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Governance Issues for Macroprudential Policy in Advanced Economies[1]

The recent severe financial crisis is leading policymakers around the world to add a new set of tools for the management of their economy. "Macroprudential" policies may allow authorities to cushion the blow from dangerous financial crises by using an approach that fits between monetary policy for the economy as a whole and traditional regulation of individual financial institutions (now referred to as "microprudential" regulation to distinguish it from the new approach.) There are multiple definitions of "macroprudential," but the core concept is to manage factors that could endanger the financial system as a whole, even if they would not be obvious as serious threats when viewed in the context of any single institution. Risks that are common to many financial institutions simultaneously, such as excessive exposure to housing credit, can combine with a high degree of interconnections between financial institutions to create systemic risks even when each individual institution appears sound, absent the potential for financial contagion.

Those unfamiliar with macroprudential policy may wish to read the author's comprehensive primer on the topic, written for non-specialists, (see www.brookings.edu/papers/2011/0311_capital_elliott.aspx.[2]) This paper will examine one of the key issues in more detail: how should macroprudential authorities be structured and governed? Macroprudential policy has rarely been used in advanced economies in recent decades and the structures to set policy in this area are generally very new, or have not yet been formed. Even where an existing body is taking on these responsibilities, their nature will require new governance approaches. A number of questions therefore arise:

- Should macroprudential policy be run by a single authority, multiple authorities, or a committee?
- Which authority or authorities should be in charge of policy?
- In practice, what entities will conduct macroprudential policy in the major financial centers?
- What objectives should be given to the macroprudential authorities?
- What tools should be available to the macroprudential authorities?
- How should macroprudential authorities decide when and how to take action?
- To what extent should authorities use subjective judgment?
- How should macroprudential policy be coordinated with monetary policy?

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[2] Parts of this paper draw directly from that primer, although the bulk of this paper consists of new material.

- How should macroprudential policy be coordinated with safety and soundness regulation?
- How should policy be coordinated internationally?
- How can we assure proper accountability for macroprudential decisions?
- What other structural issues are important for sound governance?
- What is the optimal communications strategy?
- How could the authorities counter political pressure not to puncture bubbles?
- What are the major risks facing the macroprudential authorities?

Should macroprudential policy be run by a single authority, multiple authorities, or a committee?

As with monetary policy, high-level macroprudential policymaking needs to be decided by a single body. It would be awkward, and potentially disastrous, to have multiple authorities making separate decisions about the state of the credit cycle and the need for macroprudential intervention, just as we would not set up multiple central banks with authority over different parts of a nation's financial system. However, there is room for the authority to be vested either in a single body or in a committee that makes a *coordinated* overall decision, and different countries have chosen different paths in this regard. Execution of any decisions could also fall onto different bodies, depending on the tool or tools chosen for use by the macroprudential authority.

There are a number of pros and cons about setting up a single macroprudential authority rather than a committee:

Pros of a single authority

Coherence of decisionmaking. A single authority is more likely than a committee to take a coherent point of view about macroprudential policy. (Of course, anyone who has dealt with bureaucracies knows that this is a matter of degree and not an absolute difference of quality. Even a single body can contain seriously dissenting viewpoints.) Coherence is important for multiple reasons. First, incoherence will generally exhibit itself as the taking of partially conflicting policy actions, which reduces the effectiveness of the intended actions. Second, signaling effects are one of the paths by which macroprudential policy, like monetary policy, will be effective; signals will have less effect when they are unclear. Third, macroprudential policy is new enough that we will need to learn from our mistakes, which is easier if there is a coherent policy to judge. Fourth, accountability is difficult in the absence of clarity.

Reduced probability of in-fighting. Struggles between different bureaucracies and ideological views are likely to be fewer and less severe within a single authority than inside a committee, although, again, this is a matter of degree.

Ability to act. Committees often find it difficult to move forward in the absence of a strong consensus. This could be particularly troublesome in boom periods where the macroprudential authority needs to

slow down excessive activity, resulting in lower profits for many parties and potentially lower economic activity. “Taking away the punch bowl” is seldom popular, so there will probably be committee members who push strongly against it or wish to slow or dilute the actions. One way to reach a consensus is to delay or hobble a necessary action.

Greater independence. Related to the last point, there will be strong pressures not to slow down a boom. These pressures become harder to resist when there are multiple points of pressure available for opponents of action, such as would undoubtedly be true with a committee. If one of the authorities represented on the committee has been captured by its regulated constituency, or is simply politically weak and therefore in a poor position to resist pressure, it will become even harder to act.

Cons of a single authority

Potential for groupthink. A single authority may develop a particular way of looking at the world that blocks out contrary facts and beliefs. A committee structure could increase the range of ideas and information sources that are given weight in the deliberations.

Potential for an autocrat to take control. The head of a single authority may find themselves in a position where they can totally dominate the internal debate, which is particularly true if he or she controls the careers of all or a majority of those on the committee. This can create a more extreme version of groupthink, where the decisions are really those of a single, possibly inflexible, person.

Lesser credibility. If a committee of key regulators and policymakers were able to reach a consensus, the combined weight of the various members might make it easier to stand up to political pressures and doubts than would be the case of a single authority.

Less flexibility. A committee *might* find it easier to reverse itself if it makes a mistake than would a single authority. This is not guaranteed, of course.

On the whole, the author would recommend a single authority, in order to combat the great difficulties the body will face in taking painful actions during boom periods, which is probably the greatest single problem facing such authorities in these early days of macroprudential policy. However, there are clearly arguments on both sides of the ledger, as listed above.

Whichever choice is made, single authority or committee, the detailed governance structure should be designed to minimize the disadvantages of that approach. For example, the Financial Policy Committee being set up under the Bank of England, is a committee that will have external members with considerable clout and independence[3]. This should reduce the problems of groupthink and careerism

[3] The FPC will be described in the future tense in this paper because the enabling legislation has not yet been put in place. However, there is currently an interim FPC that operates along the lines currently envisioned for the ultimate version.

that otherwise endanger structures with a unitary authority. It provides some of the benefits of a committee without taking on the disadvantages of dispersed authority so strongly.

A committee structure, on the other hand, needs a strong chair and various organizational strengths such as its own research support and independent funding, as has largely been structured into America's Financial Stability Oversight Council (FSOC). These will hopefully aid the committee to reach independent decisions and to stick to its guns in the face of political pressures.

Which authority or authorities should be in charge of policy?

The first question in choosing who will be in charge of macroprudential policy is the extent of the role of the central bank. Again, there are pros and cons to a powerful central bank role:

Pros of a strong central bank role

Overlap of macroprudential and monetary policy. As discussed below, there are a number of overlaps between the two types of economic policy. In particular, very loose monetary policy can set off a "search for yield" in financial markets that can stimulate a financial bubble. For its part, macroprudential policy could potentially gum up the monetary transmission mechanisms and reduce the effectiveness of monetary policy decisions. The overlaps are not so large as to warrant a single unified policy, but they are sufficient to call for careful coordination, which is easier if the central bank plays a major role in macroprudential policy.

Political independence. Central banks have generally earned a great deal of independence from political influence, as a result of years of failed experiments in politically directed monetary policy. Macroprudential policy will need this same kind of independence, since one of its roles is also to "take away the punch bowl."

Credibility. In most advanced economies, the central banks have established strong and credible organizations, which could help macroprudential policy withstand onslaughts from those who might suffer from necessary restraints being placed on credit booms.

Strong analytical resources. Macroprudential and monetary policy issues are similar enough that the strong intellectual resources available at the central banks would be helpful in tackling the difficult complexities that arise as macroprudential policy grows from infancy.

Cons of a strong central bank role

Subservience to monetary policy goals. Decisionmakers at a central bank might consciously or unconsciously prioritize monetary policy goals ahead of macroprudential policy requirements. Wherever the decisions are made, there will be a need to deal with the overlap of monetary and macroprudential policy. A powerful central bank role may encounter too strong an incentive to shortchange macroprudential policy.

Tainting of monetary policy decisions. In theory, the problem could run the other way. A central bank might become so enamored of macroprudential policy that it would aid those policies by tightening or loosening monetary policy inappropriately. In practice, this is unlikely to be a major problem for many years, as the credibility of monetary policy as an approach has already been established while macroprudential policy is relatively new.

Excessive power in a single body. There is always a tension between the political independence necessary for effective central banking and the benefits of democratic control of major economic decisions. Handing still more power to a non-elected central bank would make this problem even more severe, although not necessarily unmanageable. In some political systems, there could also be a real risk of cronyism, for example, through regulatory capture by the private sector banks. Excessive power would be a still greater risk in situations where the central bank already plays a major supervisory role in addition to conducting monetary policy.

Potential erosion of a central bank's monetary policy independence or credibility. Macroprudential policy has the potential to become unpopular when exercised to force higher safety margins in the financial system in order to restrain a boom or prepare for the subsequent bust. It has the further disadvantage that the policy actions may not be given any credit if a bust is actually avoided or does relatively little harm because of the preparation. The greater the number and importance of potentially unpopular roles that a central bank takes on, the more risk that its central role in monetary policy management is undermined.

Whatever choice is made about the centrality of the central bank's role, there clearly needs to be strong coordination with the macroprudential authority, as discussed below. Therefore, if there is a committee structure, it should almost certainly include the central bank as part of it. Beyond that, it would be sensible to include microprudential regulators, both for their expertise and because there is also a significant overlap between macroprudential and microprudential policy, also discussed below. In particular, most of the tools available to execute macroprudential policy are ones that traditionally are used by microprudential regulators, such as minimum capital requirements, and will remain necessary for them to use. Using the same tools for two sets of purposes requires careful coordination.

If there is a single macroprudential authority, and it is not at the central bank, it would be desirable to establish it as a new authority. In theory, if there is a single microprudential authority, or a dominant one, then this body could also take on macroprudential authority. However, the author believes that the risk would be too high that the new macroprudential powers would become subservient in practice to microprudential goals. There are enough surface similarities between macroprudential and microprudential policies that it would be easy to fall into old habits and pay insufficient attention to the new role.

What entities will conduct macroprudential policy in the major financial centers?

