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**Implementing a macroprudential framework:  
Blending boldness and realism**

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*"God grant me the serenity to accept the things I cannot change, the courage to change the things I can, and the wisdom to know the difference." Reinhold Niebuhr*

## **Introduction<sup>1</sup>**

Paraphrasing Milton Friedman, "We are all macroprudentialists now". With breathtaking speed, in the wake of the crisis the concept has risen from virtual obscurity to currency in the policymaking world. The notion had been around for some time. It had been evolving quietly in the background from its first appearance in the late 1970s at BIS meetings. It was known only within a small, albeit growing, circle of cognoscenti. Once the crisis broke out, the concept helped policymakers frame their efforts to strengthen regulatory and supervisory frameworks.<sup>2</sup>

The window of opportunity to put in place a fully-fledged macroprudential framework should not be missed. Indeed, major progress is being made as we speak. And Asian countries have been early runners in this race: for years they have pursued policies with strong macroprudential elements without using the term. But how can policymakers' best address the challenges involved?

Today, I will argue that to meet these challenges we need a finely balanced blend of boldness and realism. Boldness, to face the hard design questions head on; realism, to avoid overreach and manage expectations. In other words, we should be as ambitious as possible, but no more. In all this, there is an important role for further research, to allow the framework to grow at a pace commensurate with our knowledge.

In what follows, I will first recall the basic concept, distinguishing it from what I consider less helpful interpretations. I will then characterise different ways of implementing

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<sup>2</sup> FSF (2009), G20 (2009), De Larosiere (2009), Bank of England (2009) and Brunnermeier et al (2009).

the macroprudential approach along four dimensions -- the criterion of success; the degree to which systemic risk is tracked, the balance between an aggregate and sectoral approach; and that between rules and discretion – before turning to the implications for governance arrangements. I will finally highlight some key questions for research. In the process, I will explore the appropriate balance between boldness and realism.

## I. What does “macroprudential” mean?

As originally defined, macroprudential is an orientation or perspective *of* regulatory and supervisory arrangements (Table 1).<sup>3</sup> It means calibrating them from a system-wide or systemic perspective, rather than from that of the safety and soundness of individual institutions on a stand-alone basis. It means following a top-down approach, working out the desirable safety standard *for the system as a whole* and, from there, deriving that of the individual institutions within it. It means taking explicitly into account the fact that drivers of risk depend on the collective behaviour of financial institutions (are “*endogenous*”), and are not something outside their influence (“*exogenous*”). Asset prices and the macro-economy are not a given, as they may appear to each individual firm; they reflect systematically its decisions along those of its peers. Financial crises are not an act of God or perfect storms; they are the outcome of systematic distortions in perceptions of risk and responses to it, including as a result of fallacies of composition.

The proximate objective a macroprudential approach to regulation and supervision is to limit the risk of episodes of system-wide financial distress; its ultimate goal is to avoid or contain the costs they generate for the real economy (eg, output loss).

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<sup>3</sup> See Crockett (2000) and Borio (2003); for a history of the term, Clement (2010) and Maes (2009); and for more recent treatments along the same lines, Knight (2006), Caruana (2009) and BIS (2009a).

For analytical convenience, it is helpful to think of the approach as having two dimensions. There is a *time dimension*, dealing with how aggregate risk in the financial system evolves over time. And there is a *cross-sectional* dimension, dealing with how risk is allocated within the financial system at a point in time.

To each dimension corresponds a source of system-wide financial distress. In the time dimension, the source is the procyclicality of the financial system, ie those mechanisms that operate within the financial system and between it and the macro-economy and that can generate outside financial cycles and business fluctuations. In the cross-sectional dimension, the source is common exposures and interlinkages in the financial system, that result in joint failures of financial institutions by making them vulnerable to common sources of risk.

To each source of financial distress corresponds a policy principle. To address procyclicality, the principle is to build up buffers in good times, as aggregate risk grows, so that they can be drawn down in bad times, as it materialises. Such countercyclical buffers can help to stabilise the system. To address common exposures and interlinkages, the principle is to calibrate prudential tools with respect to the contribution of each institution to systemic risk, once a given level of acceptable risk for the system as a whole is selected. This calibration can help ensure that each institution pays for the externality it imposes on the system.

