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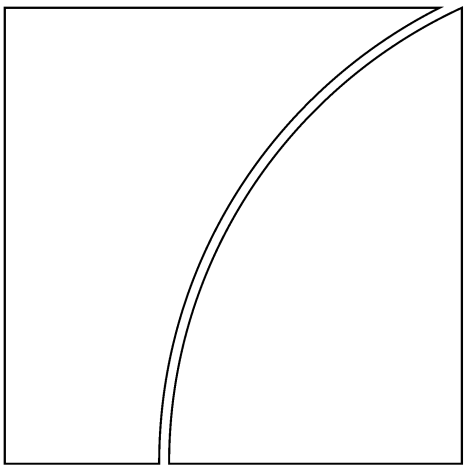

BIS Working Papers

No 128

Towards a macroprudential framework for financial supervision and regulation?

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February 2003

Abstract

Over the last decade or so, addressing financial instability has risen to the top of the policy agenda. This essay argues that in order to improve the safeguards against financial instability, it may be desirable to strengthen further the macroprudential orientation of current prudential frameworks, a process that is already under way. The essay defines, compares and contrasts the macro- and microprudential dimensions that inevitably coexist in financial regulatory and supervisory arrangements, examines the nature of financial instability against this background and draws conclusions about the broad outline of desirable policy efforts.

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Press & Communications
CH-4002 Basel, Switzerland

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Fax: +41 61 280 9100 and +41 61 280 8100

This publication is available on the BIS website (www.bis.org).

ISSN 1020-0959 (print)

ISSN 1682-7678 (online)

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"Words, like nature, half reveal and half conceal the soul within"

Alfred Lord Tennyson

"When I use a word... it just means what I choose it to mean – neither more, nor less"

Humpty Dumpty

Introduction[1]

Financial instability may not necessarily be here to stay. But it has been sufficiently prominent over the last couple of decades to rise, slowly but surely, to the top of the international policy agenda. The sizeable economic costs of financial crises in industrial and emerging market countries could not be ignored.

Banking supervisors were used to a quiet life in the (largely) financially repressed systems that emerged in the postwar period. They have been much busier of late. Bankhaus Herstatt failed in 1974. Few could have imagined then that this would mark the beginning of a long journey in ever closer and wider international cooperation among prudential authorities. Now, some 30 years on, efforts to upgrade bank capital standards are grabbing the headlines worldwide. They have even become an issue in electoral campaigns.

These efforts are part of a broader challenge: strengthening the safeguards against financial instability. The basic question is how best this should be done.

The answer ultimately depends on how we think of financial instability, of its ultimate causes and implications. Events have forced many of us to go back to basics; to question assumptions we once took for granted. The debate has been rich and has furthered our understanding greatly. Even so, having lost some trusted "points of reference" we are still searching for new ones.

This essay will argue that we can get a bit closer to the right answers by exploring the implications of an ungainly word, increasingly used but still looking for a precise meaning. The word is "macroprudential". The thesis is that to improve further the lines of defence against financial instability we should strengthen the macroprudential orientation of the regulatory and supervisory framework.

In fact, the process is well under way. Friedman once said: "We are all Keynesians now".[2] One could equally well say: "We are all (to some extent) macroprudentialists now"- to coin another clumsy word. The shift in perspective has been remarkable over the last few years. And it is likely that it will continue.

We might be moving towards the right answers. But this essay will raise still more questions. The intention is to use the "macroprudential" perspective as a kind of looking glass, to put old issues into a new focus. Once that is done, however, more questions will emerge.

The outline of the essay is the following. Section I defines terms and concepts: what is meant by a "macroprudential" perspective? Section II will argue that this perspective is useful to understand financial instability. Section III moves from diagnosis to remedies, and argues that the macroprudential perspective can also be helpful in identifying broad sets of policy responses. Finally, some conclusions are drawn.

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[1] This paper is a revised version of an invited lecture at the CESifo Summer Institute Workshop on "Banking regulation and financial stability" that took place in Venice, Italy, on 17-18 July 2002. It is forthcoming in *CESifo Economic Studies*. I would like to thank Philip Lowe, Bengt Mettinger, Hyun Shin, Kostas Tsatsaronis and two anonymous referees for their helpful comments, and Janet Plancherel for the patience and efficiency with which she put the lecture together under heavy time pressure. This essay reflects personal views and not necessarily those of the BIS. Any remaining errors are my sole responsibility.

[2] Quoted in Samuelson (1973).

I. The micro- and macroprudential dimensions defined[3]

Definitions

Shades of grey are best appreciated when set against their two primitive components, black and white. Likewise, it is especially helpful to *define* the micro- and macroprudential perspectives in such a way as to sharpen the distinction between the two. So defined, by analogy with black and white, the macro- and microprudential souls would normally coexist in the more natural shades of grey of regulatory and supervisory arrangements.

As defined here, the macro and microprudential perspectives differ in terms of *objectives* and the *model* used to describe risk (Table 1).

Table 1

The macro- and microprudential perspectives compared

	Macroprudential	**Microprudential**
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid output (GDP) costs	consumer (investor/depositor) protection
Model of risk	(in part) endogenous	exogenous
Correlations and common exposures across institutions	important	irrelevant
Calibration of prudential controls	in terms of system-wide distress; top-down	in terms of risks of individual institutions; bottom-up

The ***objective*** of a macroprudential approach is to limit the risk of episodes of financial distress with significant losses in terms of the real output for the economy as a whole. That of the microprudential approach is to limit the risk of episodes of financial distress at individual institutions, regardless of their impact on the overall economy.

So defined, the objective of the macroprudential approach falls squarely within the macroeconomic tradition. That of its microprudential counterpart is best rationalised in terms of consumer (depositor or investor) protection.[4]

To highlight the distinction between the two, it is useful to draw an analogy with a portfolio of securities. For the moment, think of these as the financial institutions in an economy. Assume, further, that there is a (monotonically) increasing relationship between the losses on this portfolio and the costs to the real economy. The macroprudential approach would then care about the tail losses on the portfolio as a whole; its microprudential counterpart would care *equally* about the tail losses on *each* of the component securities.

The implications for the setting of prudential controls are straightforward. The macroprudential approach is top-down. It first sets the relevant threshold of acceptable tail losses for the portfolio as a

[3] Previous statements of the distinction between the macro- and microprudential perspectives can be found in Crockett (2000a) and (2001a). Borio et al (2001) apply the distinction to the analysis of capital standards. Tsatsaronis (2002) provides a more in-depth, complementary analysis of these issues.

[4] This view of prudential policy is formalised in Dewatripont and Tirole (1993).

whole. It then calibrates the prudential controls on the basis of the marginal contribution of each security to the relevant measure of portfolio risk. As portfolio allocation theory teaches us, correlations[5] across securities, and the distinction between systematic and idiosyncratic risk, are of the essence. By contrast, the microprudential approach is bottom-up. It sets prudential controls in relation to the risk of each individual security. The result for the overall portfolio arises *purely* as a consequence of aggregation. Correlations across securities are ignored.[6]

Next, consider the ***model*** used to describe risk. The macroprudential perspective assumes that risk is in part *endogenous* with respect to the behaviour of the financial system; the microprudential approach assumes that it is *exogenous*.

The analogy can be helpful here too. In finance theory, we are used to thinking that the risk of a portfolio depends on some exogenous risk factors. The macroprudential approach assumes that these risk factors are in part endogenous with respect to the characteristics of the portfolio. By contrast, the microprudential approach assumes that risk can be taken as exogenous. In fact, its analysis is squarely in the tradition of partial equilibrium. The focus on the risk profile of individual securities (read institutions) justifies the choice.[7]

Moreover, since the macroprudential approach measures risk in terms of the dispersion of an economy's output, it also recognises that the financial system has first-order effects on it. These effects are ignored in the microprudential perspective.

