
General Introduction and Outline of the Book

The recent episode of the Northern Rock bank panic in the United Kingdom, with depositors queuing from 4 a.m. in order to get their money out, reminds us that banking crises are a recurrent phenomenon. An interesting IMF study back in 1997 identified 112 systemic banking crises in 93 countries and 51 borderline crises in 46 countries between 1975 and 1995, including the Savings and Loan crisis in the United States in the late 1980s, which cost more than \$150 billion to the American taxpayers. Since then, Argentina, Russia, Indonesia, Turkey, South Korea, and many other countries have also experienced systemic banking crises.

The object of this book is to try and explain why these crises have occurred and whether they could be avoided in the future. It is fair to say that, in almost every country in the world, public authorities already intervene a great deal in the functioning of the banking sector. The two main components of this public intervention are on the one hand the financial safety nets (composed essentially of deposit insurance systems and emergency liquidity assistance provided to commercial banks by the central bank) and on the other hand the prudential regulation systems, consisting mainly of capital adequacy (and liquidity) requirements, and exit rules, establishing what supervisory authorities should do when they close down a commercial bank.

This book suggests several ways for reforming the different components of the regulatory-supervisory system: the lender of last resort (part 2), prudential supervision and the management of systemic risk (part 3), and solvency regulations (part 4) so that future banking crises can be avoided, or at least their frequency and cost can be reduced significantly.

Why Are There So Many Banking Crises?

Part 1 contains a nontechnical presentation of these banking crises and a first, easily accessible, discussion of how the regulatory-supervisory system could be reformed to limit the frequency and the cost of these crises. The main conclusions of this part are the following:

- Although many banking crises have been initiated by financial deregulation and globalization, these crises were amplified largely by political interference.
- Public intervention in the banking sector faces a fundamental commitment problem, analogous to the time consistency problem confronted by monetary policy.
- The key to successful reform is independence and accountability of banking supervisors.

The Lender of Last Resort

Part 2 explores the concept of lender of last resort (LLR), which was elaborated in the nineteenth century by Thornton (1802) and Bagehot (1873). The essential point of the “classical” doctrine associated with Bagehot asserts that the LLR role is to lend to “solvent but illiquid” banks under certain conditions. More precisely, the LLR should lend freely against good collateral, valued at precrisis levels, and at a penalty rate. These conditions can be found in Bagehot (1873) and are also presented, for instance, in Humphrey (1975) and Freixas et al. (1999).

This policy was clearly effective: traditional banking panics were eliminated with the LLR facility and deposit insurance by the end of the nineteenth century in Europe, after the crisis of the 1930s in the United States and, by and large, in emerging economies, even though they have suffered numerous crises until today.¹ Modern liquidity crises associated with securitized money or capital markets have also required the intervention of the LLR. Indeed, the Federal Reserve intervened in the crises provoked by the failure of Penn Central in the U.S. commercial paper market in 1970, by the stock market crash of October 1987, and by Russia’s default in 1997 and subsequent collapse of LTCM (in the latter case a “lifeboat” was arranged by the New York Fed). For example, in October 1987 the Federal Reserve supplied liquidity to banks through the discount window.²

¹See Gorton (1988) for U.S. evidence and Lindgren et al. (1996) for evidence on other IMF member countries.

²See Folkerts-Landau and Garber (1992). See also chapter 7 of this book for a modeling of the interactions between the discount window and the interbank market.

The LLR's function of providing emergency liquidity assistance has been criticized for provoking moral hazard on the banks' side.³ Perhaps more importantly, Goodfriend and King (1988) (see also Bordo 1990; Kaufman 1991; Schwartz 1992) remark that Bagehot's doctrine was elaborated at a time when financial markets were underdeveloped. They argue that, whereas central bank intervention on aggregate liquidity (monetary policy) is still warranted, individual interventions (banking policy) are not anymore: with sophisticated interbank markets, banking policy has become redundant. Goodfriend and Lacker (1999) suggest that commercial banks could instead provide each other with multilateral credit lines, remunerated *ex ante* by commitment fees.

Part 2 contains two articles. Chapter 2, written with Xavier Vives, provides a theoretical foundation for Bagehot's doctrine in a model that fits the modern context of sophisticated and presumably efficient financial markets. Our approach bridges a gap between the "panic" and "fundamental" views of crises by linking the probability of occurrence of a crisis to the fundamentals. We show that in the absence of intervention by the central bank, some solvent banks may be forced to liquidate if too large a proportion of wholesale deposits are not renewed.

