

MACROPRUDENTIAL POLICY, LEVERAGE, AND BAILOUTS

Allan M. Malz

Macroprudential policy is a major initiative developed after the 2008 global financial crisis. It aims to reshape regulatory policy, emphasizing financial stability as well as the viability of individual intermediaries. It refers to a wide range of policy measures intended to avoid crises, partly drawn from established regulatory and supervisory tools. Proponents hope it will emerge alongside monetary policy and the regulation and supervision of intermediaries as a primary approach to securing stable growth.

The promise of macroprudential tools, however, is overstated. Macroprudential tools cannot compensate for an existing regulatory system that increases risks to financial stability. Banks are inadequately capitalized, and the larger banks are too complex and opaque for their risks to be grasped by regulators, investors, and securities analysts, or even their own management. Explicit or implicit public-sector subsidies and guarantees of support for some intermediaries and types of debt, collectively known as “too big to fail” (TBTF), the safety net, and bailouts, generate moral hazard and shift risk to the public. Confidence in the ability of narrowly targeted rules or on-site supervision to correct for the resulting high leverage is misplaced.

The problems of leverage and moral hazard can be addressed directly, and not through additional layers of rules. The rationale

Cato Journal, Vol. 39, No. 3 (Fall 2019). Copyright © Cato Institute. All rights reserved. DOI: 10.36009/CJ.39.3.2.

Allan M. Malz is an Adjunct Associate Professor at Columbia University. He has served as a risk manager at several financial firms and is a former Vice President at the Federal Reserve Bank of New York.

for macroprudential tools in addressing these issues assumes an unrealistic extent of detailed knowledge of the financial system and ability to control it, and the ability to correct specific weaknesses in the financial system with policy measures that have predictable effects.

Relying on macroprudential tools may also lead to deemphasizing monetary policy at critical junctures. A focus on financial stability has always been an inherent part of monetary policy. But macroprudential tools are advocated not only as useful occasional supplements to changes in interest rates and monetary aggregates, but as alternatives to monetary policy and the primary means of responding to concerns about financial stability.

It may be the case that monetary tools are not sufficient in some circumstances to ensure financial stability as well as the goals of stable prices and growth. However, using macroprudential tools as a first resort, absent a lasting solution to the problems of undercapitalized banks and overt and tacit guarantees, can only muddle policy. TBTF is largely a creation of policy. It would be better to first stabilize banking and end TBTF, and then see what tools are still needed to complement monetary policy.

Historical Background of Macroprudential Policy

Although the term “macroprudential policy” is relatively new,¹ central banks’ focus on financial stability is not. Bagehot’s rule for a central bank as crisis lender of last resort contains a macroprudential provision: emergency liquidity is to be provided only against good collateral, encouraging banks to maintain a stock of unencumbered, reliably eligible assets. In its first decade, the Federal Reserve considered imposing “direct pressure” on banks to restrain short-term call money financing of stock purchases (Friedman and Schwartz 1963: 283).²

¹The term first appears in internal central bank documents in 1979 and in publications from 1986 (Clement 2010). Work at the Bank for International Settlements (BIS) has been important in advancing the macroprudential viewpoint.

²Elliott, Feldberg, and Lehnert (2013) review this and many other historical U.S. examples.

Not long before the global financial crisis, today's macroprudential debate was foreshadowed by one over "lean or clean." By the late 1990s, the prevailing monetary policy framework—setting the policy interest rate close to the unobservable natural rate to attain low positive inflation and growth at capacity—had been clearly formulated.³ It seemed overwhelmingly successful in the disinflation of the 1980s and in contributing to stable growth during the Great Moderation years that followed and ended with the crisis. Inflation rates were surprisingly low, while real growth was steady, if somewhat disappointing, and with a surprisingly low variance.

Tension between financial stability and monetary policy goals nonetheless increased. Signs of excessive financial ease appeared, such as buoyant stock markets and rising leverage. Large financial shocks were more frequent compared to the immediate postwar era. It was unclear whether low real interest rates were due to easy monetary policy or fundamental economic factors.

One strand to the discussion questioned whether low and stable inflation was a sufficient condition for financial stability. Proponents of "leaning against the wind" argued that low inflation didn't justify monetary ease in the face of alarmingly loose financial conditions. Failing to take account of financial conditions in setting monetary policy could defer, but not avoid, the resulting fragility and misallocation of resources.⁴ Those taking the "clean up afterwards" view argued that, if what turned out in hindsight to be a monetary error eventually obliged the central bank to tighten abruptly and induce a credit crunch, it could address those consequences (Bernanke and Gertler 2001).

Another strand debated whether financial variables not part of the standard framework, particularly asset prices, should be taken into account in setting monetary policy. Proponents of leaning called attention to the pattern of rapidly rising asset prices and unusually low volatility followed by financial shocks. Opponents argued that it was difficult to measure risk premiums or identify deviations from fundamental values *ex ante*. Rising asset prices would in any case induce the appropriate monetary tightening through their stimulative effects.

³It is summarized by Clarida, Gali, and Gertler (1999).

⁴See, for example, Borio and White (2003), Rajan (2005), and White (2009).

This was part of a debate on whether the financial system is naturally stable or has an endogenous, inherent tendency to excessive swings. While the lean-versus-clean debate focused on asset prices, the volume and riskiness of credit aggregates were also identified as behaving procyclically. Easy financial conditions perpetuate and reinforce themselves and vice versa, leading to alternating booms and busts. Financial cycles extend over a much longer period than business cycles, the macroeconomic fluctuations that are usually the focus of monetary policy (Borio 2014). One could have an extended period of macroeconomic and apparent financial stability, but under the surface excessive debt levels were ultimately leading to a crisis.⁵

The debate turned in part on costs and benefits. The “lean” view focused on the tail risks of accommodative monetary policy, that is, the risk of a financial crisis and a large, protracted, and extremely costly decline in real growth. The costs of leaning may at best be deferred rather than avoided if an expansion is unsustainable. The “clean” view emphasized the cost in forgone growth of raising interest rates in response to false positives in asset prices and credit aggregates. The costs of growth limping perpetually behind potential would be greater than the highly uncertain benefits of successfully avoiding crises.⁶

Rationale of Macroprudential Policy

The crisis placed systemic risk—the risk of severe financial crisis—in the foreground of the debate.⁷ Macroprudential policy has found remarkably wide support, uniting central-bank and academic analysts with otherwise divergent views on financial regulation. The background remains the compatibility of financial stability with the

⁵Borio (2003) summarizes the extensive precrisis BIS research on procyclicality and financial stability.

⁶Estimating these costs is hardly straightforward, as one must net immediate, likelier, and smaller costs of tightening against future, highly contingent, and much larger costs of a crisis, with a great deal of model uncertainty. Svensson (2017) is a recent example of cost estimates and International Monetary Fund (2015) a recent survey.

⁷The term “systemic risk” came into frequent use in the 1990s. It emphasizes contagion, the rapid transmission of losses from one intermediary to others, and the potential for harm to the economy and society at large. Early examples include Corrigan (1991) and Kaufman (1994).

desired stance of macroeconomic policy, but skepticism of the stability of the financial system has grown, and efforts to identify non-monetary tools to address stability risks have intensified.

