returned until the transactions have occurred. In this case, the fund would no longer resemble a standard mutual fund. Instead, investors might be given an initial payout that comes from selling the cash or Treasury securities in the portfolio. The rest of the redemption would be met by the

realized value of the sale of the assets that depends on market conditions over an agreed time frame. This option would eliminate the first-mover advantage and would not require the calculation of the swing price. Investors would, however, be subject to market risk (which they do not face now) after submission of a redemption request. In addition, this option would require significant changes to the pricing methods used for calculating redemption proceeds. The main difference is that some part of the redemption request would be paid immediately and would only have the price risk associated with the Treasury (and Treasury equivalent) securities.

While either of these last two options might be an improvement over existing arrangements, both are very complicated. More importantly, they presume that it is reasonable to suggest that the underlying asset class is consistent with promising redemptions within seven days. Therefore, we favor a different approach to handling these funds. We believe that our recommendations are simpler and more appropriate remedies for the underlying problems with these types of funds.

¹ Securities and Exchange Commission, 2016.

² Bank of England, 2021.

Housing

CHAPTER SIX



The total market value of U.S. single family housing, the largest item on household balance sheets, is more than \$34 trillion.

The mortgage market, by far the largest source of household debt in the United States, exceeds \$11 trillion.¹ Given its size and its unique position in household finances, the housing market can trigger financial crises, as it did in the Global Financial Crisis.

In this chapter, we detail financial stability risks from the housing market that can generate externalities (or spillovers) to the financial system and the real economy that cannot be handled by microprudential policy or by private agents. In particular, we focus on (1) the risk from defensive actions taken by borrowers with high financial leverage, which can generate drops in aggregate demand; (2) the risk stemming from liquidity strains in the securities and loan markets, leading to disruptions in mortgage credit supply; and (3) the risk of failure of nonbank servicers leading to disruptions in credit supply.

Recent events provide two periods of stress to examine—the Global Financial Crisis and Great Recession from 2007 to 2009 and the 2020-2021 COVID-19 pandemic. The Global Financial Crisis had elements of both the first and second risks, with much of the damage to the real economy caused by the large drop in home prices that led to disruptions in borrower demand.^{2,3,4} The effects of the COVID-19 recession were cushioned by the Federal Reserve’s unprecedented intervention in the market for agency mortgage-backed securities. However, liquidity strains in the non-agency securities and loan markets disrupted mortgage credit supply. Widespread failures of nonbank mortgage servicers did not materialize, largely because of emergency government intervention. Emergency actions are not a

permanent solution and do not address the underlying issue.

Financial Stability Risks from High Financial Leverage Resulting in Drops in Aggregate Borrower Demand

The Global Financial Crisis had its roots in a relaxation of lending standards when housing prices were rising—loans without verification of income and assets, loans with sloppy appraisals, as well as loans with non-traditional features, such as loans with low initial rates that reset after two or three years, interest-only provisions, or negative amortization. These features lower the initial payment so more borrowers can qualify for a mortgage. While non-traditional loans were found in all markets, they dominated in private-label securities, which went from about 10 percent of the market in 2001 to 40 percent in 2007. Easy credit paved the way for borrowers to extract huge amounts of equity through multiple cash-out refinances. Freddie Mac estimates that in 2005 and 2006, more than \$300 billion of equity was extracted each year. For 2018, that number was approximately \$100 billion. Some lenders may or may not have realized how lax the standards were, but they were originating loans to distribute them through securitization and had no long-term stake in the loans, and they thought ever-increasing home prices mitigated the risk.

When home prices stalled, and interest rates rose, the market began to unravel, with a viciousness few anticipated. Tightening of monetary policy in 2006 led to large increases in rates for mortgages with teaser rates. These borrowers could not afford their monthly

payments when the teaser rates expired and were unable to refinance their subprime mortgages when home prices stopped rising. This in turn led to defaults of subprime mortgages (loans to borrowers with low credit ratings), and quickly spread to prime mortgages and Alt-A mortgages (loans to borrowers with credit ratings between subprime and prime).

This had large implications for the economy. Highly leveraged borrowers reduced spending to service their debts—which led to less aggregate demand for goods and services, reducing income and forcing unemployment on many people not initially affected.⁵ In normal times, borrowers in financial difficulty sell their home, pocket some cash, and downsize. With home prices down close to one-third, this was not possible, producing many defaults with further spillovers, notably a loss of confidence in large sectors of the financial system leading to runs, fire sales, and frozen credit markets. The Great Recession was devastating—more than 8 million foreclosures, 8.8 million jobs lost, \$7 trillion in home equity lost, and \$11 trillion in stock market equity wiped out. Even though the financial crisis started in the United States, its consequences were global. Twenty-four countries experienced banking crises, and the recession was global.

Potential Mitigants

Circumstances today are different. Lending standards are tighter. Household leverage is lower. But that could change, and it is crucial to avoid a repeat of the lax mortgage lending standards that led to the Global Financial Crisis.

One powerful mitigant is technological change. The ability to quickly process large amounts of data has improved automated valuation models for home prices, making appraisal fraud less likely. Automatic verification of income and assets has also become possible for many borrowers, making it easier to predict the probability of default.

On the regulatory front, the Ability to Repay Rule/Qualified Mortgage (QM) Rule stopped many sloppy lending practices, specifically loans without documentation and loans with non-traditional features which lower the initial payment.⁶ Effective in January 2014, the rule was designed to prevent borrowers from obtaining loans they cannot afford while protecting lenders from borrower litigation for loans that meet the requirements of the rule. The rule requires lenders to make “a reasonable, good faith determination” of each borrower’s ability to repay the loan, accounting for factors such as borrower income, assets, and employment. One way to satisfy this requirement is to make sure a loan meets the definition of the “qualified mortgage.” In addition to verification of income, assets, and employment, all qualified mortgages should generally meet the following requirements:

1. The loan cannot have negative amortization, interest-only payments, or balloon payments.
2. Total points and fees cannot exceed 3 percent of the loan amount.*
3. The mortgage term must be 30 years or less.
4. Adjustable-rate mortgages must be underwritten to the maximum interest rate

* Higher points and fees are allowed for loan amounts below \$100,000.

applicable during the first five years of the mortgage.

5. Prepayment penalties are generally permitted but subject to a three-year phase-out.

For a loan to be “qualified,” the debt-to-income (DTI) ratio cannot exceed 43 percent, but government loans and loans purchased by one of the government-sponsored enterprises (GSEs) are automatically considered “qualified.” (Government loans are generally insured by the Federal Housing Administration (FHA), Veteran’s Administration (VA), or Rural Housing Service (RHS), and securitized by Ginnie Mae.) The exemption of government loans is permanent, but the so-called GSE patch—which applies to Fannie Mae and Freddie Mac—was not. In 2019, close to 95 percent of 2019 conventional (GSE or non-agency) mortgages were automatically QM, either because they were purchased by the GSEs or had a DTI less than 43 percent or were government loans.

In December 2020, the Consumer Financial Protection Bureau (CFPB) proposed replacing the 43 percent DTI limit with a price-based standard.⁷ Any GSE or non-agency mortgage with a spread less than 150 basis points over the prime mortgage rate will be deemed “QM, safe harbor;” any mortgage of 150 basis points or more but less than 225 basis points over the prime mortgage rate will be deemed “QM, rebuttable presumption.” While the exact definition of what constitutes a QM mortgage has been redefined, the core of the rule—loans with non-traditional features leave the lender with liability—remains unchanged, discouraging the origination of mortgages with non-traditional features such as balloon payments, negative amortization, or short-reset provisions. In March 2021, however, the CFPB

said that it was delaying implementation of the change, originally set to be effective July 1, 2021, to October 1, 2022 and that lenders could use *either* standard until a final decision is made.⁸

Additional Ex Ante Measures Could Help Sustain Borrower Spending

Additional policies could minimize the likelihood that a drop in home prices would result in a drop in aggregate demand. We recommend (1) ex ante measures, such as limitations on loan-to-value (LTV) ratios on some mortgages and residual income tests to shrink the number of highly vulnerable homebuyers and (2) more proactive loss mitigation.

LOAN-TO-VALUE CAPS ON CASH-OUT REFINANCING AND INVESTOR PROPERTIES

Limitations could be placed on the maximum loan-to-value ratios. In the aftermath of the crisis, the GSEs, the FHA, and Ginnie Mae placed LTV limits on riskier activities such as cash-out refinances and loans to investors (as opposed to owner-occupied homes). For example, the GSEs’ investor loans have a maximum LTV of 75 percent for one-unit properties and 70 percent for two-to-four-unit properties. Cash-out refinances have a maximum LTV of 80 percent.

In the interest of financial stability, limitations on cash-out refinancing and investor loans, as have already been implemented (albeit not permanently), would be prudent. These policies should be institutionalized by Congress (for

example, rules could bar cash-out refinances above 80 percent LTV and investor loans above 75 percent LTV). In 2008, Texas enacted legislation that forbid equity extraction greater than 80 percent LTV after the home was purchased, and Texas loans fared considerably better than the rest of the nation during the financial crisis.⁹

These precautions should be limited to cash-out refinances and investor loans; they should not include purchase loans because of the importance of home ownership as a way for Americans to build wealth.¹⁰ While many other countries have placed LTV limits on purchase mortgages (with mixed success), doing so in the United States would make it very difficult for first-time homebuyers.^{*11,12,13} The median LTV of a first-time home buyer using a loan backed by a GSE is 90 percent, and the LTV on government loans is even higher.

RESIDUAL INCOME TESTS

Residual income tests could help dampen the unwelcome cycle of lenders making loans that borrowers can't reasonably afford to pay—with associated spillovers to aggregate demand in bad times. Currently, mortgage underwriting largely uses DTI as an indication of ability to repay. But this ratio does not measure whether borrowers have sufficient income to cover living expenses after paying the mortgage and related costs. Consider two borrowers, one

earning \$40,000 a year and the other earning \$80,000 a year. The first borrower proposes to spend \$15,000 a year (\$1,250 a month) on a mortgage and related payments; the second borrower proposes to spend \$30,000 a year (\$2,500 a month) on a mortgage and related payments. Thus, both have a DTI of 37.5 percent. The borrower earning \$40,000 (\$35,000 after taxes) or \$2,917 per month, would be left with just \$1,667 per month for all living expenses. The borrower earning \$80,000 (\$68,000 after taxes) or \$5,667 per month, would be left with \$3,167 per month for all living expenses. Any unexpected expense could well be devastating to the budget of the first borrower and more likely to cause a default and a sharp cutback in spending than with the second.

Residual income is used in underwriting VA mortgages; these mortgages have both a DTI and a residual income test. VA mortgages default less frequently than FHA mortgages with comparable characteristics that do not use such a test. Residual income tests are used in underwriting non-QM mortgages, as protection for both the borrower and lender.¹⁴ Lenders must verify borrowers have the ability to repay, and can be sued if borrowers later claim they didn't have the ability to repay. Adding a residual income test increases the likelihood the borrowers can repay and adds a layer of protection for the lender. More widespread use of these tests, in

* Classens et al (2013), using data from 2,800 banks in 48 countries over the 2000-to-2010 period, shows that borrower-LTV caps are effective in reducing the growth in bank's leverage and asset growth during booms but do not help stop declines in adverse times. Classens (2014) finds that LTV limitations are the single most employed macroeconomic policy tool. He showed that 24 of the 42 countries surveyed used LTV as a macroprudential policy at least once from 2000 to 2013, and it was used in 28 percent of the country/year combinations. Of the 14 advanced economies, 11 of them have used the LTV tool. Research on how effective this tool is at damping macroeconomic cycles are mixed.

conjunction with debt-to-income measures, would provide additional protection against drops in aggregate demand.

More Proactive Loss Mitigation Could Help Sustain Borrower Spending

In addition to restricting lending, a robust toolkit for proactive loss mitigation, constructed to avoid moral hazard, is needed. Tools would include: (1) streamlining refinancing to prevent borrowers from going delinquent, (2) using forbearance as a tool, and (3) allowing mortgage modifications to minimize the likelihood that borrowers lose their homes. These measures reduce the pressure on borrowers by reducing debt-service payments, thus reducing the amount borrowers must cut spending and hence creating less of a feedback loop through aggregate demand.

STREAMLINED REFINANCING

During the Global Financial Crisis, the Home Affordable Refinancing Program (HARP), designed for borrowers with good payment histories, prevented 3.5 million borrowers from going delinquent by allowing for streamlined refinancing. HARP expired at the end of 2018. A Fannie Mae program allows streamlined refinancing if the LTV is greater than 95 percent but, with home prices having risen in recent years, few borrowers qualify. Borrowers who do not qualify for the Fannie Mae program use normal refinance channels, in which the strongest borrowers are able to refinance easily and weaker borrowers, including those with higher loan-to-value ratios have difficulty refinancing. Freddie's similar program expired

in September 2019.

HARP reduced default rates dramatically.^{15,16} Refinancing also led borrowers to expand their use of debt instruments, such as auto loans, home equity lines of credit (HELOCs), and other consumer borrowing that are proxies for spending, partially counteracting a drop in aggregate demand.

Allowing a future HARP to take effect automatically if unemployment rises above a certain threshold, or if home prices fall more than a predetermined amount, would be a valuable tool for financial stability. If implemented during a normal period, it would have limited market repercussion because the threshold trigger points would be considerably out of the money.¹⁷

FORBEARANCE AS A TOOL

Forbearance gives borrowers a breather, a period during which they do not have to make mortgage payments. Forbearance was used before and during the Great Recession, but it has become much more flexible as a result of improvements made to address natural disasters—increasing the forbearance term and increasing the options to pay back the forborne amount. During the 2020-2021 pandemic, forbearance was a valuable tool for avoiding defaults. Forbearance is permitted for up to one year. And there is a waterfall of options to pay back the forborne amount—lump sum payback (if the borrower has the resources), payment spread over several years (if the borrower can pay more for a period of time), adding the payments to the end of the life of the mortgage (if the borrower is able to pay the pre-pandemic amount), or a mortgage modification if the borrower can no longer pay

the old amount.

Forbearance generally requires little documentation, just an attestation that the borrower has a financial hardship. There were concerns that if this rule was too loose in the wake of COVID-19, borrowers would have an incentive to withhold mortgage payments (a moral hazard). In fact, few instances of moral hazard have materialized. At the peak in May 2020, 8.55 percent of the one-to-four-family mortgages were in forbearance, declining to 5.5 percent by the end 2020.

This forbearance was a temporary one-off measure. We recommend that it be institutionalized for national emergencies so market participants can rely on it.

ENHANCING THE MORTGAGE MODIFICATION TOOLKIT

When borrowers' economic circumstances change so they are unable to meet current mortgage payments, one option is a loan modification—increasing the amortization period of the loan, reducing the interest rate, or cutting the principal to reduce monthly payments.

The modification procedures could be improved. First, FHA and VA loans were a very small proportion of total loans going into 2007; they are now a much larger proportion, but the FHA and the VA lack the flexibility and resources to address the needs of non-performing borrowers. Several simple fixes

could help, including a more robust non-performing loan sales program (allowing the loans to be sold to an entity that could offer deeper payment reductions and principal forgiveness). Another fix would be to allow a modified mortgage to stay in the pool if it is beneficial to the borrower.¹⁸ Finally, giving the VA the opportunity to do a partial claim, as the FHA can do, would improve modifications for VA loans.* Second, there should be minimum modification standards for all loans, including portfolio loans and loans in private-label mortgage-backed securities, which lie outside the government purview. Third, modifications that allow for immediate principal reduction create a taxable event. Legislation could allow for principal reduction to be non-taxable if certain macroeconomic triggers are met.