A microprudentialist would argue that for a financial system to be sound it is necessary and sufficient that each individual institution is sound. A macroprudentialist would take issue with this. To him, it would not be necessary: the output costs of financial stress at individual institutions, or even groups of institutions, banks or otherwise, need not be large enough. More subtly, he would not regard it as sufficient either. This would depend on ***how*** soundness was pursued. In his view, a macroprudential approach would have a better chance of securing financial stability and, thereby, of making also *individual* institutions safer. The approach could help in the identification of vulnerabilities and in designing appropriate policy responses.

As argued below, this has to do with the nature of financial instability, and hence with the role of risk perceptions and incentives. The endogeneity of risk comes into its own here. At this point, however, let's just pick an illustration that brings out the difference in perspectives most starkly.

By taking risk as exogenous, it would not be possible for a microprudentialist to conceive of situations in which what was rational, even compelling, for an individual institution could result in undesirable aggregate outcomes. A macroprudentialist would find this possibility natural. For example, it could make sense for a financial firm to tighten its risk limits and take a defensive stance in the face of higher risk. But if all did that, each of them could end up worse off. Tightening credit standards and liquidating positions could precipitate further financial stress and asset price declines. Risk would thereby increase.

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[5] The term "correlation" is used loosely here. For the purpose at hand, tail interdependence is more suitable. When returns cannot be accurately described by multivariate normal distributions, the difference can be important, as correlations are too restrictive. See Embrechts et al (1999).

[6] Obviously, this analogy has its limitations. In particular, the monotonic relationship assumes that the marginal contribution of each financial institution to the macro risk of distress (losses) is the same, regardless of its specific characteristics. For instance, there is no distinction between banks and non-banks at this level of abstraction. And the analogy glosses over the distinction between institutions and markets. Obviously, any rigorous theoretical analysis would need to address these issues. For this reason, taking the analysis one step further, Tsatsaronis (2002) prefers to focus on the more basic notion of "intermediation capacity". He sees this as reflecting the ability of financial arrangements to channel funds from savers to investors, overcoming the problems arising from asymmetric information, and to allocate and absorb risk. Borio (2000) argues that the functional distinction between markets and institutions can easily be overstated.

[7] Put differently, a microprudential researcher would focus on games against nature. Nature throws the dice and determines the risk characteristics of an economy. The only issue is how this risk is sliced and distributed. Moreover, strictly speaking, he would be concerned only with single-player games. A macroprudential researcher would focus on games among economic agents. The outcome would determine the level of aggregate risk.

From definitions to actual practices

How do current prudential frameworks compare against this stark macro-micro distinction? It is easy to see that the two souls coexist to varying degrees. Some differences may reflect historical and institutional aspects, including whether prudential powers are located with central banks or separate agencies. Others depend on whether we focus on objectives or on the means through which those objectives are pursued.

Take the *micro* elements first. Prudential standards are generally calibrated with respect to the risks incurred by individual institutions, the hallmark of a microprudential approach. The widespread use of peer group analysis in assessing risk is micro too. The benchmark here is the average performance of institutions, regardless of what this implies in the aggregate. And microprudential is also a certain reluctance to contemplate adjustments in standards or the intensity of supervision that would internalise macroeconomic consequences. Recall, for instance, the differences of opinion between the Federal Reserve and the Office of the Controller of the Currency in the United States during the "headwinds" of the early 1990s. At the time, the Fed was concerned about the implications for overall risk of a tightening of supervisory standards with respect to real estate exposures pursued by the other supervisory agency.

Next, consider the *macro* elements. Prudential authorities for banks often list among their objectives preventing systemic risk, even though the notion is vague enough to accommodate goals that could fall short of a macro approach: not all situations where systemic risk is invoked need involve potentially significant costs for the real economy. Likewise, it is not unusual for the intensity of supervision to be tailored to the size and complexity of institutions, which may match, by design or incidentally, their systemic significance. And the monitoring of risk goes well beyond peer group analysis. It routinely looks at aspects such as concentration of exposures across institutions and vulnerabilities to common shocks, like those associated with asset prices, sectoral, regional or macroeconomic developments.

II. Financial instability: from micro to macro

Which elements predominate is very much in the eye of the beholder. From a policy perspective, however, what matters is the balance between the two. Arguably, there are good reasons why we should strengthen further the macroprudential orientation of the framework.

At least three reasons spring to mind. First, in some important respects, the macroprudential objective actually subsumes the rationale for its microprudential counterpart. Second, as a result of a better balance between market and official discipline, strengthening the macroprudential orientation holds out the promise of better economic performance. Third, and more subtly, the nature of financial instability is such that a strict microprudential approach is less likely to deliver a safe and sound financial system. Take each in turn.

Reason 1: high costs of financial instability

The output costs of financial instability can be very large and their incidence widely felt. Even acknowledging measurement difficulties, studies indicate that the costs of banking crises can easily run into double digits of GDP.[8] Output and growth opportunities are forgone. Severe financial distress can numb the effectiveness of standard macroeconomic tools, such as monetary and fiscal policies. Among industrial countries, Japan vividly illustrates this point. And the very social fabric of society can come under strain. The experience in a number of emerging market countries is telling.

Put bluntly, if the microprudential objective is rationalised in terms of depositor protection, there is a sense in which its macroprudential counterpart subsumes it. For the macroprudential objective is couched in terms of the size of the losses incurred by economic agents, *regardless of which hat they happen to wear*. In particular, even in those cases where depositor protection schemes may insulate depositors from *direct* losses, they cannot spare them the indirect, and more insidious, pain of widespread financial distress as citizens of a country.

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[8] See, for instance, Hoggarth and Saporta (2001), who measure costs in terms of output forgone, and the references therein.

Reason 2: balance between market and policy-induced discipline

Since a microprudential approach seeks to limit the failure of *each* institution, regardless of its systemic consequences, it is arguably more likely to result in an overly protective regulatory and supervisory framework. Any failure, no matter how unimportant for the economy, could seriously damage the reputation of supervisors. The risk is that market forces may be stifled excessively. Resources can be misallocated and growth opportunities forgone. If taken too far, and underpinned by overly generous safety net arrangements, a microprudential approach could even undermine the very objective it is supposed to attain. It is well known that numbed incentives to monitor and limit risk can ultimately generate costly instability - the so-called moral hazard problem.[9]

This does not mean that depositor protection schemes are undesirable. Far from it. Limited schemes can act as effective pre-commitment mechanisms. By limiting the incidence of losses on the more vulnerable segments of society, they can relieve political economy pressures to "bail out" institutions.[10] By the same token, they can facilitate a more discriminating attitude towards the resolution of financial distress and thereby underpin a shift towards a macroprudential orientation. The point is that the pursuit of depositor protection objectives is best done through a combination of a macroprudential orientation and more targeted protection schemes.

Reason 3: nature of financial instability

While a commonly held view of systemic risk suggests that financial stability can be secured through a microprudential approach, an analysis of the origin of financial crises with significant macroeconomic costs suggests that a macroprudential perspective is important. This analysis also reveals certain peculiar characteristics of risk perceptions that hold clues about possible policy responses. The distinction between the cross-sectional and time dimension of risk, especially system-wide risk, is crucial here. In addition, incentives play an important role. It is worth elaborating on these points in some detail.

Two views of systemic risk

The commonly held view of systemic risk that limits the tension between the micro- and macroprudential perspectives combines three ingredients.[11] First, and most importantly, it tends to see widespread financial distress as arising primarily from the failure of *individual* institutions. The failure then spreads, through a variety of *contagion* mechanisms, to the financial system more generally. Interlinkages through balance sheets and overreactions driven by imperfect information are seen as key channels. Second, it tends to treat risk as endogenous in terms of the *amplification* mechanisms, but not with respect to the *original* shock, which is seen as exogenous. Third, this often goes hand in hand with a rather static view of instability. In other words, for a variety of reasons, the financial system is seen as initially vulnerable; suddenly, a shock occurs, which is then amplified by the endogenous response of market participants. There is no role for the factors underlying the build-up of the vulnerability in the first place. Finally, in many models, structurally illiquid portfolios are the key source of vulnerability and amplification. Liquid liabilities, and the threat of deposit runs, play a key role.