This view of what the term “macroprudential” means, as developed in BIS work over the years, can be distinguished from more recent interpretations which, to my mind, are not as helpful.

One such interpretation sees macroprudential as effectively synonymous with *any* policy that promotes financial stability or limits systemic risk. Such a broad definition risks making the term redundant: one could just as well use “financial stability policy” instead. Moreover, it also risks blurring areas of responsibility and overstretching the term. Almost *any* policy can have an impact on financial stability, and sometimes a substantial one at that. Monetary and fiscal policies, just to name two, immediately spring to mind. The original

rationale for the term was to promote a different use of *prudential* (regulatory and supervisory) tools, so as to improve the pursuit of financial stability. It was to help use those tools from a very different perspective; hence its definition as antonym of “microprudential”.<sup>4</sup>

A second interpretation sees “macroprudential” as effectively synonymous with any policy -- or possibly just any regulatory and supervisory policy -- that addresses the *too-big-to-fail* problem, or that of Systemically Important Financial Institutions (SIFIs).<sup>5</sup> This definition neglects the time dimension. It also ignores the serious problem of *correlations* of exposures across institutions. Each individual institution may appear “systemically unimportant”, but be “systemically important as a group”, whenever exposures and vulnerabilities -- be these on the asset or liability side -- are sufficiently similar. Most spectacularly, during the US banking crisis of the Great Depression, it was not the largest institutions that generated the turmoil. *Exclusive* focus on SIFIs risks missing the forest for the trees.

That said, the analysis also indicates that the use of the term is likely to evolve over time with institutional arrangements. In particular, institutional arrangements *specifically* put in place to pursue system-wide stability along the lines described above with respect to proximate objective and strategy could legitimately be called “macroprudential”. By implication, *any* tools at the disposal of the corresponding authority could also be regarded as such.<sup>6</sup>

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<sup>4</sup> That said, there is a grey area. What is and is not a “prudential” instrument is not always clear cut. The same applies to the scope of “regulatory and supervisory arrangements”. Analytically, this is probably best defined in terms of the *core objective* for which the authority using a particular tool is responsible for? But what if the authority is responsible for multiple objectives (eg, monetary and financial stability, such as some central banks are)? For example, some central banks may regard the use of restrictions on credit growth, such as ceilings on loans, as a macroprudential tool if they use them with a system-wide stability objective in mind.

<sup>5</sup> In policy discussions, the too-big or too-systemically-important-to-fail issue is often regarded as synonymous with the SIFIs issue. This is misleading. Even if there are no expectations of a bail out, a SIFI imposes an externality on the financial system, simply by virtue of its larger contribution to systemic risk. Bail-out expectations reduce *ex ante* discipline because they imply an unpriced subsidy, which exacerbates distortions. Getting rid of the too-big-to-fail problem does not solve the SIFI problem, ie the need to price the externality.

<sup>6</sup> For instance, on the possible use of taxes in this context, see IMF (2010), Perotti and Suarez (2009) and Acharya et al (2010).



## **2. Characterising macroprudential frameworks: what balance?**

Even the strict definition of “macroprudential” can accommodate a broad range of frameworks. They can differ in several respects: the criterion of success; how closely instruments target systemic risk and contributions to it; the balance between an aggregate and a sectoral approach; and the balance between rules and discretion. All this has implications for governance arrangements. Consider each aspect in turn.

### **The criterion of success**

The proximate objective of a macroprudential approach to regulation and supervision is to limit the risk of system-wide financial distress. But how demanding should the corresponding criterion of success be? This issue is especially pertinent to the time dimension, ie when addressing procyclicality (BIS (2009b)).

One possibility is for the criterion of success to be strengthening the resilience of the financial system to deal with stressful conditions. If so, it is sufficient to ensure that the buffers in the system are high enough to cope with the downturn of the financial cycle, to avoid exacerbating it through fire sales and credit restrictions. There should be enough redundancy in capital and liquidity holdings above strict regulatory minima to prevent destabilising behaviour. And there should be enough margin between the value of collateral and the amount lent against it to absorb any decline in asset prices without exhausting the protection. Building up buffers in good times is an efficient solution: they are accumulated when it is easier and cheaper to do so; they become available when most needed; and, over the whole cycle, they are lower on average, reducing any deadweight costs.