The US, the UK, and the EU have each set up bodies to conduct or coordinate macroprudential policies going forward. Interestingly, each has chosen a quite different structure from the others. In the case of the US, the Financial Stability Oversight Council (FSOC) will have the power to make most macroprudential decisions, with the implementation often left to the Fed or, to a lesser extent, other regulators. The FSOC is composed of 15 members, primarily the heads of the major national regulatory bodies, but with some representation, generally non-voting, of state regulators, insurance regulators, and financial experts. The Secretary of Treasury serves as the Chair of the FSOC and has greater power than just running the meetings. (For example, no non-bank financial institution can be designated as systemically important without the Chair's assent.) The Dodd-Frank Act also created an Office of Financial Research (OFR) within the Treasury Department to provide technical expertise to the FSOC, especially in regard to data gathering and analysis and overall analyses of financial stability. Despite being within Treasury, Congress clearly intended the OFR to have a somewhat independent role, since the Director is protected by a fixed six-year term and shielded from pressure to revise Congressional testimony to reflect overall Administration views.

The FSOC has a wide-ranging grant of power to deal with large banks and with systemically important non-bank financial institutions and it is mandated to preserve financial stability. It is therefore in a position to actively conduct macroprudential policy, including by leaning against the wind. Currently, however, there appears to be more emphasis in the US on the reduction of systemic risk generally, with less focus on the cyclical aspects of macroprudential policy, although this could change.

The UK has chosen to concentrate macroprudential authority, and financial regulatory authority more generally, at the Bank of England. Consistent with this, legislation is being pursued to create a Financial Policy Committee (FPC) at the Bank with a clear macroprudential objective of leaning against the wind, in addition to the reduction of systemic risk more generally. There is already an interim FPC that will provide guidance to the Bank while awaiting final legislation. Both the interim committee and the ultimate one will include prominent external members, so that it will not be purely a Bank of England creature. One aspect of the legislation is that Parliament will very likely specifically authorize the Bank to use, or direct the use, of only certain tools as part of its policy. It can always make recommendations on the use of tools outside this list, which would still carry considerable weight, particularly in areas where the authority with ultimate responsibility has a reporting relationship to the Bank.

The EU has created a European Systemic Risk Board (ESRB) that is intended to encourage appropriate macroprudential actions by the national regulators. It describes its mission, in part, as being "responsible for the macro-prudential oversight of the financial system within the Union in order to contribute to the prevention or mitigation of systemic risks to financial stability in the Union that arise from developments within the financial system and taking into account macro-economic developments, so as to avoid periods of widespread financial distress.[4]" At this initial stage of its development – it is less than a year old – its powers are purely advisory, including the authority to make its advice public. If it

[4] Quoted from the ESRB website, http://www.esrb.europa.eu/about/tasks/html/index.en.html

follows the path of many other EU-wide institutions, it is likely to accrete considerably more decision-making power over time.

The ESRB is a large body with 37 voting members (27 heads of national central banks, plus 10 others) and almost another 30 non-voting members. Many outside observers assume that the smaller Steering Committee, of 14 members and weighted more towards heads of EU-wide institutions, will end up dominating decisions. The ESRB will rely considerably on the European Central Bank for technical assistance and is located in Frankfurt with the ECB.

What objectives should be given to the macroprudential authorities?

Clearly, macroprudential authorities should focus on the stability of the financial system. Unfortunately, this is difficult to measure precisely, although the failure to achieve it can become quite obvious. It may be possible in the years ahead to develop good, objective measures of systemic stability, but, for now, there will need to be considerable judgment applied. This is discussed in more detail in several places below.

It is critical, however, that "financial stability" not be defined purely as the absence or near-absence of the risk of a systemic crisis. The term must encompass the need for the financial system to be a stable provider of the necessary credit to keep the economy moving forward. A narrow focus on the risk aspect of financial stability could lead to excessively high safety margins that reduce risk, but at a very high cost. For example, one could certainly make the regulated system much safer by requiring capital ratios of, say, 80%, but it would mean a far smaller regulated sector, providing much less credit.

What tools should be available to the macroprudential authority?

There are quite a number of instruments that could be used by themselves, or in combination, to execute macroprudential policy, which are discussed in detail in Appendix A, taken from Elliott (2011b). These include:

- Counter-cyclical capital requirements
- Dynamic loan loss provisioning
- Counter-cyclical liquidity requirements
- Limitations on leverage in asset purchases
- Loan to Value (LTV) ratios for mortgages
- Loan to Income (LTI) ratios for mortgages
- Minimum margins/haircuts on secured securities lending
- Administrative caps on aggregate lending
- Reserve requirements
- Constraints on currency mismatches
- Credit controls
- Taxation
- Monetary policy

This listing focuses on instruments for managing systemic risks that vary with the state of the credit cycle. In addition, macroprudential authorities may be granted the ability to force structural changes in systemically important institutions or the structure of types of financial transactions in order to reduce overall systemic risk without regard to the state of the cycle. In the US, the FSOC, in combination with the Federal Reserve in its supervisory capacity, has considerable powers in this regard.

In theory, macroprudential authorities could also be given crisis management powers, but I agree with most analysts in placing this outside of the macroprudential role, which is generally conceived as being about prevention rather than resolution. Macroprudential authorities should be able to provide good advice and technical support to a crisis resolution authority, but ought not to be leading the process. Crisis resolution is much closer in nature to microprudential supervision and also could well involve the use of fiscal powers that do not naturally belong with a macroprudential authority.

A key structuring decision in setting up any macroprudential authority is to determine which tools will be available to that authority. In this regard, it is important to note that many, if not all, of the tools listed above will not be controlled directly by the macroprudential authority. Most likely, the authority will be allowed to *suggest* the use of any tool to the regulators who do control that instrument, although politics may cause some tools to be excluded even from suggestions. The real question is when the macroprudential authority will be allowed to *direct* an action by other regulators, such as increasing the minimum capital requirements for banks, creating or enlarging a counter-cyclical capital buffer.

In general, a competent macroprudential authority would benefit from having a wide range of potential instruments. That said, there could be reasons to exclude some tools from the list. For example, a legislature may not wish to hand over authority on taxation, even of a limited type, to an unelected body. Monetary policy, for its part, will almost certainly remain with the central bank and it is unlikely that the macroprudential authority will be allowed to direct the monetary authority on instruments such as overall interest rates. Finally, aggregate limits on total lending or other forms of credit controls may be viewed as ineffective or too dangerous for most modern economies with sophisticated financial systems.

If the legislature wishes to keep macroprudential authorities focused on a few key instruments, which the author does not generally favor, then there is at least an argument for allowing a subset of the tools that are most generally useful, including counter-cyclical capital requirements, but excluding the others initially. Having only a subset available may well make the authority less effective, but it could limit potential unintended consequences and may make it easier for markets and the public to understand what the authority will do.

There is also the question of how narrowly the macroprudential authority will be allowed to focus its action. In particular, the use as a macroprudential tool of maximum loan-to-value ratios on mortgages would presumably be more effective if it could be varied across a country, depending on the degree to

which a given region or city is experiencing a housing boom[5]. Cutting things a different way, certain types of lending may develop in a dangerous manner at a time when other types are saner.

There are a number of trade-offs between the increased potential effectiveness coming from very focused use of macroprudential tools and the governance and communications issues created by that approach. The narrower the ability of the authority to focus its actions, the more it will effectively be creating winners and losers from its actions and hence the more powerful it becomes. Central banks have been able to achieve a great deal of independence in their conduct of monetary policy in part because their actions affect broad swaths of the economy equally. It is true that their actions may benefit lenders at the expense of borrowers, or vice versa, but these are at least very broad categories and monetary policy moves between restraint and easing frequently enough for the choices to balance out to a considerable extent. (A given central bank could still have an overall bias that is favorable to borrowers or to lenders, of course.)

Especially in its early days, macroprudential policy that creates focused groups of winners and losers may well find itself under strong political attack. Unfortunately, there is likely to be an asymmetry here, because losers from government actions are often considerably more vocal than the winners who are essentially receiving a benefit they did not expect. Perhaps even more likely, there may be a focused class of losers coupled with much more dispersed benefits to society as a whole. For example, a macroprudential authority might decide that there was a dangerous housing boom in the nation's largest city, but not elsewhere, and accordingly lower the maximum loan-to-value ratio for mortgages within the city limits. Those affected are likely to complain loudly about the unfairness created by arbitrarily choosing that particular geography, when they perceive similar problems just over the city's borders or in the second-largest city and where they see pockets of their own city that are not in a boom. Similarly, there is a risk that much of the benefit might be undone by changes in lending behavior that effectively move the bubble into the next most congenial location, such as just over the city's borders.

This does not mean that macroprudential authorities should always move in a broad manner, but merely to point out that there are trade-offs and that these need to be considered when deciding what powers a new macroprudential authority should have.

How should macroprudential authorities decide when and how to take action?

The details of the decision-making process lie outside the scope of this paper, but the macroprudential authority must be set up in a manner, and with the resources, to have the following:

A framework to judge credit conditions and asset price levels. Macroprudential policy is intended to "lean against the wind" when economic forces are feeding bubble conditions or creating a credit bust. Therefore, there must be a framework to evaluate wind speed and direction, as well as likely near-term

[5] The Republic of Korea apparently sets mortgage standards that differ within relatively small geographies for just this reason.

changes in both. Most analysts agree that there will have to be a measure of subjective judgment on top of the various proposed quantitative analyses, given the current state of forecasting.

A process to determine which tools to use when action is required. If the authorities are vested with multiple macroprudential powers, as they should be, then there must be a way to decide which tools are used, and to what degree, when action is needed. (See Elliott (2011b) for a detailed discussion of this set of issues. Appendix C of this paper excerpts a suggested set of questions for macroprudential authorities to consider in this regard.)

A framework for imposing the chosen changes to safety margins. For example, how should counter-cyclical capital requirements be raised or lowered? The most straightforward approach is probably that suggested by the Basel Committee -- adding a counter-cyclical capital buffer on top of the minimum capital requirements resulting from the rest of the Basel rules. This can be thought of either as a number of percentage points tacked on top of the otherwise required ratios of capital to risk-weighted assets or as a multiple of those ratios. For example, capital requirements could be increased by 10% simply by multiplying all existing ratio requirements by 1.1 or the total requirements could be increased by, say, one percentage point. In theory, a separate set of calculations could be used to determine the total level of capital needed, but there are compelling reasons to retain the Basel structure rather than creating a competing set of rules. An alternative regime could lead to confusion and to odd decision-making processes if the new set of rules appeared to be about to bind on the banks due to overall financial conditions that might lead to macroprudential action.

