# Financial Stability Considerations and Monetary Policy*

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The Federal Reserve faces a dilemma with respect to financial stability. On the one hand, the simplest interpretation of its mandate gives the Federal Reserve a limited role in addressing financial stability risks. On the other hand, monetary policy can interact with financial stability considerations. Hence, the Federal Reserve cannot ignore financial stability and has strong incentives to ensure that risks are not only identified but also addressed. Given that no part of the U.S. government can mitigate all of the threats identified by the Fed, we argue that Congress should evaluate the effectiveness of the post-crisis regulatory reforms.

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## 1. Introduction

"The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production,

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> so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."
>
> Monetary Policy Objectives, Federal Reserve Act

A plain reading of the Federal Reserve Act's instructions regarding monetary policy objectives makes no reference to financial stability considerations. So it might seem odd that these days, the Federal Reserve (Fed) pays significant attention to financial stability risks. We suspect the reason for doing so is twofold. First, financial instability was a central feature of the last recession. That recession was very costly and, in the course of battling it, the Fed and other central banks were forced to resort to unconventional and at the time untested monetary policy tools. Second, it is widely believed that some of these policies will become part of the standard toolkit and that, unless accompanied by appropriate macroprudential safeguards, they could have the potential to contribute to instability. Both of these factors suggest that there are important interdependencies between monetary policy and financial stability.

Echoing Dudley (2015) and Fischer (2015), we argue that the United States does not currently have a fully effective framework for managing financial stability risk. The Financial Stability Oversight Council (FSOC), which is formally tasked with responding to emerging threats to the stability of the United States, has a limited set of tools and powers that would not be sufficient to prevent a replay of the last crisis. It also has a limited ability to attend to financial stability risks that the Fed currently is concerned about.

These considerations put the Fed in a difficult position. The most natural interpretation of its mandate might be for the Fed to ignore financial stability risks and focus on a literal interpretation of its mandate. However, given the important interactions between monetary policy and financial stability risks, this option does not seem credible. This leaves three options. The Fed could hope that Congress will review and redesign the FSOC to expand its toolkit and powers. A second option is that Congress amends the Federal Reserve Act to give the Fed's Board of Governors an explicit financial stability objective and the additional powers necessary to achieve that objective. This would build on the Federal Reserve Board's separate regulatory and supervisory powers. A third possibility is the Fed could conclude that financial stability is a necessary condition

for maximum sustainable employment and stable prices, and could ask the Fed's Federal Open Market Committee (FOMC), which is exclusively tasked with setting monetary policy to achieve the dual monetary policy mandate of stable prices and full employment, to incorporate financial stability considerations into its deliberations over monetary policy.

The remainder of the paper has four parts. First, we discuss the Federal Reserve Board's approach to identifying financial stability risks as laid out in its recently launched Financial Stability Report. By publishing a high-quality analytical Financial Stability Report, the Federal Reserve Board demonstrates that it takes financial stability risks seriously and sees them to be an important risk to the economic outlook.

Next, we consider two sets of financial stability risks that authorities might need to address at some point in the future. Drawing heavily on Aikman, Bridges, Kashyap, and Siegert (2019), we review the events leading up to the last crisis and explain what types of policy interventions would be necessary if we found ourselves faced with similar vulnerabilities. To consider a timelier example, we also consider which interventions might be necessary if the vulnerabilities identified in the Federal Reserve Board's recent Financial Stability Reports were to persist and intensify. In both cases, we find that the FSOC and its members would not have all of the necessary powers to mitigate these threats.

In a third section we argue that the Fed should take this regulatory underlap seriously: a future financial crisis would make it difficult for the Fed to achieve its dual mandate of price stability and full employment, given low equilibrium interest rates and potentially more limited monetary policy space. In addition, the regulatory underlap means that the Fed cannot rely on other authorities to offset any unintended consequences that its monetary policy stance might have for financial stability.

The final section considers the options mentioned above for reviewing the institutional framework. Each of these options has costs and benefits, so we do not see one dominant option. However, we think our analysis suggests that doing nothing and accepting the status quo arrangements bears significant risks. There is a strong case for Congress convening a commission to review the effectiveness of the post-crisis regulatory reforms, including whether authorities

have sufficient flexibility to react to new vulnerabilities. The fact that financial stability policy and monetary policy are not always separable from each other means that it should also be in the Fed's interest to make sure that financial stability risks are not only identified but also effectively addressed.

## 2. The Federal Reserve Board's Financial Stability Report and Its Role in Identifying Financial Stability Risks

Despite lacking an explicit financial stability objective that extends beyond its supervisory responsibilities, in November 2018 the Federal Reserve Board launched a biannual Financial Stability Report, or FSR (Board of Governors of the Federal Reserve System 2018). In May 2019 it published the second edition of this report. The FSRs begin by stating that the report "summarizes the Federal Reserve Board's framework for assessing the resilience of the U.S. financial system and presents the Board's current assessment." The decision to publish an FSR despite not being explicitly responsible for financial stability suggests that the Federal Reserve Board considers financial stability risks to be of critical importance for the country's overall economic outlook. The fact that the Federal Reserve System takes financial stability risks very seriously is further evidenced by the fact that it has conducted two high-level "war games" that evaluated potential policy responses to financial stability risks (see below).

The FSR is a high-quality, analytic document that is filled with detailed commentary about the financial vulnerabilities facing the United States. It groups vulnerabilities into four categories: elevated asset valuations, excessive borrowing by businesses and households, excessive leverage within the financial system, and short-term funding risks. For each of these categories the FSR includes a wide range of data and useful charts that help the reader form a top-down view on current financial stability risks. The grouping itself, especially if we recognize that some of these factors are connected and interact, encompasses almost every plausible channel through which financial instability could arise. So the FSR casts a wide net in assessing risks that the Federal Reserve Board considers most important.

However, there are aspects of the way the FSR analysis is organized, and issues that are omitted, that are striking. First, while the FSR contains an overview section that describes the Federal Reserve Board's view on each of the various risk categories, it offers no summary measure of financial vulnerabilities. Even within each of the four categories that the FSR considers, it presents multiple indicators and leaves it to the reader to reconcile various pieces of countervailing information with the overall assessment of the risks.

Absent any agreed-upon summary indicators, different policymakers are free to cherry-pick their own preferred indicators of vulnerabilities, which makes reaching a consensus on the size of the vulnerabilities difficult; and having a consensus position on the risks the system is facing is presumably a necessary precursor to agreeing on any actions to address these risks. Imagine trying to achieve a dual mandate of stable prices and maximum employment without having agreed on any price or labor market statistics to discipline the discussion.

A second, related issue is that the FSR stops short of discussing potential policy interventions or recommending that relevant authorities take action. This may simply reflect the Federal Reserve Board's assessment that the current risk environment does not require any policy action, but it may also reflect the fact that the Federal Reserve Board is not explicitly tasked with addressing financial stability risks and may prefer to leave it to other authorities to draw the necessary conclusions.

A third issue is the way in which debt vulnerabilities are analyzed. The experience in the global financial crisis suggests that *who* ends up owing the debt can be much more important than the aggregate level of household debt. Most theories of "household deleveraging risk," i.e., the risk that highly indebted borrowers amplify a downturn by cutting back on consumption in order to continue servicing their debts, also point to the importance of focusing on the condition of the most highly indebted borrowers. Kashyap (2019) explains why, for households, the distribution of the debt service to income ratio (DSR) merits special attention. Essentially, he argues that the right-hand tail of that distribution is likely to be a good proxy of the number of at-risk households and deleveraging risk. Yet, the FSR shows no data on the distribution of debt service ratios for

households. The analysis of corporate indebtedness is more granular but is largely restricted to large, listed companies.