Financial markets are viewed as more prone to market failure than other sectors of the economy, a view buttressed by two propositions about the sources of systemic risk. The first is the presence of externalities unique to financial markets. The leverage of one intermediary has a negative and uncompensated impact on the asset risk of others, by increasing their risk as lenders and their market and credit risk as investors. The second is that variations in risk appetite can lead to large responses of risk premiums to a shock or change in economic conditions. For some economists skeptical of market efficiency, these variations are “bubbles,” resulting from irrational bouts of ill-founded optimism in booms and pessimism in busts. Others view them as adaptations to economic realities such as the role of collateral and limited ability to diversify and hedge important risks.⁸

Macroprudential tools can shore up the overall resiliency of the financial system, internalize the systemic costs of leverage, and mute variability in the response of risk premiums to changes in risk appetite (Adrian, Covitz, and Liang 2015). Even among observers with more confidence in financial markets’ rationality and efficiency, macroprudential policy is appealing as a second-best response to defects in the regulatory system that are unlikely to be remedied anytime soon, such as the incentives to take risk generated by public-sector guarantees.

The rationale of macroprudential policy relates it to monetary policy. Procyclicality implies that easy credit tends to self-reinforce, increasing the odds that any shock is severe enough to trigger a systemic risk event. If tighter regulation enables the financial system to withstand larger shocks without crisis, it can relieve monetary tightening of some of the burden of avoiding it. Monetary policy on its own, or the use of just one instrument, interest rates, is inadequate to achieve the two goals of macroeconomic and financial stability, so an additional instrument, macroprudential policy, is needed.

⁸See, for example Borio (2011), Geanakoplos (2009), and Barro (2006). Cochrane (2011) surveys alternative explanations of asset price fluctuations.

The rationale is sometimes framed in terms of additional channels through which monetary policy affects the economy. The credit channel refers to its impact on financing by external lenders, which has higher monitoring costs than internal financing. Lower interest rates support asset values and strengthen firms' balance sheets, enabling firms to secure financing on more favorable terms and making them less dependent on retained earnings (Bernanke and Gertler 1995). The risk-taking channel refers to the stimulative effect of lower rates through enhanced funding liquidity and by lowering realized volatility and risk premiums. By supporting asset prices, monetary ease also loosens internal risk management and regulatory capital constraints (Adrian and Shin 2010; Borio and Zhu 2012).

One ambiguity in the rationale of macroprudential policy is whether it is intended to dampen the financial cycle or prevent crises. These risk-management objectives are not necessarily the same. The former would lower overall volatility, including many relatively high-probability events, while the latter focuses on avoiding low-probability tail risks.

Much of the interest in macroprudential policies concerns developing countries. Extensive private and public borrowing in major currencies, primarily the U.S. dollar, appears cyclical. The developing world has generated much of the sharp increase in domestic and cross-border debt of the past decade.⁹ Developing countries have limited ability to counter inflows with monetary tools or exchange rates. Avoidance of depreciation further encourages foreign-denominated indebtedness. Depreciation, when it becomes unavoidable, may impose a debilitating local credit crunch because of a "sudden stop" in external financing and rise in the local value of debt. Local borrowers' creditworthiness declines and risk-management constraints on extending credit tighten. Macroprudential policy has been put forward with particular urgency for developing countries as a substitute for the "lost" tool of autonomous monetary policy.

⁹The terms "global liquidity" and "global financial cycle" are used to describe this phenomenon. According to the BIS global liquidity indicators (Table E2-USD), at the end of 2018, U.S. dollar credit outstanding to non-U.S. residents other than banks totaled \$11.5 trillion, having increased about 8.5 percent annually since the beginning of 2000. Emerging market economies have accounted for a steady one-third of the total. Not only U.S., but also European and other non-U.S. banks are large intermediaries of these flows, exposing them to U.S. dollar funding risk. See, for example, Calvo (2013) and Rey (2013). Cohen, et al. (2017) is a recent literature survey.

Macroprudential Policy Indicators and Tools

Central banks and international organizations have devoted substantial resources to analysis of financial stability. The Bank of England has been publishing a *Financial Stability Review* since 1996, the European Central Bank (ECB) since 2004, and the International Monetary Fund (IMF) a *Report* since 2002.

Since the crisis, the advanced market economies have introduced administrative bodies to monitor financial stability and implement macroprudential policies. This involves coordination across functionally separate oversight of the banking, securities, and insurance industries, and, in the United States and Europe, across state or national boundaries. The U.S. Dodd-Frank Act in 2010 authorized a Financial Stability Oversight Council (FSOC) with powers including identification and resolution of intermediaries deemed TBTF, called “systemically important financial institutions” (SIFIs). Within the Federal Reserve, the Large Institution Supervision Coordinating Committee (LISCC) coordinates policy, and an initial *Financial Stability Report* appeared in 2018. The Bank of England in 2011 created a Financial Policy Committee, distinct from its Prudential Regulation Authority, focused on macroprudential policy. The European Union organizes macroprudential policy primarily through the ECB and the European Systemic Risk Board (ESRB), chaired by the ECB president. The BIS hosts the two international committees of central bankers and government officials coordinating macroprudential policies, the Financial Stability Board (FSB) and the Basel Committee.

Macroprudential tools are designed to be applied as warranted by instability risk. A great deal of effort has therefore gone into developing indicators that reliably identify and measure aspects of systemic risk, referred to as “imbalances” or “vulnerabilities.” Many such indicators have been proposed, focusing on leverage, credit aggregates, especially short-term borrowing, and asset valuations. Crises are extremely difficult to predict with any accuracy. The indicators are indirect but observable substitutes for the characteristics of the financial system of concern, and their predictive power isn’t well established.¹⁰

¹⁰See Adrian, Covitz, and Liang (2015) for a survey of the indicators developed thus far and their rationales.

Considerable emphasis has been placed on the credit-to-GDP gap, the difference between the current and long-term trend values of the ratio of aggregate credit to national income. Trends in credit aggregates may, however, understate vulnerabilities. In the United States, leverage has been increasing rapidly for decades.¹¹ The current negative gap is thus an artifact of rapid trend growth and indicates a small diminution in a major vulnerability, not the absence of one.

Indicators based on asset prices also have limitations. In principle, like all market prices, they reflect at any moment the forward-looking assessments and dispersed information of market participants. However, they also reflect the participants' risk preferences. The paradox of volatility limits the use of asset prices as forecasts and introduces the possibility of circular reasoning. Measures such as credit spreads and option prices may be low because default or market risk is assessed to be low, or because risk premiums are unusually low relative to the assessed risks. Similarly, the yield curve may be flat because shorter-term interest rates are not expected to rise, or because longer-term bonds are more prized by investors.

Moreover, the financial system itself is constantly changing for many reasons, including the response to regulation and technological change. It is hoped that researching more indicators will improve their power to pinpoint imbalances and vulnerabilities.

While macroprudential *policy* refers to a broad regulatory orientation toward financial stability, the application of its *tools* is thought of more narrowly. Many tools have been sketched out, but not fully defined. Some tools now classified as macroprudential have long been used for microprudential regulation. The extent to which newer regulation has a macro- or microprudential motivation isn't always clear.

The term macroprudential is often, but not universally, understood to apply to tools that vary over time, parametrically or at the discretion of regulators, to address time variation in specific imbalances.

¹¹The U.S. ratio peaked in mid-2009 at 382 percent of GDP, after a quarter-century period during which it more than doubled from 163 percent in 1980. It currently stands at about 350 percent (Federal Reserve Board, Financial Accounts of the United States [Z.1], Tables D.3 and F.2, available at www.federalreserve.gov/releases/z1/current/default.htm).