A way of deciding how much to move the requirements and on what timeframe. As with the analysis to determine whether a move is necessary, there will need to be quantitative measurements, supplemented by subjective judgment, to indicate the new level of capital requirements.

Clear means of communicating the decisions and their rationales. It will be difficult, but critically important, to ensure that macroprudential decisions are understood by politicians, regulators, banks, financial markets, and other key constituencies. Lack of clarity could lead to confused reactions and market volatility as well as undermining the prospects for achieving the necessary public and political support. This is discussed further below.

Access to the data necessary for all of the above. Macroprudential authorities will be prodigious consumers of data about the financial system and, to a lesser extent, about the rest of the economy. They will need the legal power to ensure that the data they need is available to them, either from other regulatory authorities or from the financial industry directly. Nearly everyone agrees on the desirability of using existing regulatory data sources where possible, to avoid imposing unnecessary burdens on the financial industry, but this will not always be feasible. Sometimes it may be necessary to collect information directly or to be able to require regulatory authorities to gather additional information for the use of the macroprudential authorities.

To what extent should authorities use subjective judgment?

It is hard at this point in the development of macroprudential theory to imagine a set of formulas good enough to eliminate the need for the authorities to make judgment calls, even though this clearly has its own drawbacks. The use of judgment has the great advantage of allowing the authorities to take into account information which is not contained in the models, including the possibility that an asset price boom is driven by a genuine economic development and not an investment fad. Or the authorities may be aware that other factors, such as world economic conditions, are likely to damp down the boom without the need for macroprudential actions.

Kannan et. al. (2009) conclude from their simulation analyses that "using a macroprudential instrument designed specifically to dampen credit market cycles would also be useful. But expectations should be realistic about what can be achieved with such an approach. In particular, it is often difficult to accurately identify the source of the shock driving house price booms. Invariant and rigid policy responses raise the risk of policy errors that could lower, not raise, macroeconomic stability. Hence, discretion would need to be applied."

Tucker (2009) states that he is "doubtful that macroprudential instruments could be operated as a rule. To steer the banking system towards increasing its resilience to incipient problems in a stretched sector, a whole series of judgments would have to be made. Whether the rate of credit growth seemed excessive; whether terms were overly lax; or whether the 'bubble bursting' would materially damage banks."

The IMF comes to the same conclusion, stating "[t]hese results suggest that policy reactions to indicators of potential financial vulnerability should be neither automatic nor rigid – policymakers need room for discretion.[6]"

However, subjective judgments can be wrong, they can be biased, and they can be harder to explain and defend. There is a fair chance that adding subjective judgment would raise the predictive ability of the authorities compared with using only a formula, but there would also be a danger of the authorities falling into the very human trap of buying into the same prevailing fallacies about the causes of an asset price bubble as did the rest of society. Worse, political pressure might be harder to resist when applying subjective judgment. This is not just a question of defending a decision but also of the human trait of convincing ourselves of those beliefs that will minimize conflict with others. Certainly, however, there would also be the issue of convincing politicians and the public that the authorities were acting appropriately. In the beginning, this could go either way. A formula provides an objectivity that might be helpful, but a formula that has not yet proven itself might be less convincing than the arguments of experts.

The Basel Committee (2010) acknowledges that national regulators will need to use subjective judgment. In order to increase the consistency and effectiveness of actions across the world, the

[6] IMF WEO (2009).

committee proposed five principles to guide decisions on use of counter-cyclical capital buffers (the only instrument they fully endorsed at that point):

"Principle 1: Buffer decisions should be guided by the objectives to be achieved by the buffer, namely to protect the banking system against potential future losses when excess credit growth is associated with an increase in system-wide risk."

The committee notes that the buffer, as such, "is not meant to be used as an instrument to manage economic cycles or asset prices." This does not mean that there would be no effects on these, but that the core purpose is to achieve stability in the financial system.

"Principle 2: The credit/GDP guide [a particular analytical measurement suggested in the report to measure excessive credit growth] is a useful common reference point in taking buffer decisions. It does not need to play a dominant role in the information used by authorities to take and explain buffer decisions. Authorities should explain the information used, and how it is taken into account in formulating buffer decisions.

Principle 3: Assessments of the information contained in the credit/GDP guide and any other guides should be mindful of the behaviour of the factors that can lead them to give misleading signals.

Principle 4: Promptly releasing the buffers in times of stress can help to reduce the risk of the supply of credit being constrained by regulatory capital requirements.

Principle 5: The buffer is an important instrument in a suite of macroprudential tools at the disposal of the authorities."

How should macroprudential policy be coordinated with monetary policy?

If regulatory authorities other than central banks play a significant role in macroprudential policy, then it will be important to ensure that they coordinate appropriately with their central bank. As an obvious example, it would be unfortunate if tough new macroprudential policies were put into place to stop a potential bubble at the same time as the central bank slammed on the brakes for the economy as a whole, unless the situation were truly so troublesome as to merit action on both fronts.

Conventional monetary policy actions have considerable effects on credit activity and asset prices through a variety of transmission channels, which are explained in Appendix B. These include:

- Changes in the supply and demand of short-term funds
- Indirect, and occasionally direct, effects on intermediate and long-term interest rates
- Effects on currency exchange rates, which are sensitive to interest rates
- Changes in asset prices in general, especially of interest-sensitive assets
- Effects on risk aversion and the perception of risk levels

- Impacts on capital levels of financial intermediaries
- Changes in levels of bank reserves held at the central bank

Many of these transmission channels directly affect banks, and other financial firms, in important ways, while all of them have at least important indirect effects. In particular, prolonged low interest rates have been shown to encourage financial institutions and other market participants to take levels of risk that they would otherwise have shunned, levels that can become truly quite excessive in extreme cases[7]. There is an ongoing debate about whether this fact should lead monetary authorities to hold rates higher than they otherwise would at times of over-exuberance in the financial markets. Opponents of this approach generally assert either that it is too hard to detect bubbles or that the damage to the wider economy from higher interest rates more than offsets the benefits of taming the financial cycle, or that both negatives are true. The debate is too complicated to be adequately covered in this paper. (See Bean et. al. (2010) for a review of the arguments.) However, it is worth noting that the more one believes in an active monetary response to financial crises, the less likely one would be to support macroprudential tools that work by affecting the financial system widely. That does not mean, though, that such a belief would be inconsistent with more focused uses of macroprudential policy, such as dealing with bubbles confined to a single sector like housing.

Working in the other direction, substantially increasing the required macroprudential safety margins could make it harder for monetary policy easing to be effective. For example, interest rate easing may not translate into significantly greater lending if capital, liquidity, and loan-to-value requirements are all set at levels that discourage such lending.

Because of the various interlinkages, the most effective overall economic policy would require coordination with macroprudential actions that also affect credit provision in significant ways. Similarly, the information required to understand the necessary macroprudential actions overlap to a considerable extent with that needed for monetary policy, making it highly desirable that all authorities share their information and thought processes.

Finally, macroprudential regulators and monetary authorities both need politicians and the public to accept their actions, lest they eventually lose the independence to make these decisions. If one group is pushing the economy in a particular direction that appears to be at odds with the other group, it could do harm to both. Of course, the risk for macroprudential regulators is probably greater, because they will have a quite new mandate, yet little history to show that this approach is useful.

Coordination must involve appropriate exchanges of information about the state of the financial system and of systemically important institutions, with particular emphasis on those aspects that represent the greatest dangers. Ideally there would also be an open exchange of views about the economy and the financial system. There should be frequent communication at the staff level between the various

[7] See Altunbus et. al. (2008) for example.

authorities, complemented by more formal discussions perhaps once a quarter, or more frequently if danger looms.

How should macroprudential policy be coordinated with safety and soundness regulation?

Most financial regulation concerns the safety and soundness of individual financial institutions. This is both to prevent collapses of individual entities and because individual solvency is at the core of systemic solvency, although apparent safety at each separate institution is not an absolute guarantee of systemic safety. With the advent of macroprudential policy, this "safety and soundness" regulation is often referred to as "microprudential." (I will switch off between the two terms, for the sake of variety and because microprudential is an ugly word.)

There is a clear need for macroprudential and microprudential authorities to coordinate. First, the large majority of the tools used for macroprudential purposes are the same as those used for microprudential reasons, just used for different reasons and sometimes in different ways. As a practical matter, the safety and soundness regulators will generally have the responsibility of ensuring that each financial institution meets the combined macro- and microprudential requirements. There is no point in wasting resources by having the macroprudential authority do individual audits to ensure compliance.

Second, there are overlapping areas of judgment where the macro- and microprudential authorities could find themselves working at cross purposes. The most concerning relates to the transition from a period of credit expansion to a credit bust. For illustration, assume that microprudential authorities were requiring a core capital ratio of 10% and that macroprudential authorities had foreseen the credit bust and added a counter-cyclical buffer of 5 percentage points, for a total of 15%. As the bubble bursts and the credit bust begins, the macroprudential authorities might wish to remove the entire buffer, allowing the total requirement to drop to 10% again. However, safety and soundness regulators might be too nervous to let the requirement drop back to normal levels and might move the minimum requirement under their control up to 12% or even up to 15%[8].

There is a potential similar problem during the boom period. Microprudential regulators might come to realize that core capital levels are too low, perhaps because financial institutions are gaming the system or because additional information comes to light or the overall economic environment changes. If macroprudential regulators have created a significant counter-cyclical buffer, then the safety and soundness regulators might not be willing to expend the political capital to raise the core levels or might find it too difficult to do so.

The clear implication of these examples, and others, is that the two sets of authorities need to coordinate in order to achieve their separate purposes while accessing some of the same tools.

[8] There is a similar concern that market nervousness might force financial institutions to retain the higher levels. This potential response of markets and microprudential regulators at the time a bubble bursts is an argument for macroprudential buffers to be built to a sufficient level during a boom that the effective total safety margins will drop afterwards even if there is some counteraction by markets and regulators.

Sometimes there may simply be an inherent conflict between the two sets of goals, but most of the time there will be a way to accomplish both, since the two types of regulators are focused on different issues.

There is an argument for enhancing the coordination by housing the macroprudential authority within the same body that regulates safety and soundness. This is not an unreasonable argument, but the author views macroprudential policy as more like monetary policy in its scope and thought processes than it is like microprudential policy, although it has similarities to both. It should be possible to have the necessary coordination through good information sharing and regular high-level discussions. If there is a committee running macroprudential policy, then clearly safety and soundness regulators should be represented.

