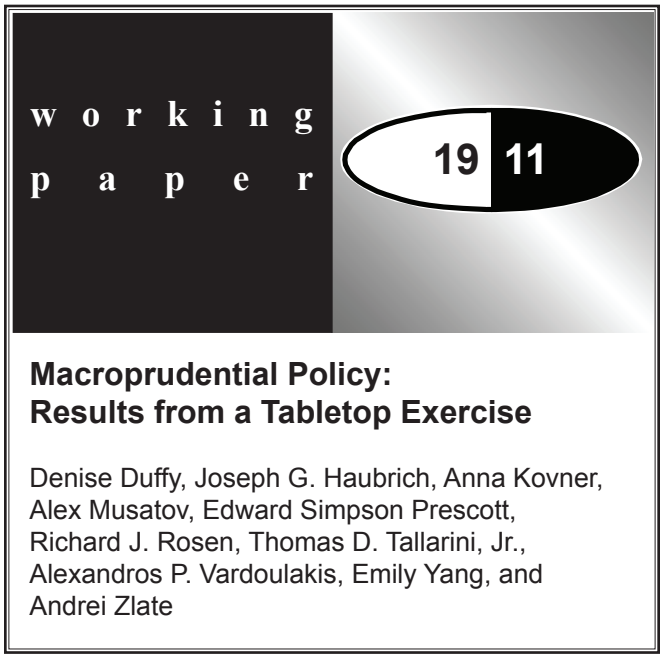

Macroprudential Policy: Results from a Tabletop Exercise

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This paper presents a tabletop exercise designed to analyze macroprudential policy. Several senior Federal Reserve officials were presented with a hypothetical economy as of 2020:Q2 in which commercial real estate and nonfinancial debt valuations were very high. After analyzing the economy and discussing the use of monetary and macroprudential policy tools, participants were then presented with a hypothetical negative shock to commercial real estate valuations that occurred in the second half of 2020. Participants then discussed the use of the tools during an incipient downturn. Some of the findings of the exercise were that during an asset boom, there were limits to the effectiveness of U.S. macroprudential tools in controlling narrow risks and that changes to the fed funds rate may not always simultaneously meet macroeconomic and financial stability goals. Some other findings were that during a downturn, it would be desirable to use high-frequency indicators for deciding when to release the countercyclical capital buffer (CCyB) and that tensions exist between microprudential and macroprudential goals when using the CCyB and the stress test.

Keywords: financial stability, macroprudential policy, monetary policy, tabletop exercise
JEL Codes: E58, G01, G18

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1. Introduction

Since the financial crisis, there has been a renewed interest in the use of macroprudential policy. Broadly, the term macroprudential refers to regulatory policies that promote financial stability or dampen cyclicality in the financial system and its effects on the real economy. Examples of policies that may have macroprudential implications include leverage requirements, the countercyclical capital buffer (CCyB), stress testing, liquidity requirements, and central bank lending.

Several of these tools, such as the CCyB and stress testing, are relatively new and have only been introduced since the financial crisis. Consequently, the Federal Reserve does not have practical experience with them through an economic cycle. Furthermore, other tools, such as loan-to-value guidelines, have been little used in a macroprudential context in the United States. For this reason, the Conference of Presidents' Committee on Financial Stability decided that a tabletop exercise—an interactive guided discussion—in which participants explored the use of macroprudential tools in a hypothetical economic scenario would be a useful way to review these tools, think through the implications and limitations of their use, understand how the tools interact with monetary policy, and identify ways to improve their use.

In November 2018, the authors of this document ran such a tabletop exercise for the committee.[1] The purpose of this memo is to document what the participants learned from the exercise.

[1] Participants in the exercise included Loretta Mester (Federal Reserve Bank of Cleveland and chair of the Conference of Presidents' Committee on Financial Stability), Lael Brainard (Federal Reserve Board and chair of the Board of Governors' Committee on Financial Stability), Robert Kaplan (Federal Reserve Bank of Dallas), Neel Kashkari (Federal Reserve Bank of Minneapolis), Eric Rosengren (Federal Reserve Bank of Boston), and John Williams (Federal Reserve Bank of New York).

This document first provides an overview of the exercise. Next, it summarizes the discussion, and then presents insights drawn from the exercise.

2. Overview

The exercise consisted of two stages. In the first stage, participants were presented with hypothetical macroeconomic and financial conditions as of 2020:Q2 along with a list of risks facing the economy. The conditions were similar in some ways to those in late 2018, but with a more vulnerable financial system due to higher commercial real estate (CRE) valuations and higher nonfinancial business debt. The purpose of this choice was to generate a discussion that would be useful for analyzing both present economic conditions and somewhat unfamiliar ones.

The scenario was also designed to generate tensions between macroeconomic and financial stability goals. Unemployment was rising but remained low, and inflation expectations were anchored near 2 percent and, if anything, were likely to drop. Based solely on macro conditions, monetary policy should not be tightened. In contrast, the high valuations in the financial sector raised the possibility that a rate increase might be warranted as a way to reduce financial vulnerabilities.

After being presented with the first-stage economic and financial conditions, participants analyzed the economy and discussed the risks facing it. Next, they reviewed macroprudential tools. Then they discussed the tools and how, if at all, they would use them along with monetary policy.

In the next step in the exercise, the participants were presented with a hypothetical second stage that advanced the exercise six months, to 2020:Q4. In the second stage, one of the risks discussed in the first stage was realized, and the participants had to discuss what policy

actions they would pursue. While the participants had been informed of the economic and financial conditions before the start of the first-stage exercise, the specifics of the second stage were not disclosed until the second stage had begun. By not revealing the information about the second-stage scenario during the first stage, the exercise simulated decision-making under uncertainty and prevented the participants from unconsciously crafting their stage-one decisions in anticipation of the stage-two shock. Participants then analyzed the new economic conditions and discussed monetary and macroprudential policy.

At each stage, there was significant and fruitful discussion about the best course of action. The discussions identified tradeoffs in using macroprudential tools, ways to improve their implementation, and their potential limitations. Additional benefits came from discussions about what macro and financial conditions would need to look like in order to make use of particular tools, as well as what additional information might be needed to better understand the risks.

3. Hypothetical Stage-One Scenario

Participants were presented in advance with a large amount of information on economic and financial conditions describing a hypothetical economy as of 2020:Q2. Included was a short Financial Stability Report. A summary of this information follows.

Hypothetical Macroeconomic Conditions

The hypothetical U.S. economy had continued to expand through 2020:Q2, though growth had been slowing and some hints of future weakness were appearing. For example, the growth of real GDP had slowed modestly in the second half of 2019 as the stimulative effects of the 2017 tax reform subsided (Figure 1-1). Real GDP had grown 2.1 percent in the most recent quarter, but this growth was supported by strong investment by nonfinancial firms and

investment in nonresidential structures (Figures 1-2 and 1-3). Furthermore, there were some signs of a pullback in investment, particularly in retail CRE.