A more demanding criterion of success is to mitigate also the upswing of the financial cycle. If so, the tools should be able to act as effective “speed limits” (Borio (2007)). They should be able to restrain the build-up of risk during the boom, not just by making able

to withstand larger shocks, but also by moderating the credit expansion, the increases in asset prices and the compression of risk premia themselves.

My sense is that we should be bold and design a system that is *in principle* capable of acting as a speed limit. If it works, the benefits would be much greater: the boom does not just *precede* the bust, it *causes* the bust. But we should also be realistic, and not set this as *the* criterion of success at this stage: we will need time to assess the effectiveness of the tools as speed-limits. An overly ambitious criterion of success risks raising expectations too much and could complicate

The experience with the tools that have been tried so far is somewhat mixed (eg, Borio and Shim (2008), BIS (2010), Caruana (2010), CGFS (2010)). For example, statistical (“through-the-cycle”) loan provisioning has no doubt made banks in Spain more resilient, but seems to have had little effect on the credit boom. The increase in capital requirements during the boom may need to be quite large before it has a restraining effect: it is very cheap to raise capital in good times and the impact of higher capital on loan spreads appears to be relatively small.<sup>7</sup> Maximum loan-to-value ratios may be more effective (Gerlach and Peng (2005)). In general, however, the ability to circumvent all of these restrictions should not be underestimated.

## **Tracking systemic risk**

A macroprudential approach to regulation and supervision will necessarily calibrate instruments based on some measure of systemic risk. But how tight should we expect this mapping to be?

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<sup>7</sup> In a credit boom, profits tend to be quite high. This reduces the need to meet any additional capital requirements through external equity, which tends to be more expensive than internal equity because of the well-known costs associated with informational asymmetries. Moreover, even if equity has to be raised externally, as it represents a very small proportion of the banks' funding, any induced increases in loan spreads are bound to be very small.

As a first step in addressing this question, let me clarify a point that is not appreciated enough. *Given our current knowledge*, it is not realistic to expect a single measure of systemic risk to cater for *all* purposes; in fact, it is actually dangerous to do so.

Here, the distinction between the time and cross-sectional dimensions of aggregate risk is critical. In the time dimension, the ideal measure would be a fool-proof leading indicator of financial distress, with a lead sufficient to take remedial action, ie at least over one year. Such a gauge would be the perfect benchmark for calibrating tools. In the limit, one could envisage a framework analogous to inflation targeting: instruments would be adjusted so as to maintain the gauge within an acceptable range (Borio and Drehmann (2009a)). In the cross-sectional dimension, the ideal measure would allow for a robust quantification of the contribution of each institution to systemic risk. This means, for instance, that individual contributions should aggregate to total risk.

Trouble is: given our state of knowledge, no single measure can perform the two functions simultaneously. In fact, measures that work well in the time dimension offer no guidance in the cross-section; and those that work in the cross-section can provide the wrong signals in the time dimension.

In the time dimension, the most promising leading indicators at our disposal seek to identify the build-up of financial imbalances in real time. Some work, including at the BIS, does suggest that simple indicators can fairly reliably signal financial distress years ahead, in real time and out of sample. These indicators are based on simultaneous positive deviations of the ratio of (private sector) credit-to-GDP and asset prices from historical norms (eg, Borio and Drehmann (2009b), Alessi and Detken (2009)). They work because they exploit the “paradox of financial instability” to the policymakers’ advantage (Borio and Drehmann (2009a)): the system looks strongest precisely when it is most vulnerable. Credit growth and asset prices are unusually strong, leverage measured at market prices artificially low, risk premia and volatilities unusually low *precisely* when risk is highest. What looks like low risk is, in fact, a sign of aggressive risk-taking. This is one reason why (macro) stress tests, given

the current state of technology, can so easily lull policymakers into a false sense of security, as they did before the current crisis (Borio and Drehmann (2009a)). Given initial conditions, they are unable to generate sufficient damage, as they underestimate the underlying fragility of the system (Alfaro and Drehmann (2009)).

