

Fault Lines in the Pursuit of Financial Stability¹

by William White

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A. Introduction and Summary

The financial and economic crisis that began in 2007 was shocking, not just because of its magnitude and eventual duration, but because it was to such a large degree unexpected. Preceded as it was by the “Great Moderation”, some influential commentators had even suggested that the business cycle had been banished for good. Indeed, extant economic models implied that long periods of sub par economic performance were essentially impossible.

Searching for an explanation for this unexpected event, attention quickly focussed on the operations of the financial system as “somehow” the cause of the crisis. One part of the response was to try to introduce a financial sector and financial frictions into the economic models used by policymakers. Another response was to tighten the regulations affecting the financial sector with a view to ensuring that similar crises could not happen in the future. An immense international effort has been mounted, centred around the Basel based institutions², but involving virtually every country in the world. The purpose of this paper is to evaluate whether those changes have raised sufficiently the likelihood of future economic and financial stability. The

¹ The views expressed in this paper are those of the author and do not necessarily reflect the views of any institutions with which he has been associated. The author would like to thank Charles Goodhart, Desmond Lachman, Robert Pringle, James Stewart, Leslaw Skoczylas, Dirk Schoenmaker and Andrew Smithers for helpful comments.

² The Bank for International Settlements in Basel hosts the Financial Stability Board, the Basel Committee on Banking Supervision and a number of other committees and organizations. Broadly put, these groups lay out the regulations, while national authorities, with the support of the IMF and OECD, try to enforce them.

conclusion drawn is that future crises, whether in the financial sector or the broader economy, can by no means be ruled out.³

It will be argued below that a fundamental problem has been largely overlooked. It is not sufficient to ensure that a weak financial system does not aggravate economic downturns, by restricting the *supply* of credit. This has been the objective sought by most post crisis regulatory changes in pursuit of financial stability. Arguably more important is the need to ensure that an overly exuberant financial system does not weaken other parts of the economy, by encouraging an unsustainable buildup of debt during upturns. This aggravates the subsequent downturn by limiting the *demand* for credit. The only policy that would suffice to avoid *both* problems is to lean against the buildup of debt in the first place.

That would be the explicit objective of a **macrofinancial** stability framework, in which both monetary policy and regulatory policy would together “lean against the wind” of credit and debt creation as it fluctuates over time. However, such a framework has not been adopted in most large countries or monetary jurisdictions. As before the crisis, monetary policy post-crisis remains firmly directed to the pursuit of near-term price stability. Against a backdrop of disinflationary supply side shocks, easy monetary policies have encouraged stocks of debt to build up, cycle after cycle. They are now at levels that might trigger an economic downturn but will most certainly aggravate any downturn arising from some other sources.

In principle, **macroprudential** regulatory policies might be used alone to deal with this broad problem of economic instability. Macroprudential policies are defined as focussing on the stability of the system as a whole. However, in practice, policymakers have focussed much more narrowly on measures to ensure the stability of the financial system alone, rather than moderating the broader implications of the financial cycle⁴. Further, while some of the macroprudential measures taken in the post crisis period have been used in a time varying (dynamic) way to lean against strong increases in private sector credit (especially mortgages), their influence has been overwhelmed by the

³ See White (2014) for a more narrowly focussed, but much more detailed analysis.

⁴ Kohn (2019) notes that some prudential regulations, loan to value ratios for example, are “targeted more towards preserving borrower rather than lender resilience”.

effects of ultra easy monetary policy which has encouraged the further build up of global debt. Other macroprudential measures (static) to deal with the systemic implications of interdependencies within the financial system, and the “too big to fail” problem, also have serious shortcomings.

The reality is that most of the post crisis reform effort has gone into traditional **microprudential** regulatory policies that also do not vary over time. Moreover, microprudential policies seek to strengthen the health of individual institutions, rather than the financial system as a whole. Thus, they are two steps away from the ideal of countercyclical policies directed to stabilizing the economic system as a whole. In this regard, the regulators and the central banks have both retreated into post-crisis policies that focus on cleaning up after a crisis rather than leaning against it. In effect, post-crisis policies have essentially been “more of the same”.

Some of these microprudential initiatives have clearly been helpful, but certain shortcomings can also be identified. Not least, tighter regulations of institutions by sector invites migration to less regulated sectors as well as innovations specifically designed to avoid the regulations. For example, pre-crisis regulation of banks contributed to the growth of a particular form of “shadow banking”. Since the crisis, the rapid growth of asset management companies has raised questions about the risks they might now pose to the global financial system.

With so much regulatory reform since the crisis, but with so many fears still remaining about possible future instability, those outside the policy making community are increasingly asking whether more fundamental changes are not required. Some wish to redress the shortcomings already noted in how the current system operates. Others suggest the need for a more radical overhaul of our current “fiat money” system. They argue that the capacity of the financial system to create money out of nothing is the root cause of the problem of excessive credit and debt creation. Still others bemoan the absence of an International Monetary System that might force discipline on those participating in it.

Whatever the path suggested for resisting pressures to increase debt in the future, policy makers must also face another and more immediate challenge.

How can we deal with the current problem of debt overhang arising from the excessive reliance on easy monetary policy in past decades? Indeed, since the last crisis began, monetary policy has been used in an experimental way, unprecedented in the post-War period. As a result, the debt problem has taken on a truly global dimension in just the last few years. While dealing with this problem is beyond the scope of his paper, it needs much more attention than it is getting from policymakers⁵. In retrospect, the markets might not be alone in facing accusations of complacency.

B. The Financial Cycle and the Real Economy

There is now an extensive literature on “boom-bust” financial cycles throughout history⁶. They have occurred recurrently under a variety of regulatory and monetary regimes. A common theme is some piece of good news in the real economy that seems to justify higher expectations of profits and more investment financed by rapid credit expansion⁷. Rising prices for financial assets and real estate provide more collateral for still more lending. Momentum trading and rising enthusiasm provide more positive feedback (“procyclicality”) until interest rates begin to rise and expectations are eventually reassessed as unrealistic. These developments raise doubts about the capacity of highly leveraged borrowers to service debts. This often triggers a “Minsky moment”, preceded by a period of credit deceleration, in which private sector credit dries up and boom turns into bust⁸.

This literature clearly implies that achieving price stability (a sustained low level of inflation) is not sufficient to ensure stability in the real economy⁹. Moreover, recent history also supports this view. Indeed, the last three major economic downturns (1990, 2001 and 2008) did not have their origins in

⁵ See White (2019)

⁶ A classic reference to this history is Kindelberger and Aliber (2005). Early post crisis historical studies are by Reinhart and Rogoff (2009) and Schularik and Taylor (2012).

⁷ The likelihood of this happening rises as memories of past crises, associated with such behaviour, fade over time.

⁸ Perhaps the most compelling theoretical exposition of this process is provided by Minsky (1986) who emphasizes the importance of both private debt accumulation and changes in income distribution in affecting system dynamics. Keen began suggesting formal models of these non-linear processes many decades ago. See Keen (1995) and, most recently, Keen (2017).

⁹ Complementary arguments to support this conclusion are presented in White (2006)

central bank tightening in response to sharply rising inflation. Rather, they had their origins in high and rising debt levels and associated disturbances in financial markets. The financial cycle should by now have displaced the business cycle as the chief source of concern for central bankers. Unfortunately, this crucial lesson does not yet seem to have been learned.

The relatively slow recovery from credit driven busts also has its roots in the burden of debt built up in the preceding period of the boom. Attempts to service debt take priority and lead to expenditure cutbacks. Through the Keynesian “paradox of thrift” this behaviour stifles growth. Economic weakness can then undermine the health of the financial system¹⁰. In extremis, this can lead to a 1930’s type of debt- deflation or even hyperinflation as governments resist such processes through monetary expansion¹¹.

Nor is the stability of the financial sector sufficient to ensure stability in the real sector. Reinhart and Rogoff (2009) document many historical cases where the real economy had a steep downturn in spite of the financial sector continuing to function quite well. Koo (2003) suggests that the Great Recession in Japan was not due to a weakened banking sector, and an inadequate supply of credit, but rather to an inadequate demand for loans as corporations tried to reduce debt after a long period of overexpansion. Similarly, European respondents to the ECB’s Access to Finance Survey have since 2015 ranked the availability of credit among the least of their concerns¹². The problem appears to be a reluctance to invest, against a backdrop of high corporate debt, and thus a decrease in the demand for loans, rather than a decline in supply.

A corollary of this insight is that efforts to increase financial stability can even increase the likelihood and cost of crisis in the real economy. This could be the result if risks are simply shifted out of the financial sector onto the shoulders of households and corporations that are less well placed to bear them. The replacement of defined benefit pension plans with defined contributions is a case in point. Securitization of risky loans is another. The unfortunate

¹⁰ Consider Reinhart and Rogoff (2009) p 145 who state “Severe financial crises rarely occur in isolation. Rather than being the trigger of recession, they are more often an amplification mechanism.” For a modern example, think of the current state of the Italian banking system.

