



Guest Editor's Introduction

Bank capital adequacy regulation under the new Basel Accord

The 1988 Basel Accord on the international harmonization of regulatory bank capital requirements has been criticized for quite a while as being too crude and out of line with the evolving standards for managing and assessing bank performance. Intended to protect depositors and deposit insurance schemes from the consequences of inadequate or reckless portfolio management by banks and to prevent systemic instabilities arising from large-scale banking failures, the 1988 Accord in essence prescribed that banks hold capital of at least 8 percent of their risk-weighted assets.¹ Most critics noted that the 1988 Accord treated all corporate credits alike and thereby invited regulatory arbitrage, that it ignored modern credit risk management techniques, that it failed to take account of the dynamic distortions of capital regulation, and that it neglected complementary regulatory instruments such as supervisory monitoring or prompt corrective regulatory action.²

The Basel Committee on Banking Supervision reacted to these criticisms with several adjustments of the accord and more importantly with its complete overhaul in the late 1990s, leading to a first Consultative Paper in June 1999. After intensive discussions, several large-scale experiments with the banking industry, and a second Consultative Paper in January 2001, the Basel Committee has produced its third Consultative Paper in April 2003, with the hope of finalizing the new accord by the end of 2003, for implementation by year-end 2006.³ The proposed new accord differs from the old one in two major respects. First, it allows the use of internal models by banks to assess the riskiness of their portfolios and to determine their required capital cushion. This applies to credit risk as well as to operational risk and decentralizes the regulatory capital adequacy requirements for banks significantly, if they choose this option and if their internal model is validated by the regulatory authority. Second, the new accord acknowledges the importance of complementary mechanisms to safeguard against bank failures, by explicitly building on two additional

¹ For descriptions and discussions of bank capital regulation in general and the Basel Accord in particular, see, e.g., Dewatripont and Tirole (1994) or Berger et al. (1995).

² For an interesting portfolio of criticisms and suggestions see the 2001 Special Issue of the *Journal of Banking and Finance* (Altmann, 2001) and, in particular with respect to quantitative risk management techniques, the JBF's 2000 Special Issue (Jackson and Perraudin, 2000).

³ See the Basel Committee's excellent Web site, <http://www.bis.org/bcbs/index.htm>, for comprehensive information.

“pillars,” next to the traditional focus on minimum bank capital. The three pillars of the new accord are:

- minimum regulatory capital requirements (Pillar 1),
- supervisory review (Pillar 2),
- market discipline (Pillar 3).

In May 2002, the Basel Committee and the *Journal of Financial Intermediation* jointly held a conference at the Bank for International Settlements in Basel to bring together regulators and academics in a wide-ranging review of issues pertaining to the new capital accord. Out of more than 50 submissions, 13 papers were selected for presentation at the conference, and provided for a stimulating discussion. Seven of these 13 papers survived the regular refereeing process of the *Journal of Financial Intermediation* and are collected in this special issue. In the remainder of this introduction, I will briefly review these contributions.

The papers in this issue are quite diverse, but there are at least two common themes running through them. These themes are the dynamics of portfolio and capital structure management on the one hand, and the interrelation between capital requirements and broader regulatory activity on the other. This pattern was not planned—in fact, the refereeing process was completely unguided—and the relative consistency of the outcome probably reflects a growing consensus among academics and practitioners alike that bank capital regulation is a truly dynamic problem that must be analyzed in the context of the regulation of all aspects of banking activity. In this sense, the papers collected here help to break new ground for the future debate about bank capital regulation.

The first two papers in this issue, by Dangl and Lehar and by Decamps, Rochet, and Roger, take up both of the central themes together. In “Value-at-risk vs. building block regulation in banking,” Dangl and Lehar study a model of bank portfolio choice in continuous time, in which the regulator sets capital requirements as well as an audit policy. These two regulatory tools, simple model descriptions of Pillar 1 and Pillar 2 type regulations in the new Basel Accord, complement each other in the optimal control of bank risk taking, and the paper shows how risk-based capital requirements improve upon Basel 1 type risk-insensitive requirements through the differential impact on supervisory monitoring. Typically, well-adjusted risk-based capital requirements do not only benefit depositors (or the deposit insurance provider), but also equity holders, because they allow commitment to portfolio choices that increase the bank’s charter value. Yet, the paper also shows that risk-based requirements may be worse for equity holders than Basel 1 type requirements, if they induce too much bank closure for banks close to financial distress.

