

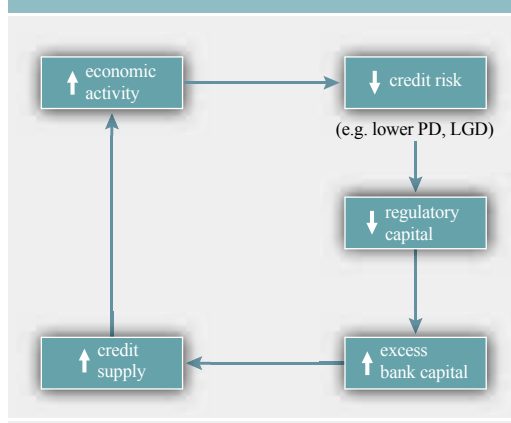
C IS BASEL II PRO-CYCLICAL? A SELECTED REVIEW OF THE LITERATURE

The purpose of this special feature is to review the ongoing academic debate on the potential pro-cyclical effects of bank capital regulation under Basel II, as well as the initiatives undertaken and new proposals put forward to reduce such potential effects. The main conclusions that seem to emerge are fourfold. First, based on simulation exercises, Basel II may increase the volatility of bank capital requirements over the business cycle. Second, available empirical microeconomic evidence on the relationship between bank capital and the credit supply suggests that bank lending may become more cyclical with Basel II, but mostly as far as undercapitalised and illiquid banks are concerned. Hence, at the aggregate level, the extent to which Basel II may amplify the business cycle depends on the degree of undercapitalisation and access to liquidity of the banking sector as a whole. Third, given the data limitation and identification problems, it is still too early to precisely assess whether or not Basel II has affected the business cycle in the countries where it is already implemented. Fourth, while there seems to be a view among academics that Basel II, as it currently exists, may not be adequately designed to cope with all sources of risks in the financial system, financial regulatory authorities have recently been discussing a comprehensive set of measures to enhance the Basel II framework with the aim to contain leverage and promote the build-up of counter-cyclical capital buffers in the banking sector.

INTRODUCTION

In the discussion on the impact of the revised regulatory framework for capital adequacy (Basel II), the potential for an amplified pro-cyclicality in the financial system and the economy as a whole has been a major source of concern. In economic downturns, credit risk, measured by the borrower's probability of default (PD) and loss given default (LGD), would be high, as would capital requirements (now tied more closely to risk than under a

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“flat-rate” capital requirements framework such as Basel I).¹ Banks would therefore face higher capital needs, at a time when (i) write-offs on defaulted loans reduce their profits and impair their capacity to build up reserves and (ii) raising capital is expensive due to both the general depreciation of assets and the increasing aggregate demand for capital. The combination of higher capital requirements and the difficulty of raising new capital when it is most needed could induce banks to reduce credit to firms and households, and eventually amplify the downturn. Conversely, during an economic upturn, banks holding excess capital would face lower capital needs (for the same risk exposure), expand credit further and potentially fuel a credit-led boom (see the figure above).

Under the assumption that banks play a specific role in the economy and that the bank credit supply affects economic activity, risk-based capital requirements would work to amplify the business cycle if two conditions are met. First, capital requirements would need to increase

¹ It should be noted, however, that, according to Basel II, banks should apply “through-the-cycle” PDs and are required to operate with “downturn LGDs”, which should be less sensitive to GDP fluctuations than the real LGDs. In addition, only banks that apply the advanced internal-rating-based (IRB) approach use models to compute the LDGs. In the foundation IRB approach, the LGDs are exogenously imposed by the supervisor (with the exception of retail exposures), and should therefore be stickier than in the advanced IRB approach.

in economic downturns and decline in upturns (the so-called “pro-cyclicality” of regulatory capital). Second, credit supply would need to be inversely related to capital requirements (the so-called “bank capital channel”).