¹¹ Sargent and Wallace (1981) provide a theoretical explanation for such an inflationary outcome. Bernholz (2006) provides many historical examples to prove that this is not just idle theorizing.

¹² See the discussion in Finance Watch (2018) pp 12-13.

implications of securitizing mortgages (and tranching them) prior to 2007 are now obvious, though the implications of more recent attempts to securitize corporate loans remains to be seen. Finally, Mian (2019) suggests that concern about the health of the financial sector has been an important impediment to introducing state -contingent risk sharing, even though it might help to soften the slowdown of household spending in downturns.

Accepting the reality and importance of the financial cycle implies the need to reject a number of the hypotheses that were central to the belief system prior to the crisis. *Financial markets* might well be “efficient” in evaluating relative risks and returns at a moment in time. However, if they systematically alternate between unwarranted bouts of optimism and pessimism¹³ over time, then they are clearly inefficient in some broader sense. Large misallocations of capital seem not only possible but likely. As well, innovation in the financial sphere is not necessarily welfare enhancing¹⁴, but could be motivated by rent seeking or regulatory arbitrage.

Beliefs about how the *real economy* functions also have to change. Since the busts following booms are long and deep¹⁵, a basic assumption underlying widely used economic models (real business cycle models and DSGE models) is violated. Economies do not have properties that quickly restore “equilibrium” when production falls below pre crisis trends. Had the IMF and OECD, among others, accepted this fact, they might have avoided an embarrassing outcome. Each organization had to revise downward its next-year forecast for global growth for nine consecutive years after the onset of the crisis¹⁶.

It is also important to note that monetary policy can become even more ineffective in stimulating aggregate demand if it is used asymmetrically over repeated cycles. With positive, global supply side shocks holding down prices, it has in fact been possible since the late 1980s to ease policy more aggressively in downturns than to tighten it in upturns. This has implied that the “headwinds” of debt, and the other unintended consequences of

¹³ Essentially the ebb and flow of “animal spirits” described by Keynes (1936)

¹⁴ Recall Chairman Volcker’s famous comment about financial innovation and ATM machines.

¹⁵ Reinhart and Reinhart (2010).

¹⁶ This was due in part to the failure to recognize how the level of potential had weakened due to earlier weak investment.

monetary easing, have not been extinguished in each cycle. Rather, they have been allowed to accumulate over time. This perhaps helps explain why the response of aggregate demand to monetary stimulus was greater in 1990 and 2000 than it was subsequent to 2009.

To be more precise, monetary policy works largely by bringing spending forward from the future to today¹⁷. However, in this process, debts are accumulated which constitute claims against future spending. As tomorrow becomes today, the weight of those debt claims on aggregate demand steadily increases¹⁸. Some go even further in suggesting that easy monetary conditions can reduce aggregate supply, by encouraging resource misallocations in upturns and by providing support for zombie companies and zombie banks in downturns¹⁹. Finally, low intermediation margins and the search for yield foster financial instability. Repeated and asymmetric reliance on monetary stimulus has made the work of both future central bankers and financial regulators even more difficult.

As an illustration of these effects, the global ratio of non-financial debt to GDP was significantly higher in 2017 than it was in 2008²⁰. The growth of private sector debt was particularly marked. Moreover, whereas rising private sector debt was previously an advanced economies phenomenon, by 2017 it had affected many emerging markets as well. China became a particular source of concern, as the Chinese government tried to restrain lending by the “shadow banking” sector.

In addition, there has been a significant deterioration in the quality of corporate lending in the United States, but also elsewhere²¹. The lowest investment-grade corporate issues accounted for one third of the US market in 2008 but are now half the market in both the US and Europe. To argue, as the Fed currently does²², that the recent buildup of corporate debt in the US is not

¹⁷ For a much more detailed description of the various channels through which monetary policy is thought to affect aggregate demand, see White (2016)

¹⁸ In addition, rising debt levels lead to rising wealth inequality and a host of associated problems.

¹⁹ Cerra and Saxena (2008), Cerra and Saxena (2017), Borio et al (2015) and Andrews et al (2017)

²⁰ See the non-financial debt statistics (households plus corporates plus governments) compiled by the Bank for International Settlements. Also, Buttiglione et al (2014).

²¹ In McKinsey and Company (2019) it is contended that “Corporates across most of Asia are under significant stress to service debt obligations”

²² Powell (2018)

worrisome, because it does not threaten the financial system, could be missing the forest for the trees. Indeed, recently, some corporations do appear to have become more worried about their debt levels, which may presage even weaker investment growth going forward²³.

The Case for Adopting a Macrofinancial Stabilization Framework

The above arguments all indicate that it might have been better to “lean” against excessive credit growth in the upturn than to try to “clean” up afterwards. How might this have been done, and how might it conceivably be done in the future. A longstanding suggestion²⁴ has been the need to adopt a macrofinancial stabilisation framework: namely, the joint use of monetary tightening and more restrictive financial regulation to resist credit developments judged likely to turn into a “boom-bust” cycle.

At a more formal level, this seemed suggested by literature discussing the governance of other, complex adaptive systems²⁵. A variety of negative feedback rules are commonly required to stabilize such systems. Less formally, it was initially a “belt and braces” approach to the fact that each set of instruments had both advantages and disadvantages. Monetary tightening was desirable since, as Jeremy Stein famously said, “monetary policy gets in all the cracks”. However, relying solely on monetary tightening might result in destructively high interest rates for the whole economy, when the credit problem was actually quite localized. As for macroprudential tightening, such instruments could be fine tuned to deal with localized events. In contrast, the downside of such measures included being prone to evasion by highly adaptive agents, not least by diverting credit origination to less heavily regulated sectors.

In the event, the central banking community has essentially rejected the idea of using monetary policy to lean against credit excesses. The most important

²³ See Historically weak US corporate investment in the post crisis period cannot have been due to corporations trying to reduce debt, as occurred in Japan during their “balance sheet recession”. Rather, US debt ratios (leverage) have risen as corporations have issued debt to buy back equity. Smithers (2019) attributes this to corporate management trying to boost stock prices and thus their bonuses.

²⁴ See White (2005) and White (2009). For a recent paper which adds to an impressive body of BIS research in this area, see Borio et al (2018)

²⁵ For a very early discussion see Meadows (1997) and for more specific references to economic systems see Kirman (2010)

reason is that this approach might at times mean undershooting their near-term inflation target, which central bankers remain remarkably loath to do²⁶. Another reason seems to be a lingering belief in the Greenspan doctrine that it is easy to clean up after a credit bust. A third reason has to do with the practical difficulties involved in actually deciding when to lean and then how best to do it. These difficulties are very real and are discussed below. Finally, it might also be the case that ever-accumulating debt levels, over the last few decades, have alerted central bankers to the dangers of monetary tightening for whatever reason²⁷. However, this last consideration leaves open the possibility that, in a future world where the debt problem has been resolved, there might be a greater willingness to revisit this issue.

As for the use of **macroprudential** regulations to lean against credit bubbles, a number of advanced market economies have turned to their use in recent years. However, it is crucial to note that this has not generally been done in support of tighter monetary policy directed to the same objective. Rather, in sharp contrast to the recommendation above, they have been tightened to avoid some of the undesired side effects of “lower for longer” monetary policy. Monetary and macroprudential policies are thus being treated as offsets to each other (substitutes) rather than complements. Since it has been argued above that the repeated use of monetary easing renders it less effective, and that the undesired side effects cumulate over time, the adoption of this combination of policies needs far stronger analytical support than has thus far been provided.

Finally, it is worth noting here that changes in **microprudential** regulations have had procyclical effects for a very long time²⁸. Regulations were tightened during the Great Depression and then systematically eased in the decades of strong growth leading up to the crisis of 2008. Since the crisis, they have again been systematically tightened, running the risk of conflict with an aggressively

²⁶ In recent years, decimal point undershooting of inflation targets has elicited unprecedented policy responses. This is surprising since there is little historical evidence that very low inflation or price declines cause economic depression. Indeed, historically, most such periods have been associated with rapid productivity growth and strong increases in overall demand spurred by lower prices. See Atkeson and Kehoe (2004)

²⁷ See the discussion of this, so-called “debt trap”, issue in the report by the Group of Thirty (2015)

²⁸ Dagher (2018).

expansionary monetary policy²⁹. True to form, as the major economies have crawled back towards full employment in the last few years, new initiatives have been taken to roll back the earlier moves towards tightening³⁰.

Most of this recent pressure for regulatory easing arises from the financial industry itself³¹. However, supervisors might have opened the door somewhat by suggesting, albeit totally reasonably, that “It is a good time to take a step back and ask how the different bits and pieces of the regulatory framework fit together³² “. Fortunately, a large number of influential people and institutions³³ have forcefully argued that a regulatory rollback, at this late stage of the business and financial cycle, would be highly imprudent.