The labor market was described as healthy. The unemployment rate had recently increased to 3.7 percent, but remained well within the estimated range of its natural rate (Figure 1-4). Average hourly earnings and the employment cost index for total compensation had been growing at pace of roughly 3 percent (Figure 1-5), while productivity had been growing at a rate of roughly 1 percent (Figure 1-6).

Inflation was close to target, with the latest available PCE inflation reading at 2.1 percent (Figures 1-7 and 1-8). However, inflation expectations were beginning to show signs of drifting lower. It was assumed that the FOMC had been gradually tightening monetary policy since 2018, and the SOMA portfolio had declined consistently with the Committee's public communications. The federal funds rate was 3.25 percent, and markets were expecting two additional increases (25 basis points each) in the next 12 months (Figure 1-9). Finally, long-term interest rates had increased by almost as much as the federal funds rate over the last two years, and the 10-year Treasury rate was 4.00 percent.

Hypothetical Financial Stability Report

The hypothetical Financial Stability Report assessed the vulnerabilities of the U.S. financial system and identified valuation pressures and leverage in the private nonfinancial sector as the biggest vulnerabilities. Figure 2 provides an overview of the report.

Valuation pressures were elevated, having intensified from 2018 levels primarily in equity markets, corporate debt markets, and commercial real estate. In equity markets, the forward price-to-earnings ratio for S&P 500 firms was close to, but below, the highs observed in

the first three quarters of 2018 (Figure 3-1). In corporate debt markets, spreads on investment-grade bonds, speculative-grade bonds, and leveraged loans were low (Figures 3-2 and 3-3).

The other major source of valuation pressures was in CRE (Figures 3-4 and 3-5). CRE prices were at historical highs, while capitalization rates—the ratio of net operating income to property values—were at post-crisis lows. Participants were presented with evidence suggesting that REITs and insurance companies had increased their shares of the CRE market. Moreover, there was evidence that banks, including G-SIBs, were lending to the REITs that were increasing their CRE holdings. Finally, regional banks had significant exposure to CRE.

The other category of elevated financial vulnerabilities was assumed to be nonfinancial sector leverage. The credit-to-GDP ratio, one of the CCyB indicators, had continued to increase during the last two years, moving slightly above its long-term trend (Figure 3-6). Although household sector borrowing had slowly been picking up, most of the build-up in vulnerabilities stemmed from leverage in the nonfinancial business sector. Gross leverage of speculative-grade and unrated firms was high (Figure 3-7).

Vulnerabilities associated with financial sector leverage were presented as low to moderate. Overall, banks remained strongly capitalized and, furthermore, the CCyB had been activated in 2019 and set at 50 basis points. However, Tier 1 capital ratios had trended slightly downward, on average, for regional banks, which are not subject to the CCyB and which continued to have large exposures to commercial real estate and were seeing increases in nonperforming loan ratios (Figures 3-8 and 3-9).

Finally, vulnerabilities associated with funding risks were low, with a few exceptions. Concerns existed for mutual funds that were holding speculative-grade bonds because of potential outflows and forced sales if spreads were to increase from their assumed current

historical lows. Similar concerns existed for loan funds that were holding considerable amounts of low-rated leveraged loans.

Hypothetical Risk Scenarios

Finally, the participants were also presented with three risk scenarios, or potential shocks to the economy:

1. Increased international tensions could depress global economic activity and lower asset prices, raise credit spreads, and generally tighten financial conditions. Multinational firms would be particularly affected, and there would be vulnerabilities in mutual funds and ETFs, particularly those that hold corporate bonds and leveraged loans.
2. Commercial real estate (CRE) prices could drop sharply. The value of loans backed by CRE would drop significantly, and delinquencies would rise. There would be a significant impact on some regional banks and community banks. Life insurance companies and fixed-income mutual funds would be impacted by their holdings of CMBS.
3. Election-year dynamics could lead to a debt-ceiling impasse and uncertainty over tax and spending policy. This situation would lead to a loss of confidence, and foreign holders of U.S. Treasury securities would pull back. Equity markets would decline amid increased volatility.

Macroprudential Tools

Participants were also provided with an overview of macroprudential tools. Here, we provide some background on the tools that will be helpful for understanding the following discussion.

Table 1 provides a list of supervisory and regulatory tools.[2] Some tools, such as capital requirements, can be used to build resilience against shocks, while others, such as credit regulations, can be used to lean against emerging risks. Similarly, some tools can be used to target specific exposures, such as loan-to-value minimums, while others are more general. Owing to the nature of the scenario, the overview and discussion during the exercise focused mainly on the CCyB, the CCAR stress tests, and softer tools such as supervisory guidance, moral suasion, and public communications.

An important feature of most of the tools is that they take time to implement because of the need to go through the rulemaking process required by the Administrative Procedures Act, and in some cases, they require coordination with other regulatory agencies.[3] Many tools are subject to limitations in their scope of application, with most applying only to banking organizations, and particularly larger ones. Some of the softer tools, such as moral suasion, and public communications, can be applied to a broader set of firms, including nonbanks. However, a major limitation of these softer tools is that they are not legally binding. Table 1 summarizes most of these characteristics.

Table 2 provides a list of monetary policy and liquidity tools. A number of monetary policy tools have macroprudential implications, even if that is not their primary policy use. For example, monetary policy tools such as the federal funds rate can act against risks to financial

[2] For more details on regulatory macroprudential tools, see Tobias Adrian, Patrick de Fontnouvelle, Emily Yang, and Andrei Zlate, "Macroprudential Policy: A Case Study from a Tabletop Exercise," Federal Reserve Bank of New York *Economic Policy Review*, February 2017, pp 1-30 (https://www.newyorkfed.org/medialibrary/media/research/epr/2016/epr_2016-adrian-macroprudential-policy.pdf?la=en).

[3] The delay in implementing regulatory macroprudential tools was one lesson from the tabletop exercise described in Adrian et al. (2017).

stability arising from valuation pressures, excess leverage, and liquidity and maturity transformation.

Monetary policy tools, unlike most of the regulatory tools, can be quickly implemented. However, using monetary policy tools to address risks to financial stability could lead to the perception of conflicts between macroeconomic and financial stability policy objectives; that is, monetary tightening may reduce the risks of overheating in specific sectors at the cost of slowing economic growth more broadly. It may also raise concerns about credit allocation, depending on the type of intervention conducted.

All of these tradeoffs with the tools were reviewed during the overview. The overview did not cover lender-of-last-resort activities, such as the discount window, because liquidity problems were not at the heart of the scenario.

4. Summary of Stage-One Discussion

Assessment of Economic and Financial Conditions

The stage-one discussion first focused on assessing the different risks facing the economy. Participants discussed the strong business fixed investment in light of the other conditions and noted that the economic conditions might reflect overly optimistic sentiment, particularly in the CRE sector. A key risk expressed was whether the economy was positioned for a soft landing.