This view has an impeccable intellectual pedigree. Some of its more formal elements go back at least to the canonical model of systemic risk of Diamond and Dybvig (1983).[12] This view permeates much of

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[9] For instance, if ill-designed, a safety net can address one cause of instability, generalised liquidity crises, by generating another, namely slower-moving solvency crises.

[10] Note that this rationalisation of deposit insurance schemes is rather different from the one normally found in the literature. It recognises that, in modern economies, it is "runs" by *sophisticated* creditors, typically exempt from insurance, that can precipitate a crisis, especially through the inter bank market. And it sees discretionary emergency liquidity assistance as a better instrument than deposit insurance to deal with liquidity crises, since it does not afford *unconditional* protection in the case of failure to achieve that goal. At the same time, deposit protection schemes can be useful precisely in cases of *insolvency*, by shielding supervisors from public pressure to bail out institutions, thereby lending credibility to the threat of a more discriminating resolution of the insolvency.

[11] This view, in fact, is a mixture of various elements stressed by somewhat different strands of thought. It is supposed to capture a general intellectual atmosphere that has permeated much of the thinking on systemic risk.

[12] Santos (2000) reviews part of this literature and its relationship to bank regulation and minimum capital requirements in particular. De Bandt and Hartmann (2000) provide a more general survey of systemic risk and Davis (1995) a broader overview of the literature on financial instability.

the literature on systemic risk that focuses on domino effects, as exemplified in the well known review article by Kaufman (1994). And it has also influenced much of the thinking in the policy community.[13]

There is little doubt that systemic risk *can* arise from processes of this kind. Failures that result from mismanagement at individual institutions are the most obvious examples. In this case, exposures through payment and settlement systems and the inter bank market more generally are key channels of transmission.[14] Possible instances may include, for example, Herstatt, Drexel Burnham Lambert, BCCI and Barings, just to quote a few. In these cases, idiosyncratic factors have the potential to become systemic through the web of contractual, informational and psychological links that keeps the financial system together. By now, we understand these processes reasonably well.

But the significance of such instances pales in comparison with that of the cases where systemic risk arises primarily through *common exposures* to macroeconomic risk factors across institutions. It is this type of financial distress that carries the more significant and longer-lasting real costs. And it is this type that underlies most of the major crises experienced around the globe. By comparison with the canonical model of systemic risk, these processes are still poorly understood.

Financial crises of this type can differ in many respects. The precise configuration of vulnerabilities varies, including whether they are primarily located among private or public sector borrowers, the relative role of domestic and cross-border exposures, and the importance of foreign currency mismatches. The precise triggers and hence timing are essentially unpredictable. And the main forces behind the crises can either be domestic or foreign.

Even so, beyond these differences, behind many such episodes a fairly common, if highly stylised, pattern can be detected. Generally, there is first of all a build-up phase. This is normally characterised by booming economic conditions, benign risk assessments, a weakening of external financing constraints, notably access to credit, and buoyant asset prices (Graph 1).[15] The economy may be perceived as being on a permanently higher expansion path. This configuration promotes and masks the accumulation of real and financial imbalances; the system becomes overstretched. At some point, the process goes into reverse. The unpredictable trigger can reside either in the financial sphere (eg an asset price correction) or in the real economy (eg a spontaneous unwinding of an investment boom). If the system has failed to build up enough buffers and the contraction goes far enough, a financial crisis can erupt. Ex post, a financial cycle, closely intertwined with the business cycle, is evident.[16]

It is not difficult to detect elements of this kind behind many of the severe financial crises in industrial and emerging market countries since at least the 1980s. These include several of the banking crises in Latin America in the 1980s and early 1990s, the crises in East Asia later in the decade, those in the Nordic countries in the late 1980s-early 1990s and the more prolonged one in Japan. Moreover, even if no major crisis broke out, countries such as the United States, the United Kingdom and Australia also experienced strains in their financial systems in the early 1990s following similar patterns.

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[13] See, for instance, ECSC (1992).

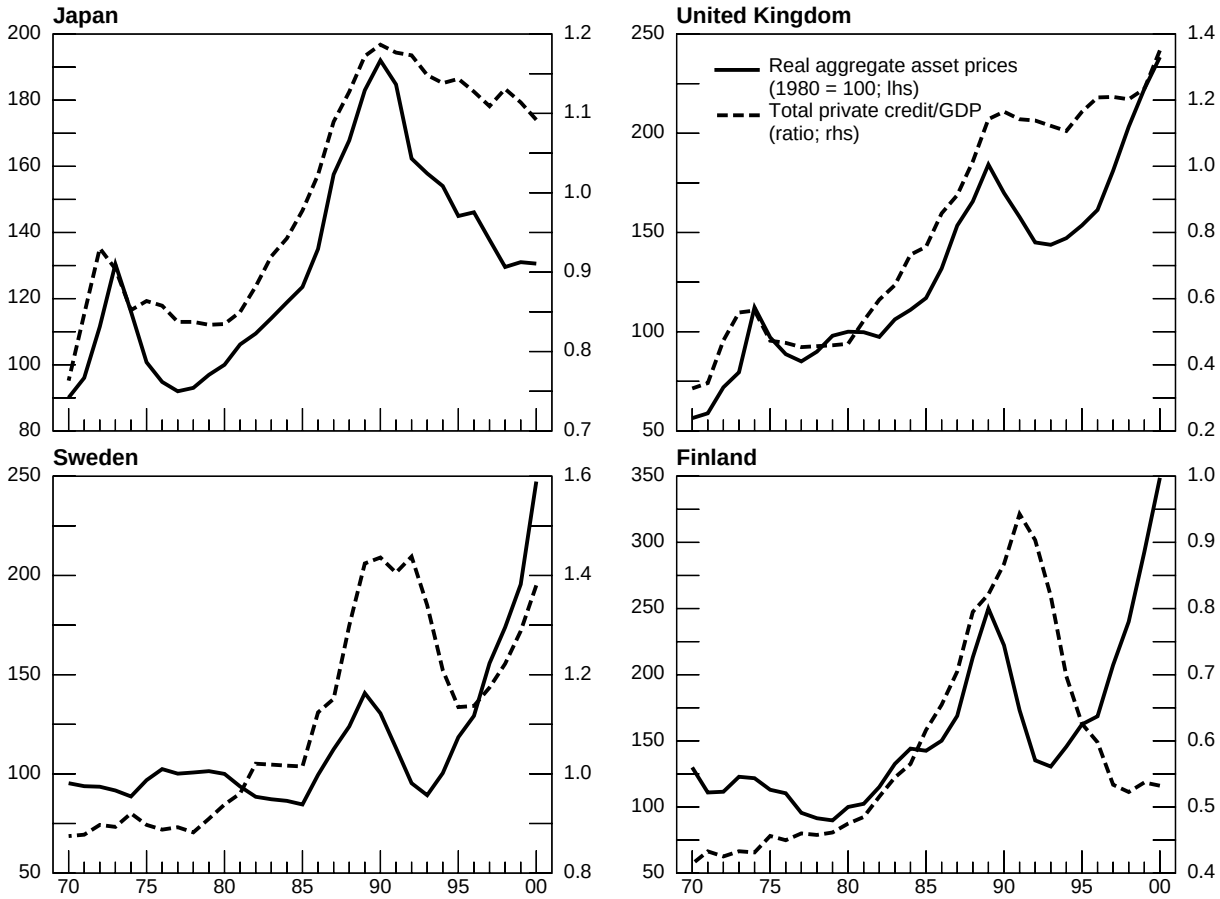
[14] For the link between systemic risk and the interbank market, see in particular Rochet and Tirole (1996a). For a review of systemic risk in payment and settlement systems, see, for instance, Borio and Van den Bergh (1993) and references therein, as well as the many publications of the Committee on Payment and Settlement Systems on the BIS website. In the same spirit, Furfine (1999) examines the scope for contagion through Fedwire in the United States. See also Rochet and Tirole (1996b).