C. Could Time Varying Macroprudential Policy Alone Suffice?

Suppose a phase of economic expansion with monetary policy narrowly directed to the objective of price stability. Suppose too a rapid rate of credit growth that might prove costly. Could time varying macroprudential policies suffice to ward off that danger?

Before turning to the question of the effectiveness of such a policy, a crucial shortcoming noted above must be underlined. Those currently charged with macroprudential regulation do not have the objective of leaning against the financial cycle. Barwell (2013) documents how post-crisis regulators in the UK and in Europe began with this objective, but then slowly retreated into a much narrower one. In the US, a narrower objective might have been the case from the start. All these regulators are now focused on preserving the stability of the financial system, defined as a system capable of providing essential services even in the aftermath of a financial crisis. As with monetary policy,

²⁹ A counter argument says that the demand for credit collapses in a bust. Thus, no short term harm is done by tightening microprudential standards and making the system safer over time.

³⁰ See Antilla (2018) as well as Masters (2019). In the US, the emphasis has been on rolling back the Volcker rule, and lightening the regulatory burden on smaller banks.

³¹ Arguments used include the assertion that regulations are cutting credit growth and demand in turn, that compliance is expensive and complicated, and that supervisors have been given “excessive” powers.

³² Quoted in Kulati and Hartwell (2017)

³³ Among them would be Jaime Caruana, Sheila Bair, Janet Yellen, the IMF, OECD and the Systemic Risk Council in the US. On a particular issue, the proposed rollback of the authority of the US FOSC to designate non-bank financial institutions as being systemically important, see the letter to Secretary Munchin (Treasury Department) and Chairman Powell (Federal Reserve) jointly signed by two previous heads of the FOSC and the two previous heads of the Federal Reserve.

macroprudential policies have become more focussed on resilience (clean up after) than sustainability (lean against the unsustainable).

Why this narrowed focus? In part, it might have been due to a sense that the broader objective was simply unrealistic. Experience with the use of time varying macroprudential instruments in Spain (dynamic provisioning) and in Hong Kong³⁴, to lean against credit booms, did not avert a serious subsequent crisis³⁵. However, it did leave the banks significantly healthier than otherwise. Moreover, macroprudential regulators must have retained serious doubts about whether they could actually deliver even the narrower objective of financial stability. Indeed, closer examination does indicate formidable, practical impediments to achieving that goal.

The first concern has to do with shortcomings of the regulatory governance structure at the international level³⁶. The establishment of the G20 in 2008, along with the “upgrading” of the Financial Stability Forum to the Financial Stability Board, gave greater political legitimacy to international regulatory bodies. So too did the expansion of the membership of many existing groups to all G20 members³⁷.

Yet there was a quick retreat from early suggestions³⁸ that internationally agreed financial regulations might be enshrined in international hard law (treaties) and enforced by a designated international financial institution. Rather, the international process continues as before, a patchwork of soft law standards, principles, recommendations and codes of conduct. International discipline now consists of oversight by relevant bodies³⁹, FSAP’s by the IMF (as before) and peer pressure to support compliance. The concern this raises is that compliance might easily “crack at the first sign of trouble.”⁴⁰

³⁴ Leung (2015)

³⁵ It is noteworthy that, because of their exchange rate regimes, neither Spain nor Hong Kong could conduct an independent monetary policy. Thus, the question of whether the joint use of monetary and macroprudential instruments might have been successful was not tested.

³⁶ These shortcomings have implications for both macroprudential and microprudential regulation.

³⁷ The Basel Committee on Banking Supervision and the other BIS based committees all saw their memberships grow to encompass all of the G20 members.

³⁸ See for example, Eatwell and Taylor (2000)

³⁹ For example, the BCBS regularly reviews whether countries are meeting the requirements set by Basel III.

⁴⁰ Finance Watch (2018) p30

At the national (and European) level, many new bodies were set up to focus on the pursuit of financial stability. This was a major step forward. Nevertheless, most of these bodies are inter agency committees, implying that diverse agency objectives and the inevitable turf battles will impede the promulgation of clear recommendations⁴¹. Moreover, with very few exceptions, these oversight bodies have no powers of compulsion⁴². At best, a few have provisions to “explain or comply”. When one considers the inherent difficulty of making judgements about when to act, in the interests of ensuring financial stability, these national arrangements seem a blueprint for inaction⁴³.

The difficulties involved in knowing when to act are indeed formidable⁴⁴. The first issue is specifying clearly the target we are trying to achieve. If the objective is ensuring the provision of essential financial service in difficult circumstances, what are those services and what level of provision would be adequate? Macroprudential tightening will have real economic costs in growth forgone. Are the costs worth it, compared to the estimated costs of the crisis that the tightening is trying to avoid?⁴⁵ Answering this question will also demand an assessment of the adequacy of insolvency procedures for financial firms, since spillover costs from single bankruptcies could constitute a large part of the overall costs of financial instability.

The next difficult task is identifying when systemic risks have risen enough to warrant action. One important issue is that we have no agreed model of the interlinkages that affect how financial crises unfold,⁴⁶ and thus no way of

⁴¹ Goodhart and Schoemaker (2019), referring specifically to the activation of countercyclical capital requirements, state that “the political economy of capital requirements may lead to a biased approach.

⁴² Edge and Liang (2019)

⁴³ Berner (2018, p5) states “I am also concerned that the Financial Stability Oversight Council (FSOC) is walking back from its mission to identify and mitigate threats to financial stability and promote market discipline”. Since Berner was the previous head of the Office of Financial Research (OFR) at the US Treasury, his views should carry considerable weight. Feldberg (2018), another previous employee at the OFR, identifies shortcomings in data sharing and an unwillingness of the FSOC to pursue issues that might discomfort one or other of its member agencies.

⁴⁴ For an excellent discussion of the issue of how to use time varying macroprudential instruments in practice, see Barwell (2013)

⁴⁵ We are far from having an answer to this broad question. More narrowly, Cerutti et al (2016) conclude “the empirical evidence on the effectiveness of macroprudential policies in influencing credit flows and asset prices is, however, still preliminary and sometimes inconclusive.”

⁴⁶ Which is not to say that no progress has been made. See Mester (2015) on the role played by research in informing the process of financial regulation in the post crisis period.

calculating the probability of a financial crisis. It may in fact be impossible to agree on such models since financial systems are complex, adaptive systems likely to have multiple equilibria and highly non-linear outcomes. A further complication, emphasized by Scott (2016), is that crises may have their roots not in interconnectedness but rather in contagious panic. Predicting such a shift in sentiment would seem even more difficult.

At the moment, there appear to be two schools of thought about possible indicators of growing financial stress. One school focuses on highly aggregated data, like credit growth relative to trends and exaggerated prices for financial assets (including property)⁴⁷. These have been recurrent features of financial crises in the past. Another school focusses on highly disaggregated data (so called Risk Maps) revealing more about nodes of pressure and possible rupture points within the financial sector. This second approach has received strong support from the G20⁴⁸ although it is inherently much more resource intensive. Moreover, complexity theory clearly advises that identifying “triggers” for crises is much less likely to be successful than identifying underlying tensions. That said, there are historical grounds for beliefs that crises are often triggered by developments in specific markets (think junk bonds) that are either new or have been subject to very rapid growth.⁴⁹

Once the need to act has been decided, what precisely to do is another difficult issue. In principle, the list of possible instruments is long; a cap on loan to value or loan to income ratios, balance sheet restrictions on lenders, countercyclical capital or reserve ratios and a host of other instruments. But in practice, as in the US currently, some of these instruments might not be legally available⁵⁰. A further complication is that many macroprudential instruments, for example countercyclical capital requirements, are actually microprudential

⁴⁷ A seminal reference is Borio and Lowe (2002). Note, however, that their methodology was originally developed to support a macrofinancial framework, rather than the narrower objective of stability within the financial sector.

⁴⁸ Of the 20 data areas highlighted by the G20 and the IMF as requiring significant improvements, 17 had to do with the financial sector. The “main data gaps (are) those related to financial interconnectedness....and the build up of risk in the financial sector”.

⁴⁹ See The Economist (2014).

⁵⁰ The Federal Reserve is limited to changes in margin requirements on equity purchases, unchanged since 1974, and changes in the countercyclical capital requirement. See Buiter (2018).

instruments being used for a different purpose: systemic stability rather than institutional stability.

This raises two questions. Is the instrument legally available for use by the macroprudential authority? If it is, will the microprudential authority take offsetting action to achieve its particular objectives? Further, in some countries (like the US), regulatory changes made at one level of government might be met with offsetting changes at some other level of government. These possibilities add another layer of complexity to the adaptive changes likely to be made by the market itself to whatever changes are made to the regulations.

The decision to use any individual instrument should depend on a careful assessment of its effects on growth as well as on financial stability. Unfortunately, those charged with responsibility for macroprudential regulation will generally have only a limited understanding of either effect. Moreover, it is a political reality that the distributional effects of the use of different instruments must also be considered. For example, in recent years the lowering of loan to value ratios for mortgages in some countries has been criticized for particularly reducing the ability of poorer households to buy a house. When policy makers start to consider packages of instruments, with interacting effects on all three objectives, the uncertainty about the effectiveness of policy rises commensurately.

