

# Macro-Prudential Regulation

*ECMI Commentary No. 25/4 August 2009*

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There is a widely held view that the current financial crisis resulted from an insufficient reach of regulation and that the solution is to take existing regulation and spread it without gaps across institutions and jurisdictions. If this were to be the main policy response, it would be a mistake for several reasons, the most important of which is that at the heart of the crisis lay highly regulated institutions in sophisticated jurisdictions—Northern Rock, IKB, Fortis, Royal Bank of Scotland, UBS, Citigroup. If there were no mortgage fraud, no tax secrecy, and no conflicts of interest, a crisis would still have occurred. And while risk did shift outside the capital adequacy regime, the special investment vehicles were not secret and supervisors had the discretion to look at how regulated institutions were managing risks and to respond if necessary.

This is not the first international banking crisis the world has seen. Some estimates put it as the eighty-fifth.<sup>1</sup> If crises keep repeating themselves, it seems reasonable to argue that policymakers need to carefully consider what they are doing and not just “double-up”. It also means that policymakers should not superficially react to the characters and colors of the current crisis. The last eighty-four crises occurred without credit default swaps and special investment vehicles. The last eighty-something had nothing to do with credit ratings. The solution to the crisis is not more regulation, though more comprehensive regulation may be required in some areas. Instead, it is better regulation—in particular, regulation with a greater macro-prudential orientation, as recommended by numerous recent official reports.<sup>2</sup>

## **What is macro-prudential regulation?**

It seems banal today to point out that the reason we try to prevent financial crises is that the costs to society are invariably enormous and exceed the private cost to individual financial institutions. We regulate to internalize these externalities in the behavior of such institutions. One of the main tools regulators use to do this is capital adequacy requirements. But the current approach to capital adequacy is too narrow. Capital

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<sup>1</sup> For a discussion on the history of financial crises, see Reinhart and Rogoff (2008).

<sup>2</sup> These include the April 2 communiqué of the G-20 leaders, the Turner Review (FSA 2009), the G-30 report (2009), the de Larosiere Group report (2009), the UN Commission of Experts recommendations (2009), and the 11th Geneva Report (Brunnermeier and others, 2009).

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adequacy levels are set on the implicit assumption that we can make the system as a whole safe by ensuring that individual banks are safe. This represents a fallacy of composition. In trying to make themselves safer, banks and other highly leveraged financial intermediaries can behave in ways that collectively undermine the system. This is in essence what differentiates macro-prudential from micro-prudential concerns.

Here is an example of macro-prudential concerns. Selling an asset when it appears to be risky may be considered a prudent response for an individual bank and is supported by much current regulation. But if many banks do this, the asset price will collapse, forcing risk-averse institutions to sell more and leading to general declines in asset prices, higher correlations and volatility across markets, spiraling losses, and collapsing liquidity. Micro-prudential behavior can cause or worsen systemic risks. A macro-prudential approach to an increase in risk is to consider systemic behavior in the management of that risk: who should hold it, and do they have the incentive to do so? If it is liquidity risk, is it in the interests of the system if all institutions, regardless of their liquidity conditions, sell the same asset at the same time? Risk in a financial system is more than an aggregation of risks in individual institutions; it is also about endogenous risks that arise as a result of the collective behavior of institutions.

Macro-prudential regulation concerns itself with the stability of the financial system as a whole. By contrast, micro-prudential regulation, consisting of such measures as the certification of those working in the financial sector and rules on how financial institutions operate, concerns itself with the stability of individual entities and the protection of individuals. Micro-prudential regulation examines the responses of an individual bank to exogenous risks. By construction, it does not incorporate endogenous risk. It also ignores the systemic importance of individual institutions resulting from such factors as size, degree of leverage, and interconnectedness with the rest of the system.

The existing framework of banking regulation was insufficiently macro-prudential and had been recognized as such by commentators for some time (see Borio 2005; Borio and White 2004; and Persaud 2000). Moreover, the emphasis on micro-prudential regulation may have contributed to the buildup of some macro risks.

Through many avenues, some regulatory and some not, often in the name of prudence, transparency, and sensitivity to risk, the growing influence of current market prices has intensified homogeneous behavior in financial systems. These avenues include mark-to-market valuation of assets; regulator-mandated market-based measures of risk, such as the use of credit spreads in internal credit models or price volatility in market risk models; and the increasing use of credit ratings, where the signals are slower moving but positively correlated with financial markets. Where measured risk is based on market prices, or on variables correlated with market prices, it can contribute to systemic risk as market participants herd into areas that appear to be safe.<sup>3</sup> And measured risk can be highly procyclical, because it falls in the buildup to booms and rises in volatile busts.

