Are Changes in Financial Structure Extending Safety Nets?

William R. White

Introduction

Over the past decade or so, a series of financial crises has attracted the attention of policy-makers, academics, and the public. These crises have commonly had material costs, not only to shareholders of affected financial institutions, but also to taxpayers and economic agents more broadly in the form of higher unemployment and lower output. While many of these crises have had idiosyncratic roots, there seems to be a common structural thread linking them. Increased risk taking on the part of private sector participants in financial markets has been facilitated by financial market deregulation and technological change. Liberalized financial systems seem inherently more prone to "procyclicality" and to intermittent financial crises than do repressed financial systems. This may be the price to be paid for the greater allocative efficiency they provide. Section 1 of this paper attempts to document some major structural trends in the financial system; trends defined here as marketization, globalization, and consolidation. Section 2 emphasizes the diversity in the character of recent financial crises. While these crises may share common roots, they are not all quite the same.

Against this empirical background, section 3 provides an assessment of whether there has been a tendency towards growing recourse to the use of the financial safety net in recent years. The term "safety net" is used generically here to describe the use of government instruments to mitigate damage in the event of difficulties in the financial system. Thus, the focus is clearly on crisis management rather than crisis prevention. The instruments considered are of both a micro nature (deposit insurance, government guarantees, short-term liquidity support to institutions, crisis coordination,

and exit policies) and a macro nature (easing monetary policy and support from the International Monetary Fund (IMF)). In the current conjunctural circumstances, where it seems increasingly accepted that we are facing the aftermath of a major financial bubble, this focus on crisis management may, in fact, be timely.

The task addressed in section 4 of the paper is to explore how the major trends in financial structure, as defined above, could contribute both to extensions of the safety net and to how it is applied. For example, if the trend towards market-based financial systems led to policy-makers putting greater reliance on monetary easing to deal with financial stress, rather than more traditional micro instruments, imbalances in the economic system might be inadvertently encouraged to build up over time. Again, by way of example, globalization and consolidation each contribute to increased opacity and complexity in the financial sector. This might invite a stronger public sector response to private sector financial difficulties than would otherwise be the case.

Section 5 asks whether the growing use of safety-net instruments poses a moral-hazard problem. On the one hand, the financial safety net can play a useful role in mitigating the damage arising from financial difficulties. This presumably explains the increased recourse to safety-net instruments in many countries. On the other hand, crises are often caused by imprudent risk taking, which is encouraged by safety-net provisions. Thus, the positive role played by the safety net in crisis management should, in principle, be traded off against the moral hazard that the net might generate over time.

The final task undertaken in this paper is to assess whether, in practice, the moral-hazard problem remains serious enough to merit increased attention from policy-makers. After all, “good design” for safety-net instruments could conceivably mitigate the moral-hazard problem materially, as could better regulation and supervision of major participants in the financial system. In spite of major recent advances with respect to this latter possibility, the conclusion reached in this paper is that the moral-hazard problem still seems a matter of practical significance. Accordingly, policy-makers might be asked to reflect more deeply on this intertemporal problem, and on the ultimate desirability of the major trends in financial structure that seem to be aggravating it.

1 Changes in Financial Structure

Designing and operating safety nets is a challenging business at the best of times. Moreover, the challenges increase when the structure of the financial system is itself undergoing major change. This, in fact, has been the case over the past few decades. A variety of underlying forces for change have

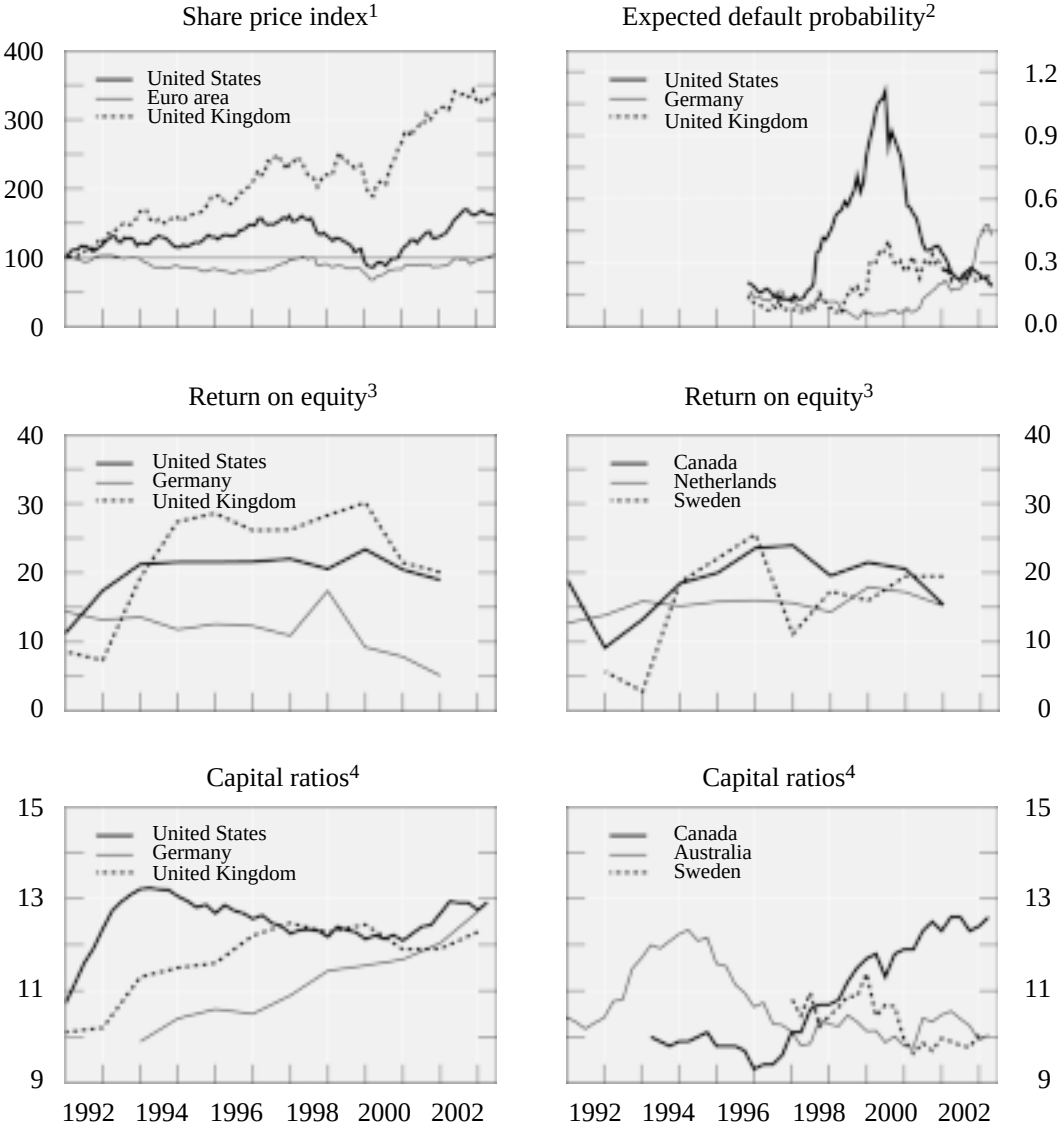
been at work: most notably, technology, deregulation, the impact of demographics on saving behaviour, and changing attitudes to shareholder value. The manifestations of these forces are described in this paper as marketization, globalization, and consolidation. Marketization refers to the growing importance of markets, as opposed to financial intermediaries, in the allocation of credit and the transfer of risk. Globalization refers to the increasing integration of domestic and international financial markets, as well as the increasing international presence of major banks and other financial intermediaries. Consolidation refers to the growing size and cross-sectoral scope of financial institutions. In section 4 of the paper, attention is directed to the ways in which these trends might affect the use of safety-net instruments.

Before turning to this, it is worth considering briefly the underlying forces for change, particularly insofar as they affect rates of return on capital in the financial services industry, the appetite for risk, and the potential need for safety-net instruments. Foremost among the underlying forces must be technological change. New technology allows risks to be unbundled and rebundled and then sold separately. Added to the new products thus provided, technological change has provided new means for delivering products and for disseminating information much more widely and much more cheaply. Taken together, these developments have led to a general commoditization of products that constitutes a direct attack on traditional "relationship" banking. Deregulation has also been a common feature of financial systems both in the industrial countries and increasingly in emerging-market economies.[1]

These forces have increased competition in many jurisdictions and have tended to drive down rates of return. This can be seen most clearly with respect to Japanese and continental European banks (see Figure 1 and Tables 1 and 2) and the insurance industry more generally (see Figure 2). In contrast, the relatively good performance of banks in the English-speaking countries perhaps reflects their longer experience in dealing with such forces and thus greater ability to achieve cost efficiencies.[2] A pernicious complication in many countries, discussed further below, is that increased competition between private sector sources is being encouraged by deregulation even as subsidized competition from state-supported financial institutions continues. In some countries, demographic considerations have encouraged reliance on private pension schemes with a concomitant shift in

1. For a fuller description of all these forces in a European context, see White (1998a).
2. Broadly stated, deregulation in the financial sector was first pursued most vigorously in North America and the United Kingdom, but came only later in Japan and continental Europe. Many emerging-market economies have also followed these trends in recent years.

Figure 1
Indicators of bank health



1. Ratio to broad equity index; end-1991 = 100.
2. Expected probability, in percentages, that a company will default within one year; median for banks in each country.
3. Profits before tax as a percentage of capital and reserves.
4. Total capital as a percentage of risk-weighted assets.

Sources: Organisation for Economic Co-operation and Development (OECD); KMV; national data.

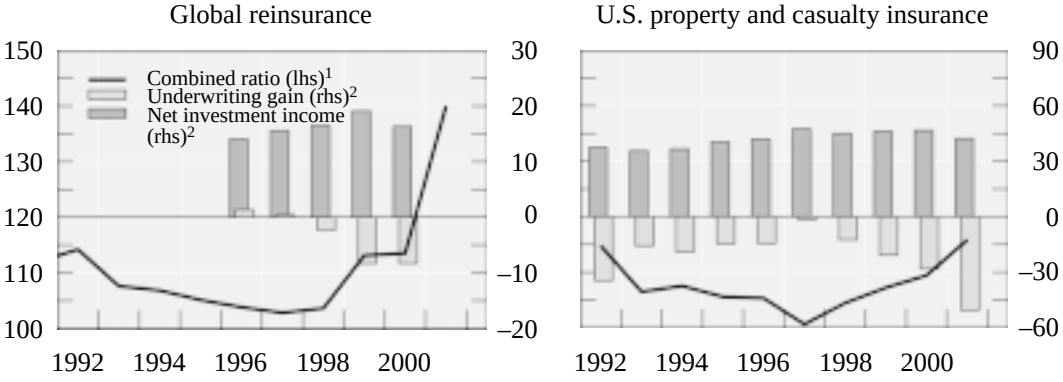
Table 1
Long-term accounting indicators of performance of banks

	Pre-tax profits			Non-interest income		
	1986–88	1990–94	2000–01	1986–88	1990–94	2000–01
	as a percentage of assets			as a percentage of assets		
United States	0.7	1.3	1.8	30	35	43
Japan[1]	0.6	0.3	–0.4	24	8	–29
Germany	0.6	0.6	0.3	20	24	36
United Kingdom	1.0	0.7	1.2	37	42	43
France[2]	0.5	0.2	0.7	19	32	62
Italy	1.0	0.8	1.1	25	22	33
Canada	1.0	0.9	1.0	27	32	54
Spain	1.1	1.0	0.9	18	21	32
Australia	1.2	0.7	1.3	40	43	51
Switzerland	0.7	0.5	0.8	49	50	61
Sweden	0.8	0.9	1.1	31	36	58

Note: For Germany, France, Italy, Spain, Australia, and Switzerland, all banks; for other countries, commercial banks only.
1. Fiscal years.
2. First period refers to 1988.

Source: OECD.

Figure 2
Performance of the insurance industry



1. Losses and expenses as a percentage of premiums earned.
2. In billions of U.S. dollars.

Sources: National Association of Insurance Commissioners; Standard & Poor's (S&P).

emphasis towards enhanced rates of return, including returns on investments in the shares of financial institutions. Indeed, concern for shareholder value in the operation of financial institutions has now spread well beyond the United States, to Europe in particular.