SIMULATION EXERCISES SUGGEST CAPITAL REQUIREMENTS MAY BE MORE CYCLICAL UNDER BASEL II

Based on simulation exercises, there is a general consensus in the academic literature that capital requirements under the new capital framework are likely to be more cyclical than under Basel I. Generally, the integration of the PDs and LGDs into the calculation of capital requirements is considered to be the main driver of cyclicity. Allen and Saunders² document, based on US data, that increases in interest rates and decreases in asset prices both work to raise the corporate sector PDs and LGDs, which enter the calculation of capital requirements. For Sweden, Jacobson et al.³ find that fluctuations in corporate PDs are not only affected by financial factors, but also by the real side of the economy, in particular by GDP. As regards the relative impact of these risk parameters, PDs are usually considered to be the main contributors to the cyclicity of the framework.

Due to the lack of data, the literature has assessed the cyclicity of capital requirements under Basel II on the basis of simulations. Work by Kashyap and Stein⁴ and Gordy and Howells⁵ make clear that the extent of cyclicity in capital requirements depends on the assumptions that underlie these simulations and, in particular, on how the loan portfolio varies with macroeconomic conditions (what they call the portfolio “re-investment rule”). In all simulations, the re-investment rule depends exogenously on the bank’s macroeconomic environment, but two different approaches were chosen. Under one approach (see Kashyap and Stein⁴), the composition of banks’ loan portfolios remains “passive” over time, in the sense that it is fixed at the beginning of the simulation. In the other approach (see Gordy and Howells⁵), banks’ loan portfolios are

assumed to be “cyclical” in order to mimic the sensitivity of banks’ portfolios to the business cycle that one observed under Basel I. This latter approach makes it possible to identify the marginal increment to pro-cyclicality associated with shifting from Basel I to Basel II. In particular, banks tend to tighten their lending standards during downturns, as described by Gertler and Gilchrist⁶, and Bassett and Zakrajsek⁷, who show that the average quality of the new loans usually decreases at the start of a recession. Such technical assumptions are found to have a first-order effect on the results. Overall, required capital is expected to be twice as volatile with a passive re-investment rule as with a cyclical rule. In the latter case, banks rebalance their portfolio towards higher-quality borrowers in downturns, so that their credit risk diminishes (relative to a passive portfolio), which limits the initial rise in required capital. At the limit, Rösch⁸ shows that the capital required on non-defaulting loans may even decrease in a downturn, if banks rebalance their portfolio aggressively enough. In addition to the methodology employed, the results of the simulations also depend on other factors, such as the country or the sample period. As a consequence, the literature therefore reports a broad range of estimates. The general conclusion is that capital requirements should be more cyclical under Basel II than under Basel I. For example, Catarineu-Rabell et al.⁹ find

- 2 L. Allen and A. Saunders, “Incorporating Systemic Influences into Risk Measurements: A Survey of the Literature”, *Journal of Financial Services Research*, Vol. 26, No 2, October 2004.
- 3 T. Jacobson, R. Kindell, J. Lindé and K. Roszbach, “Firm default and aggregate fluctuations”, *Sveriges Riksbank Working Paper Series*, No 226, September 2008.
- 4 A. N. Kashyap and J. Stein, “Cyclical implications of Basel II capital standards”, *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. 28, 2004, pp. 18-31.
- 5 M. Gordy and B. Howells, “Procyclicality in Basel II: Can we treat the disease without killing the patient?”, *Journal of Financial Intermediation* Vol. 15(3), 2006, pp. 395-417.
- 6 M. Gertler and S. Gilchrist, “Monetary policy, business cycle, and the behaviour of small manufacturing firms”, *Quarterly Journal of Economics*, Vol. CIX, 1994, pp. 309-340.
- 7 W. Bassett and E. Zakrajsek, “Recent developments in business lending”, *Federal Reserve Bulletin*, December 2003, pp. 477-492.
- 8 D. Rosch, “Mitigating procyclicality in Basel II: a value at risk based remedy”, University of Regensburg, mimeo, 2002.
- 9 E. Catarineu-Rabell, P. Jackson and D. Tsomocos, “Procyclicality and the new Basel Accord – banks’ choice of loan rating system”, *Economic Theory*, No 26, 2005.

that Basel II would have increased banks' capital charges by about 15% in the United States during the credit crunch of the early 1990s, while the numbers given by Kashyap and Stein are somewhat higher for the period 1998-2002, with 30-45% of extra capital charges, on average, during the downturn.