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<sup>3</sup> See Persaud (2000) for a discussion on how, through the financial sector's use of value-at-risk models, "the observation of safety creates risk and the observation of risk creates safety". The late economist Hyman Minsky also argued in more general terms, and long before the advent of value-at-risk models, that risks are born in periods of stability.

## **Macro-prudential regulation and the cycle**

The economic cycle is a major source of homogeneous behavior, so addressing it is a critical macro-prudential concern. In the up phase of the cycle, price-based measures of asset values rise, price-based measures of risk fall, and competition to increase bank profits grows. Most financial institutions spontaneously respond by expanding their balance sheets to take advantage of the fixed costs of banking franchises and regulation; trying to lower the cost of funding by using short-term funding from money markets; and increasing leverage. Those that do not do so are seen as under leveraging their equity and are punished by stock markets. In the more prosaic words of Chuck Prince, former CEO of Citigroup, during an interview with the Financial Times in July 2007, “when the music is playing, you have to get up and dance.” By contrast, when the boom ends, asset prices begin to fall and short-term funding to institutions with impaired and uncertain assets or high leverage dries up. Forced sales of assets drive up their measured risk, and the boom inevitably turns to bust.

One of the key lessons of this crisis is that market discipline is little defense against the macro-prudential risks that come with the economic cycle. The institutions that have been most resilient to the crisis, such as HSBC and J.P. Morgan, had lower equity “ratings” (lower price-earnings ratios) than those that proved to be less resilient, such as Northern Rock, Bear Stearns, Fortis, and Lehman Brothers. Market discipline has an important role to play in the efficiency of the financial sector, but it cannot be on the front line of defense against crises.

One reason that market discipline was seen as such an important pillar in the pre-crisis approach to banking regulation was the implicit model that regulators had in mind: financial crashes occur randomly as a result of a bad institution failing and that failure becomes systemic. The historical experience is rather different. Crashes follow booms. In the boom almost all financial institutions look good, and in the bust almost all look bad. Differentiation is poor. The current crisis is another instance of this all-too-familiar cycle. But if crises repeat themselves and follow booms, banning the products, players, and jurisdictions that were merely the symptoms of the latest boom will do little to prevent the next one.

Moreover, the notion that some financial products are safe and some are not, and that the use of unsafe products is the problem, also looks suspect in a boom-bust world. The booms are often a result of things appearing to be safer than they are. Securitization was viewed as a way of making banks safer. Diversified portfolios of subprime mortgages were viewed as having low delinquency rates. Micro-prudential regulation is necessary to weed out the truly reckless institutions and behavior. But it needs to be supplemented with macro-prudential regulation aimed in part at acting as a countervailing force against the decline of measured risk in a boom (and thus excessive levels and interconnectivity of risk taking) and against the rise of measured risk in the subsequent collapse.

Supervisors have plenty of discretion, but they find it hard to use because of the politics of booms. Almost everyone wants a boom to last. Politicians want to reap electoral benefit from the sense of well-being and prosperity during a boom. Policy officials convince themselves, and try to convince others, that the boom is not an unsustainable credit binge but the positive result of structural reforms that they have put into place. Booms have social benefits. They are associated with a higher appetite for risk and a perception that risks have fallen, and this often means greater access to finance for the previously unbanked and underinsured. Booms are not quite a conspiracy of silence, but

there are few who gain from their early demise. So booms tend to be explained away, excused, and accommodated, allowing them to grow larger and larger and thus to cause more damage when they eventually collapse.

### ***Countercyclical charges and buffers***

In light of the observations above, there is a growing consensus around three ideas: Capital requirements need to have a countercyclical element in order to, in the words of the April 2 G-20 communiqué, “dampen rather than amplify the financial and economic cycle” by “requiring buffers of resources to be built up in good times.” There should be greater emphasis on rules rather than supervisory discretion to counterbalance the political pressures on supervisors. And these rules should include leverage limits and liquidity buffers.