In short, a loss mitigation toolkit was developed in the aftermath of the Global Financial Crisis. Certainly, the forbearance and loan modification tools have evolved, and have been a critical part of the COVID-19 response. But, in the refinancing arena, most of the programs have expired. We should take to heart the lessons learned in both the Great Financial Crisis and the COVID-19 pandemic and allow these programs to kick in automatically based on macroeconomic triggers.

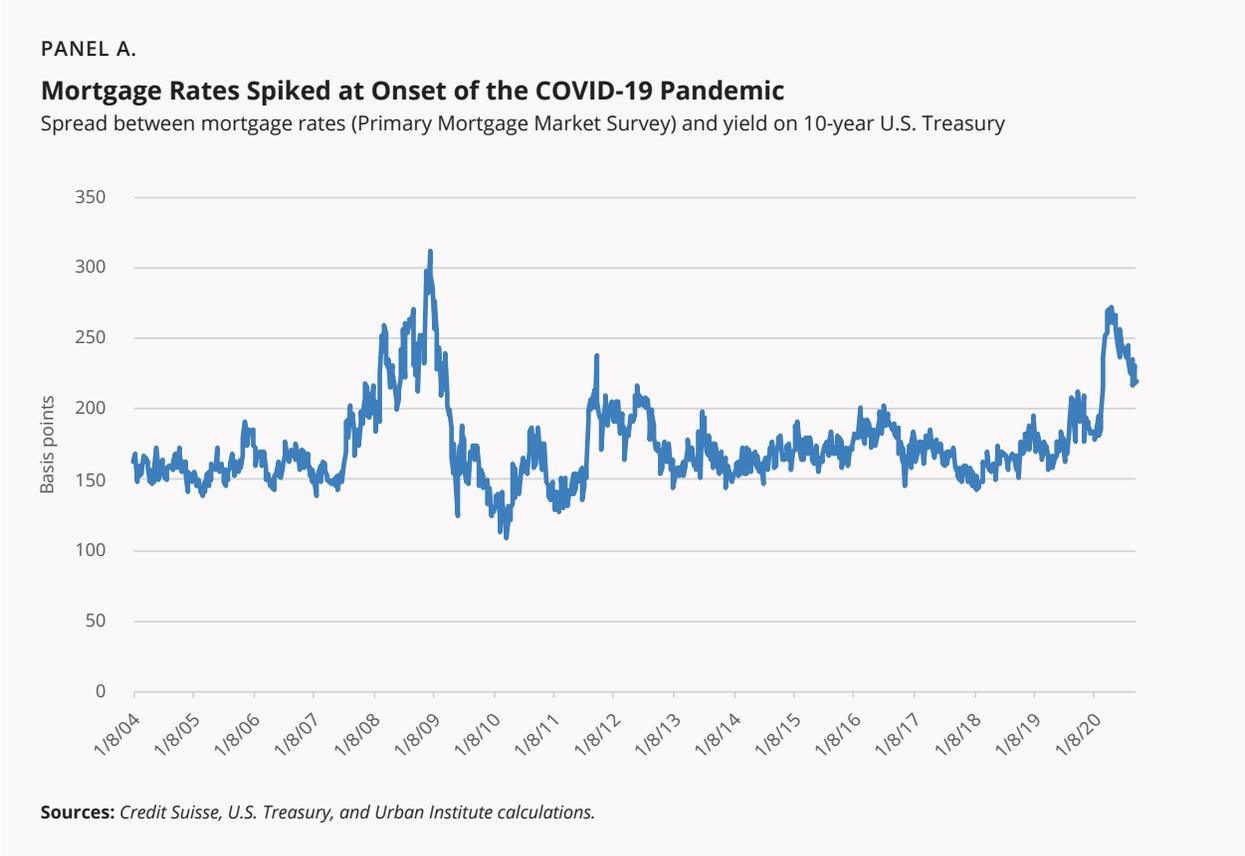
* When a servicer modifies a loan, they buy it out of the pool at par. They then adjust the interest rate to slightly above the then-prevailing rate. If interest rates have risen, it means the borrower will pay a higher rate. By allowing the mortgage to stay in the original pool, the borrower avoids this additional cost. A partial claim defers repayment of mortgage principal through an interest-free subordinate mortgage that isn't due until the first mortgage is paid off.

Financial Stability Risks Stemming from Liquidity Strains in the Securities and Loan Markets

Financial stability risks stemming from liquidity strains in the securities and loan markets, and the resulting credit disruptions, became clear both during the Global Financial Crisis and the recent pandemic. Prompt Federal Reserve action has mitigated the risk to the agency mortgage-backed securities (MBS) market. However, the sectors of the market that the Federal Reserve did not reach experienced a huge diminution of credit with potential spillovers to aggregate demand. Moreover, the agency MBS market is vulnerable to credit disruptions, which have necessitated heavy Fed intervention twice in 12 years to address potential financial market spillovers.

There are two major differences between the years leading up to the Great Financial Crisis and today. First, the securitization share of the private-label securities market was much larger and the government market was much smaller in 2005-2006. Second, before the financial crisis, much more of the risk was concentrated in the banking sector, which was much more highly levered than it is currently. Today, much more of both origination and investment activity occurs outside the banking system. One feature is unchanged: The system relies on leverage from the repurchase agreement (repo) market; dealer financing of securities and loans is critical. This makes the system unstable when asset values decline rapidly.

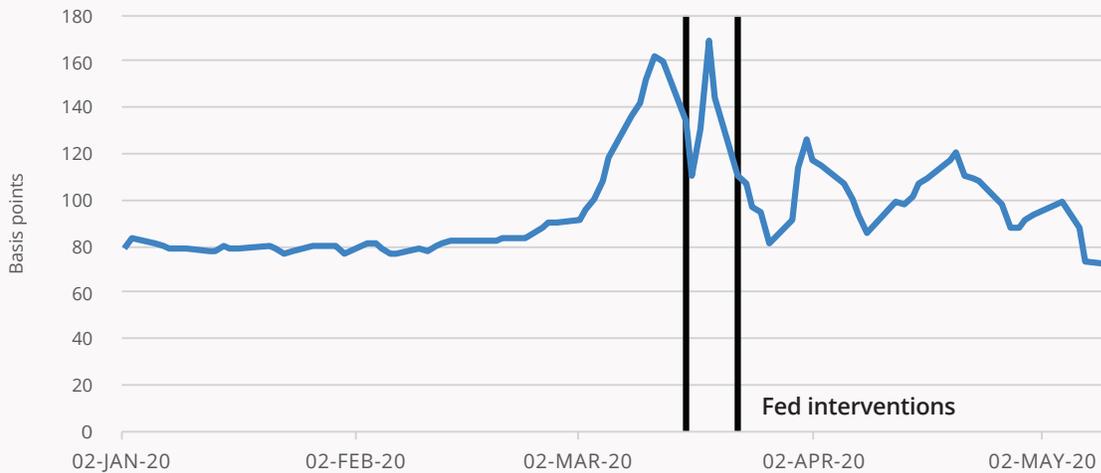
In 2008, when home prices fell and delinquencies rose, a vicious cycle emerged, with de-leveraging in a stressed market.



PANEL B.

Mortgage Rates Spiked in March 2020 Until the Fed Intervened

Spread between rate on 30-year fixed-rate mortgages and yield on 10-year U.S. Treasury note



Sources: Credit Suisse, U.S. Treasury, and Urban Institute calculations.

As delinquencies rose, the prices of mortgage loans and mortgage securities fell. This generated margin calls and forced selling. In addition, liquidity strains developed. The very complicated nature of some of these securities, including many with substantial internal leverage, made it difficult to assess both what these securities were worth as well as the financial strength of the institutions holding these securities.* Bid-ask spreads widened considerably. This price action caused dealers to raise the “haircuts” on borrowing as well as funding costs, in turn generating forced selling and more deleveraging, causing more price deterioration in the securities and the vicious cycle repeated.

The deleveraging was not confined to the private-label securities market. In 2008-2009, agency mortgage spreads were also very wide. Panel A shows the spreads between the mortgage selling at par and the 10-year Treasury note from 2004 on. Spreads widened dramatically in 2007 and 2008. Spreads declined to more normal levels only after the Federal Reserve began an aggressive purchase program.

Some lessons from 2007-2009 were remembered. Internal leverage was contained, securities structured after the Global Financial Crisis were simpler and the use of derivatives has been sharply curtailed. However, the

* Internal leverage refers to the structure of a security which, effectively, increases the risk (and thus potential reward or loss) relative to simply buying a mortgage or pool of mortgages.

COVID-19 pandemic revealed that the core issues related to the lack of market liquidity, and the potential for credit market disruption, have not been resolved.

The early days of the 2020 pandemic looked a lot like 2008. The difference was that the Fed acted much more quickly. Panel B shows agency mortgage spreads from January to mid-May 2020. Spreads first rose dramatically in March as the pandemic hit. As prices took their first dramatic turn, mortgage real estate investment trusts, hedge funds, and other levered MBS investors began to sell. Prices dropped, generating margin calls on these securities. There were no buyers and prices dropped (spreads widened) further. This change reflected illiquidity, as there is no credit risk on these securities.

On March 15, the Fed announced it would buy up to \$500 billion of Treasury securities and \$200 billion of agency MBS. After tightening for a few days, spreads widened, a signal that market participants saw this as insufficient. On March 23, the Fed announced it would buy Treasury securities and agency mortgage-backed securities “in the amounts needed to support smooth market functioning and effective transmission of monetary policy to broader financial markets and the economy.”¹⁹ And the Fed did exactly that; March purchases totaled \$292.2 billion, all in the second half of the month. This exceeded the purchases made during any month of the Global Financial Crisis.

There are three basic channels for mortgage origination in the United States: (1) government loans, backed by the full faith and credit of the U.S. government; (2) GSE loans, guaranteed by Fannie Mae or Freddie Mac, which are in conservatorship and have a line of credit to the U.S. Treasury; and (3) non-agency loans, which include both mortgages held on bank portfolios

as well as private-label mortgage-backed securitization.

Credit availability in the non-agency market, which did not benefit from Federal Reserve intervention, was severely crippled by pandemic-related market disruptions. In 2019, GSE plus Ginnie Mae volume was 62.2 percent of the total; the remaining 37.8 percent was non-agency origination. In the second quarter of 2020, non-agency origination accounted for 15 percent of the total, rising to 21 percent in the third quarter.

As prices on agency MBS with no credit risk began to fall in March, price declines were even more rapid on the private-label securitizations and on non-agency mortgage loans, because many of these assets were held by leveraged players. Price drops on the securities and on not-securitized loans in turn generated margin calls, which in turn generated more forced selling, which generated further price drops. When the forced selling was over, the markets began to recover, but slowly. And if a mortgage originator cannot profitably make a loan, the loan won't be originated. As a result, access to mortgages outside the agency market was very constrained for seven months—until the last quarter of 2020.

Potential Mitigants

The pandemic experience showed that the securities market problems were not just with the very complex securities where valuation was difficult. There is a fundamental liquidity issue in both the agency and non-agency mortgage market. The repo market, on which major players rely for financing, does not work well when prices decline rapidly because margin calls generate more forced selling,

which accelerate price declines. And in these markets, with wide bid-ask spreads, price discovery is often difficult.

For the agency mortgage market, we suggest a central liquidity facility at the Federal Reserve for which all entities can borrow at a penalty rate, analogous to the facility we describe in chapter 3 for Treasuries. Bank-affiliated dealers and independent dealers who are subject to prudential regulation would not be required to pay an upfront fee; other market participants would. The Federal Reserve would set the upfront fee, haircuts, and the terms of the penalty rate. Given the systemic importance of the mortgage market and that agency mortgage-backed securities are, effectively, backed by the government and that the Fed has been actively buying agency securities alongside Treasuries in its quantitative-easing programs, creating a standing repo facility for agency securities seems appropriate.

For the non-agency mortgage market, the most direct mitigant to credit disruptions would be limits on repo leverage. The procyclical nature of this leverage (allowing for more leverage during good times, lowering leverage limits during times of stress) has exacerbated credit disruptions. The Federal Reserve and the Financial Stability Oversight Council (FSOC) should commission a study on whether repo lending could be made less procyclical. One possibility would be a limit on the maximum amount that could be borrowed, where that limitation is derived from a study of the market value of the underlying collateral through the economic cycle. While making repo leverage less procyclical would not entirely prevent credit disruptions, it would require a much larger liquidity event before the supply of credit is affected.

Financial Stability Risks Stemming from Disruptions in Credit Supply Due to the Failure of the Nonbank Servicing Sector

One potential threat to the stability of the mortgage markets is nonbank servicers, whose market share has increased tremendously. The increase has been particularly pronounced in Ginnie Mae securities, where the nonbank servicing share has risen from 29 percent at the end of 2013 to 77 percent in January of 2021. Failure in this sector has the potential to disrupt the flow of credit.

When mortgage originators sell loans into the secondary market, they usually retain the mortgage servicing rights (MSRs) but also can choose to sell these rights or can retain the mortgage servicing rights but contract out the servicing responsibilities to a sub-servicer. The owner of the MSR, whether the originator or the new buyer, has the right to receive servicing income from the loan and has the responsibility to service the loan. A servicer is responsible for collecting principal and interest (P&I), as well as tax and insurance (T&I) payments, and then remitting those payments to investors, insurance companies, and local taxing authorities. If a borrower is late with their payment, the servicer must do everything it can to collect the payment from the borrower. If a borrower fails to make payments for some period, usually 90 or 120 days, and if all subsequent efforts to get the borrower to resume payments fail, the servicer must initiate a short sale or a foreclosure to recoup the remaining loan balance on behalf of the investor. Servicers must report to investors the status of these mortgages and critically, for most loans, servicers are contractually required to advance funds to investors, insurance

companies, or taxing authorities, regardless of whether the borrower pays.

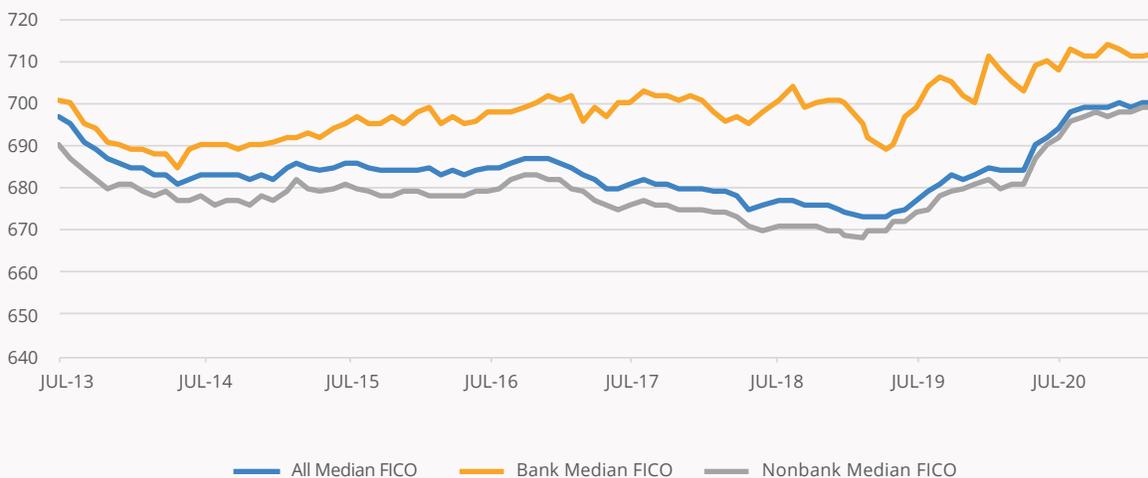
The shift from bank to nonbank mortgage origination and servicing reflects several factors. First, bank capital requirements, imposed after the financial crisis, make it very expensive for banks to hold MSR assets on their balance sheets. Second, several nonbank servicers specialize in troubled assets, and it has made sense to transfer delinquent and higher-risk mortgages to them. Third, elevated reputational risk stemming from the government's use of the False Claims Act has made many banks hesitant to do government lending.*

The Riskiest Loans are Concentrated in the Government Market Where Nonbank Servicers Dominate

The riskiest loans in the mortgage marketplace are now concentrated in the Ginnie Mae market (mainly mortgages guaranteed by the FHA or the VA) where the nonbank originators who tend to service their own mortgages now dominate. And within the Ginnie Mae market, the loans serviced by nonbanks tend to be riskier (for example, they have lower credit scores and higher debt-to-income ratios) than those serviced by banks. This is not true in the market for servicing loans securitized by Fannie and Freddie.