[15] The relationship between credit and asset prices is investigated econometrically in, for instance, Borio et al (1994) and Hofmann (2001); its theoretical underpinnings have received renewed attention in recent years (eg Bernanke at al (1999), Kiyotaki and Moore (1997) and, in a different vein, Allen and Gale (2000)). More generally, the role of credit booms in the build-up of financial crises is widely recognised (eg Honohan (1997), Gourinchas et al (2001) and Eichengreen and Arteta (2000)). Of course, the roles of credit and asset prices in the context of boom-bust financial cycles have a long tradition (eg Kindleberger (1996) and Minsky (1982)) and history (eg Goodhart and De Largy (1999) and Kent and D'Arcy (2001)).

[16] Mechanisms of this sort are also at work in episodes of market stress, which may or may not have serious macroeconomic consequences (eg Borio (2000)).

Graph 1

Real aggregate asset prices and credit



Note: The real aggregate asset price index is a weighted geometric mean of real share prices, real residential property prices and real commercial property prices; the weights are based on net wealth data and the deflators used are those of private consumption.

Sources: Private real estate associations (inter alia, Jones Lang LaSalle); national data; BIS estimates and calculations.

By comparison with many canonical models of systemic risk, three key differences stand out. First, it is not possible to understand the crises unless we understand how vulnerabilities *build up over time*. This requires an understanding of the mutually reinforcing *dynamic* interaction between the financial and the real economy, and not just in the unfolding of financial stress but, importantly, as risk is built up. What we need is a proper theory of business fluctuations that merges financial and real factors. The triggering shock is, in fact, the least interesting aspect of the story. The boom sows the seeds of the subsequent bust. To an important extent, risk is *endogenous*. Second, it is not so much contagion from individual failures but *common exposures* to the same risk factors that explain the crisis.[17] Third, much of the action is on the *asset side* of balance sheets as opposed to the liability side. It is on the asset side that the exposures build up and the underlying changes in valuation originate. The liability side can play a role primarily in the precise unfolding of the crisis, as it can affect the abruptness and virulence with which asset side adjustments are enforced. For instance, the foreign currency external financing constraint is critical for emerging market countries. But it is the

[17] Note that, for any given set of institutions, common exposures to risk factors arise from two sources. First, directly, from the exposure of these institutions to economic agents outside this set. Second, indirectly, from exposures to each other (the interlocking aspect). In practice, it is arguably the former that has played the main role in widespread crises with macroeconomic consequences. See Elsinger et al (2002) for an interesting approach that can be used to shed evidence on this question and for some corroborating evidence in the case of the Austrian banking system.

deterioration in asset quality that fundamentally drives the process.[18] This is all the more so given the willingness to socialise losses in our time.[19]

The role of risk perceptions

If we look at the genesis of the crises more closely we will find another curious feature. Indicators of *risk perceptions* tend to decline during the upswing and, in some cases, to be lowest close to the peak of the financial cycle. But this is precisely the point where, with hindsight at least, we can tell that risk was greatest. During the upswing, asset prices are buoyant, risk spreads narrow and provisions decline. They clearly behave as if risk fell in booms and rose in recessions. And yet, there is a sense in which *risk rises in booms*, as imbalances build up, *and materialises in recessions*, as they unwind.[20]

This observation points to a fundamental distinction between the dimensions of risk. We all seem to be better equipped to measure the cross-sectional than the time dimension of risk. And we find it especially difficult to measure how the absolute level of systematic (system-wide) risk evolves over time.[21] It is no coincidence, for instance, that rating agencies pay particular attention to the *relative* riskiness of borrowers or instruments.[22] Nor, indeed, that much of the extisting literature on the effectiveness of market discipline is of a cross-sectional nature.[23] By the same token, one could argue that the Achilles heel of markets may not be so much *indiscriminate* reactions to idiosyncratic problems but rather preventing the build-up of *generalised* overextension. This is why there is much mileage to be gained by focusing not so much on contagion but on common exposures.

The role of incentives

And risk measurement is only part of the story. Another important aspect has to do with *incentives*. The key problem here is the wedge between individual rationality and desirable aggregate outcomes. We are all very familiar with the arguments here. Notions such as “prisoner’s dilemma”, “coordination failures” and “herding” spring to mind.[24] Just a few specific examples: would it be reasonable to expect a bank manager to trade off a sure loss of market share in a boom against the distant hope of regaining it in a future potential slump? Or to adopt less procyclical measures of risk on the grounds that if others adopted them as well a crisis might be less likely? Or to fail to tighten credit standards or liquidate positions only because, if everyone else did the same, the depth of a recession could be mitigated? Policy responses will need to keep this tension in perspectives very much in mind.

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[18] There is a strand of the literature on financial crises in open economies that can be seen as a natural extension of the contrasting paradigms discussed here. Thus, a number of authors have stressed the role of external liabilities and self-fulfilling runs (eg Chang and Velasco (1998) and Sachs and Radelet (1998)) while others have stressed fundamental vulnerabilities. Among the latter, and in contrast to the analysis developed here, ex ante distortions associated with implicit government guarantees have tended to play a key role (eg Corsetti et al (1999)). Corsetti (1998) reviews some of the recent literature on this.

[19] A number of academics have recently been developing notions of systemic risk that are closer to the one put forward in this essay. What might be called the emerging “LSE school” stresses the endogeneity of risk (eg Danielsson et al (2001), Danielsson et al (2002)) and the time dimension of risk (Goodhart and Danielsson (2001)). Acharya (2001) focuses on common exposures and the asset side of balance sheets. Hellwig (1995, 1998), has for a long time emphasised the need for a system-wide, general equilibrium approach, but within a static framework and a focus on interest rate risk as the key driver of credit risk too. Work that extends the Diamond and Dybvig-type models to link bank run equilibria to economic fundamentals, not least in the context of differential information, can also be seen as a step in the direction of a more macroprudential notion of systemic risk, as defined here (eg Morris and Shin (1998), Zhu (2001)). And for some time now, a number of authors have noted the importance in deteriorating fundamentals as a cause of financial crises; see eg Gorton (1988) and Calomiris and Gorton (1991).

[20] There are a number of ways in which this statement can be rationalised or made more precise. The most intuitive states that the signs of possible financial imbalances in the upswing lead to a rise in the uncertainty regarding future outcomes. The boom might indeed be sustainable, but “tail losses” are also higher. See Lowe (2002) in particular. More formal rationalisations are also suggested in Borio et al (2001).

[21] See, initially, Crockett (2000b) or Borio and Crockett (2000) and BIS (2001a). A detailed discussion of this point can be found in Borio et al (2001). See also Goodhart and Danielsson (2001).

[22] See Cantor (2002).

[23] A careful reading of the well known survey article on market discipline by Flannery (1998) makes this abundantly clear.

[24] Borio et al (2001) provide a discussion of these issues. See also Goodhart and Danielsson (2001) for an elaboration closely linked to the problems of risk measurement.

Bounded rationality and distorting government intervention?

Thus, a combination of risk perceptions that fall short of a tall order and distorting incentive wedges seem to underlie much of the financial instability that we see. And importantly, it would not seem necessary to rely on either bounded rationality - appealing as this may be to careful observers of human nature - or misguided government intervention to explain the economic processes at work.