Analyzing the distribution of debt servicing ratios can be challenging, as it requires detailed loan-level data. The Fed would appear to be in a good position to look at some of these issues. It already runs a detailed Survey of Consumer Finance that provides insights into the debt burdens of the most highly indebted borrowers. And the Home Mortgage Disclosure Act requires the vast majority of mortgage lenders to report their mortgage origination activity to the Federal Financial Institutions Examination Council. However, the data are subject to limitations, which makes it difficult to get a complete picture of household DSRs.[1]

For corporate borrowers, the Fed can rely on the financial statements of publicly listed firms or data on leveraged loan markets to provide some breakdown of debt levels by borrower types. But data availability can still be an issue when assessing the distribution of debt amongst smaller, privately held companies. In a "war game" that evaluated the policy response to any increase in U.S. financial stability risks, senior Fed officials also voiced concerns regarding the insufficient granularity of data on leveraged loans (Duffy et al. 2019).

## 3. Addressing Financial Stability Risks

Having argued that by publishing a comprehensive Financial Stability Report, the Fed acknowledges that financial stability is an important determinant of economic performance, we next consider whether the Fed can rely on others to address any risks that it might identify in its FSR. In particular, we will focus on whether the FSOC as the authority formally responsible for U.S. financial stability could be reasonably expected to address all identified vulnerabilities.

We take two perspectives on this question. First, we will draw on the analysis in Aikman, Bridges, Kashyap, and Siegert (2019)

[1]For instance, the data reported as part of the Home Mortgage Disclosure Act include second-lien mortgages separately, which makes it difficult to look at households' combined DSRs. It also does not include other debts, such as auto loans and student loans. And while it contains data on borrowers' income and the size and interest rate of the loan, it does not include data on the term of the loan. This means that amortization cost and DSRs have to be estimated based on average mortgage terms (see Butta, Popper, and Ringo 2015).

to identify the vulnerabilities that led to the global financial crisis, and consider the actions that authorities would have had to take to address these vulnerabilities. Second, we consider the main vulnerabilities identified in the Federal Reserve Board's November 2018 and May 2019 FSRs and consider the types of interventions that might be necessary if these vulnerabilities were judged to require policy action.

### *3.1 Addressing Vulnerabilities that Developed in the Run-up to the Financial Crisis*

Aikman, Bridges, Kashyap, and Siegert (2019) argue that the financial system prior to the global financial crisis was vulnerable because of three factors. First, in the run-up to the financial crisis, the overall U.S. financial system was undercapitalized relative to the risks it was exposed to. While leverage in the traditional commercial banking system had remained largely the same, certain nonbank financial institutions that were outside of the regulatory perimeter had grown substantially. For example, between 2001 and 2007, nonbank financials accounted for more than 70 percent of the total growth in U.S. home mortgage credit. Broker-dealers in particular had always relied on high leverage, and largely funded their significant growth by issuing more debt. They were hence much less able to absorb losses than commercial banks. Table 1 shows leverage across different parts of the U.S. financial system.

The table also shows clearly the second important vulnerability: U.S. nonbanks were particularly reliant on short-term debt funding that could be withdrawn quickly in the event of stress. For example, the repo liabilities of broker-dealers increased from $1.4 trillion in 2001 to $3.0 trillion in 2007 (see figure 1).

The third important risk was the unprecedented surge in U.S. household debt (table 2). Mortgage debt doubled in the six years before the crisis, and by 2007 it had reached 72 percent of GDP. That boom was accompanied and reinforced by soaring property prices, which rose by two-thirds in the five years to their peak in early 2006.

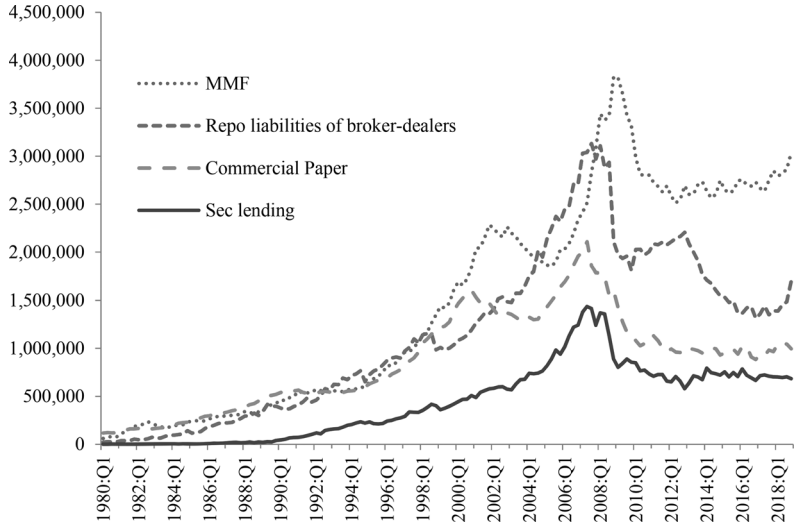
The aggregate loan-to-value ratio on the stock of U.S. housing remained broadly flat during this period, meaning that for each 1 percent increase in house values, homeowners also increased their

**Table 1. Size and Structure of the U.S. Leveraged Financial System**

| | Size, Leverage, and Liquidity Risk of Leveraged Financial Institutions | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2001:Q4 | | | | 2007:Q4 | | | |
| | Assets ($bn) | Leverage | Liquid Assets | Short-Term Funding | Assets ($bn) | Leverage | Liquid Assets | Short-Term Funding |
| Commercial Banks | 6,552 | 11.0 | 6.6% | 26.5% | 11,182 | 9.8 | 4.6% | 33.2% |
| Savings Inst. | 1,317 | 11.6 | 3.0% | 18.2% | 1,852 | 9.1 | 2.3% | 22.6% |
| Broker-Dealers | 2,376 | 28 | 2.4% | 57.3% | 4,686 | 45 | 0.4% | 63.4% |
| Gov.-Sponsored Enterprises | 1,417 | 42.3 | 0.2% | | 1,677 | 23.7 | 0.7% | |
| Total | 12,657 | | | | 19,397 | | | |

**Source:** Financial Accounts of the United States; Federal Deposit Insurance Corporation; Adrian, Fleming, et al. (2017); and Annual Reports of Fannie Mae (Federal National Mortgage Association) and Freddie Mac (Federal Home Loan Mortgage Association).
**Notes:** Based on Aikman, Bridges, Kashyap, and Siegert (2019). "Leverage" is defined as total assets divided by (book) equity. "Liquid assets" refers to the ratio of cash and Treasury securities to total assets. For brokers, "short-term funding" refers to repo funding relative to total assets. For deposit takers, it refers to (estimated) uninsured domestic deposits and foreign deposits relative to total assets. While deposits are typically short-term liabilities, many types of deposits, including insured deposits in particular, are "behaviorally stable" and were not withdrawn during the crisis (see Martin, Puri, and Ufier 2018). Government-sponsored enterprises include Fannie Mae and Freddie Mac.