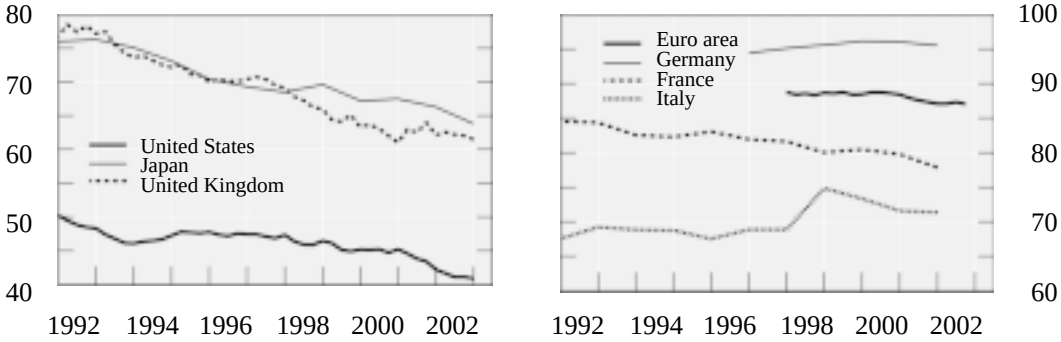
The upshot of all these forces could be a sharpening dilemma. Financial institutions find it harder to maintain rates of return even as shareholders demand that returns rise. This could have a number of implications. Merton (1998) and Hellwig (1995) have expressed concern that the loss of rents is, in fact, reducing the ability of financial institutions to adapt to shocks, while Padoa-Schioppa (2002) has expressed concern that the shocks might have become bigger. One reason for this latter development might be a tendency on the part of financial agents to take on greater risks as a means to resolve the above dilemma,[3] particularly if institutions face rigid cost structures. This tendency would be further exacerbated by the availability of safety-net instruments, which would become more valuable in the context of increased competition and heightened uncertainty.[4] From a systemic perspective, the dangers associated with such risk-seeking strategies would seem obvious.

Some limited empirical support for the **marketization** hypothesis is presented in Figures 3 to 5. Figure 3 shows how the ratio of bank loans to total corporate financing has been declining, particularly in the United States, but also elsewhere. The increasing sophistication and complexity of these markets are indicated by the growing size of the over-the-counter derivatives markets. At the time of the Bank for International Settlements (BIS) survey in December 2002 (see Figure 4), the notional amounts outstanding had

3. Consider how the loan losses to emerging-market economies in the 1970s seemed to spark a series of risky initiatives to reconstitute profits. In turn, banks went into leveraged buyouts, property lending, proprietary trading, and then lending to emerging-market economies all over again. One difference between lending to emerging-market economies in the 1970s and 1990s was that European banks were very much in the vanguard in the more recent episode. This seems to have been related to the particular difficulties faced by European banks in making reasonable rates of return in their traditional domestic markets. For a recent review of the extensive theoretical and empirical literature in this area, see Carletti and Hartmann (2002).

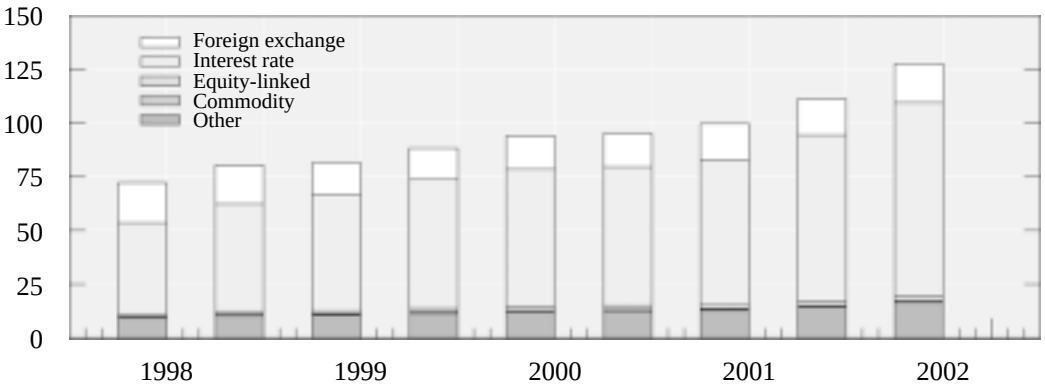
4. See Merton (1977) on the calculation of the value of guarantees using option theory.

Figure 3
Bank loan versus capital market financing



Notes: Bank loans to the corporate sector are shown as a percentage of the sum of such loans and short- and long-term securities issued by corporations. For the United States, they exclude mortgage credit.

Figure 4
Over-the-counter derivatives
Notional amounts by instrument, in trillions of U.S. dollars



Sources: FOW TRADEdata; Futures Industry Association; BIS calculations.

risen to $140 trillion, and the gross market values[5] were $6.4 trillion. Figure 5 has been added to indicate the extraordinary pace of recent expansion in the credit-risk transfer market. This market has truly revolutionary implications in that it is not contingent on prices in other markets, and thus essentially redundant. Rather, credit-risk transfer instruments are truly state-contingent, marking an important step towards complete markets.

The growing reality of **globalization** is also apparent. Figure 6 shows that the proportion of cross-border financial transactions has been rising steadily.[6] Figure 7 indicates the growing influence of foreign banks in the domestic banking systems of emerging-market economies. Van der Zwet (2003) has recently analyzed the net operating income of the world's 50 largest financial institutions. Her study indicates a marked rise in recent years in the proportion of net revenues coming from foreign as opposed to domestic operations.

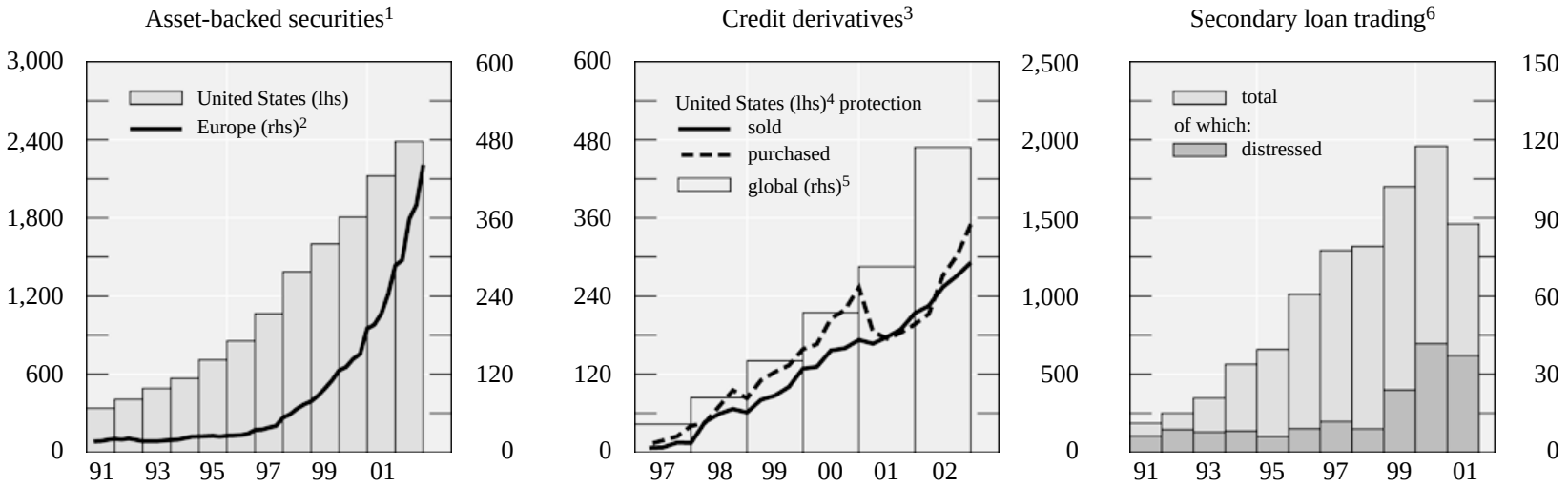
Finally, Table 3 provides evidence that **consolidation** and concentration in the financial services industry have been rising, especially in the origination of syndicated loans and in derivatives markets (see Figure 8). The recent study by the Group of Ten (2001) confirms these trends and also makes clear the increasing extent to which large financial firms trade with other large financial firms. There seems, in fact, to be a much stronger tendency for mergers to take place between traditional banks and those having investment banking functions, than for mergers between banks and insurance companies. Van der Zwet (2003) finds that, among the banks sampled, only 4 per cent of their income came from insurance activities, while insurance companies earned only 9 per cent of their operating income from banking activities.[7]

2 More and Different Kinds of Financial Difficulties to Manage

Over the past few decades, there has been a long series of financial incidents that have attracted the attention of public policy makers and others. Through the 1980s and 1990s, the greatest attention was focused on sovereign debt

5. Gross market values measure the replacement cost of all outstanding contracts (with positive value) had they been settled on the last day of the reporting period. The $6.4 trillion exposure figure was a marked increase from the $3.0 trillion recorded in June 2001.
6. See BIS (2003a, Table VII.5), which shows similar global trends for syndicated loans.
7. Reflecting on these results, van der Zwet concludes that internationally coordinated supervisory oversight is more important than domestic cross-sectoral supervisory oversight.

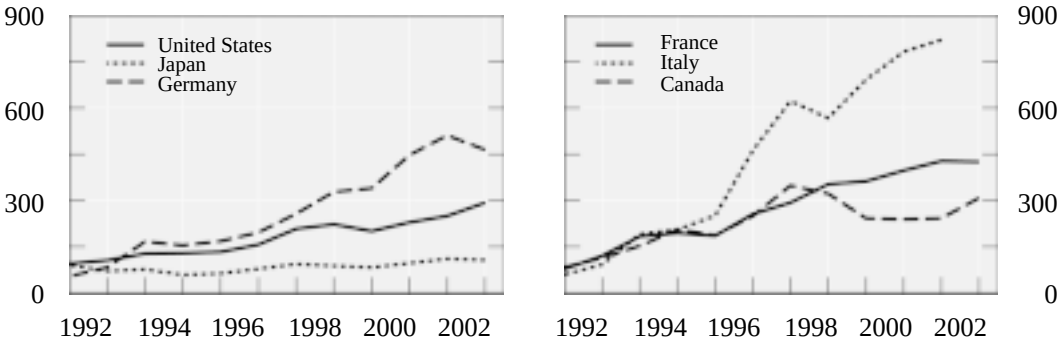
Figure 5
Credit-risk transfer markets
In billions of U.S. dollars



1. Amounts outstanding.
2. International bonds.
3. Notional principal values.
4. All banks.
5. Market participants' estimates (BBA surveys).
6. Global; turnover data.

Sources: Board of Governors of the Federal Reserve System; British Bankers' Association (BBA); Dealogic; International Swap Dealers Association; Loan Pricing Corp.; Thomson Financial Securities; BIS.

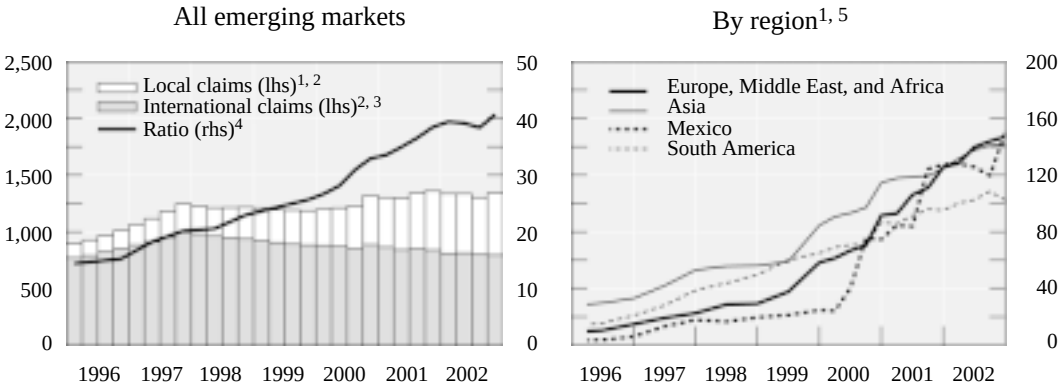
Figure 6
Cross-border transactions in bonds and equities
As a percentage of GDP



Note: Gross purchases and sales of bonds and equities between residents and non-residents.

Source: National balance of payments data.