EVIDENCE ON THE EFFECT OF REGULATORY CAPITAL ON CREDIT SUPPLY

The cyclicity of capital requirements is not a sufficient condition for Basel II to have pro-cyclical effects. Indeed, banks tend to hold a significant amount of capital above regulatory requirements (so-called "capital buffers") in practice, which may insulate their credit supply from changes in capital requirements. The reasons for holding capital buffers are manifold, e.g. for efficiency reasons, as a signal to the market, or to avoid the costs associated with having to issue fresh equity at short notice in case the Tier 1 capital ratio unexpectedly falls below the regulatory minimum. Large capital buffers have been observed in the United States and in EU countries.¹⁰ Among others, Flannery and Rangan¹¹ document a dramatic capital build-up between 1986 and 2001 in the United States. For their sample of US bank holding companies, they report a rise of the average market equity ratio to 17.5% in 2001, from a low of 5.8% at the end of the 1990-91 recession. Book-value capital ratios also rose sharply during the 1990s, with bank holding companies holding, on average, 75% more book capital than the regulatory minimum capital in 2001. Similar numbers are found in Europe, where Tier 1 ratios for large and complex banking groups were almost twice as high as required (i.e. about 8%) at the end of 2006, and have remained significantly above regulatory minima even during the recent financial crisis. Are such buffers large enough? Most empirical studies have tried to answer this question indirectly by assessing the impact of bank capital positions on bank lending.¹² Overall, the evidence on the effect of capital positions on bank lending is somewhat mixed. On the one hand, Gropp and Heider¹³ show that EU banks' leverage can be

fully explained by the same determinants as for non-financial firms (namely the market-to-book ratio, profits, size or risk) and is independent of the banking sector's regulatory pressures. On the other hand, Hancock et al.¹⁴ find evidence that bank capital does affect lending in the United States, and that credit supply is less sensitive to GDP shocks for well-capitalised banks than for banks with low capital positions. In addition, they estimate the responses of lending to capital shocks directly, and find that capital shocks caused banks to reduce lending more quickly in the 1990s than in the 1980s. Kishan and Opiela¹⁵ studied, also for the United States, the relationship between bank capitalisation and monetary policy by looking at lending by banks broken down into different asset size and capital leverage ratio groups. They found that undercapitalised banks have the largest response of loans to monetary policy shocks, but the smallest response of time deposits, indicating that small, poorly capitalised banks are unable to raise alternative funds to sustain lending levels when monetary policy tightens. The most recent studies on European countries corroborate these findings. Based on a comprehensive micro-dataset from Spain that contains monthly information on firms' loan applications, as well as detailed balance-sheet information of both firms and banks, Jiménez et al.¹⁶ provided compelling evidence that lower GDP growth or higher short-term interest rates decrease the probability that a loan application results in a loan being

10 Note that in most studies the capital buffer is approximated by the Tier 1 ratio or by the capital-to-asset ratio.

11 M. Flannery and K. Rangan, "What caused the bank capital build-up of the 1990s?", *Review of Finance*, Vol. 12, 2008, pp. 391-429.

12 The idea behind these studies is that bank capital requirements may have an effect on lending only if the bank capital position has an effect in the first place.

13 F. Heider and R. Gropp, "The determinants of capital structure: some evidence from banks", *ZEW Discussion Paper*, No 08-15, 2008.

14 D. Hancock, A. Laing and J. Wilcox, "Bank Capital Shocks: Dynamic Effects on Securities, Loans, and Capital", *Journal of Banking and Finance*, Vol. 19, June 1995, pp. 661-67.

15 R. Kishan and T. Opiela, "Bank Size, Bank Capital and the Bank Lending Channel", *Journal of Money, Credit and Banking*, Vol. 32, 2000, pp. 121-141.

16 G. Jiménez, S. Ongena, J.-L. Peydró and J. Saurina, "Hazardous times for monetary policy: what do twenty-three million bank loans say about the effects of monetary policy on credit risk-taking?", *ECB Working Paper Series*, ECB, forthcoming.

granted, especially by banks with low capital or liquidity. All in all, micro-econometric evidence suggests that Basel II may increase the sensitivity of bank lending to the business cycle, but only where undercapitalised and illiquid banks are concerned. Ultimately, the cyclical impact of Basel II at the aggregate level will therefore depend on the degree of undercapitalisation of the banking sector as a whole.