There is also a related communications issue. It is important that communications to the financial industry and the public about the required levels of various safety margins make clear what part comes from microprudential concerns and what part is there for macroprudential objectives.

How should policy be coordinated internationally?

A large part of the world's financial system operates on a global basis, rather than a national or local one. Unfortunately, this adds the need for an additional governance structure, at least in terms of international coordination mechanisms and agreed rules of the road relating to actions that have international ramifications. Some, such as the Institute of International Finance (IIF), have recommended the creation of an international macroprudential body, perhaps associated with the Financial Stability Board, in order to aid coordination. However it is accomplished, coordination across countries will be needed for multiple reasons.

For example, regulators in a given country may determine that their credit markets are starting to boom to a dangerous extent and that it is time to raise capital requirements and/or deploy other macroprudential tools. However, there is a risk that lenders in other countries might step in to fill the gap. They might be able to do this by lending through branches operating in that country or the total capital in the group might be sufficient for them to comfortably redeploy some of it to the booming country. They also have the alternative in some cases of lending to companies that are based in the booming nation, but which can borrow outside their home country either directly or through foreign subsidiaries.

It therefore becomes important that there be global coordination of macroprudential activities. At the extreme, this could in theory mean treating the globe as one large market and having all relevant countries move in tandem. However, such global coordination would not only be too difficult, but would also almost certainly be counterproductive, given that national economies and financial systems remain different enough that the right medicine for one country can be poisonous to another. The task becomes one of ensuring that the differences in macroprudential choices across borders do not cause excessive damage to the policies each nation needs to employ for its own purposes.

One method that has been proposed is for other countries to honor the macroprudential choices of host countries. Thus, if the UK, for example, were to raise capital requirements on its domestic loans, then other countries should also raise capital requirements on UK loans being made by their own banks. A global bank would thereby find that its total capital requirements were based on a weighted average of the requirements relevant to its business in the various countries in which it operates. Unfortunately, there would remain considerable potential for "gaming" the different capital standards across countries, such as, in this example, by finding ways to reclassify what is essentially a UK domestic loan as a loan in a country with lower capital requirements.

The Basel III agreement endorsed by the Group of Twenty (G-20) leaders calls for national regulators to honor each other's macroprudential decisions, at least within the range of a counter-cyclical capital buffer of up to 2.5% of risk-weighted assets. It will be necessary to find appropriate coordination mechanisms for the other macroprudential tools that authorities will use. A few of these require no real coordination, such as limitations on loan-to-value ratios for mortgages, since the underlying contracts under local law are at issue. However, most other tools could be undercut by internationally active lenders and borrowers if the right mechanisms are not found to discourage this.

How would the authorities deal with any regulatory arbitrage that developed?

This could be a particularly difficult question in practice and the answer would depend considerably on the specific circumstances and legal authorities. One type of regulatory arbitrage would be the development of major non-bank financial institutions that lie outside the macroprudential framework. The best response might either be to begin regulating these as banks, both for "safety and soundness" and macroprudential reasons, or to adapt the macroprudential responses to encompass these other institutions as well. If neither of these actions makes sense, then the arbitrage would create constraints within which macroprudential policy would have to operate, yielding "second best" solutions at times.

Another potential difficulty would cross borders, with one nation using macroprudential policy very different from another and affecting cross-border lending behavior. As noted, it probably makes sense to defer to the macroprudential decisions of other countries, so that if, for example, mortgage lending in the UK were deemed by the British to need restraining then other countries whose banks lend into the UK should be placed under similar restraints. However, there might be more complicated interlinkages that are harder to unravel. These would likely matter only if macroprudential policy varied a great deal across borders -- which argues for a bias towards broadly similar policies in today's globally inter-linked world.

Nonetheless, for both good and bad reasons, there will be differences in macroprudential policy among major trading partners. It will be necessary for lines of communication to be open and for the authorities in different countries to be willing to listen to the concerns of their peers. Of course, virtually the same points could be made in regard to the desirability of monetary policy to be broadly consistent across borders and for there to be good communications. Yet, differing national approaches remain an area of serious concern and there are sometimes suspicions that one country is engaging in "beggar thy neighbor" policies by influencing exchange rates or other economic variables that lead it to benefit at

the expense of others. So, there is no reason to expect easy answers that will always work on such cross-border issues. All that can be done is to design a system to minimize the damage from these divergences.

It would be about as difficult theoretically to coordinate macroprudential policies as it already is to coordinate monetary policies. It would probably be even more difficult in the beginning, given the uncertainties and different views that would exist initially about the policy framework. The broad idea would be to respond in a similar manner across the globe to similar financial circumstances. If there were a global bubble in commodities fueled in part by excessive credit, then it would be in the interests of most countries to deflate that burgeoning bubble and to increase the effectiveness of the response through coordination of policies.

The task would not be easy, however. There might well be a difference of opinion between those countries that primarily produce commodities and those that primarily consume them about whether a bubble is forming or not. Or, there might be a set of countries which were experiencing a housing bubble while other nations were not. Even within those where a bubble had formed or was forming, they could well be at different stages or experiencing it to different degrees and the danger in each case might vary considerably, depending on the local housing and financial systems. These various differences could make coordination difficult[9].

That said, there are certain aspects of coordination that would virtually always be useful and important. Regulators should share information about the state of the financial system in their countries, especially as regards any potential dangers. Major financial institutions with substantial cross-border activities must be observed from the multiple viewpoints of the different national regulators, in order to assure that there is a combined picture available for macroprudential decision-making. (There is already a mechanism of "colleges" of supervisors for each of the most critical global institutions. These operate on a somewhat informal and consensual basis.) It would also be useful for any major macroprudential steps to be communicated in advance of implementation to regulatory colleagues in other countries, in case there should turn out to be implications that are not obvious to a given national regulator.

How can we assure proper accountability for macroprudential decisions?

Macroprudential authorities must be accountable to the representatives of the public for their decisions, just as monetary policy officials are. The right approach is probably similar in both cases. The authorities must make clear decisions which they then communicate along with their reasons for making them. It is also desirable for them to make periodic reports to their governments, as the Fed does in its appearances before Congressional committees to explain their monetary policy stance. In the end, the body politic has the ability to rescind or limit the independence and authority of these bodies and could legitimately choose to do so if the authorities appeared to be making too many wrong decisions when viewed with the benefit of hindsight.

[9] There are parallels with the theoretical discussions in monetary policy concerning Optimal Currency Areas. See Lafrance and St-Amant (1999) and Benigno (2004), for example.

In the UK, Parliament will decide what macroprudential tools may be directed by the Bank of England and its Financial Policy Committee. This initial decision could, of course, be altered by Parliament later and there would be a real chance of that happening if the macroprudential authorities fail to make a clear and convincing case for the actions they take. At the EU level, the ESRB's sole powers are advisory, which makes it all the more critical that its analyses be convincing. The FSOC in the US is potentially more powerful than either of these bodies, having been given a very wide grant of authority, but it appears likely to operate with a much narrower approach, except, perhaps, in financial crises.

Of course, establishing credibility by sound analyses and decisions will be harder than achieving the same result with monetary policy, because credit cycles are longer than business cycles. This means that the correctness of a macroprudential decision may not be clear for a number of years, whereas the consequences of monetary policy decisions tend to manifest themselves somewhat faster.

What other structural issues are important for sound governance?

At the risk of stating the obvious, authorities with macroprudential powers must be structured on sound governance principles. Conflicts of interest, unmanageable organizational complexities, capture by political or commercial forces, and other such flaws must be avoided. There will be temptations to let each of these problems creep in as a result of pressure to compromise and satisfy all parties with an interest in how the authorities are structured. For example, if every group with an interest in the outcome is given representation on a macroprudential board, there would be great potential for crippling complexity and conflicts of interest. At the same time, there must be ultimate accountability and a structure that ensures that the authorities do not operate with an excessively narrow view. There is no single right answer for how to achieve this balance, but it should be given a great deal of attention when structures and processes are designed.

What is the optimal communications strategy?

Communications will be crucially important to the macroprudential authorities. Most importantly, public and political support, particularly critical in the early days, will depend heavily on understanding what the authorities are doing and why. Accountability also depends heavily on clarity about the intended actions and their effects. Beyond that, signaling effects should become important over time in magnifying the impact of the actions being taken. In monetary policy, the first interest rate move in a new direction tends to have disproportionate impact because of what it signals about the direction of future changes. Additional changes still have their effects magnified somewhat by the information they provide about likely future actions. Macroprudential actions may not benefit initially from the same degree of magnification, given the newness of this area, but this should change as the authorities gain credibility and the markets come to understand their actions better.

There is a question of the degree of transparency surrounding macroprudential decisions. If the authorities were able to reduce the process to a set of formulas, then there would be a strong argument for making those formulas public. It probably makes sense to release those formulas and their current

values even if they were just a portion of the items considered by the authorities. In addition, the subjective elements of the decision-making processes should be disclosed as well, within reason. In this regard, it is similar to the information releases from the Fed or the European Central Bank when monetary policy decisions are made.

How could the authorities counter political pressure not to puncture bubbles?

Political pressure will doubtless be brought to bear whenever macroprudential authorities attempt to damp down the development of credit booms. Boom periods create a host of winners, some of whom are true winners, such as brokers who pocket commissions based on asset prices and volumes, and some of whom are winning only temporarily, because their profits exist only if they were to sell while the bubble remained in place. Politicians will almost inevitably respond to the protests of these constituencies, especially as there tend to be few groups that are seen as being hurt by the boom. The arguments will usually not be in the form of naked claims of self-interest, but will be wrapped in economic theories, such as the alleged productivity gains that came from the Tech Bubble or the benefits that purportedly arose from expanding the base of homeowners substantially.

Central bankers already face this sort of political pressure whenever they start to raise interest rates, since that action usually slows down the overall economy, creating many more losers than winners in the short run, even though it may be necessary for the common good in the longer run. However, they start with stronger economic theories to guide them and can point to years of experience that show why the temporary sacrifices are necessary. They also benefit from relative political independence gained from historical experiences that have shown that lack of independence can lead to major economic problems.

Macroprudential authorities will need to make the best arguments they can, but it will take courage to withstand the onslaught. Over time, a consensus should develop, as it has with monetary policy, that the overall approach is right and that political independence is necessary to gain the benefits and minimize the pain.