The second article, chapter 3, written with Xavier Freixas and Bruno Parigi, formalizes two common criticisms of the Bagehot doctrine of the LLR: that it may be difficult to distinguish between illiquid and insolvent banks (Goodhart 1995) and that LLR policies may generate moral hazard. They find that when interbank markets are efficient, there is still a potential role for an LLR but only during crisis periods, when market spreads are too high. In "normal" times, liquidity provision by interbank markets is sufficient.

Prudential Regulation and the Management of Systemic Risk

Part 3 is dedicated to prudential regulation and the management of systemic risk. Although the topic is still debated in the academic literature (see Bhattacharya and Thakor (1993), Freixas and Rochet (1995), and Santos (2000) for extended surveys), a large consensus seems to have emerged on the rationale behind bank prudential regulation. It is now widely accepted that it has essentially two purposes:

- To protect small depositors, by limiting the frequency and cost of individual bank failures. This is often referred to as *microprudential* policy.⁴

³However, Cordella and Levy-Yeyati (2003) show that, in some cases, moral hazard can be *reduced* by the presence of LLR.

⁴See, for example, Borio (2003) or Crockett (2001) for a justification for this terminology.

- To protect the banking system as a whole, by limiting the frequency and cost of systemic banking crises. This is often referred to as *macroprudential* policy.

Notice that, from the point of view of economic analysis, these two types of policies have very different justifications:

- Microprudential policy is justified by the (presumed)⁵ inability of small depositors to control the use of their money by bankers. This is why most countries have organized deposit insurance funds (DIFs) that guarantee small deposits against the risk of failure of their bank.⁶ The role of bank supervisors is then to represent the interests of depositors (or rather of the DIF) vis-à-vis banks' managers and shareholders.⁷
- Macroprudential policy is justified by the (partial) failure of the market to deal with aggregate risks, and by the public good component of financial stability. As for other public goods, the total (declared) willingness to pay of individual banks (or more generally of investors) for financial stability is less than the social value of this financial stability. This is because each individual (bank or investor) free-rides on the willingness of others to pay for financial stability.

These differences imply in particular that, while microprudential policy (and supervision) can in principle be dealt with at a purely private level (it amounts to a collective representation problem for depositors), macroprudential policy has intrinsically a public good component. This being said, governments have traditionally controlled both dimensions of prudential policy, which may be the source of serious time consistency problems⁸ (this is because democratic governments cannot commit on long-run decisions that will be made by their successors) leading to political pressure on supervisors, regulatory forbearance, and mismanagement of banking crises.

The first article in part 3, chapter 4, builds a simple model of the banking industry where both micro and macro aspects of prudential policies can be integrated. This model shows that the main cause behind the poor management of banking crises may not be the “safety net” per

⁵The supporters of the “free banking school” challenge this view.

⁶Contrary to what is often asserted, the need for a microprudential regulation is not a consequence of any “*mispericing*” of deposit insurance (or other form of government subsidies) but simply of the *existence* of deposit insurance.

⁷This is the “representation theory” of Dewatripont and Tirole (1994).

⁸A similar time consistency problem used to exist for monetary policy, until independence was granted to the central banks of many countries.

se as argued by many economists, but instead the lack of commitment power of banking authorities, who are typically subject to political pressure. However, the model also shows that the use of private monitors (market discipline) is a very imperfect means of solving this commitment problem. Instead, I argue in favor of establishing independent and accountable banking supervisors, as has been done for monetary authorities. I also suggest a differential regulatory treatment of banks according to the costs and benefits of a potential bailout. In particular, I argue that independent banking authorities should make it clear from the start (in a credible fashion) that certain banks with an excessive exposure to macroshocks should be denied the access to emergency liquidity assistance by the central bank. By contrast, banks that have access to the LLR either because they have a reasonable exposure to macroshocks or because they are too big to fail should face a special regulatory treatment, with increased capital ratio and deposit insurance premium (or liquidity requirements).

The three other articles in part 3 study the mechanisms of propagation of failure from one bank to other banks, or even to the banking system as a whole.

Chapter 5, written with Jean Tirole, shows that “peer-monitoring,” i.e., the notion that banks should monitor each other, as a complement to centralized monitoring by a public supervisor, is central to the risk of propagation of bank failures through interbank markets.