Ginnie Mae Loans Serviced by Nonbanks Tend to be Riskier

FICO scores of Ginnie Mae mortgages, bank vs. nonbank servicers



Sources: eMBS and Urban Institute

* The False Claims Act is a Civil War-era statute that can impose triple damages on an entity caught making untrue statements to the government. It had never been applied to financial services before 2011. The bank certifies that all material on a loan application is correct, if it is later found to be wrong, the institution has certified an untrue statement.)

Risks to the Nonbank Servicers

The Conference of State Bank Supervisors outlines four risks to the nonbank mortgage servicers/originators.²⁰ First, nonbanks don't have a stable source of short-term funding for either their originations or their servicing advances. Nonbanks often obtain liquidity from warehouse lines of credit provided by banks. In times of stress, lenders face strong incentives to cancel the lines and nonbanks, most of whom have lower credit ratings, likely would be unable to replace that funding during crisis periods.

Second, nonbanks have relatively few resources to absorb these shocks. Their largest assets are mortgages held for investment or sale and mortgage servicing rights. Both are often pledged as collateral. And MSR's can be very volatile instruments. Their value changes dramatically with changes in interest rates. Moreover, unlike bank participants in the mortgage market, the nonbank originator/servicers have no prudential regulator. Fannie Mae, Freddie Mac, and Ginnie Mae do set minimum capital and liquidity requirements, but that is no substitute for actual regulation. The CFPB regulates nonbanks for consumer-related issues. The state banking supervisors nominally do the prudential regulation, but they have done little and don't have the expertise to do more.

Third, servicing advances on government-insured loans—primarily FHA and VA loans—can become a real burden during periods of stress, and nonbanks are much more exposed to this risk. The GSEs buy delinquent loans out of MBS pools when the mortgages are four months delinquent. The mortgages then sit on the balance sheets of Fannie and Freddie, and are managed by the servicer, but the

servicer is reimbursed by the GSEs for servicing expenses. By contrast, when a government mortgage defaults, the servicer not only loses the servicing income but is responsible for advancing monthly principal and interest payments to the investor using its own funds, as well as incurring the costs of servicing the loan—until the default is resolved by a sale or some other mechanism. This places substantial pressure on servicers of government loans; they must have the financial strength to keep advancing—an obligation that can cause a severe liquidity crunch if defaults rise rapidly and unexpectedly.

Fourth, servicing costs are much higher for delinquent loans than for performing loans and are particularly high for Ginnie Mae loans. Servicing delinquent FHA loans is about three times as expensive as servicing delinquent GSE loans. The servicer is not repaid for these advances until the loan or the home is sold, and the servicer submits an insurance claim, and even then, the reimbursement is much less than the money spent. And the VA only covers the first 25 percent of the original balance. The servicer absorbs the rest.

Given these four risks, the FSOC in its 2019 annual report identifies the nonbank sector as a source of potential financial instability. It said:

Given these fragilities, the nonbank sector could potentially be a source of weakness as a contraction in the largest nonbanks' ability to originate and service mortgages may transmit risk to the broader financial system through several channels. If delinquency rates rise or nonbanks otherwise experience solvency or liquidity strains, Ginnie Mae and the Enterprises could experience losses and operational challenges associated with

transferring servicing to a financially sound servicer, especially the servicing of delinquent mortgages. ...

Nonbanks could also transmit risk through contagion. During a period of significant market stress, strains in one nonbank could cause counterparties to question the viability of others. This could cause stress to spread among market participants. Broader contagion could lead to dislocation in the housing and mortgage markets during periods of stress.²²

A worrisome scenario is an across-the-board rise in defaults that threatens a few larger or multiple smaller nonbank servicers, curtailing the number of potential buyers of servicing and complicating regulatory efforts to contain the panic. It is not clear that the servicing capacity is available to accommodate nonbank servicer failures in size. And these failures would have widespread repercussions in the mortgage market; the value of MSRs would plummet, causing counterparties to question the viability of other nonbank servicers, and leading to more failures in this sector.

More importantly, mortgage credit, particularly credit to riskier borrowers, disproportionately FHA borrowers, would evaporate overnight. This would depress home prices in low-income and minority communities that rely heavily on FHA lending. This would further increase defaults, and could, in turn, lower aggregate demand.

It initially appeared that the pandemic might trigger that problem. The GSEs and the FHA announced borrower forbearance provisions, which were further enhanced by the CARES Act, in March 2020, which gave homeowners six months forbearance, with an option for another six simply by attesting to a hardship. However, the CARES Act did not address

the servicing advance issues. According to the terms of servicing contracts with both Ginnie Mae and the GSEs, the servicers would be responsible for advancing during the forbearance period, which had the potential to place substantial strain on the system if forbearance rates are high. In fact, the test never came. Ginnie Mae and the GSEs put into place emergency measures to address servicer liquidity issues, and forbearance rates were much lower than feared.

Emergency Actions Taken; Planned Actions Accelerated

Ginnie Mae introduced its Pass-Through Assistance Program (PTAP) in early April 2020. It allowed issuers to apply for assistance to meet their contractual obligation to make timely and in-full principal and interest payments due MBS holders without being held in default under the Ginnie Mae Guaranty Agreement. Servicers were able to borrow at a penalty rate to meet their obligations to Ginnie Mae. However, this funding facility does not cover servicer expenses related to advances, real estate taxes, and insurance payments, or FHA mortgage insurance premiums. These amounts are 25 to 30 percent of the total payments. The program, however, made warehouse lenders more comfortable leaving their lines of credit in place. The percentage of borrowers who took advantage of forbearance was lower than anticipated. Moreover, the steep decline in rates, and the float on the prepaid balances, provided originators another source of liquidity.

Before the pandemic, Ginnie Mae had been trying to stand up a financing facility that would give nonbank servicers an additional source of

liquidity.²³ The facility was established on April 7, 2020. Nonbank servicers can access financing for servicing advances through an expanded note securitization trust. However, only the largest originators will likely be able to take advantage of it because it requires that private investors invest in the servicer advances of these entities.

Ginnie Mae is also strengthening its counterparty risk-management oversight to include capital requirements, recovery and resolution planning, and stress testing. This is certainly helpful, but Ginnie Mae does not have the ability to monitor its servicers on a real-time basis.

The GSEs also took emergency actions to remove the pressure on servicers. Generally, servicers of GSE mortgages are responsible for advancing until a borrower is four months delinquent. However, borrowers who have chosen forbearance are technically not delinquent, so servicers would have been responsible for advancing for 16 months if the borrower needed to forbear interest for the 12-month maximum. In an effort to address servicer liquidity concerns, the GSEs have announced that servicers will only be responsible for advancing principal and interest payments for the first four months. However, they will be responsible for advancing taxes, insurance, guarantee fees, and private mortgage insurance payments for up to 16 months.

Potential Mitigants

These emergency actions are ad hoc solutions introduced to avert a catastrophe. But the catastrophe was averted primarily because the impact was smaller than anticipated due

to lower forbearance take up. Four longer-term mitigants are necessary: (1) Ginnie Mae should continue to strengthen its counterparty risk-management oversight; (2) a prudential regulator for nonbank mortgage servicers should be established; (3) nonbanks should be given access to a secure source of funding; and (4) regulators should explicitly take systemic risk into account.

GINNIE MAE

Ginnie Mae has made great progress in putting in place counterparty risk-management oversight. It has developed surveillance tools for its nonbank servicers. It must continue to enhance and refine these tools. With nonbanks constituting more than 90 percent of Ginnie Mae origination, and 77 percent of its servicing, these steps are critical. However, that alone is insufficient.

ESTABLISHMENT OF A PRUDENTIAL REGULATOR

Each state regulator is charged with regulating the nonbanks in its jurisdiction, but none of them are expert in prudential regulation; most focus primarily on consumer protection. In 2015, the Conference of State Banking Supervisors proposed rules for prudential regulation that have never gone into effect.²⁴ Given that the nonbanks operate across multiple states, we recommend one regulator for all 50 states. Currently, the only regulation comes from the capital and liquidity requirements that Ginnie Mae and the GSEs impose as minimum standards for doing business. That does not constitute prudential regulation; they are securitizers and are not equipped to be regulators. De facto

regulation often comes from banks that serve as warehouse lenders to the nonbanks. Before a nonbank violates a GSE or Ginnie Mae requirement, it will trip a covenant in its warehouse agreement, and the warehouse line will be reduced, limiting the ability of the nonbank to continue to extend credit.

One federal regulator should be charged with the prudential regulation of the nonbank mortgage-servicing sector. The Federal Housing Finance Agency (FHFA) is the obvious choice. It already has significant regulatory experience overseeing the mortgage market through its regulation of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks. In addition, Fannie Mae and Freddie Mac significantly monitor nonbanks for counterparty risk purposes, and that data can be leveraged by FHFA. Charging the FHFA with prudential regulation of nonbanks would require congressional authorization.

FEDERAL HOME LOAN BANK (FHLB) MEMBERSHIP

The Federal Home Loan Banks are government agencies; their mission is to provide reliable liquidity to support housing finance and community development. Their membership, as determined by Congress, is restricted to banks, insurance companies and CDFIs, (community development financial institutions), but the overwhelming majority of their lending (advances) is to banks. Access to Federal Home Loan Bank financing would give nonbanks, certainly central to the mission of supporting housing finance, a source of liquidity that would remain in place during periods of stress, providing stability to the system.²⁵

However, the inclusion of nonbanks as FHLB members raises several operational issues.

First, the FHLBs would need to increase their risk-management capabilities. The banks, which comprise most of the FHLB's credit risk, have much stronger capital positions than their nonbank counterparts. Moreover, the FHLB is better positioned to perfect an interest in the collateral in the event of the bankruptcy of a bank than in the event of the bankruptcy of a nonbank. Second, mortgage servicing rights, a major asset for most nonbanks, are currently not acceptable collateral for the FHLBs. The Federal Housing Finance Agency, the regulator of the FHLBs, has the power to approve new collateral types, and would need to do so.

Allowing FHLB membership for nonbank mortgage originators/servicers would likely require congressional action. This should be done only in conjunction with the establishment of a prudential regulator.

REGULATORY RECOGNITION OF SYSTEMIC RISK

FHFA, as the regulator of Fannie Mae, Freddie Mac, the FHLBs, and, as we propose, of nonbank servicers, should have an explicit mandate to consider systemic risk, including by stress testing the FHLBs if they take on an expanded role as liquidity providers to both banks and nonbanks.

CONCLUSION AND RECOMMENDATIONS

We have identified three major financial stability threats to the housing and mortgage markets: (1) defensive actions taken by highly indebted borrowers scrambling to make their monthly mortgage payments, curtailing their

spending, with attendant drops in aggregate borrower demand, (2) risks resulting from a freezing of the securities and loan markets resulting in disruptions in credit supply, and (3) the failure of the nonbank servicing sector, which also produces a disruption in credit supply.

EXTERNALITIES	RECOMMENDATIONS
<p>Defensive actions taken by highly indebted borrowers. These borrowers can be forced to scramble to make their required payments, even if they do not default. In this case, borrowers are prone to reduce their spending, generating drops in aggregate demand, creating a feedback loop through unemployment, which generates further decreases in spending and aggregate demand.</p>	<p>Ex Ante Actions:</p> <ul style="list-style-type: none"> • Loan-to-value caps on investor properties and cash-out refinancings. • Add residual income tests, in addition to the currently used debt-to-income ratio. <p>Ex Post Actions:</p> <ul style="list-style-type: none"> • Streamlined refinancings if national or regional unemployment reaches a preset level; and a governance structure is in place to approve it. • Institutionalize forbearance for national emergencies. • Enhance mortgage modifications for government-guaranteed loans. • Allow principal reduction modifications to be non-taxable or tax deferred to the borrower.
<p>Liquidity strains in the securities and loan markets, leading to disruptions in mortgage credit supply.</p>	<p>For government-guaranteed or government-sponsored mortgages, a central liquidity facility that all entities can borrow from, at a penalty rate, if they need liquidity. The terms of this facility should be aligned with those of the Treasury repo facility recommended in chapter 3.</p> <p>Limits on repo leverage derived from a study of changes in the market value of the underlying collateral through an economic cycle.</p>

The failure of the nonbank servicing sector, leading to disruptions in mortgage credit supply.

Ginnie Mae should complete its actions to strengthen counterparty risk management.

Establish the FHFA as the prudential regulator for nonbank servicers.

Allow the nonbanks to establish FHLB membership after the prudential regulator is in place.

Require that the FHFA account for systemic risk in its regulation of Fannie, Freddie, the FHLBs, and potentially the nonbank servicers. This would include stress testing the FHLBs if they take on an expanded role as liquidity providers to both banks and nonbanks.

¹ Housing Finance Policy Center at Urban Institute, 2021.

² Mian and Sufi, 2010.

³ Mian and Sufi, 2011.

⁴ Mian and Sufi, 2012.

⁵ Mian, Rao and Sufi, 2013.

⁶ CFPB, 2019.

⁷ CFPB, 2020.

⁸ CFPB, 2021.

⁹ Kumar and Skelton, 2013.

¹⁰ Goodman and Mayer, 2018.

¹¹ Claessens, 2014.

¹² Kuttner and Shim, 2013.

¹³ Claessens, Ghosh and Mihet, 2014.

¹⁴ Goodman, Seidman and Zhu, 2015.

¹⁵ Abel and Fuster, 2018.

¹⁶ Karamon, McManus and Zhu, 2017.

¹⁷ Gerardi, Lowenstein and Willen, 2021.

¹⁸ Goodman and Kaul, 2019.

¹⁹ Federal Reserve Board, March 2020.

²⁰ Conference of State Banking Supervisors (CSBS), 2019.

²¹ Kaul and others, 2018.

²² Financial Stability Oversight Council (FSOC), 2019.

²³ CSBS, 2017.

²⁴ Federal Housing Finance Agency (FHFA), 2020.