On the other hand, the situation without the use of macroprudential tools is virtually the same as giving in to political pressure and never using them. Therefore, if they are used even partially and hesitantly, the economic results may well be significantly better than if the authority did not exist at all.

On the bright side, there is little likelihood in practice of the theoretical possibility that macroprudential authorities will overshoot by being too tough. The political pressures are almost certain to ensure that any errors are on the side of too little action.

What are the major risks facing the macroprudential authorities?

There are several ways in which the use of macroprudential tools could go wrong in practice, including:

Excessive timidity. As noted, political pressures might keep the tools from being used to any great extent. This does not appear likely to create any more problems than are faced today, although it would mean that the benefits would largely fail to materialize.

Excessive aggressiveness. As again was noted, this is very unlikely to occur given the political pressures not to act to deflate potential bubbles. A greater risk in this area would be that counter-cyclical buffers would be brought back down to zero too fast or too frequently. Again, however, the present system operates implicitly with buffers that are effectively at zero anyway, so while this would be an opportunity cost compared with ideal policy, it might still be better than today's situation.

Policy confusion. There is certainly a risk, especially in the early days, that policymakers send confused signals or change their methods too frequently. This could add volatility to financial conditions and thereby the overall economy. It would also likely raise the cost of capital and debt funding for financial institutions, costs which would be passed through in higher loan costs and reduced availability of credit.

Inappropriate credit allocation. If macroprudential tools are used not just to set overall credit conditions, but also to make certain sectors more or less attractive, there would be a danger of getting these allocations wrong and encouraging an inefficient allocation of societal resources. The misallocation could simply be due to mistakes or, more perniciously, it could result from political pressures to favor one sector or another.

Excessive interference in business decisions. Some of the potential macroprudential tools could be used to allow regulators to micromanage the financial system. For example, if counter-cyclical capital requirements were set on a sectoral level, authorities could be tempted to substitute their own judgment for that of the markets on exactly what kinds of loans are sensible. Some of the other tools are potentially even more heavy-handed, such as the setting of total limits on credit provision by banks. Setting the limits and dividing them among the different institutions would give scope for authorities to play favorites among institutions or among uses of the credit capacity.

Excessively high average capital requirements. The addition of counter-cyclical capital buffers, which are always positive or zero, will raise the regulatory capital requirements on average over time. Directionally, this is almost certain to make credit more expensive and less available, on average. If none of the intended benefits of "leaning against the wind" are achieved, then this could lead to slower economic growth. On the other hand, if capital ratios are still too low after Basel III, as some have suggested, then the buffers may have an unintended positive benefit of bringing average levels closer to the optimal ones. (Other observers, of course, believe Basel III is already too high, in which case the problem would be aggravated.)

Appendix A

What macroprudential tools are available?

The prime focus of countercyclical macroprudential policy is to attempt to avoid or minimize the effects of asset price bubbles supported by credit booms. Although the boom period generally increases economic growth and short-term prosperity, the inevitable bust that follows more than wipes out these benefits. As discussed in great detail in the primer, the most severe financial crises, as well as many more modest ones, result from excessive and rapidly rising asset prices supported by high levels of financial leverage. The use of credit to help fund the asset purchases means that the financial system is hurt badly by the bursting of such bubbles, with terrible knock-on effects for the wider economy, given the importance of finance to the smooth functioning of advanced economies. The most recent crisis is a perfect example, but many other financial crises have followed the same path. (By contrast, the bursting of the Tech Bubble in the early 2000's, which was primarily funded by equity rather than credit, did significantly less harm to the rest of the economy.)

Macroprudential policy can assist in two ways. First, it can focus on better preparing the financial system during the boom times to be able to survive the busts, such as by requiring higher levels of capital as the system enters the danger zone. Second, it can attempt to keep credit busts from becoming more severe than necessary, in order to minimize the damage to the real economy when credit and other financial services are withdrawn. This may well involve damping down the preceding credit boom in order to minimize the repercussions of its demise.

There are a number of tools available for macroprudential authorities, including:

Countercyclical capital requirements. This is the tool which has received the most attention and the widest acceptance by authorities. It has been endorsed by both the Basel Committee on Banking Supervision (Basel Committee), the committee of regulators that coordinates global banking rules, and the Financial Stability Board (FSB), a multi-lateral body empowered by the Group of Twenty (G-20) world leaders to advise on financial stability issues. The G-20 itself has endorsed countercyclical capital as part of its approval of the Basel Committee and FSB recommendations.

As described earlier, the idea is to force banks (and sometimes other regulated credit providers) to hold more capital during worrisome booms. The primary purpose is to build up protection against the hidden risks that lie below the surface of over-exuberant booms, so that banks will be in a better position to continue providing credit if the boom turns into a bust. A secondary purpose is to discourage excessive lending by making it more expensive, since capital is more expensive for banks than other funding sources[10]. This is particularly important because capital tends to be too cheap during booms, due to

[10] Various policy analysts have pointed out that the greater expense is principally due to various policy distortions, such as preferential tax treatment for debt, and therefore society as a whole might be better off with much higher capital levels. However, as long as these distortions exist, banks will find that their private costs of capital are

realized and unrealized gains feeding through balance sheets and the excessive eagerness of markets to supply new capital as a result of "bubble thinking." (Appendix A explains many of the details of the nature of bank capital and how it is regulated.)

Countercyclical capital surcharges can either be set across-the-board for each financial institution or type of institution or can be specific to a given credit product or sector of lending. There are pros and cons to each approach, which are laid out in detail in Appendix B.

The next section below discusses why countercyclical capital is so strongly favored as a policy tool, after the remainder of this section lays out the main alternative tools.

Dynamic loan loss provisioning. This idea is somewhat similar to countercyclical capital requirements in that banks would be forced to reserve for a higher level of loan losses during a boom than they would otherwise. This can be implemented in one of two ways. First, the rules can attempt to counteract the procyclical aspects of conventional loan loss reserving; reserves tend to fall during booms even though it is the loans made during periods of over-optimism that are usually the most dangerous. Traditional loan loss provisioning methodologies generally require or encourage banks to estimate their losses based on relatively recent experience. During a boom, that recent experience will show unusually low loss levels, leading to diminished provisions. Dynamic loan loss provisioning applied in this manner essentially tries to keep loan loss provisions at a level sufficient for an average downturn. Second, the rules could go beyond that to try to build up quasi-capital reserves above the true best estimate of future loan losses during booms, either by focusing on losses under a stress case or by adding a margin of error in some other manner. The latter approach adds an element that is very similar to countercyclical capital requirements.

Spain employed dynamic loan loss provisioning for most of its banks, but not for its "cajas" or savings banks[11]. The consensus is that this approach probably cushioned the damage to its mainstream banks, even though Spain still ended up with a major financial crisis, partly due to the cajas and partly to crucial underlying aspects of its economic and financial systems.

Countercyclical liquidity requirements. Banks are increasingly being required by their regulators to hold at least minimum levels of safe, shorter-term or highly liquid assets to cover the possibility of their needing cash quickly to stop a bank run or to handle a freeze in credit markets that makes it difficult to raise funds. The revised capital and liquidity rules recently promulgated by the Basel Committee, known as "Basel III," will impose some form of liquidity requirements over time, although the details are still being worked out. Some countries already have formal liquidity requirements in place and all regulators pay attention to liquidity issues on at least a judgmental basis. Increasing liquidity requirements in a boom would have an effect somewhat similar to increasing capital requirements, in that it would raise

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higher than for other funding sources, regardless of what the overall societal costs are. Therefore, having to hold more capital creates a disincentive for banks to undertake lending.

[11] See Jimenez and Saurina for the theoretical underpinnings of the Spanish approach.

both the cost to the banking system of making loans and the safety of the individual institutions and of the system as a whole. (Costs go up because the whole reason banks are tempted to fund themselves excessively with short-term debt is that it is cheaper under normal circumstances.)

Regulators generally believe that capital requirements are a more effective way to handle cyclical pressures, but there could well be room for dynamic liquidity requirements as a complement. As with countercyclical capital requirements, and indeed most of the potential macroprudential instruments, regulators will need to keep in mind the trade-off between increased systemic safety and the cost burden of higher liquidity requirements and its effects on the financial system and the larger economy. Complicating matters further, strength in one area, such as capital, can sometimes make up for relative weakness elsewhere. For example, liquidity tends not to be a serious concern when a financial institution is perceived to have plenty of capital, because bank runs and their equivalents are generally spurred by concerns about solvency, fears which can be alleviated by strong levels of capital.

Administrative caps on aggregate lending. Regulators in some countries can put a limit on total lending by financial institutions as a class and/or on individual financial institutions. This approach is generally only used in less advanced economies where there is more state intervention in general and banks dominate the financial sector. The tool allows quite direct control of total credit volumes, but at the expense of substituting government decisions for market signals. In addition, the more complicated the financial sector, and the instruments through which credit is provided, the harder it is to make the cap stick. For example, capital markets now provide much of the credit for US businesses, so aggregate lending caps on banks would largely be negated by an increased issuance of bonds. Trying to enforce caps in a more sophisticated environment is likely to end up involving increasingly interventionist policies that fail under the sheer weight of the required regulations. Appendix C presents a table from the Bank of England outlining the difficulties in a number of past interventions.

On the other hand, a number of less financially sophisticated economies have been able to exert substantial control over credit conditions using such administrative caps, since banks dominate the financial system and the government is in a position to directly cap bank lending.

Reserve requirements. Banks in many countries are required to hold a certain minimum percentage of their deposits as reserves at the central bank. In the past, the US and many other developed countries varied these reserve requirements to influence the propensity of banks to lend. This has ceased to be effective in the more advanced economies for reasons similar to those that limit the effectiveness of administrative caps on lending volumes. However, reserve requirements are still an important instrument in China and a number of the less financially developed economies.

Limitations on leverage in asset purchases. Authorities can place limits on the amount of leverage allowed on various types of *transactions* as opposed to controlling the total leverage at different types of *institutions*. This only works well if substantial amounts of borrowing are tied to transactions, such as asset purchases, rather than to general borrowing by households or businesses. Fortunately, transactions tied to real estate and securities comprise a large portion of the credit market in most

countries. The next paragraphs review various types of transaction-based leverage limits. The relevance of these caps is that they could be varied over time to reduce the riskiness of loans being made during a period of over-exuberance or to relax limitations during a bust.

