# Why Are There So Many Banking Crises?

## The Politics and Policy of Bank Regulation

JEAN-CHARLES ROCHET

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# *Preface and Acknowledgments*

In November 2000, I was invited by the University of Leuven to give the Gaston Eyskens Lectures. The main topic of my research at the time provided the title: "Why are there so many banking crises?" These lectures were based on the content of ten articles: four had already been published in academic journals and the other six were still work in progress.

Since then, I have been invited to teach these lectures in many other places: the Oslo BI School of Management (March 2002), the Bank of Finland (April 2002), the Bank of England (May 2002), Wuhan University (November 2002 and December 2004), and the Bank of Uruguay (August 2004). Now that all these articles have been published in academic journals, I have collected them into a single volume that will, I hope, be useful to all economists—either from academic institutions, central banks, financial services authorities or from private banks—who are interested in this difficult topic. I thank my coauthors—Jean-Paul Décamps, Xavier Freixas, Bruno Parigi, Benoît Roger, Jean Tirole, and Xavier Vives—for allowing me to publish our joint work.

I also thank the academic journals—CESIfo, the Journal of Money, Credit and Banking, Review of Financial Stability, European Economic Review, the Journal of the European Economic Association, the Journal of Financial Intermediation, and the Economic Review of the Federal Reserve of New York—for giving me the right to use my articles for this monograph. Chapter 1 was originally published in *CESIfo Economic Studies* (2003) 49(2):141–56; chapter 2 in *Journal of the European Economic Association* (2004) 6:1116–47; chapter 3 in *Journal of the European Economic Association* (2004) 6:1085–115; chapter 4 in *Journal of Financial Stability* (2004) 1:93–110; chapter 5 in *Journal of Money, Credit and Banking* (1996) 28(Part 2):733–62; chapter 6 in *Journal of Money, Credit*

*and Banking* (1996) 28:832–62; chapter 7 in *Journal of Money, Credit and Banking* (2000) 32(Part 2):611–38; chapter 8 in *European Economic Review* (1992) 36:1137–78; chapter 9 in *Economic Policy Review*, Federal Reserve Bank of New York, September 7–25, 2004; and chapter 10 in *Journal of Financial Intermediation* (2004) 13:132–55.

I have benefited a great deal from the comments of the audiences to the lectures, as well as from many colleagues. I am particularly grateful to Sudipto Bhattacharya, who organized my one-year visit to the London School of Economics, and David Webb, who kindly offered me hospitality in the Financial Markets Group. I thank my editor, Richard Baggaley, for actively supporting the project from the very beginning. Without him, this book would never have come out. Thanks also to Jon Wainwright of T&T Productions Ltd, who provided wonderful assistance in proofreading. Finally, I thank my colleagues at the University of Leuven (particularly Frans Spinnewyn) for starting the whole process by inviting me to give the prestigious Gaston Eyskens Lectures.

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# 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]

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

[2] See 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]

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

[4] See, 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 that 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 problems[8] (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

[5]The supporters of the "free banking school" challenge this view.

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

[7]This is the "representation theory" of Dewatripont and Tirole (1994).

[8]A 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.

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

[10]Peek 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

[11] This 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:

[12]Morgan (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.