Finally, even if we know “what” to do, a number of “how” questions remain. Should macroprudential policies prohibit certain financial activities outright, or change the incentives to pursue them? Should policy changes be based on rules or discretion or some combination of both? Should policy changes be incremental or are large changes required to change agent’s mind set and expectations about the future? The answer to each question will rest on universal analytical insights, but also on the idiosyncratic characteristics of each regulatory domain.

All the arguments above indicate that the use of time-varying macroprudential policies, even in pursuit of the limited objective of stability within the financial sector, will prove very difficult. This perhaps explains why so much effort, in the post crisis period, has gone into static policies designed to improve the

chances of financial stability at all stages of the cycle. Some of these policies focus on systemic stability (and are also deemed macroprudential), but most focus on individual institutions or markets (deemed microprudential).

D. Other Macroprudential Measures

Conscious of their implications for the stability of the financial sector as a whole, regulatory attention has focussed on identifying global systematically important banks (G-SIBs) and how they might be wound down without unacceptable side effects and with minimal costs to taxpayers. Significant attention has also been put on reducing interdependencies in the financial system that could lead to systemic distress. While important progress has been made, shortcomings still need to be addressed as does the problem of unintended consequences.

Thirty global institutions have been designated as G-SIBs by the Financial Stability Board. It is an important advance that this designation reflects a variety of objective criteria including size, complexity, interdependence and a dominant influence over an important part of the financial system. These firms simply cannot be allowed to fail in a disorderly way because the collateral damage to the system (the Expected Losses) would be too great. However, receiving this designation is almost an invitation to lenders to G-SIBs to do so on inappropriately easy terms. A G-SIB designation must then go hand in hand with improved resolution procedures to ensure that lenders to G-SIBs would still face significant losses should the firm face difficulties.

Broadly speaking, the attempted solution to this problem has been to recognize that Expected Losses are defined as being the product of two terms; the Probability-of- Default (PD) and the Losses-Given-Default (LGD)⁵¹. Policy efforts have been directed at reducing both terms.

The Probability-of-Default has certainly been reduced by the microprudential measures (discussed below) that apply to all banks. In addition, there has been

⁵¹ LGD include both explicit balance sheets losses and the implicit losses caused by collateral damage to the economy. While the authorities wish to *lower* LGD overall, they wish to *raise* the proportion of the balance sheet losses absorbed by the private sector. This raises the complex question of the intertemporal tradeoff between better crisis management (affecting losses today) and moral hazard (affecting losses tomorrow).

a special capital surcharge imposed on G-SIBs⁵² as well as other measures to ensure private sector lenders, rather than taxpayers, bear the burden of prospective losses⁵³. Tarullo (2016) also emphasizes, for US based banks, significant improvements in data availability and risk management procedures more generally. Yellen (2019) describes the more stringent application of stress tests to the largest US banks as “the most important supervisory innovation since the financial crisis”.

All of this being accepted as significant regulatory improvements, a number of commentators have looked at the market’s assessment (using share prices and other inputs) of the likelihood of default of banks affected by new capital regulations. Sarin and Summers (2016) conclude that “they find no evidence that markets regard banks as safer today than they were before the crisis”. In effect they contend that the effects of higher capital requirements have been offset by reductions in franchise value arising from other regulatory changes. Acharya (2010) and Blundell-Wignall (2013) use market generated data to draw similar conclusions, with the latter emphasizing the exposure of large banks to potential losses from trading in derivatives.

It is also instructive to remember that Lehman Brothers was judged to be well capitalized the day before it went bankrupt. Similarly, stress tests have regularly been easily passed in Europe by banks that shortly afterwards required significant government support. The much diminished status of a number of European G-SIBs, relative to their American counterparts, is another source of concern about their longer time viability. Recent comments about Japanese monetary policy⁵⁴, by the Chairman of Mizuho (one of three

⁵² Tarullo (2016) p9 asserts that the surcharge in the US reduces the Expected Loss to a level approximating that of a large bank holding company that has not been designated as a G-SIB. Buiter (2018) p7 is less comforting when he asserts that “systematically important non-bank financial intermediaries remain woefully undercapitalized and have increased their share of total financial intermediation as a result of regulatory arbitrage”.

⁵³ Of particular importance has been the requirement that G-SIBs issue long term debt that can be converted into equity in the case of resolution. The Total Loss Absorbing Capacity (TLAC) of these institutions was raised to 16 percent of risk weighted assets in 2019 and will rise to 18 percent in 2022. However, Goodhart (2017) remains concerned that triggering private sector losses of this magnitude, in the case of resolution, would be (p.2) “likely to lead to a widespread collapse of the bank bond market as a whole, at least for a time, with implications for contagion”

⁵⁴ Ultra easy monetary policy in Japan, as elsewhere, has squeezed profit margins and forced a re evaluation of previous business models. Japanese banks have increased risky investments abroad and have just begun to cut rural branches in a serious way. See Jenkins (2019), where the title says it all “Not just a Japanese disease: Mizuho’s woes afflict the world”

Japanese mega banks), is a pertinent indicator from an industry insider that large firms remain vulnerable.

Reducing the collateral damage due to the bankruptcy of a G-SIB (Loss-Given-Default) could be done in a variety of ways, but each has proved hard to implement. Many have called for such institutions to be carved up into smaller ones. There has been little appetite for this, perhaps because a larger number of similarly structured and managed firms might be as much a source of systemic instability as one big firm⁵⁵.

Indeed, it is notable that, in some countries, particularly the United States, the individual size and relative importance of the largest banks within the banking sector has actually grown significantly since the crisis. Ironically, this has been due to officially sanctioned mergers and acquisitions. In early 2019, serious consideration was given to the possibility of a merger between the two largest private banks in Germany, indicating that this trend to consolidation might well continue. Further, there have been repeated calls in Europe for cross border bank mergers to produce banks big enough to compete internationally with much larger US banks. Evidently, this dynamic is not going in the right direction.

Calls have also been heard for firms to be split along functional lines⁵⁶, though only in the UK have such proposals (following the Vickers Report) been implemented. The underlying assumption that investment banking is much riskier than retail banking has by no means been generally accepted⁵⁷. Attempts have also been made to reduce the interdependencies among G-SIBs, not least through the Volcker rule which targeted proprietary trading predominantly done with other G-SIBs⁵⁸. Litan (2011) describes the politics

⁵⁵ Goodhart (2013) p255.

⁵⁶ Many commentators in the US advocate bringing back the Glass Steagall Act. Also consider the Liikanen proposals in Europe.

⁵⁷ See Goodhart (2013) and Buiter (2018).

⁵⁸ Volcker has stated that the Volcker rule was not directed to reducing proprietary trading as such, since such trading was not an important contributor to the crisis. Rather, the objective was to reduce the interdependencies between large firms. Volcker feels that these interdependencies increased the uncertainty among regulators about the effects of closing one of them down. This encouraged the government bailouts which occurred in the US in 2008.

and practicalities militating against enforcement of the Volcker rule, while Antilla (2018) notes successive rollbacks to date.

Great efforts have also gone into improving resolution procedures for G-SIBs, with the Financial Stability Board publishing a key document on this in 2011⁵⁹. One problem is that most such firms have enormously complex internal structures, sometimes with thousands of subsidiaries. Another problem is that they all operate internationally and are therefore subject to both domestic and foreign legislation. Similarly, they are of interest to both home and host supervisors, which requires cooperative solutions for both crisis management and crisis resolution.

One attempt to deal with the complexity issue is to force G-SIBs to construct a “Living Will”, effectively a roadmap as to how the firm might be broken up and parts wound down in an orderly way. Supervisors must be satisfied with the feasibility of such plans, and can reject them⁶⁰. However, in many jurisdictions, they lack the legal power to force a reorganization more to their liking. Another development, raising the likelihood of an orderly resolution of a G-SIB, has been the requirement that they issue debt that can be reliably “bailed-in” to pay for losses in the case of bankruptcy. Presumably, the resolution authorities will find it easier to act knowing that taxpayers will not be liable for their actions⁶¹.

In spite of these and other important advances, Domanski (2018) notes that “the success of our efforts in the area of resolution will depend on proper implementation” and in this regard “significant implementation work remains, both in the EU and beyond”. Similar concerns have been raised by other respected experts⁶². Each has expressed doubt that it would be possible to resolve a G-SIB today without suffering unacceptable side effects⁶³.

⁵⁹ FSB (2011). Also see the provisions in the Dodd Frank Act in the US and the establishment of the Single Resolution Authority in Europe.

⁶⁰ Indeed the Fed has already rejected a number of such proposals. Buiter (2018) p 11, points to a common problem. “The living wills I have thus far seen don’t seem likely to be implementable at the speed with which crises occur”.

⁶¹ The key word is “easier” rather than easy. Recent experience in Italy shows the political difficulty of bailing in retail bond holders.