The discussion of risk focused mainly on CRE risk, and participants noted that more granular data on CRE exposures, including information on the geographic distribution of exposures across banks as well as the distribution of CRE exposure by bank size, would be valuable. While leveraged lending was discussed in less detail, the participants shared a similar

sentiment surrounding leveraged loans. Specifically, they noted that detailed data were needed to understand the distribution of highly leveraged loans, since aggregates may mask pockets of risk. In addition, a better understanding of the ultimate holders of leveraged loans was of interest, particularly of those loans in the nonbank sector and for the riskiest tranches of collateralized loan obligation (CLO) debt.

Regarding the corporate debt market, participants mainly focused on the run risk that mutual funds and loan funds could face if spreads were to widen suddenly. They acknowledged that it would be hard to do anything about such a risk because these institutions are regulated by the SEC. Another avenue would be to work through the Financial Stability Oversight Council (FSOC), however that can take time. The participants did not discuss the high equity market valuations.

The participants broadly agreed that the conditions raised some concerns, and there was a discussion on whether rate pauses should be considered.

Macroprudential and Monetary Policy Tools

The second part of the stage-one discussion covered macroprudential tools. This discussion was the most extensive of the exercise. It covered guidance and other supervisory tools, the CCyB, the stress tests, and monetary policy. To simplify the summary, we organize it by tool.

One common theme in the discussion was whether these tools could be narrowly targeted toward CRE risk, or to banks exposed to CRE, and to a lesser extent, leveraged lending. This focus was likely due to the scenario being one in which real economic conditions were solid, but obvious risks from CRE and nonfinancial business debt were also present. In addition, the participants discussed the legal authority to make decisions, noting that, in some cases, tools can

be used by the Board, and in other cases, using them requires cooperation with other supervisors.[4] Both when viewing problems solely through the lens of Federal Reserve authority and when viewing them through the lens of the joint authority of financial regulators, participants agreed on the value of coordinated public and private communications.

Regulations, Supervisory Tools, Communication, and Moral Suasion

The participants spent a considerable amount of time discussing supervisory tools such as guidance. In particular, they discussed the interagency guidance on leveraged lending, which was issued in 2001 and updated in 2013. Given recent experience with the leveraged lending guidance, the participants discussed the value of supervisory guidance generally.[5] A September 11, 2018, interagency statement clarified that supervisory guidance does not have the full effect of law and that firms are not automatically required to follow guidance and they cannot "violate" guidance. In light of the interagency statement, participants discussed what still could be done with guidance. With the significant hurdles and time lags involved in drafting regulatory rules, participants thought that the Federal Reserve should begin drafting regulations surrounding CRE and leveraged lending as a proactive measure that could be quickly proposed and published for comment if risks were observed.[6] Furthermore, despite the implementation lag, putting out a

[4] In terms of the authority to make decisions, the participants were not given specific limitations on their authority. However, much of the discussion operated under the assumption that all Federal Reserve tools under the control of the FOMC or Board could be used. In general, when discussing tools that the Federal Reserve does not have, participants assumed they could not use these tools, though they did discuss whether it would be desirable to have them.

[5] For a study of the impact of leveraged lending guidance on large, closely, supervised banks, see Sooji Kim, Matthew C. Plosser and João Santos, "Macroprudential Policy and the Revolving Door of Risk: Lessons from Leveraged Lending Guidance," *Journal of Financial Intermediation*, Vol. 34, April 2018, pp 17-31. DOI: 10.1016/j.jfi.2018.01.011. (Working paper version available as *Federal Reserve Bank of New York Staff Report* 815, May 2017.) (https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr815.pdf?la=en).

[6] One lesson of a tabletop exercise conducted in 2015 was that the Administrative Procedures Act and the need to get interagency agreement on some regulations greatly lengthen the time it takes to implement new regulatory rules. (See Adrian, Patrick de Fontnouvelle, Emily Yang, and Andrei Zlate, "Macroprudential Policy: A Case Study from

notice of proposed rulemaking might have a more immediate announcement effect that would be beneficial.

Given the limitations of guidance and rulemaking, the participants explored the effectiveness of moral suasion, such as could be exercised through public speeches on the build-up of excesses, the new Federal Reserve Financial Stability Report, and private conversations with bankers and other market participants. While all participants thought these were valuable, some recognized that moral suasion has important limits, particularly in preparing for tail risk.

The mention of tail risk brought up a question about what could be accomplished with safety and soundness examinations. Here, one challenge is that when banks are doing well, it is difficult to use safety and soundness criteria to make them raise capital for financial stability tail risk. For example, a well-performing bank could challenge the recommendation on legal grounds. Participants also pointed out that supervisors have more authority once losses are observed, but sometimes by then it is too late. Finally, they also noted that if problems extend to more than one bank, there would still need to be some coordination among regulators in order to get the regional banks to limit CRE risk as a group. Furthermore, an attempt at moral suasion that publicly singled out a bank might lead to a "stigma" problem that would amplify funding problems for the bank.

Stress Tests[7]

In general, participants viewed the stress test as the most important macroprudential tool, highlighting the test designers' ability to tie the scenario design to specific exposures. However,

a Tabletop Exercise," *Federal Reserve Bank of New York Economic Policy Review*, February 1, 2017, pp. 1-30 (https://www.newyorkfed.org/medialibrary/media/research/epr/2016/epr_2016-adrian-macroprudential-policy.pdf?la=en).

[7] Before the tabletop exercise, the Board of Governors released a notice of proposed rulemaking that would raise the threshold for CCAR banks and reduce the stress-testing requirement for smaller regional banks ($100bn to $250bn)

participants raised some concerns. First, the most recent tests had already modeled stressed CRE with a 40 percent drop in prices in 2018; so there was a question of how much more severe a CRE shock could reasonably be made. Second, participants noted that the proposed stressed capital buffer (SCB) floor of 2.5 percent might limit the ability to generate capital requirements that vary by firms' CRE exposures. In addition, participants noted that the stress test is not explicitly designed to have a macroprudential focus and banks may complain about the realism of scenarios.

Finally, participants discussed the implications of the other stress-test change: reducing the frequency of supervisory stress tests on smaller regional banks from every year to every other year. Here, the discussion raised questions such as whether an off-cycle stress test could be run. They thought that the Federal Reserve could do this internally, particularly if banks were still required to report their data annually. While this information would be valuable for supervisors, participants thought that it might be hard to limit dividends based on an internal off-cycle stress test.