While Dangl and Lehar simply assume that the supervisor knows more about the banks’ portfolio choice when operating Basel 2 type capital requirements, Decamps, Rochet, and Roger, in their paper “The three pillars of Basel II: optimizing the mix,” show how market information may help regulators in taking the right action. They, too, study bank portfolio choice in a continuous-time model, but focus on the interaction of capital requirements and market discipline in regulating bank moral hazard, which represent Pillar 1 and Pillar 3 in the new Basel Accord.

As Decamps, Rochet, and Roger rightly point out with respect to the regulatory consequences of Pillars 2 and 3, “[S]omewhat contradictorily, while the proposed reform states very precisely the complex refinements of the risk-weights to be used in the computation of this regulatory minimum, it remains silent on the other intervention thresholds.” Despite the long review process of the Basel Committee’s proposals, this imbalance is still reflected in the third Consultative Paper of April 2003, in which Pillar 1 gets 132 pages, Pillar 2 16 pages, and Pillar 3 15 pages, with enormous precision going into the description of Pillar 1 and much less quantitative information into those of Pillars 2 and 3. In order to model the effect of market discipline precisely, Decamps, Rochet, and Roger therefore introduce a traded subordinated claim into the banks’ liability structure (in the spirit of Calomiris, 1998), and show how the need to refinance this claim imposes additional discipline on banks, thus reducing the need for direct regulatory intervention. The authors then introduce yet another regulatory tool into the analysis, about which the Basel Accord is more or less silent, supervisory intervention in the form of bank recapitalization. They show how to implement capital requirements and how to determine jointly the different thresholds of bank performance for bank closure, bailout, and prompt corrective regulatory action in this more comprehensive model of bank regulation.

Building on Hellmann et al.’s (2000) analysis of bank capital and risk-taking incentives, Repullo in his paper “Capital requirements, market power, and risk-taking in banking,” introduces a specific model of imperfect competition in the deposit market in a dynamic model of bank portfolio choice (this time in discrete time with an infinite horizon). Different from the former two papers, Repullo explicitly considers the determinants of the banks’ liabilities, and studies how minimum capital requirements and another regulatory tool, deposit rate regulation, influence the banks’ deposits and choice of portfolio risk. As the paper models the supply of capital explicitly, it can analyze the welfare consequences of capital requirements in the game between banks and the capital market. Repullo finds that in very competitive markets with low intermediation margins banks have an incentive to take excessive risks, and that both flat-rate (Basel 1) capital requirements and interest rate ceilings are effective in eliminating this problem. From a welfare perspective, however, these regulatory instruments make depositors worse off, since they lower equilibrium deposit rates. Repullo also shows that risk-based (Basel 2) capital requirements, if they can be implemented by the regulator, are strictly better than the other two instruments because they correct the banks’ risk-taking incentives without distorting equilibrium deposit rates.

While Repullo’s paper considers steady-state strategies in a stationary environment, Dangl and Zechner, in their paper “Credit risk and dynamic capital structure choice,” present a fully dynamic model of debt structure in a continuous-time framework. Their paper helps to understand one important dimension of model risk, which is among the main unresolved issues in the new Basel Accord. Applied to banks, the model sheds light on the incentives of banks to adjust their leverage in the absence of capital requirements, a topic that is sometimes neglected in the discussion of capital adequacy regulation. As their model applies to arbitrary firms, however, it also allows a better understanding of the risk determinants of banks’ assets. In particular, the paper shows how dynamic leverage adjustments by firms impact credit spreads, default frequencies, and Value-at-Risk measures of their bonds and how misleading the static measures typically used by banks and regu-

lators can be. Clearly, these results are crucially important when regulators allow banks to calculate their capital requirements using empirically calibrated models.

The last three papers in the special issue are empirical. Barth, Caprio, and Levine in their paper “Bank regulation and supervision: what works best?” approach the problem of banking regulation even more broadly than the Basel Committee and provide a picture that includes even more dimensions than the three pillars of regulation in the new Basel Accord. Building on an extensive new survey among bank regulators in 107 countries, they carry out a cross-country evaluation of bank regulation along five dimensions: capital requirements, supervisory power, deposit insurance, private sector monitoring, and bank activity restrictions.⁴ Barth, Caprio, and Levine do not only provide various quantitative measures of these dimensions, which allow more precise international comparisons, but also evaluate the impact of these indicators on bank performance. Methodologically, among the most interesting aspects of their work is the ability to account for interactions in regulatory measures when assessing the performance of individual measures. The paper provides many insights into the effectiveness of different forms of bank regulation. Among its most interesting findings in the context of bank capital regulation is that “stringent capital regulations are not closely associated with bank development, performance or stability when controlling for other features of bank regulation and supervision.”