⁶² For example, see Duffie (2016), p.3, Mester (2015) p11, Goodhart (2013) and even Janet Yellen (2019).

⁶³ Tarullo (2016) speaks eloquently of the need to assure orderly resolution but is then silent on what else needs to be done, if anything, to ensure this can happen.

Finally, there are other constraints impeding the degree of international cooperation likely to be required to resolve a SIFI in an orderly way. First, individual countries will be loath to cede the degree of sovereignty likely to be necessary for an ideal resolution procedure. Second, countries will be tempted to ring fence the assets held in their jurisdiction. Third, differences in national practices might impede international cooperation⁶⁴.

Another set of macroprudential policies has been directed to reducing interdependencies in the financial system. In addition to the Volcker rule initiative, noted above, the most important initiatives have been to reduce interbank exposures (especially cross border interbank exposures) and measures to force derivative trades into clearing houses. Each has a sensible rationale but also some significant downsides.

The essential collapse of the interbank market in 2008 could have led to a whole series of cascading bankruptcies, a process that was avoided only through unprecedented support from central banks. This possibility had been flagged by a BIS committee as far back as the early 1980s and the issue was returned to repeatedly.⁶⁵ In the end, however, not much was done. The fundamental problem, then as now, is that interbank lending is a key part of an efficient financial system. It transfers money from banks with excess deposits to banks with an excess demand for loans. It also facilitates the temporary financing of current account deficits. The difficult issue is determining the point when this efficiency has become “too much of a good thing”.

After the crisis, there was a marked reduction in cross border interbank lending (as a proportion of all crossborder lending), particularly for European and US banks. The downsides of this were seen most clearly in Europe where the withdrawal of banks in the “core” from the “periphery” led to a collapse in lending and major recessions in all the peripheral countries concerned. Similar developments occurred in South East Asia in the crisis of 1997. These developments demonstrate the eventual costs of intemperate cross border

⁶⁴ Fernandez de Lis S (2016) p26.

⁶⁵ The initial Holland Committee, a sub-group of the Eurocurrency Standing Committee (later the Committee on the Global Financial System), was followed by the Frankel Working Group, the Yoshikuni Working Group and finally the Brockmeijer Working Group. All of these groups prepared reports and recommendations.

lending, but they provide no guide as to how to moderate such flows in the first place.

Exposures arising from the bilateral trading of derivatives has also been the focus of attention of those worried about interdependencies in the financial system. The solution proposed by the G20 was to provide capital incentives to move derivative trades to regulated exchanges and central counterparties (CCP's). By reducing bilateral counterparty exposures, overall risk management would be improved and systemic risks reduced. An added bonus was thought to be the provision of much more information about the risk exposure of individual institutions. In the event, the proportion of interest rate derivative trades cleared through CCP's rose from 20 % in 2010 to 60 % in 2018, while comparable numbers for credit default swaps rose from 10% to 40%⁶⁶. In part, this was due to significant cost savings for participants who benefitted in various ways from pooling, netting and the operational efficiencies of CCP's.

However, as time has passed, the assessment of the systemic benefits of CCP's has become more nuanced. CCP's are relatively few in number and their main counterparties tend to be a relatively few systemically important banks. Moreover, the links between the CCP's and these banks are varied (sometimes including ownership) with potentially complicated interactions. The upshot is that "the risks of banks and CCP's should be considered jointly, rather than in isolation"⁶⁷, since the systemic risk arises from these linkages. As well, questions have been raised about how clearing houses assess volatility and set "haircuts" in normal times⁶⁸, and how squabbling counterparties might refuse to support a CCP close to failure⁶⁹.

The broad conclusion seems to remain that central clearing, assuming the CCP is well managed⁷⁰, does generally reduce the risks of systemic failures. Nevertheless, Domanski et al (2015) and Faruqui et al (2018) convincingly argue that *exogenous shocks* might still lead to destabilizing "domino effects"

⁶⁶ Centrally cleared FX derivative trades doubled, but only from 1% to 2 %%. See Faruqui et al (2018).

⁶⁷ Ibid.

⁶⁸ Stafford (2019)

⁶⁹ Dizard (2019)

⁷⁰ This implies adequate identification of the risks involved in trades, proper pricing of risk, adequate capital and well defined procedures for allocating losses. A fundamental problem is that "for profit" clearing houses are always tempted to cut standards to increase their market share.

under some circumstances. Moreover, *endogenous* interactions might also lead to destabilizing feedback loops. Both studies welcome the increasing attention paid by regulators to such issues, but also warn against complacency given the need for more research into the potential behaviour of these complex systems⁷¹. Since clearing houses now centrally clear derivatives with a notional value of over 400 trillion dollars, this is not a trifling affair⁷².

There is a final downside to all these macroprudential measures to ensure the stability of the financial sector. To the extent it is thought this stability is now assured, it seems to follow logically that there is no need to develop procedures to better manage future crises. The Dodd-Frank Act in the United States has a number of provisions⁷³ which Yellen (2019) asserts have “scaled back the Fed’s emergency liquidity powers, leaving it with a toolkit that could prove inadequate to cope with a situation like the Crash of 2008”⁷⁴. Given the remaining shortcomings of resolution procedures in the United States, noted above, Buiter (2018, p12) concludes that these new restrictions on the Fed “represents a major error of judgement”.

A closely related issue is who might provide liquidity support to non US firms that might find themselves short of dollars in a crisis. When mainly European banks found themselves in that position in 2008, the Fed lent them almost one trillion dollars, via the US discount window and via FX swaps between central banks. Today, similar exposures to dollar shortages exist, though mainly with Asian counterparties⁷⁵. The crucial questions that then arise are, whether the Fed will extend the existing swap agreements to other parties, and whether Congress will allow it? The fundamental problem is that the international

⁷¹ Duffie (2018) p3 is still more critical. He contends that most CCP’s have become “too big to fail” and that “Effective operating plans and procedures for the failure resolution of CCP’s have yet to be proposed”. Finally, he notes that “Data repositories for the swaps market have not come close to meeting their intended purposes”.

⁷² For a recent call for action, see The Economist (2019) and its reference to a letter sent by Paul Tucker, previously the Deputy Governor of the Bank of England, to Randal Quarles, who is responsible for regulation at the Federal Reserve. Tucker refers to clearing houses as “super-systemic”, and potentially “a devastating mechanism for transmitting distress across the financial system”. Similarly, Dizard (2014) states “The last set of crisis fixes will make the next Big One even bigger. Ground Zero will be the CCP’s”.

⁷³ See Scott (2016) and The Group of Thirty (2018).

⁷⁴ Yellen (2019, p1) p1.

⁷⁵ The BIS estimates the level of dollar liabilities in 2018, issued by non-US residents, at around \$11 trillion.

financial system is dollar based, but the US authorities have no legal obligation to support its smooth functioning⁷⁶.

The broad conclusion to be drawn is that neither the time varying nor the static macroprudential policies introduced post crisis seem sufficiently robust to ensure the stability of the financial system. The “last best hope” is that post crisis improvements to traditional microprudential policies will prove sufficient to meet this broader objective. However, a careful look indicates this conclusion must also be significantly qualified.

E. Post-Crisis Microprudential Reforms

It would perhaps be best to begin by asking the question whether there was anything conceptually wrong with the pre crisis regulatory framework? Goodhart (2013) asserts that the need for regulatory oversight must begin with the assumption that banks will act “imprudently” if left to regulate themselves. He therefore concludes that regulators in the pre crisis period did make a fundamental error by adopting the risk measurement tools developed by the banks themselves. In particular, he contends that the assumption of “Normality”, in the probability distributions used by banks to assess the probability of losses, is inappropriate for prudential authorities who should be worrying about “fat tail” events. If this was a valid criticism, it remains so since the latest version of the Basel regulations (Basel III) is essentially “more of the same”.

For individual banks, the principal threat to their survival is **credit losses**. In principle, banks protect themselves in three ways. First, they price loans according to the overall risk they bring to the portfolio. This implies paying attention to the gains from diversification. Second, when perceptions of risk change, lenders make explicit provisions for expected losses. Third, institutions hold capital to meet the challenges posed by unexpected losses. The question is whether any identified pre crisis deficiencies have been rectified by subsequent regulatory changes?

⁷⁶ See Aldasoro et al (2018) and The Economist (2018). If a non-US institution is short of liquid dollars and has to sell longer term US dollar assets, it might have to do so at “fire sale” prices which could exacerbate problems of economic weakness in the US. If it rather chose to sell domestic assets and then swap them into dollars, this would drive up the dollar and exacerbate the dollar shortage problem elsewhere. These arguments support the case for intervention by the Federal Reserve.