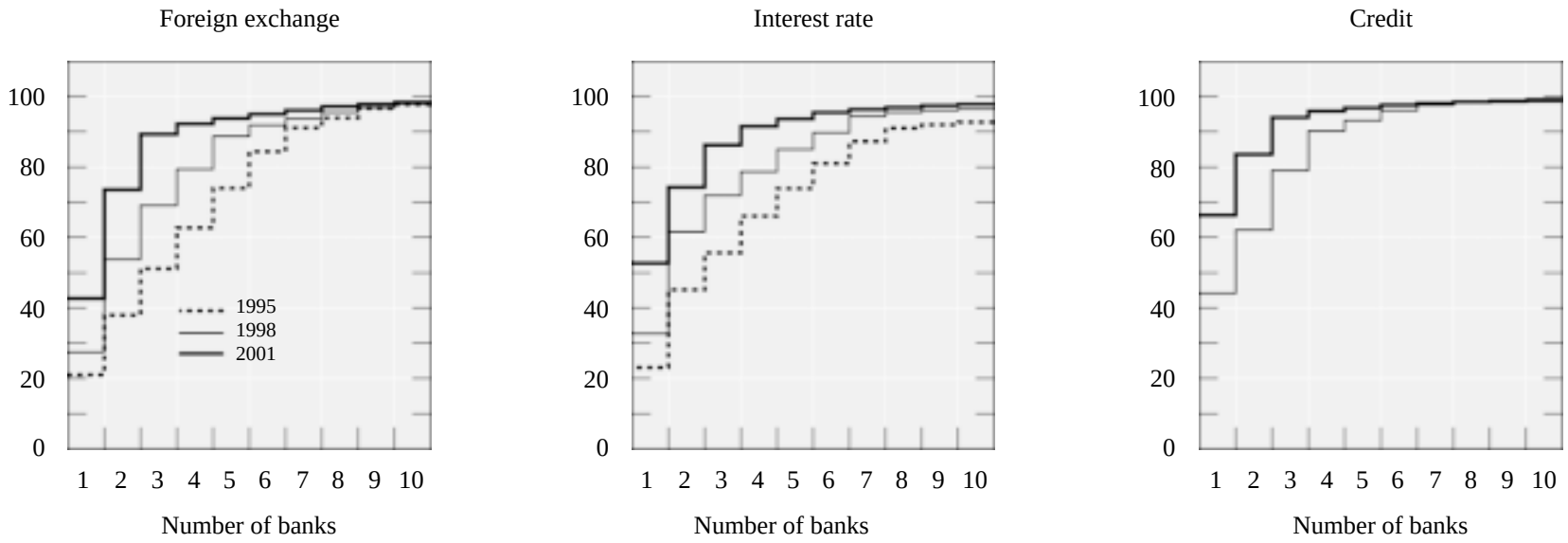
Figure 7
Foreign banks' local business in emerging markets



1. Claims booked by the foreign offices of banks in the BIS reporting area vis-à-vis residents of the country in which the foreign office is located and denominated in the local currency of the borrower.
2. In billions of U.S. dollars.
3. BIS reporting banks' cross-border claims in all currencies plus their foreign offices' local claims in foreign currency.
4. Local claims as a percentage of local plus international claims.
5. In billions of constant U.S. dollars, converted from local currency at end-2002 exchange rates.

Source: BIS.

Figure 8
U.S. banks' holdings of derivatives contracts
Cumulative percentage of total notional amount outstanding



Note: Total over-the-counter and exchange-traded derivatives contracts held by U.S. commercial banks.

Sources: U.S. Office of the Comptroller of the Currency; BIS calculations.

Table 2
Profitability of major banks
As a percentage of total average assets

	Pre-tax profits			Provisioning expenses			Non-interest margin			Operating costs		
	2000	**2001**	**2002**	**2000**	**2001**	**2002**	**2000**	**2001**	**2002**	**2000**	**2001**	**2002**
United States (10)	1.86	1.49	1.66	0.56	0.71	0.72	3.07	3.10	3.11	4.45	4.06	3.46
Japan[1] (12)	0.13	–0.93	0.04	0.81	1.36	0.28	1.08	1.14	0.81	1.14	1.20	0.82
Germany (4)	0.53	0.14	0.05	0.17	0.24	0.39	0.83	0.90	0.80	1.62	1.62	1.50
United Kingdom (4)	1.65	1.27	1.11	0.29	0.31	0.36	2.36	2.07	2.02	2.68	2.48	2.40
France (4)	0.85	0.74	0.58	0.17	0.22	0.20	0.93	0.94	1.03	1.94	1.87	1.81
Italy (6)	1.15	0.81	0.48	0.44	0.55	0.67	2.06	2.04	2.16	2.37	2.39	2.61
Canada (6)	1.26	0.92	0.61	0.29	0.41	0.59	1.89	1.95	2.06	2.76	2.84	2.76
Spain (4)	1.33	1.20	0.93	0.35	0.44	0.49	2.65	2.86	2.66	2.63	2.60	2.37
Australia (4)	1.85	1.47	1.49	0.20	0.27	0.26	2.42	2.22	2.16	2.39	2.15	2.29
Switzerland (2)	0.96	0.42	0.08	0.04	0.14	0.21	0.73	0.68	0.84	2.87	2.91	2.47
Sweden (4)	1.16	0.82	0.70	0.06	0.10	0.09	1.60	1.49	1.48	1.72	1.51	1.44

Note: The figures in parentheses indicate the number of banks included. For Japan, the number changed from 13 in 2002, following a merger.
1. Fiscal years; for 2002, September data.

Source: Fitch Ratings.

Table 3
Concentration measures across financial product lines
In percentage

	Institutions' share in:[1]			
Top five institutions in:	**International bond underwriting**	**Issuance of international equities**	**Arrangements of syndicated loan facilities**	**Total derivatives**
Bond underwriting				
1991–93	36.5	42.2	7.4[2]	—
1994–96	36.1	43.1	25.1	14.9
1997–99	40.9	43.7	23.6	19.2
2000–02	42.5	38.9	19.8	24.2
Equity underwriting				
1991–93	29.8	60.4	7.7[2]	—
1994–96	33.0	54.2	6.5	8.8
1997–99	38.5	53.0	7.1	12.7
2000–02	38.3	56.2	12.7	13.5
Syndicated loan lead arrangement				
1993	20.3	20.5	50.0	—
1994–96	17.1	17.3	54.4	20.7
1997–99	13.9	8.6	49.9	26.6
2000–02	26.6	14.7	41.9	38.7
Derivatives dealing				
1994–96	11.8	8.3	40.0	33.0
1997–99	20.4	14.3	35.5	38.7
2000–01	23.8	16.5	39.0	49.7

1. Percentage share of the total volume of activity in a given category (columns) accounted for by the top five institutions in a given activity (rows). For example, in 1991–93, the top five bond underwriters accounted for 36.5 per cent of the total volume of international bonds underwritten. The same institutions accounted for 42.2 per cent of the total volume of international equities underwritten over the same period.
2. 1993 only.

Sources: Dealogic; Dealogic Loanware; Swaps Monitor; BIS calculations.

crises,[8] yet it is important to note that a much more varied range of difficulties can also be identified. Presumably, each different type of problem would call for a different policy response, if any. While any classification scheme has its deficiencies, since individual incidents commonly have characteristics spanning various classes, the following distinctions seem useful: (i) operational disruptions; (ii) insolvencies having short-term effects on the functioning of financial institutions and payment systems; (iii) short-term price volatility having similar disruptive effects in

8. For an excellent survey documenting the historical evolution of banking and currency crises, see Bordo and Eichengreen (2000). After a period of rather great stability in the 1950s and 1960s, the number of both sorts of crises (also twin crises) has been steadily on the rise.

financial markets; (iv) medium-term price misalignments leading to bubbles and the bursting thereof; and (v) financial contagion across countries and markets. It is not difficult to find concrete examples of each type of financial problem.

Losses due to operational risk at financial institutions have received attention from the Basel Committee on Banking Supervision (BCBS), particularly in the context of the proposed reform of the Basel Capital Accord. Such operational events are defined by the Committee to include internal fraud, external fraud, losses arising from inappropriate employment and business practices, damage to physical assets, business disruptions and system failures, and losses from failed transactions processing and process management. A survey of 89 banks revealed that there had been 47,000 loss events in 2001 with total losses amounting to around $8 billion (see BCBS 2003). A recent report by the Financial Services Authority in the United Kingdom also suggests that the failure of insurance companies in the European Union in recent years (and near misses) was due primarily to operating risk (see McDonnell 2003). In particular, the report notes the weakness of many internal control systems, including internal audit.

While difficult to prove, the incidence and gravity of such events appear to have been increasing. It is perhaps not surprising at the end of a long economic and financial boom, that fraudulent behaviour would become more common. This has often been seen historically.[9] Of added concern today, however, would be the possibility of associated litigation that could result in the award of heavy penalties to miscreant firms.[10] Should such an outcome threaten ratings downgrades, it would in turn raise the related issue of the growing use of "trigger clauses" of various kinds in contemporary legal contracts. The exercise of such clauses has the potential to threaten the access of such financial firms to normal market liquidity. Indeed, a firm might have to repay all its outstanding borrowing immediately and, to the extent such firms were market-makers, this could threaten market functioning as well.

Perhaps of more secular importance has been the trend to complexity in financial systems, which makes system failures and business disruptions potentially more likely and more costly. For example, the explosive growth of derivatives markets has served to transfer both market risk and, increasingly, credit risk to those presumed best capable of bearing it (of

9. For example, Fisher (1933, 349) speaks of the various phases that encourage people to take on greater debt burdens, with the final two being "reckless promotions" and "the development of downright fraud."

10. This possibility has come to the fore in the wake of the Enron and WorldCom scandals, in particular.

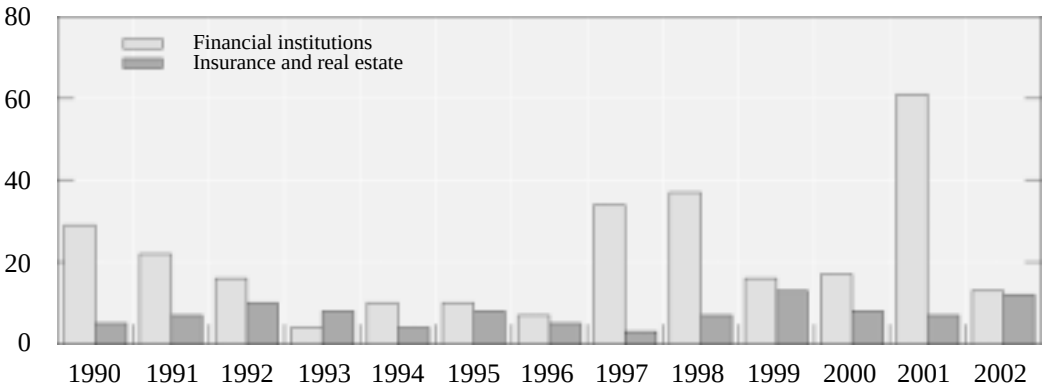
which more below). However, these trends have left investors much more exposed to financial loss in the event that the IT systems underlying these transactions suddenly fail to work. Finally, the events of 11 September 2001 underlined the exposure of payment systems to physical attacks, and the possibility that economic targets might receive increasing attention from terrorists given their disruptive potential. The recent announcement by the U.K. Chancellor of the Exchequer[11] that he intended to bring down legislation to allow the government to take over key parts of the City's infrastructure, in the event of a major terrorist attack, provides further evidence of how seriously this operational exposure problem is now being treated.

Individual institutional insolvencies also have the potential to have sudden systemic effects even if, in recent years, the worst fears associated with such events have not been realized. The failure of Drexel Burnham Lambert in 1990, that of Barings in 1995, and the recent difficulties faced by a number of European insurance companies were all contained events. The Drexel Burnham Lambert failure was arguably the most dangerous of these incidents in that it threatened for some time the integrity of the securities settlement process. Contrasting the potential costs of this threat with the fact that the firm was only of medium size, undertook essentially "plain vanilla" derivatives operations, and had virtually no international exposure, serves to highlight what difficulties might have arisen had the firm's operations been more complex. Arguably, under the urging of Gerald Corrigan of the Federal Reserve Bank of New York, this incident was the primary catalyst for much of the subsequent work directed to crisis prevention by both the private and public sectors.

In many past cases, the underlying reasons for insolvencies were operational, as noted above, but failures can arise from other sources as well. Looking backwards, Figure 9 seems to indicate an upward trend in the incidence of insolvencies in the financial sector in the major industrial countries. Another relevant point (evident in Figures 10a and 10b) is that the long-term credit ratings of the major banks and insurance companies in the G-10 countries have also been trending down, particularly in continental Europe and Japan. Moreover, the current conjunctural circumstances might support a continuation of this trend, even if sometimes vigorous adjustment

11. See Eaglesham (2003). The effect of the legislation would be to override normal contractual and trading rules to avoid gridlock in the system in the event of disruptions.