By contrast, in the cross-section, the most useful measures at our disposal rely heavily on market prices. They exploit the analogy between the financial system and a portfolio of securities. Treating each institution as a security, they allow us to estimate measures such as system-wide Value-at-Risk or expected shortfall. And, based on these, they allow us to derive the marginal contribution of each institution to the corresponding systemic risk measure (eg, Tarashev et al (2009) and (2010), Huang et al (2010), Acharya et al (2010), Goodhart and Segoviano (2008)).<sup>8</sup> True, some of these inputs, such as probabilities of default, could also come from supervisors. But others, such as correlations or other measures of interdependence, are unlikely to. In fact, I would conjecture that reliance on some market inputs will remain inevitable.<sup>9</sup>

If one tried to use these market-based measures of systemic risk to address the time dimension, two problems would arise. The measures would provide the wrong signal: systemic risk would look low when, in fact, it was high. And adjustments for individual institutions contributions to systemic risk would actually exacerbate procyclicality. Capital standards, for instance, would be comparatively low during the boom and high during the bust. This means that market-based measures, unless used as *contrarian* indicators of risk after suitable normalisation, should not be part of leading indicators of aggregate risk. It also

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<sup>8</sup> A popular, and helpful, measure of contributions to systemic risk is CoVar (Adrian and Brunnermeier (2009)). However, this measure does not meet the additive property, whereby individual contributions add up to the aggregate measure of systemic risk. For a discussion, see Tarashev et al (2010).

<sup>9</sup> The term “common exposures” can also be used to refer to exposures that incorporate the effects of interlinkages, ie indirect exposures. There is a very large and growing literature on networks, tracing the impact of contagion through interlinkages. My sense is that *direct* common exposures, on counterparties outside the given set of financial institutions (eg, households and corporations) play a much more important role in financial instability (Borio (2003)). Empirical work is consistent with this view (eg, Elsinger et al (2006)).

means that, when used in the cross-sectional dimension, it would be helpful to filter out from them the procyclical element. Relying on through-the-cycle or stressed parameters are obvious possibilities.<sup>10</sup> In other words, in the cross-sectional dimension, market prices are part of the solution; in the time dimension, they are part of the problem, if interpreted literally.

What does all this imply for the blend between boldness and realism in tracking systemic risk and contributions to it? We should be bold in analytical work aimed at developing better indicators. But realism should prevail in implementation. The indicators we have in both dimensions are a good start – they did not even exist a few years ago. But we should be aware of their pros and cons, matching closely the type of indicator with its purpose. And we should not ask too much from them, even when combined with judgement. We should avoid a false sense of precision. As they say: it is better to be approximately right than precisely wrong.

### **Aggregate and sectoral approaches**

The distinction between a sectoral and aggregate approach applies equally to the time and cross-sectional dimensions. In the time dimension, the core issue is the extent to which prudential tools are calibrated with respect to aggregate variables (such as total credit) or sector-specific ones, such as credit to a particular part of the economy. In the cross-sectional dimension, it is primarily the issue of the breadth of institutional coverage, otherwise known as the “perimeter of regulation”.

There are pros and cons to both approaches. The main advantages of an aggregate approach is that it is less vulnerable to regulatory arbitrage, is more encompassing of

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<sup>10</sup> It is sometimes argued that whether an institution is systemic or not depends on the context (state). This is true, in the sense that even small and otherwise unimportant institutions can generate systemic disruptions. But this occurs only when they are seen as a canary in the coal mine: as representative of broader problems shared by other institutions. One obvious example is at the turn of a financial cycle, when the boom turns into bust and the first institution to face difficulties is seen as

sources of risk and is less subject to the danger of straying into credit allocation, especially in the time dimension. The main advantage of a sectoral approach is that it can be more targeted and less blunt, whenever the sectors at the source of vulnerabilities can be identified confidently. Historically, the property market has been a common target of intervention, given its outsize role in financial crises.