The pricing of risky loans has in fact received relatively little attention from regulators. Indeed, prior to 2008 and again in recent years, the narrowing of credit spreads and the decline in market volatility was generally interpreted as a positive sign for the future stability of the system. Instead, it should have been seen as a potentially dangerous by product of ultra-easy monetary policy. Nor has portfolio diversification been seen as a high priority. Both before and since the crisis, in most countries, there has been a steady upward drift in the share of loans backed by property in one form or another. This is not encouraging given that property has so often been at the centre of “boom-bust” credit cycles.⁷⁷

Some apparent progress has been made with respect to expected losses. Prior to the crisis, provisions for losses were only allowed when the loss was imminent or had actually occurred. This implied that the provisioning which did occur was both “too little and too late”. Moreover, since actual losses tended to materialize only when the economy was already in a downturn, there was the possibility that reductions in bank capital at the same time might cut the supply of loans and thus prove “procyclical”⁷⁸.

In July 2014, the IASB published IFRS9, an international accounting standard that responded to concerns raised earlier by the G20. As of 1 January 2018, a provision must be made for any assessed increase in credit loss expected over the lifetime of the loan⁷⁹. An added benefit is that banks have been forced to improve their risk modelling capabilities to support any such assessment. One downside is that some countries, like the United States, do not adhere to IASB standards since efforts to promote convergence to international accounting standards have not been fully successful. Another downside is that expectations of future losses might be suddenly revised and the losses concentrated in the early months of a downturn. This could increase “procyclicality” rather than reduce it.⁸⁰

The principal development affecting bank capital was the promulgation in 2013 of Basel III by the Basel Committee on Banking Supervision. It raises significantly the capital required using the more granular “risk weights” introduced under Basel II.

⁷⁷ Turner (2016)

⁷⁸ Huizinga and Laeven (2019) provide evidence that this has been the case historically, with the “procyclicality” seen in all OECD countries being most pronounced in Europe.

⁷⁹ More precisely, IFRS9 says that if credit risk has not increased significantly, allowances should be based on losses expected over the next 12 months only.

⁸⁰ Abad and Suarez (2019)

Moreover, it significantly limits the definition of what qualifies as capital by excluding a number of liabilities that would not actually be loss absorbing in a crisis. Furthermore, it introduces a new leverage ratio that limits the total amount of assets (on an unweighted basis) that can be accumulated against a given amount of capital. This was in part a response to the concern that banks were consciously managing down their capital requirements using their own internal models. It is a fact that the ratio of risk weighted asset to total assets has been declining constantly since the introduction of Basel 1⁸¹. Quite recently, other measures have also been introduced to help deal with this problem.⁸²

It is also a fact that capital, measured at book value, as a proportion of risk weighted assets has essentially tripled under Basel III. It is contended that leverage ratios have fallen sharply as well. Yet it has been suggested that book capital might be a misleading measure of “the distance to default” because of eventual losses that have not yet been recognized. Using banks’ market valuation as an alternative and more forward looking measure of capital reveals a markedly smaller improvement in post crisis performance⁸³.

Even if capital ratios have risen significantly, it still begs the question of whether they have risen enough. All we know is that Basel III requirements are significantly higher than Basel II, a relative rather than an absolute statement. Yet, the Basel II levels have been described by Tucker (2018) as “wafer thin” and by Lord Vickers as “hopelessly lax”. Martin Wolf (2010) has also observed that “tripling almost nothing does not give one very much”. There has in fact never been a rigorous examination of how much capital banks should hold. Basel II aggregate requirements were set to match those of Basel I, and Basel I requirements were simply set to maintain the level of capital that the banks then held.⁸⁴

How much capital should banks hold? If capital is to be held as a buffer against unexpected losses then, by definition, the estimated probabilities of losses on individual balance sheet assets can tell us nothing. Unexpected losses are in the

⁸¹ See Blundell-Wignall et al (2009)

⁸² The Basel Committee asked different banks to use their internal models to calculate the riskiness of a hypothetical portfolio. The variance of the resulting estimates was shockingly high. The supervisors responded by restricting in a variety of ways the use of internal models. One practical effect has been the identification of a significant capital shortfall for a number of large European banks.

⁸³ See Ford (2018)

⁸⁴ Goodhart (2011)

realm of “radical uncertainty” not risk. Perhaps a better way to proceed would be to look at capital ratios held voluntarily by banks before the era of limited liability banking and massive safety nets. These ratios were many times higher than they are today. Moreover, risks exist today that are unique to the current age. Operational risks are heightened by the ubiquity of technological platforms, often outdated and blended with other platforms after mergers. Cyber crime is another current threat. Finally, there is immense uncertainty about the costs to financial institutions of climate change⁸⁵. All of these “known unknowns” argue in favour of higher capital standards.

Indeed, a number of well-known economists have suggested that banks today be required to build up much higher ratios than is currently the case. Admati and Hellwig (2013) call for a 25 percent ratio on an unweighted basis. Moreover, that sentiment seems to be widely shared⁸⁶. It is important to add, however, that this capital “buffer” would be available to be run down in the event of an unexpected shock. This contrasts with the current approach which seems to treat most capital as unavailable for such smoothing. Tarullo (2016), for example, suggests that banks must always adhere to minimum capital requirements in order to “retain the confidence of its customers and counterparties.”⁸⁷

Other concerns have also been expressed about the current capital requirements for banks. Recent European history teaches us that it is inappropriate to give sovereign debt a zero risk weight. In addition, it worsens the sovereign-bank nexus (the “doom loop”) that poses dangers in Europe in particular. There also remain a wide range of views as to whether supervisors should emphasize weighted or unweighted capital ratios. Closely related is the question of whether these different requirements might interact to produce undesired consequences

⁸⁵ The G20 and the FSB have supported the establishment of the Taskforce on Climate Related Financial Disclosure. Financial institutions must now evaluate prospective losses, due to climate change, on the assets they hold. Losses might arise from actual climate change (say, insurance related losses due to flooding) or losses associated with mitigating global warming (say, stranded fossil fuels).

⁸⁶ Sandbu (2017) summarized a recent CEPR conference on the subject by saying “ The consensus was that we still fall far short from what would be a safe financial system”. Checcetti and Schoenholtz (2019) conducted a small survey of risk management professionals and found they wanted capital levels twice as high as current levels and four times as high as the Basel III minimum. Goodhart and Schoenmaker (2019) call for a significant increase in the Capital Conservation buffer as a “rules based” alternative to the “discretionary” use (or non use) of the Counter Cyclical Capital requirement.

⁸⁷ Tarullo (2016) p8. The so called “conservation buffer” could be run down, but this capital amounts at most to 2.5 per cent of risk weighted assets.

at different phases of the credit cycle. Finally, the fact that risk weights assigned using internal models can move “procyclically”, a shortcoming aggravated by the use of fair value accounting, is a longstanding problem that has not yet been resolved.

Another feature of the Basel III framework is that it recognizes that banks face **funding liquidity risk** as well as credit risk. New regulations prescribe the need for an adequate level of short-term liquid assets and for relying less on flighty sources of funding. In light of the market developments in 2009, these requirements seem eminently sensible. Yet a deeper look also raises some questions. If banks are required to hold a certain level of liquidity, can they still use it to meet liquidity needs⁸⁸? Why do runs on banks (both retail and wholesale) occur in the first place? Surely it is because lenders fear the bank will go insolvent and they will not get their money back. But if this is the case, the answer is to raise capital requirements⁸⁹. Finally, if a bank is solvent, the central bank should always be in a position to lend as the lender of last resort, rendering liquidity requirements otiose.

A topic receiving increasing attention⁹⁰ is whether post crisis changes to financial regulation have somehow reduced **market liquidity** and raised the likelihood of long periods when “liquid” assets could not be sold at reasonable prices. Such a development, reminiscent of post Lehman events, could have systemic implications. While markets more broadly have generally continued to function well, in positive economic conditions to date, concerns remain about how well markets might function in less positive economic conditions.

In recent years, market functioning does seem to have changed. Long periods of low volatility, both actual and expected, are hard to explain against a backdrop of increasing political and economic uncertainty and “surprises”⁹¹. Moreover, periods of calm have increasingly been interrupted by violent “flash crashes”. While recovery generally took only minutes rather than days or weeks, clusters of

⁸⁸ Goodhart (2013) p256 states “A liquidity *requirement* is an oxymoron.” Buiter (2018) goes even further in referring to “The nonsense of the Basel liquidity requirements”.

⁸⁹ See Thakor (2018).

⁹⁰ For example, see CGFS (2016)

⁹¹ The Economic Policy Uncertainty Index has been on an upward trend since 2010. Citi’s Economic Surprise Index has registered disappointing data (relevant to expectations) for an extended period.

large market movements have also become increasingly common⁹². Moreover, a number of market “anomalies”⁹³ have been still longer lasting, raising the question of why normal arbitrage no longer seems to be occurring, and whether this is a symptom of some deeper malaise. Direct measures of market liquidity seem to indicate little or no deterioration in the market for US Treasuries, although there are clear signs of deteriorating liquidity in the market for corporate bonds.