Countercyclical Capital Buffer (CCyB)

Some participants felt that despite its bluntness, the CCyB is currently the easiest regulatory tool to use to address potential systemic vulnerabilities given the framework in place in the United States. The Federal Reserve Board has some flexibility on when the CCyB can be activated or released. Under the conditions of the exercise scenario, a majority of the tabletop-exercise participants would raise the CCyB from its current level of 50 basis points—for some, to more than 100 basis points—to bolster large banks' resilience to spillover effects from a

to every other year. For more details, see the October 31, 2018, proposal. For the purposes of this exercise, we assumed that the proposed rule was in place.

potential CRE correction; however, some concerns were raised about the effectiveness of this strategy. In particular, a few participants questioned whether the CCyB could address CRE-related risk, which in this scenario was concentrated in smaller regional banks not subject to the CCyB. However, others argued that increasing the CCyB would make the G-SIBs more resilient, so that in the event of a CRE shock, they would become an alternative source of credit for those who borrowed from distressed regional banks. Whether this was even feasible would depend on just how substitutable lenders were for CRE projects, but, more important, some participants questioned whether G-SIBs would actually be willing to undertake this kind of CRE lending if the CRE shock was large enough. Finally, some participants expressed reluctance to use the CCyB at all because of concerns about its effectiveness and its impact on lending. In particular, they were worried that using the CCyB would prevent lending that might keep the economy from falling into a recession.

Other

Participants discussed possible stresses associated with a wave of redemptions at mutual funds that held loans. They also noted that the financial stability issues covered during the tabletop exercise should be raised during FOMC meetings, as part of the financial stability discussion, and perhaps more frequently than quarterly when we are in the late stages of an economic cycle.

Monetary Policy

There was a clear desire to not follow through on the 50-basis-point increase in the federal funds rate that market participants had expected earlier in the year. Participants felt that when the economy changed, the FOMC should not be constrained by past market expectations, particularly when those expectations were based on a different forecasted path for the economy.

Furthermore, participants noted that the drop in the fed funds rate would not help with the financial stability vulnerability that comes from elevated asset prices and that it was an example of a case in which a change in the fed funds rate was limited in its ability to meet both macroeconomic and financial stability goals.

5. Hypothetical Stage-Two Scenario

For the second stage, the participants were presented with hypothetical economic conditions in 2020:Q4, six months after stage one, in which the economy had worsened and the CRE shock had materialized (as in risk scenario 2 discussed in section 3). In particular, real GDP growth had slowed to 1.75 percent, unemployment had increased to 4.0 percent, and inflation had ticked down to 1.9 percent. One component of GDP—private fixed investment in structures—had particularly dropped.

The participants were also told that information on CRE suggested a rapid decline in investment and in sentiment. CRE prices had dropped about 15 percent since 2020:Q2, as had the number of transactions. Anecdotal reports indicated that new projects were being shelved, particularly those that had yet to break ground, foreign money was pulling out of CRE, and retail CRE was collapsing.

Evidence indicated that underwriting standards had tightened, particularly for regional banks with less than $250 billion in assets. Among large banks, regional banks had the largest exposure to CRE, and there was considerable variation in their exposure. The G-SIBs had less direct exposure to CRE but had some indirect exposure through lending to nonbanks with significant CRE exposure. Participants were presented with Table 3, which showed exposure to CRE by type of financial institution.

Other financial indicators were less concerning. Equity markets were down only slightly since 2020:Q2. Spreads on corporate loans and bonds had widened but not by enough to pose a threat by themselves.

6. Summary of Stage-Two Discussion

The stage-two discussion started with an assessment of the new economic conditions and focused on whether the drop in CRE prices and volumes were signs of a correction that reduced financial vulnerabilities or signs of a collapse in CRE. Since stage two occurred only six months after stage one, participants felt that they did not have enough data to distinguish between the two possibilities. For example, participants wanted to wait for more observations of payroll data and lending data to assess economic conditions and ascertain if we were in a credit crunch.

Despite the lack of conclusive evidence that CRE was collapsing, the stage-two conditions still led to a vigorous discussion on the challenges of using macroprudential and monetary policy tools during a downturn. The monetary policy discussion was relatively straightforward. No one believed in continuing the path of the two rate hikes expected by the market earlier in the year. The main issue was whether to cut rates now or to wait for more data, such as payroll numbers, before deciding to cut.

Next, participants discussed the use of macroprudential regulatory tools, focusing mainly on the use of the CCyB and, as with monetary policy, whether it should be released immediately or only after more negative data arrived. However, other parts of the discussion brought up issues unrelated to those covered in the discussion of monetary policy. In particular, the targeting of the CCyB was relevant. Some participants thought that the decision to release the CCyB depended on which banks were affected by the risks. For example, they felt that since the CCyB

applies only to the G-SIBs, the case for releasing the CCyB would be strengthened if risk affected those institutions.

Another concern associated with releasing the CCyB was how it would be interpreted by markets. On one hand, would a rapid release of the CCyB, particularly after raising it only 18 months earlier (and possibly six months earlier as well), precipitate problems by signaling that the downside risk was very high? On the other hand, would releasing the CCyB following a shock preserve its credibility as a countercyclical tool?

Additionally, participants felt that the longer-term moving average indicators, while useful for assessing whether to increase the CCyB, were less informative about the release stage. The only CCyB indicators that would respond to a sudden increase in problems would be those based on real-time financial markets. Although some CCyB indicators are based on high-frequency data, such as equity prices and bond spreads, others are based on moving averages of quarterly credit data, and these indicators will lag actual conditions too much to be useful. Participants felt that one lesson from this exercise was that the most useful indicators for the release decision would be different from those most useful for the activation decision. These indicators should be able to distinguish in a timely manner between a correction in financial markets and actual financial stress.

Finally, participants discussed the tension between the macroprudential and microprudential aspects of the tool. Some participants noted that although the CCyB was designed to address macroprudential concerns, relaxing it could create problems at the microprudential level for a weak bank covered by the CCyB. This was not particularly relevant in our scenario because the regional banks were not subject to the CCyB, but the discussion recognized that there could be other scenarios in which a G-SIB was affected, and where the

Federal Reserve would be proposing looser capital standards precisely when risks were increasing. However, other participants thought the role of the CCyB was to bolster lending resilience rather than bank solvency, for which other capital requirements are in place.

This tension between macro- and microprudential objectives also arose during a discussion of the use of the stress test. Here, most participants favored making the stress-test scenarios less severe to ease conditions and encourage lending. However, other participants noted that it is important to maintain the credibility of the stress test, that is, not make it too easy for banks to pass.

The topic of disclosing stress-test scenarios and results also came up. Stress-test scenarios are public, so the severity of the test needs to be, as discussed above, sufficiently severe to maintain credibility but not so severe that it is implausible. Of more concern was what might happen if a bank were to fail a stress test and that information were to be disclosed as is required by the stress test. There are several historical examples where disclosing regulatory decisions led to a run on a weakened bank (e.g., Franklin National in 1974). However, in the context of this stage-two scenario, where the weak banks are regional ones, it was felt that severe liquidity pressures on a troubled regional bank could be handled by finding another bank to acquire the weak regional one.