Figure 9
Insolvencies in the financial industry



Note: Number of defaulted companies per year.

Source: CreditPro.

efforts in the financial sectors of many countries would work in the opposite direction.[12]

Short-term price volatility in financial markets has at times also threatened financial instability. Two good examples would be the stock market crash of 1987 and the events surrounding the Russian debt crisis and the winding down of Long-Term Capital Management (LTCM) in 1998. In the former case, very large price movements were variously attributed to dynamic portfolio insurance and the withdrawal of market-makers from their normal functions under stress.[13] In the latter case, a number of markets (commercial paper and high-yield) became markedly less receptive to borrowers. This elicited unusual recourse to bank funding as a substitute and an associated increase in interbank funding to transfer funds from more creditworthy banks to those being judged less creditworthy. These perturbations also touched the foreign exchange market, with the yen/dollar rate moving 13 per cent over 7 and 8 October. These disturbances led to significant injections of central bank liquidity and, in the latter case, to public sector intervention to catalyze a private sector initiative to deal with the difficulties at LTCM in an orderly way (see CGFS 1999).

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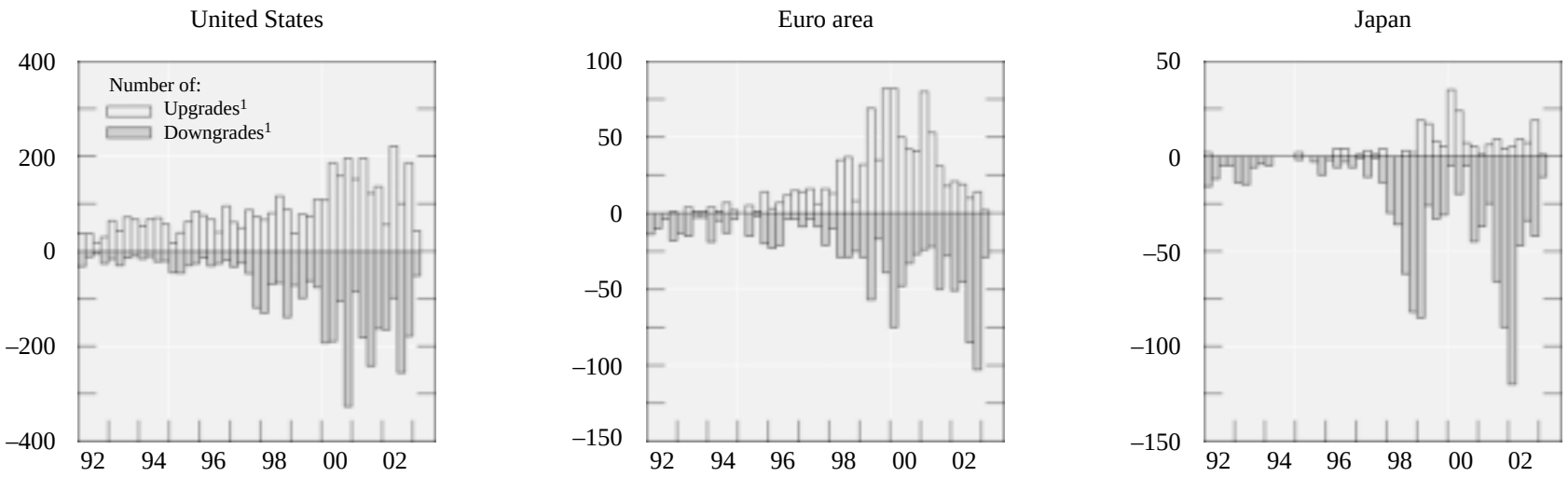
12. As argued in BIS (2003a), the resilience of the global financial system up to the spring of 2003 was remarkable, given the number and variety of shocks to which it had been subjected in recent years. Indeed, until that point, there had been no major individual bankruptcies.

13. See Jacobs (1999). A number of studies into the functioning of markets under stress have more recently been carried out in the context of the BIS. See BIS (2002) and Barth, Remolona, and Wooldridge (2002).

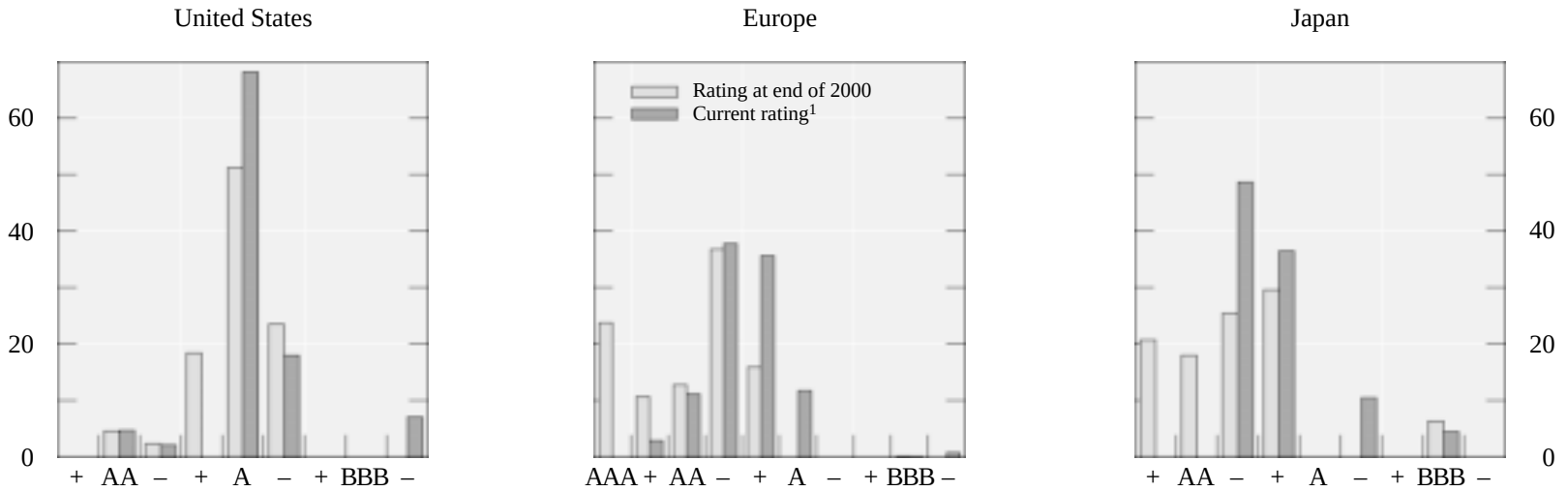
Figure 10a
Long-term credit rating changes of banks



Note: Rating changes by S&P, Moody's, Mikuni, and R&I.
1. During the quarter.

Source: Bloomberg.

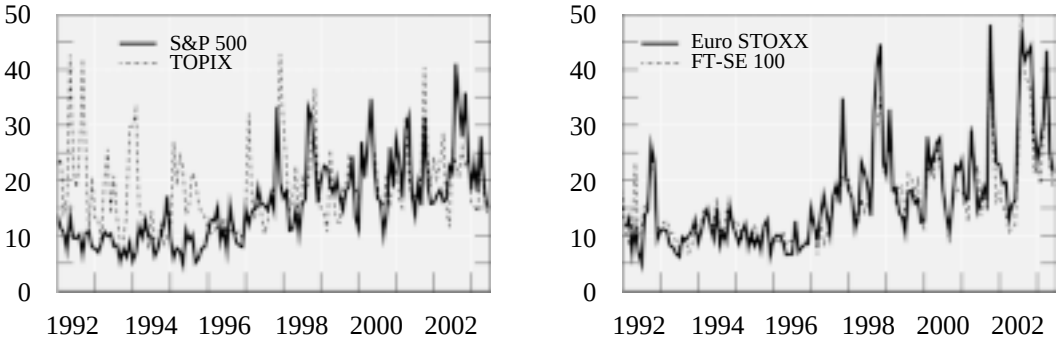
Figure 10b
Insurance companies' ratings



Note: Each bar represents the assets of insurance companies with the corresponding rating as a percentage of total assets of the selected companies from each region. Companies as included in industry groups of the S&P 500, Dow Jones STOXX 600, and TOPIX indexes.
1. As of April 2003.

Source: Bloomberg.

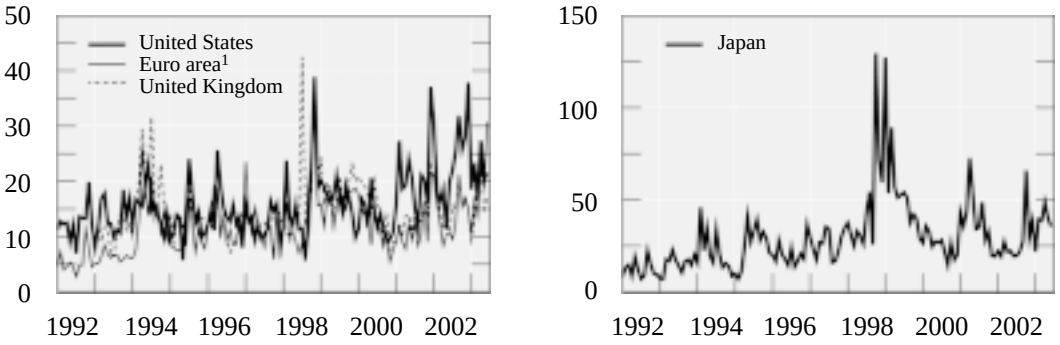
Figure 11
Historical volatility of equities



Note: Measured as the annualized standard deviation of daily percentage changes of indexes during calendar months.

Sources: National data; BIS calculations.

Figure 12
Historical volatility of bond yields



Note: Measured as the annualized standard deviation of daily percentage changes in the yield on 10-year government bonds during calendar months.
1. Prior to 1999, Germany.

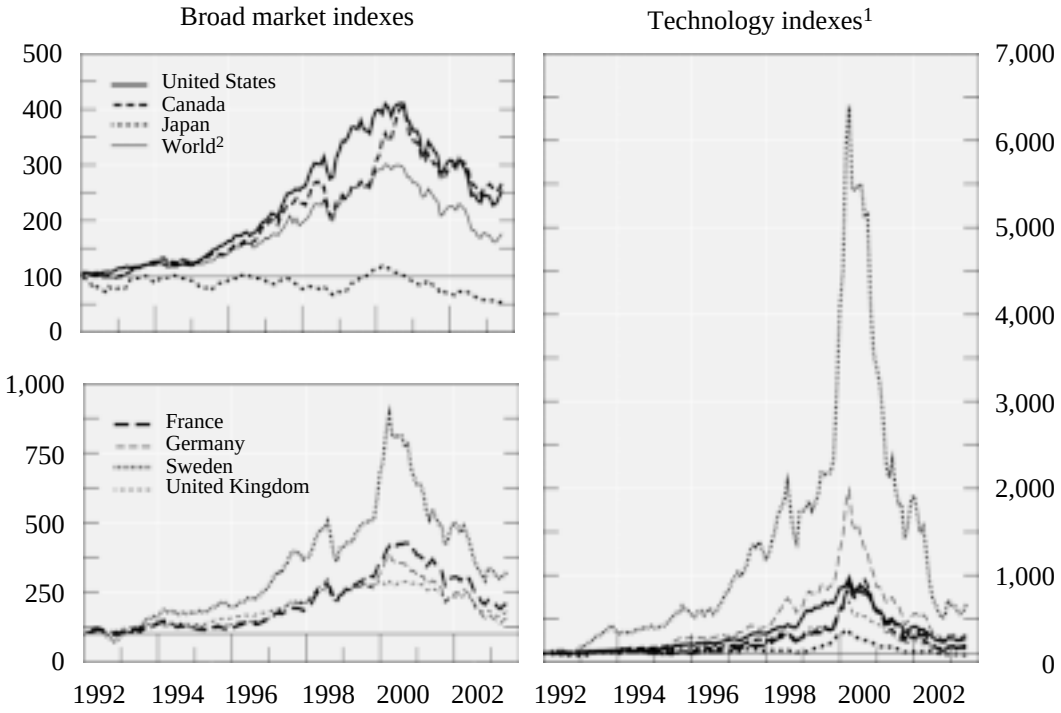
Sources: National data; BIS calculations.