One reason for suspecting that new regulations have played a role is that US broker dealers, that were previously “market-makers”, have sharply reduced both their leverage levels and the absolute size of their balance sheets⁹⁴. Their inventories of corporate bonds have been particularly affected. However, as Adrian, Kiff and Shin (2018) convincingly argue, there are other reasons than increased regulations that might explain this changed behaviour⁹⁵. Not least, their pre-crisis levels of leverage were simply unsustainable. It is also important to note that these portfolio changes began to occur well before these post crisis changes in financial regulation.

There are also other non-regulatory factors that might have affected how markets function in the post crisis world. Not least has been the sharp increase in high-frequency (algorithmic) trading, the increased importance of non-bank investors relying on momentum strategies, and the rapid growth of passive index funds⁹⁶ as well as funds that target volatility. When allied with their generally lower levels of capital, these new participants could help explain “a new market regime of stronger, longer rallies, but more abrupt sudden shocks”.⁹⁷

⁹² Wigglesworth (2019) quotes research work done by JP Morgan. “If one defines a shock as a one day drop that is five standard deviations bigger than the daily average movement over the past month, then there have been five such violent tumbles since 2016. We have to go back to the 1940’s to find a three year period with as many abrupt slides”.

⁹³ Perhaps the most striking anomaly is that the Covered Interest Rate Parity condition in foreign exchange markets has been persistently violated in the post crisis period. Further, declining long bond rates signal recession, yet low credit spreads and high equity prices seem to deny this possibility.

⁹⁴ Adrian and Kiff (2018)

⁹⁵ They include relying more on matching order streams and less on inventory management, the effects of lower expected returns, more expensive funding and the growth of non bank lending and market-making..

⁹⁶ As an aside, the rise of passive funds also raises governance issues. Three extremely large asset management firms in the US could now exercise effective control of virtual ty every corporation in the US. Could they use this power to restrict competition?

⁹⁷ Wigglesworth (2019)

Yet regulatory and also monetary policies might have contributed in other ways to these post crisis market developments. Much trading is dependent on the availability of acceptable collateral. However, higher liquidity requirements for banks, regulatory impediments to securities lending, quantitative easing and stricter collateral requirement for CCP's all restrict the supply of good collateral and, perhaps, market liquidity in turn. More broadly, central bank policies have interfered with normal processes of price discovery in many markets, and have been associated with waves of Risk-On and Risk-Off trading⁹⁸. More research is clearly needed on the possible negative effects of all these policy measures taken in aggregate.

Finally, it must be noted that post crisis regulations have been tightened for **non bank financial institutions** as well as banks⁹⁹. In part, this reflects the fact that the "shadow banking system" made a significant contribution to the crisis itself. The development of long intermediation chains, prone to "procyclicality"¹⁰⁰ and inherently fragile, resulted in a run to safety when one link of that chain (the capacity of mutual funds to always return 100 cents on the dollar) was called into question. Structured finance vehicles, which were part of that chain, then had to receive support from their sponsoring banks. However, since then, the use of these structured finance vehicles has essentially stagnated¹⁰¹. Moreover, regulatory measures have been taken to reduce the likelihood of runs on mutual funds. The FSB was likely right when it recently concluded¹⁰² "Those aspects of non bank financial intermediation that contributed to the financial crisis have declined significantly and generally no longer pose financial stability risk".

⁹⁸ See European Central Bank (2019). They find that, after the beginning of the Asset Purchase Program (APP), lower rates induced banks, and especially non banks, to purchase more risky assets than had been the case prior to the APP. A combination of "more flighty" investors, acting individually in a still more "flighty" way, could imply disorderly price movements should rates start to rise. The ECB notes that the problem might be further exacerbated by a possible rise in risk aversion.

⁹⁹ It is beyond the scope of this paper to deal with the prospective health of pension funds and insurance companies, and the role played by regulatory changes. However, CGFS (2018) suggests both sectors are facing formidable challenges arising in part from the post crisis environment of very low rates of interest.

¹⁰⁰ See Singh and Aitken (2010)

¹⁰¹ See Financial Stability Board (2019)

¹⁰² Financial Stability Board (2018). Duffie (2016) seems to agree when he writes "The biggest achievement in the area of shadow banking is the new set of rules governing money market mutual funds." So called CNAV (constant-net-asset-value funds) will only be able to invest in government assets.

While it is comforting to note that old problems will not recur, the FSB also noted a major change in the nature of non bank financial intermediation since the crisis. This raises the possibility of new problems. Looking only at those institutions deemed to have “bank like” exposures, that could therefore be a threat to financial stability, the FSB notes the particularly rapid growth of Collective Investment Funds¹⁰³ which now account for 72 percent of the global total. Developments in the United States have spearheaded this change, although similar developments have been observed in Europe and China.

The head of the FDIC in the US has drawn attention to a massive shift in the structure of the mortgage market, away from banks and towards non bank originators and service providers¹⁰⁴. She simply asks what the associated risks might be, without venturing any answer.¹⁰⁵ Seru (2019) confirms that the share of household lending and mortgage lending extended by “fintech shadow banks” has risen very sharply, and adds that the expansion in the US has been greatest in those counties where bank regulation has been tightened the most. He concludes that more attention needs to be paid to how both regulatory and monetary policies affect the business models of lenders. Further, since fintech shadow banks have global scope, global authorities also should be involved.

While the FSB report highlights the growth of Collective Investment Funds, it still concludes that “the FSB has not identified other new financial stability risks from shadow banking that would warrant additional regulatory action at the global level”¹⁰⁶. However, this assessment has not been universally shared. Recently, the editor of the Banker magazine suggested that we run “the risk of a rerun of the financial crisis, this time led by non-banks.”¹⁰⁷ Moreover, early in 2019, at least three senior European central bankers (including Mario Draghi) publically

¹⁰³ These include open ended fixed income funds, credit hedge funds and money market mutual funds. These funds have features that make them susceptible to runs.

¹⁰⁴ McWilliams (2018) For mortgage originators, the proportion of non bank mortgages rose from 9 percent in 2009 to 44 percent in 2018. For mortgage servicing, the increase was from 5 percent to 41 percent.

¹⁰⁵ One specific concern has been raised in The Economist (2018). The article notes that many mortgage service providers could go bankrupt in the next downturn. Should this happen, what might be the implications of many mortgage payments not being serviced for an extended period of time?

¹⁰⁶ Financial Stability Board (2017b)

¹⁰⁷ Caplen (2019). While his article was motivated by developments in China, Caplen feels regulators outside of China are most remiss in not seeing the dangers of financial exposures outside the banking system.

expressed concern that the shadow banking system was a source of worry and that regulators lacked the tools to deal with this problem.¹⁰⁸

A particular concern has been expressed over asset management companies that promise same day redemptions while at the same time investing heavily in non-liquid assets. This latter tendency has been aggravated by the very low rates of return available on more liquid assets. Governor Carney of the Bank of England eloquently summed up his concerns by saying “These funds are built on a lie, which is that you can have daily liquidity for assets that fundamentally aren’t liquid”. As with banks and mutual funds in earlier cycles, this maturity mismatch invites runs by investors¹⁰⁹. All of these observations support the view of the FSB that future developments in the area of non-bank financial intermediation need to be closely monitored.

Finally, considerable attention has also been paid recently to the rapid rise in lower quality corporate debt, and the growing importance of non bank financial intermediaries in both originating such debt and in ultimately holding it. In a case study contained in Financial Stability Board (2019), it is contended that the level of loans made to highly leveraged corporates could be as high as \$2.4 trillion, and that “junk” bonds issued by corporates now amounts to \$2.3 trillion. These numbers far exceed those seen pre crisis. Moreover, the covenants on these loans have weakened, almost to the point of non-existence¹¹⁰. This threatens not only the probability of default but also recovery rates.

The primary driver for this development has been the very low interest rate environment and the associated search for yield. However, a secondary element has been more onerous regulatory requirements on banks which may have reduced their willingness to make riskier loans and increased their desire to securitize the loans they did make. A prominent feature of recent developments has been the tendency for specialized companies to buy leveraged loans, to tranche them (Collateralized Loan Obligations) and then to sell a significant proportion of them to others. Evidently, there are some worrisome similarities

¹⁰⁸ Jenkins (2018)

¹⁰⁹ This possibility was confirmed in late June 2019 by heavy redemptions in the shares of six UK funds managed by H2O, an asset management company owned by Nataxis Investment Managers.

¹¹⁰ Financial Stability Board (2019) Section 5.2.2 notes that covenant lite loans were 80 percent of the total in 2018 versus less than 20 percent in the pre crisis period.

between these market developments and those affecting sub-prime mortgages in the United States in the last crisis¹¹¹.

One set of concerns has to do with the implications for corporate borrowers. Leverage levels have risen sharply, especially when the proceeds of the borrowing have been used to pay out dividends or buy in equity¹¹². In a downturn those firms could prove vulnerable to default, at worst, or a ratings downgrade at best. Rollover risk could also rise sharply. The rapid expansion of corporate debt in emerging markets, with much of it denominated in dollars, adds another element of uncertainty about the ability to meet debt service requirements.