7. Lessons Drawn from the Exercise

This document summarized a macroprudential tabletop exercise that was conducted by members of the Committee on Financial Stability of the Conference of Presidents in November 2018. The exercise gave participants a hypothetical economy subject to several risks and asked

them to assess and analyze the use of macroprudential tools in that scenario. Several lessons emerged from the exercise. Organized by category, these are:

Information Gathering and Reporting

1. Assessing the financial stability risks of CRE exposure requires granular data on the distributions of CRE exposure. The mean can hide a lot of risk.
2. Similarly, assessing the financial stability risks of leveraged loan exposures requires details on who the ultimate holders of these exposures are.

Guidance, Moral Suasion, and Communication

1. The effectiveness of guidance is limited, and safety and soundness justifications are harder to use when things are going well.
2. Moral suasion is an alternative to guidance. The Board of Governors' new Financial Stability Report may be a new tool for moral suasion.
3. Given the time required to issue new rules, they should be drafted in advance. This would reduce the time needed to implement them, and even if they are not implemented, their release could be used as a communication tool.

Stress Tests

1. During a boom, the Fed's ability to control risk in an asset class such as CRE has limits.
2. During a boom, macroprudential tools have difficulty targeting narrow risks at the institution level. At the asset-class level, the stress test can have some effect but only on banks subject to the stress test.
3. The new stress-testing regime for regional banks might make it harder to get a weak regional bank to raise capital by restricting dividend payouts during the off-years of the supervisory stress tests. If supervisors are unable to require banks to raise capital based

on their off-cycle stress tests, then alternative methods for limiting dividend payouts for these banks during off-stress-test years should be devised.

4. During a downturn, there are tensions between micro- and macroprudential goals. The stress test can be used to encourage or enable lending during a downturn, but it can also be used to control risk at the individual bank level. Furthermore, there are credibility concerns in balancing these goals. If the test is too easy, it won't control individual bank risk and it might hurt the credibility of the stress test. If it is too hard, it will restrict lending at the macro level.
5. During a downturn, disclosure of stress-test results may reduce confidence in a weak bank and lead to funding problems for it.

Countercyclical Capital Buffer (CCyB)

1. During a downturn, when shocks impact non-CCyB banks (or other lenders), any increase in lending from the release of the CCyB will depend on borrowers' ability to switch to borrowing from G-SIBs as well as whether the G-SIBs will respond by lending rather than retaining their capital buffer. This substitutability will partially depend on how relationship-based the original lending is.
2. During a downturn, the indicators used to justify releasing the CCyB should be based on high-frequency data, so policymakers can move quickly in response to a shock. These indicators would be different than those used to assess raising the buffer, since longer-term moving averages seem more useful for identifying high levels of credit that are not temporary. More generally, the indicators used to assess whether to increase the buffer and whether to release it need not be the same.

3. As with the stress test, during a downturn there are tensions between micro- and macroprudential goals with the CCyB. Relaxing the CCyB for a weak G-SIB might allow it to take on too much risk, while not relaxing it will discourage lending.

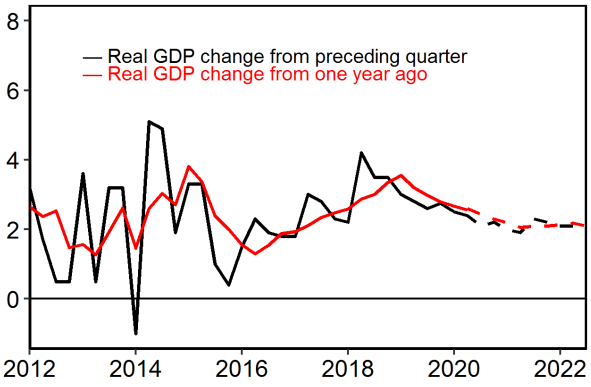
Monetary Policy

1. Participants felt that when the economy changes, the FOMC should not be constrained by past market expectations, particularly when those expectations were based on a different forecasted path for the economy.
2. It needs to be recognized that there are economic conditions under which changes to the fed funds rate will be of limited use in simultaneously meeting macroeconomic and financial stability goals.
3. With constraints on the use of macroprudential tools such as the CCyB, monetary policy may become biased toward tightening during booms, possibly conflicting with macroeconomic objectives.

The above lessons illustrate the value of thinking through the use of macroprudential tools to address financial stability concerns. The exercise illustrated the limitations of the tools, identified ways to improve them, and identified tensions in their use.

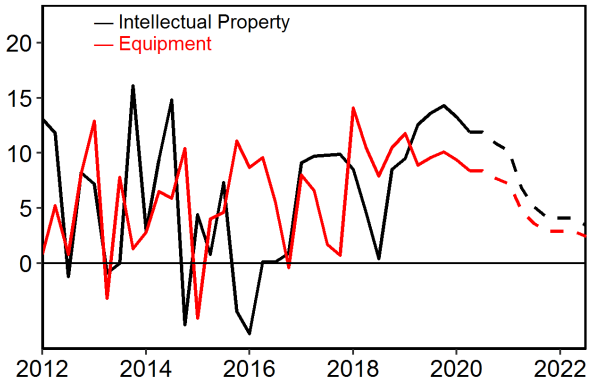
Figure 1: Hypothetical Macroeconomic Data and Forecasts*

Fig. 1-1 Real GDP



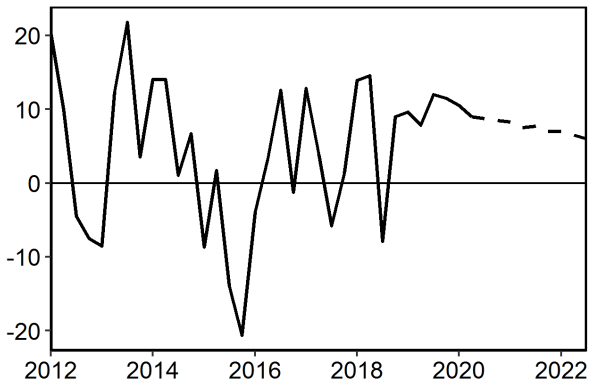
Note: Percent change, Annualized
Source:BEA

Fig. 1-2 Business Fixed Investment



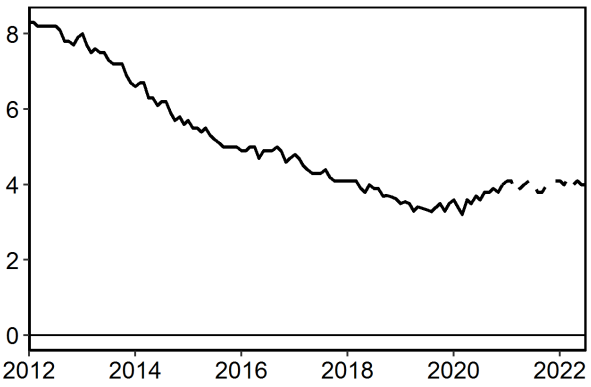
Note: Percent change, Annualized
Source:BEA