The references in the G-20 communiqué echo a statement by the Basel Committee on Banking Supervision following its March 2009 meeting, recommending the “introduction of standards to promote the buildup of capital buffers that can be drawn down in periods of stress.” These statements by the G-20 and the Basel Committee, coupled with similar conclusions by other official reports, suggest that the argument in favor of macro-prudential regulation has been won. But how countercyclical capital charges and liquidity buffers are to be implemented has not yet been addressed in great detail. Given the politics of booms, the “how” is almost as important as the “whether.”

In practical terms, Goodhart and Persaud have recommended that regulators increase the existing or base capital adequacy requirements (based on an assessment of inherent risks) by two multiples calculated using a few simple, transparent rules.<sup>4</sup>

The first multiple would be a function of the growth of credit and leverage. Regulators should meet with monetary policy officials (where they are separate) in a financial stability committee. This meeting would produce a forecast of the growth of aggregate bank assets that is consistent with the central bank’s target for inflation (or other macroeconomic nominal target). The forecast would have a reasonable band around it reflecting uncertainty. If a bank’s assets grow above this band, the bank would have to put aside a higher multiple of its capital for this new lending. If its assets grow less than the lower bound, it may put aside a lower multiple.

For example, suppose that the financial stability committee concluded that growth in aggregate bank assets of between 7.5 percent and 12.5 percent was consistent with its inflation target of 3 percent. Growth in a bank’s assets by 25 percent, or twice the upper range, may lead to a doubling of the minimum capital adequacy level from 8 percent to 16 percent of risk-weighted assets. A related approach is to have one minimum capital adequacy requirement for “bad” times and one that is twice that level for “good” times, with good and bad times being determined by bank profitability. Of course it is impossible to ascertain whether these capital levels would have made the system safe, but the consensus today is that they would have at least made it safer.

Financial stability committees exist in many countries. But they generally work poorly because their deliberations have no consequence. Requiring such committees to agree on a sustainable level of growth in bank assets could make their work more penetrating and action oriented.

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<sup>4</sup> The original ideas were published in Goodhart and Persaud (2008a, b) and expanded in Brunnermeier and others (2009).

The second multiple on capital requirements would be related to the mismatch in the maturity of bank assets and liabilities. One significant lesson of the crisis is that the risk of an asset is determined largely by the maturity of its funding. Northern Rock and other casualties of the crash might well have survived with the same assets if the average maturity of their funding had been longer. The liquidity of banks' assets has fallen far more than the credit quality of those assets.

If regulators make little distinction on how assets are funded, however, financial institutions will rely on cheaper, short-term funding, which increases systemic fragility and interconnectedness. This private incentive to create systemic risk can be offset through new capital or reserve requirements. It is partly this notion that the G-20 communiqué refers to when stating that the G-20 leaders have agreed to introduce measures "to reduce the reliance on inappropriately risky sources of funding." Liquidity buffers, with their size related to maturity mismatches between assets and liabilities, would have similar effect. But once again there is little discussion of methodology and implementation. Measuring the true maturity of bank assets and liabilities is not a straightforward exercise.

In the framework set out in the Geneva Report (Brunnermeier and others 2009), assets that cannot be posted at the central bank for liquidity can be assumed to have a minimum maturity of two years or more. If a pool of these assets was funded by a pool of two-year term deposits, there would be no liquidity risk and no liquidity charge. But if the pool of funding had a maturity of one month and so had to be rolled over every month, the liquidity multiple on the base capital charge would be near its maximum—say two, so the minimum capital adequacy requirement would rise from 8 percent to 16 percent.

In a boom in which the first countercyclical multiple is also two, the final capital adequacy requirement would be 32 percent of risk-weighted assets (8 percent  $\times$  2  $\times$  2). Liquidity multiples would make lending costlier, since banks traditionally fund themselves short and lend long. But the liquidity multiples would give banks an incentive to find longer-term funding, and where they cannot do so, a liquidity buffer or liquidity reserve that could be drawn down in times of stress would buy time for institutions to deal with a liquidity problem.

### ***Can the cycle be measured?***

Many people, most notably former U.S. Federal Reserve Chairman Alan Greenspan, voice the concern that it is very hard to know when we are in a boom. Of course, measuring the cycle is what inflation-targeting central banks do on a daily basis. But this misses the point a little. If the purpose of countercyclical capital charges were to end boom-bust cycles, we would need to be more confident about the calibration of booms than we are today. But if the purpose is to lean against the wind, our calibrations can be less precise.