**Figure 1. Increase in Short-Term Liabilities in the U.S. Financial System in $Million**




**Source:** Financial Accounts of the United States, based on Adrian, de Fontnouvelle, et al. (2017).
**Notes:** The size of money market funds is measured as outstanding money market fund shares (liabilities) in table L.121 of the Financial Accounts of the United States. Commercial paper refers to commercial paper (liabilities) issued by any sector (table L.2019), which includes asset-backed commercial paper. Repo liabilities of broker-dealers are based on security repurchase agreements (liabilities) in table L.130. Securities lending captures net securities loaned by funding corporations in table L.132.

mortgage debt by around 1 percent. In part, this reflected the fact that existing homeowners extracted housing equity by taking out additional debt. More importantly, new homeowners took out larger mortgages in order to purchase more expensive homes.

As a result, affordability metrics for households become increasingly stretched. The share of the stock of mortgagors with debt of more than four times their income more than doubled between 2001 and 2007 from 6 percent to 13 percent.[2] The number of new subprime

[2] Above we have argued that debt servicing ratios (DSRs) are a good proxy for deleveraging risk. The variation in debt-to-income ratios that we consider here is closely related to variation in DSRs, but strips out variation in interest rates (which affects the cost of servicing a loan of a given size).

## Table 2. U.S. Household Debt and Its Characteristics

| | A. Household Debt and House Price Boom | | | | |
|---|---|---|---|---|---|
| | **2001:Q4** | **2004:Q4** | **2007:Q4** | **2017:Q4** | |
| Level of Indebtedness: $trn; (% GDP in Parentheses) | | | | | |
| Household Debt | $7.9 (73.4%) | $10.9 (86.4%) | $14.3 (97.1%) | $15.1 (76.6%) | |
| of which: Mortgage Debt | $5.3 (49.7%) | $7.9 (62.5%) | $10.6 (72.4%) | $10.1 (51%) | |
| House Prices | | | | | |
| Annual Growth | 6.7% | 13.7% | −5.3% | 6.2% | |
| Loan-to-Value Ratio (Mortgage Debt/Housing Assets) | | | | | |
| Household Sector | 35.8% | 37.6% | 45.7% | 36.1% | |
| | **B. The Heavily Indebted Tail and Marginal Borrowers** | | | | |
| | **2001:Q4** | **2004:Q4** | **2006:Q4** | **2007:Q4** | **2017:Q4** |
| Heavily Indebted Tail | 2001 | 2004 | — | 2007 | 2016 |
| LTV > 90% | 9.5% | 9.4% | — | 9.4% | 10.6% |
| Debt to Income > 4x | 6% | 11% | — | 13.2% | 10.7% |
| DSR > 40% | 16.9% | 17.3% | — | 20.2% | 13.9% |
| Marginal Borrowers | 2003 | 2004 | 2005 | 2006 | 2007:H1 |
| Subprime | | | | | |
| Originations (# million) | 1.1 | 1.7 | 1.9 | 1.4 | 0.2 |
| Combined LTV (%) | 90% | 95% | 100% | 100% | 100% |
| Proportion on "Teaser" Rates (%) | 68% | 77% | 81% | 77% | 68% |
| "Near-Prime": Alt-A Pools | | | | | |
| Originations (# million) | 0.3 | 0.7 | 1.1 | 0.9 | 0.3 |
| Median Combined LTV (%) | 90% | 90% | 90% | 95% | 95% |
| Proportion Interest Only (%) | 16% | 37% | 40% | 44% | 52% |

**Sources:** Financial Accounts of the United States; S&P/Case-Shiller; Federal Reserve Board's "Household Debt Service and Financial Obligations Ratios" release; Survey of Consumer Finance; Mayer, Pence, and Sherlund (2009).
**Note:** Based on Aikman, Bridges, Kashyap, and Siegert (2019).

mortgages nearly doubled between 2003 and 2005, and 80 percent of these mortgages were made with short-term "teaser" interest rates (Mayer, Pence, and Sherlund 2009).

Financial fragility and household debt affected the depth of the subsequent downturn in two separate but related ways. The fragilities in the financial system meant that lenders had to cut back lending as they struggled to absorb losses and saw funding withdrawn, which led to a credit crunch that reduced investment and employment. As households also struggled to deal with excessive debt, they cut spending, amplifying the downturn further. This effect is typically referred to as "household deleveraging risk" or the "aggregate demand externality."[3]

### *3.1.1 Possible Interventions*

Based on a range of studies, Aikman et al. (2019b) find that each of these two channels can explain between one-third and one-half of the depth of the crisis. So in order to make a meaningful difference to the severity of the crisis, authorities would have had to address both financial-sector fragility and household indebtedness. Aikman, Bridges, Kashyap, and Siegert (2019) estimate that policy interventions to significantly reduce both of these vulnerabilities would not have been prohibitively expensive, but they would have required an activist approach to macroprudential regulation.

However, the authority nominally in charge of financial stability, the FSOC, lacks the powers that would have been necessary to fully address the vulnerabilities that developed in the run-up to the crisis. In particular, the FSOC has no authority that would allow it to limit household debt buildups itself. It could have issued a "comply or explain" recommendation to the predecessor of the Federal Housing Finance Agency or relevant banking regulators to restrict the availability of mortgage financing. But it is not clear that these agencies would have had the authority to intervene on the grounds

[3]See Kashyap and Lorenzoni (2019) for a model that captures stability risks from both borrower and lender vulnerabilities and can be used to study when separate tools are needed for attending to both.

of financial stability concerns.[4] And while many of the macroprudential authorities that have been set up in other countries rely on issuing similar nonbinding recommendations, there are some indications that the FSOC's ability to influence other regulators is limited.[5] Attempts to issue recommendations have in the past received pushback from the relevant primary regulators. And in the context of money market mutual funds, the FSOC never finalized the draft recommendation that it had consulted on, even as the Securities and Exchange Commission decided to implement reforms that were more limited in scope.

The FSOC's ability to move unregulated entities into the regulatory perimeter is also limited. The FSOC's primary tool is the ability to designate nonbanks for higher capital requirements and enhanced supervision by the Federal Reserve Board. However, this process is limited to designating a small number of systemically important institutions, and some designations have been challenged and overturned by the courts. The FSOC can also issue "comply or explain" recommendations to impose new or heightened standards for all firms conducting certain activities to relevant primary regulators. But this relies on activities already being regulated. There is no clear process (such as a regular public review) for asking Congress to expand the regulatory perimeter to other, currently unregulated, activities.[6]

[4]Problems might not have been limited to the formal mandate of the primary regulators. In addition, there may have been issues in relation to regulators' resourcing and expertise. The predecessor agency to the Federal Home Financing Agency, the Office of Federal Housing Enterprise Oversight (OFHEO), ran a stress test in the first quarter of 2008 and concluded that Fannie Mae (Federal National Mortgage Association) and Freddie Mac (Federal Home Loan Mortgage Corporation) were capitalized sufficiently to withstand a 10-year period of housing market stress. Both Fannie Mae and Freddie Mac were deemed insolvent by September 2008. Based on this track record, it seems doubtful to us that the OFHEO would have been inclined to follow any guidance in this area.

[5]Edge and Liang (2019) document that out of 47 financial stability committees they survey, only 4 have powers to take direct actions themselves. In this sense the FSOC may be the rule rather than the exception internationally.