Loan-to-value (LTV) ratios for mortgages. Real estate is relatively well-suited to this type of limitation, since it tends to be a "large ticket" item and one where it is difficult to evade the restrictions by lending funds without tying in the real estate, since lenders place a high value on having the collateral protection that comes with the mortgage form of the transaction. In particular, households and small businesses generally cannot obtain very much credit without using their homes or business premises as collateral.

Financial regulators often have the ability to enforce a maximum LTV ratio for mortgages, at least those made by regulated financial institutions and sometimes more broadly. At one time in the US the common maximum LTV ratio was 80% for most private loans, (equivalent to a 20% down payment), although the government's Federal Housing Administration would lend to qualified borrowers while requiring only a 3% down payment. In recent decades, the maximum LTV ratio offered by private financial institutions tended to be in the 95-97% range[12], although many borrowers put down more in order to obtain a better rate. Further, most US mortgages are securitized with the backing of Fannie Mae or Freddie Mac, which imposed their own LTV requirements, with the implicit penalty being a higher borrowing rate in the market if the loan could not have the benefit of their backing.

There are limits to the degree of effectiveness of LTV ratios. Not all mortgages are securitized, some that are securitized are done outside of Fannie and Freddie, and there is a large financial sector that provides second mortgages and home equity lines that effectively allow homeowners to increase their leverage after taking the original mortgage.

One of the moves being made by the US Congress and federal regulators in the wake of the housing and financial crises is to force higher LTV ratios through various mechanisms, such as placing additional regulatory burdens on mortgages that are not made with a sufficiently high down payment.

Loan-to-income (LTI) ratios. An alternative approach to limiting the risk of mortgages is to require that the borrower have a clear ability to service the loan from their earnings, so that lenders do not rely excessively on the value of the collateral. This can clearly serve to mitigate the over-exuberance of a real-estate bubble, unless there are easy ways around the actual limits. However, the ability to protect financial institutions from loss is lessened, although not eliminated, by several factors. First, some states in the US do not allow the mortgage lender any effective recourse to the income or other assets of the borrower if they default on their mortgage. If a borrower in one of those states chooses to default when the value of their home declines below the mortgage principal, then the lender has little more protection than the value of the collateral, regardless of the LTI ratio. Second, income levels can fluctuate and are correlated with overall financial and economic conditions. Borrowers with good LTI

[12] There were a number of instances, however, of products where the LTV equaled or exceeded 100%.

ratios at the time their mortgages are issued may still be caught in a recession and find themselves unable to pay. Regulators in Europe often have more confidence in LTI ratios than their US counterparts, probably because European mortgages are generally all on a recourse basis and income levels appear not to swing as much as they do in the US.

Minimum margins/haircuts[13] on secured lending. In recent years, a large proportion of financial transactions among big institutions were undertaken through various forms of secured lending, such as repurchase agreements (repos). This has been particularly the case in the so-called "shadow banking" sector that has gained market share from banks in recent years but which has neither the same level of prudential regulation nor access to insured deposits or other stable sources of funds. The Bank of England (2009), the Committee on the Global Financial System (CGFS)[14], and others, have suggested that the margins and haircuts that are used might be made subject to regulatory minimums that would vary over time.

The recent financial crisis was substantially worsened by large, swift increases in required margins and haircuts as providers of lending against securities responded to adverse developments such as the collapse of Lehman. These moves forced many securities holders to sell significant amounts of their holdings regardless of the price they could obtain, since they could no longer finance the securities at any reasonable cost under the panicked market conditions. These "fire sales," pushed securities prices down further, often leading lenders to demand even higher margins and haircuts, initiating another round of fire sales.
If it were possible to avoid such strong cyclical moves, by ratcheting up the minimum levels more smoothly during boom times so as to avoid a sudden spike in requirements during periods of panic, then there would be less need for these fire sales. Kashyap et. al. (2011) provides an interesting theoretical model of the interplay of regulatory minimums of this type with more conventional capital and liquidity requirements.

In the US, the Fed retains the ability to use margin requirements to limit the amount of borrowing against common stock, which is a special case of secured lending that is often used by individual investors, and sometimes by institutions. Securities brokers in the US may lend only a certain specified percentage of the value of a stock and if the stock declines too far in value then they have to make a "margin call" asking for additional collateral. Apparently the Fed considered increasing the required margin during the Tech Bubble as a way of signaling its concern with the level of the stock market, but concluded that it would have been so easy for the borrowing to occur in other ways that the move would have been toothless and seen as such. For example, much higher effective levels of leverage can also be obtained through the purchase of options or futures on stock prices without the need for direct financial leverage, undermining the effectiveness of margin requirements focused on outright purchases.

[13] "Haircut" is the industry term used for the difference between the value of an asset used to secure a loan and the amount of the secured loan that will be made. The haircut covers the lenders' risk that a failure by the borrower will force them to sell the collateral, at a time when it may have fallen in price.
[14] See Committee on the Global Financial System (2010), for example, for a quite detailed discussion of the issues.

Taxation. Targeted taxes represent another way of changing the incentives for financial institutions or market participants to take certain actions. For instance, there have been various proposals to use taxes to encourage sounder liquidity management. (The UK bank levy exempts assets funded by deposits and capital and has a reduced rate for debt with maturities above one year, for example, as a way to tilt the balance towards more stable funding sources, among other goals[15].)

Almost any instrument which uses a minimum or maximum ratio or absolute cap or floor could instead be arranged to tax violations of these levels, rather than absolutely forbidding them. This is discussed further below in regards to uncertainty and public policy choices. If taxation is used to influence the level of risk in the financial system, rather than being imposed simply to raise revenue, then changes in those tax policies could be considered to respond to booms and busts.

One key difference between taxation and the setting of safety margins such as through capital requirements, is that taxation does not directly improve system resilience and may lessen it by draining resources. Increased capital requirements, in contrast, provide incentive effects while also directly improving the ability of the system to withstand losses. On the flip side, taxation does produce revenues for the government that can be used for other purposes or set aside to support interventions to mitigate financial crises. The latter point, of course, also leads to questions of moral hazard if the existence of taxation leads to an assumption that government rescues would be available.

Constraints on currency mismatches. In many countries a considerable portion of credit activity takes place in currencies other than the country's own. This became a problem in parts of Central Europe and some other parts of the world during the recent crisis and, in general, these exposures represent a risk factor that becomes more important during boom times. Limits could be tightened during booms and released again during busts or in more normal times.

Capital controls. In some developing nations, capital inflows from outside the country are a major factor in credit cycles, with a strongly pro-cyclical effect. Foreign money flows in during good times and out again in bad, exaggerating the domestic credit cycle. Some countries have begun to use capital controls in a manner they view as macroprudential. There is a long history of economic debate on capital controls, which are too complicated to fully discuss here. There is certainly a theoretical argument for using them as a macroprudential tool, however opponents view the possibility with deep concern. First, the existing literature shows that capital controls can have a number of adverse consequences, although it may be that the financial stability benefits would outweigh these. Second, opponents fear that capital controls might be imposed for other, less benign, reasons but be protected by labeling them as "macroprudential" in nature.

[15] The Financial Crisis Responsibility fee proposed by the Obama Administration also discriminated among funding sources for similar reasons.

Monetary policy. As noted earlier, there is reason to believe that overall monetary policy conditions play a significant role in helping to support or suppress financial cycles. In particular, prolonged low interest rates have been shown to encourage financial institutions and other market participants to take levels of risk that they would otherwise have shunned, levels that can become truly quite excessive in extreme cases[16]. There is an ongoing debate about whether this fact should lead monetary authorities to hold rates higher than they otherwise would at times of over-exuberance in the financial markets. Opponents of this approach generally assert either that it is too hard to detect bubbles or that the damage to the wider economy from higher interest rates more than offsets the benefits of taming the financial cycle, or that both negatives are true. The debate is too complicated to be adequately covered in this paper. (See Bean et. al. 2010 for a review of the arguments.) However, it is worth noting that the more one believes in an active monetary response to financial crises, the less likely one would be to support macroprudential tools that work by affecting the financial system widely. That does not mean, though, that such a belief would be inconsistent with more focused uses of macroprudential policy, such as dealing with bubbles confined to a single sector, such as housing.

Many other potential tools exist, such as those listed in CGFS (2010) in Table 1 of that report. However, those listed above are likely to be the most relevant in the near term.

[16] See Altunbus et. al. (2008) for example.

Appendix B

How do traditional monetary mechanisms affect credit volumes?

In the US, as in much of the rest of the world, the central bank conducts monetary policy primarily by taking steps to move a targeted short-term interest rate to a desired level. The interest rate level is chosen to try to optimize the mix of economic growth and inflation, according to the best information and theories available to the central banks at the time. Some central banks focus almost solely on inflation rates, viewing their mission as that of maintaining a stable value of their currency in terms of its power to purchase goods and services. Others, such as the Fed, have an additional mandate related to growth; in the US case it is an explicit mandate to try to minimize the unemployment rate, at least on average over the long run.

In theory, the central bank ensures that the targeted short-term interest rate moves as desired by taking a series of actions, such as buying or selling government securities on the open market in order to influence the money supply. In practice, the demonstrated ability of central banks to effectively determine the actual level of the targeted interest rates through actions such as those has made the signaling effect far more important than the enforcement mechanism that it would otherwise have to use. Barring exceptional circumstances, an announcement by the Fed, for example, that it wants to push up the rate at which banks lend to each other overnight, (the "Fed Funds" rate), by half a percentage point will generally lead to an almost instantaneous move of the rate to that level.

There are a number of ways in which central bank monetary policy actions are transmitted to the wider economy, many of which affect lending volumes. (For ease of presentation, the descriptions will generally focus on US monetary policy, except where noted.) These monetary transmission mechanisms include:

Supply and demand of short-term funds. When central banks intervene directly, rather than relying on signaling effects, they most often do so by buying or selling short-term government securities. This works to influence the targeted rate, such as the Fed Funds rate, because there is normally a fairly close relationship between the rate on short-term government securities and the Fed Funds rate, since banks generally look for a relatively stable "credit spread" on top of Treasury rates to compensate them for the credit risk that a bank might not repay the loan. (Government securities denominated in the local currency, especially short-term ones, are usually viewed as carrying no credit risk.) Higher or lower interest rates will generally be passed along to some degree to borrowers, thereby influencing the volume of new credit.