Time-varying tools are particularly dependent on the accuracy and pertinence of indicators. A number of proposed measures are directed at mortgage borrowing or leveraged lending, a form of financing used heavily in mergers and acquisitions. A limit on debt service- or loan-to-income or loan-to-value ratios, for example, may be imposed temporarily rather than permanently.¹²

Short-term financing by banks has been a particular focus of macroprudential regulation. The Basel liquidity requirements are cited as a key macroprudential measure introduced in response to the crisis, and illustrate some of the ambiguities. These requirements are based on the bank's balance sheet rather than on system-wide indicators. The regulation is not designed to vary over time in response to changes in fragility indicators, but rather only with the size of the bank and its reliance on short-term market funding or maturity mismatch.

Among the better-defined tools is the Basel III countercyclical capital buffer (CCyB), which obliges covered banks to issue 0 to 2.5 percent of Common Equity Tier 1 Capital (CET1) relative to risk-weighted assets (RWA), in addition to the 7 percent required at all times. It is set periodically at the discretion of each jurisdiction's bank supervisor. In the United States, it applies to "advanced-approach banks," and is set annually following Board review. It was first introduced in 2016 and has been set to zero since, most recently in March 2019.¹³ The capital conservation buffer is sometimes also classified as a macroprudential tool.

¹²For surveys of macroprudential tools, see Kashyap, Berner, and Goodhart (2011); Claessens (2015); and Cerutti, Claessens, and Laeven (2017).

¹³See www.federalreserve.gov/newsevents/pressreleases/bcreg20190306c.htm. CET1 is roughly a bank's common stock and retained earnings. Internationally active banks with at least \$250 billion in assets are classed as advanced-approach banks in the United States. The CCyB is one of three layers of CET1 required in addition to the Basel minimum of 4.5 percent of RWA. Banks are restricted from dividend and other capital payouts unless the three requirements are met. In April 2018, the Federal Reserve proposed a substantial revision of the other two (www.federalreserve.gov/newsevents/pressreleases/bcreg20180410a.htm). The capital conservation buffer is an additional 2.5 percent required of all banks, and is intended to keep a bank's capital ratio falling below the minimum in bad times, while the global systemically important bank (GSIB) surcharge applies to the very largest banks.

Only a few countries, including the United Kingdom, but mostly smaller ones in Scandinavia and eastern Europe, have thus far imposed a nonzero CCyB.¹⁴ The guidelines for its setting emphasize the credit-to-GDP gap (Basel Committee on Banking Supervision 2010), which has been low in many countries since the crisis.¹⁵ While credit aggregates don't currently appear exceptionally high, that, as noted, is due to their rapid growth prior to the crisis. At the same time, debt, particularly in emerging markets, has been growing rapidly, and until recently financial conditions have been far from tight. It is somewhat odd, given its rationale, that so few countries have increased the CCyB.

Efforts have been made to catalogue the long and wide-ranging list of macroprudential tools, and to measure patterns across jurisdictions and over time in the frequency of their use, and whether they are being applied as expected to counter financial vulnerabilities. The data are gathered by survey, and one authority may classify a measure as macroprudential where another would not. And, like measuring the amount of regulation by the number of rules or pages in the U.S. Federal Register, an item count of measures may not be a reliable guide to their impact on the financial system.¹⁶

The measures are quite heterogeneous. A European Union survey includes over 50 different types (Budnik and Kleibl 2018).¹⁷ The IMF maintains a database collating the EU's and other surveys, as well as national sources, and lists close to 100 macroprudential tools.¹⁸

¹⁴France and Germany plan to impose a 0.25 percent CCyB, which would take effect from mid-2019. The ESRB tracks CCyB implementation at www.esrb.europa.eu/national_policy/ccb/html/index.en.html.

¹⁵Edge and Meisenzahl (2011) show that, at least in the United States, credit-to-GDP gap measures are subject to extensive data revisions, problematic for a measure intended to guide timely changes in capital ratios.

¹⁶Supervisory guidance as well as formal rules can also play a role. For example, Supervisory Letter 13-3 of March 2013 effectively instructed U.S. banks to limit their leveraged lending. The letter and subsequent clarifications are available at www.federalreserve.gov/supervisionreg/srletters/sr1303.htm.

¹⁷The ESRB tracks macroprudential tools at www.esrb.europa.eu/national_policy/html/index.en.html.

¹⁸The database and supporting documentation are available at www.elibrary-areaer.imf.org/Macroprudential/Pages/Home.aspx.

The proposed measures have proliferated partly out of concern that if constraints are imposed on one sector, such as banking, financial activity will evasively migrate to other intermediaries. This “leakage” problem is partly driven, however, by the guarantees extended to large banks. For example, much hedge fund leverage is extended by the prime brokerage subsidiaries of bank holding companies, and is ultimately dependent on the latter’s ability to borrow in large volumes at short term.

Implementation of macroprudential tools appears to be concentrated in smaller and developing countries, which often have less well-developed financial sectors and may be less responsive to measures that act through relative pricing and market conditions. These are not uniformly motivated by a financial stability goal. Many are limits on foreign exchange positions and other measures more akin to capital controls or foreign exchange policies. China, for example, varies quantitative restrictions on banks to keep its exchange rate stable in the face of capital outflows.

The overall impression is that macroprudential tools have not yet been widely deployed in advanced market economies. This is consistent with the emphasis on the particular vulnerabilities of small and emerging market economies to shifts in sentiment and capital flows, as concern is growing about these countries’ large foreign-denominated debt. But it is at odds with frequently voiced and well-founded concerns about reaching for yield and rising leverage in advanced economies.

Macroprudential Policy and Existing Regulation

Macroprudential regulation is proposed as an enhancement rather than replacement of the existing regulatory regime. A realistic view of its potential benefits should take account of how it would likely be implemented and interact with current rules.

Relying heavily on macroprudential tools requires regulators and supervisors to recognize threats to stability and react quickly and correctly. Especially to the extent that the approach involves time-varying and narrowly focused rules, this seems optimistic. Regulators and supervisors are subject to many pressures that may delay implementation or divert them to less effective measures. They will have a justifiable desire to avoid overreacting, and to await additional information (Tarullo 2014).

The complexity of the regulatory system, with its functional and jurisdictional divisions, interacts with political influences to make rapid deployment of macroprudential tools even more challenging. It may be infeasible to implement interventions, say, to limit mortgage lending growth in the face of resistance by focused interest groups.¹⁹

Some macroprudential tools may be less effective because they are so specific and may miss their mark, for example restrictions on mortgage credit extended by banks. Others, such as the CCyB, are of recent design, and there is little experience with their longer-term effectiveness. Regulators would likely want to address concerns about the stability of the financial system as a whole by drawing on several of these, so their interaction would make the effects of implementation even harder to foresee. They may not behave as desired, and their costs may outweigh the benefits. These problems are compounded by the fact that some proposed tools are informed largely by the experience of the global financial crisis, while an evolving financial system is likely to present new and unanticipated risks.

The tools would constitute an additional set of rules seeking to offset behaviors encouraged by existing regulations. For example, several of the tools attempt to limit issuance of riskier debt, while long-standing regulation may impel institutional investors to seek out such debt.

Above all, macroprudential policies are likely to be ineffective in preserving financial stability if intermediaries remain excessively leveraged and their investors can shift risk to taxpayers. While capital requirements have been increased modestly since the crisis, the range of safety net and bailout policies that encourage risk shifting has been revised, but remains largely in place. Macroprudential policies would be added on top.