[6]In principle, the FSOC could recommend changes in the scope of regulation to Congress as part of the annual testimony on the FSOC's risk assessment. But we are skeptical if this would catalyze action unless it was part of a regular statutory process, such as an annual review of the regulatory perimeter.

The Federal Reserve Board's new post-crisis toolkit would likely have allowed it to address some of the vulnerabilities in the financial system. For example, it could have uncovered and addressed leverage and maturity mismatches in nonbank affiliates of bank holding companies (which would have included a number of large broker-dealers) via its annual stress tests, increased countercyclical capital buffers for bank holding companies, and set minimum margin requirements. But the Fed's powers are also limited. The Fed also lacks a clear, well-defined process for asking Congress to expand the scope of its supervisory powers to apply to new types of financial companies that might pose risks. And it has no tools that can be used to tackle household debt vulnerabilities. A June 2015 "war game" exercise conducted by four Reserve Bank presidents concluded that instead, the Fed's FOMC might have had to use monetary policy to lean against a buildup of risks outside of the core financial system (Adrian, de Fontnouvelle, et al. 2017).

Of course, post-crisis reforms have significantly changed the structure of the financial system, so the initial conditions we would be starting from would be very different. The banking system is better capitalized, and broker-dealers have either disappeared or been brought into the scope of prudential regulation. This means that an exact rerun of the developments that led to the last crisis would be much less damaging. So perhaps a more relevant consideration is whether the financial stability concerns that are currently being raised by the Federal Reserve Board could be well managed by the FSOC. This mirrors the focus of a more recent "war game" that Federal Reserve officials conducted in 2018 (Duffy et al. 2019).

### *3.2 Addressing Vulnerabilities Identified in the Last Two FSRs*

The commentary in the Federal Reserve Board's first two FSRs suggests that currently the Federal Reserve's concerns focus on vulnerabilities in the area of asset valuations and corporate debt. Conversely, it strikes a more sanguine tone with respect to financial system leverage, funding risks, and household debt.

### *3.2.1 Asset Valuations*

Within the broad area of asset valuations, the November 2018 FSR opens by discussing risks related to the high valuation of long-term Treasuries. It suggests that high valuations are in part driven by historically low term premiums—the difference between the yield investors require for holding longer-term Treasuries and the expected yield from rolling over shorter-dated ones. The May 2019 FSR provides evidence that low Treasury yields appear to be reflected in elevated prices of a range of other assets, such as corporate bonds or commercial real estate. This should not come as a surprise, as investors tend to use Treasury yields as a proxy for the risk-free rate that is used to discount the future payoffs of a wide range of financial assets.

Stretched asset valuations matter for financial stability because any sharp downward adjustment in prices can expose investors to losses and may threaten their solvency or liquidity.[7] However, not all sharp falls in asset prices are the same. For instance, the $20 trillion S&P 500 equity market briefly fell by 20 percent toward the end of 2018, and yet the real economy has continued to perform well. Similarly, while sharp falls in equity prices at the end of the "dot-com bubble" coincided with a recession, this recession was short and was generally considered benign by historical standards. Conversely, the 20 percent falls in house prices, and the resulting sharp fall in value of $1 trillion of U.S. subprime mortgage-backed securities in 2007 triggered a global financial crisis. Jordà, Schularick, and Taylor (2015) provide evidence that, more generally, equity bubbles are less likely to give rise to financial stability concerns than other types of asset price reversals, and price drops are more likely to pose risks to financial stability if the boom was fueled by debt. This difference may be driven by the fact that credit-driven bubbles can result in a debt overhang on the side of borrowers. It may also reflect the fact that equity funding tends to be provided by less high-leveraged real money investors who find it easier to absorb losses, while "safe" debt is more likely to be held by highly leveraged lenders.

[7]Losses on certain derivative positions can trigger significant margin calls, which can expose some nonbanks to liquidity risk even if there are no concerns regarding their solvency (see, e.g., Bank of England 2018).

One specific asset class that the FSR focuses on is corporate debt, and leveraged loans in particular. The November 2018 FSR presented evidence that high valuations in this sector are not fully explained by the low level of risk-free rates, and that the valuations appear particularly stretched for more risky assets (e.g., leveraged loans rated BB or lower). As part of a detailed discussion of ways in which leveraged loans could pose risks to financial stability, the May 2019 FSR shows that traditional financial institutions appear to be resilient to any sharp fall in asset prices, and that risks are more likely to be driven by the behavior of highly indebted borrowers (see below). However, sharp falls in asset prices may also pose risks to nonbanks that are important investors in leveraged loans and the collateralized loan obligations (CLOs) that are used to securitize around one-quarter of the global leveraged loan market. This includes structured credit funds, CLO managers, and hedge funds. Indeed, Bank of England (2019) shows that the majority of CLOs are held by nonbanks.

### *3.2.2 Borrowing by Businesses*

High valuations of corporate debt tend to translate into accommodative conditions for new corporate borrowing, and into a buildup in corporate leverage. The FSR provides evidence that the current environment is no exception, and shows that the business credit-to-GDP ratio has grown significantly in the past five years. By May 2019 it had reached a historical high level. The ratio of debt to assets for publicly traded nonfinancial firms is also at one of the highest levels in recent history. Detailed analysis of balance sheet data suggests that within that, the most highly leveraged firms have increased their debt load the most. However, total debt service costs for these risky firms are being held down by low interest rates and are still at the low end of their historical range.

While the May FSR argues that losses on corporate loans are unlikely to pose risks to leveraged financial institutions that hold these loans, it does highlight risks related to the behavior of borrowers. In particular, any reassessment of risks in the corporate sector and the resulting tightening in financial conditions could have an effect on investment and employment by highly indebted corporates. This could have significant macroeconomic consequences and

make any future downturn worse, including due to aggregate demand externalities similar to the ones discussed above.

### *3.2.3 Possible Interventions*

Given the lack of summary indicators, it is unclear whether the Federal Reserve Board believes the vulnerabilities identified in its FSRs warrant policy actions. Instead, we focus on discussing potential policy options *assuming the risks warranted a meaningful policy response.*

The ability to mitigate threats from misaligned asset prices depends in part on the perceived reasons for any mispricing and the asset classes that are affected. Part of the elevated asset valuations appear to be driven by compressed term premiums, which affect a wide range of asset classes. This makes it difficult to use macroprudential measures to target asset valuations at source, e.g., by reducing the amount of new money flowing into a specific asset class. Instead, it may be appropriate to build resilience to potential price corrections by strengthening capital and liquidity requirements across the entire financial system. However, doing so is difficult, not least because large parts of the financial system are not currently subject to prudential requirements, and the FSOC and its member organizations have limited powers to impose such requirements.

In addition to compressed term premiums, there appear to be sector-specific factors that result in high valuations of corporate debt. An effective way of tackling risks specific to corporate debt valuation might be to subject the entities that are most exposed to risky corporate debt, such as structured credit funds, CLO managers, and hedge funds, to appropriate prudential requirements. However, these entities do not currently tend to be within the regulatory perimeter.

Instead, the appropriate policy response may involve limiting the amount of additional debt flowing into the corporate sector. Regulators could, for example, impose limits on banks' ability to originate loans that would result in the borrower's total debt exceeding a multiple of its earnings. Such an intervention would be similar to the nonbinding 2013 "Interagency Guidance on Leveraged Lending" published by U.S. banking regulators. Applying such rules at the

origination stage would mean that they are effective even if the loans are not retained on banks' balance sheets.