It also seems to be the case that many measures of short-term market volatility (see, for example, Figures 11 and 12) have increased since the second half of the 1990s.[14] It remains to be seen whether this could have worrisome consequences related to still high levels of debt and leverage in financial markets. One lesson arising from the LTCM incident was that unexpected volatility forced deleveraging, which, in turn, led to still more volatility. The fact that LTCM, believing the volatility of its portfolio to be low, had returned equity to investors meant that they were more leveraged and exposed when volatility rose contrary to expectations. The growing use of trigger clauses of various sorts in financial contracts would add a further potential for non-linear price responses to shocks of various sorts.[15]

Medium-term misalignments and systemic vulnerabilities have been seen in many emerging-market economies over the past decade, but financial markets in industrial countries have also been affected. Figures 13 and 14 show some significant cycles in prices over the past decade. This category of problems seems commonly to arise when some initially justified grounds for optimism about the economic future are extended to such a degree as to become unjustified.[16] The process commonly involves accelerating credit growth (both from domestic sources and because of inflows of foreign capital), rapid increases in asset prices, and an associated consumption or investment boom. This boom phase can then be followed by a sudden deflation of expectations, an associated bust, and, potentially, feedback effects on the health of those who provided the credit in the first place.[17] If a country's exchange rate also falls sharply during this phase, and there was a high initial level of currency mismatching, the financial damage is likely to be materially enhanced.[18] Finally, supposing that, as was often the case, the boom phase was also characterized by continuing low levels of CPI

14. See also CMF (2002), which documents how measures of equity market volatility have risen since 1997.
15. See Samson (2001); and also see Buffett (2003), who describes derivatives, in part due to their potential for such non-linear interactions, as "financial weapons of mass destruction. The dangers are now latent—but they could be lethal."
16. McKinnon and Pill (1996) refer to this as "excessive optimism." This does not seem unrelated to the problem of "irrational exuberance."
17. Processes of this sort have been the subject of various BIS papers and conferences in recent years. See Borio, Kennedy, and Prowse (1994); Andersen and White (1996); White (1998b); Borio, Furfine, and Lowe (2001); Borio, English, and Filardo (2003a); and Borio and White (2003b). For conference material, refer to BIS (1996, 1998, 2001, 2003b). For much earlier descriptions of such events, a good source is Heaton (1948, Chapter XXVII).
18. See Goldstein and Turner (2004) for a comprehensive overview of this crucial issue.

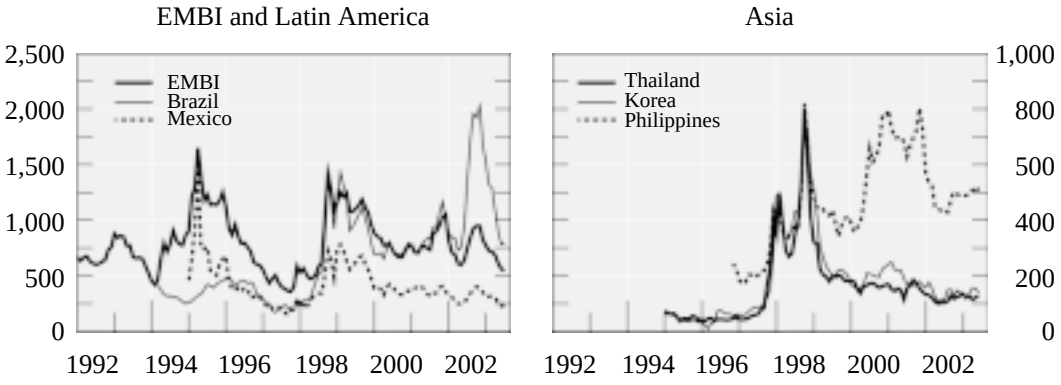
Figure 13
Stock market indexes
Monthly averages, December 1991 = 100



1. Technology, media, and telecommunications stocks.
2. MSCI World Index.

Source: Datastream.

Figure 14
Bond spreads for selected emerging markets



Note: U.S. dollar international bonds over 10-year U.S. Treasury bonds; since 1999, for Brazil and Mexico, stripped spread of emerging-market bond indexes calculated by JP Morgan Chase.

Source: Bloomberg.

inflation, the bust might turn into outright deflation if the financial system were seriously enough impaired.[19]

The Mexican crisis of 1994 provides a good example of the genre, with initial optimism justified by a strong swing to fiscal probity, the denationalization of the banking system, and the introduction of NAFTA. The East Asian crisis of 1997 and 1998 had similar origins in sound macroeconomic policies, an export-oriented development strategy, and a growing belief that "Asia is the future." In the industrial countries, the experience of Japan in the late 1980s and early 1990s also conforms closely to this model. More recently, reference could be made to eventual overvaluations in the equity markets of the advanced industrial countries, particularly the high-tech stocks considered most likely to benefit from "new era" increases in productivity and profits. The Nasdaq collapse in 2000 subsequently spread in significant (if lesser) measure to other equity markets around the globe, with the reverberations being felt particularly by pension funds and insurance companies. These financial entities invested heavily in equities, given their promise of exceptional rates of return, in spite of the fact that their risk profile might have been thought inappropriate, given the fixed nature of their longer-term liabilities. In spite of these difficulties, the financial systems of the industrial countries have proved extraordinarily resilient to date. Various ways in which changes in financial structure have contributed to this resilience are evaluated in section 4.

The last category of financial disruptions can be described as **contagion** across countries and markets. A number of country examples can be given. The Mexican crisis of 1994 had reverberations throughout Latin America and even into Asia. During the Asian crisis itself, there were indications of contagion from one country to another and even effects in eastern Europe. The Russian debt default of 1998 led to the market volatility that brought down LTCM and subsequently led to the devaluation of the Brazilian real. As for interconnections between markets, credit spreads in high-yield corporate markets have also, over the last few years, shown an increased correlation with sovereign spreads (see BIS 2003a, Graph VI.13). As well, it appears that correlations between yields on stock indexes in various international markets were significantly higher in the 1990s than in the period from 1975 to 1990 (see Schröder 2003).

This having been said, all of these examples suffer from a common fault. Evidence of correlation is not the same as evidence for contagion, defined

19. This was the case in the United States in the 1930s and in Japan in the 1990s. It was also seen in some countries affected by the Asian crises of 1997–98. Note, however, that not all deflations arising from other sources need have equally worrisome consequences. See BIS (1999, 77–81) for a discussion of this issue.

here as disruptive effects for which there seems to be no domestic explanation. Consider the fact that many of the countries that experienced crises in Asia in late 1997 suffered from very similar structural weaknesses: weak banks, fixed exchange rates, and currency mismatches (see Summers 2000 and Shafer 2003). It is entirely possible that the Thai crisis (the first of many) served mainly to focus attention on pre-existing problems in other countries. Indeed, when we look at recent market behaviour in the light of the crises in Argentina and Turkey in 2001, what seems to emerge is not contagion but an increasingly sharp differentiation between more worthy and less worthy sovereign credits.

As for the increasing correlation of returns across markets, if this is simply the result of shocks over time being dispersed through markets interrelated by arbitrage, it is not obvious that this is a bad outcome. Nevertheless, another interpretation is also possible. Indexes of risk aversion can be calculated using price movements derived from a wide range of financial markets. Figure 15 shows wide swings over the past decade in the appetite for risk,[20] indicating that many markets might simultaneously be affected by such swings in sentiment. Indeed, a closer look at Figure 15 indicates that this measure of risk aversion rose during each of the major international crises, only to fall later under the influence of lower global interest rates. From early 2001, however, investors seem to become generally more risk-averse, even as policy rates came down.

3 A Growing Reliance on Financial Safety Nets?

3.1 The rationale for government intervention

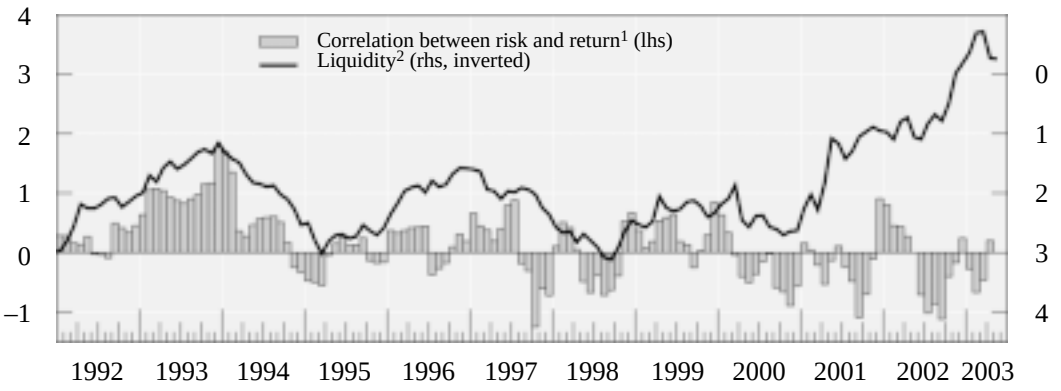
Over the years, the public sector has intervened in various ways to reduce the incidence of financial crises and the damage they cause. Attention will be restricted in this paper to public policy instruments directed to the second purpose.[21] The perception of the need for a public sector involvement reflects the view that financial stresses have the potential to feed back onto the real side of the economy.[22] That is, there could be systemic effects leading to the overall social costs being greater than the costs borne by

20. For an explanation of its construction, see Tsatsaronis (2000).

21. A large number of standards and codes directed to crisis prevention can be found at the Web site of the Financial Stability Forum (www.fsforum.org). Note that those philosophically opposed to government intervention in crisis management stress the advantages of crisis prevention.

22. Padoa-Schioppa (2002, 20) defines financial stability as referring "to the preservation of the core economic functions of the financial system in channelling savings into investment and providing for an efficient and safe payment mechanism."

Figure 15
Investors' attitude towards risk and liquidity



1. Slope coefficient of a cross-sectional regression of realized returns on historical volatility for a number of asset classes.
2. GDP-weighted average of overnight real rates in the Eurocurrency market for the United States, Japan, Germany, France, and the United Kingdom.

Sources: Datastream; national data; BIS estimates.

financial market participants themselves. This is a form of market failure warranting public sector intervention.

Whether these systemic events originate in problems with financial institutions, financial markets, or the payment system,[23] policy-makers worry that the willingness and/or capacity of economic agents to spend would be adversely affected by these financial events, as would output and employment. Much of the early academic literature focused on the problem of sound banks being subjected to bank runs by depositors, and facing bankruptcy resulting from illiquidity.[24] This, in turn, would affect the payment system and the ongoing capacity of the economic system to function. Another strand of thought focused on capital-constrained banks.[25] This could be the result of an asset-price collapse or the by-product of losses arising from various sources. If the willingness to lend of a significant number of banks were sufficiently reduced, there would very likely be

23. Efforts directed to crisis prevention can be characterized in the same tripolar way. See White (1994). At the BIS, the three standing committees of national experts that focus on financial stability are the Basel Committee on Banking Supervision, the Committee on the Global Financial System, and the Committee on Payment and Settlement Systems. They are concerned respectively with the stability of banking systems, the functioning of markets, and systemically important payment systems.
24. See Diamond and Dybvig (1983). A topic that has received less attention by academics is the possibility of "runs" in the interbank market. A series of Euro-Currency Standing Committee (ECSC) studies focused on the potential for such problems. See ECSC (1992).
25. See Bernanke (1983).

feedback effects on corporate investment in particular and the economy in general. In recent years, the focus of attention has shifted somewhat from difficulties arising at financial institutions to the potential disruptive effects on the real economy should certain financial markets cease to function or be seriously impaired.[26]

At the international level, the traditional concern has been that external credit to finance trade deficits would dry up, forcing a degree of domestic retrenchment that would be unacceptably harsh. In the 1990s, similar worries began to be expressed about rapid capital outflows, generally after a period of sustained inflows that eventually raised doubts about debt sustainability.[27] The concerns raised above about international contagion, as well as the possibility of multiple equilibria,[28] also indicate a potential for serious and unnecessary damage arising from liquidity shortages in international financial markets. This kind of reasoning, in association with recent experience of financial disruptions of various sorts, has led to the belief that there is damage to mitigate. Logically, this is a prerequisite before turning to the use of instruments of public policy for damage mitigation.[29]

3.2 Specific instruments: Original rationale and growing extensions?

Supposing that there is damage to mitigate, the next issue is how the use of safety-net instruments might serve to reduce such damage in the short run. In this section, the arguments supporting the use of individual micro instruments (deposit insurance, government guarantees, lender of last resort (LOLR), exit policies) and macro instruments (generalized infusions of

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26. See ECSC (1994) and CGFS (2001).

27. A book by Goldstein and Turner (2004) emphasizes the particular problems arising from foreign currency mismatches in such circumstances.