¹⁹Edge and Liang (2019) present an analytical survey of financial stability governance structures around the world. Aikman, et al. (2019) discuss the institutional and political challenges of macroprudential policy and compare the potential effectiveness of the FSOc unfavorably with that of the U.K. Financial Policy Committee. They note (p. 125) that there is no U.S. regulator empowered to impose limits on residential mortgage loan-to-income ratios. Haldane and Madouros (2012) present a critique of regulatory complexity with capital requirements as its main example.

The Richmond Fed has estimated that the federal government explicitly or implicitly guarantees 79 percent of U.S. banks' liabilities.²⁰ The estimate doesn't include guarantees that are unstated, even implicitly, but that the public comes to expect. Expected guarantees would be smaller than promised if the promises lack full credibility. But in the United States, they are likely more extensive than captured in the Richmond Fed estimate.

Deposit insurance, for example, incentivizes large and small banks to increase leverage. The Continental Illinois resolution in 1984 extended protection to all depositors, disregarding the program's limits, and led to an overt TBTF policy.²¹ The 2008 crisis brought a further overt extension of deposit insurance. The Temporary Liquidity Guarantee Program (TLGP) of 2008–09 guaranteed uninsured deposits, albeit temporarily and within limits, including interbank lending, and other nondeposit unsecured debt, including bonds. The public likely now views deposit insurance as going far beyond its original purpose of protecting retail and business deposits up to certain limits.

Large banks in addition rely to varying degrees on guarantees to lower their debt yields, particularly on senior bonds. While difficult to estimate, a large-bank funding advantage has significant empirical evidence to support it. This “uplift” is generally substantial—several ratings notches—and has increased since the crisis, especially in Europe (Acharya, Anginer, and Warburton 2016; Hannoun 2011). Rating agencies candidly try to estimate each bank's ratings uplift given its reliance on government support and the likelihood it will actually materialize (Moody's Investors Service 2018).

Perceived guarantees can be destabilizing whether the expectations are fulfilled or not, as seen during the 2008 crisis. The effect of the Lehman bankruptcy in September may have been magnified by the surprise it caused after the Federal Reserve assumed a first-loss position in Bear Stearns' mortgage-debt book in March. In contrast,

²⁰The 2016 estimate is available at www.richmondfed.org/research/national_economy/bailout_barometer. The estimate of implicit guarantees is based in part on the post Dodd-Frank U.S. resolution framework. Although still in flux, the framework of resolution at the holding company level and the line of credit granted to the FDIC, the resolution authority, has raised issues including the circumstances under which resolution would be initiated and support for subsidiaries during resolution. See Kupiec and Wallison (2015).

²¹As expressed before Congress by the Comptroller of the Currency in its aftermath and reported in the *Wall Street Journal* on September 20, 1984. See also Boyd and Gertler (1993).

several emergency lending programs supported money market mutual funds, retroactively validating the perception that they were a substitute for insured bank deposits.²² Dodd-Frank aimed to reduce systemic risk by shrinking the safety net, but there is considerable evidence that it has not succeeded, and that it is not well designed to do so.

Better Ways to Avoid Financial Instability

A better approach to financial stability policy would start by addressing the intertwined problems of bank leverage and the perception and reality of government support. A more stable financial system is attainable in which public oversight is largely limited to chartering and realistic supervision, and responses to stress events are addressed by monetary policy tools and lender-of-last-resort facilities.

Higher ratios of better-quality capital are a direct and appropriate way to address excessive leverage and the credit expansion it supports. The credible withdrawal of guarantees is a direct and appropriate way to address moral hazard. A number of proposals have been made in this spirit, including higher but simpler capital requirements, making the resolution regimes of banks and dealers more predictable and credible, reducing the tax advantages of debt compared to equity financing, restriction of deposit insurance, narrow banking, and free banking. They would generally reduce rather than add to the complexity of financial regulation.

Several proposals have been put forward for increasing bank capital requirements beyond the current Basel standards or their U.S. implementation. Most favor using a leverage ratio, in which the denominator of the minimum capital ratio is a measure of overall bank assets, rather than RWA.²³ The proposals also for the most part mandate that regulatory capital consist of equity rather than subordinated debt and other nonequity claims.²⁴

²²That perception, created by the funds' par redemption feature, depended on the stable net asset value exemption from mark-to-market accounting granted by the Securities and Exchange Commission in 1982.

²³The Basel II standards in place before the crisis had a weak correlation with the incidence of distress among banks during the crisis. Simple leverage ratios performed less poorly in discriminating between weaker and stronger banks. See Demirgüç-Kunt, Detragiache, and Merrouche (2013); Haldane and Madouros (2012).

²⁴The proposals also differ in their definition of the asset-side total exposure and treatment of derivatives, other off-balance sheet items, and netting.

In the Senate, the Brown-Vitter bill proposed a 15 percent leverage ratio, while the House Hensarling Financial CHOICE Act proposed 10 percent. The Federal Reserve Bank of Minneapolis has published a plan calling for a 23.5 percent minimum equity ratio to RWA, which it equates to a 15 percent leverage ratio, for large banks, rising to a 38 percent ratio to RWA for large banks deemed to have remained systemically important.²⁵

Higher capital ratios are warranted not only by the crisis experiences of recent decades, but also by the stark contrast between historical bank capital ratios and those of recent decades. Ratios near 50 percent were not unusual in the 19th century.²⁶ Some proposals have also revived the idea, implemented in some jurisdictions in the 19th century, of additional or double liability over and above paid-in capital, to be imposed on shareholders if needed to meet liabilities (Macey and Miller 1992).

Financial markets could solve the problem of appropriately capitalizing banks without minimum capital rules if they could better evaluate banks' asset risks. As for any firm, given its funding mix and investments, returns on a bank's equity and debt issues of different maturities and priorities would adjust so they are comparable to similarly risky paper in the market as a whole. The bank could choose to reduce the shareholders' prospective return by issuing more equity, or offer higher debt yields.²⁷ Changes in banks' assets might also be part of any adaptation.

This simplification overlooks differences among types of risk. Low routine volatility and high losses on rare occasions may be more characteristic of finance than other businesses and appeal to a more

²⁵See Federal Reserve Bank of Minneapolis (2017). Admati, et al. (2013) succinctly state the case for higher minimum capital. It's worth noting that, even after the crisis, the basic Basel III minimum capital rule, requiring total capital of at least 8 percent of RWA, is unchanged from Basel II.

²⁶See Berger, Herring, and Szegö (1995); Miles, Yang, and Marcheggiano (2013); and Barth and Miller (2018). A bill (S. 2155) passed in May 2018 goes in the opposite direction, reducing capital requirements on larger banks below \$250 billion in assets, though not on the very largest banks.

²⁷The effect of lower leverage in lowering equity in the absence of tax and other distortions is called the "Modigliani-Miller offset," after Proposition II of Modigliani and Miller (1958). Miller's own comment (1995) on the ability of markets to make these assessments was "[s]tandard government blunderbuss, one-size-fits-all regulations cannot, and should not be expected to match the kind of delicate balancing of interests achievable through private contracting."

limited audience of potential investors. Banks' ability to reduce the relative cost of equity financing through lower leverage is limited by tax and regulatory distortions, such as deductibility of interest and deposit insurance.²⁸

The required assessments by investors as well as internal management of large banks are much more difficult with balance sheets as opaque as they are. Bank equity and credit analysts don't understand the firms they follow as well as their counterparts in other sectors. Some opacity is inherent in all firms, but may be more characteristic of finance. For example, default correlation, the likelihood of a surprisingly large cluster of simultaneous defaults during a downturn, is important in assessing lenders' asset quality, but difficult to grasp or measure. Guarantees and the additional regulation introduced to counteract the risk-taking they induce worsen opacity in finance.