Limiting the amount of new capital that can be made available to fund corporate debt would also address the vulnerabilities associated with corporate indebtedness by reducing borrowers' ability to take on additional debt and making them less likely to contribute to aggregate demand externalities in a downturn. However, the FSOC does not have any binding powers in this area. And while the Fed and other FSOC members might be able to take action, banking regulators have recently clarified that their existing nonbinding guidance in this area should be read as ensuring the resilience of banks rather than leaning against a buildup in corporate indebtedness. The head of the Office of the Comptroller of the Currency, for example, noted in February 2018 that "institutions should have the right to do the leveraged lending they want, as long as they have the capital and personnel to manage that and it doesn't impact their safety and soundness."[8] This statement suggests that banking regulators may feel they are not authorized to act based on concerns around borrower deleveraging risk.

These observations lead us to three important conclusions. First, both in the run-up to the global financial crises and in a hypothetical scenario in which the vulnerabilities identified in the current FSR intensify, effective policy interventions would involve changes to the regulatory perimeter as well as actions targeted at borrower indebtedness. Second, both historically and currently, the Federal Reserve Board is not well positioned to manage all of these vulnerabilities using its supervisory tools. Third, the FSOC also lacks the authority and tools to fully attend to these risks. This assessment is consistent with concerns voiced by Dudley (2015) and Fischer (2015) that the migration of activities outside of the regulatory perimeter, the lack of policy tools that can be flexibly recalibrated over time to match evolving risks, and the fragmentation of the regulatory landscape leave the United States without a fully effective macroprudential framework.

[8]See https://www.forbes.com/sites/debtwire/2018/02/28/new-occ-head-disowns-post-crisis-lending-guidelines-expects-leverage-to-increase/#30c27a3a54db.

## 4. Monetary Policy and Financial Stability Risks

The last section demonstrated that the Fed cannot reasonably expect other authorities to address all of the financial vulnerabilities that may develop. To the extent that the Fed's mandate of ensuring price stability and full employment was orthogonal to financial stability, this might not be an issue that the Fed needs to worry about. But below, we argue that there are a number of ways in which monetary policy and financial stability affect each other.

### *4.1 Effect of Financial Instability on Monetary Policy*

Financial instability can have important implications for the FOMC's ability to achieve its monetary policy objectives of maximum employment and stable prices.

The most obvious way in which financial stability can affect the objectives of a monetary policymaker is by contributing to high unemployment, and by causing deflationary pressures that monetary policy may find difficult to offset. The latter is particularly relevant in a world characterized by low equilibrium interest rates ("r*"). The combination of a persistent slowdown in economic growth and shifting demographics means that the nominal rate of interest that we would expect the economy to operate at in equilibrium is currently estimated to be in the region of 2.5 percent, less than half its level in the late 1980s.[9]

The structural shifts that caused this decline in equilibrium interest rates are beyond the control of monetary policymakers. However, they are relevant for the conduct of monetary policy, as they may restrict the FOMC's ability to react to adverse shocks by lowering the federal funds rate below this equilibrium level. Historically, even standard recessions were typically associated with a roughly 5 to 6 percentage point reduction in the federal funds rate; and a modified Taylor rule suggests that if it hadn't been for the fact that interest rates cannot be reduced significantly below zero (the "effective lower bound"), it would have been appropriate to cut interest

[9]See, e.g., Holston, Laubach, and Williams (2017). This 2.5 percent is based on a predicted real rate of 0.5 percent and an assumed inflation rate of 2 percent.

rates by 9 percentage points during the last financial crisis.[10] So the FOMC may be stuck at the effective lower bound more frequently, and this would be especially likely following another severe financial crisis.

If low equilibrium interest rates restrict the FOMC's ability to react to future shocks in a way that allows the FOMC to "clean up" the consequences of the shock and continue meeting its inflation target, then the Fed should have an interest in ensuring that such shocks are as rare as possible.

### *4.2 Effect of Monetary Policy on Financial Stability*

Importantly, the connections between monetary policy and financial stability run in both directions: while financial instability can affect the efficacy of monetary policy in "cleaning up" after a credit boom, loose monetary policy can also contribute to the buildup of a credit boom. This has led to a large body of literature that considers the merits of running monetary policy that is tighter than warranted by current macroeconomic conditions in order to "lean against the wind" (see below).

There are a number of ways in which discretionary monetary policy decisions could affect financial stability. We focus on the effect that monetary policy might have on the vulnerabilities described in the May 2019 FSR. This task is made more difficult by the fact that the FSR itself is largely silent on how monetary policy and financial stability risks may interact. Moreover, we focus on the effect of *unconventional* monetary policy tools on these vulnerabilities. Following the global financial crisis, the Fed has taken unprecedented actions to contribute to a slow but steady economic recovery, and has prevented much greater pain being inflicted on the economy.[11] These actions included reducing short-term interest rates to their effective lower bound, providing extensive liquidity support, providing forward guidance, and conducting large-scale asset purchase programs ("quantitative easing") that provided monetary stimulus while also helping to jump-start frozen asset markets. The decline in equilibrium interest rates that we have observed over the past

[10] See Bernanke (2015) and Rosengren (2019).

[11] See, e.g., International Monetary Fund (2013) or Chen et al. (2016).

decades creates challenges for traditional policy levers and may mean that policies like quantitative easing become a much more regular component of monetary policymakers' toolkit.

Below, we argue that unless accompanied by appropriate macroprudential measures, the more regular use of unconventional monetary policy tools could intensify the vulnerabilities identified in the FSR. If the Fed wants to be confident that it can always run a monetary policy stance that is appropriate in light of current macroeconomic conditions without worrying about contributing to a credit boom, then the Fed may want to ensure that any financial stability risks are being addressed effectively via other tools.[12]

### *4.3 Effect of Unconventional Monetary Policy on Asset Valuations*

There is extensive evidence that the large-scale asset purchases that central banks conducted in the wake of the global financial crisis reduced Treasury yields not just by lowering future expected policy rates but also by compressing term premiums (see, e.g., Gagnon et al. 2011; Krishnamurthy and Vissing-Jorgensen 2011; D'Amico et al. 2012; Li and Wei 2013; Hanson and Stein 2015; Abrahams et al. 2016; and Kaminska and Zinna 2019). Moreover, a range of studies show that large-scale asset purchases also affected the prices of other assets such as corporate bonds (see, e.g., Krishnamurthy and Vissing-Jorgensen 2011; Joyce et al. 2012; and Swanson 2015).

The fact that unconventional monetary policy affects term premiums is hardly surprising. Asset purchases can not only contain a signal about future monetary policy, but they also have a mechanical effect on the balance between supply and demand for long-term bonds. Given that term premiums are defined as the yield *not explained* by future interest rate expectations, any increase

[12]A similar logic led the United Kingdom's Monetary Policy Committee to include a financial stability knockout criterion in its 2013 forward guidance. This criterion stated that the MPC would abandon its forward guidance if "the Financial Policy Committee (FPC) judges that the stance of monetary policy poses a significant threat to financial stability that cannot be contained by regulatory actions."

in bond prices that is driven by a greater scarcity of Treasuries will show up as a compression in term premiums. The effect of quantitative easing on term premiums is one of the key distinguishing features between quantitative easing and other monetary policy tools. Indeed, reducing term premiums was one of the key objectives of the Fed's large-scale asset purchases (see, e.g., Kohn 2009).