Recall that without countercyclical charges, the natural inclination in a boom is to lend even more because measured risks fall. The pre-crisis regulatory approach took the economic cycle and amplified it. The goal instead should be to moderate the worst excesses of the cycle, not to kill it. Indeed, the cycle is an important source of creative destruction in our economic system.

### ***Valuation and mark-to-funding accounting***

Many commentators consider accounting issues to be central in the crisis. They argue that the use of fair-value accounting has added to the spiral of sales. But suspending fair-value accounting is not helpful in an environment made worse by uncertainty. Instead, financial institutions should complement mark-to-market accounting with mark-to-funding valuations (see Brunnermeier and others 2009).

Under mark-to-funding valuations there are essentially two alternative prices for an asset: today's market price and the discounted present value of the future earnings stream. In normal times these two prices are nearly the same. But in a liquidity crisis the market price falls substantially below the present value. If an institution has short-term funding, the realistic price to use is the market price. If it has long-term funding, the present-value price is a better measure of the risks faced by the institution. Under a mark-to-funding accounting framework a weighted average of the market price and present-value price would be used whose weights would depend on the weighted average maturity of the institution's funding. The combination of liquidity charges and mark-to-funding value accounting would create incentives for institutions to seek longer-term funding and would encourage a tendency for illiquid assets to be owned by institutions with longer-term funding.

At first sight, mark-to-funding would not appear to alleviate the problem facing banks today—in fact, it could make matters worse—because they have short-term funding. But this proposal would have had two ameliorating effects in the crisis. First, many of the bank-owned special investment vehicles that managed assets that were still performing from a credit point of view, but had become highly illiquid, had long-term funding. In the absence of fair-value accounting standards, they would not have joined the selling frenzy that compounded the crisis. Second, without the mark-to-market volatility, institutions with long-term funding would have been more willing to buy these assets. That would have provided greater price support, limiting the spiral of losses that endangered so many banking institutions.

### ***Compensation***

In the G-20 communiqué and elsewhere, great attention is placed on dealing with the incentives of individual bankers and traders. However, there are clear limits to how much governments should be involved in private firms' decisions on executive pay. While measures to lengthen bankers' horizons are necessary, greater hopes should be placed in macro-prudential regulation pushing banks to develop incentive packages that better promote through-the-cycle behavior. If that failed, however, regulators should certainly do more to address the important issue of incentives.

### ***Macro-prudential regulation beyond the cycle***

The other dimension of macro-prudential regulation is the cross-sectional one – namely, how to manage the buildup of risks arising from the structure of the financial system.

### ***Risk assignment***

Requiring the banking system to hold more capital on average will not improve the resilience of the financial system as a whole unless there is also a better match of risk taking to risk capacity. Indeed, piling up capital requirements may act as an anticompetitive barrier, reinforcing the specter of a few banks holding a government hostage because they are too big to fail.

Micro-prudential regulation was often accompanied by a misguided view of risk as an absolute, constant property of an asset that can be measured, sliced, diced, and transferred. This is an elegant view of risk and has the merit of allowing banks to build highly complex valuation models and to sell highly complex risk management products to handle and distribute risk. But it is also an artificial construct that has little bearing on the nature of risk.

In reality, there is not one constant risk. The three broad financial risks—credit risk, liquidity risk, and market risk—are very different. Moreover, the potential spillover risk from someone holding an asset depends as much on who is holding the asset as on what it is. Different holders have different capacities for different risks. The distinction between “safe” and “risky” assets is deceptive: one can do a lot of damage with a simple mortgage, for example.

The capacity for holding a risk is best assessed by considering how that risk is hedged. Liquidity risk—the risk that an immediate sale would lead to a large discount in the price—is best hedged over time and is best held by institutions that do not need to respond to an immediate fall in price. A bank funded with short-term money market deposits has little capacity for liquidity risk. Credit risk—the risk that someone holding a loan will default—is not hedged by having more time for the default to happen but by having offsetting credit risks. Banks, with access to a wide range of credits, have a far greater capacity than most to diversify and hedge credit risks.

The way to reduce systemic risk is to encourage individual risks to flow to where there is a capacity for them. Unintentionally, much micro-prudential regulation did the opposite. By not requiring firms to put aside capital for maturity mismatches and by encouraging mark-to-market valuation and daily risk management of assets by everyone, regulators encouraged liquidity risk to flow to banks even though they had little capacity for it. By requiring banks to hold capital against credit risks, regulators encouraged credit risk to flow to those that were seeking the extra yield, were not required to set aside capital for credit risks, and had limited capacity to hedge that risk. No reasonable amount of capital can remedy a system that inadvertently leads to risk-bearing assets being held by those without a capacity to hold them.