A combination of aggregate and sectoral approaches is best. We should be bold in pursuing an aggregate approach as far as possible. This is what a macroprudential orientation is all about. At the same time, we should be realistic. Extending the macroprudential approach beyond the banking sector will not be easy: the perimeter of regulation remains one of the toughest challenges ahead. This is especially so from a dynamic perspective, as institutions strive to avoid regulatory burdens. And we should be careful not to take sectoral approaches too far. The temptation to drift inadvertently into ever more intrusive credit allocation should be resisted. The experience of the postwar period is a healthy reminder of the limitations of such policies.

## **Rules and discretion**

The design of a macroprudential framework cannot escape the perennial question of the balance between rules and discretion.

The main advantage of rules is that, once in place, they do not require continuous justification or explicit decisions. If well structured, they can thus act as automatic stabilisers. They can also act as effective pre-commitment devices, relieving supervisors from what can be overwhelming political economy pressures not to take action: in the cross-sectional dimension, on fair competition grounds; in the time dimension, to keep enjoying an

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a symptom of broader vulnerabilities. The argument does not detract from the usefulness of identifying such institutions abstracting from such a context.

apparently endless boom. Moreover, the temptation to believe that “this time things are different” can be very powerful for everyone, including the authorities themselves (eg, Reinhart and Rogoff (2009), Borio (2007a)).

Discretionary measures have their strengths too. Designing effective rules can be difficult. And it is easier to tailor discretionary measures to the specific features of individual institutions’ contribution to systemic or the build-up in financial imbalances and vulnerabilities. Discretionary measures are also harder to arbitrage away: circumvention of a rule becomes easier over time.

What about the blend of boldness and realism? We should be bold in seeking to develop rules as far as possible. Especially in the time dimension, the political economy pressures and the temptation to discount risks can be too powerful, at least in some institutional contexts. Indeed, these pressures are likely to be even stronger than those against a tightening of monetary policy to contain inflation. There is at least *some* constituency that dislikes inflation, but *none* that dislikes the inebriating feeling of getting richer. But we need to be realistic too. Rules should be simple and understandable. And a degree of discretion will be inevitable, in fact considerable in some cases. To illustrate this, consider the cross-sectional and time dimensions in turn.

In the cross-sectional dimension, indicators of contributions to systemic risk are still rather crude. Moreover, the problem is compounded by the need to choose the perimeter of the system. Should it be just the domestic one? Or that made up by the main global institutions? Should it cover just banks or other institutions too? The choice makes a big difference to the corresponding calibration.

In the time dimension, the limits of strict rules become apparent once we move beyond non-state contingent (fixed) variants. It is relatively straightforward to design non-state contingent rules that have countercyclical properties (Borio et al (2001), Borio and Shim (2008)). Rules based on through-the-cycle or stressed parameters are one example (eg, forms of dynamic loan loss provisioning or margin requirements; CGFS (2010)). Low

maximum loan to value ratios are another: quite apart from increasing the buffer against a decline in asset prices, they reduce the sensitivity of credit extension to increases in asset prices during the boom, when these assets are used as collateral.

But more ambitious attempts to track systemic risk can easily run into limitations. Consider, for instance, the design of simple countercyclical capital buffers (Drehmann et al (2010), BCBS (2010)). It is hard to find a *single* macro variable that would build up and release buffers automatically in a timely fashion. For example, the credit-to-GDP ratio is especially good for the build-up phase, but its fall often lags the emergence of incipient strains, so that it is slow in releasing capital. Credit spreads are not particularly reliable across cycles. Aggregate banking sector profits do not exhibit sufficient variation in good times, and hence may fail to track the build-up of risks.

The reason for this general result is not difficult to find. The best variable to guide the build-up phase would also be the best leading indicator of financial distress; the best one to guide the release would be the best contemporaneous indicator of distress. It is hard to imagine how the *same* variable could be the best leading *and* contemporaneous indicator of financial distress. This suggests that some degree of discretion is inevitable in this case.<sup>11</sup>

## **Governance**

Designing governance arrangements for macroprudential frameworks is no easy task. The challenges become most apparent when compared to those in monetary policy frameworks.