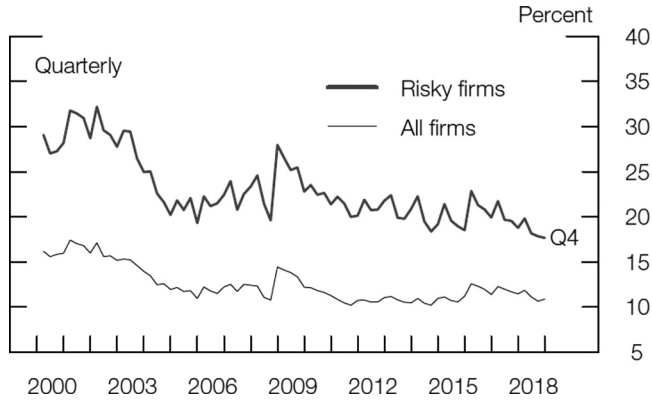
Low levels of term premiums are one of the key drivers of asset valuations highlighted in the May 2019 FSR. Stretched asset valuations are always a source of risk, but they may be of particular concern if they are driven by compressed term premiums. A compression in term premiums means that investors receive less compensation for the risk that inflation or short-term interest rates may surprise on the upside. This not only leaves the prices of long-term Treasuries, and the investors who hold them, vulnerable to a snap-back of interest rates to previous levels, but it also makes them more vulnerable to small deviations from their new expected path.

### *4.4 Effect of Unconventional Monetary Policy on Corporate Indebtedness*

If monetary policy reduces the yield that investors expect to earn on corporate bonds, then this should also make it cheaper for corporates to roll over existing debt once it falls due. In the short term, this is good news from a financial stability perspective, as it reduces the burden of servicing an existing stock of debt. But in the longer term, financially constrained corporates may be tempted to use the additional breathing space that loose monetary policy affords them to increase the amount of debt funding. This is consistent with the fact that despite significant falls in interest rates, interest expense ratios for U.S. public nonfinancial corporates have remained broadly stable since 2005 (see figure 2).

The risks associated with such corporate "releveraging" may become apparent if interest rates rise again in the medium run, which might make some corporate borrowers' interest expense ratios unsustainable. Interest rates would appear to be most at risk of increasing if monetary policy rates are significantly below the long-term equilibrium rate of interest, or if unconventional

**Figure 2. Interest Expense Ratio for Public Nonfinancial Corporations in the United States**




**Source:** May 2019 Financial Stability Report.
**Note:** The interest expense ratio is defined as the ratio of total interest expenses to earnings before interest, depreciation, and taxes.

monetary policy has led to a temporary compression in term premiums.[13]

The risks associated with such releveraging are not confined to corporates. Internationally, policymakers tend to be at least as worried about the risks associated with household indebtedness, which might also be triggered by a snap-back in term premiums (or interest rates more generally). However, the average initial fixed interest rate period for mortgages in the United States (by far the biggest liability of U.S. households) is currently more than 25 years. More than four out of five new mortgages that have been taken out have had interest rates that are fixed for 30 years (Pradhan 2018). These choices mean that U.S. households are currently relatively insulated from rate movements so that any interest rate risk is likely to be borne by lenders.[14]

[13]This illustrates that a *tightening* in monetary policy can lead to the *crystallization* of vulnerabilities that have previously built up. However, our discussion focuses on the effect of monetary policy on the buildup of future vulnerabilities.

[14]A corollary of this is that lenders will need to hold enough capital to be able to absorb any interest rate risk without having to deleverage.

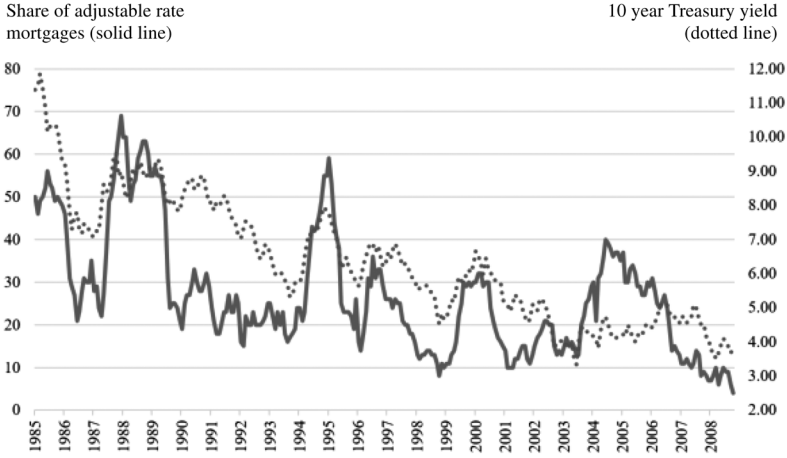
There are two important caveats to this relatively sanguine assessment of risks stemming from the interaction between monetary policy and household indebtedness in the United States. First, the shares of mortgages with long fixed terms vary regionally. In particular, more expensive areas tend to feature a larger share of adjustable-rate mortgages, which may appear more affordable. In particularly expensive areas such as Silicon Valley, the share of adjustable-rate mortgages is twice the national average. So there might be some regional variation in the effect of an interest rate snap-back. More importantly, the share of new mortgages that have adjustable rates tends to increase as interest rates rise and "locking in" low rates by taking out a fixed-rate mortgage seems less attractive.[15] For instance, when interest rates increased toward the end of 1994, the share of new mortgages that had adjustable rates reached more than 50 percent, with similar dynamics being observable in other tightening cycles (see figure 3). So the relatively benign current conditions for household exposure to interest rate movements are not guaranteed to persist.

### *4.5 Empirical Evidence for the Relationship between Term Premiums and Financial Stability*

To explore the empirical significance of term premiums for financial stability, we can turn to the emerging literature on GDP-at-risk (see, e.g., Adrian et al. 2018; International Monetary Fund 2018; Adrian, Boyarchenko, and Giannone 2019; and Aikman, Bridges, Hoke, et al. 2019). Standard regression analysis seeks to explain the *mean* of the distribution of the variable of interest. The GDP-at-risk framework instead investigates the relationship between different indicators and the *left tail* of the future distribution of GDP. In our analysis we look at the determinants of the 10th percentile of the future GDP distribution. Roughly speaking, this allows us to check how financial stability risks affect the severity of a one-in-ten-year downturn at different time horizons. While not all downside risk to future GDP

[15] See Moench, Vickery, and Aragon (2010) for a more detailed analysis of how the share of adjustable-rate mortgages depends on (the term structure of) interest rates.

**Figure 3. Correlation between the Share of Adjustable-Rate Mortgages and Interest Rates**




**Source:** Federal Reserve and Federal Housing Finance Agency Monthly Interest Rate Survey.

is driven by financial conditions, we would certainly expect financial vulnerabilities to affect this downside risk.