The opacity of banks plays a crucial role in crises. An exposure worrying financial markets—for example, securitizations of badly underwritten residential mortgages—may not be that large relative to the size of the financial system. But if the suspect asset class is large enough, and lenders can't discern which bonds are toxic or which banks are holding them, they will decline to extend credit to any potential holder. In retrospect, Lehman Brothers was at least arguably barely solvent in September 2008 when it suffered a run on its short-term borrowing (Ball 2018), but potential lenders could not be confident of that. Bear Stearns' balance sheet was opaque enough that its rating composition remained a subject of debate for years following its demise, though its public-sector assumption ultimately proved profitable.²⁹

A hindrance to credibly reducing or eliminating intermediary guarantees is the difficulty of resolving failed and failing firms. The Dodd-Frank Titles I and II resolution regime, requiring large banks to provide regulators with a "living-will" guide to unwinding them if they are insolvent, has proven difficult to implement. Bank opacity

²⁸The money premium, which permits banks to finance themselves at lower cost by issuing liabilities such as deposits that provide services as money, has a similar effect.

²⁹Kotlikoff (2018: 24) recounts an amusing anecdote illustrating the impenetrability of Bear's balance sheet.

drives a vicious circle, adding to the difficulty and risk of permitting large banks to fail. The resulting uncertainty and inhibition of resolution makes a crisis bailout more likely, and any pledge to end guarantees less credible.

The guarantees thus permit banks to grow in size, complexity, and opacity, as well as undermine the market's ability to assess their risks in relation to return. In the absence of a market assessment, determining the appropriate level of capitalization is based on modeling, educated guesswork, and historical comparisons. A high regulatory leverage ratio is distortive, ignoring as it does the relative risks of different assets and penalizing low-risk activities, such as Treasury repo and covered foreign-exchange arbitrage, that consume a great deal of balance sheet.³⁰ Capital based on risk-weighted assets can be gamed by selecting the riskiest investments in a risk-weight category, or by adjusting internal models up to the point that would be flagged in supervisory review. The regulatory definition of equity capital is based on accounting definitions, and must be adjusted for hard-to-evaluate assets such as goodwill and mortgage servicing rights. Discipline by investors, who would know where to drill down for a specific bank, would be more effective in keeping capital aligned with asset risk than the Basel system. But neither investors nor on-site supervisors can effectively monitor capital adequacy with banks as opaque and complex as they are today.

Proposals for higher capital requirements have come under criticism based on the agency problems and moral hazard potentially generated within any large firm by the separation of ownership and control. Theoretically, leverage can exacerbate agency problems by providing incentives for managers to prefer risky projects and enabling equity investors to shift risk to debtholders. But it may also reduce agency problems by increasing banks' franchise value, sharpening managerial decisionmaking, and incentivizing monitoring by lenders—in turn facilitating banks' liquidity creation function.³¹

³⁰See Malz (2018) on the market impacts partly attributable to regulatory capital ratios. The regulatory definition of the asset-side total exposure, which can be quite different from the reported balance sheet total, is intended to at least roughly address this problem.

³¹See, for example, Diamond and Rajan (2000) and Calomiris and Kahn (1991). Thakor (2014) summarizes the arguments in the debate.

Similar arguments are made rationalizing bank opacity. Permitting bad news about banks' assets to become public would prevent the banks' money issuance from trading at par rather than at a fluctuating market price (Gorton 2014).

Estimates of the impact of lower leverage on banks' financing costs, and thus the input cost of lending, show only small such effects.³² It is thus highly unlikely that equity funding ratios would be as low as they are in the absence of public-sector guarantees. Any agency costs of higher capital would be offset at least partially by the benefits of reducing the risks generated by complexity and opacity. The arguments in any event don't support exacerbating agency and opacity problems through public policy.³³

The financial system is now far down a bad path and enmeshed in the consequences of opaque, overleveraged intermediaries dependent on guarantees. The challenge is to break out of the trap in which guarantees and the general policy direction of the past half-century validate the market values of debt and equity, and investors' bailout expectations. Higher capital requirements are a necessary transitional step, since, without them, guarantees cannot be credibly unwound.

It is argued that it is impossible for governments to commit to a no-bailout policy because of precedent, and because no such commitment can be credible.³⁴ This would leave only the alternatives of regulation and Pigovian taxation to offset the implicit subsidy the funding advantage provides to large banks and reduce the associated market distortions. But it may be possible to withdraw guarantees in a better-capitalized financial system that builds an experience of fewer crises and bailouts.

Unwinding guarantees cannot be done overnight, but only gradually, by not carrying out bailouts in situations where the public might

³²See, for example, Barth and Miller (2018); Miles, Yang, and Marcheggiano (2013); and Hanson, Kashyap, and Stein (2011). These estimates are conservative, that is, biased toward showing a larger effect on cost, through the assumption that the Modigliani-Miller offset is zero.

³³It has also been argued that, because of the safety net, higher capital requirements merely prompt banks to evasively shift to riskier assets and keep their expected return on capital unchanged.

³⁴See, for example, Chari and Kehoe (2016). Calomiris and Haber (2014) argue more generally that banking can realistically be reformed only by taking into account the political environment that has shaped it.

expect one, rather than continuing to validate bailout expectations *ex post*.³⁵ Leverage and guarantees work in tandem. As long as investors believe that banks will be supported if their insolvency can trigger widespread problems, they will be prepared to lend short term in large volumes and at lower yields. As long as the financial system remains fragile due to banks' inadequate capitalization, that support will in fact be forthcoming in a stress event. Higher capital ratios may also lead over time to a reduction in size of the largest banks, since size increases their systemic risks and strengthens expectations of support, adding to their funding advantage.

Monetary Policy and the Limitations of Macroprudential Policy

The focus on macroprudential policy has put financial stability back in the center of monetary policy discussions and stimulated research on financial crises and systemic risk indicators. The idea that monetary policy should take financial conditions as well as its macroeconomic targets into account is more widely accepted.

Proposals have also been made to apply macroprudential tools as a coequal or even preferred policy response to systemic risk, with monetary policy secondary. This approach is sometimes referred to as “separability”: macroprudential tools ought to be the first resort to preserve financial stability, and monetary policy the first resort to achieve inflation and growth goals (Adrian and Liang 2018). It is argued that macroprudential tools are a more effective and efficient way to deal with vulnerabilities, without changing the stance of monetary policy, because they can be targeted to specific sectors, leaving monetary policy less constrained in aiming at macroeconomic goals.

The contrasting view sees monetary and macroprudential policy as inseparable and monetary policy actions as indispensable in addressing financial imbalances and vulnerabilities. Both agree on the need for more awareness of stability indicators in setting monetary policy and for stability-enhancing reforms to regulation of finance.

The tension between the separability approach and including financial stability as a consideration for monetary policy has been

³⁵It will, however, also slow progress by offering fewer opportunities to disappoint the expectation of support.

mounting steadily since the crisis. Real interest rates are even lower than before the crisis, and may be lower than at any time (other than World War II) in modern records. The financial system remains highly leveraged and the corporate sector more so than in decades. There is still considerable evidence of reaching for yield behavior.³⁶ Overseas indebtedness in U.S. dollars has grown and currency crisis fears are acute in Argentina and Turkey.