BANKS' OPTIMAL RESPONSE TO BASEL II REGULATION

The empirical studies on the effect of capital requirements on bank lending were conducted over a sample period when Basel II had not yet been implemented. The conclusions of these studies will remain valid under Basel II only if the changes in regulation are not accompanied by any change in banks' lending behaviour. As Repullo and Suarez¹⁷ put it, however, "a misconception is to accept that the cyclical behaviour of capital buffers under Basel II can be somehow predicted from the empirical behaviour of capital buffers in the Basel I era. If buffers are endogenously affected by the prevailing bank capital regulation (even if they appear not to "bind"), reduced-form extrapolations from the Basel I world to the Basel II world do not resist the Lucas critique." Will the relationship between bank capital requirements and credit supply remain the same under Basel II as under Basel I? A few theoretical analyses have tried to answer this question. Their common conclusion is that the elasticity of lending to regulatory capital should be lower under Basel II, which should work to mitigate the pro-cyclical effects. The theory can be split into two sets of papers, which look at the question of pro-cyclicality from two different angles. The first strand of the theory focuses on the dynamics of bank capital buffers, and assumes only one class of credit risk in banks' loan portfolio. Heid¹⁸, Zhu¹⁹ and Repullo and Suarez¹⁷ show that under Basel II banks are likely to manage their capital more dynamically, in the sense that they will engage in regulatory capital arbitrage across time. Recognising that future adverse shocks

to their earnings may impair their capacity to lend in the future, banks will, as a precaution, accumulate capital in excess of regulatory capital in upturns. In these models, banks hold a counter-cyclical capital buffer, which plays a crucial role in mitigating the volatility in capital requirements. Heid¹⁸ shows that the effects of Basel II on the overall economy will be moderate, despite the fact that capital charges may vary significantly over time. Repullo and Suarez¹⁷ reach the same conclusion, although they note that the higher buffers maintained in expansions still remain insufficient to prevent a significant contraction in the supply of credit upon the arrival of a recession.

In the second strand of the theoretical literature, banks do not build up capital buffers over time, but rather make regulatory capital arbitrages across the various classes of credit risk present in their loan portfolios. Jokivuolle et al.²⁰ and Boissay and Kok Sørensen²¹ present models based on the textbook over-investment model of De Mezza and Webb²² with heterogeneous borrowers and asymmetries of information on the credit market. Under Basel I, capital requirements increase the cost of lending to all borrowers, irrespective of their quality, which gives rise to the standard cross-subsidisation effect: high-quality borrowers underinvest, while low-quality borrowers overinvest. By contrast, Basel II reduces cross-subsidisation by giving banks incentives to identify the high-quality borrowers, since the (shadow) cost of capital is lower for safe than for risky loans. In addition, under Basel II capital requirements on high-quality loans are, by construction, not

17 R. Repullo and J. Suarez, "The procyclical effects of Basel II", *CEMFI Working Paper*, No 0809, 2008, p. 35.

18 F. Heid, "The cyclical effects of the Basel II Capital Requirements", *Journal of Banking and Finance*, Vol. 31, 2007, pp. 3885-3900.

19 H. Zhu, "Capital regulation and banks' financial decisions", *International Journal of Central Banking*, Vol. 4(1), 2008, pp. 165-212.

20 E. Jokivuolle, I. Kiema and T. Vesala, "Credit allocation, capital requirements and procyclicality", *Bank of Finland Discussion Paper*, No 23, 2009.

21 F. Boissay and C. Kok Sørensen, "The stabilizing effects of risk-sensitive bank capital", *ECB Working Paper Series*, ECB, forthcoming.