Intermediate and longer-term interest rates. Short-term rates also influence longer-term interest rates, although theoreticians argue about the extent to which a change in short-term rates induced by monetary policy actions will flow through to changes in longer-term rates. One of the reasons for the uncertainty is that many factors go into forecasting future economic conditions and therefore the future

course of interest rates. For example, it is possible that an increase in short-term rates will lead to a slowing in the economy which exerts downward pressure on expectations of future interest rates.

Currency exchange rates. Interest rates in a country will generally also affect exchange rates for that country's currency. Higher interest rates tend to increase the demand for securities denominated in that currency, pushing up exchange rates. Working in the opposite direction, higher interest rates are generally assumed to slow economic growth, decreasing expected future demand for the country's currency. There are also other indirect effects of interest rate movements than can affect the value of the currency. As a result, interest rate movements can have significant impact on exchange rates, but the mechanisms are complex and not always easily predictable. Exchange rates in turn can have many indirect effects on the overall economy and on lending volumes, although the ultimate impact can be hard to predict accurately.

Asset prices in general. Many financial assets are of a long enough maturity that the level of interest rates can have a significant effect on their valuation. In theory, and usually in practice, investors pay close attention to the value in today's dollars of the future cash flows they expect to receive from an investment. This means that the discount rate, the interest rate used to calculate today's value of the future cash flows, is quite important. For example, a safe bond with a 5% coupon will be worth about its stated principal value if the discount rate is also 5%, but will be worth somewhat less if the discount rate is 6%. This effect can be seen most clearly in the bond market, where an increase in general interest rates will almost always cause a decline in the price of bonds. Moreover, the same logic applies with equities and with other assets, such as real estate. Common stock prices decline when interest rates in the economy rise, all else equal, because the future earnings of a company will be worth less in today's dollars. It is more difficult to be sure how this plays out in the stock market, unfortunately, since so many other factors affect stock prices by changing expectations of future earnings. For example, the same forces that cause interest rates to rise may also cause earnings expectations to rise, counteracting the interest rate effect.

Lending is likely to increase when monetary policy reduces the discount rates used by investors and leads to an increase in asset values. The higher asset values make borrowers more creditworthy by raising the value of their collateral and increasing the resources they have to pay off the loan. Lower interest rates can also lower the operating costs of firms and individuals by reducing their interest expense, further increasing their creditworthiness.

Risk aversion and perceptions of risk levels. As noted earlier, banks and other credit providers tend to become willing to accept greater risk when interest rates are particularly low, sometimes referred to as due to a "search for yield." This tendency should not exist with fully rational decision makers operating without institutional rigidities, but it recurs frequently in the real world, leading Borio and Zhu (2008) to propose that a "risk channel" plays a significant role in monetary policy transmission. One implication is that counter-cyclical capital or other macroprudential tools may be useful in restoring an appropriate focus on risk when markets are either too risk-accepting or too risk-averse.

Ioannidou et. al. (2008) demonstrated that Bolivian banks took more risk and charged lower risk premiums when interest rates were lower. Altunbas et. al. (2010) found a similar result in the US and the EU. They found "evidence that unusually low interest rates over an extended period of time contributed to an increase in banks' risks. This result holds for a wide range of measures of risk, as well as macroeconomic and institutional controls."

Tucker (2009) states that, when bubbles are building, "important contributory factors will typically have included illusions about risk-adjusted returns; underestimating the extent to which buoyant conditions are being driven by falling liquidity premia; and a sense that, if the bubble bursts, the central bank will somehow be able to contain the spillovers. This amounts to 'risk illusion', which should probably be as much debated as 'money illusion' is in monetary economics."

Aikman et. al. (2010) built a model of the financial system in which an analogous process to risk illusion plays a central role[17]. They found that this model produced credit cycles that look broadly similar to what we have experienced in reality over the years, suggesting that misperceptions of risk do have a key role in credit cycles.

Capital levels. As discussed in considerable detail throughout this paper, banks generally charge more for loans and provide fewer of them when capital requirements are high. Decreases in capital requirements produce the opposite effect. Regulators, sometimes including central banks, often intervene directly to influence capital levels. In addition, some of the mechanisms described above, such as the effects on asset prices, indirectly influence capital levels. (A general increase in the value of investments will increase the market value of assets held by banks, raising the net worth of these banks. This can happen immediately for assets that are "marked to market," or over time as other assets are sold at a profit.)

Bank reserves. Decades ago, one of the primary effects of a change in monetary policy was a change in bank lending due to increased or decreased reserves held at the central bank. Banks are generally required to keep a portion of the deposit moneys they receive from customers as reserves at the central bank. In earlier times, such reserve levels were often a key constraint on the total volume of lending, especially when deposits provided the great bulk of funds available for lending. Therefore, if the Fed eased monetary policy by buying Treasuries this would increase the capacity for lending by adding to the reserves banks held at the Fed. Similarly, a sale of Treasuries would lower the reserves held at the Fed, reducing the lending capacity of banks.

This monetary transmission channel has become considerably less important as banks have developed other sources of funds besides deposits and as some types of deposits have ceased to carry reserve requirements. In addition, banks in the US currently have very large excess reserves that they are

[17] Their model assumes banks have incentives to coordinate on high risk strategies to boost their short term profitability, out of a fear that failing to do so will send a negative signal to investors about their ability to produce returns as high as those banks that do take too much risk. This is not strictly "risk illusion" since the banks know what they are doing, but the practical effects are likely to be similar.

holding at the Fed, reflective of their caution about lending in the present environment as well as a somewhat lower demand from potential borrowers. Thus, the creation of additional reserves at the banks might lead to little change in lending behavior at the moment. Despite its much reduced importance, this reserve mechanism remains one of the key drivers in many theoretical models of monetary policy transmission, as the models have not always kept up with changes in the actual financial system.

Appendix C

How should the various tools be combined?

This is a particularly difficult question. The state of understanding of macroprudential tools is still somewhat primitive even when examining such tools one at a time. There has been little work analyzing how they might be combined most effectively, especially in combination with countercyclical capital, the favorite tool of many authorities. In addition, the right choice may vary considerably depending on the precise circumstances of the country, its financial and economic system, its macroprudential governance structure, and the particulars of the systemic threat.

At this point, the most useful decision-making structure may be to walk through a series of questions before choosing the set of tools to use. (The following assumes that the macroprudential authority has identified a problem. The difficulties in correctly identifying such a need for action are discussed in considerable detail in the overview paper.) These questions should include:

- What is the nature of the uncertainty about the systemic threat and potential responses?
- What tools are legally available and politically feasible?
- Is the systemic threat concentrated in a single sector or closely-related sectors?
- Can the activity be contained within the closely-regulated financial sector?
- If so, do the authorities have sufficient control to ensure appropriate actions without spillovers?
- If so, are the authorities in a better position than the private sector to make the decisions?
- Are there international ramifications of the systemic threat or potential responses?
- How strong are capital and liquidity levels in the relevant financial sectors?
- How risky is the systemic threat?
- What is the larger macroeconomic policy position?

What is the nature of the uncertainty about the systemic threat and potential responses?

Unfortunately, policy actions must be taken despite uncertainties about their effects. This may particularly be an issue with macroprudential policy, since it is quite early days for the systematic application of such an approach. One area that has been studied more than others in regard to policy uncertainty is the trade-off between a price-like mechanism (for example, a tax or a minimum capital or liquidity ratio that adds costs to credit provision) and a quantity limitation, such as a limit on total lending by an institution or sector. Weitzman (1974) wrote a seminal work establishing a set of principles that apply in many areas of regulation, such as pollution control, where there is a choice between price and quantity mechanisms. One of his conclusions was that the choice of instrument depends to a significant extent on the relative degree of uncertainty about the social costs of allowing too much pollution or other “bad” versus the uncertainty about the cost to the private sector of obeying the rules. As with pollution control, regulation of systemic financial risk imposes costs on the private sector that must be weighed against the harm to the economy from letting risk become excessive. If the costs of regulation are relatively clear, but we are uncertain about whether letting systemic risk rise above a certain level would produce catastrophic results for the economy, then Weitzman shows that we should prefer quantitative limits to maximize our ability to avoid the potential catastrophe. If, on the

other hand, the greater uncertainty is about the cost of imposing restrictions, then we should prefer taxes or capital requirements or other actions that give the private sector flexibility to respond with the lowest-cost solution to the need to limit systemic risk. (It is difficult to put Weitzman's reasoning and conclusions into intuitive terms, so these illustrations should not be taken too literally.)

More recently, Perotti and Suarez (2009) and Jeanne and Korinek (2010) have built on these insights with specific applications for taxes versus capital/liquidity ratios. Perotti and Suarez, for example, argue that taxation might be superior to liquidity ratios for inducing the socially appropriate behavior in regard to systemic liquidity. In general, it appears that the insights first brought to light by Weitzman argue for price-like policy tools, such as countercyclical capital, as opposed to aggregate lending caps or maximum loan-to-value ratios.

Finally, each macroprudential authority will have to make its own determination of the degree of confidence it feels in using each tool. That is, how sure is the authority of the effects, including side-effects, of using the tool and how sure is it of the degree of response it will obtain from a given movement of the instrument. One of the arguments advanced for countercyclical capital requirements is the long history regulators have with using capital requirements in general. Many of the other tools do not come with this base of experience.

What tools are legally available and politically feasible? Perhaps it goes without saying, but not every macroprudential authority will have the legal right to use every instrument. Even for those that do, there may be political constraints or costs that must be weighed in choosing which tool or tools are right for the job at hand. For example, in the US and UK, a rise in the capital required for a bank to hold mortgage assets would likely encounter considerably less political resistance than a decrease in the maximum LTV ratio on mortgages. This is not to say there would be no resistance to a capital change, but it would not have strong resonance with politicians or their voters, since it seems so technical. Down payment requirements, however, are easily understood by voters and they can translate them into their own situations and those of people they know. A further constraint may be potential conflicts with the microprudential regulators, since most of the tools discussed here can be used for either micro- or macro-prudential purposes.

The political costs and constraints may matter most in the early days of macroprudential policy, since it will not have had a chance to demonstrate its value yet. Although, on the other hand, actions may become tougher as memory of the recent terrible crisis fades, unless other, probably smaller, crises follow before the recollection fades too much.