One issue in the discussion is whether low real rates reflect an equilibrium or are induced in part by monetary policy. Possible real factors include the “savings glut” generated by an aging, wealthier world population seeking low-risk investments, and low real investment, business formation, and productivity growth. Realized and expected inflation remain low as well. The secular stagnation view (Summers 2014) attributes low rates to weak demand that over longer periods generates a downward hysteresis or ratchet effect on potential growth and calls for sustained expansionary monetary and especially fiscal policy. Since demand can only be supported at the cost of increased risks to financial stability, macroprudential tools are required.

The inseparability standpoint also identifies a downward ratchet effect in the behavior of real rates. But the mechanism is accommodative monetary policy over successive financial cycles, not stifled demand. It induces misallocation of resources, high and rising debt levels, and social strains that further constrain monetary policy toward ease. This point of view suggests addressing slower real growth with structural reforms and greater competition (Borio 2016).³⁷

Monetary policy is a more suitable and reliable way to address an overheating financial system, and should be viewed as the primary tool for achieving financial stability. In a former Fed governor’s succinct expression, monetary policy “gets in all of the cracks,” as interest

³⁶As one example among very many, the allocation to bonds rated BBB (the lowest investment-grade rating) or lower in U.S. property and casualty insurers’ fixed-income portfolios rose from 7.5 percent in 2005 to 22.5 percent in 2017 (New England Asset Management 2018), indicating an effort to increase yields while keeping the portfolio largely investment grade. Such investors may be forced sellers if a financial or economic shock leads to widespread downgrades.

³⁷See also Rajan (2010).

rates are transmitted to borrowers and lenders.³⁸ It is the most reliable way to inhibit leverage, as it reduces the additional return all asset owners can anticipate from debt financing, and inhibits panics by reducing the impact of a decline in asset values on owners' positions. The pervasiveness of monetary conditions contrasts with the complexity of a regulatory approach to vulnerabilities, which requires a detailed familiarity with the financial system unavailable to market participants or supervisors. There are situations in which booms have proven tenacious and difficult to counter by raising interest rates alone, but recognizing this possibility doesn't require treating macroprudential tools as a first resort.

The Fed and other central banks have long taken account of financial conditions in assessing the state of the economy and judging whether policy is tight or easy. Like macroeconomic indicators, financial conditions reflect the uncertain and variable lags with which the effects of policy changes unfold. But they present a particular challenge because financial stress episodes can erupt suddenly and generate tremendous costs.

Financial conditions, however, are not incorporated into monetary policy goals or models. The prevailing monetary policy framework relies heavily on quantitative targets that can be summed up in simple Taylor-type rules indicating appropriate rate levels.³⁹ To date, the financial-cycle point of view hasn't been expressed in a tractable model of that type.

Federal Open Market Committee (FOMC) minutes generally cite financial conditions in much the same way they cite labor and product market conditions. With inflation and the output gap at given levels, the short-term rate might seem high if loans are hard to get and investors are cautious, but low if lenders are eager and markets are buoyant. The term "financial conditions" is more routinely employed in FOMC minutes and the semiannual *Monetary Policy Report*,

³⁸ "[W]hile monetary policy may not be quite the right tool for the job, it has one important advantage relative to supervision and regulation—namely, that it gets in all of the cracks" (Stein 2013).

³⁹ Incorporating more than one short-term interest rate, financial frictions such as liquidity constraints, and other more realistic features of the financial system into these models has been a lively research topic since the crisis. Woodford (2010) summarizes the issues involved. The targets have also been at odds with the steady anchoring of inflation expectations to lower realized rates.

while terms such as “systemic” or “vulnerabilities” are employed in financial stability reporting.

The substantive difference is unclear and may give rise to confusion about the implementation of macroprudential measures and their interaction with monetary policy. The availability of macroprudential tools, together with the absence of financial conditions from formal policy goals, may support avoidance of monetary tightening. If signs of overheating appear, some FOMC participants have proposed primary reliance on a macroprudential rather than a monetary policy response. A recent example concerns the CCyB, which “can lean against rising financial vulnerabilities at a time when the degree of monetary tightening that would be needed to achieve the same goal would be inconsistent with the dual mandate goals of full employment and price stability” (Brainard 2018).⁴⁰

Statements by Fed officials and FOMC minutes through most of 2018 assessed financial conditions as accommodative or easy, while the CCyB remained at zero. Consistency between these statements and macroprudential policy would have suggested setting a positive CCyB in 2018.⁴¹ Reliance on macroprudential tools may thus enhance policy asymmetry over the cycle. If macroprudential tools are a first resort in an overheating economy, and are ineffective or not applied, any bias toward looser monetary policy during a boom will be amplified, leaning in the wrong direction.

The Great Moderation period prior to the crisis provides another cautionary illustration. Looking back on the low initial level and smoothed, predictable trajectory of the funds rate as it was raised prior to the 2007 crisis, “either monetary policy should have been tightened more aggressively or macroprudential measures should have been implemented in order to tighten credit conditions in the overheated housing sector” (Dudley 2014). Overlaying housing-finance limits on the comprehensive public-sector subsidies and guarantees favoring mortgage credit, however, would have met

⁴⁰Governor Brainard continued making a case for a nonzero CCyB in several speeches later in 2018 and 2019.

⁴¹By the end of 2018, market volatility had led the minutes to describe financial conditions as “tightening.” An explanation by the Board’s Vice Chair for Supervision in early 2019, following the most recent affirmation of a zero CCyB, is provided at www.federalreserve.gov/newsevents/speech/files/quarles20190329a.pdf.

political opposition, taken time to implement even if it were carried out, and had unpredictable results.

Monetary policy is insufficient to insure financial stability in the current regime of large, opaque intermediaries, highly leveraged and reliant on public-sector support. But with higher capital levels and less risk-shifting, monetary policy and investor due diligence could again have the primary responsibility for averting excessive debt levels. Such an approach would be consistent with macroprudential policy advocates' goal of a more resilient financial system.

By creating uncertainty about whether credit expansion is due to regulatory policy or to a buoyant economy, TBTF and other guarantees undermine both financial and macroeconomic stability. Financial intermediary leverage or credit growth that is high or rising fast enough to raise vulnerability concerns is also not compatible with macroeconomic goals (Stein 2014). Financial conditions can make it prudent to tighten even though the output gap is still positive. Some flexibility in hitting targets may be preferable in the long term, rather than relying on discretionary macroprudential tools.

The presence of guarantees muddies the waters, as they may foster leverage overall or in some sectors, although macroeconomic conditions are not very accommodative. Prior to 2008, housing-finance subsidies and guarantees made it more difficult to distinguish whether monetary policy was set appropriately. If intermediaries were adequately capitalized for long-term solvency through the cycle, high or rising credit and leverage would point more clearly toward tightening.

Macroprudential policy has also become intertwined with the debate on the exit from crisis-era monetary policy and about whether the precrisis operating framework can or should be restored. The argument is made that a large central bank balance sheet serves as a macroprudential measure, apart from any advantages in setting short-term interest rates. The central government would supplant private liquidity creation and accommodate surge demand for liquidity by issuing additional short-term debt (Greenwood, Hanson, and Stein 2015, 2016). These proposals are similar to calls for a narrow banking system, in which bank-issued forms of money would be eliminated, but applied to short-term funding markets as well to preclude run-like phenomena more generally.⁴²

⁴²See also Cochrane (2014).