22 D. De Mezza and D. Webb, "Too much investment: a problem of asymmetric information", *Quarterly Journal of Economics*, Vol. 102, 1987, pp. 281-292.

only lower, but also more cyclical than those on low-quality loans (see e.g. Gordy and Howells²³). This triggers regulatory arbitrage between low and high-quality loans over the business cycle, as it then becomes optimal for banks to raise their lending standards in upturns in order to reap all benefits from relatively lower capital requirements on high-quality loans. This tightening in lending standards in good times crowds the riskiest borrowers out of the credit market, reduces overinvestment and limits excess lending when it is needed the most, i.e. when the economy is overheating. Overall, the theoretical literature agrees that the elasticity of aggregate lending to regulatory capital is likely to be lower under Basel II, and that this may partially offset the effects of pro-cyclical capital requirements. These predictions contrast with the observation that banks used to tighten lending standards under Basel I during recessions, and therefore emphasise the potential relevance of the Lucas critique.

A fair conclusion that stems from the academic literature is that Basel II probably has a benign effect on the business cycle in normal times, when the banking system is generally well capitalised. However, the recent financial crisis has refocused the debate on the potential negative effects of risk-sensitive capital requirements in bad times. Indeed, from a social welfare perspective, financial institutions have been found to have overexposed themselves not only to credit and operational risks, but also to more systemic risks, such as market liquidity and funding liquidity risks. In the first place, the Basel II framework is not designed to cope with such risks. In a panic, no reasonable capital buffer can restore confidence, and additional capital requirements may even work to amplify the deleveraging process.

The Basel II capital framework has been transposed into EU law by the implementation of the Capital Requirements Directive (CRD), which came into force in EU countries in January 2008. Did the CRD have a pro-cyclical effect in the EU during the recent financial crisis? A preliminary assessment recently

carried out by the European Central Bank, in cooperation with the Banking Supervision Committee (BSC) and the Committee of European Banking Supervisors (CEBS), on the basis of 2008 data points to rather modest effects. The main conclusion of this work is that it is still too early to precisely identify and assess the cyclical effects of the capital requirements, owing to the recent implementation of the CRD and the concomitance of the implementation phase with massive policy interventions in the banking sector.

RECENT PROPOSALS TO REDUCE THE POTENTIAL PRO-CYCLICALITY OF BANKING REGULATION

As shown in academic literature described above, the concerns about the cyclical nature of capital regulation are not new. The first proposals to limit cyclical effects had already been made as the Basel II framework was being developed, and the new framework already recommends the use of through-the-cycle (TTC) ratings (as opposed to point-in-time (PIT) ratings) as a way to reduce volatility. Typically, TTC ratings do not change rapidly in response to fluctuations in the macroeconomic conditions, and are thus less influenced by the business cycle. The use of TTC ratings is therefore a way to smooth the potential volatility of the PDs, and ultimately the capital requirements. For this reason, Catarineu-Rabell et al.²⁴ recommend that regulators encourage banks to adopt TTC ratings, provided that the data used to calculate the PDs cover a period sufficiently long to include at least one business cycle. Gordy and Howells, by contrast, see a great cost to the use of TTC ratings. Such ratings, they argue, would by construction disconnect regulatory capital from economic capital, and therefore make the information disclosed by banks less transparent. The recent financial crisis also shows the limits of using TTC ratings. For banks to maintain credibility, it is indeed crucial to have strong capital positions during the downturns. Hence, even banks that use TTC ratings (and therefore face stable capital

²³ Gordy and Howells (2006), op. cit.

²⁴ Catarineu-Rabell (2005), op. cit.

requirements) may be forced to raise capital in order to align their capital positions with banks using PIT ratings. Given these caveats, it was proposed to smooth the output, rather than the input, of the Basel II formula (so-called “counter-cyclical indexing”). Perhaps the best justification for this was given by Kashyap and Stein²⁵. For these authors, capital requirements should reflect the trade-off between the private cost of capital (underinvestment) and the social cost of bank failures. They ask the following question: what capital requirements would a regulator who cares not only about bank default risk, but also about the efficiency of bank lending, choose? They show the optimum has two characteristics. First, regulatory capital should be positively related to individual risk at any point in time (i.e. in the “cross-sectional” dimension): relatively more capital should be required on relatively riskier loans, in order to force banks to internalise the social cost of credit risk-taking. Second, regulatory capital should be negatively related to aggregate risk (i.e. in the “time series” dimension): less capital should generally be required when capital is scarce (typically in recession) in order to support bank lending. In other words, when underinvestment is severe, the regulator should be willing to tolerate default risk. This can be achieved by applying a counter-cyclical multiplier to the capital required under Basel II, keeping the required capital ratio constant (at 4%) and the risk weights unchanged. This multiplier would be indexed to the business cycle, i.e. reduced by the regulator during a recession to offset the effect of higher PDs on required capital. Gordy and Howells²⁶ recommend that national regulators pre-commit to a simple and transparent indexation rule, in order to (i) prevent potential discretionary, non-cooperative regulatory changes, while (ii) allowing countries with desynchronised business cycles to apply different multipliers. Counter-cyclical indexing raises the question as to which variable(s) should the multiplier be indexed to. One possibility is to link the multiplier to individual banks’ characteristics. For example, Goodhart and Persaud²⁷ propose to condition capital requirements on the growth of the value of bank assets (bank by bank), with the