The implications for lenders are also of concern. Ratings downgrades for borrowers would imply forced sales of those bonds now rated in the lowest category of investment grade. There are also a variety of reasons to expect market liquidity to suffer in such circumstances¹¹³. As for leveraged loans, these markets are commonly illiquid and covenants might further impede the ability of lenders to cut their losses. While it is true that the largest part of these loans have been widely distributed through CLOs, data is not generally available on the identity of the ultimate purchasers. Thus, we do not know whether their survival would be threatened by such losses or whether their bankruptcy might prove systemic or not¹¹⁴.

While all of these concerns are valid, there are also grounds for believing their seriousness is not yet so great as to threaten systemic stability. While this issue is debatable, what cannot be denied is that we are once again observing how regulatory initiatives have prompted market adaptation and the generation of problems elsewhere in the financial system. In a fundamental sense, our system of financial regulation suffers as great a problem of temporal inconsistency as does monetary policy. Both problems have their roots in the fact that we have a

¹¹¹ Not least are concerns that highly rated upper tranches of these CLO's might still be subject to significant default risk, as were CDO's earlier.

¹¹² Many bond issues have been associated with takeovers of companies by private equity firms. There are credible reports that leverage levels have been underestimated by overestimating the cost saving and prospective profits arising from the takeover.

¹¹³ In addition to the general points made above, Smith (2018) points out that retail investors are now involved since mutual funds and ETF's have invested in CLOs. Retail sales would spark illiquidity problems since bank loan markets do not trade frequently and settlement can take weeks.

¹¹⁴ The FSB is currently looking into this issue. One concern is whether those who have purchased CLO's might be subject to "runs" on their liabilities.

fiat money system in which money and near money can effectively be created out of thin air.

In the fiat money system that we have, banks create leverage in the normal course of business. However, leverage can be deemed excessive, leading to bank “runs” that can be very costly. That is why the authorities have introduced “safety nets” to reduce the chance of such runs. However, a problem is created by this solution since safety nets produce “moral hazard”¹¹⁵. That is, they encourage more bad behaviour to which officials have to respond with “regulation”. But this regulation in turn creates another problem, as just noted, that of “evasion” and the threat of runs elsewhere in the system. The authorities then respond by widening the safety net¹¹⁶, and then this leads to another whole cycle of public and private sector interactions. In principle, this process could go on forever. These considerations, pertaining to the unsustainability of the policy regimes we currently rely on, both monetary and regulatory, provide a prima facie case for recommending a more fundamental rethink of those regimes.

F. What Solutions Might a Fundamental Rethink Suggest?

The first point to make is a philosophical, or more specifically an ontological one. What is the nature of the systems we are dealing with? Policy efforts to ensure stability in our economic and financial systems have all been premised on the assumption that those systems are understandable and easily controllable, like a machine. That is not true. Rather, these systems are complex, adaptive systems, like many others in nature and society. The properties of these systems have been studied by many other disciplines, whose insights could also help guide economic policymakers¹¹⁷. In effect, we need a paradigm shift in how we think about the economy. Unfortunately, such a change seems unlikely without the catalyst of another serious economic crisis, and perhaps not even then.

Accepting the constraints of more conventional economic thinking, many scholars have proposed a range of proposals to better stabilize our economic system and to help avoid the particular problem of credit driven “booms and busts”. They are

¹¹⁵ See Colomiris and Chen (2019).

¹¹⁶ In fact, this has been going on for decades. See White (2004). For a recent example, consider the expanded access of liquidity support to bank holding companies and mutual funds in the US during the last crisis. Looking forward, asset management companies might accept more regulation to get access to central bank liquidity.

¹¹⁷ For a recent effort to draw some lessons for central bankers in the pursuit of monetary policy, see White (2017).

listed very briefly here, without any effort being made to choose among them. However, these proposals are listed broadly in an order corresponding to how easy it would be to implement them. Unfortunately, the same order also proceeds from measures that are least likely to be effective to those most likely to be effective. Political processes will determine where we end up in this trade off between practicality and effectiveness.

It is presumed that it would be easiest to change national policies, less easy to change behaviour, and still less easy to change the structure of the domestic financial system. To change the monetary regime would be the most radical, and therefore the most difficult, domestic change of all. And still more difficult would be getting international agreement on what should replace the current international monetary non-system¹¹⁸.

Beginning with changed **policies**, the first thing to suggest is that we do need a macrofinancial stabilisation framework in which both monetary and regulatory polices “lean” against the credit cycle. As a corollary, all policies (monetary, regulatory and fiscal) should be used more symmetrically over each individual cycle. That would be required to stop the buildup of stocks of debt, both private and public over time.

In the regulatory realm, efforts to improve the conduct of macroprudential policies should be supplemented with policies directed to changing the **behaviour** of lenders. There should be greater reliance on self discipline and market discipline. Excessive risk taking could be met with judicial penalties directed more to individuals than to corporations¹¹⁹. As well, interest deductibility (for taxes) and limited liability in the financial sector could both be ended. Market discipline requires better numbers, that can only be provided through wholesale change in accounting (especially fair-value accounting) and auditing (especially dealing with the Big Four¹²⁰). In principle, and equally important, should be efforts to change the behaviour of borrowers so that they properly evaluate the longer run consequences of increasing debt. In practice, this seems likely to be a lost cause.

¹¹⁸ See Pringle (2012) and Ocampo (2017) for thoughtful suggestions for reform.

¹¹⁹ Goodhart (2017).

¹²⁰ KPMG, Ernst and Young, Deloitte and Pricewaterhouse Cooper.

There have been a long list of proposals having to do with changing the **structure** of the system. Many have noted that financial globalisation, securitisation and consolidation have all brought problems in their wake. They could, in principle, be rolled back. International subsidiaries (separately capitalized) might replace branches. Securitisation could be resisted through reducing the importance of collateral (as opposed to anticipated cash flow) in making lending decisions. Breaking up big financial firms would deal with the problem of “too big to fail”.

Others, however, are less optimistic that any of these changes could be made to work. The fallback position for many is simply the imposition of a very much higher capital ratio, as noted above. However, there are also a wide variety of views on how high would be high enough, and differences of opinion on how capital ratios should be calculated (risk weighted, unweighted, both, or just an absolute capital level).

A number of others, also pessimistic about the efficacy of all the proposals made above, have suggested the need for still more fundamental changes to **national monetary regimes**. Again, a wide variety of views can be identified.

On the one hand, there are those that advocate “free banking”. They suggest that financial regulation should be swept away and the provision of safety net support by central banks severely limited. The stability of the financial system would be ensured by market discipline, with banks making imprudent loans being reined in by other banks fearing the systemic fallout.

On the other hand, there are those that advocate “narrow banking”, some variant of the original proposal made by the Chicago School in the 1930s. In the original version, banks would have to hold government securities as backing for all current accounts. They would therefore lose their capacity to create money, and to drive credit “booms and busts”. Instead all risky loans would be financed by true savings, and each loan would bear a direct risk of loss. More modern versions¹²¹ also address the so called “boundary problem”; namely, that non-banks could create substitutes for narrow money. Technological developments have made this

¹²¹ An unusually comprehensive approach is suggested by McMillan (2014). See also the many publications of Laurence Kotlikoff on “Limited Purpose Banking”.

much more likely than in the 1930's. As with "free banking", financial regulation and safety nets would be swept away¹²².

Barring a decision, jurisdiction by jurisdiction, to retreat into autarky, all proposals for change at the national level will have to face an international challenge. For virtually every country other than the US, the decision to adopt a macrofinancial framework could have immense implications for exchange rate movements. Arguably, the decision in recent years by the Swedish Riksbank and the Bank of Canada, not to use monetary policy to lean more heavily against a worrisome increase in house prices and household debt, has reflected such concerns.

Similarly, proposed regulatory changes at the national level will immediately raise questions about international competitiveness and level playing fields. That is why the Basel led process has been so influential in recent decades. As for unilateral changes to the national monetary regime, that will raise a whole host of questions. The defeat in June 2018 of the Sovereign Money Initiative ("narrow money") in Switzerland was apparently due, in part at least, to widespread fears of going it alone.

Lurking behind all the problems identified in this paper, and also all the proposed solutions, is an inconvenient reality. We do not have an **International Monetary System** with rules which try to preserve economic stability at the international level. Absent such rules, every country is able to pursue its own short run interests, regardless of the longer run implications for systemic stability. The massive increase in the size of the balance sheets of all of the world's most important central banks could be a dangerous case in point. The recent recourse by the US to substantial fiscal stimulus, with the economy already near full employment and its external position worsening, is another. Unfortunately, for the moment at least, there seems little political appetite to raise this most fundamental of questions.

¹²² However, note an important difference. Under "free banking" getting rid of regulations (that encourage bad behaviour) and safety nets (that do the same) would be a **precondition** for systemic stability. Under "narrow banking", imprudent behaviour would no longer be possible and so regulations and safety nets would be **redundant**.

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