Clearinghouses

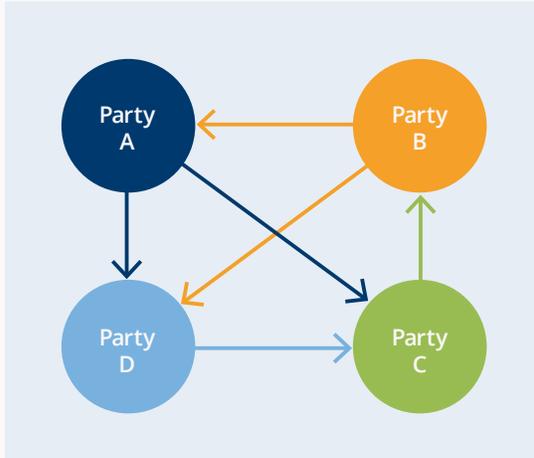
CHAPTER SEVEN



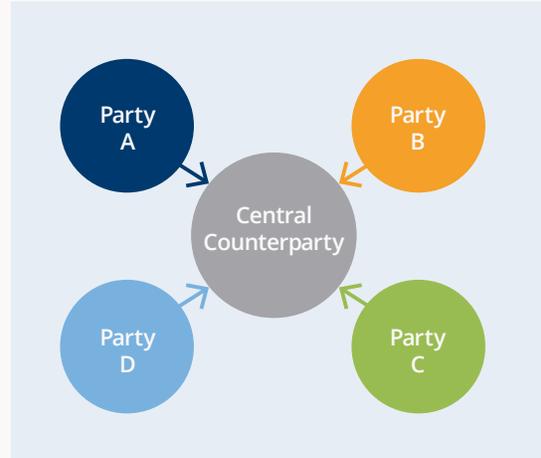
How Trading Worlds Differ

In bilateral trading, parties to a contract are directly and indirectly exposed to each other, while in a centralized world a single counterparty acts as counterparty to all counterparties.

BILATERAL WORLD



CENTRAL COUNTERPARTY



Introduction to Systemic Risk Issues

Clearinghouses—more precisely called central counterparty clearinghouses (CCPs)—are an increasingly important feature of the global financial system, in part because of the reforms made after the Global Financial Crisis. Well-functioning clearinghouses can improve the efficiency of markets, ensure transactions are executed smoothly, and enhance the stability of the financial system, but they can also concentrate risks in particular entities.

A CCP is a middleman that acts as a principal between a buyer and a seller of a financial instrument or contract. It ensures that all parties' trades will be executed and settled as agreed and that payment will be made.

To make this guarantee, clearinghouses impose margin requirements to ensure they have funds to complete payments even if one party defaults. Margins have two components: an upfront deposit of "initial margin" of collateral linked to the size and risk of the trade, and subsequent exchanges of "variation margin" equal to the daily change in the value of the collateral. The change in value is paid to the counterparty following a gain and called from the counterparty following a loss. Members of the clearinghouse also are required to pre-fund a default fund based on extreme, but plausible, market stress events affecting multiple clearing members. This requirement is meant to ensure that if margin funds aren't sufficient in default, funds will be available to cover uncollateralized credit losses. Members initially contribute to this fund and may also be required to supplement it if it proves insufficient and replenish it thereafter. Derivatives contracts

are between two parties where the value depends on the price of some underlying asset. The Dodd-Frank Act required that most standardized derivatives between major market participants be centrally cleared, via a CCP, whether originally executed on an exchange or directly (over-the-counter). Derivative CCPs are regulated by the Commodity Futures Trading Commission or Securities and Exchange Commission and, if designated as systemically important financial market utilities, by the Federal Reserve Board. The Federal Deposit Insurance Corporation is responsible for recovery and resolution if a CCP fails, but not for oversight in other times.

Required central clearing of derivatives reduced counterparty risk through a more comprehensive approach to netting (combining multiple trades to result in a net obligation amount between parties), collateralization through margining, and improved transparency (by making exposures visible to regulators). However, it has also resulted in the centralization of credit and operational risk in a smaller number of systemically important institutions where for each category of instrument typically only one CCP is available. Were a CCP to fail, something that has not yet occurred, the disruption to the financial system could be enormous. Even the fear of an impending failure could result in a run on a CCP that would lead to large price dislocations because the consequences would be far-reaching and very hard for CCP members to anticipate, and the uncleared market has very limited capacity.

There are two basic ownership structures for CCPs. The CCPs that clear most securities are mutualized—that is, they are owned by their members, who both make decisions about risk and bear any losses, thus aligning

incentives well. By contrast, most derivative CCPs are for-profit public companies. (The largest derivative CCPs include divisions of CME Group, Intercontinental Group, and the London Stock Exchange Group.) CCP ownership capital at risk, typically referred to as “skin in the game,” for derivative CCPs is limited relative to the capital provided by members. That, combined with CCPs’ unilateral authority to set collateral, margin, and default fund resources and their ability to call on member firms to replenish default funds if resources prove inadequate, creates misalignment of interests between the CCP owner and the members. The owners’ rational self-interest is to maximize clearing activity at their own CCP and to minimize the amount of their own resources at risk; if losses that are greater than planned for materialize, CCP owners are entitled to take steps to transfer the losses to the members. This tension has been exacerbated by the mandate for central derivatives clearing introduced after the Global Financial Crisis.

Industry participants have repeatedly cited risk concerns with CCPs. For example, CCPs are contractually entitled to determine and self-certify margin rules and default fund sizing unilaterally and with limited transparency. Members have limited ability to challenge the determinations. To compute margin prudently requires the assessment of product liquidity, concentration factors and diversification benefits, which can be quite complex for individual instruments and more so for portfolios of instruments. Lack of transparency on stress testing, conducted to ensure adequate fund size, exposes clearing members to unpredictable calls. Clearing members have expressed concern that profit-motivated CCPs will compete in ways that create more risk exposure for their members.

The central clearing mandate leaves clearing members without an ability to influence rules, risk decisions, and operations of the exchange that directly affect them or to choose an alternative trading venue. For example, clearing members complained when, in December 2017, the CBOE and CME listed bitcoin contracts (which have extremely high volatility and which many members were not authorized to transact) and then commingled the contracts with the default fund for other instruments.

Finally, concentrations of exposure exist both within and across CCPs. Evidence suggests that CCP exposure in times of market stress is driven by concentration of exposure to the largest counterparties (meaning that the percentage of risk deriving from the largest market participants grows) and, furthermore, crowding of exposure to commonly held positions (meaning that more market participants have exposures to the same trades).¹ In addition, CCPs share many members in common; some firms belong to as many as 23 separate CCPs.² These interconnections mean that, although major CCP members have more capital and liquidity and are generally more resilient as a result of the reforms that followed the Global Financial Crisis, problems at any single clearinghouse could nonetheless quickly be transmitted to other clearinghouses.

Externalities

Four externalities from the existing arrangement manifest during times of stress:

The **first** externality comes when initial margin requirements abruptly surge. All entities with open positions must then deliver more collateral for their existing positions, exacerbating the demand for cash or cash

equivalents. Many CCP users are not well equipped to raise cash on short notice and may have to sell other assets to meet these demands, which can result in fire sales. This problem is present for all CCPs, both those for derivatives and securities. Indeed, the issue arose in January 2021 for equity trading for GameStop and other stocks whose trading volumes and volatility were surging.

However, the risks housed by CCPs that clear derivatives are much longer-lasting than the risks housed by CCPs that clear securities. For the clearing of most securities, the risk exists over the length of the settlement period—for equities, typically two days after a trade is struck. During this period, price fluctuations in the value of the security create risk for the CCP should it need to step into the place of a defaulting counterparty. So margins must be set to cover the risk. Likewise, if the CCP fails, the open risk that members face is essentially bounded by the exposure to changes in the value of securities that are in the midst of being cleared.

For derivatives, the life of contracts between the CCP and its members is much longer; for example, a swap of a 10-year floating rate for fixed rate. As a consequence, should a CCP have to take the place of a defaulted counterparty, it would be taking on the risk associated with the risk of the position *over the life* of the contract. Some derivative contracts, such as those traded on futures exchanges, are highly standardized and often very liquid. Other contracts, including those traded over-the-counter and given up for clearing by a CCP, are less so. Derivatives offer vastly more contractual variability, inherent leverage, and valuation complexities than most securities. When setting margin, the CCP must take into account an appropriate close-out period for

each product that it clears, based on stressed market conditions, potential concentrations, and market volatility for the instrument. As a result, length and illiquidity of derivative positions make the exposure of the CCP to a failed member vastly greater than in the case of most securities. Likewise, if a derivative CCP were to step in to replace a failed member and then became impaired, the support that the members might need to offer would also be greater. As a consequence of these distinctions, the subsequent externalities which follow below are more prevalent with derivatives CCPs.

The **second** externality arises from the knock-on effects of actions that privately owned CCPs might take to push losses onto clearing members. If a member defaults, CCP management can use its discretion to replenish its resources and to restore its matched book (meaning to replace the trades of the defaulting counterparty so the CCP can resume its market-neutral position as an intermediary with no exposure to the underlying markets). The CCP has three ways to do this:

1. CCPs have rights to impose contract tear-ups whereby the CCP effectively steps out of its role as intermediary and unexpectedly returns open risk to the end user and non-defaulting clearing members who happen to have the corresponding and offsetting position to the defaulter.
2. CCPs have rights to impose haircuts on (that is, confiscate without recourse) variation margin gains (payments that the clearinghouse would otherwise have been required to make to clearing members for positions which have increased on value), resulting in unanticipated losses by non-defaulting clearing members and their end users. (This is akin to a bank haircutting large

customers' deposits to replenish its own resources.)

3. Clearing members generally prefund a default fund, but CCPs can call on members to replenish a default fund if it proves inadequate under terms that vary by CCP, but in some cases are uncapped. This again may force members to incur losses and raise cash on short notice.

These CCP actions create the potential for a highly unpredictable, unexpected, and uncapped impact on both clearing members and end users. The following externalities can follow from these actions:

1. An end user whose contract has been torn up may not be able to manage the resulting open risk. Major swap market participants must clear through CCPs, so if the CCP is not functioning effectively, the bilateral market is unlikely to be deep. This can lead to large price movements and fire sales. Risk-sharing and the ability to transfer it will be diminished.
2. The haircutting of variation margin gain (or even its threatened use), without limitation and at the discretion of the CCP, will likely lead end users to run on the CCP and remove in-the-money positions from the CCP. Given that major swap market participants are obligated to clear through CCPs, and there is no portability between CCPs, a withdrawal by CCP members will effectively close the derivative market, with large-scale repercussions across all derivative and underlying cash markets resulting from the inability to hedge and transfer risks.
3. In scrambling to make additional contributions to default funds, members

may have to sell assets. This can lead to fire sales when the markets for those assets are not liquid during stress. Additionally, they are likely to be unwilling or unable to send incremental resources to a failing CCP, which will bring that market to an abrupt halt. This reliance on clearing members as a lender of last resort for another public for-profit company also affects the resources and investors in the clearing member.

The **third** externality comes from the overlap in clearing membership across exchanges. During market stress, multiple defaults, or a default by a very large firm that is a member of several, or indeed most, CCPs, will likely cause losses across multiple platforms to be put back to the remaining member firms. Market conditions would be challenging so margin requirements would likely be rising already. Therefore, this scenario would lead to a more exaggerated version of all the problems that arise when a single CCP encounters trouble. With the surviving firms receiving capital calls from multiple CCPs, nothing guarantees the survival of the system. Furthermore, CCPs are not uniformly subject to regulated resiliency, recovery, or resolution regimes. So even a well-run single CCP could buckle.

The **fourth** externality would arise if CCP operational losses, investment losses, or custodial and settlement failures prevented continuity of operations. In this case, market participants may be precluded from managing risk, or accessing their collateral and margin. If the CCP is unable to function (for example, due to a cyberattack) assets would be trapped and market volatility and seizure would ensue. The inability of members to simply take their trades elsewhere due to lack of alternatives exaggerates this risk. To the extent that CCP owners rather than clearing members make

the risk-management decisions related to these activities, the owners should be responsible for and have adequate resources to cover losses arising from their own operational failures, as well as to ensure operational resiliency.

In short, the systemic consequences from a failure of a major CCP, or worse, multiple CCPs, would be severe. Pervasive reforms of derivatives markets following 2008 are, in effect, unfinished business; the systemic risk of CCPs has been exacerbated and left unaddressed.

Recommendations

Over the past several years, CCP vulnerabilities have attracted attention from the Committee on Payments and Market Infrastructures of the Bank for International Settlements, the International Association of Securities Commissioners, the Financial Stability Board, and the Office of Financial Research's Financial Research Advisory Committee, as well as industry participants.³ In 2020, an industry-led group of clearing members and end users recommended stability-enhancing changes that aim to build CCP resiliency and ensure that exposures of clearing participants are transparent, predictable, and measurable.⁴ We find the group's recommendations to be compelling and have added some of our own:

To enhance systemic risk oversight of CCPs and cross-border planning:

1. Expand the scope and deepen the active engagement of the Federal Reserve in providing systemic risk oversight of CCPs. The Fed already has authority for conducting some stress tests and directly supervising some CCPs—those designated

as systemically important by the Financial Stability Oversight Council (FSOC). Its authority should be actively exercised, extended to a more complete set of CCPs, and enhanced by additional responsibilities to directly supervise and implement, or monitor and provide guidance, as applicable, for each of the following recommendations. The Fed has more relevant expertise than the other potential regulators and has a systemic-risk orientation that makes it the best organization to fill this role.

2. Strengthen cross-border CCP resolution planning. Where not in place, given the concentration of clearing members across all systemic CCPs, regulators should establish crisis-management groups tasked with agreeing to memoranda of understanding to ensure effective communication, sharing of information, and coordination within and across borders. A playbook should be developed for resolution. These duties would be part of the systemic risk responsibility assigned to the Federal Reserve.
3. Make sure that systemically important CCPs outside the United States have access to a lender of last resort who can provide dollar funding. This might be provided through a foreign central bank that is willing and able to lend and has access to a Fed swap line. If such funding is not available, and conditioned on a Fed finding that a non-U.S. CCP is adequately supervised, the Fed should consider extending access to the discount window to systemic non-U.S. CCPs. (Currently access is restricted to FSOC-designated systemically important financial market utilities.) It is in the United

States' interest to prevent the failure of systemic CCPs around the world. If a properly supervised entity needs access to dollar funding, and satisfactory information sharing is in place to limit risk, discount window access would strengthen the system.

To establish consistent through-the-cycle standards of resilience:

4. Robust, transparent collateral eligibility requirements.
5. *Through-the-cycle margin requirements that are less susceptible to stress-amplifying increases during times of market disruption.* These margin requirements would include best-practice standards related to haircuts, margin period of risk, and look-back periods (over which the potential of a contract to fluctuate in value is assessed), concentration charges (in situations where individual members have very large positions, or many members have the same positions) and portfolio margining.
6. *Consideration of shorter settlement intervals (for example, T+1 or T+0.5 in securities markets) to reduce the systemwide amount of collateral required.** In securities CCPs, this change would partially offset the impact of through-the-cycle margin requirements.
7. *A minimum standard for default funds (which cover losses when collateral proves insufficient) should be adopted, and it should be large enough to cover the default of the two largest clearing members at any point in time.* Default fund sizing rules currently vary by CCP; imposing minimum standards

* "T" is the transaction date and "+1" is the number of days to settlement.

would help build more uniform levels of resilience to counterparty defaults across CCPs, especially given the high level of counterparty commonality.

8. *Transparent, audited risk methodologies, including the development of standards and supervisory stress testing to support adequacy of upfront resources from both members and the CCP itself.* Each of these elements further levels the risk-management playing field across CCPs. The same standards should apply across jurisdictions to further equalize resilience.

To increase CCP upfront contribution to resilience and align interests, we recommend:

9. *Quantitative assessment of non-default losses (losses from risks, such as operational problems or cyberattacks, other than default of a clearing house member) to ensure adequacy of CCP resources.*
10. *Meaningful levels of CCP skin-in-the-game to better align the interests of for-profit CCPs with clearing members.* This would take the form of increasing the amount of default fund capital contributed by the CCP upfront, positioning of CCP capital ahead of non-defaulting clearing member capital in the default waterfall (the order in which losses are allocated), and a requirement for the CCP to raise long-term debt that can be bailed in, or wiped out, if losses exceed the default fund. Similar to the resolution requirements for other systemically consequential financial institutions, these steps would assist with resolution and provide a change-in-ownership mechanism to restore confidence and maintain continuity of operations.