Ultimately, it might be possible convincingly to rationalise the observed instability by building rigorous frameworks starting from the inevitably imperfect and hence differential information that characterises all human interactions. Consider just a few examples. Recent research indicates that rational departures of asset values from fundamentals can be sustained given short horizons of agents and differential information (lack of "common knowledge").[25] And those short horizons can be justified on the basis of contractual arrangements that reflect conflicting incentives and differential information between suppliers of funds, on the one hand, and users or managers of those funds, on the other ("principal/agent problems"). The same can be said of the asymmetric nature of booms and busts. For instance, short selling constraints may make positive departures from fundamentals more likely than negative ones,[26] while the natural asymmetries linked to financing constraints and hence balance sheet weakness, together with capital overhangs, could explain the specific characteristics of the busts. And, of course, it is precisely imperfect information that can best explain the presence of such short selling/financing constraints, notably reflecting concerns with counterparty/credit risk, and limits to arbitrage more generally.[27]

For much the same reasons, there is a risk of attaching too high a weight to distorting government intervention as the root cause of financial instability. This is not to deny that, as already noted, the "moral hazard" problem associated with mispriced (explicit or implicit) government guarantees can unwittingly contribute, and often has contributed, to instability. After all, one of the objectives of strengthening the macroprudential orientation of the prudential framework is precisely to reduce the scope of such subsidies. Rather, the point is that both logically and historically the causes of financial instability precede government intervention. Logically, as noted, differential information and distorted incentives are sufficient to generate instability. Indeed, the original notion of moral hazard is linked to this more general imperfect information inherent in economic relationships. And historically, financial instability predates extensive government intervention in the economy.[28] In fact, it was the widespread financial instability of the inter war years that largely prompted the establishment of extensive safety nets and prudential frameworks.[29]

III. From diagnosis to remedies

So much for definitions and diagnosis. But what about policy responses? It is here that question marks find their preferred habitat. Given our state of knowledge, it is at best possible to sketch out broad directions for change rather than to identify concrete proposals.

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[25] See eg Allen and Gale (2000), Allen et al (2003) and Abreu and Brunnermeier (2003). See also Froot et al (1992) for an example of the implications of short horizons for asset pricing in the context of rational speculation.

[26] See, eg Carey (1990).

[27] It is well known that asymmetric information (including ex post non-verifiability by a third party) is essential to explain financing frictions of the kind relevant here; see, eg Hart and Holmström (1988), Gertler (1988), Hart (1995) and Bernanke et al (1999) for surveys of various aspects of what has become a rather fragmented field of inquiry. See also Schleifer and Vishny (1997) on the limits of arbitrage more generally.

[28] See Bordo et al (2001).

[29] One implication of the presence of safety nets is that, by comparison with the historical period when they were less extensive, banking crises may take somewhat longer to emerge, as liquidity constraints would be less binding. This is especially likely where external considerations are less of an issue, as is typically the case in industrial countries. This conjecture seems to be broadly consistent with the evidence in Gorton (1988), who finds that in the pre-Depression era in the United States, crises tended to occur close to the peak of the business cycle, rather than once the downturn was already well under way.

In that spirit, what follows highlights a few key issues. In keeping with the previous analysis, it considers the cross-sectional and time dimensions of risk in turn, although much of the discussion focuses on the time dimension.

The cross-sectional dimension

Three specific questions stand out when considering the cross-sectional dimension of risk. What should be the scope of the prudential framework? How should standards be calibrated? What are the implications of size?

A macroprudential approach suggests that the ***scope*** of the prudential framework should be rather broad. The capacity to intermediate funds and allocate risks, thereby sustaining economic activity, is key (Tsatsaronis (2002)). To varying degrees, all financial institutions perform this function. In fact, markets as well as institutions do so.[30] At the same time, it is still the case that certain institutions, because of their specific function, may be more relevant than others. For instance, the role of "banks" as suppliers of liquidity services of next to last resort implies that financial distress at these institutions may have larger macro economic costs. These characteristics would need to be taken into account too.

For practical purposes, a macroprudential perspective would thus suggest that in assessing vulnerabilities to financially induced macro stress the gaze should be cast widely. The perspective is also broadly consistent with the shift under way towards greater convergence in prudential standards across financial intermediaries.[31]

As regards ***calibration***, at a high level of abstraction the main implication of a macroprudential approach is straightforward. The prudential standards should be calibrated with respect to the marginal contribution of an institution to system-wide macro risk. The approach would make an explicit distinction between the "systematic risk" (common exposure) charge and the "idiosyncratic risk" charge. The latter would be non-zero only to the extent that failure of the institution had macro stress effects, either directly or through knock-on channels.[32]

But how exactly can the decomposition between systematic and idiosyncratic risk be estimated? This is clearly an open question for research. For institutions whose securities are publicly traded, their prices could yield some, albeit noisy, information.[33] For others, balance sheet information, in terms of asset composition or performance, could provide some raw material. But it is too early to tell what the results of such a line of research might be. What we *can* be confident about is that as risk measurement techniques develop, the raw material for inference and aggregation will improve. The New Basel Capital Accord should play a key role in this respect.

The one area where measurement is less of a problem relates to the ***size*** of institutions. *Other things equal*, larger institutions have greater system-wide significance. As such, from a macroprudential perspective they would be subject to tighter prudential standards.[34] This is indeed consistent with the common practice of at least subjecting them to more frequent and intense supervision. But one could easily imagine going one step further. This could involve, for instance, higher capital requirements for any given level of institution-specific risk.[35] In principle, the strengthening of Pillar 2 under the New Capital Accord could be quite helpful here.

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[30] For a discussion of analogies between the two, see, for instance, Borio (2000).

[31] See, for instance, Borio and Filosa (1994).

[32] Interestingly, the weights in the proposed New Capital Accord have been derived from a conceptual model that, for each bank portfolio, assumes a single systematic risk factor, full diversification of the idiosyncratic component of risk and a common correlation across all exposures.

[33] See, for instance, De Nicolo and Kwast (2001) for an attempt to estimate the impact of financial consolidation on systematic risk based on stock price information.

[34] See also the discussion of the implications of mergers on system-wide risk in Tsatsaronis (2002). BIS (2001b) provides a broader analysis of the impact of financial sector consolidation on systemic risk.

[35] Some supervisory authorities have indeed called for such a treatment on systemic grounds. The Swiss banking supervisory agency is a case in point.

The time dimension

It is in the time dimension that the macroprudential perspective comes into its own, not least because of the endogeneity of risk. If the perspective is correct, then it stands to reason that cushions should be built up in upswings so as to be relied upon when the rough times arrive.[36] This would strengthen institutions' ability to weather deteriorating economic conditions, when access to external financing becomes more costly and constrained. Moreover, by leaning against the wind, it could reduce the amplitude of the financial cycle, thereby limiting the risk of financial distress in the first place. In other words, this strategy would add a welcome counterweight to the powerful *procyclical*[37] forces in the system.

The question is: how can this best be done? There are many aspects to this problem. What follows focuses only on four of them. First, how ambitious should we realistically be in seeking to improve risk measurement? Second, given the procyclicality in risk assessments, what could be the implications of the more risk-sensitive New Capital Accord? Third, to what extent can longer horizons help in mitigating biases in risk assessment and stabilising the system? Finally, what is the appropriate division of labour between accounting and prudential norms?

Can the measurement of risk through time be improved?

The choice of strategy to ensure that cushions are built up at the right time depends on views about how far it is realistically possible to improve on the measurement of the time dimension of risk. Consider two views, in increasing order of ambition.

The ***first view*** assumes that it is, in effect, fruitless to try to improve significantly on how risk is measured though time. Judgments about the profile of macro risk are too hard to make.[38] The poor record of forecasters is seen as evidence of this. At the same time, while it may be hard to tell whether the risk of a downturn is higher or lower, it is much easier to tell whether the current state of the economy is above or below previous average experience. The question then, for instance, is *not* whether the boom is sustainable or not, but, rather, whether the economy *is* in a boom.

On this basis, it is simply prudent to take advantage of the favourable conditions to build up cushions as a form of insurance, without *explicitly* taking a stance on the future evolution of the economy. Moreover, what is true for the economy's output is also true for other variables correlated with financial distress, such as asset prices and credit expansion.