28. Such a situation can arise when capital markets impose such a high risk premium for borrowing that the debt burden becomes unsustainable, even though the burden would be sustainable at a lower level of interest rates. The underlying issue is whether the risk premium charged is fully justified or not in terms of economic fundamentals. Unfortunately, reasonable people can differ widely in their judgments on these issues.

29. However, there is also a school of thought that questions whether the damage is likely to be as great as claimed. Kroszner (1998, 17) states, "The emphasis on the fragility of banks and the banking system in the absence of a government safety net may be overstated." He notes that, without a safety net, panic runs rarely affected sound banks and that private banks devised their own ways to deal with such problems. It is a fact, for example, that bank capital ratios in the United States were much higher prior to the establishment of the Federal Reserve. Goodfriend and King (1988), Benston and Kaufman (1998, 11), and Kane (2001) also argue that the need for government intervention is no greater with respect to banks than non-banks.

liquidity, IMF lending) are presented. The broader question of how these presumed benefits might be traded off against the costs of moral hazard is reserved for section 4 of the paper. In addition to clarifying the rationale for the use of individual instruments, this section also attempts to document which ones appear to be more commonly used now than in the past.

A review of the literature reveals wide variations in the degree of consensus (based on theory but generally limited empirical analysis) about the economic benefits arising from the use of each of the public policy instruments being considered here. Nevertheless, there is also widespread recognition that political considerations commonly argue in favour of the use of such policy instruments, regardless (see Goodhart 1996). This may help explain what appears to be the broad trend towards increased government involvement in crisis management. In the industrial countries in particular, politicians are commonly blamed for economic bad news and accordingly take steps to avoid it, regardless of potential longer-run negative implications. This is an observation that also has relevance well beyond the realm of mainstream economics.

Beginning first with micro instruments, the positive effects of **deposit insurance** schemes now seem generally agreed on, at least by government and international officials (see Garcia 2002). One important benefit is consumer protection for those deemed incapable of adequately assessing the riskiness of individual banks themselves.[30] But a still more important benefit concerns the increase in systemic stability generated by the reduced likelihood of bank runs. Following on the original article by Diamond and Dybvig (1983), Dale (2000) and many others feel that banks are inherently fragile and that the decision to "run" can be perfectly rational behaviour in the face of uncertainty as to possible (if unlikely) outcomes. Supposing for some reason that financial problems have begun to emerge, deposit insurance reduces the uncertainty that might otherwise be generated about the safety of deposits. In turn, this reduces the collateral damage that might otherwise follow if the failure of a single institution were to generate concerns about the safety of the system as a whole. Nakaso (2001) makes the case for deposit insurance in a rather different way. He argues that in the absence of either an adequate explicit or even an implicit deposit insurance

30. For completeness, some other benefits should also be mentioned. Deposit insurance encourages the use of the banking system for payments, thus increasing efficiency and accountability. Moreover, it levels the playing field in tough times when state-owned banks, big banks, and foreign-owned banks might be relatively advantaged. Finally, there are some benefits with respect to crisis prevention and management. If those responsible for paying out deposit insurance could insist on banks being "resolved" earlier, then problems might be dealt with before they take on crisis proportions.

scheme in Japan in the early 1990s,[31] the official sector was fearful of a sudden collapse of confidence in the banking system. Such concerns led to an alternative reliance on official forbearance and generalized infusions of liquidity to maintain stability.

If most commentators see some merit in the idea of deposit insurance, there is more disagreement as to whether deposit protection schemes should be explicit or not. Most commentators seem to accept the former position (see Garcia 2000). One part of the argument is that, in the middle of a crisis, policy-makers will be forced to offer explicit protection to everyone. Thus, the costs to taxpayers may be very high. In contrast, Demirgüç-Kunt and Detragiache (2000) seem to argue that poor design can make the explicit protection route even more costly. This design issue is returned to below.

Explicit deposit insurance schemes are certainly much more widespread than they used to be.[32] The first nationwide system was introduced in 1934 in the United States, but other countries only began to follow in the post-war period. This trend accelerated in OECD countries in the 1980s, culminating with the introduction of limited deposit insurance in the European Union in 1994. Emerging-market countries have more recently accelerated their introduction of such schemes, pursuant to the drawing up of a code of best practice by the IMF in 1997 and a set of guidelines prepared by a group of national experts under the aegis of the Financial Stability Forum (see FSF 2001). The recent establishment of the International Association of Deposit Insurers with a secretariat at the BIS, is likely to strengthen this trend.

Government guarantees to financial institutions constitute another aspect of the financial safety net. In some cases, the intention was explicitly to provide a "safe haven" that would encourage more savings. In other cases, the government guarantees were not initially intended to make the system safer, but rather to support the provision of credit to specific kinds of borrowers (rural borrowers, small businesses, the mortgage sector, etc.) deemed unlikely to be adequately served by the private sector.[33] While such programs are seen in virtually every industrial country, special emphasis might be put on the public sector savings banks in Germany, the Post Office Savings Bank in Japan, and the various government-sponsored enterprises (GSEs) in the United States. These entities have a very significant market

31. At the time, there was an explicit legislative cap on the use of the deposit insurance fund, given the failure of a single borrower. This was at the very opposite end of the spectrum from an implicit guarantee.
32. For a full documentation, see Demirgüç-Kunt and Huizinga (1999).
33. For a fuller description, see Walter and Weinberg (2002).

presence in their respective countries.[34] While such public sector activities are being scaled back in Europe,[35] the proposed privatization of the Japanese Post Office Savings Bank has been long delayed. In sharp contrast, in the United States, the expansion of the balance sheets of Fannie Mae and Freddie Mac in recent years has been of the order of 25 per cent per annum.

Another way in which governments have become more involved is through providing implicit guarantees for all bank liabilities in the midst of crises. In Japan, in early 1999, the perception that such a guarantee from the government had been offered may have contributed to the virtual disappearance of the previously widening "Japan premium," paid by Japanese banks for access to funds in the interbank market (see Figure 16).[36] A similar offer by the Korean government kept funds flowing into Korean banks in the midst of the Asian crisis in 1997–98. More generally, as indicated in Table 4, there is a big gap between the overall rating of financial institutions and their inherent financial strength (average Bank Financial Strength Ratings (BFSR)). This could be another indicator of the influence of safety-net provisions.

The lender-of-last-resort (LOLR) instrument is defined here as lending by central banks to individual institutions.[37] More generalized infusions of market liquidity are discussed below. This instrument of crisis management was first discussed at the beginning of the nineteenth century and has been part of the central banker's arsenal ever since.[38] The initial rationale for LOLR was runs on banks by retail depositors, but, in more recent years, the official sector has tended to put greater focus on failures in the interbank market (as discussed above), where lending is typically unsecured. The concern is that, faced with uncertainty about the solvency of a counterparty, there could be a withholding of credit even from a sound bank. While dangerous enough in itself, should the payment system also be compromised,

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34. In Germany, the public sector savings banks hold about 40 per cent of all deposits (February 2003). In Japan, the Post Office holds almost 50 per cent of all deposits (April 2003). In the United States, GSEs either own outright or have securitized more than half of all existing residential mortgages (2002Q3). While the liabilities of these GSEs have no explicit guarantee from the U.S. government, unlike their Japanese and German counterparts, there is a general market perception of an implicit guarantee.

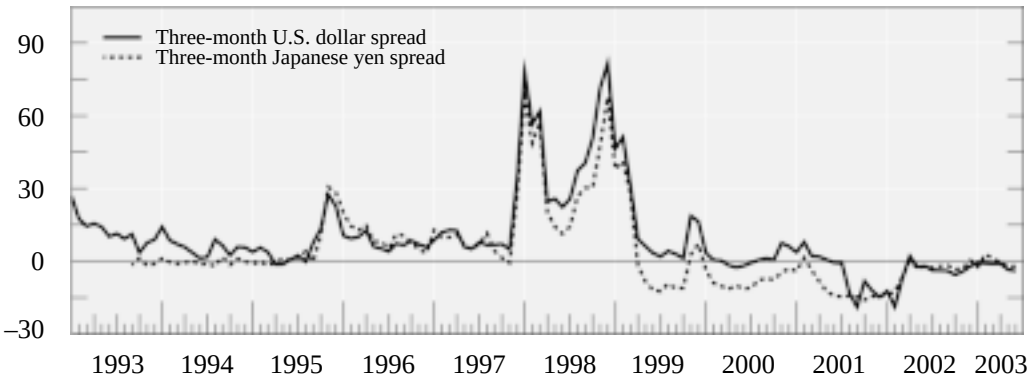
35. In Europe, the European Commission has imposed heavy fines related to the use of implicit state subsidies to many firms.

36. A complementary explanation was the introduction around that time of repo transactions (effectively using Japanese Government Bonds (JGBs) as collateral) rather than unsecured borrowing.

37. This seems consistent with the approach suggested by Goodhart (1999, 344). Note that this definition also excludes the provision of credit to financial institutions under standing facilities at the discretion of the borrower.

38. For a survey of the recent literature, see Freixas and Giannini (1999).

Figure 16
Differentials in U.S. dollar and Japanese yen interbank interest rates between Tokyo and London
Monthly averages; in basis points



Source: Global Insight.

Table 4
Intrinsic strength and ordinary ratings of banks
Prevailing at 2003Q1

	Number of rated banks	Range of BFSRs[1]	Average BFSR[1]	Average long-term deposit rating[2]
United States	142	A to D	B^-/C^+	A1/A2
Japan	44	C^+ to E	D	Baa1
Euro area	178	A to E	C^+	A1
Austria	11	C^+ to B^-	C^+	Aa3
Belgium	4	B	B	Aa2/Aa3
Finland	3	B^- to C^+	C^+	A2
France	27	A^- to D	C^+	A1/Aa3
Germany	33	B to E^+	C	Aa3
Greece	8	C to D^-	D^+	Baa1
Ireland	14	B to C^-	C	A2
Italy	30	B^+ to D^+	C	A2
Luxembourg	8	B to C^-	C^+	A1
The Netherlands	8	A to C	B	Aa2
Portugal	8	B^- to C^-	C^+	A2
Spain	24	A^- to C	B^-	A1
United Kingdom	40	A to D	B^-/C^+	A1
Switzerland	8	B^+ to C^+	B^-	Aa3

1. Bank financial strength ratings (BFSRs) measure intrinsic safety and soundness on a legal stand-alone basis. The ratings range from A to E.
2. Ordinary long-term deposit ratings factor in external credit support from owners, industry groups, and/or official institutions. The ratings range from Aaa to C3.

Source: Moody's.

the collateral damage might be even greater.[39] In such circumstances, direct liquidity support of the individual bank in question would seem to be essential.

Over the decades, central banks have used their LOLR facilities many times. While generalized depositor runs have almost disappeared since the founding of central banks, other disruptions have sometimes led to central bank intervention. One landmark event in the United States was the provision of $22 billion overnight to the Bank of New York in 1985, pursuant to a computer failure that prevented the bank from recording credits to offset debits. Another was the provision of funds to selected institutions (along with a general liquidity infusion) to deal with U.S. settlement problems in the immediate wake of the events of 11 September 2001. Interestingly, all these relatively recent events in the United States were associated with operational risks of one sort or another that threatened the payment system. This experience could actually be interpreted as a more restrictive use of this traditional instrument.

The use of the LOLR instrument does seem to have changed over recent years, but in the direction of less use rather than more. In both Europe and North America, banks increasingly prefer to rely on market sources of funding to avoid any suspicion that their recourse to public funds meant that they might be having difficulties. On the other side of the transaction, central banks also seem to have backed away from Bagehot's dictum of lending freely on good collateral. Rather, the dominant principle more recently seems to have become one of "constructive ambiguity," presumably reflecting concerns about moral hazard. One important exception among the central banks of the industrial countries has been the behaviour of the Bank of Japan. Over the past decade, and in sharp contrast to earlier behaviour, the Bank of Japan has used its LOLR instrument repeatedly to help support individual institutions that were no longer able to turn to the interbank market.[40]

Exit policies refer to the role of the public sector in resolving difficulties associated with weak financial institutions. Since the failure of Bankhaus Herstatt in 1974, there have been no further "disorderly" failures, but there have certainly been a few close calls. All weak institutions, including financial firms, can, in principle, either be liquidated or undergo some form

39. There is not much empirical work on interbank exposure arising from the payment and settlement system. Furfine (2001) argues that these risks have been exaggerated in the United States, but he also recognizes that his study has certain limitations and that the dangers could well be greater.
40. An excellent summary of these events is provided by Nakaso (2001).

of restructuring.[41] In each case, the process may be more stakeholder centred or more official centred, with the latter tending to be significantly faster in practice. This provides a clear rationale for government involvement in such processes, since speed is of the essence in the case of weak financial institutions. Delay reduces the liquidity both of the troubled institution and potentially its counterparties and could lead to systemic problems. Moreover, with the creditors of financial institutions often being highly dispersed, the likelihood of a speedy resolution conditional on stakeholder co-operation would be minimal. The fact that financial supervisors commonly have some detailed knowledge of the firm in question also argues for their active involvement in the resolution process.