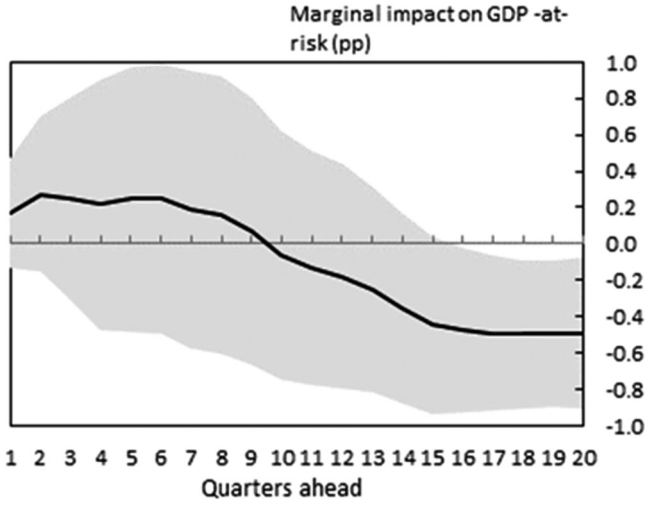
More specifically, our GDP-at-risk calculations summarize the relationship between the 10th percentile of the GDP distribution at various forecast horizons $k$ as a function of vulnerabilities $X$ and a set of control variables $Z$ today (time $t$):

$$GDP^{10}_{t+k} = \beta X_t + \gamma Z_t.$$

Drawing on the methodology in Aikman, Bridges, Hoke, et al. (2019) and data on 16 advanced-economy countries running from 1995 to 2017, we find a subtle relationship between a compression in term premiums and the 10th percentile of future GDP. While a one-standard-deviation compression in term premiums seems to make relatively bad GDP outturns less bad in the short run, the net effect of a compression in term premiums turns significantly negative in the longer run (see figure 4).

While the evidence is only indicative and should not be interpreted as establishing a causal relationship, it is consistent with a

**Figure 4. Effect of a One-Standard-Deviation Compression in Term Premiums on the 10th Percentile of GDP (in percentage points)**

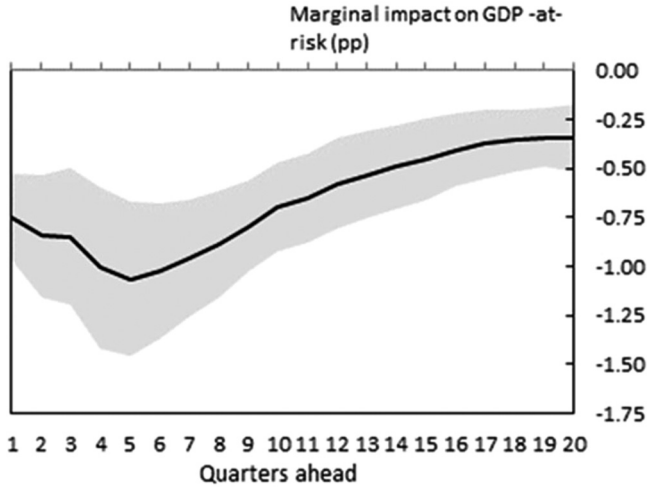



**Notes:** See Aikman, Bridges, Hoke, et al. (2019) for details on the methodology and data. Changes in GDP are measured as the change in the average annual rate of growth at each horizon. Shaded swaths indicate a two-standard-deviations range. All regressions control for lagged GDP growth to control for general macroeconomic conditions.

story where a compression in term premiums improves the short-term outlook for financial stability by supporting asset prices and reducing households' and corporates' debt servicing costs, but contributes to risks building up over time. Figure 5 provides some indicative evidence that this effect might operate through the influence of term premiums on debt servicing ratios and subsequent "releveraging" decisions. The chart demonstrates that GDP-at-risk is strongly correlated with the overall level of DSRs, and that higher DSRs are associated with larger downside risks to GDP growth over the entire horizon.[16]

[16]Hofmann and Peersman (2017) provide separate, confirming evidence on this effect by demonstrating that monetary tightening leads to an initial increase in DSRs, which is partially offset by lower debt levels in the long run. While this

**Figure 5. Effect of a One-Standard-Deviation Increase in DSRs on the 10th Percentile of GDP (in percentage points)**




**Notes:** See Aikman, Bridges, Hoke, et al. (2019) for details on the methodology and data. Changes in GDP are measured as the change in the average annual rate of growth at each horizon. Shaded swaths indicate a two-standard-deviations range. DSR data are taken from the BIS database for debt service ratios. The measure of DSRs that we use captures the debt service ratios of both households and nonfinancial corporations. Data on DSRs are only available from 1999, so figure 5 is based on a shorter sample than that used for figure 4. All regressions control for lagged GDP growth to control of general macroeconomic conditions.

## 5. Where Does This Leave Us?

The foregoing sections can be summarized as making two arguments. First, the Fed cannot reasonably expect the FSOC or any of its other member organizations to take action to address all of the vulnerabilities that may emerge in the future. Second, there are important interdependencies between its monetary policy objectives and financial stability that the Fed ought to take into account. If monetary policy can affect financial stability risks (and vice versa), then the

evidence looks at changes in the policy rate, we would expect to see similar effects for an increase in term premiums.

Fed should have an interest in ensuring that somebody is unambiguously responsible for addressing—and is empowered to address—these risks. That kind of separation in responsibilities would allow the FOMC to set aside financial stability risks when deciding on its monetary policy stance. However, given the remaining gaps in the regulatory architecture, that option does not currently exist. This leaves three alternatives to address the void.

### *5.1 Option 1: Revisit the FSOC*

First, the Federal Reserve could encourage Congress to redesign the FSOC and expand its powers to effectively manage financial stability risk. In particular, the FSOC would need to have a more extensive and active role in publicly reviewing and—where necessary—recommending to expand the regulatory perimeter, and would need to have powers to address borrower indebtedness. This is important because the FSOC cannot rely on its members to be the front-line responders for dealing with these vulnerabilities. The member agencies do not have the relevant powers either, and, as Kohn (2014) has emphasized, not all the members even have an explicit financial stability objective.

Expanding the toolkit of the FSOC would appear to be the most natural approach, as it would build on the existing macroprudential framework that the United States has put in place following the crisis. It would also ensure that financial stability decisions are made by an authority that is used to focusing on tail risks rather than the central outlook of the economy (as, e.g., monetary policymakers are). Given that the Chairman of the Federal Reserve Board is a member of the FSOC, such an arrangement could also ensure effective coordination between monetary policy and macroprudential policy.[17]

[17]By "coordination" we do not mean that macroprudential policy and monetary policy should always be tightened or loosened at the same time. Our discussion above has illustrated that it can be optimal to tighten macroprudential policy precisely when monetary policy is optimally loose. Instead, we mean that the relevant policymakers are aware of each other's views and—where relevant—intended actions.

However, there is a widespread belief that the post-crisis overhaul of the regulatory framework has been completed, and whether an initiative to revisit the FSOC's powers would be successful is therefore doubtful. The experience of the Office of Financial Research (OFR) casts doubt on whether there is much appetite in either the Treasury or Congress for having a much more activist FSOC.[18] The OFR has been starved for resources and encountered various challenges when it tried to promote discussions of financial stability risks.

Moreover, this approach would double down on the current structure of the FSOC. This structure is centered on the Treasury Secretary, who chairs the Council and has numerous responsibilities, while the independent staffing available to support the FSOC is limited. The fact that the FSOC is chaired by a member of the administration can make it difficult for the committee to consistently abstract from short-term political considerations.

In practice, it seems that the committee's activities and actions have oscillated with the changes in the chairs. For example, in 2016 the chair appealed a ruling that MetLife was not to be designated as systemically important by the FSOC. Under a new chair, the FSOC supported dismissing this appeal in 2018, and published new designation guidelines that were publicly criticized by the two previous FSOC and Federal Reserve Chairs.[19]

One last consideration is that if the responsibilities of the FSOC were to be reopened, it seems inevitable that each of the member agencies would need to be consulted regarding changes. Given the different orientations and objectives of the different agencies, this sort of consultation is unlikely to result in the members speaking in unison.