Fig. 1-3 Private Nonres. Investment: Structures



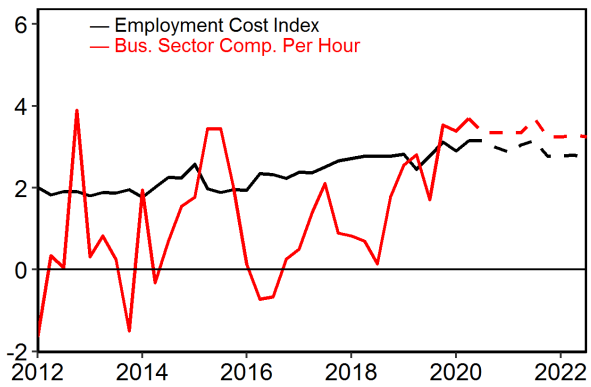
Note: SA, Percent change, Annualized
Source: BEA

Fig. 1-4 Unemployment Rate



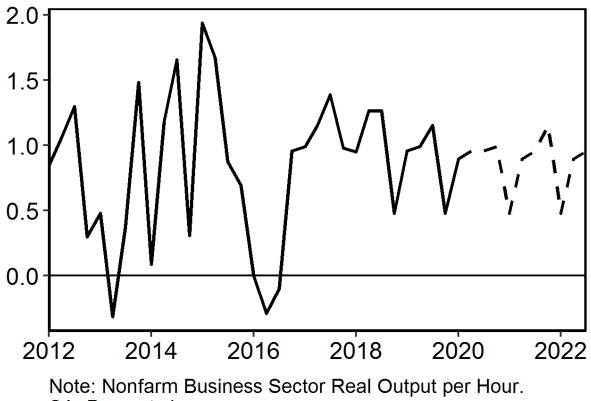
Note: SA, Percent
Source: BLS

Fig. 1-5 ECI & Comp./Hr



Note: SA, Percent change year over year
Source: BLS

Fig. 1-6 Productivity

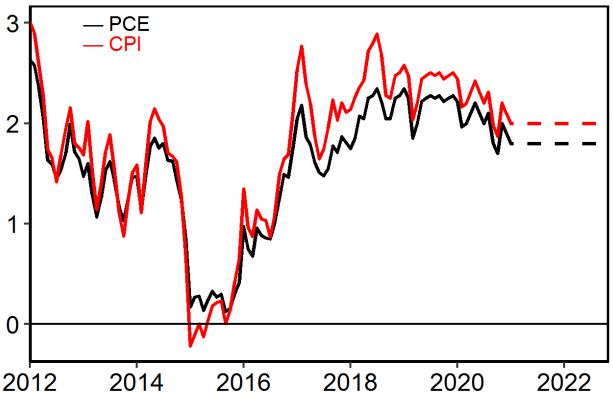


Note: Nonfarm Business Sector Real Output per Hour.
SA, Percent change year over year
Source:BLS

* Notes to Figure 1: Actual data used through 2018:Q3. Data for 2018:Q4–2020:Q2 were created for the exercise. Dashed lines after 2020:Q2 show hypothetical staff forecasts as of 2020:Q2.

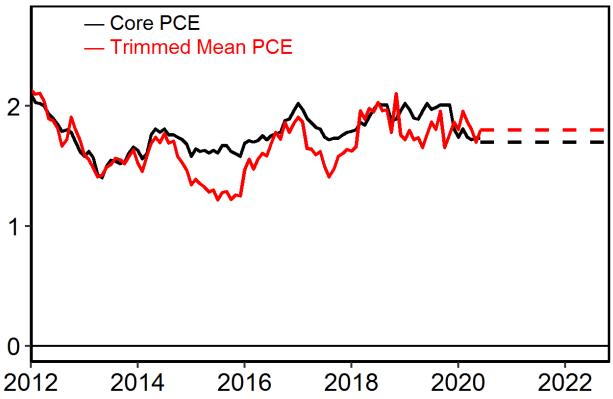
Figure 1, continued: Hypothetical Macroeconomic Data and Forecasts

Fig. 1-7 Inflation



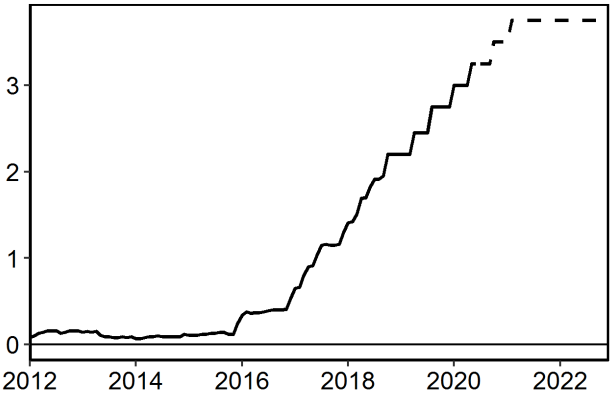
Note: Percent change year over year
Sources: BEA, BLS

Fig. 1-8 Core Inflation



Note: Percent change year over year
Sources: BEA, FRB Dallas

Fig. 1-9 Effective Fed Funds Rate



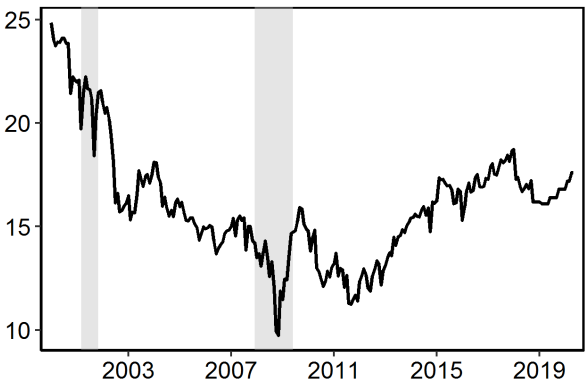
Note: Percent
Source: Board of Governors

Figure 2: Hypothetical Financial Stability Report as of July 2020

Valuation Pressures	Elevated • The equity price-to-earnings ratio is close to historical highs outside the dot-com era. • Spreads on corporate bonds and leveraged loans have compressed considerably during the last year and are below historical averages, while standards and terms on leveraged loans have deteriorated over the last year. • CRE prices are at historical highs, and capitalization rates are at post-crisis lows.
Private Nonfinancial Sector Leverage	Elevated • Vulnerabilities have gradually moved from moderate to elevated in the last two years. • In the nonfinancial corporate sector, debt owed by highly levered and lower-rated firms remains elevated. • Household borrowing has advanced slowly and is mainly driven by prime borrowers, but many high loan-to-value loans continue to be originated.
Financial Sector Leverage	Low to Moderate • Capital positions at CCAR banks and insurance companies remain at high levels. • Leverage at regional banks and nonbanks with large exposures to CRE have increased slightly. • Some measures of hedge fund leverage remain high but have levelled off.
Funding Risks	Low • Large BHCs' holdings of liquid assets remain at high levels. • Banks' core deposit funding remains high, while short-term funding remains near historical lows. • Concerns about potential outflows from mutual bond and loan funds have risen.