To facilitate recovery and minimize market disruption, we recommend:

11. Predefined default fund assessment caps and loss-allocation plans for market participants. This would create a more predictable environment, allowing for better risk management. Losses exceeding these allocations would be addressed through resolution and recovery of the CCP by the Federal Reserve and the resolution authority in a manner transparently disclosed to market participants.
12. A requirement that tools such as variation margin haircuts or tear-ups be limited in scale, predefined, subject to approval by the Federal Reserve, and aligned with both domestic and cross-border resolution planning.

Collectively these changes would attend to the four existing externalities. They build on existing consultations, build resilience up front, and complete the process begun after 2008 by addressing gaps in systemic risk mitigation that have now been present for some time. In short, they would make the financial system safer without extending support in a reckless way.

EXTERNALITIES	RECOMMENDATIONS
<p>Increased margin calls during stress that lead to cash needs and trigger fire sales.</p>	<p>Implement through-the-cycle margining methodologies and robust collateral standards. Methodologies, including concentration/liquidity charges, portfolio margining credit, haircuts, margin period of risk and look back periods, should be transparent and not at the sole discretion of CCP management. Consider shortening settlement intervals (which would partially offset the impact of through-the-cycle margining in securities CCPs).</p>
<p>Fallout from actions that exchanges might pursue to push losses onto members. The consequences can include fire sales and reduced credit extension.</p>	<p>Implement improved and transparent stress testing with regulatory oversight and uniform design.</p> <p>Impose uniform standards for default funds that properly reflect risks and follow-up auditing.</p> <p>Set appropriate capital levels and bail-in debt that align the interests of the CCP and its members and provide a mechanism for continuity of operations.</p>
<p>Disruptions from actions taken by an impaired CCP to continue operating.</p>	<p>Improve overall CCP resilience.</p> <p>Predefined assessment caps and loss-allocation rules that are approved after accounting for systemic effects and can only be used at the discretion of the resolution authority.</p>
<p>Cross-CCP spillovers whereby trouble at one CCP is transmitted to others, amplifying any of the problems that exist for a single CCP.</p>	<p>Expand Federal Reserve authority and responsibility to deal with systemic risk issues associated with CCPs.</p> <p>Improve cross-border CCP resolution planning, including establishing memoranda of understanding across borders.</p> <p>Ensure that systemically important non-U.S. CCPs have access to dollar funding in times of stress.</p>

¹ Huang, Menkveld and Yu, 2019.

² Committee on Payments and Market Infrastructures (CPMI), the Financial Stability Board (FSB), the International Organization of Securities Commissioners (IOSCO) and the Basel Committee on Banking Supervision (BCBS), 2017.

³ Office of Financial Research Financial Research Advisory Committee, 2019.

⁴ JPMorgan and others, 2020.

Regulatory Structure and Process

CHAPTER EIGHT



For the most part, this report focuses on known threats to financial stability. As our numerous recommendations reflect, appropriately regulating known threats to financial stability is no small feat. Yet even if Congress and regulators implemented every recommendation included in other chapters, that progress would not ensure the long-term resilience of the financial system. A primary reason is that the system keeps changing. The structure of the financial system and the nature and locations of potential threats to stability are constantly evolving as a result of new innovations, market dynamics (such as another period of low-for-long interest rates), and efforts to reduce the costs of regulatory compliance. Accentuating the challenge, the regulatory structure in place remains fragmented and inadequately focused on threats to stability, plus data needed to identify threats remain dispersed and inadequately subject to broadly adopted, well-designed standards.

Promoting financial stability, therefore, requires more than adopting the right rules at any given moment. It also requires building a regulatory regime in which regulators have the data and information they need to identify emerging threats to stability, the tools they need to address those threats, and the incentive to do both in a timely way. As this report reflects, these challenges are particularly pressing in the nonbank financial sector.

U.S. FINANCIAL REGULATORY STRUCTURE

Surveying the structure of the financial regulatory regime in the United States in light of these priorities reveals both weaknesses and bright spots. The current U.S. regulatory regime is a highly fragmented system that reflects history more than any effort at optimal design. This history is reflected in the existence of separate banking, insurance, and securities regulators despite substantial blurring and interconnections among these domains. It comes through in the multiplicity of federal regulators, including three bank regulators—the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC), and the Federal Reserve—and two market regulators—the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC). It also comes through in the dearth of any meaningful federal oversight of insurance companies despite their importance. Insurance companies are still overseen by state supervisors, and states also continue to play a role, albeit a smaller one, in bank and securities regulation. Adding to the complexity are specialized federal regulators such as the Federal Housing Finance Authority (FHFA) and the Consumer Financial Protection Bureau (CFPB), which have obligations commensurate with their names.

The United States Financial Stability Oversight Council (FSOC)

Voting Members		Non-voting Members
 SECRETARY OF THE TREASURY, CHAIR OF FSOC	 CHAIR, FEDERAL DEPOSIT INSURANCE CORPORATION	DIRECTOR, OFFICE OF FINANCIAL RESEARCH
 CHAIR, FEDERAL RESERVE BOARD OF GOVERNORS	 DIRECTOR, FEDERAL HOUSING FINANCE AGENCY	DIRECTOR, FEDERAL INSURANCE OFFICE
 COMPTROLLER OF THE CURRENCY	 CHAIR, NATIONAL CREDIT UNION ADMINISTRATION	A STATE INSURANCE COMMISSIONER
 DIRECTOR, CONSUMER FINANCIAL PROTECTION BUREAU	 INDEPENDENT MEMBER WITH INSURANCE EXPERTISE	A STATE BANKING SUPERVISOR
 CHAIR, SECURITIES AND EXCHANGE COMMISSION	 CHAIR, COMMODITY FUTURES TRADING COMMISSION	A STATE SECURITIES COMMISSIONER

Sources: U.S. Treasury
<https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/fsoc/about-fsoc>

This fragmented structure and drawbacks that flow from it have been described in great detail in numerous reports.*^{1, 2, 3, 4, 5} In addition to providing an exhaustive overview of the way the current regulatory architecture contributes to systemic risk and other challenges, most of these reports also provide recommendations for revamping it. Given the extensive attention already devoted to the topic and our assessment that there is room for meaningful improvement even without major structural changes, we focused our attention

on improving the current structure. That said, we see merit in many of the recommendations and encourage Congress to consider these proposals.

The good news is that structural reforms implemented in the Dodd-Frank Act—the creation of a new Financial Stability Oversight Council (FSOC) and a new Office of Financial Research (OFR)—create a blueprint that could enable meaningful improvement without massive regulatory consolidation. The FSOC

* Significant contributions include: the U.S. Government Accountability Office, 2016; International Monetary Fund, 2015 and 2020; The Volcker Alliance, 2015; and Neiman and Olson, 2014..

is the primary centralized mechanism for promoting coordination among the major federal financial regulators and for ensuring that the head of each financial regulator spends some time focused on threats to financial stability. It currently includes the Secretary of the Treasury as chair, and the heads of the Fed, the SEC, the CFTC, the FDIC, the OCC, the National Credit Union Administration (NCUA), the CFPB, and the FHFA. The President also appoints one voting member with insurance experience. There are also five non-voting members: the head of the OFR, the director of the Federal Insurance Office (FIO), a state insurance commissioner, a state banking supervisor, and a state securities commissioner. The OFR is charged with providing support to the FSOC and member agencies, promoting data standardization and collection, and conducting research related to financial stability.

The creation of a financial stability committee was a common reform around the globe in the wake of the 2008 financial crisis.⁶ Forty-seven of 58 countries examined had a financial stability committee in 2018, and the great majority of the committees were created after the 2008 financial crisis. No country had “created a new single regulatory agency with sole authority for macroprudential policies” and the majority of the countries with financial stability committees (25 countries) had—like the United States—opted to have the finance ministry chair or co-chair the committee. Although it will be some time before anyone can assess the efficacy of these new committees, their establishment across so many jurisdictions is striking.

Addressing Threats to Systemic Stability

How effective have the FSOC and OFR been in achieving the goals set before them? Do these and other recent reforms provide other FSOC members the information, authority, and incentives needed to address emerging threats? The indicators have been mixed.

One rationale for the FSOC was to create a more accountable, transparent, durable, and inclusive body to replace the President’s Working Group on Financial Markets. But the President’s Working Group, created by executive order and consisting of a small subset of the current FSOC members (Treasury, Fed, SEC, and CFTC) continued serving as a locus for decision-making both before and during the pandemic. For example, it was this body, rather than FSOC, that issued a recent report on the need for further reform of money market mutual funds. This may suggest that the size and formalities surrounding the FSOC, even if helpful in some ways, are inhibiting its nimbleness and efficacy.

How have the FSOC and OFR used the tools given to them? One of FSOC’s key tools is the ability to designate financial market utilities and nonbank financial institutions as “systemically important,” and thereby subject to additional oversight and regulation. At first glance, this process appears to have worked well enough for financial market utilities; eight have been designated. However, as reflected in the recommendations in chapter 7 for additional oversight and regulation of central counterparty clearinghouses (CCPs) that are already designated systemically important, the consequences that flow from being designated

a systemically significant financial market utility may not suffice to address the systemic threats they pose.

For nonbanks, the FSOC spent years promulgating the criteria it would use, and then used those criteria to designate four nonbank financial institutions, only to de-designate three of those institutions and have one designation be overturned by a U.S. District Court. The court's decision was hotly contested and appealed by the Obama administration, but that appeal was dropped by the Trump administration so the ruling stands. The infrequency with which the FSOC has invoked its authority to designate systemically important financial institutions (SIFIs) may understate the influence of the authority. The threat of designation as a SIFI may cause nonbanks to avoid designation by reducing their footprint or opting not to grow or evolve. The de-designation of GE Capital, for example, is a success story. It came only after the firm underwent a significant restructuring in which it shed operations that had been central to its initial designation, which is precisely the type of structural change that the threat of designation is meant to incentivize.⁷ Nonetheless, for a threat to be a meaningful deterrent, there must be some expectation that the threat would be carried out if warranted. The lack of any designations and the current case law purporting to impose additional limitations on how the FSOC goes about identifying SIFIs suggests meaningful shortcomings in the current system.

Putting the potential inadequacy of the consequences of designation for systemically important financial market utilities alongside the infrequent use of the FSOC's authority to designate SIFIs suggests that the current framework may not be the optimal approach

for addressing the systemic threats posed by nonbanks and that better designed alternatives need to be considered.

Another key tool given to the FSOC is the authority to make a recommendation to a primary regulator related to financial stability and then demand that the regulator comply or explain when, in the view of the FSOC, the regulator has failed to address a potential threat to stability within its jurisdiction. The FSOC has gone through the initial stage of using this authority only once, and then it was to address a threat—money market mutual funds—that had already become manifest. It has yet to use this authority to compel a primary regulator to address an emerging threat, or a “near miss.” Just as with SIFI designations, the threat may be powerful even when used only rarely. It is possible agencies may choose to address threats preemptively to avoid being called to task publicly by the FSOC. Nonetheless, despite the many threats to stability identified elsewhere in this report, it is notable that the tool is not being deployed in practice or as a threat.

The results for the OFR have been similarly mixed. It has issued just one rule and it has yet to use its subpoena authority. Early on, it was a global leader in pushing for widespread use of the Legal Entity Identifier (LEI), a data standard meant to make it easier for market participants and regulators to track risk exposures. It has made some progress in mandating use of the LEI for certain purposes, but the United States has generally lagged behind Europe in its adoption, reducing the efficacy of the standard for both public and private uses. There is also little evidence that the regulators work closely with the OFR, even when those regulators are undertaking new data initiatives that could benefit from data expertise.

Perhaps the best way to assess the efficacy of FSOC and the other post-crisis structural reforms is by looking at outcomes. The good news is that the COVID-19 crisis did not evolve into a financial crisis. At the same time, massive interventions by the Federal Reserve and congressional support, both re-authorizing emergency-era tools and providing widespread fiscal support, were needed to avert a more significant economic crisis.

More importantly, as chapter 9 shows, many of the deficiencies revealed in March 2020 could have been identified earlier using a framework like the one presented in this report. Nonetheless, these challenges remained unaddressed and were not on the table for imminent reform.

Combining this evidence with the more extensive discussions of the shortcomings of the U.S. regulatory regime in reports by the Government Accounting Office, the International Monetary Fund, the Volcker Alliance, and others above suggests further reforms are needed. Neither the FSOC nor OFR seem to be as effective as they could be, and other regulators remain more focused on their primary missions than on the ways their actions and activity within their jurisdiction may affect the stability of the financial system.

Incentives, Capacity and Information

Studies of regulatory design, in finance and other disciplines, make clear that there is no silver bullet. Most options involve tradeoffs. Hence, our aim is not to perfect the regulatory system, but to increase the probability that potential threats to systemic stability are identified and addressed in a timely fashion.

We see three paths for improvement.

The **first** is to provide all financial regulators a stronger incentive to consider the systemic ramifications of their actions and the activities and firms they oversee. For many regulators, systemic risk is still not something they are explicitly obliged to consider, much less prioritize.

Creating the right incentives to consider financial stability risks, however, means more than clarifying each regulator's mandate. It also requires mechanisms to hold the FSOC and its members accountable when they act, or fail to act, in ways that compromise the resilience of the financial system. It is easier to maintain the status quo than to change it. The amorphous and distant nature of threats to financial stability, the high probability that actions to reduce systemic risk will be costly today but only produce benefits in the future, and crowded regulatory agendas can accentuate tendencies to ignore emerging threats.

This incentive challenge is accentuated when regulators adopt new rules or act to enhance resilience, and the affected firms have both the incentive and means to fight back. In contrast, the public that will pay the price for the failure to take those actions has few legal tools to combat inaction. Hence, a key challenge will be finding ways to use reporting requirements, congressional oversight, and interagency monitoring to create mechanisms for holding FSOC and FSOC members accountable should they fail to address potential threats to stability.

A **second** way to improve outcomes is by enhancing regulators' capacity to identify and address emerging threats. Capacity building takes time and takes multiple forms. On a basic level, it requires expertise and resources. This expertise and the information technology and

other resources needed must exist not only within the financial regulatory system writ large, but, to some extent, within each financial regulator. Capacity building is also about having the right tools for identifying potential threats and assessing their significance. Recent developments in stress testing, for example, have enhanced the capacity of regulators to assess the impact of a given shock and what steps should be taken beforehand to reduce the probability that a shock will trigger instability.

Another dimension of capacity is the available time and attention of the people involved. One place this challenge arises is with FSOC leadership. There are drawbacks to the Treasury secretary serving in this role. Most importantly, the obligations of the secretary, as the administration's leading economic policymaker, extend far beyond mitigating threats to stability. Outside of crisis periods, other obligations can consume much of the secretary's attention. At the extreme, and overlapping with the incentive issue, is the possibility of subtle conflicts between the near-term priorities of any administration and the type of reforms and investments that may be optimal for addressing threats to stability. Similar dynamics can arise within other financial regulators, as leaders often have an array of other priorities and may not be inclined to devote the time or develop the expertise needed to identify and address emerging threats to stability.