Given the scepticism about the ability to measure changes in risk, this view tends to favour relatively simple rule-based adjustments. Many types of policy would seem to fall under this broad heading. One example is Goodhart and Danielsson's (2001) suggestion of relating various prudential norms to loan or asset price growth**.** Another, quite subtle, example is the loan provisioning rule recently introduced by the Spanish supervisory authorities (so-called "statistical provisions"). In this case, yearly provisioning expenses tend to be based on average loan loss experience over past business cycles.[39] More generally, conservative valuation principles, such as valuing assets at the lower of market or book value, could be seen as performing a similar function.

The main advantage of this family of policy options is their simplicity. In addition, once the rule is accepted, there is no issue of the authorities being seen as "outguessing" markets. This would make the rules easier to implement in comparison with discretionary adjustments in prudential tools based on measures of risk, with the authorities inevitably in the defensive against the manifested consensus of market participants. Finally, concerns with possible mistakes in the use of discretion or a limited "credit culture" among market participants would add to their appeal.

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[36] Of course, this should be subject to some absolute minimum, so as to avoid the risk of undue forbearance and limit the scope for "betting-for-survival" behaviour.

[37] Here and in what follows, a variable or type of behaviour is said to be procyclical if its movement is such as to *amplify* financial and business cycles.

[38] This is the view expressed, for instance, by Goodhart and Danielsson (2001).

[39] See Fernández de Lis et al (2001) and Borio and Lowe (2001).

Their main disadvantage is that by *themselves* they would not do much to encourage conscious improvements in risk measurement. As a result, they would also tend to exacerbate incentives to arbitrage them away.[40] Depending on their specific features, they could also be seen as unduly intrusive and blunt. Some of them would clearly not be consistent with the search for a better balance between market and policy-induced discipline.

The ***second view*** argues that it is worth seeking to improve the way we measure risk through time. Statements about changes in risk may well be possible conditional on a richer information set. These could eventually form the basis for judgments about the risk of financially induced macro stress. These judgments in turn could underpin a more articulated policy response, including through discretionary measures. It is worth elaborating on this.

The current efforts to develop indicators of banking crises or, more generally, macroprudential indicators and assessments of financial system vulnerabilities belong to this family of responses. My own reading of the evidence is that we are still a long way from an adequate answer, but that the glass is half full.

Our own research at the BIS tends to confirm this. With Phil Lowe, we have recently begun to explore how far one could predict banking crises in both industrial and emerging market countries on the basis of a very parsimonious approach guided by the stylised features of the financial cycle.[41] We measured the performance of the indicators in terms of the noise-to-signal ratio, following the very useful toolkit applied to currency and banking crises by Kaminsky and Reinhart (1999). We did, however, make a few important modifications. First, we used ex ante information only, as required by policymakers. Second, we focused on cumulative processes, measured in terms of deviations of the key variables from ex ante recursive trends. This was supposed to capture the build-up of vulnerabilities. Third, we looked only at a very limited set of variables: private credit to GDP, real asset prices and investment. Fourth, we calibrated the signal by considering the variables jointly, rather than on a univariate basis. Finally, we allowed for multiple horizons, in the conviction that the precise timing of a crisis is essentially unpredictable.

As a first go, the results were encouraging (Table 2). Over a three-year horizon, close to 60% of the crises could be predicted, and only one in almost 20 observations was incorrectly classified (crisis or non-crisis). Likewise, crying wolf too often, the usual problem, was far less of an issue here. A large part of the improvement resulted from the use of cumulative rather than marginal processes. The credit gap alone, for instance, clearly outperformed exceptionally high growth rates in credit. It could capture around 80% of the crises, with a comparatively low noise-to-signal ratio by the standards of the literature, although at the cost of higher noise by comparison with the multivariate, joint calibration (one in six observations incorrectly classified).

We interpret these results as saying that it should be possible to form judgments about the build-up of vulnerabilities with a *reasonable* degree of comfort. After all, our preliminary analysis could be improved in several directions, in terms of both the definition of variables and techniques. Indeed, more recently in a follow-up study, we showed how the inclusion of a real exchange rate gap helps to improve the results in the case of emerging market countries (Borio and Lowe (2002b)).[42] More generally, the literature on measuring indicators of pending financial macro stress is very much in its infancy.[43] And the information available to policymakers to form a judgment is much richer, and likely to improve over time.[44,45]

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[40] Of course, this depends on the characteristics of the measures. The Spanish rule for loan provisioning, for instance, seems to have been quite successful so far.

[41] See Borio and Lowe (2002a) for details of the approach. Borio and Lowe (2002b) extend the analysis further.

[42] Other improvements could be considered, quite apart from refinements in the statistical methodology. For example, our studies to date could not use real estate prices, because the information available for emerging market countries is too limited. Similarly, the definition of "financial stress" could be refined to capture better the type of episodes that are consistent with macro stress. And, following similar principles, further indicators could be developed tailored to types of financial crises other than those considered here.

[43] Rigorous statistical analysis has largely focused on currency, rather than banking crises; see, for instance, IMF (2002a) for a review, as well as Hawkins and Klau (2000). Likewise, banking supervisors have tended to concentrate their efforts on indicators of individual bank, rather than systemic, failure (Van den Bergh and Sahajwala (2000)). More generally,

Table 2

Indicators of banking crises[1]

Horizon[2]	Private sector credit				Joint credit (4% points) and real asset price[5] (40%) gaps[4]	
	Real credit growth (7%)[3]		Credit gap[4] (4% points)			
	Noise/signal	% crises predicted	Noise/signal	% crises predicted	Noise/signal	% crises predicted
One-year	.54	74	.24	79	.13	42
Two-year	.43	87	.21	79	.08	53
Three-year	.39	89	.20	79	.06	55

[1] Based on a sample of 34 industrial and emerging market countries; annual data 1960-99, including 38 crises. [2] A signal is correct if a crisis takes place in any one of the years included in the horizon ahead (always including the current year). Noise is identified as mistaken predictions within the same horizon. [3] Percentage annual growth rate. [4] A gap is measured as the percentage (point) deviation from an ex ante, recursively calculated Hodrick-Prescott filter. Credit is measured as a ratio to GDP. [5] Equity prices only.

Source: Borio and Lowe (2002a).

The above indicators could give some idea of the *probability* of distress; what about the other key variable, vz the extent of possible losses given distress? Here, macro-stress tests, conceptually analogous to their micro counterparts, could play a role. These would map assumed adverse changes in macro risk factors into losses in the financial system. In recent years, considerable work has been done in this area[46] but, again, much more research is needed to develop acceptable methodologies.

One could then imagine a two-pronged approach. On the one hand, indicators of potential distress could be used to form a judgment about the probability of adverse outcome. These could be complemented by other, perhaps more traditional, measures of macroeconomic risks to the outlook. On the other hand, stress tests could be used to assess the likely damage of an adverse event. The indicators would add "bite" to the stress tests, which could otherwise be discounted too easily. The resulting information could then help to calibrate a prudential response or to adjust micro-based risk measures.

Such a top-down approach to risk measurement would likely reduce the procyclicality of current risk measurement methodologies. Indeed, a review of the methodologies would indicate that these either tend to ignore macroeconomic factors or, to the extent that they do not, they may even incorporate them in a way that could exacerbate procyclical tendencies.

Given space constraints, it is only possible to illustrate the basic point here.[47] Consider three types of methodology: those of rating agencies, banks' internal ratings and full credit risk models.

considerable work has been done trying to lay out a broad set of so-called "macroprudential" indicators. See, for instance, IMF (2002b) and references therein.

[44] Goodhart and Danielsson (2001), while sharing many of the concerns expressed here about the difficulties of measuring risk over time, reaches more pessimistic conclusions. His evidence, however, is based on the predictability of business cycle fluctuations *on the basis of their duration only*. The point here is that his approach is unnecessarily restrictive. Judgments can be conditioned on a broader information set.