[18]As a matter of disclosure, Kashyap was on the Federal Research Advisory Council to the OFR; however, these views are our own and we have not discussed this with any current or former members of the OFR leadership or the U.S. Treasury.

[19]The authors of the comment stated, "We caution against taking the steps outlined in the proposed guidance. We believe that these steps — in design and in practice — would neuter the designation authority. Though framed as procedural changes, these amendments amount to a substantial weakening of the post-crisis reforms. These changes would make it impossible to prevent the build-up of risk in financial institutions whose failure would threaten the stability of the system as a whole." See https://int.nyt.com/data/documenthelper/887-bernanke-geithner-lew-yellen-letter/a22621b202dfcb0fe06e/optimized/full.pdf#page=1.

### *5.2 Option 2: Expanding the Federal Reserve Board's Toolkit*

As a second option, the Fed could ask Congress to amend the Federal Reserve Act to give the Federal Reserve Board an explicit financial stability objective, and to expand the Federal Reserve Board's toolkit beyond its existing supervisory powers to allow it to achieve this objective. Such an option might seem attractive, as it would be most likely to ensure the effective coordination of macroprudential policy and the FOMC's monetary policy decisions. The coordination benefits of having macroprudential policy and monetary policy committees sit within the same institution is one of the reasons why the United Kingdom decided to set up its macroprudential authority as a committee within the central bank. However, in order to address financial stability risks in a targeted and effective manner, the Federal Reserve Board would still require additional powers. Otherwise, the Federal Reserve Board may find itself in the same position that the FSOC is in today. Again, the powers that the Federal Reserve Board would require are likely to include powers to address excessive borrower indebtedness, as well as a process for publicly reviewing the regulatory perimeter and recommending any necessary changes to Congress.

Unless there is a broad consensus that the current arrangements for managing financial stability are inadequate, it is hard to imagine that Congress would make a surgical, targeted technocratic change to include explicit responsibilities and powers with respect to financial stability in the Federal Reserve's remit. But the risks associated with not having a fully effective financial stability framework suggest that there should be significant value in trying to build such a consensus. Hence, we include suggestions for an evidence-based review of the effectiveness of the current regulatory framework below.

### *5.3 Option 3: Use Monetary Policy to Address Financial Stability Concerns*

A third approach could be for the Fed to conclude that financial stability is a necessary condition for achieving maximum sustainable employment and stable prices, and try to take actions to address financial stability risk even without Congress having made any changes to the Federal Reserve Act. However, unless the Federal

Reserve Act is being reopened to amend the Federal Reserve Board's objectives, it seems doubtful that the Federal Reserve Board would receive any of the additional powers that are necessary to address financial stability risks in a targeted way, as part of the Federal Reserve Board's supervisory responsibilities.

Instead, the Federal Reserve System might have to rely on the FOMC to incorporate financial stability considerations into its deliberations over the setting of monetary policy and use monetary policy to "lean against the wind." This would put a significant burden on the FOMC, which does not currently have any regulatory or supervisory objectives. A number of authors have argued that using monetary policy to lean against the wind may be optimal if the macroprudential toolkit is incomplete (see, e.g., Gourio, Kashyap, and Sim 2018; Caballero and Simsek 2019). However, monetary policy is a crude tool and is unlikely to be the most effective way of addressing financial stability risks (see, e.g., Farhi and Werning 2016 and Korinek and Simsek 2016). Convincing Congress to amend the Federal Reserve Board's objectives may hence be a price worth paying to be granted powers that allow the Federal Reserve Board to achieve those objectives.

## 6. Conclusion

Given that we have just passed the 10-year mark since the global financial crisis, there have been many conferences devoted to looking at the lessons from the crisis. In the course of these discussions, there have been many calls to reconsider whether the Dodd Frank Act went too far in regulating various aspects of the financial system. The current administration is in the process of rolling back some parts of Dodd Frank. This kind of reconsideration seems appropriate. Dodd Frank was enacted right after the crisis, and Congress has not yet undertaken a systematic review of this far-reaching piece of legislation in light of new research on the causes and consequences of the crisis, as well as in light of structural changes in the financial system.

However, it seems equally appropriate to step back and ask whether there are financial stability risks that Dodd Frank did not fully mitigate. As a first step, authorities would need to collect more

granular data, including data on the distribution of debt across different borrowers, to identify financial stability risks. This could be achieved by enhancing the data-gathering abilities of the OFR. In addition, our analysis strongly suggests that there are two structural gaps in the current macroprudential landscape in the United States. One is the absence of any regulator having sufficient authority to extend the regulatory perimeter to account for risks that continue to appear outside the banking system. The fact that the Federal Reserve Board identifies leverage lending as a source for concern and that a large fraction of leveraged lending exposures are held by investors that reside outside of the regulatory perimeter is a timely reminder of why authorities need the flexibility to adjust the regulatory perimeter. A second gap is the absence of tools that regulators have for dealing with borrower indebtedness.

Our suggestion is for Congress to establish an expert commission to take a systematic look not only at whether there are areas in which post-crisis reforms have unnecessarily restricted the provision of financial services to the real economy, but also whether there are important regulatory gaps in the current architecture. This commission could survey international best practices for how financial stability risks have been addressed elsewhere and consider what might be suitable for the United States. It could also draw on detailed work that the Financial Stability Board has been doing at an international level to evaluate the effectiveness of post-crisis reforms and to identify new, emerging vulnerabilities. While the appetite to make any far-reaching changes to the U.S. framework may be limited, we believe our analysis suggests that there is a strong case for examining whether the current regulatory framework gives authorities enough flexibility to address emerging risks. And as a profession, we would struggle to explain why we have not done everything we can to reduce the risk of future crises.

The recent experience of the U.S. Commission on Evidence-Based Policymaking provides some insights into how such an expert commission might be designed. That commission was a bipartisan effort that was set up to address challenges that existed across multiple government agencies. It was sponsored by members of Congress who strongly believed in the mission of the commission and selected members based on technical expertise. The commission was given a clear deadline for when to issue a final report, and members worked

hard on arriving at recommendations that had unanimous support. Many of their recommendations were included in the Foundations for Evidence-Based Policymaking Act of 2018 that was signed into law. For example, the act requires agencies to appoint a chief evaluation officer, and establishes a Chief Data Officer Council tasked with promoting data sharing among agencies. Upon completion of its work, some members of the commission continued to work through a think tank to support the implementation of the steps that had been agreed upon.

One advantage of starting with a commission to address these issues is that it allows experts to agree on a small set of tangible changes before putting its proposals to Congress. This would help focus the discussion on holes in the macroprudential toolkit that a group of experts identifies as most relevant, rather than debating a full rewrite of the FSOC's mandate or the Fed's responsibilities.

The Fed also has a key role to play in seeing that the issues we have raised are resolved: by publishing a comprehensive and insightful FSR, the Federal Reserve Board has already demonstrated that it takes financial stability very seriously. And the fact that financial stability policy and monetary policy are not always separable from each other means that it should be in the Fed's interest to make sure that financial stability risks are not only identified, but that there is also somebody minding the shop and ensuring that identified risks are being addressed.

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