A first challenge is measuring the objective. Price stability is much easier to measure than financial stability. It is not just that financial stability is multidimensional and a

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<sup>11</sup> That said, it is worth investigating further the possibility of designing financial contracts that rely, as far as possible, on rules; an obvious example includes various contingent capital mechanisms based on non-discretionary triggers. See, for instance, Kashyap et al (2008).



more elusive concept. As the “paradox of financial instability” highlights, the system may be fragile – and in this sense unstable – for a very long time even if financial distress does not emerge. There is a long lag between the time risks are taken and their consequences materialise, longer than the one-to-two year horizon normally adopted for price stability. All this puts a premium on accountability. It also indicates that operational independence is critical to provide some insulation from lobbying pressures

A second challenge relates to the imperfect alignment of objectives, control over instruments and know-how. Authorities in charge of regulation and supervision have tended to view their task from a microprudential perspective. In addition, unless they are central banks, they have less know-how to factor in their decisions macroeconomic or market-wide considerations. Moreover, in some cases, command over the tools lies with authorities who do not see financial stability as a relevant concern, such as accounting standard setters. All this indicates that new and specific arrangements may have to be put in place.

I believe we should be bold in designing new governance arrangements. Given their expertise, central banks should play a *key* role. Current reforms have fully incorporated this lesson. Operational independence for crisis *prevention* should be assured, while recognising that the government will inevitably have to be closely involved at the crisis *management* stage. But we should also be realistic about what the arrangements can achieve. Crises cannot be avoided entirely. We should not define mandates in precise quantitative terms, as this false precision would be counterproductive. Above all, mandates should be consistent with the tools available to the authorities, erring on the side of caution. Means have to be commensurate with ends.

Operationally, an important issue is how to coordinate the use of tools from a micro and macroprudential perspective. A useful approach is to consider explicit “overlays”, in the form of transparent adjustments to calibrations from the microprudential perspective. Examples include specific countercyclical adjustments and systemic surcharges. This would allow the authorities to decouple instrument settings for the same tool (eg, capital and

liquidity) along the two different perspectives, facilitating separate governance arrangements for each. Overlays are especially helpful if discretionary adjustments play an important role in the framework. They facilitate communication and support accountability.

### **3. Key research questions**

There is no dearth of research questions. This is an area in which we should not set limits to boldness. At the same time, a dose of realism is welcome, to help answer the more pressing questions with which policymakers are grappling. Let me focus on three aspects only: the *measurement* of financial instability; the *analytics* of financial instability; and the *efficacy* of tools.

Despite the progress made, measurement is still in its infancy. In the time dimension, there is much scope to improve leading indicators of systemic financial distress. I have suggested that a promising line of work is to seek to exploit systematically the paradox of financial instability. Within that broad approach, many questions remain. What are the pros and cons of different quantitative aggregates, such as types of credit? Is there useful additional information in the liability side of financial sector intermediaries, such as the ratio of wholesale to retail funding? Is it possible to develop coherent measures of aggregate leverage? How best can we incorporate the international and global dimensions? Can we do a better job with information contained in risk premia? In the cross-sectional dimension, much more can be done to combine balance-sheet and market price information and to compare the pros and cons of different aggregate measures. In doing all this, we should resist the temptation of confusing complexity with sophistication. Simple, easily understood and transparent approaches are most likely to prove more robust and be widely accepted. Occam's razor should guide our efforts.

Better analytics should help inform better measurement. Most ambitiously, it would be great if one could integrate the time and cross-sectional dimensions within a single and

convincing model. This is an extraordinarily tough challenge, but worth pursuing by the most daring and gifted. More generally, I suspect that a proper analysis of financial instability will call for a rethink of macroeconomic models, by revisiting the interaction between monetary, financial and real factors (Borio (2007b)). We need models in which liquidity -- in its various incarnations, including monetary and credit aggregates -- the measurement and pricing of risk, and distortions in capital accumulation and balance sheets play fundamental roles. We need models that generate booms and bust cycles endogenously. What cross-sectional and intertemporal coordination failures are more critical? We need models in which, as the empirical evidence strongly suggests, financial crises have very long-lasting, if not permanent, effects on the level of output (eg, Cerra and Saxena (2008), IMF (2009)). What can explain these effects? And what implications do they have for macroeconomic policies, beyond macroprudential policy?