That said, there are also some very good reasons to have the Treasury secretary chair the FSOC. The Treasury secretary usually plays a lead role in crisis response and chairing the FSOC helps ensure the secretary is prepared when a shock strikes. Leading the FSOC improves the secretary's incentive to address potential threats because the secretary, and

by extension, the administration, is more likely to be held accountable for deficiencies revealed during periods of distress. It may also enhance the democratic legitimacy of FSOC, given the Treasury secretary's position as a member of the President's Cabinet and role in the administration. These factors may help to explain why, looking abroad, the minister of finance is so often chosen to lead a country's financial stability committee.

The **final** area with significant room for improvement relates to information. A longstanding challenge in financial regulation is that regulated firms know far more about their activities than the regulators charged with supervising them. Although they overlap with regulatory capacity, information challenges have an additional dimension because of a second and growing challenge—information gaps; that is, information that is theoretically knowable, but that is not known by any actor, private or public. This arises, for example, when data are disaggregated across actors or collected in inconsistent forms, making it impossible to aggregate and analyze the data to yield answers to pressing questions. Data and information gaps are rarely the cause of instability, but they can increase the types of shock that can trigger instability, accentuate the degree of dysfunction from a shock, and impede both preemptive and crisis-time regulatory efforts to combat instability.^{8, 9, 10}

Reducing information asymmetries and information gaps will require a multi-pronged approach. Standardizing data is often a critical first step and can yield both private and public benefits when appropriately institutionalized. Well-designed and widely adopted data standards have the potential to improve intra-firm risk management, inter-firm monitoring, oversight by financial regulators outside of

crises, and the generation of new, pertinent information during periods of systemic distress. Each of these effects can help reduce financial fragility. Nonetheless, even when reducing information gaps and asymmetries is beneficial in the long term for all involved, the inability of either private or public actors to see the full benefits can contribute to under-investment in the promulgation and adoption of well-designed standards. The upfront investments, compromise, and need for coordination among private and public actors can serve as yet further impediments.

Another challenge is that the type of information regulators most need when seeking to identify potential stability threats is often probabilistic and forward-looking. Stress tests are one way in which regulators have sought to improve their understanding of what is likely to happen under a given set of circumstances. Although the answers that tests yield are inherently limited by the quality of the models and data available, and can miss critical feedback loops, they mark an important step in the direction of producing the type of information needed.

In other domains, regulators have yet to try to systematically produce the forward-looking information that would be most useful. For example, new regulations often induce changes that affect financial market functioning and structure in ways that affect stability. Imposing new regulations on banks can cause them to scale back activity, for example, causing it to migrate elsewhere. Imposing new burdens or costs elsewhere, such as the money market mutual fund reforms already adopted, could cause investors to move large sums of money to new types of instruments in ways that can have systemic ramifications. These effects are not a reason to avoid addressing known threats,

but they must be considered beforehand and assessed afterward. These examples illustrate how the process of ensuring regulators have the information they need is not just a matter of making sure they have the requisite data, but also the incentives and capacity to engage in ongoing learning.

Crafting specific reforms to improve regulatory incentives, capacity, and understanding requires careful attention to context. Some recurrent challenges require particular attention. A threshold challenge is that periods of stability can sow new threats to stability. One way such threats can emerge is that periods of stability may induce a false sense of success or otherwise contribute to regulatory complacency. Periods of stability can also affect asset pricing, leverage and other market activity in ways that can increase fragility. Although the focus thus far has been on improving resilience, incentives, and capacity to maintain rigor are also key aims.

Another set of challenges arises from the way the financial system is constantly changing. Some of this change reflects innovations and improvements in information technology. Efforts to minimize the cost of evolving regulatory burdens are another driver of change. Regardless of the cause, the result is often a movement of maturity and liquidity transformation from more-regulated domains to less-regulated ones. This means that holding the law constant often amounts, in effect, to deregulation.

Recent work by Andrew Metrick and Daniel Tarullo show how a “congruence principle,” providing that economically similar instruments and activities should be regulated in comparable ways, could reduce migration driven by asymmetric regulatory burdens and better address the persistent threats

posed by nonbank financial intermediation.¹¹ Their case studies, which show how a lack of congruence contributed to fragilities revealed during the COVID-19 crisis, reflects the need to strengthen regulatory capacity and incentives in the ways outlined here. Their proposal is the type of proactive, forward-looking, systemically oriented approach that these reforms could help to advance.

Sometimes regulators will have the authority to extend existing statutory mandates to reach new threats. In other instances, the location or nature of the threat will be beyond their purview or will require action by Congress. The overarching point is that maintaining adequate regulation requires more than just avoiding increased laxity; it also requires ongoing vigilance, a willingness to provide regulators new tools as threats evolve, and a willingness by regulators to use the tools available to address systemic threats, no matter where they arise or what form they take.

Recommendations

1. Institutionalize systemic stability as a priority for every FSOC member. Congress should clarify that the mandate of each FSOC member includes using its existing tools and authority to promote financial stability and resilience. Although this may be already implicit in the Dodd-Frank Act and the composition of the FSOC, clarification could help ensure that each FSOC member recognizes that it has the authority and obligation to monitor and address emerging threats to financial stability within its jurisdiction and to consider the systemic ramifications of its actions.

To further help fulfill this mandate, every FSOC member should be required to have an internal Office of Financial Stability and Resilience.

These offices would report directly to the leaders of the agencies, would work with peers at other member agencies, and would help prepare each agency's contribution to the FSOC Annual Report (discussed further below). The aim would be to ensure that each member agency has the skills, resources, and incentives required to promote systemic resilience, and to flag situations when this aim may conflict with the agency's other objectives.

Clarifying the stability obligation of each FSOC member would also serve as a reminder that FSOC members have a duty to work together to address potential threats. This includes a duty to work cooperatively with other FSOC members to identify threats and build resilience in normal times, a duty to work together during periods of systemic distress, and a duty to share information and work with the reformed OFR, described in our sixth recommendation, outside of crises.

Additional process-related requirements would help keep FSOC members focused on the systemic implications of their actions and ensure they have the expertise and information they need to understand the ways their actions may create ripple effects in other domains. For example, FSOC members should be required to undertake an impact analysis that assesses how a proposed rule or other action may exacerbate or reduce threats to financial stability—such as how it would affect market functioning, liquidity, or migration. Agencies should be required to follow up to assess the accuracy of their predictions after reforms are fully implemented.

Legislation would help to clarify these obligations and ensure formation of a Stability Office at each FSOC member, but there is room for significant improvement even without congressional action. In the

event of congressional action, it may also be appropriate to consider whether other minor modifications or clarifications may be required for the clarified stability mandate and office to be effective. For example, it may be appropriate to clarify that any time a financial regulator must undertake a cost-benefit analysis, its assessment of the systemic consequences and cost should be given deference in the event of judicial review.

2. FSOC leadership. A new position—under secretary for financial stability—should be created within the Treasury Department. The under secretary would be supported by an office with sufficient staff to address the many tasks the Treasury Department must fulfill in leading FSOC. At the discretion of the Treasury secretary, the under secretary would have full authority to take any actions that the Treasury secretary is authorized to take as chair of the FSOC, including leading FSOC meetings, voting at those meetings, and testifying before Congress on matters relating to financial stability.

This change would require legislation, but the Treasury secretary could make internal operational changes in this direction without congressional action.

3. FSOC Annual Report. The FSOC should continue to produce an annual *Financial Stability Report*, but the process and composition should be revised to enhance accountability and efficacy. The biggest change is that the main annual report would come solely from the Treasury secretary, as head of the FSOC, instead of from the whole committee. The FSOC chair could consult with other agencies, but no other agency would be a signatory or have any authority over the contents of the main report. Instead, each FSOC member would issue its own report that would become an appendix to the main report.

Each FSOC member's contribution would address any disagreements with the main report, any trends or other developments that may affect stability and were not adequately addressed in the main report or that are particularly relevant to that member, and a description of that agency's actions over the preceding year in fulfillment of its obligation to promote financial stability.

A primary aim of the annual report, including its appendices, would be to provide an overview of known or emerging sources of systemic risk and to propose ways to address them. To avoid missing changes that build slowly but in aggregate are quite significant, the main report would include a lookback that explains how the financial system and financial flows had changed relative to a snapshot taken three years previously. Every significant change and every emerging threat identified in the annual report or any appendix should be accompanied by a description of efforts to address the threat, what further reforms or action may be warranted (see next recommendation), or, if no further reforms are required, a clear statement as to why the FSOC or agency chair believes no further action is needed. Over time, there should be an effort to create greater comparability and potentially even a rating system for threats identified by FSOC or member agencies.

These changes would require legislation, but some changes along these lines could be incorporated without legislative action.

4. Addressing regulatory and data gaps. Every year, as part of the FSOC Annual Report, the chair should include a section on regulatory shortcomings, information gaps, and recommendations for how to address them. This would include identifying the actions that a primary regulator or regulators should

take when one or more FSOC member already possesses the authority needed to address the threat. It would also include recommendations to Congress when new authority is required to effectively address an emerging threat or data gap. The report should also provide an update with respect to each of the recommendations in the previous year's report.

Legislation would ensure this reporting is obligatory and does not vary from one administration to the next, but the FSOC could include such recommendations even without congressional action.

5. Designation process. For any financial institution or activity above a given threshold, the under secretary for financial stability should be required, at least once every three years, to present to the FSOC a balanced case identifying the major considerations for and against designating that entity as systemically important. Even when the conclusion is that non-designation remains the right decision, these reports (particularly if grouped by financial institution type) could help keep FSOC members abreast of the evolving significance and business models of the largest nonbank financial institutions.

As part of this process, the FSOC could also evaluate whether a financial institution or utility—or activities in which such institutions are engaging—pose a systemic threat that is best addressed through a mechanism other than designation as a systemically important utility or institution. The FSOC could, for

example, determine that there is a sufficient probability that a financial institution not subject to federal prudential oversight could pose a threat to stability that it should be brought within the regulatory perimeter. But the FSOC could further determine that the Federal Reserve is not the right body to oversee the institution, or that heightened capital requirements imposed on SIFIs are ill-suited to address that threat. In these instances, the FSOC should include its findings and recommendations for legislative change in the annual report. The aim is to open up the possibility of having the FSOC co-determine whether a financial institution or utility poses a potential threat to stability and the best way to address that threat, subject to subsequent approval by Congress, rather than assuming that the only options are placing an institution into categories of systemically important utilities and institutions, or taking no action.

Concentrated Risks

Some critical infrastructures and institutions in the financial system should potentially be subject to greater oversight but are ill-suited to be designated as “systemically important” financial market utilities. For example, on-premise computing services have shifted significantly toward cloud-sourced services. There are good reasons for this shift, but it also increases both cyberattack surfaces (anything outside an

* A federal district court ruled in 2016 that MetLife could shed its designation as a systemically important financial institution, despite FSOC's determination to the contrary, reasoning that the FSOC was obliged to weigh the costs of designation alongside the identified benefits, which the FSOC had not done, and because the FSOC had not adequately complied with guidance that it had voluntarily issued regarding the designation process. The court also said the FSOC decision was “arbitrary and capricious.”

institution's firewall) and vectors (paths or means of exploitation). Furthermore, the top two providers, Amazon Web Services and Microsoft Azure, make up a large share of the cloud services market. This means that a cyberattack or other vulnerability on one of these providers could affect many financial institutions simultaneously.¹³

A related example is the widespread use of Aladdin—BlackRock's risk management technology platform. The same system is provided as a service to BlackRock's customers, including many of its competitors. Public data is limited, but an analysis by the Financial Times found that in 2020, "\$21.6 trillion sits on the platform from just a third of its 240 clients," and that clients include both giant asset managers, such as Vanguard and State Street, and large nonfinancial firms, such as Apple, Microsoft, and Alphabet, which collectively hold hundreds of billions of dollars in their corporate treasury investment portfolios.¹⁴ As with cloud services, the widespread use of a single platform makes it more likely that a cyberattack or other vulnerability could affect numerous different firms simultaneously. Depending on how firms use Aladdin, such widespread reliance could also lead to correlated trading activity or positions, which could also hamper multiple firms simultaneously.

These are just a few examples of the ways reliance on common vendors can create concentrated risk exposures. With the prevalence of outsourcing of middle- and back-office operations at many financial firms, there are likely many others. The aim here is not to pre-judge the ideal market structure or appropriate regulatory approach. Market concentration can offer advantages.

Moreover, regulators and firms—in part at the behest of regulators—already are taking meaningful precautions when relying on outside vendors or other providers. Nonetheless, these remain examples of the types of concentrated risks that could threaten stability and that may not be adequately revealed or addressed by the current regulatory system.

Legislation would ensure this reporting is obligatory and does not vary from one administration to the next, but the FSOC could undertake three-year reviews and make recommendations to Congress for a new type of regulatory tool or oversight even without congressional action. Separately, given the confusion created by the *MetLife* decision, Congress should reaffirm the discretion that the Dodd-Frank Act gives to the FSOC over the processes it uses for designating a nonbank financial institution as systemically important.*¹²

6. Transform the Office of Financial Research into the Comptroller for Data and Resilience.

All of the authority and responsibilities of the Office of Financial Research should be vested in a new Comptroller for Data and Resilience (CDR). The CDR should be independent and have bureau status, even if it remains housed within the Treasury Department.

To help the CDR promote data standards and coordinate data collection among agencies, Congress should require that any action by an FSOC member agency that must be reviewed by the Office of Management and Budget under the Paperwork Reduction Act should simultaneously be submitted to the CDR for review and consultation. The FSOC member proposing the rule should be required to

consult in good faith with the CDR on matters such as how the action uses data standards or data that firms already produce for other purposes; how the data collected could be used in connection with mapping, tracing, or other efforts to monitor systemic threats; and whether the terms under which the member agency would collect new information adequately enable that agency to share it with the CDR or other member agencies, when safe and appropriate. The CDR should not have any authority to mandate changes or to delay implementation of a new rule.

FSOC members should be expected to comply with any reasonable request by the CDR for access to data or information, other than confidential supervisory information, that is already in their possession. In the event of a disagreement, the FSOC should have the authority to determine whether information should be shared and on what terms.

The CDR's efforts to promote data standardization, collection, and coherence should continue to serve as the foundation for its role in helping to identify, monitor and mitigate systemic threats. Since the FSOC and the Federal Reserve produce broad annual reports, the CDR should issue one of the addenda to the main report from the FSOC chair as opposed to a separate annual stability report.

The success of the revitalized CDR will hinge on its leadership. A highly respected leader, such as someone who has held a top position at the Federal Reserve or Treasury, would attract top-tier staff and more effectively gain the respect and cooperation of other FSOC members. Ensuring the independence and authority of the CDR will enhance its ability to attract strong leaders.

These changes would require legislation, but some improvements could be made even without legislative action.

7. FSOC membership. To solidify the status of the CDR as an independent and important voice on matters of financial stability and resilience, the CDR should be a voting, rather than non-voting, member of the FSOC. In addition, to reduce the size of the FSOC, the NCUA should cease to be a member. The presidential insurance appointee should be replaced by the head of the Federal Insurance Office as a voting member. This would both reduce the number of people around the table and make it easier for the FIO to take a more substantive role when warranted to address potential systemic threats, as discussed in chapter 4.

Separately, each FSOC member should be allowed to authorize a member of a commission or governing board to vote at FSOC meetings. For regulators with a commission structure, it may make sense for someone other than the chair to take primary responsibility for focusing on systemic risk.

These changes would require legislation.

8. FSOC/CDR working groups. Given the dynamism of the financial system and the possibility that threats will emerge that will require a range of expertise to analyze, it is critical that the FSOC and CDR have a readily available mechanism to bring together interdisciplinary groups of experts. The FSOC already uses working groups and could expand on their use to good effect. For example, emerging threats identified in the annual report, whether in the main report or one of the appendices, may trigger the creation of a new working group to investigate the

potential threat and determine the right mix of responses, if any.