[45] Will the indicators continue to perform satisfactorily in the future? As always, there is no such guarantee. For example, efforts made in recent years to improve the infrastructure of the financial systems might reduce the likelihood of distress for any given threshold level. Moreover, learning from post-liberalisation mistakes could well reduce the incidence of crises. At the same time, the historiography of financial crises suggests that the core regularities on which the indicators are based have been so common in the past that they may prove comparatively robust in the future.

[46] The IMF and national central banks have been quite active in this area.

[47] For a more detailed treatment, see, in particular, Lowe (2002), Borio et al (2001), Allen and Saunders (2003) and references therein. See also Berger and Udell (2003) for possible reasons for, and some evidence of, excessive procyclicality in risk assessments.

By design, *rating agencies*' risk assessments tend to be comparatively less sensitive to the business cycle, although downgrades in particular do bunch up in recessions. One way of rationalising this is that they pay special attention to relative risk. Another is to think of agencies as rating companies based on a standardised macro stress scenario, such as a "typical" recession.[48]

Banks' internal rating methodologies vary considerably across institutions. Available evidence is rather limited, but it generally points to a higher degree of procyclicality. This may result from a tendency to adjust credit risk perceptions assuming the continuation of current conditions and to focus on rather short horizons, more in line with the annual accounting cycle. For the quantification of risk, one year is quite common.[49]

Most quantitative credit risk models do not incorporate macro effects. The degree of procyclicality of the corresponding risk assessments arises from the use of rating agencies' and, above all, market inputs, notably share prices and credit spreads. Moreover, further developments of the models could actually *exacerbate* the procyclical properties. For instance, the models so far ignore the positive correlation between the probability of default and loss-given-default, which is at least in part associated with recessions.[50] As with internal ratings, one-year horizons are commonly used.

The New Basel Capital Accord and procyclicality

This procyclicality in risk assessments has attracted considerable attention recently as a result of the proposed revision to the Capital Accord. In its search for greater risk sensitivity, the New Accord implies that, in contrast to previous arrangements, the minimum capital on a given portfolio will change alongside its perceived riskiness, whether measured by external or banks' own internal ratings. The Accord would then result in a much better measurement of cross-sectional or relative risk, as it was originally designed to do. But it might have unintended consequences with respect to the time dimension of risk.[51]

There is indeed some preliminary empirical evidence to suggest that minimum capital requirements will be more procyclical than under current arrangements. In particular, they could increase considerably in bad times. The size of the effect depends very much on the type of risk assessment methodology used and the option adopted. The available evidence, however, suggests that swings of the order of 30% in the course of a normal business cycle may be possible. As indicated by evidence from Mexico gathered by Segoviano and Lowe (2002), these could be greater in case of larger business cycle fluctuations accompanied by financial distress (Graph 2).[52]

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[48] This is the formalisation found in Carey (2000). Rating agencies' risk assessments are sometimes characterised as "through-the-cycle" and contrasted with the "point-in-time" nature of banks' internal credit rating systems or model-based measures; see in particular, Amato and Furfine (2003) for an empirical examination of the degree of procyclicality in ratings. See also Cantor (2002), who provides a somewhat different characterisation of rating agencies' ratings.

[49] Note that, strictly speaking, there is a distinction between the horizon for the *assessment* of risk and that for its *quantification*. The former includes the period ahead considered in the evaluation of the risk, the latter the period used for the risk metric. The distinction is clearest if one considers an instrument that is marked to market. Events that might occur over the residual maturity of the instrument affect its current value and its future variability (the assessment horizon). But the holder might just be interested in potential changes in this value over a possibly shorter horizon over which it plans to hold the instrument. This determines the quantification horizon for risk. These issues are further discussed below.

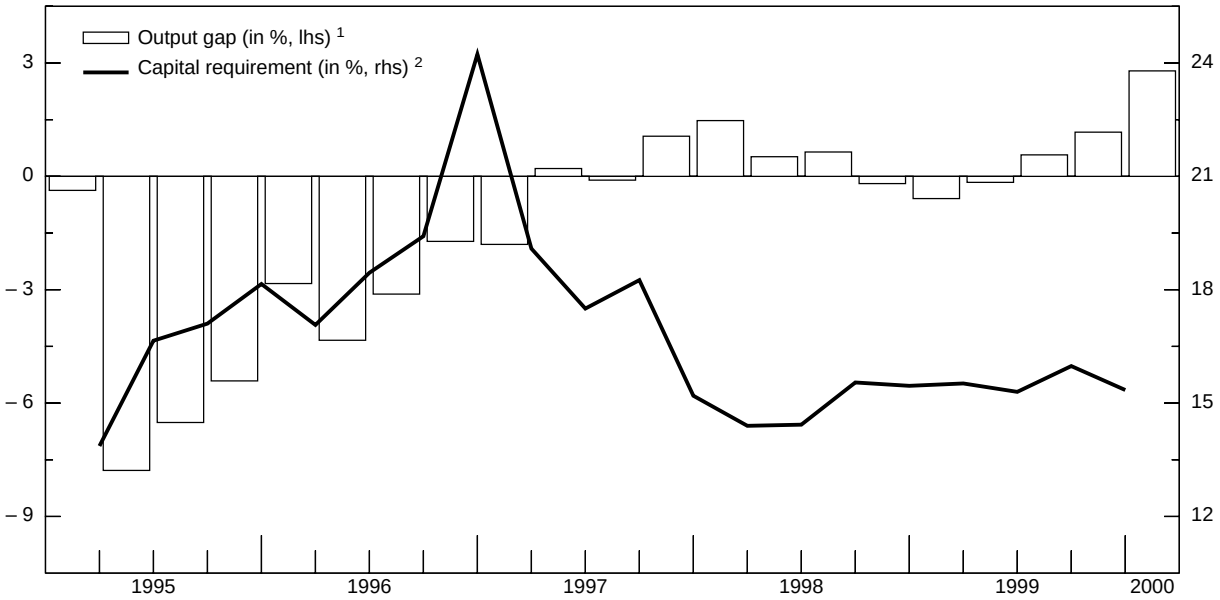
[50] This positive correlation in the time dimension has recently been documented by Altman et al (2002).

[51] See, for instance, Danielsson et al (2001) and ECB (2001). For the provisions of the Accord, see BCBS (2001a) and (2001b). See also BIS (2001a). Note that concerns with the procyclicality of capital standards had already been expressed in relation to the current Accord ((Goodhart (1995), Blum and Hellwig (1995)). These, however, had little to do with time-varying risk perceptions. They related simply to the fact that higher losses in recessions would make capital requirements more binding. The evidence on whether such minimum requirements have led to "credit crunches" is reviewed in BCBS (1999).

[52] See, in addition, Jordan et al (2002) and Catarineu-Rabell et al (2002). Note that in November 2001 the Basel Committee decided to reduce the steepness of the risk curve linking the capital requirement weights to the probability of default partly with a view to dampening the cyclical variability in minimum requirements. This response deals with a time dimension issue through changes in cross-sectional calibration. BCBS (2001b).

Graph 2

Mexican output gap and hypothetical IRB capital requirements



1 Hodrick Prescott filter applied (BIS). 2 Based on a uniform internal rating system used by banks. The system has been devised by the supervisory authorities.

Source: Segoviano and Lowe (2002).

Even so, regardless of what happens to the *minimum* requirements, the more important question is whether capital cushions *as a whole* and risk measurement generally will be more procyclical under the new Accord. Here, one can point to a number of factors that could alleviate or even fully offset the additional procyclical influences. Think of these factors as another instance of the famous "Lucas critique": behaviour changes as the regime changes. The previous evidence may be partly misleading. There are at least two reasons for this.[53]

First, the Accord is helping to spread and "hardwire" an historic improvement in risk measurement and management culture. The level of the debate has risen immensely over the last couple of years. And awareness of the potential adverse implications of unduly procyclical risk assessments has risen pari passu, both among market participants and supervisors. More generally, better risk management means that problems can be identified and corrected earlier.