If the purpose of public sector involvement is to ensure rapid resolution of weak institutions, the evidence is mixed on the efficacy of such interventions. On the positive side, reorganizations in most countries have commonly occurred before the financial distress became public, forcing the firm into insolvency. In the United States, the introduction of the Federal Deposit Insurance Corporation Improvement Act (FIDICIA) has provided particularly clear criteria and incentives for dealing with such firms. Nevertheless, there remain concerns that in many jurisdictions there still continues to be an element of regulatory forbearance that has allowed value to be destroyed over time. As described in a recent study, "Even bank supervisors are hindered by limited information, bureaucratic inertia, political pressure, risk aversion and perhaps a reluctance to declare their pre-insolvency rehabilitation efforts a failure."[42]

Goodfriend (2001) estimates that a more timely resolution of the savings and loan (S&L) crisis in the United States would have lowered the overall costs from $120 billion to $20 billion. Although the costs of forbearance in the case of Japan over the last decade are very difficult to quantify, they seem likely to be very large. Interestingly, Bordo and Schwartz (2000, 12) contend that the official strategy in the United States in the 1980s was much the same as the strategy later followed by the Japanese: "to obfuscate the dire situation of the U.S. money centre banks." The difference in outcome was that the U.S. strategy worked, as a result of a combination of renewed economic growth and ongoing inflation, whereas it has not worked in Japan in the absence of these supportive macroeconomic conditions.

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41. The former focuses on realizing value from the asset side of the balance sheet, while the latter focuses on reorganizing the liabilities. For a detailed and recent review of the literature in this area, see the Contact Group on the Legal and Institutional Underpinnings of the International Financial System (2002).
42. Ibid, p. 16.

Two sets of **macroeconomic instruments** can also be used to mitigate the damage arising from difficulties in the financial sector: generalized liquidity infusions at the national level and international support from the IMF. With respect to generalized infusions of liquidity, one rationale could be concern about system-wide financial problems. Another might be the belief that, since modern interbank markets are highly efficient in allocating credit to individual institutions, generalized liquidity infusions should suffice to channel liquidity to those that need it. In the literature dating from Henry Thornton, the emphasis is on extraordinary short-run increases in the demand for reserve money. Liquidity infusions thus prevent disruptive short-term increases in interest rates and would presumably be quickly reversed once the original shock had dissipated.[43] However, in the face of financial disruptions, it is also possible that the purpose of the infusion would actually be to lower interest rates and to ease monetary policy in a more sustained way. The direct effects on the cost and availability of credit would be welcome, as might also be the enhanced appetite for risk taking often generated by lower rates.[44] The possibility that the stock market might be positively affected would be another consideration (see Miller, Weller, and Zhang 2002).

Has the incidence of this type of public sector behaviour been on the increase? Some examples might seem relatively clear-cut, even if the distinction between a temporary easing of liquidity constraints and a more lasting easing of monetary policy is not always easy to make. The reaction of the central banks in the major industrial countries to the Y2K problem and the events of 11 September 2001 might be thought to fit better in the former category of policy actions, while the response to the stock market crash in 1987 might be assigned to the latter.

A further problem in assessing whether liquidity injections are being used more commonly as a specific response to financial instability is that alternative motivations can easily be suggested. Consider, for example, the adoption of quantitative reserve targets over the past few years by the Bank of Japan. On the one hand, these could be thought of as an innovative monetary policy response to the constraints posed by the zero lower bound problem. On the other hand, recognizing that these reserve infusions seem to have had no effect on either monetary or credit aggregates, they might be

43. Laidler (2003) notes that quantity theorists, who believed that monetary swings caused the price swings that led to business cycle effects, also generally supported such action to mitigate the severity of the economic downturn.

44. See Figure 15. Swings in the degree of measured risk aversion over the past two decades seem to have been significantly influenced by movements in interest rates.

better viewed as part of the Bank of Japan's efforts to maintain confidence in a financial system widely viewed to be undercapitalized.

For another hard-to-interpret example, consider the movements of policy rates in the United States during the 1990s. On the one hand, it could be argued that concerns about financial stability played an important and perhaps definitive role. Policy rates were lowered sharply and kept lower at the beginning of the decade than a simple Taylor rule would have predicted. Whether intended or not, this helped recapitalize a weakened banking system.[45] In 1997, when traditional domestic macroeconomic growth considerations seemed to call for tightening, policy rates were left unchanged because of the Asian banking and exchange rate crisis. In 1998, with the economy still growing rapidly, interest rates were lowered sharply in response to the Russian debt moratorium and the LTCM crisis. Policy rates were lowered once more in 2001, and again more sharply than a Taylor rule would have suggested.[46] It could be that this last development was in response to the Nasdaq crash and other signs of financial instability at home and abroad.[47] Indeed, Chairman Greenspan (2002) suggested as much when he referred to the Fed having wished to take out some "insurance" against truly bad outcomes. On the other hand, other explanations for these policy moves are equally plausible. Inflation was under good control throughout the decade, and there was convincing evidence of positive supply-side shocks driven by technological progress. Either could legitimately have provided a bias towards easing.[48] Perhaps the most that can be said convincingly is that concerns about financial instability may have played a complementary role to these more traditional considerations in the period under review.

Finally, consider the rationale for, and extensions of, sovereign lending by the IMF. Up to the collapse of the Bretton Woods system, the rationale for Fund lending (and indeed the Fund's existence) was reasonably clear. It was to use Fund liquidity to support the fixed exchange rate system among the

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45. With short rates very low and long rates significantly higher, banks could and seemingly did play the yield curve to improve their profits and write down bad loans.

46. See BIS (2002, Graph IV.8). Policy rates in the early 1990s were similarly over-predicted by a Taylor rule.

47. Domestic considerations could have included overextended corporate and consumer balance sheets and fears of a more generalized stock market decline. The events of 11 September 2001 were another consideration. At the international level, Argentina and Turkey were on the verge of crisis, and contagion was a source of potential concern.

48. The ways in which changes in financial structure can interact with more inflation-oriented monetary policy regimes to cause problems has been an important sub-theme in many of the BIS papers referred to in footnote 17. The current state of thinking on this is summarized in Borio and White (2003b).

industrial countries and head off the use of policy instruments that might interfere with international trade. Since then, as the focus of the Fund's activities has shifted to emerging-market countries, the rationale has become less clear. Initially, it had to do with helping individual countries that faced troubles to avoid the pain of "the market solution" while ensuring, through conditionality, that domestic adjustments were made and the Fund eventually repaid. Such an interpretation, however, was always hard to reconcile with the fact that a number of countries had ongoing Fund programs for many years.

Whatever the motivation, it is clear that Fund lending programs have increased in variety, number, and size. On variety, the kinds of lending programs have expanded from the original Standby Arrangement to eight separate programs today, in spite of the Fund having closed down a number of specialized facilities introduced over the years. Moreover, whereas all previous programs were envisaged as having to do with crisis management, the Contingent Credit Line (CCL), established in 1999, had as its objective the provision of Fund financing prior to difficulties occurring, with a view to preventing any potential crisis. The basic idea was that a highly creditworthy country would, in using the facility, receive the Fund's stamp of approval concerning its domestic policies. This would help shield the country from contagion. In fact, no country has chosen to use the facility, reflecting fears that the markets would rather interpret such use as a sign of weakness.

As to numbers, the proportion of the Fund's membership with outstanding programs has been on a steady upward trend for over two decades (see Giannini 1999). Finally, the size of programs has also been increasing. Prior to the Mexican crisis of 1994, Fund lending was generally restrained by quota requirements. These were put aside in the Mexican case, with the size of the package determined on the basis of perceptions about Mexico's short-term liquidity requirements in U.S. dollars.[49] Successive Fund programs for Thailand, Indonesia, and Korea grew ever larger with the Korean package amounting to $21 billion. Moreover, even this large sum was thought inadequate to deal with the threatened withdrawal of short-term loans to Korea by private sector lenders. As a result, efforts were made by the public sector to induce creditors to roll over these loans, a practice that was subsequently repeated at the time of the Brazilian crisis of 1998. The Fund did, however, adopt a much firmer position in response to both the Russian

49. As concerns mounted about the Fund's capacity to raise funds on such a large scale, the General Arrangements to Borrow (GAB) were extended to a larger number of emerging-market countries in what became known as the New Arrangements to Borrow (NAB).

crisis in 1998 and developments in Argentina in 2001. Whether this marks the beginning of a new trend remains to be determined.

4 How Has Changing Financial Structure Affected Safety Nets?

Financial liberalization and its complements—marketization, globalization, and consolidation—may have had implications for the use of safety-net instruments. The likelihood of resorting to such instruments may have been enhanced. Moreover, these changes in financial structure may influence the choice of safety-net instruments in the case of financial difficulties. The implications of marketization for the use of safety-net instruments are due primarily to differences in the character of market-based as opposed to intermediated financial systems. The resilience of the global financial system over the past few years, in the face of economic weakness, shocks of various sorts, and the collapse of stock market values worldwide, has been remarkable. In the United States, in particular, this resilience has been attributed to the growing reliance on market-based processes aided by the introduction of new financial instruments.

More market-based systems do have numerous advantages. In association with the continuing availability of credit from financial institutions, they provide more diversified sources of credit. This can help avoid credit crunches and liquidity squeezes that might otherwise lead to unwelcome constraints on spending. For example, the capacity of corporations to switch between bank credit, commercial paper, and bond financing over the past few years has facilitated the adjustment of corporate balance sheets in the wake of the excesses of borrowing and spending of the late 1990s. The increased capacity of households to borrow against the rising value of their houses in the United States, the United Kingdom, and several other countries played a significant role in cushioning consumer spending and ensuring that the last global recession was the shallowest in the post-war period.

Market-based systems also provide the facility to diversify risk more broadly, and to transfer it to those most capable of bearing it. This has been evident for some time with respect to the transfer of market risk, but more recently credit-risk transfer mechanisms have also become much more common. Syndicated loans, asset-backed securities, credit default swaps, and collateralized debt obligations have all played a growing role. The upshot seems to be that the financial losses suffered in recent years have been borne by a wider range of creditors than ever before: the proverbial Belgian dentists, venture capitalists, pension funds, and insurance companies, among others. No major financial institutions have failed, and there

have been no disruptions to date in any significant payment and settlement systems.

Banks have traditionally been the focus for the use of safety-net instruments, in large part because of the crucial role they play in the payment system and their capacity to transfer liquidity to those that need it.[50] As the role of banks in the system diminishes, one might then conclude that the use of safety-net instruments might be less required. Deposit insurance, for example, is a response to the possibility that banks with short-term liabilities and longer-term assets will have inadequate liquidity to respond to a "run." However, modern financial markets should allow banks to obtain liquidity quickly and at little cost, thus obviating the need for deposit insurance. Goodfriend and King (1988) make a very similar argument with respect to traditional LOLR procedures. They contend that the market will allocate credit to "solvent" but illiquid banks every bit as efficiently as a public sector entity might do. The conclusion they draw is that central banks should no longer provide such credit facilities, nor should they engage in the expensive regulation and supervision that providing such facilities entails. Exit policies also become less relevant when an increasing proportion of troubled financial agents are non-banks. Presuming there are fewer externalities when such firms fail, the market can be left to sort things out itself. This line of thought leads to the general conclusion that, in a more market-based system, there would be less need for the use of safety-net instruments.

Rather different conclusions can be suggested, however, once focus is redirected to the possible shortcomings of market-based systems. The availability of more diversified sources of credit for corporations and households might encourage overborrowing. This could, in turn, lead to overexposure should any of the assumptions underlying initial borrowing decisions fail to materialize. Expectations of sharp increases in the growth rates of profits might fuel both investment and consumption, as equity prices rose in consequence, but such expectations could easily prove over-optimistic. The increased ability to withdraw equity from the housing stock, often to support higher current levels of consumption, can also have a downside with respect to future spending. This will be particularly so if house prices subsequently fall, or interest rates rise, or if those not owning houses are forced to spend less on other things to pay the rent (either explicit or implicit) for more expensive lodging. Such an effect must eventually be expected since a change in a relative price (housing) cannot enrich everyone in aggregate.