What can regulators do? They need to differentiate institutions less by what they are called and more by how they are funded. They should require more capital to be set aside for risks where there is no natural hedging capacity. This will draw risks to where they can be best absorbed. They also must work to make value accounting and risk management techniques sensitive to funding and risk capacity. Instead, under the current system, the natural risk absorbers behave like risk traders, selling and buying when everyone else is doing so.

Capital requirements encouraging those with a capacity to absorb a type of risk to hold that risk not only will make the system safer without destroying the risk taking that is vital for economic prosperity; they also will introduce new players with risk capacities. This would both strengthen the resilience of the financial system and reduce our dependence in a crisis on a few banks that appeared to be well capitalized during the previous boom.

### ***Systemic institutions***

Not all financial institutions pose systemic risks. Regulation should acknowledge that some banks are systemically important, and others less so. In each country supervisors establish a list of systemically important institutions that receive closer scrutiny and

require greater containment of behavior. Critical factors that determine systemic importance for an institution, instrument, or trade are size of exposures, especially with respect to the core banking system and retail consumers; degree of leverage and maturity mismatches; and correlation or interconnectivity with the financial system.

In the past, interconnectivity has been understood to include issues such as payment and settlement systems, and these remain vital. Today, interconnectivity may also include institutions that behave in a highly correlated manner even if individually they appear small relative to the size of the financial system.

Goodhart and Persaud, as members of the UN Commission of Experts on Reforms of the International Monetary and Financial System, have urged the commission to recommend establishing a list of systemically important instruments. And where instruments are declared systemically important because of their volume, link to leverage, or interconnectivity, they recommend requiring that the instruments be registered and, where appropriate, exchange traded and centrally cleared.

### **Host and home country regulation**

A gathering view is that financial institutions are global and so financial regulation needs to be global. But reality does not rhyme so easily. The crisis would not have been averted by more international meetings, and it has taught us that there is much that needs to be done at the national level to strengthen regulation. Countercyclical and liquidity charges cannot be set or implemented globally but need to be handled nationally in accordance with national cycles.

Although there is a clear need for cross-border sharing of information and coordination of regulatory actions and principles (particularly in micro-prudential regulation), the setting of capital rules and banking supervision is likely to switch back from “home country” to “host country.” This should not be resisted because it would have two additional benefits, particularly for emerging economies. First, if foreign banks were required to set up their local presence as independent subsidiaries that could withstand the default of an international parent, it would reduce exposure to lax jurisdictions more effectively than trying to force everyone to follow a standard that could be inappropriate and would in any case be enforced with different degrees of intensity. Second, nationally set countercyclical charges could give common-currency areas or countries with fixed or managed exchange rates a much-needed additional policy instrument—one that could provide a more differentiated response than a single interest rate could to a boom in one member state and deflation in another. This policy instrument may also be important in emerging economies, where, perhaps as a result of the absence of developed bond and currency markets, interest rates are not an effective regulator of the economic cycle.

### **Conclusion**

Warren Buffett famously remarked that you see who is swimming naked only when the tide runs out. By this, he probably means that while fraud and unethical practices are going on all the time, they become visible only when the veil of rising market prices is removed. They are not the cause of the tide going out; they are merely revealed by it. We must continue to clamp down on fraud and ethical abuses and promote transparency, but this is not enough to avoid crises. We cannot avoid crises without avoiding the booms—booms that are always underpinned by a good story explaining why it is prudent for individual institutions to lend more. Micro-prudential regulation is

not enough; it must be supplemented by macro-prudential regulation that catches the systemic consequences of all institutions acting in a similar manner. While we cannot hope to prevent crises, we can perhaps make them fewer and milder by adopting and implementing better regulation—in particular, more macro-prudential regulation.

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European capital markets have experienced rapid growth in recent years, corresponding to the gradual shift away from relationship banking as a source of funding and at the same time, have had to absorb and implement the massive output of EU-level regulation required to create a single market for financial services. These developments, combined with the immense challenges presented European financial institutions by the globalisation of financial markets, highlight the importance of an independent entity to undertake and disseminate research on European capital markets.

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