The relationship between macroprudential and monetary policy raises governance issues pertaining to the clarity with which the objectives of macroprudential policy and tools are defined. How are these to be formulated and to what extent quantitatively? Is the objective to avoid major crises or to reduce the amplitude of the financial cycle? The objectives of macroprudential policy are not fully distinct from those of macroeconomic policy, as they also involve deviations of inflation and growth from targets, but unusually large and costly ones. Monetary policy can reduce the cost of achieving its own goals by reducing the volatility of inflation and employment, as well as by reducing the probability of large and costly deviations. With its proliferation of proposed tools, macroprudential policy may open a path to proliferating rules to combat possible vulnerabilities that present a low or inadequately demonstrated risk to the financial system.⁴³

Conclusion

Reliance on macroprudential tools is problematic in several ways. First, in spite of reforms to the regulation of bank capital, high leverage, regulatory complexity, and public-sector guarantees continue to be hallmarks of the financial systems of advanced market economies. Banks' asset risks remain opaque. After repeated experience, including the crisis, the market will continue to assume that intermediaries will be rescued as necessary to avoid a new disaster. Macroprudential policy doesn't fix this problem, but tries to ward off its consequences. There is an alternative path that uses higher regulatory capital standards as an interim step toward gradually eliminating guarantees without destabilizing the financial system.

Second, employing macroprudential tools while leaving intermediaries undercapitalized but guaranteed would add layers of regulation that may achieve the purpose of cooling or stimulating risk-taking, but at the expense of raising the inefficiency and evasion costs and risks of regulation. It is an inverse form of regulatory evasion, not by the regulated but by the regulator: the adverse effects of a defective regulatory framework are addressed not by improving the framework but by adding to it. Macroprudential tools also widen the use of discretion in financial regulation, adding to the already-severe

⁴³See, for example, Tucker (2016, 2018).

problem of on-site supervisors endeavoring to assess risks they are as ill-situated as management and investors to fully understand.

Finally, the apparent breathing space for monetary policy that the availability of macroprudential tools offers carries risks. Some proponents of macroprudential policy have made clear that they consider it desirable and practicable to use it as a primary defense against imbalances and vulnerabilities, with monetary policy secondary. In general, however, macroprudential policy will shift the risk assessment of policymakers toward ease and “cleaning up afterwards,” making a repetition of earlier extended episodes of low rates followed by crises likelier.

References

- Acharya, V. V.; Anginer, D.; and Warburton, A. J. (2016) “The End of Market Discipline? Investor Expectations of Implicit Government Guarantees.” Available at <https://dx.doi.org/10.2139/ssrn.1961656>.
- Admati, A. R.; DeMarzo, P. M.; Hellwig, M. F.; and Pfleiderer, P. (2013) “Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity Is Not Socially Expensive.” Stanford Graduate School of Business Working Papers, No. 2065.
- Adrian, T.; Covitz, D.; and Liang, N. (2015) “Financial Stability Monitoring.” *Annual Review of Financial Economics* 7 (1): 357–95.
- Adrian, T.; and Liang, N. (2018) “Monetary Policy, Financial Conditions, and Financial Stability.” *International Journal of Central Banking* 14 (1): 73–131.
- Adrian, T.; and Shin, H. S. (2010) “Financial Intermediaries and Monetary Economics.” In B. M. Friedman and F. H. Hahn (eds.), *The Handbook of Monetary Economics*, Vol. 3, 601–50. Amsterdam: Elsevier.
- Aikman, D.; Bridges, J.; Kashyap, A.; and Siegart, C. (2019) “Would Macroprudential Regulation Have Prevented the Last Crisis?” *Journal of Economic Perspectives* 33 (1): 107–30.
- Ball, L. M. (2018) *The Fed and Lehman Brothers*. New York: Cambridge University Press.
- Barro, R. J. (2006) “Rare Disasters and Asset Markets in the Twentieth Century.” *Quarterly Journal of Economics* 121 (3): 823–66.
- Barth, J. R., and Miller, S. M. (2018) “Benefits and Costs of a Higher Bank Leverage Ratio.” *Journal of Financial Stability* 38: 37–52.

- Basel Committee on Banking Supervision (2010) “Guidance for National Authorities Operating the Countercyclical Capital Buffer.” Bank for International Settlements (December).
- Berger, A. N.; Herring, R. J.; and Szegö, G. P. (1995) “The Role of Capital in Financial Institutions.” *Journal of Banking and Finance* 19: 393–430.
- Bernanke, B. S., and Gertler, M. (1995) “Inside the Black Box: The Credit Channel of Monetary Policy Transmission.” *Journal of Economic Perspectives* 9 (4): 27–48.
- (2001) “Should Central Banks Respond to Movements in Asset Prices?” *American Economic Review* 91 (2): 253–57.
- Borio, C. (2003) “Towards a Macroprudential Framework for Financial Supervision and Regulation?” BIS Working Paper No. 128.
- (2011) “Implementing a Macroprudential Framework: Blending Boldness and Realism.” *Capitalism and Society* 6 (1): 1–23.
- (2014) “The Financial Cycle and Macroeconomics: What Have We Learnt?” *Journal of Banking and Finance* 45: 182–98.
- (2016) “Revisiting Three Intellectual Pillars of Monetary Policy.” *Cato Journal* 36 (2): 213–38.
- Borio, C., and White, W. R. (2003) “Whither Monetary and Financial Stability: The Implications of Evolving Policy Regimes.” *Monetary Policy and Uncertainty: Adapting to a Changing Economy*, 131–211. Federal Reserve Bank of Kansas City.
- Borio, C., and Zhu, H. (2012) “Capital Regulation, Risk-Taking and Monetary Policy: A Missing Link in the Transmission Mechanism?” *Journal of Financial Stability* 8 (4): 236–51.
- Boyd, J. H., and Gertler, M. (1993) “U.S. Commercial Banking: Trends, Cycles, and Policy.” *NBER Macroeconomics Annual* 8: 319–77.
- Brainard, L. (2018) “Safeguarding Financial Resilience Through the Cycle.” Speech at the Global Finance Forum, Washington, D.C., Board of Governors of the Federal Reserve System.
- Budnik, K., and Kleibl, J. (2018) “Macroprudential Regulation in the European Union in 1995–2014: Introducing a New Data Set On Policy Actions of a Macroprudential Nature.” European Central Bank Working Paper No. 2123.

- Calomiris, C. W., and Haber, S. H. (2014) *Fragile by Design: The Political Origins of Banking Crises and Scarce Credit*. Princeton, N.J.: Princeton University Press.
- Calomiris, C. W., and Kahn, C. M. (1991) “The Role of Demandable Debt in Structuring Optimal Banking Arrangements.” *American Economic Review* 81 (3): 497–513.
- Calvo, G. A. (2013) “The Mayekawa Lecture: Puzzling over the Anatomy of Crises—Liquidity and the Veil of Finance.” *Monetary and Economic Studies* (Bank of Japan) 31: 39–64.
- Cerutti, E.; Claessens, S.; and Laeven, L. (2017) “The Use and Effectiveness of Macroprudential Policies: New Evidence.” *Journal of Financial Stability* 28: 203–24.
- Chari, V. V., and Kehoe, P. J. (2016) “A Proposal to Eliminate the Distortions Caused by Bailouts.” Federal Reserve Bank of Minneapolis Economic Policy Paper 16–01.
- Claessens, S. (2015) “An Overview of Macroprudential Policy Tools.” *Annual Review of Financial Economics* 7: 397–422.
- Clarida, R.; Gali, J.; and Gertler, M. (1999) “The Science of Monetary Policy: A New Keynesian Perspective.” *Journal of Economic Literature* 37 (4): 1661–1707.
- Clement, P. (2010) “The Term ‘Macroprudential’: Origins and Evolution.” *BIS Quarterly Review* (March): 59–67.
- Cochrane, J. H. (2011) “Presidential Address: Discount Rates.” *Journal of Finance* 66 (4): 1047–1108.
- _____ (2014) “Toward a Run-Free Financial System.” In M. N. Baily and J. B. Taylor (eds.), *Across the Great Divide: New Perspectives on the Financial Crisis*, 197–249. Stanford, Calif.: Hoover Institution Press.
- Cohen, B. H.; Domanski, D.; Fender, I.; and Shin, H. S. (2017) “Global Liquidity: A Selective Review.” *Annual Review of Economics* 9 (1): 587–612.
- Corrigan, E. G. (1991) “The Banking-Commerce Controversy Revisited.” Federal Reserve Bank of New York *Quarterly Review* 16 (1): 1–13.
- Demirguc-Kunt, A.; Detragiache, E.; and Merrouche, O. (2013) “Bank Capital: Lessons from the Financial Crisis.” *Journal of Money, Credit and Banking* 45: 1147–64.
- Diamond, D. W., and Rajan, R. G. (2000) “A Theory of Bank Capital.” *Journal of Finance* 55 (6): 2431–65.