Is the systemic threat concentrated in a single sector or closely-related sectors? If there is a clear focus of the risk, such as a housing bubble, it would be logical to first consider applying tools aimed specifically at that sector. This has the advantages of responding directly to the specific problem and also maximizes the signaling benefit by focusing on the problematic area. However, this could be inappropriate or inadequate for several reasons.

- **There may not be a good tool available** for that particular sector. It could be that there just is not a logical tool, or perhaps that tool, such as the US margin requirements on equities, is too easy to work around.

- **The tool may be insufficient**. For example, lowering the maximum allowable LTV for mortgages may reduce both the volume of risky loans and the risk inherent in each loan, but still not completely eliminate a housing bubble. Lenders might even push to increase the volume of their loans, reassured by the reduced riskiness of each individual loan.

- **The true problem might be wider**, but happened to have manifested itself first, or most strongly, in one particular sector. In that case, sector-specific action could be like pushing a finger into an inflated balloon -- the air just moves to another part of the balloon.

Appendix B contains a more detailed discussion, taken from the primer, of the question of wide versus narrow application in the context of countercyclical capital requirements.

Even if the sector-specific tool would not be enough for the full scope of the problem, it may still make sense to apply that tool as part of a package, especially if it is a solid instrument without too many negative side-effects. There could also be merit in combining it with tools of wider application if there is uncertainty about the effectiveness of the sector-specific tool. (Sometimes a tool is promising, but still uncertain.)

Can the activity be contained within the closely-regulated financial sector? If the source of the systemic threat is controlled by the closely-regulated financial sector and there is little potential for the activity to move outside that circle, then direct administrative controls, such as caps on lending, become feasible. Thus, an economy where credit provision is dominated by a small set of domestic banks is a better candidate for such administrative controls, as long as there is little danger that those controls would simply create or substantially enlarge other credit providers that are less regulated. On the other hand, the more sophisticated financial systems in the advanced economies are very difficult to control in this manner, since it is much too easy for credit activity to migrate to capital markets rather than financial intermediaries or to less regulated intermediaries. For those countries, these policy options can pretty much be rejected out of hand.

If so, do the authorities have sufficient control to ensure appropriate actions without spillovers? Even if a less sophisticated economy is dominated by closely-regulated financial institutions, there is still a question as to whether the government has the ability to enforce its administrative controls without doing undue harm. For example, a relatively weak macroprudential or financial regulatory authority might be in a position to declare lending caps, but not to enforce them effectively. Banks may be able to exert political influence to invalidate the limits in advance or to receive forgiveness after the fact for violating them. An issue that makes a high degree of control harder is that the authority must effectively divide the total cap into a series of individual institution caps, which can be easier to appeal to political

allies than trying to overturn the entire policy. Yet the net effect of multiple political interventions could in fact negate the policy move. Further, in some economies, the accounting and auditing systems may simply not be good enough to enforce the caps. In the extreme, even the bank itself may not have sufficient controls to ensure that the accumulation of all the lending decisions within the bank do not add to more than it intended.

In addition, of course, there is the risk that cosmetic solutions will be found to continue the excessive lending without violating the letter of the administrative controls, such as by providing guarantees, perhaps even implicit ones, instead of directly making loans.

If so, are the authorities in a better position than the private sector to make the decisions? Even if administrative controls appear feasible and enforceable, there is a core question as to whether the central authority is in a better position than the financial institutions to make the decision about lending caps or similar controls. A major risk with administrative controls is that it substitutes the judgment of a government entity for the implicit judgments of the financial system. At one level, this is inherent in any macroprudential policy dealing with excessive cyclicality, since it assumes, correctly I believe, that financial markets can move to excess or make other collective mistakes. However, there is a great deal of difference between relatively nuanced regulatory actions, such as the use of countercyclical capital requirements, and direct administrative controls, which sharply limit the room for judgment by market participants.

There are some economies where it is likely at this point in time that the level of sophistication of central financial authorities and the nature of the incentives that they face, make them more capable of arriving at the right choices than the collective decisions of those they regulate. It is critical that this be true if the macroprudential authorities are going to initiate an intrusive set of policies such as administrative controls on lending, which can lead to fairly specific intervention in financial institution activities. One danger, of course, if that there is a strong tendency for humans and institutions to judge their capabilities as stronger than they are and those of the people they deal with as weaker.

Finally, Moreno (2011) discusses a number of potential short-run benefits for emerging market economies of using many of the alternative tools besides countercyclical capital requirements. However, he adds some interesting caveats:

> "Over the medium term, the use of supplementary and macroprudential tools raises issues of financial development and efficiency. On the one hand, many supplementary tools discussed here have been abandoned in advanced economies because of the heavy costs imposed on the financial system and distortions in resource allocation. On the other hand, recent experience showed clearly that market discipline is not enough to guarantee financial stability. The crisis has prompted a reassessment of how these two competing considerations should be balanced.

> Another concern is that the focus on supplementary tools, including capital controls, could draw attention away from the need for sound macroeconomic policies. A number of central banks take the view that there is no substitute for conservative fiscal, monetary and regulatory policies in order to prevent fluctuations in global capital flows from causing severe disruptions in [e]merging market economies."

Are there international ramifications of the systemic threat or potential responses? Macroprudential authorities have a freer hand if they are dealing with purely domestic issues. For instance, the administrative controls discussed above could be harder, or even impossible, to effectively implement if the financial system is open to international financing transactions. Lending caps to hold down excessive real estate speculation, for example, could be rendered less effective because foreign lenders step in to take on the risk. This would have the advantage of transferring some of the eventual pain overseas, as the US found, (due to other causes than lending caps), after it sold large amounts of mortgage-backed securities to foreigners. However, as that example also shows, the ramifications of the resulting bust can still be quite severe for the domestic institutions. In the other direction, domestic institutions may move portions of their risky lending overseas, if the over-exuberance extends across borders. This could have the advantage of slowing the local portion of the bubble, but exposes the domestic financial institutions to large losses on their foreign risks. This effect can be magnified by the relative ignorance of domestic institutions about their foreign lending. They have a better chance of recognizing when their lending has gone too far in the market they are familiar with.

The international aspect does not show up only when lending caps or other administrative controls are instituted. All of the macroprudential tools that focus at the institutional level are subject to those same international ramifications, including countercyclical capital requirements. In the case of the latter tool, there is a global consensus that if a local macroprudential authority adds countercyclical capital requirements for certain types of domestic borrowing, the authorities in other countries will mimic that action in regard to such loans made into that country. It will remain to be seen in practice how effectively this global agreement is followed.

Macroprudential tools that focus on individual transactions, rather than institutions, are somewhat less affected by international issues. For instance, imposing lower maximum loan to value ratios on UK mortgages would have an effect on any mortgage made in that country, regardless of the location of the lender. Thus, all such lending would be made less risky, both from domestic and foreign lenders, and there would probably be some local benefit as well from dampening a housing bubble. However, the dampening effect would be reduced by the willingness of foreigners to add their lending supply, as compared to a purely domestic market. Sadly, market delusions such as housing bubbles very frequently prove attractive to foreign money and not just domestic funding sources.

In sum, the international aspects of macroprudential policy are likely to reduce the effectiveness of administrative controls, giving a relative advantage to tools such as countercyclical capital where there is an ability and a willingness to apply them in a globally coordinated manner, and also providing a relative

advantage to transaction-level restrictions such as loan-to-value ratios. The balance of these factors will depend significantly on the particular circumstances of a country.

How strong are capital and liquidity levels in the relevant financial sectors? The benefits of altering the minimum required levels of capital and liquidity for financial institutions will depend to some extent on their starting points. If the industry's capital levels are already high, perhaps well above the regulatory minimums, including the preferred cushions banks hold, there might be little benefit to increasing the minimums to counter over-exuberance in the markets. On the other hand, it is possible in that situation that liquidity levels are near their minimums. In fact, the higher capital levels could easily lead banks to feel comfortable taking more liquidity risk and to accepting it at their counterparties. Under those conditions, choosing to increase the minimum liquidity levels may do more for safety than an equivalent change in capital ratios and would also be a greater deterrent to excessive lending, since it would have more effect on the lenders' costs than an increase in a minimum capital ratio that was not currently binding.

The starting points also matter because the increase in systemic safety resulting from a given increment of additional capital or liquidity decreases the higher the initial level[18]. That is, going from an 8% capital ratio to a 9% ratio provides significantly more systemic risk reduction than raising it from 18% to 19% and certainly than raising it from 89% to 90%. However, the marginal cost to the financial institution, and the economy, of the capital increase is fairly linear. Since the benefits decrease at higher levels while the marginal cost remains relatively constant, it makes most sense, all else equal, to bolster the weaker element first.

How risky is the systemic threat? The greater the perceived risk, the wider the set of tools that is likely to be optimal. First, there are limits to the effectiveness of each tool and, as noted, many of them produce less marginal benefit the more strongly they are pursued. Dealing with a big problem may, therefore, require a number of tools. Second, the bigger the problem, the more important it becomes that macroprudential policy works. A classic analysis by Brainard (1967) concludes that optimal policy in the presence of uncertainty about the effects of that policy generally argues for using all relevant tools, even if there is only one discrete target variable. This argument would push for using multiple policy tools generally, even with smaller risks, but the author believes that the offsetting disadvantages in this case suggest simpler policy choices if the systemic threat is not large. We will only learn what works in the area of macroprudential policy by making choices and seeing the effects, which will be harder the more tools are combined. Similarly, the signaling effects on markets may be diminished if too many actions are taken at the same time. For that matter, communicating macroprudential actions to all interested parties would be easier with single policy moves.

What is the larger macroeconomic policy position? Macroprudential policy takes place in a larger macroeconomic context, necessarily influenced by policy choices in that area. These affect both the level and nature of risk in the financial system and may make some macroprudential choices more or

[18] See, for example, Miles et. al. 2011.

less attractive than they would otherwise be. For example, changes in monetary policy normally impact the difference in cost between shorter- and longer-term funding. If, as an extreme, short-term funds are actually more expensive than long-term funds for an extended period of time, then altering the minimum liquidity requirements may have less effect than usual, since banks will already have economic incentives to hold medium- to long-term funding[19].

[19] There may still be incentive effects, of course, since the inverted yield curve would point towards lower short-term rates in the future. A bank which believed the yield curve accurately predicted future short-term rates might not feel economic pressure to hold medium- and long-term funding. That said, firms that care about their stock prices, as most financial firms do, show some tendency to prefer actions that maximize near-term earnings.

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