Second, Pillars 2 and 3 can underpin this shift. Greater disclosure means that markets may become less tolerant and more suspicious of risk assessments that move a lot over time and lead to substantial upgrades in good times. And supervisors, if they so wished, could rely on the strengthened supervisory review powers to induce greater prudence in risk assessments and/or an increase in capital cushions above the Pillar 1 minima. As advocated by the Basel Committee, stress-testing the credit exposures can be an invaluable tool here.

The bottom line is that we do not quite know the answer. At the same time, there are reasons for cautious optimism. We will need to watch developments closely. But in doing so, we should never lose sight of the fact that the positive contribution to financial stability of the New Accord goes well beyond its implications for procyclicality.

Longer horizons and the role of maturity

Encouraging *longer horizons* for risk assessment could help to limit procyclicality. In particular, it stands to reason that the longer the horizon over which agents chart the future, the less likely it is that they could continue to anticipate the persistence of current conditions. In jargon, lengthening the

[53] See, in particular, the discussion in BIS (2002a) and Greenspan (2002).

assessment horizon is likely to strengthen any mean-reverting tendencies in risk perceptions and hence prudence. We know, for instance, that over longer horizons equity returns mean-revert while over shorter ones they show approximate random walk behaviour.[54] Recall also the famous paper by Frankel and Froot (1990), which had found similar properties in foreign exchange traders' expectations.[55]

The *maturity* of credit exposures implicit in contracts is important here. The residual maturity determines the time horizon over which events could affect the value of the contract. Longer maturities therefore encourage longer assessment horizons. And they could arguably limit the risk of generalised withdrawal of funds or credit crunches at times of stress. Think, for example, of the risks implied by the short maturity of external debt in the case of emerging market countries. Here again, we see the tension between a micro- and a macroprudential approach. *Other things equal*, from the perspective of an individual institution, the longer the maturity of its exposure, the higher the credit risk faced. But for an economy in the aggregate, it is by no means clear that shorter maturities would reduce overall credit risk. What may make sense from the perspective of an individual institution may also have unintended consequences in the aggregate. The calibration of prudential standards would need to take these effects into account as well.[56]

Longer horizons may also be relevant for *capital* decisions. Conceptually, the risk quantification horizon for capital decisions corresponds to the time required to take remedial action, either by replenishing capital or shedding risk. A macroprudential perspective would explicitly incorporate the fact that, at times of generalised stress, remedial action would necessarily be harder and hence take longer, not least owing to the endogenous increase in risk from attempts to manage exposures. The one-year horizon adopted in current practices may well be too short. In fact, empirical evidence tends to support this conclusion.[57]

The relationship between accounting and prudential norms

These considerations point to the *broader relationship between accounting valuations*, on the one hand, and *prudential norms*, on the other. The impact of accounting on financial stability should not be underestimated. It is widely recognised that differences in valuation methodologies can have first-order effects on measures of net worth and income. They can be as important as the specification of the capital standards that should apply to them. And accounting conventions can have a major impact on firms' internal risk management practices.[58] Deficiencies in accounting practices, for instance, have played a role in many of the financial crises seen over the last two decades. Even so, for a number of objective reasons, valuation issues had, until recently, received less attention.

A number of developments have brought such issues into the limelight. First, the New Basel Accord has forced a reconsideration of the link between expected and unexpected losses, loan provisioning, capital and pricing. Second, the debate on appropriate loan provisioning has come to the fore. There is a fairly broad consensus that more forward-looking *provisioning* could help to bring accounting valuations closer into line with economic valuations and could eliminate a source of artificial procyclicality. In particular, waiting for default to be highly probable before a provision can be made fails to recognise deteriorations in credit quality short of probable default.[59] But there is no agreement on how best to strengthen the forward-looking element. Finally, and more generally, proposals for fair value accounting have stirred a heated debate.[60]

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[54] Fama and French (1988).

[55] This issue is explored more thoroughly in Borio et al (2001).

[56] These issues are discussed in Lowe (2002).

[57] See Barakova and Carey (2002).

[58] Enron's internal risk management manual is quite telling here: "Reported earnings follow the rules and principles of accounting. The results do not always create measures consistent with underlying economics. However, corporate management's performance is generally measured by accounting income, not underlying economics. *Risk management strategies are therefore directed at accounting rather than economic performance*" (italics added). See Crockett (2002) for an elaboration on these issues.

[59] The changes incorporated in IAS39 go in this direction.

[60] These issues are discussed in Borio et al (2001), Borio and Lowe (2001), BIS (2002a) and Crockett (2002).

A key question is whether cushions against risk and uncertainties should be built through "conservative", as opposed to "true and fair", valuations or through other means, such as specific prudential norms like minimum capital requirements. In the past, reliance on conservative valuations has been quite common. More recently, the shift towards "true and fair" valuations has reduced the scope of such mechanisms. Looking forward, one concern with fair value accounting is precisely that greater reliance on market values could have destabilising effects whenever asset price misalignments are at the origin of financial instability. In the process, it might also increase the procyclicality of the financial system.

The issue of the relationship and roles of accounting and prudential norms will have to be addressed. On the one hand, conservative valuations may be a simple and effective means of introducing cushions into the system. On the other hand, it might be argued that a sharper distinction between the roles of accounting and prudential norms would increase transparency and clarify the relationship between the different goals and means to attain them. This could help reduce the tension between the two perspectives and also speed up progress towards convergence on agreed accounting principles. Clearly, this is an under-researched area that deserves greater attention.[61]

Conclusion

Tennyson once said: "Words, like nature, half reveal and half conceal the soul within". But, one could add, while we *cannot* choose what nature is like, we *can* choose what words mean.

This essay has argued that two sharp, intentionally polarised definitions of the "macroprudential" and "microprudential" perspectives are helpful in bringing out the two souls that inevitably coexist in the current regulatory and supervisory arrangements. And that they are useful in highlighting the complementarities, as well as tensions, between the two approaches to securing financial stability. The key thesis developed is that strengthening further the macroprudential orientation of the framework could promote the achievement of this goal.[62]

Strengthening the macroprudential orientation would, in some respects, bring the framework closer to its origin, when the main concern was the disruption to the economic life of a country brought about by *generalised* financial distress. It would take it somewhat away from the pursuit of narrowly interpreted depositor protection objectives while at the same time helping to achieve them in a more meaningful way. And it holds the promise of bringing realistic objectives into closer alignment with the means to attain them.

If this diagnosis is shared, then there is still plenty of work ahead. The agenda is a full one, both for researchers and policymakers. For researchers, there is quite a lot to be done analytically and empirically to sharpen the macroprudential perspective, to better understand what it can tell us about the dynamics of risk and financial instability, and to help develop the tools to address them. For policymakers, the task is to turn the desirable into the feasible, to distinguish the feasible from the impracticable, and to make progress in implementing the shift. Success will also depend on the ability and willingness of market participants to incorporate more meaningfully the lessons of a macroprudential perspective into their own assessment of risk.

In some respects, the search for appropriate policy responses to financial instability resembles the state of monetary policy in the early 1970s. Now, as then, both researchers and policymakers are beginning to sharpen their understanding of the "enemy". Now, as then, they are groping for solutions. Now, as then, there is no reason to believe that, eventually, their endeavours will not be successful.

In fact, strengthening the macroprudential orientation of the policy framework will put a premium on closer cooperation between supervisory authorities and central banks.[63] This is true regardless of the specific allocation of supervisory responsibilities. It reflects the processes that generate financial instability and its consequences for the macroeconomy. As argued elsewhere, the relationship

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[61] Aspects of these issues are discussed in Borio and Lowe (2001) and Crockett (2002).

[62] Recently, Padoa-Schioppa (2002) too has emphasised the importance of the macroprudential dimension.

[63] For a focused elaboration on this point, see Crockett (2001b).

between the monetary and financial regimes deserves particular attention.[64] There is still a lot we need to learn about how monetary policy interacts with prudential policies and how best to make the two mutually supportive. We need much more research in this area too. But this, as they say, is another story.

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