Chapter 6, also written with Jean Tirole, studies the risk of propagation of bank failures through large-value interbank payment systems.

Finally, chapter 7, written with Xavier Freixas and Bruno Parigi, shows that the architecture of the financial system, and in particular the matrix of interbank relations has a large impact on the resilience of the banking system and its ability to absorb systemic shocks. This paper is related to several important papers on the sources of fragility of the banking system, notably Allen and Gale (1998), Diamond and Rajan (2001), and Goodhart et al. (2006).

Solvency Regulations

Part 4 contains three articles, which are all concerned with the regulation of banks' solvency, and more precisely with the first and second Basel Accords. The first Basel Accord, elaborated in July 1988 by the Basel Committee on Banking Supervision (BCBS), required internationally active banks from the G10 countries to hold a minimum total capital equal to 8% of risk-adjusted assets. It was later amended to cover market risks. It has been revised by the BCBS, which has released for comment

several proposals of amendment, commonly referred to as Basel II (Basel Committee 1999, 2001, 2003).

The first article, chapter 8, is mainly concerned with the possibilities of regulatory arbitrage implied by this first accord. It shows that improperly chosen risk weights induce banks to select inefficient portfolios and to undertake regulatory arbitrage activities which might paradoxically result in increased risk taking.⁹

This article belongs to a strand of the theoretical literature (e.g., Furlong and Keeley 1990; Kim and Santomero 1988; Koehn and Santomero 1980; Thakor 1996) focusing on the distortion of the allocation of the banks' assets that could be generated by the wedge between market assessment of asset risks and its regulatory counterpart in Basel I.

Hellman et al. (2000) argue in favor of reintroducing interest rate ceilings on deposits as a complementary instrument to capital requirements for mitigating moral hazard. By introducing these ceilings, the regulator increases the franchise value of the banks (even if they are not currently binding) which relaxes the moral hazard constraint. Similar ideas are put forward in Caminal and Matutes (2002).

The empirical literature (e.g., Bernanke and Lown (1991); see also Thakor (1996), Jackson et al. (1999), and the references therein) has tried to relate these theoretical arguments to the spectacular (yet apparently transitory) substitution of commercial and industrial loans by investment in government securities in U.S. banks in the early 1990s, shortly after the implementation of the Basel Accord and the Federal Deposit Insurance Corporation Improvement Act (FDICIA).¹⁰

Hancock et al. (1995) study the dynamic response to shocks in the capital of U.S. banks using a vector autoregressive framework. They show that U.S. banks seem to adjust their capital ratios much faster than they adjust their loan portfolios. Furfine (2001) extends this line of research by building a structural dynamic model of banks' behavior, which is calibrated on data from a panel of large U.S. banks for the period 1990–97. He suggests that the credit crunch cannot be explained by demand effects but rather by the rise in capital requirements and/or the increase in regulatory monitoring. He also uses his calibrated model to simulate the effects of Basel II and suggests that its implementation would not provoke a second credit crunch, given that average risk weights on good quality commercial loans will decrease if Basel II is implemented.

⁹These activities are analyzed in detail in Jones (2000).

¹⁰Peek and Rosengren (1995) find that the increase in supervisory monitoring also had a significant impact on bank lending decisions, even after controlling for bank capital ratios. Blum and Hellwig (1995) analyze the macroeconomic implications of bank capital regulation.

The other two articles in part 4 focus on the reform of the Basel Accord (nicknamed Basel II), which relies on three “pillars”: capital adequacy requirements, supervisory review, and market discipline. Yet, as shown in chapter 9, the interaction between these three instruments is far from being clear. The recourse to market discipline is rightly justified by common sense arguments about the increasing complexity of banking activities and the impossibility for banking supervisors to monitor in detail these activities. It is therefore legitimate to encourage monitoring of banks by professional investors and financial analysts as a complement to banking supervision. Similarly, a notion of gradualism in regulatory intervention is introduced (in the spirit of the reform of U.S. banking regulation, following the FDIC Improvement Act of 1991). It is suggested that commercial banks should, under “normal circumstances,” maintain economic capital way above the regulatory minimum and that supervisors could intervene if this is not the case. Yet, and somewhat 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.

The third article, chapter 10, written with Jean-Paul Décamps and Benoît Roger, analyzes formally the interaction between the three pillars of Basel II in a dynamic model. It also suggests that regulators should put more emphasis on implementation issues and institutional reforms.