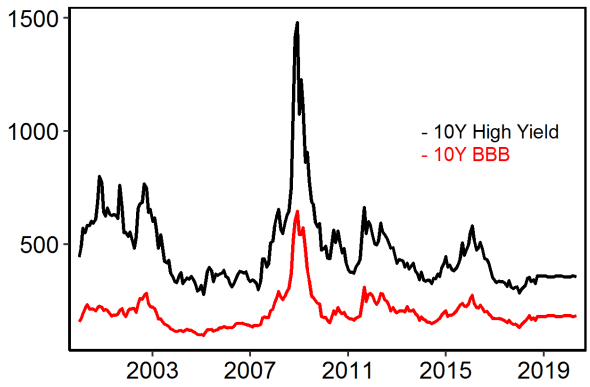
Figure 3: Hypothetical Financial Data*

Fig. 3-1 Forward P/E Ratio



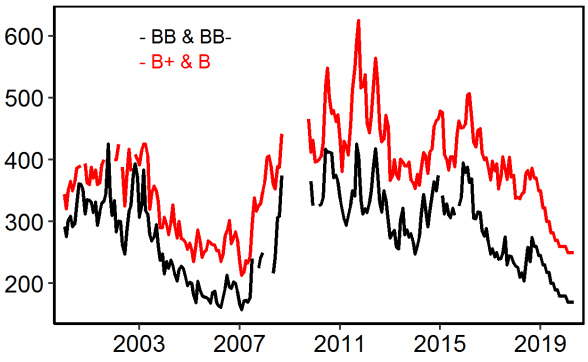
Note: Aggregate 12-month Forward P/E Ratio of S&P 500
Source: Thompson Reuters

Fig. 3-2 Corporate Bond Spreads



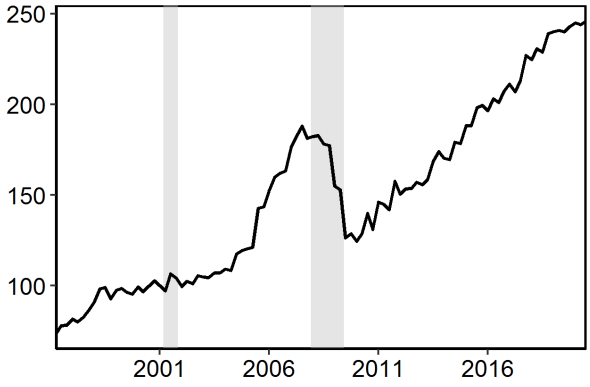
Note: Basis point spread over 10-year Treasury
Sources: Merrill Lynch, Treasury

Fig. 3-3 Avg. Spreads of New-Issue Leveraged Loans



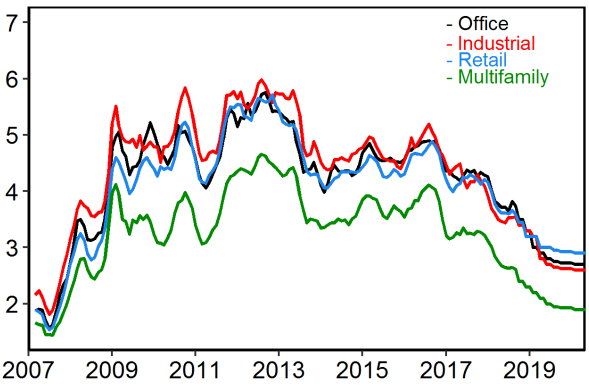
Note: Basis point spreads
Source: S&P LCD

Fig. 3-4 CRE Price Index



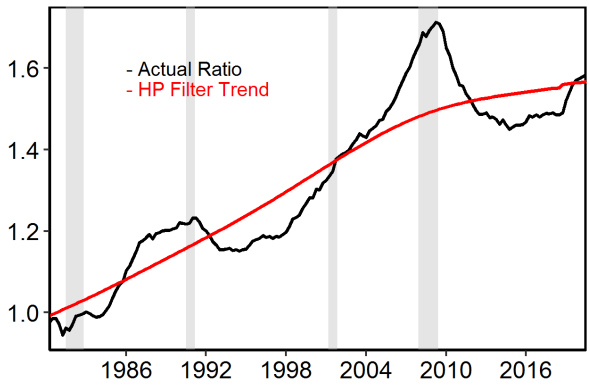
Note: Index: Q1 2000=100
Source: CoStar

Fig. 3-5 CRE Cap Rate Spreads



Note: 3-month moving avg. spreads over 10-year Treasuries
Source: Real Capital Analytics

Fig. 3-6 Private Nonfinancial Credit-to-GDP

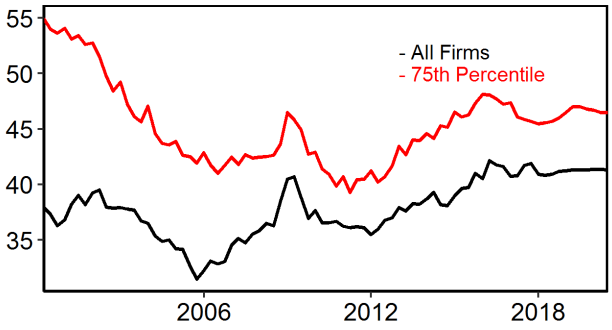


Note: Trend calculated using an HP filter with lambda=400,000
Sources: Financial Accounts of US, NIPA

* Notes to Figure 3: Actual data used through 2018:Q3. Data for 2018:Q4–2020:Q2 were created for the exercise.

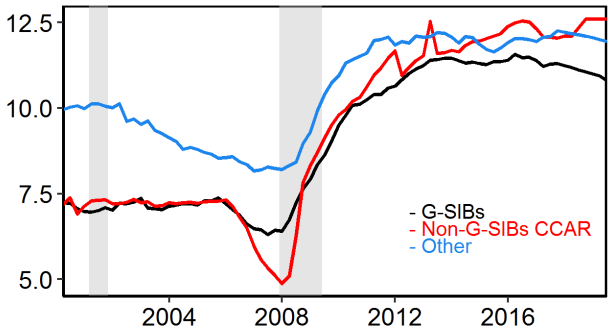
Figure 3, continued: Hypothetical Financial Data