One aspect of the New Basel Accord that has generated much concern with practitioners and academics alike is the alleged “procyclicality” of the new rules. As the new rules will make bank capital requirements more sensitive to changes in the banks’ risk exposure, and as the riskiness of loan books changes over the business cycle, the required regulatory capital under the new rules will vary with the business cycle. In particular, so the argument goes, capital requirements will increase in a cyclical downturn, which will make banks cut back their lending, because they cannot easily adjust their capital, which in turn will aggravate the downturn. In their paper “Are capital buffers pro-cyclical? Evidence from Spanish panel data,” Ayuso, Pérez, and Saurina point out a simple empirical fact that puts this discussion into a new perspective. Drawing on a large panel of Spanish banks over the period 1986–2000 (a period that includes a full business cycle), they show that on average capital requirements have only been binding for very few banks in their sample (which is consistent with the predictions of Dangl and Lehar and Benoit, Rochet, and Roger), and that the capital held by the banks in excess of the capital required by regulators has varied counter-cyclically. More specifically, in their sample a one percentage point drop in GDP is accompanied by a 17% increase in such voluntary capital buffers; this relationship is highly significant and robust to different specifications of the model. This picture stems from the era of Basel 1, with capital requirements that were more or less insensitive to the risk from corporate lending. If it carries over into the era of Basel 2, then the current concerns about the pro-cyclicality of new risk-weighted capital regulation may be exaggerated. In fact, if banks build up capital buffers in downturns without being forced to do so by regulation, then new regulation that makes part of this build-up mandatory may have little effect. On the other hand, Ayuso, Pérez, and Saurina point to another potential problem raised by their

⁴ It is worth highlighting that the authors make their data available at <http://www.worldbank.org/research/interest/intrstweb.htm>.

finding, namely that banks may have insufficient incentives to provide for future bad loans during boom times. It remains to be studied to what extent this concern is warranted. Such studies probably will have to go into more detail concerning loan demand, bank balance sheet composition, time-lags, and creditor quality, but the present study certainly provides an important first step.

In the final paper of this issue, “The empirical correlation between average asset correlation, firm probability of default, and asset size,” Lopez addresses an aspect of what may be termed the fundamental trade-off between flexibility and regulatory standardization in banking regulation. Ideally, bank regulation, and in particular, bank capital adequacy requirements, would treat each bank individually, to make best use of that bank’s particular information about its risk and balance sheet structure. On the other hand, for lack of processing capacity and information, regulators must standardize procedures and rules. Basel 1 has put excessive emphasis on the latter part of the trade-off, which Basel 2 tries to remedy.

One important rule of the new accord in this respect concerns the assessment of market risk in determining banks’ credit risks, and more precisely the modeling of the correlation between market risk and the asset values of the firms’ in a bank’s loan portfolio. Ideally, this correlation would be firm-specific, but this is impossible to implement in supervisory practice. In this case, the trade-off between flexibility and regulatory standardization consists of finding the right statistical determinants of this correlation that allows a parsimonious description of this risk factor but does not leave out too much important firm-specific information. Building on calibration results for the large sample of US, European, and Japanese firms in the KMV CreditMonitor database, Lopez argues that this risk factor not only depends negatively on the firm’s probability of default (as the original proposal for the new accord had assumed), but also depends positively on the firm’s asset size. Although a full comparison of this reduced model with a fully firm-specific model is obviously difficult, Lopez argues that including these two determinants of market risk in the evaluation of credit risk substantially improves the accuracy of the regulators’ assessments at little additional costs. As the third Consultative Paper of April 2003 shows, this argument has been well taken by the Basel Committee.

As the papers in this issue show in different ways, Basel 2 will resolve this trade-off between flexibility and regulatory standardization much better than Basel 1. But, of course, the basic incompatibility of these two diverging fundamental objectives will remain and continue to impose costs on the system. The papers in this issue contribute to a better understanding of these costs and of the second-best resolution of this conflict.

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