purpose of penalising banks with excessive lending and forcing these banks to build up reserves during booms. In the same vein, Brunnermeier et al.²⁸ suggest (inter alia) that maturity mismatches are penalised. The idea is to require more capital not only against the risk of assets, but also against the risk of funding these assets, which includes the leverage and maturity mismatch. For example, a bank that finances its assets with term deposits would have to set aside a lower amount of capital than a bank that finances similar assets with overnight borrowing from the money markets. The proposals to link the bank capital multiplier to individual bank data have generally received limited attention. One reason is the complexity and difficulty related to their implementation. Another reason is their limited impact on capital requirements at the aggregate level. Repullo et al.²⁹ show that bank-specific multipliers would actually not smooth capital requirements as much as multipliers based on macroeconomic variables. These authors also simulate and compare the smoothing effects of various multipliers indexed to macroeconomic variables. They find that the multiplier that smoothes capital requirements the most is the multiplier based on GDP growth, and that the credit growth multiplier and the stock market return multiplier are both sub-optimal.

The above proposals involve amending Basel II. Another set of proposals has been put forward, based on the idea that bank capital alone does not suffice to cope with funding and market liquidity problems. These proposals consist in complementing the existing regulatory framework by capital insurance or liquidity insurance mechanisms. Kashyap et al.³⁰,

25 Kashyap and Stein (2004), op. cit.

26 Gordy and Howells (2006), op. cit.

27 C. Goodhart and A. Persaud, “A party pooper’s guide to financial stability”, *Financial Times*, 5 June 2008.

28 M. Brunnermeier, A. Crockett, C. Goodhart, A. Persaud and H. Shin, “The Fundamental Principles of Financial Regulation”, *ICMB-CEPR Geneva Reports on the World Economy*, 11, 2009.

29 R. Repullo, J. Saurina, and C. Trucharte, “Mitigating the procyclicality of Basel II”, *Macroeconomic Stability and Financial Regulation: Key Issues for the G20*, Centre for Economic Policy Research (CEPR), March 2009.

30 A. Kashyap, J. Stein and R. Rajan, “Rethinking capital regulation”, Jackson Hole conference paper, 2008.

in particular, are relatively pessimistic about policy-makers' ability to prevent crises and therefore about the effectiveness of influencing ex ante incentives, even with the various amendments proposed above. Their proposal is aimed at limiting the costs of crises to be borne by the public sector, i.e. taxpayers, and consists in establishing a private insurance scheme funded by investors with an appetite for stable cash flows with a small probability of a serious loss (e.g. pension or sovereign wealth funds). Banks subject to capital regulation would be given the option to purchase this insurance, but it would not be mandatory. Opting into the insurance scheme should be rewarded by lowering a bank's capital ratio. Perotti and Suarez³¹ go beyond this, and what they propose can be viewed as a synthesis of the Brunnermeier et al.³² and the Kashyap et al.³³ proposals. For them, liquidity assistance to help banks cope with aggregate liquidity shocks is a good thing in principle, but has little value if banks are not given the right incentives to reduce the probability of such shocks in the first place. Their proposal aims both at giving banks the right incentives ex ante and at improving the resilience of the financial system to shocks ex post. They propose to complement Basel II regulation by establishing a mandatory liquidity insurance arrangement, whereby each bank has to pay to the supervisor a liquidity charge. This liquidity charge should be proportional to short-term wholesale liabilities, weighted by the bank's maturity mismatch. It would therefore increase with the maturity mismatch of the bank. This proposal is based on the idea that banks that finance long-term loans by rolling over short-term debt may impose a negative externality on the whole financial system. In the case of an (even benign) aggregate liquidity shortage in the economy, for example, such banks would typically be the first to deleverage and liquidate assets, which may trigger a fall in asset prices and expose other banks to refinancing problems (e.g. through margin calls). The liquidity charge would make banks internalise the potential negative externalities they may generate, and align their private incentives with the general interest.