Fig. 3-7 Gross Leverage of Speculative-Grade and Unrated Firms



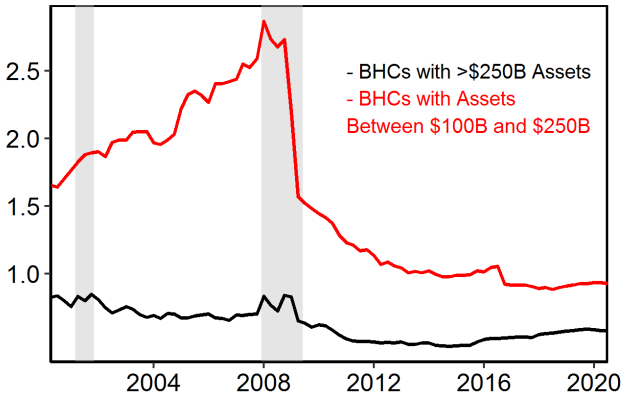
Note: Ratio of the book values of total debt and assets. 75th Percentile is calculated from subset of risky firms among the 300 largest firms, by assets.
Source: Compustat

Fig. 3-8 Common Equity Tier 1 Ratio (% of RWA)



Note: Prior to 2014:Q1, the numerator of the ratio is Tier 1 common capital. Beginning in 2014:Q1 for advanced approaches BHCs and in 2015:Q1 for all other BHCs, the numerator is common equity Tier 1 capital.
Source: FR Y-9C

Fig. 3-9 CRE to Tier 1 Capital Ratio



Note: Ratio of CRE holdings to Tier 1 capital
Source:FR Y-9C

Table 1: Supervisory and Regulatory Tools*

Tools Categories	Tools	Risks Addressed Valuation (Val), Leverage (Lev), Maturity (Mat) & Liquidity (Liq)	Applicable Scenarios		Can Target Specific Exposures	Requires Inter-agency Agreement	Applicable Institutions 19 >=$250bn or $10B in foreign ("Top 19") 35 >=$100bn ("CCAR") 12 LISCC, 8 G-SIBs	Considerations
			Boom	Bust				
Capital Regulation	Leverage Ratios	Lev	X	X		X	LR: All, SLR: Top 19, eSLR: G-SIBs *Changes with Tailoring*	Not designed to vary the requirements except eSLR allows firms to dip below buffer.
	CCyB	Val, Lev	X	If activated		X	Top 19 *Changes with Tailoring*	Increases are effective 12 months after announcement, sooner if Board chooses; decreases are effective immediately.
	Sectoral Risk Weights	Val, Lev	X	X	X	X	Depends on implementation	Not currently a part of U.S. regulation.
	CCAR	Val, Lev	X	X	X		CCAR *Changes with Tailoring*	Scenario design mitigates procyclicality, but capital still may not be countercyclical. Annual process means time lag.
Liquidity Regulation	LCR	Liq	X	X		X	LCR: Top 19 Modified LCR: CCAR *Changes with Tailoring*	Supervisors have discretion in determining time frame for remediating an LCR shortfall.
	NSFR	Liq	X	X		X	NSFR: Top 19 Modified NSFR: CCAR *Changes with Tailoring*	Still a proposal. Supervisors would also have discretion in determining time frame for remediating an NSFR shortfall.
	CLAR	Liq	X	X	X		LISCC	Supervisory stress-test scenarios and outcomes are not disclosed to the public.
Credit Regulation	LTV Ratio	Val, Lev	X		X	X	All	Requires coordination to revise the interagency lending guidelines..
	Margin	Val, Lev	X		X		All & nonbank	Board's authority to set margins is very limited, and would require rule changes to change scope.
Supervisory Guidance		Val, Lev, Liq	X	X	X		All	Not legally binding or enforceable.
Moral Suasion		Val, Lev, Liq	X	X	X		All & nonbank	Not legally binding or enforceable.
Public Communications		Val, Lev, Liq	X	X	X		All & nonbank	Not legally binding or enforceable.
FSOC Designation		Val, Lev, Liq	X	X	X	X	Nonbank	More of a structural than a cyclical tool

* Notes: CCAR – comprehensive capital analysis and review; LR – leverage ratio; SLR – supplemental leverage ratio; eSLR – enhanced supplemental leverage ratio; LISCC – Large Institution Supervision Coordinating Committee; G-SIB – global systemically important banks; CCyB – countercyclical capital buffer; LCR – liquidity coverage ratio; NSFR – net stable funding ratio; LTV – loan to value; FSOC – Financial Stability Oversight Council. "Applicable institutions" refers to institutions covered as of November 2018, reflecting the July 6, 2018 statement by the Board of Governors on the Economic Growth, Regulatory Relief, and Consumer Protection Act. "*Changes with Tailoring"* means that the institutions covered will change under the capital rules proposed on October 31, 2018.

Table 2: Monetary Policy and Lender-of-Last-Resort Tools*

Tools Categories	Tools	Risks Addressed	Applicable Scenarios		Can Target Specific Exposures	Applicable Institutions	Considerations
		Valuation (Val), Leverage (Lev), Maturity (Mat) & Liquidity (Liq)	Boom	Bust			
Monetary Policy							
Permanent OMOs	Targeting range for the federal funds rate	Val, Lev, Liq	X	X	No	OMOs with primary dealers, rate applies to all	Implementation is immediate for most tools described in this table.
	Long-term interest rates and portfolio balance channel (e.g., LSAPs)	Val, Lev, Liq	X	X	No	OMOs with primary dealers, rate applies to all	Buy (sell) long-term assets to reduce (increase) long-term interest rates.
	Maturity profile of Fed balance sheet (e.g., MEP)	Val, Lev, Liq	X	X	No	OMOs with primary dealers, yield curve applies to all	Increase (reduce) the maturity profile to lower (raise) the slope of the yield curve of underlying securities.
Temporary OMOs	Repos and reverse repos	Liq	X	X	No	Primary dealers, reverse repo counterparties	Repos are used to fulfill transitory needs for balances at Reserve Banks, and reverse repos to control the federal funds rate.
	Securities lending programs	Liq	X	X	No	Primary dealers	Securities lending supports smooth functioning in Treasury and agency securities markets.
Forward Guidance	Public statements and releases	Val, Lev	X	X	Yes	All	Signals the intended path of monetary policy conditional on macro and financial variables. (untested)
Lender-of-Last-Resort Tools							
Discount Window Lending	Discount window rate, collateral requirements, haircuts	Val, Lev, Liq		X	No	Depository institutions	Provides liquidity to depository institutions against collateral, considering the market value of the underlying asset minus a haircut.
Liquidity Facilities	Rate, collateral requirements, haircuts, maturity	Liq	X	X	No		Provides liquidity to institutions against collateral, considering the market value of the underlying asset minus a haircut, potentially with less stigma in a broad crisis.

* Notes: OMO – open market operations; LSAP – large-scale asset purchases; MEP – maturity extension program.

Table 3: Hypothetical Shares of CRE Loans by Class of Financial Intermediary as of 2020:Q2

Entity	Share of CRE
Banks	50 percent
<$100B	29 percent
$100B–$250B	8 percent
>$250B	13 percent
GSEs, Agency/GSE-backed Pools	12 percent
Insurance Companies	15 percent
ABS and REITs	17 percent
Other	6 percent

Source: Financial Accounts of the United States, Y-9C, and Call Reports