Market Discipline versus Regulatory Intervention

Let me conclude this introductory chapter by discussing an important topic that is absent from the papers collected here, namely the respective roles of market discipline and regulatory intervention. Conceptually, market discipline can be used by banking authorities in two different ways:

- *Direct* market discipline, which aims at inducing market investors to *influence*¹¹ the behavior of bank managers, and works as a *substitute* for prudential supervision.
- *Indirect* market discipline, which aims at inducing market investors to *monitor* the behavior of bank managers, and works as a *complement* to prudential supervision. The idea is that indirect market discipline provides new, objective information that can be used by supervisors not only to improve their control on problem banks but

¹¹This distinction between influencing and monitoring is due to Bliss and Flannery (2001).

also to implement prompt corrective action (PCA) measures that limit forbearance.

The instruments for implementing market discipline are essentially of three types:

- *Imposing more transparency*, i.e., forcing bank managers to disclose publicly various types of information that can be used by market participants for a better assessment of banks' management.
- *Changing the liability structure of banks*, e.g., forcing bank managers to issue periodically subordinated debt.
- *Using market information* to improve the efficiency of supervision.

We now examine these three types of instruments.

Imposing More Transparency

In a recent empirical study of disclosure in banking, Baumann and Nier (2003) find that more disclosure tends to be beneficial to banks: it decreases stock volatility, increases market values, and increases the usefulness of accounting data. However, as argued by D'Avolio et al. (2001): "market mechanisms...are unlikely themselves to solve the problems raised by misleading information.... For the future of financial markets in the United States, disclosure [of accurate information] is likely to be critical for continued progress." In other words, financial markets will not by themselves generate enough information for investors to allocate their funds appropriately and efficiently, and in some occasions will even tend to propagate misleading information. This means that disclosure of accurate information has to be imposed by regulators. A good example of such regulations are the disclosure requirements imposed in the United States by the Securities and Exchange Commission (and in other countries by the agencies regulating security exchanges) for publicly traded companies. However, the banking sector is peculiar in two respects: banks' assets are traditionally viewed as "opaque,"¹² and banks are subject to regulation and supervision, which implies that bank supervisors are already in possession of detailed information on the banks' balance sheets. Thus it may seem strange to require public disclosure of information already possessed by regulatory authorities:

¹²Morgan (2002) provides indirect empirical evidence on this opacity by comparing the frequency of disagreements among bond-rating agencies about the values of firms across sectors of activity. He shows that these disagreements are much more frequent, all else being equal, for banks and insurance companies than for other sectors of the economy.

why can't these authorities disclose the information themselves,¹³ or even publish their regulatory ratings (BOPEC, CAMELS, and the like)? There are basically two reasons for this:

- First, as argued in chapter 2, too much disclosure may trigger bank runs and/or systemic banking crises. This happens in any situation where coordination failures may occur between many dispersed investors.
- Second, as we explain below, the crucial benefit of market discipline is to limit the possibilities of regulatory forbearance by generating “objective” information that can be used to force supervisors to intervene before it is too late when a bank is in trouble. This would not be possible if the information was disclosed by the supervisors themselves.

In any case, there are intrinsic limits to transparency in banking: we have to recall that the main economic role of banks is precisely to allocate funds to projects of small and medium enterprises that are “opaque” to outside investors. If these projects were transparent, commercial banks would not be needed in the first place.

Changing the Liability Structure of Banks

The economic idea behind *direct market discipline* is that, by changing the liability structure of banks (e.g., forcing banks to issue uninsured debt of a certain maturity),¹⁴ one can change the incentives of bank managers and shareholders. In particular, some proponents of the mandatory subdebt proposal claim that informed investors have the possibility to “influence” bank managers. This idea has been discussed extensively in the academic literature on corporate finance: short-term debt can in theory be used to mitigate the debt overhang problem (Myers 1984) and the free cash flow problem (Jensen 1986). In the banking literature, Calomiris and Kahn (1991) and Carletti (1999) have shown how demandable debt could be used in theory to discipline bank managers. The subdebt proposal has been analyzed formally in only very few articles: Levonian (2001) uses a Black–Scholes–Merton type of model

¹³One could also argue that the information of supervisors is “proprietary” information that could be used inappropriately by the bank's competitors if publicly disclosed. This is not an argument against regulatory disclosure since regulators can select which pieces of information they disclose.