Developing better models can help us understand the efficacy of different macroprudential instruments. This will require models to be rich enough to incorporate tools in a meaningful way. A complementary approach is to investigate their effectiveness based on careful cross-country empirical work, supplemented by case studies. So far, data limitations have held back this type of research. But as experience with the instruments accumulates, we will have more data points at our disposal. Moreover, we should not be averse to delving further back into history, when various forms of intervention in the financial system were more common.

## **Conclusion**

It is high time to turn a buzzword, “macroprudential”, into a fully fledged and implementable framework. The window of opportunity cannot be missed. But we should not underestimate the challenges ahead.

In this presentation, I have argued that meeting these challenges calls for a finely balanced blend of boldness and realism. Boldness to design a framework that could in principle act as an effective speed limit on the build-up of financial imbalances; realism to avoid setting an overly ambitious criterion of success, beyond strengthening the resilience of the financial system. Boldness to develop better quantitative indicators of systemic risk; realism to recognise the inevitable role of judgement. Boldness to develop aggregate approaches; realism to avoid the risk of drifting unintentionally into credit allocation policies. Boldness to rely as far as possible on simple and transparent rules; realism to acknowledge the need for constrained discretion. Boldness to design new governance arrangements, ensuring a key role for central banks, the necessary degree of operational independence and control over instruments; realism to avoid a false sense of precision in the definition of mandates and to manage expectations about what can be achieved. Boldness to avoid limiting how daring research should be; realism to gear it also to providing responses to the more pressing questions policymakers are facing.

This blend could help develop and implement effective frameworks, while at the same time recognising that no one-size-fit-all-solutions exist, applicable to all countries regardless of specific circumstances.

That said, before concluding and in the spirit of further realism, let me add two additional remarks.

First, it would be an illusion to expect that a macroprudential framework could ensure, on its own, the appropriate degree of financial stability. As argued in more detail elsewhere, other macroeconomic policies will have to play a role. In particular, monetary policy is key (eg, Borio and Lowe (2002)). Monetary policy sets the universal price of leverage in a given currency area, and as such it is harder to circumvent. It operates

precisely by influencing credit and asset prices, and as such is more likely to act as an effective speed limit. And, as increasing evidence suggests, it can influence risk perceptions and attitudes – the price of risk – and as such complement closely macroprudential tools.<sup>12</sup>

Second, the macroprudential approach was originally designed with *private* sector sources of financial instability in mind; hence the prominence of booms and busts in private sector credit and asset prices. But, as the most recent experience has reminded us once more, the public sector, too, can be a source of financial instability. This has implications for the design of the indicators of systemic risk and policy responses. If anything, the nut is even harder to crack. After all, it is generally the public sector that comes to the rescue of the financial system. How can the rescued protect themselves from the rescuer, when the rescuer is the source of the problem? Looking ahead, the macroprudential approach has to be adapted to address this issue head on. We should not drive looking only in the rear mirror.

In other words, the macroprudential framework can only be one, albeit important, component of a broader framework designed to promote financial and macroeconomic stability. Other policies, notably monetary and fiscal policies, will have to play their part as well.

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<sup>12</sup> For an explanation of the general concept of the risk-taking channel, see Borio and Zhu (2008); for specific variants and formalisations, see Rajan (2005), Adrian and Shin (2009), Diamond and Rajan (2009) and Fahri and Tirole (2009); for empirical evidence, see Altubas et al (2009), Iannidou et al (2009) and Jiménez et al (2009).

<b>Table 1</b>		
<b>The macro- and microprudential perspectives compared</b>		
	<b>Macroprudential</b>	<b>Microprudential</b>
<b>Proximate objective</b>	limit financial system-wide distress	limit distress of individual institutions
<b>Ultimate objective</b>	avoid output (GDP) costs	consumer (investor/depositor) protection
<b>Characterisation of risk</b>	Seen as dependent on collective behaviour (“endogenous”)	Seen as independent of individual agents’ behaviour (“exogenous”)
<b>Correlations and common exposures across institutions</b>	important	irrelevant
<b>Calibration of prudential controls</b>	in terms of system-wide risk; top-down	in terms of risks of individual institutions; bottom-up
Source: Borio (2003)		

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