These working groups could, for example, oversee implementation of stress tests meant to gauge the location and magnitude of potential fragilities. This could include more expansive use of macroprudential stress tests (which can reveal potential interactions among different types of institutions) and reverse stress testing (which requires institutions to assess the scenarios and circumstances that would make its business model unworkable, thereby revealing hidden vulnerabilities), as well as more consistent stress testing of nonbanks, such as CCPs. Using working groups could facilitate learning and make it easier to conduct tests that require information from entities overseen by different regulators. Such efforts could very well also reveal shortcomings in regulatory authority or data.

There should likely be a combination of temporary working groups to examine specific threats or unknowns and standing working groups dedicated to ongoing areas of concern. To facilitate outside oversight, the FSOC should include an explanation in its annual report anytime a standing working group is dissolved or ceases meeting.

The original OFR was given broad authority to create temporary positions for academics and industry experts in addition to the ability to borrow employees from other member agencies. Given the importance and limited use of these authorities, Congress should consider what additional steps may be needed to ensure that the CDR can easily bring together the experts needed to address data deficiencies and identify emerging sources of systemic risk.

Legislation is required to bring about these changes, but the FSOC and even the current OFR could make some improvements without congressional action.

RECOMMENDATIONS

Institutionalize systemic stability as a priority for every FSOC member

- Congress should clarify that the mandate of each FSOC member includes using its existing tools and authority to promote financial stability and resilience.
- Every FSOC member should be required to have an internal Office of Financial Stability and Resilience.
- FSOC members should be required to undertake an impact analysis that assesses how a proposed rule or other action may exacerbate or reduce threats to financial stability.

FSOC leadership

- A new position—under secretary for financial stability—should be created within the Treasury Department, supported by sufficient staff. At the discretion of the Treasury secretary, the under secretary would have full authority to take any actions that the Treasury secretary is authorized to take.

FSOC Annual Report

- The process and composition of the report should be revised to enhance accountability and efficacy. The main report would come solely from the Treasury secretary, as head of the FSOC, instead of from the whole committee. Each FSOC member would issue its own report that would become an appendix to the main report.
- A primary aim of the report would be to provide an overview of known or emerging sources of systemic risk and to propose ways to address them. The report would include a lookback that explains how the financial system and flows had changed relative to a snapshot taken three years previously.

Addressing regulatory and data gaps

- The FSOC Annual Report should include a section on regulatory shortcomings, information gaps, and recommendations for how to address them. This section would identify actions FSOC members should take and include recommendations to Congress when new authority is required.

Designation process

- For any financial institution or activity above a given threshold, the Treasury under secretary for financial stability should be required, at least once every three years, to present to the FSOC a balanced case identifying the major considerations for and against designating that entity as systemically important.
- The FSOC could also evaluate whether a financial institution or utility or activities in which such institutions are engaging pose a systemic threat that is best addressed through a mechanism other than designation as systemically important utility or institution.

Transform the Office of Financial Research into the Comptroller for Data and Resilience

- All of the authority and responsibilities of the Office of Financial Research should be vested in a new Comptroller for Data and Resilience. The CDR should be independent and, if it remains within the Treasury Department, have bureau status.
- Congress should require that any action by an FSOC member agency that must be reviewed by the Office of Management and Budget under the Paperwork Reduction Act should simultaneously be submitted to the CDR for review and consultation.
- FSOC members should be expected to comply with any reasonable request by the CDR for access to data or information, other than confidential supervisory information.
- The CDR should issue one of the addenda to the main FSOC Annual Report.

FSOC membership

- The CDR should be a voting, rather than non-voting, member of the FSOC. To reduce the size of the FSOC, the NCUA should cease to be a member. The presidential insurance appointee should be replaced by the head of the Federal Insurance Office as a voting member.
- Each FSOC member should be allowed to send anyone in a voting position to the FSOC meetings.

FSOC/CDR working groups

- The FSOC and CDR should have a readily available mechanism to bring together interdisciplinary groups of experts. The FSOC already uses working groups and could expand on their use to good effect.
- There should likely be a combination of temporary working groups to examine specific threats or unknowns and standing working groups dedicated to ongoing areas of concern.
- The FSOC should include an explanation in its annual report anytime a standing working group is dissolved or ceases meeting.

¹ U.S. Government Accountability Office, 2016.

² IMF Monetary and Capital Markets Department, 2015.

³ IMF Money and Capital Markets Department, 2020.

⁴ The Volker Alliance, 2015.

⁵ Neiman and Olson, 2014.

⁶ Edge and Liang, 2019.

⁷ Schwarz and Zaring, 2017.

⁸ Berner and Judge, 2019.

⁹ Judge, 2017.

¹⁰ Doyle, 2018.

¹¹ Metrick and Tarullo, 2021.

¹² *MetLife Inc. v. Financial Stability Oversight Council*, 2016.

¹³ Healey and others, 2018.

¹⁴ Henderson and Walker, 2020.

Putting Reforms to the Test

CHAPTER NINE



The reforms proposed in chapter 8 are intended to make sure that the United States has a regulatory architecture that can keep pace with the evolution of the financial system. We recognize that regulatory design alone cannot ensure success. The old adage that “personnel is policy” is as true in financial regulation as elsewhere. The quality of the leaders and long-term employees of federal regulatory agencies and their commitment to prioritizing the resilience of the financial system will be critical in making this system work. The process for selecting them and their compensation should reflect the importance of the work they do.

At the same time, having the right set of tools, information, and incentives is also critical to regulatory success. To demonstrate the benefits of the specific reforms we propose and how the recommendations fit together and reinforce each other, we close our report with an analysis of how we expect the changes to operate if implemented. To do so, we examine how they would address two kinds of challenges that the current system is poorly positioned to address.

We first explain how our reforms would have helped the authorities identify and address some of the threats identified in this report. Most of these stability risks were in plain sight and had been for many years. A credible reform proposal, had it been in place, at a minimum ought to have revealed and made progress toward addressing those threats.

Next, we describe how our reforms would address some near-term risks. The examples we cover are risks related to cyberthreats, climate and climate policy change, third-party vendors that provide services to an array of financial institutions, and record levels of corporate debt. Although this report does not make specific recommendations in any of these

areas, each warrants further attention in the near future.

Looking Back

Treasury Market Dysfunction. The events of March 2020 revealed significant shortcomings in the capacity of the Treasury market to function well under stress. Prompt response by the Federal Reserve substantially mitigated the disruption. Nonetheless, given the widespread reliance on Treasuries as a highly liquid asset and the degree of dysfunction, the episode revealed that the current market structure could well pose a threat to stability.

A threshold question is whether this threat could have been detected and addressed before March. We believe it could have been, and that our proposed reforms would have made detection and mitigation more likely. Treasury markets have grown significantly since the Global Financial Crisis. At the same time, regulatory changes have limited the capacity of large banking organizations to accommodate surges in demand for liquidity in Treasury instruments. This disparity is one that bank regulators should have identified when they undertook the mandatory lookback, analyzing the impact of the post-crisis reforms. Relatedly, banking and securities regulators introduced new rules designed to enhance liquidity risk management by banks and investment funds via both substantive requirements and new disclosure obligations. Both the initial impact analyses and subsequent lookbacks of these reforms likely would have prompted close examination of Treasury market liquidity during periods of systemic distress.

Alternatively, the revised annual report of the Financial Stability Oversight Council (FSOC)

likely would have identified deficiencies in the market structure for Treasuries as a systemic threat requiring reform. There were multiple instances of fragility in the Treasury market even apart from any major shock to the real economy, including one in the fall of 2019. The FSOC, and potentially FSOC members, likely would have flagged these instances, along with the mismatch between the growth of Treasuries outstanding without a commensurate expansion in liquidity provisioning.

Further, under the revised approach, in conjunction with identifying the potential threat to stability, the FSOC would have been required to propose a way to address the threat or explain why it was not necessary to do so. Given that the new liquidity rules imposed on banks and others treated Treasuries as high-quality liquid assets and there were numerous indications of weakness, a proposal for reform seems likely. And on the off chance that the FSOC-suggested reforms were not required, the issue would have at least been placed on the agenda in a way that was transparent to Congress and the public, enabling greater accountability around the failure.

The March 2020 episode also revealed ongoing information gaps. A recent Office of Financial Research (OFR) working paper examined the possible contribution of basis trading by hedge funds to the dysfunction in the Treasury market.* The report acknowledged, “remaining data gaps limit visibility into basis trading: specifically, we do not have high-frequency or precise data on hedge funds’ balance sheets or data on their substantial borrowing in the uncleared bilateral portions of the repo market. Increasing transparency would improve the

abilities of financial regulators to monitor the risks of this trade.”¹ Although just how much information should be disclosed and to whom are open questions, this is precisely the type of data gap that belongs not just in a working paper, but before Congress.

Under the proposed reforms, this type of deficiency would likely be flagged in both the FSOC’s annual report to Congress and the addendum to the report from the Comptroller for Data and Resilience (CDR), the successor to the OFR. The reforms would also clarify that the CDR is responsible for assembling the data for this kind of investigation. If, as suggested in the working paper and as appears to be the case with respect to the Treasury market more generally, it finds important reporting gaps, it would need to disclose them and identify a strategy for closing the gaps, by using existing regulatory authority or seeking further authority from Congress.

No less important than what may have transpired prior to March 2020 is what has transpired subsequently. The degree of dysfunction and the critical importance of the Treasury market should place this item high on the reform agenda. Although there are signs that the new administration recognizes and will seek to address these issues, more than a year has passed since March 2020 and no official reforms have been proposed by the Federal Reserve or the Treasury, much less adopted. This is precisely the type of possible regulatory stagnation our proposed changes to regulatory structure and process are meant to combat.

The proposed reforms would likely have resulted in more transparency around

* The “basis trade” is a form of arbitrage between the cash and futures prices of Treasuries.

key issues, more regulatory awareness of shortcomings, and more congressional engagement. This is critical not only to address the liquidity problems on display in March, but also to mitigate the moral hazard that has since arisen. The government's prompt intervention has led to a widespread assumption that it will do the same in response to a future shock.

Prime Money Market Mutual Funds. As with Treasury market functioning, this is an issue that likely would have surfaced through the revised FSOC Annual Report and the Securities and Exchange Commission (SEC) addenda to it.* It may well have been better addressed through the impact and lookback analyses that the SEC would have been required to undertake in connection with its earlier effort to reform money market mutual funds. At the time the reforms were adopted in 2014, Commissioner Kara Stein (a member of this Task Force) voiced concerns about the impact of gating. Had the SEC been required to consider the systemic-risk implications of its actions, her objections would perhaps have gained more traction. Alternatively, the drawbacks of gating and potential benefits of swing pricing might also have emerged had the SEC engaged in a three-year lookback in 2017, as proposed in chapter 8.

The previous efforts to reform money market mutual funds also illustrate how mandatory impact and lookback analyses can facilitate learning and enhance the capacity of regulators to assess the systemic impact of their actions, apart from unearthing immediate stability threats. Even under current rules, the SEC did grapple with the question of whether and to

where institutional investors might migrate in response to the reform. But absent any obligation to engage in an impact analysis, the SEC merely concluded that it was “not able to estimate” the likely outflows from prime money market funds. The SEC further concluded that “[g]iven the heterogeneity of investors’ preferences and investment objectives and constraints,” it expected that of those that do exit “some investors will allocate assets to government funds, some to demand deposits, and others to various other alternatives.”²

Had the SEC been required to engage in an impact analysis, it would have been compelled to more precisely predict the type of migration that would likely result from its reforms. And, if it engaged in a lookback, it would have learned that its expectation that money would flow to a variety of alternatives was wrong; virtually all the money that exited went into government funds.³ Instituting a mechanism whereby the SEC and other FSOC members must identify and learn from such mistakes is key to enhancing their capacity to make more accurate assessments in the future.

Other Open-End Funds Holding Illiquid Assets. Another proposed reform, which the FSOC could implement without legislation, is to summarize in its annual report major changes in the structure or flows in financial markets, compared with three years earlier. This exercise likely would have surfaced both the rapid growth in open-end bond funds and the fragility implications of that growth. A research paper published in 2017, for example, showed that between 2008 to 2014,

* We note that, in light of the strains on money market funds, in March 2020, the President's Working Group on Financial Markets in December 2020 identified, without endorsing, several potential policy changes. <https://home.treasury.gov/system/files/136/PWG-MMF-report-final-Dec-2020.pdf>.

the assets in actively managed bond funds tripled and outstanding U.S. corporate bonds increased 44 percent. It further provided “direct evidence for the first-mover advantage.”⁴ Other data and research available would have provided further evidence that the rapid growth in these funds, particularly at a time when banks were pulling back from market making, merited further regulatory attention. Nonetheless, neither the inherently fragile structure of these funds nor their rapid growth received meaningful regulatory attention.

Although the Federal Reserve’s actions, with support from Congress and Treasury, substantially contained the disruption in the corporate bond market in March 2020, the need for such swift and dramatic action suggests these vulnerabilities were so large that they should have been identified and addressed earlier. Moreover, just as with Treasuries and money market funds, now that those interventions have occurred, market expectations of further support could exacerbate the underlying fragility. Nothing in the current system requires the FSOC or the SEC to propose reforms or explain why they are not doing so. A well-staffed under secretary at the Treasury and an SEC with a clear obligation to promote stability, combined with the mechanisms for accountability we propose, would make it more likely that these funds would soon be subject to regulations designed to address the systemic threat they now pose.

Insurance. The fragmented regulatory system and prominent role given to state regulators remain big impediments to efforts to address potential threats to stability in insurance. As chapter 4 makes clear, the opacity that continues to envelop insurance companies makes it difficult for federal regulators to assess the potential threats they pose or

how their exposures may interact with other developments that could affect stability, such as dysfunction in the bond market or widespread corporate defaults. Given that federal regulators lack any supervisory authority over large insurance companies, the FSOC Annual Report and supporting testimony could be used to offer a template for the uniform disclosure that chapter 4 suggests is needed to identify potential threats and feedback loops.

Looking back at the events of March 2020, the large declines in equity prices of life insurers pointed to fragility. Also, the same companies that experienced large drops in equity valuations in March 2020 were stressed in 2008 as well. This indicates a persistent problem in the sector, as also perceived by equity markets, that could have been identified ahead of time and addressed.

We believe that our proposed reforms would help to identify such fragilities in advance and bring much-needed transparency. In particular, more transparency on the structure of the liabilities, and their riskiness, combined with well-designed stress tests would detect the ongoing fragility. The Federal Insurance Office could—and we believe should—design the standardized stress tests in collaboration with the Federal Reserve Board so that stress scenarios for banks and insurance companies align.

Although primary oversight of insurance companies would, at this stage, remain with the states, this process would provide additional insight into the competency and incentives of state regulators. A failure to undertake robust stress testing could suggest that further federal oversight is warranted. These tests could also provide insight into the types of challenges insurance companies might face in given

scenarios in a way that would allow the FSOC to better understand the interconnections and correlated risks across different parts of the financial system.