¹⁴The “subordinated debt proposal” is discussed, for example, in Calomiris (1998, 1999), Evanoff (1993), Evanoff and Wall (2000), Gorton and Santomero (1990), and Wall (1989).

(where the bank's return on assets and closure date are exogenous) to show that mandatory subdebt is typically not a good way to prevent bankers from taking too much risk.¹⁵ Décamps et al. (chapter 10) and Rochet (chapter 9) modify this model by endogenizing the bank's return on assets and closure date. They find that under certain conditions (sufficiently long maturity of the debt, sufficient liquidity of the subdebt market, limited scope for asset substitution by the bank managers) mandating a periodic issuance of subordinated debt could allow regulators to reduce equity requirements (tier 1). However, it would always increase total capital requirements (tier 1 + tier 2).

In any case, empirical evidence for direct market discipline is weak: Bliss and Flannery (2001) find very little support for equity or bond holders influencing U.S. bank holding companies.¹⁶ It is true that studies of crisis periods—either in the recent crises in emerging countries (Martinez Peria and Schmukler 2001; Calomiris and Powell 2000), during the Great Depression (Calomiris and Mason 1997), or the U.S. Savings and Loan crisis (Park and Peristiani 1998)—have found that in extreme circumstances depositors and other investors were able to distinguish between “good” banks and “bad” banks and “vote with their feet.” There is no doubt indeed that depositors and private investors have the possibility to provoke bank closures, and thus ultimately discipline bankers. But it is hard to see this as “influencing” banks managers, and it is not necessarily the best way to manage banking failures or systemic crises. This leads me to an important dichotomy within the tasks of regulatory-supervisory systems: one is to limit the *frequency* of bank failures, the other is to *manage* them in the most efficient way once they become unavoidable. I am not aware of any piece of empirical evidence showing that depositors and private investors can directly influence bank managers before their bank becomes distressed (i.e., help supervisors in their first task). As for the second task (i.e., managing closures in the most efficient way), it seems reasonable to argue that supervisors should in fact aim at an orderly resolution of failures, i.e., exactly *preventing* depositors and private investors from interfering with the closure mechanism.

¹⁵The reason is that subdebt behaves like equity in the region close to liquidation (which is precisely the region where influencing managers becomes crucial) so subdebt holders have the same incentives as shareholders to take too much risk.

¹⁶A recent article by Covitz et al. (2003) partially challenges this view. However, Covitz et al. (2003) focus exclusively on funding decisions. More specifically they find that in the United States riskier banks are less likely to issue subdebt. This does not necessarily imply that mandating subdebt issuance would prevent banks from taking too such risk.

Using Market Information

The most convincing mechanism through which market discipline can help bank supervision is indirect: by *monitoring* banks, private investors can generate new, “objective” information on the financial situation of these banks. This information can then be used to complement the information already possessed by supervisors. There is a large academic literature on this question.¹⁷ Most empirical studies of market discipline indeed focus on market monitoring, i.e., indirect market discipline. The main question examined by this literature is: what is the informational content of prices and returns of the securities issued by banks? More precisely, is this information new with respect to what supervisors already know? Some authors also examine if bond yields and spreads are good predictors of bank risk.

Flannery (1998) reviews most of the empirical literature on these questions. More recent contributions are Jagtiani et al. (2000) and De Young et al. (2001). The main stylized facts are:

- Bond yields and spreads contain information not contained in regulatory ratings and vice versa. More precisely, bank closures can be predicted more accurately by using both market data and regulatory information than by using each of them separately.¹⁸
- Subdebt yields typically contain bank risk premiums. However, in the United States this is only true since explicit too-big-to-fail policies were abandoned (that is, after 1985–86). This shows that market discipline can work only if regulatory forbearance is not anticipated by private investors.
- However, as shown by Covitz et al. (2003), bond and subdebt yields can also reflect things other than bank risk. In particular, liquidity premiums are likely to play an important role.

In any case, even if there seems to be a consensus that complementing the information set of banking supervisors by market information is useful, it seems difficult to justify, on the basis of existing evidence, mandating all banks to issue subordinated debt for the sole purpose of generating additional information. Large banks and U.S. bank holding

¹⁷See, for example, De Young et al. (2001), Evanoff and Wall (2001, 2002, 2003), Flannery (1998), Flannery and Sorescu (1996), Gropp et al. (2002), Hancock and Kwast (2001), Jagtiani et al. (2000), and Pettway and Sinkey (1980).