For credibility reasons, the charge should be levied by a public entity (say the supervisor) and, to avoid the standard moral hazard issues, the insurance should be paid out upon aggregate liquidity runs only (and not based on individual banks). In this case, the supervisor would use the insurance fund to quickly resolve the initial liquidity shortage. Perotti and Suarez recommend the establishment of this insurance fund at the international level to address commitment problems and the potential non-cooperative use of the insurance fund.

RECENT AND ONGOING INITIATIVES TO REDUCE THE POTENTIAL PRO-CYCLICALITY OF BANKING REGULATION

The financial crisis has shown the need for enhanced financial regulation. The Financial Stability Board (FSB) recently recommended a strengthening of the regulatory capital framework (Financial Stability Forum³⁴) in order to increase the quality and level of capital in the banking system during economic upturns that could be drawn down during periods of economic and financial stress, and endorsed the work done by the Basel Committee on Banking Supervision (BCBS) to enhance the current capital regulatory framework. While the Basel II framework already includes elements which may dampen the cyclicalities of capital requirements, for example recommending the use of TTC ratings or downturn PDs in the calculation of required capital, the BCBS has recently been discussing a more global package of measures not only to reduce the cyclicalities of capital requirements but also, more generally, to improve the resilience of the banking sector to financial distress.³⁵ In line with the FSB assessment, these measures aim

31 E. Perotti and J. Suarez, "Liquidity insurance for systemic crises", *CEPR Policy Insight*, 31, 2009.

32 Brunnermeier et al. (2009), op. cit.

33 Kashyap et al. (2008), op. cit.

34 Financial Stability Forum, "Report of the Financial Stability Forum on addressing pro-cyclicality in the financial system", April 2009.

35 See Basel Committee on Banking Supervision, "Enhancement to the Basel II framework", Bank for International Settlements, July 2009.

at reducing the potential pro-cyclical effects of capital regulation by (i) giving banks incentives to accumulate counter-cyclical buffers, (ii) limiting bank leverage, and (iii) promoting a more forward-looking loan loss-provisioning behaviour by banks. Building upon the lessons learned from the financial crisis, the BCBS also reviewed the rules governing trading book capital by enhancing the three pillars of the Basel II framework in this respect. In particular, it introduced higher risk weights on asset-backed securities in order to better reflect the risk inherent in these complex products (Pillar I), issued supplemental guidance for the supervisory process to address the flaws in risk management practices revealed by the financial crisis (Pillar II) and strengthened the disclosure requirements for securitisation, off-balance-sheet exposures, and trading activities (Pillar III).

comprehensive package of measures to enhance the Basel II capital framework, including the introduction of counter-cyclical capital buffers, as well as additional measures which aim at limiting leverage in the banking sector.

CONCLUDING REMARKS

Probably one of the main conclusions that emerges from the academic debate on the pro-cyclical effects of Basel II, as currently defined, is that risk-sensitive capital requirements should have pro-cyclical effects mostly on undercapitalised banks. Hence, at the aggregate level, the extent of pro-cyclical effects of Basel II may depend on the degree of undercapitalisation of the banking sector as a whole. Thus, while the cyclical effects are probably benign in normal times when the banking system is generally well-capitalised, they might be more significant in bad times. In fact, there is a consensus among academics that Basel II may not be adequately designed and sufficient to cope with deep, systemic financial crises, and a number of proposals to improve or complement the Basel II framework have received attention. One of these proposals consists in amending the Basel II regulation, as currently defined, towards applying a counter-cyclical multiplier on required capital, so that banks do not need to build up as much capital when it is scarce as when it is abundant. In this context, the BCBS is working on a