Housing and Mortgage Market. The last financial crisis showed that highly indebted households that cut spending when their incomes deteriorate can pose a threat to the economy and create feedback loops that harm the economy. Recognizing the danger of these dynamics, some foreign jurisdictions have adopted rules, such as limiting loan-to-value ratios or loan-to-income ratios, along the lines proposed in chapter 6. In the United States, however, the types of macroprudential tools that could help mitigate these challenges have not been seriously considered. Despite the array of federal regulators that may have some authority to institute these types of measures, including the Federal Reserve, the Federal Housing Finance Agency (FHFA), and other banking regulators, none has an explicit macroprudential mandate. And so long as the Treasury secretary had relatively thin FSOC staffing and a long list of other, more pressing matters to address, there was no clear mechanism for getting these issues onto the table for discussion. New leadership from an under secretary for financial stability, coupled with expanded staffing and a financial stability mandate at all the various agencies, would increase the likelihood that tools offering macroprudential benefits would receive serious attention. An enhanced burden on each regulator to identify potential sources of instability and the FSOC's obligation to identify potential reforms or explain why they are unnecessary would increase the likelihood that reforms along the lines we proposed would be adopted.

Another key challenge arises from the role of nonbanks in originating and servicing home loans. Between 2013 and 2020, the nonbank share of mortgage origination increased from 37 percent to 73 percent, and many of those nonbanks have limited capacity to absorb the shock of a widespread decline in housing prices and modify loans or otherwise work with homeowners. A requirement that the FSOC report to Congress on major changes in the structure or flows in the financial system *and* propose necessary reforms would almost certainly have helped address this issue. (The 2019 FSOC Annual Report flagged the issue but made no recommendations for addressing it.)⁵ The rapid increase in nonbanks' share of mortgage finance is due, in part, to post-crisis banking reforms. Under our proposal, the process of instituting higher capital requirements on banks would likely have required an impact analysis that could have identified this probable issue even before it manifested. This an example of an issue that could have had severe consequences had house prices gone down, rather than up, during the COVID-19 crisis. The reforms we propose, by ensuring key policymakers pay more attention to the issue, would reduce the need to rely on such good fortune.

Central Counterparty Clearinghouses (CCPs). The systemic significance of CCPs, or clearinghouses, grew considerably as a result of post-crisis reforms that mandated central clearing of standardized derivatives. Under our proposed reforms, policymakers would have been required to pay far more heed in rulemaking to the systemic implications of the massive migration of standardized derivatives to CCPs. Such an analysis would likely have surfaced many of the challenges this report identifies, such as the flawed incentives of CCPs controlled by shareholders rather than

members and the potential for margin calls to quickly magnify problems during periods of systemic distress. Our proposal may well have triggered further examination of market structure and potential ways to mitigate these challenges even before the post-crisis rules were fully implemented.

Even if these potential sources of instability were not identified prior to the adoption of the new rules mandating centralized clearing of standardized derivatives, they most likely would have surfaced when the FSOC members undertook the recommended lookback. The change in flows and exposures resulting from implementation also would have likely been flagged in the FSOC's annual report, and quite possibly in the addenda from the Federal Reserve and the Commodity Futures Trading Commission (CFTC). Both the lookback and the FSOC report could have led to a discussion about the adequacy of current oversight of the largest CCPs, whether to expand the scope of the Fed's authority over CCPs, and the need for more comparable and robust baseline standards for the size of default funds, through-the-cycle margin requirements, or other reforms in the spirit of those we propose. The risks associated with the failure of a CCP and the limited tools for handling a failure would have also commanded attention.

Separately, having an under secretary for financial stability would ensure that a high-ranking official with both the authority and obligation to constantly engage in horizon scanning would be looking around and ahead for potential threats to stability. Given that all of the largest financial institutions are exposed to the major CCPs, and the shortcomings in the mechanisms currently in place to ensure the resilience of CCPs and to minimize the risk of destabilizing margin calls, horizon scanning

by a high-ranking official over the past decade may well have identified CCPs as priority. Apart from the regular reporting requirements, this also could have led to the creation of a working group that could have gathered insights from CCP members in addition to the CCPs and other experts, which could have been another route to many of the recommendations proposed here.

The reforms to the leadership and membership of the FSOC, the clarifications of agency mandates coupled with expanded staffing, and the new structure of the annual report are tightly connected. The subset of issues flagged here shows that potential threats to stability can arise from a wide array of sources, supporting the need to ensure each regulator has both the resources and incentives to address threats within its domain. The diversity of these threats further speaks to the importance of having a high-level official, appointed by the President and confirmed by the Senate, devoted solely to these issues. The revised FSOC Annual Report and addenda would serve the dual purpose of creating stronger incentives to identify and address risks and ensuring accountability to Congress and the public. These changes would reduce the odds of ignoring long-festering problems and make clear where the responsibility lies when there is a failure.

Looking Ahead

The Task Force discussed several financial stability risks that are receiving attention from regulators, and where meaningful progress is likely underway. At the same time, some of these risks might have been flagged and addressed earlier under our approach and, just as importantly, our proposed approach

might help to ensure ongoing diligence and coordination given the dynamic nature of these challenges.

Third-Party Vendors. Regulators recognize the widespread reliance on common vendors as a concentration risk and have made efforts to address this threat. Nonetheless, progress remains incomplete. Currently, most vendors are typically monitored indirectly, if at all. For example, bank supervisors seek to ensure that banks are taking appropriate precautions when choosing and relying on third-party vendors. These efforts, however, typically remain focused on microprudential aims, rather than on considering how common exposures to vendors, by banks and nonbanks, could create correlated risks across the financial system. If a vendor did become so dominant and indispensable in providing a service that its failure, outage, or an error by that vendor could threaten financial stability, the authorities should be aware of the risk and likely should have more authority to address it directly.

Our proposed reforms would tackle this type of challenge in several ways. First, the clarified stability mandates for FSOC members would force them to look for systemic risks posed by vendors. The regulators could no longer argue that some other part of their mandate exempts them from considering these kinds of threats. Second, our proposed three-year lookback for assessing the evolution of the system would help make sure we avoid the “boiling the frog” problem, whereby a persistent trend transforms a modest risk into a large one without having a single year with a big change. Additionally, an under secretary for financial stability might routinely run an exercise to try to identify emerging concentration risks. The CDR could provide any data needed to monitor the risks and, as appears to be the case with

respect to some vendor exposures, fill gaps in the ability of the FSOC and its members to assess the size and location of exposures across the system. Should these efforts reveal that vendors, or certain services provided by a vendor, could pose a stability threat, the FSOC Annual Report should make that threat known to Congress and the public and should identify the additional steps that FSOC members or Congress should take to help address that threat.

Nonfinancial Corporate Debt. Rising corporate debt levels in the United States, and potential weakening of the terms of that debt, have received a great deal of attention. Some of the growth occurs through bond market issuance and some via highly leveraged loans underwritten by banks and then securitized and sold. If the economy were to fall into a normal recession, in which business revenues dropped and stayed much lower for some time, debt servicing could become challenging. Even absent defaults, if businesses prioritize debt repayments, they might cut back on investment and hiring and amplify the downturn. In recent years, both FSOC’s annual report and the Federal Reserve Board’s Financial Stability Report have consistently highlighted the high levels of business debt and other potentially troubling signs, such as weakening credit standards. Nonetheless, neither has made any specific proposals to reduce corporate debt levels or mitigate the mechanisms through which corporate debt could exacerbate a recession.

Our structure would improve on current circumstances in several ways. First, the changes proposed elsewhere in this report, particularly for open-end funds that have been major buyers of bonds and other fixed-income assets, could help reduce issuance or

degradation in terms. As chapter 5 reveals, much of the growth we have seen can be traced back to the capacity of these bond funds to offer the illusion of daily liquidity without having a structure or otherwise paying the price required to make good on that promise, particularly during periods of stress. Substantive reforms that more accurately price liquidity could help ensure that bond pricing (and thereby issuance and terms) reflects both the credit and liquidity risk that such instruments pose. Additionally, a system to ensure that reforms carry over when activity migrates, as should happen if the FSOC and member agencies use Andrew Metrick and Daniel Tarullo's congruence principle to fulfill their clarified stability mandates, could also help guard against further migration driven by false promises or regulatory asymmetries.⁶ Even if corporate indebtedness is not targeted as a macroprudential issue, just taking steps to ensure that both credit and liquidity risk are appropriately priced could go a long way in slowing or even reversing the trends.

Second, the proposed reforms should also help address the problem of incomplete information about who holds some of this debt. For example, regulators should know which holders of outstanding debt are likely to unload that debt if it becomes impaired. Having this information in advance is key to enabling regulators to assess the probable fallout and potential feedback effects. This type of information gap is one that the CDR would be expected to identify and address. The CDR could undertake a rulemaking or the CDR and SEC could take joint action, such as expanding the use of Form 13F (quarterly reports filed to the SEC by institutional investment managers) for a broader set of financial instruments.

Once these information gaps are addressed and

reforms to mitigate the possibility of fire sales are adopted, further substantive reforms may be needed. Rather than projecting what shape these reforms might take, we focus on how the regime we propose would better identify and address remaining macroprudential threats.

The buildup of nonfinancial corporate debt could prolong and deepen a recession. From a borrower perspective, corporate bonds and leveraged loans can serve as substitutes, so bank and market regulators must work together. The clarified financial stability mandate we recommend—and agency staff implementing the mandate—would make clear that a coordinated approach to this type of macroeconomic threat is appropriate. Our reforms also would make it more likely that the FSOC would form a working group charged with trying to understand the extent of the problem and the types of reforms required for leveraged loans, corporate bond issuance, or both. This, too, could serve as a mechanism for monitoring and addressing the threat in the holistic manner needed to successfully target the macroprudential dynamics that tend to get ignored in the current system.

Cyber. The possibility of a major cyberattack on a critical financial institution or infrastructure or simultaneous coordinated attacks across multiple sites remains one of the most pressing potential threats to financial stability. Financial institutions and their regulators are aware of these risks, have devoted significant resources to trying to address them, and have made meaningful progress. Nonetheless, significant threats still loom large. Much of the private effort is meant to ward against cyberattacks motivated by commercial gain, but the attacks most likely to result in systemic instability would likely come from hostile states or non-state actors who would

time and structure their attack to maximize systemic disruption. To meaningfully assess and redress these risks requires close coordination not only between regulators and regulated entities, but also among interdisciplinary groups of experts, including national security experts. Inter-regulatory and international coordination in this area is key to avoiding inconsistent and duplicative demands that can counterproductively drain resources and divert expertise.

The structural reforms we propose would not solve these problems, but they would create a more robust framework for addressing constantly evolving cyberthreats. As a starting point, remaining on top of this threat would likely be a high priority for the new under secretary for financial stability. And FSOC members—armed with greater resources and expanded mandates—could better invest the effort required to understand how cyber vulnerabilities differ from other types of operational risk. Ongoing communication and coordination among firms, U.S. regulators, their counterparts abroad, and non-finance experts is required to adequately monitor cyber vulnerabilities. Thus, cyber risks would be a prime topic for the more robust FSOC working groups we envision. A well-functioning working group could help coordinate the mapping, stress testing, and other monitoring tools needed to improve cyber resilience, and could foster the interdisciplinary dialogue critical to reducing the probability of cyberattacks and containing the damage from attacks that do occur.

One of the special aspects of cyberthreats is that a successful penetration of firms' safeguards is inevitable.⁷ The working group could also insist that firms develop recovery plans that assume a successful

breach has occurred and data integrity has been compromised. This kind of work is less advanced but also requires preparation and would benefit from coordination across firms to share best practices.

The possibility of a cyberattack aimed at critical infrastructure or across multiple firms simultaneously is another reason why all financial regulators should have a clear systemic risk mandate. They would need to coordinate closely in the face of a financial shock caused by a cyberattack. An attack targeting CCPs, for example, could raise questions about whether the Federal Reserve should provide emergency liquidity to CCPs, clearing members, or both. It would also raise a host of other pressing questions that may well implicate banks, broker-dealers, CCPs, and market functioning across domains. Although the CCP reforms proposed in this report should help mitigate the impact of a cyberattack, preventative efforts are almost certain to be incomplete. The willingness of regulators to share information and to prioritize the health of the overall financial system over the health of particular institutions could be critical to minimizing the aggregate impact of a cyberattack. Having staff within each agency who are specialists in systemic stability, and relationships across agency staffs, coupled with the clarified mandate, should make the critical coordination more likely.

Climate-Related Risks. As laid out clearly in the November 2020 financial stability report from the Federal Reserve Board, climate change could have systemic repercussions through multiple mechanisms.⁸ For example, both acute climate events and changing perceptions of the risks associated with chronic hazards could trigger uncertainty, rapid repricing, or other market responses that might result in

destabilizing feedback loops. Many possible dynamics could elevate climate-related risks into potential stability threats. These include policy changes designed to bring about a steep change in carbon pricing; major changes in investor appetite driven by demand for stock-market index portfolios that screen for environmental, social, and governance (ESG) factors; activism by proxy advisers, investors, employees, or customers; and liabilities and other implications of managing stranded assets (assets whose economic life is ended prematurely because of climate change or responses to it). As with cyberthreats, meaningful and helpful efforts are already underway to address climate-related risks, and the collective attention devoted to these issues appears to be escalating rapidly. Nonetheless, the degree of coordination and communication among FSOC members and between those members and non-finance experts may well remain below what is necessary given the potential threats to stability.

A robust working group that could promote discussion and facilitate coordination could help alleviate these shortcomings and enhance the efficacy of the efforts already underway. For example, questions about how to measure and disclose climate-related risks arise in different but related ways across prudential and market regulation. Additionally, it is unclear how much

companies understand not just about their climate-related exposures, but also about their exposure to rapid adjustments (in response to climate-related changes) to the scope or cost of their insurance coverage or to policies intended to address climate change. Structured mechanisms are needed for understanding the exposure of financial firms to decisions made by insurance companies and nonfinancial firms. The working group could help organize a stress test to assess some of these risks. A CDR could also help assess the various types of data that may be useful and promote standardization to further facilitate systemic oversight. Finally, climate-related risks could require more or different regulatory authority. The mechanisms proposed for regularly making such requests in FSOC's annual report could increase the probability of timely action when needed.

Summing Up

The regulatory design and process reforms we propose will not guard against all possible future risks. But they would shore up the biggest weaknesses in the current system and make new ones of the same magnitude less likely. Even if all our recommendations are adopted, we urge periodic independent reviews of how the financial system is functioning in light of its continued evolution.

¹ Barth and Kahn, 2020.

² *Money Market Fund Reform; Amendments to Form PF*, 2014.

³ Gardner and Tetlock, 2015.

⁴ Goldstein, Jiang and Ng, 2017. b

⁵ Financial Stability Oversight Council (FSOC), 2019.

⁶ Metrick and Tarullo, 2021.

⁷ MacAskill, 2018.

⁸ Federal Reserve Board, 2020.

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- **Laurie Goodman** is a director of Arch Capital Group Ltd., MFA Financial Inc., Home Point Capital Inc. and DBRS Inc., a unit of Morningstar. She is also a consultant to The Amherst Group LLC.
- **Glenn Hubbard** is a director and chair of the board of MetLife and a director of BlackRock Fixed Income Funds. Hubbard recused himself from the chapter on insurance.
- **Anil Kashyap** is a member of the Financial Policy Committee of the Bank of England and a consultant to the Federal Reserve Bank of Chicago and the European Central Bank.
- **Don Kohn** is a director of Congressional Bancshares and a consultant to T. Rowe Price.
- **Blythe Masters** is a director of Credit Suisse Group and of GCM Grosvenor. She is an advisor to Santander Group, Maxex LLC, and Figure Technologies Inc.
- **Sandie O'Connor** is a director of Ripple Labs, Inc.
- **Kara Stein** is a director of the Investors Exchange (IEX).

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For more information, contact Stephanie Cencula
at: scencula@brookings.edu