¹⁸A similar point was made earlier by Pettway and Sinkey (1980). They showed that both accounting information and equity returns were useful to predict bank failures. Berger et al. (2000) obtain similar conclusions by testing causality relations between changes in supervisory ratings and in stock prices.

companies already issue publicly traded securities, and therefore this information is already available, while small banks would probably find it difficult to issue such securities on a regular basis and the market for them would probably not be very liquid.¹⁹

There is also a basic weakness in most empirical studies of indirect market discipline: for data availability reasons they have essentially used cross-sectional data sets containing a vast majority of well-capitalized banks. Remember that the problem at stake is the dynamic behavior of undercapitalized banks. Thus what we should be interested in is instead the informational content of subdebt yields for predicting banks' problems. That is, empirical studies should essentially focus on panel data and restrict analysis to problem banks.

Finally, most of the academic literature (both theoretical and empirical) has focused on the asset substitution effect, exemplified by some spectacular cases, like those of "zombie" Savings and Loan in the U.S. crisis of the 1980s. However, as convincingly argued by Bliss (2001), "poor investments are as problematic as excessively risky projects.... Evidence suggests that poor investments are likely to be the major explanation for banks getting into trouble." Thus there is a need for a more thorough investigation of the performance of weakly capitalized banks: is asset substitution the only problem or is poor investment choice also at stake?

In fact, the crucial aspect about using market regulation to improve banking supervision is probably the possibility of limiting regulatory forbearance by triggering PCA, based on "objective" information. As soon as stakeholders of any sort (private investors, depositors, managers, shareholders or employees of a bank in trouble) can check that supervisors have done their job, i.e., have reacted soon enough to "objective" information (provided by the market) on the bank's financial situation, the scope for regulatory forbearance will be extremely limited. Of course, the challenge is to design (*ex ante*) sufficiently clear rules (i.e., set up a clear agenda for the regulatory agency) specifying how regulatory action has to be triggered by well-specified market events.

How to Integrate Market Discipline and Banking Supervision

A few conclusions emerge from our short review:

¹⁹The argument that subordinated debt has the same profile as (uninsured) deposits and can thus be used to replace forgone market discipline (due to deposit insurance) is not convincing. Indeed, as pointed out by Levonian (2001), the profile of subdebt changes according to the region of scrutiny: it indeed behaves like deposits (or debt) in the region where the bank starts have problems, but like equity when the bank comes closer to the failure region.

- First, it seems that supervision and market discipline are more *complements* than *substitutes*: one cannot work efficiently without the other. Without credible closure policies implemented by supervisors, market discipline is ineffective. Conversely, without the objective data generated by prices and yields of banks' bonds and equity, closure policy is likely to be plagued by "ambiguity" and forbearance.
- Second, *indirect* market discipline (private investors *monitoring* bank managers) seems to be more empirically relevant than *direct* market discipline (private investors *influencing* bank managers). Also, mandating all banks to regularly issue a certain type of subordinated debt would not generate a lot of new information on large bank holding companies (because most of them already issue publicly traded securities), but would be very costly for smaller banks.²⁰
- Third, more attention should be directed to the precise ways in which supervisory action can be gradually triggered by market signals. Instead of spending so much time and energy refining the first pillar of the new Basel Accord, the Basel Committee should concentrate on this difficult issue, crucial to creating a level playing field for international banking.

There is also clearly a lot more to be done, both by academics and regulators, if one really wants to understand the interactions between banking supervision and market discipline. In particular, very little attention has been drawn²¹ so far to macroprudential regulation: how to prevent and manage systemic banking crises. It seems clear that market discipline is probably not a good instrument for improving macroprudential regulation. Indeed, market signals often become erratic during crises, and the very justification for macroprudential regulation is that markets do not deal efficiently with aggregate shocks of sufficient magnitude. Macroprudential control therefore lies almost exclusively on the shoulders of bank supervisors, in coordination with the central bank and the Treasury. A difficult question is then how to organize the two dimensions (macro and micro) of prudential regulation in such a way that systemic crises are efficiently managed by governments and central banks, while individual bank closure decisions remain protected from political interference.

²⁰The only convincing argument for mandating regular issuance of a standardized form of subdebt is that it may improve liquidity of such a market, and therefore increase informational content of prices and yields.

²¹Borio (2003) is one exception.