- Dudley, W. C. (2014) "The 2015 Economic Outlook and the Implications For Monetary Policy." Speech at Bernard M. Baruch College, New York.
- Edge, R. M., and Liang, J. N. (2019). "New Financial Stability Governance Structures and Central Banks." Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series No. 2019-019.
- Edge, R. M., and Meisenzahl, R. R. (2011) "The Unreliability of Credit-to-GDP Ratio Gaps in Real Time: Implications for Countercyclical Capital Buffers." *International Journal of Central Banking* 7 (4): 261-98.
- Elliott, D. J.; Feldberg, G.; and Lehnert, A. (2013) "The History of Cyclical Macroprudential Policy in the United States." Office of Financial Research Working Paper No. 8.
- Federal Reserve Bank of Minneapolis (2017) "The Minneapolis Plan to End Too Big to Fail." Available at www.minneapolisfed.org/publications/special-studies/endingtbtbf.
- Friedman, M., and Schwartz, A. J. (1963) *A Monetary History of the United States, 1867-1960*. Princeton, N.J.: Princeton University Press.
- Geanakoplos, J. (2009) "The Leverage Cycle." *NBER Macroeconomics Annual* 24: 1-65.
- Gorton, G. (2014) "The Development of Opacity in U.S. Banking." *Yale Journal on Regulation* 31 (3): 825-51.
- Greenwood, R.; Hanson, S. G.; and Stein, J. C. (2015) "A Comparative-Advantage Approach to Government Debt Maturity." *Journal of Finance* 70 (4): 1683-1722.
- _____ (2016) "The Federal Reserve's Balance Sheet as a Financial-Stability Tool." *Designing Resilient Monetary Policy Frameworks for the Future*, 335-97. Federal Reserve Bank of Kansas City.
- Haldane, A. G., and Madouros, V. (2012) "The Dog and the Frisbee." *The Changing Policy Landscape*, 109-159. Federal Reserve Bank of Kansas City.
- Hannoun, H. (2011) "Sovereign Risk in Bank Regulation and Supervision: Where Do We Stand?" Bank for International Settlements, October.
- Hanson, S. G.; Kashyap, A. K.; and Stein, J. C. (2011) "A Macroprudential Approach to Financial Regulation." *Journal of Economic Perspectives* 25 (1): 3-28.

- International Monetary Fund (2015) “Monetary Policy and Financial Stability.” Policy Papers.
- Kashyap, A. K.; Berner, R.; and Goodhart, C. A. (2011) “The Macroprudential Toolkit.” *IMF Economic Review* 59: 145–61.
- Kaufman, G. G. (1994) “Bank Contagion: A Review of the Theory and Evidence.” *Journal of Financial Services Research* 8 (2): 123–50.
- Kotlikoff, L. J. (2018) “The Big Con—Reassessing the ‘Great’ Recession and Its ‘Fix.’” NBER Working Paper No. 25213.
- Kupiec, P., and Wallison, P. (2015) “Can the ‘Single Point of Entry’ Strategy Be Used to Recapitalize a Systemically Important Failing Bank?” *Journal of Financial Stability* 20: 184–97.
- Macey, J. R., and Miller, G. P. (1992) “Double Liability of Bank Shareholders: History and Implications.” *Wake Forest Law Review* 27: 31–62.
- Malz, A. M. (2018) “Liquidity Risk after the Crisis.” *Cato Journal* 38 (1): 35–64.
- Miles, D.; Yang, J.; and Marcheggiano, G. (2013) “Optimal Bank Capital.” *Economic Journal* 123 (567): 1–37.
- Miller, M. (1995) “Do the M & M Propositions Apply to Banks?” *Journal of Banking and Finance* 19 (3–4): 483–89.
- Modigliani, F., and Miller, M. (1958) “The Cost of Capital, Corporation Finance and the Theory of Investment.” *American Economic Review* 48 (3): 261–97.
- Moody’s Investors Service (2018) *Rating Methodology: Banks*.
- New England Asset Management (2018) “Managing the New World Order: PC Investment Highlights.” Available at www.neamgroup.com/insights/managing-the-new-world-order-property-casualty-investment-highlights.
- Rajan, R. G. (2005) “Has Financial Development Made the World Riskier?” *The Greenspan Era: Lessons for the Future*, 313–97. Federal Reserve Bank of Kansas City.
- (2010). *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton, N.J.: Princeton University Press.
- Rey, H. (2013) “Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence.” *Global Dimensions of Unconventional Monetary Policy*, 285–333. Federal Reserve Bank of Kansas City.
- Stein, J. C. (2013) “Overheating in Credit Markets: Origins, Measurement, and Policy Responses.” Speech at a research

- symposium sponsored by the Federal Reserve Bank of St. Louis, Board of Governors of the Federal Reserve System.
- _____ (2014) "Incorporating Financial Stability Considerations Into a Monetary Policy Framework." Speech at the International Research Forum on Monetary Policy, Washington, D.C., Board of Governors of the Federal Reserve System.
- Summers, L. H. (2014) "U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound." *Business Economics* 49 (2): 65–73.
- Svensson, L. E. (2017) "Cost-Benefit Analysis of Leaning against the Wind." *Journal of Monetary Economics* 90: 193–213.
- Tarullo, D. K. (2014) "Macroprudential Regulation." *Yale Journal on Regulation* 31 (3): 505–21.
- Thakor, A. V. (2014) "Bank Capital and Financial Stability: An Economic Trade-Off or a Faustian Bargain?" *Annual Review of Financial Economics* 6: 85–223.
- Tucker, P. (2016) "The Design and Governance of Financial Stability Regimes: A Challenge to Technical Know-How, Democratic Accountability and International Coordination." Centre for International Governance Innovation (CIGI), *Essays on International Finance* 3 (September): 1–68.
- _____ (2018) *Unelected Power: The Quest for Legitimacy in Central Banking and the Regulatory State*. Princeton, N.J.: Princeton University Press.
- White, W. (2009) "Should Monetary Policy Lean or Clean: A Reassessment." *Central Banking* 19 (4): 32–42.
- Woodford, M. (2010) "Financial Intermediation and Macroeconomic Analysis." *Journal of Economic Perspectives* 24: 21–44.

© 2019. This work is published under NOCC (the “License”). Notwithstanding the ProQuest Terms and Conditions, you may use this content in accordance with the terms of the License.