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50. Padoa-Schioppa (2002, 16) makes the point starkly: "I would maintain the traditional view that financial stability could be at stake only insofar as shocks transmit to the banking sector."

As for the efficient transfer of risk, this assumes that risks are, in fact, being appropriately priced and are being transferred to those best able to manage them. There is little hard evidence to support either proposition, and indeed, there may be some circumstantial evidence pointing in the opposite direction.[51] The strong expansion in the market for credit-risk transfer instruments has elicited concern from the Financial Stability Forum about a significant transfer of risk to insurance and reinsurance companies, which have had no previous experience in this particular area. The Centre for the Study of Financial Innovation has also pointed out, with similar concerns, that first-tier banks have increasingly been transferring credit risk to second-tier banks.

It is also well known that market-based systems function efficiently only if there is an adequate amount of reliable and publicly available information on which to base investment decisions. Moreover, those availing themselves of such information must also be able to trade, in response, at relatively little cost. Unfortunately, there are grounds to question these propositions. This leads to the question of how public sector authorities might be tempted to respond when markets fail to function properly.

The information problem is essentially that described by the Grossman-Stiglitz theorem about the impossibility of informationally efficient markets. If good information is costly to produce, but efficient markets prevent producers from profiting from it, then it may no longer be produced. Arguably, this phenomenon contributed to the Enron, WorldCom, and Ahold scandals. Without good information, markets could easily become volatile and themselves a source of shocks to the financial system and the economy more generally. Sudden changes in investor risk premiums could be a further manifestation of the distrust of publicly available data. Alternatively, the information might still be produced but would be reserved for proprietary use, again implying less than fully efficient markets.

As for the ability to trade freely as new information becomes available, and as noted above, growing attention is being paid to the question of the functioning of markets under stress. The issue of market liquidity came most

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51. Altunbas and Gadanecz (2003) conclude, "We find evidence of senior banks offloading riskier loans in a potentially opportunistic way to outside junior banks (who may have little knowledge of the borrower)." Similarly, recent figures from the Federal Reserve show that in 2002 the portion of syndicated loans held by U.S. banks that were "classified" as substandard, doubtful, or loss was 6.5 per cent. For non-banks, "classified" loans were 22.6 per cent. See BIS (2003a, 133). It is, of course, also possible that these loans were purchased at discount prices and thus still reflect fair value. Moreover, it could still be the case that those taking on these risks were less leveraged or in other ways more capable of bearing losses than those who had disposed of the risks.

forcefully to policy-makers' attention around the LTCM crisis when liquidity essentially evaporated for reasons that are still not entirely clear. Borio (2000), however, notes that concerns about the creditworthiness of counterparties (the willingness to trade), allied with difficulty in raising cash to finance trades (the ability to trade), generally play a crucial role in determining liquidity in such situations. Moreover, he adds that the institutions that provide liquidity in good times are often the institutions most affected by such concerns as times worsen. This fact, similar to lower-frequency procyclicality in asset prices, exacerbates the discontinuity in market functioning between the two sets of circumstances. In this way, counterparty risk, market risk, and liquidity risk all tend to be highly correlated in stressful circumstances.

Padoa-Schioppa (2002) extends this theme by noting the role that banks play in these market processes. Not only do they provide liquidity to the market, but they are dependent on the market for ensuring their own liquidity as well as for risk-management purposes. This latter dependence has grown enormously in recent years. As banks have tried to reconcile a more volatile environment with a more competitive one, they have either relied increasingly on markets as funding sources (primarily a European response) or have used markets to shift loans off the balance sheet (the U.S. response). The upshot would seem to be that any threat to market functioning must, at the same time, be considered a threat to the banking system,[52] and therefore to systemic stability. In a similar vein, Borio (2000) concludes that "the conventional wisdom that the growth of markets for tradable instruments significantly reduces the risks of funding liquidity crises should be questioned."

This line of reasoning might lead to the expectation of a shift away from the support of individual institutions and a growing trend towards generalized infusions of liquidity by the official sector in times of market stress. This bias would, moreover, be increased if market-based systems increased the likelihood of excessive exposure to debt, as argued above, and if the ultimate resting place of market-transferred risks was not evident. Both sets of concerns imply that the economic costs of market instability could be very large. As noted in section 3.2, such a bias does seem to have become more evident in recent years. The further complications posed by the

52. In Japan, the failure of Sanyo, a minor player in the interbank market, should in itself have had little influence on that market. In contrast, the effect was that the market dried up almost completely. A similar phenomenon was observed when Yamaichi went under. The Bank of Japan felt impelled to provide general liquidity support to the market in the first case and LOLR in the second.

consolidation of financial firms and increasing concentration in financial markets are returned to below.

The increased role of markets, as opposed to bank credit, may have played a similar role in motivating higher levels of Fund lending to emerging-market countries, dating from the Mexican crisis in 1994. In practice, the extent of liquidity support seems likely to rise, along with the likelihood of a disorderly market solution to the problems of an indebted sovereign. This likelihood has increased greatly owing to the increased recourse by emerging-market economies to capital market as opposed to bank financing.[53] Flows in such markets are less influenced by the need to maintain relationships and can turn extremely quickly. Moreover, in the event of default, arranging an orderly outcome becomes much more difficult. A limited number of bank creditors can sit down with the debtor and agree, albeit not always easily, that debt forgiveness is required. In the case of thousands of bondholders, each potentially wishing to be a free rider, this becomes impossibly difficult. Whether the introduction of collective action clauses in emergency-market economy bonds issued under New York law will appreciably improve this situation remains to be seen.

The process of **globalization**, with its associated increase in complexity and reduction in transparency, could also have implications for the use of safety-net instruments.

With respect to deposit insurance, one possible reason for the expansion in the use of such schemes may have been the need to compete for deposits with other countries that offer them. In a globalized world, such deposits can be transferred much more easily. Other international complications have to do with whether foreign banks are covered, whether the deposits of foreign nationals are covered, and whether the coverage extends to foreign currency as well as the domestic one. Different countries have answered these questions in different ways, leading in some cases to accusations of unfair competition and regulatory arbitrage.

The expanded use of other kinds of government guarantees also has an international dimension. In Japan and Korea, guarantees have been offered on bank liabilities to foreigners as a direct response to the threat that foreign creditors would withdraw their financial support. The widely held market belief that the liabilities of the GSEs in the United States are supported by a government guarantee has also led to significant investment in such instruments by international investors, including many central banks. The effect of such implicit guarantees and the ensuing funding has been to

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53. One reason for this trend is that bonds were not of material significance after the debt crisis of the 1980s and, unlike loans from banks, were not subject to restructuring.

significantly reduce market pressure for more fundamental reforms to address underlying issues. In Japan, these issues included, for a time, high levels of non-performing bank loans, low rates of return on assets, and inadequate levels of capital. In the United States, GSEs have for many years been able to operate with low levels of capital and with less transparency than many privately owned financial institutions.

While international considerations have certainly made the use of the traditional LOLR instruments more complicated, it is debatable whether they have led to increased recourse to such instruments. As a consequence of globalization, it is increasingly likely that any bank needing liquidity support will be incorporated and supervised in some other jurisdiction. While the convention would be that the home country central bank would provide support, it is not hard to imagine circumstances in which the host country central bank would be drawn in.[54] A further problem with internationally active financial institutions is that they may need liquidity support in a currency different from the one that the supporting central bank is capable of creating, again leading to the need for some international financial co-operation. A good example of the genre was the swap agreement undertaken between the Federal Reserve and the European Central Bank, around the time of the 11 September 2001 tragedy, when many European banks found it difficult to provide collateral at their U.S. branches so that they could borrow directly from the Federal Reserve.[55]

When financial institutions are internationally active, exit policies to wind them down are also likely to be harder to apply, and resolution delayed accordingly. All the factors leading to delay in a national jurisdiction are magnified at the international level. To start with, needed information may be more difficult to obtain,[56] and different agencies may well have very different traditions with respect to information sharing. As for bureaucratic

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54. It is always difficult to know whether the bank is illiquid or insolvent, and this difficulty increases given the complexity of international operations. As well, there is always the possibility that the home country central bank might be less concerned about the implications of the bank failing than the host country. This is a practical issue in many emerging-market economies where foreign banks sometimes have a dominant presence in the domestic financial system.

55. There used to be a number of prearranged swap facilities between the Federal Reserve and a number of other central banks. However, these arrangements were allowed to lapse in the early 1990s just as the complications associated with globalization seemed to be increasing. Thus, the swap referred to in the text was carried out entirely at the discretion of the Federal Reserve, which had no obligation to participate in this way.

56. A simple example is given by the experience of the supervisory authorities with the destructive trades carried out by Nick Leeson at Baring Brothers. Information on his activities was available in the Far East, but its importance for the British regulatory authorities was not appreciated.

inertia, the home supervisor likely to initiate such a move will certainly need the active co-operation of the host supervisors. Agreement on action then becomes an issue. There will almost always be differences of political view here since national preoccupations will bias the views of each. If the institution in question has much more importance in one jurisdiction than another, these normal differences of view are likely to be further increased. That different regulatory regimes are in play, and that different countries can have widely different legal provisions for the bankruptcy of financial institutions, are further considerations.[57] Given the inability to forecast accurately how such legal and regulatory proceedings might unfold, a normal degree of risk aversion is likely to be exaggerated. The difficulties that emerged in the process of winding down Bank of Credit and Commerce International, which had its ownership, head office, major areas of activity, and supervisory authorities all in different places, provides a particularly vivid illustration of the complications provided by the international dimension. In the end, such complications seem likely to increase the probability of forbearance.

The fact that financial markets are internationally integrated also has important implications for the use of generalized infusions of liquidity to deal with problems of financial instability. One issue is whether international financial difficulties ought to lead national authorities to respond in this way using national instruments. The stock market crash of 1987 led to an easing of monetary policy worldwide. However, it could be argued that this was primarily a response, in each country, to concerns about the domestic economic slowdown and disinflationary forces thought likely to arise from such events. The same could be said for easing by the Federal Reserve in the face of international financial turmoil, particularly the events surrounding the Russian default and LTCM.

Whatever the motivation for a policy response, there is no doubt that generalized infusions of liquidity in one country now have greater implications for other countries than they did when economies were more closed. Monetary easing in the face of the "financial headwinds" in the United States in the early 1990s led to a sharply lower dollar. As other Asian currencies chose to depreciate with the dollar, the effective appreciation of the yen significantly complicated Japanese domestic circumstances. The

57. The Contact Group on the Legal and Institutional Underpinnings of the International Financial System (2002, 29–46) provides an excellent overview of the international issues. They note that national legislation normally provides "precise finality rules, closeout netting and offset provision, collateral arrangements and other contractual and statutory provision that carve out some transactions from formal insolvency processes." However, the legislation, and how it is likely to be interpreted by the courts, differs across countries.

subsequent massive inflow of capital into Asia then led to increases in excess capacity worldwide and contributed to the Asian crisis starting in 1997. In a similar vein, the extremely easy monetary policy followed in Japan over the 1990s, in part fostered by financial distress, led to heavy reliance on yen carry trade transactions that may well have contributed to the asset-price bubble subsequently seen in the United States. The central point is that, given growing recourse to market-based safety-net instruments, globalization could easily ensure that the law of unintended consequences applies.

Globalization may also have encouraged changes in the activities of the IMF. In recent years, there seems to have been a shift in emphasis away from the problems of individual countries to concerns about contagion and systemic problems in international financial markets. As noted, the CCL tries to address the contagion problem directly; its focus is on ensuring that countries with sound fundamentals are given Fund support ex ante to ensure they will be less affected by such problems. The Fund has also set up a new department in recent years to monitor global financial developments and potential vulnerabilities. This also attests to a shift in its focus consistent with a growing recognition that the benefits of globalization may entail costs that can be attenuated by public policy. While no practical steps have yet been taken to follow up, a number of suggestions were put forward involving a substantial expansion of the formal powers of the Fund to allow it to better manage sovereign debt restructurings. Finally, some commentators have also called for the creation of a new international "super regulator" that would both help define policies to prevent financial crises and better manage them should they occur. While recognizing that concerns about globalization lend support for such an initiative, officials of sovereign governments have thus far been unwilling to discuss the proposal in a serious way. This could be because governments are not prepared to cede the degree of power required to make such an agency work effectively[58] or because of the belief that it could not be made effective under any circumstances.

The third of the major changes in financial structure likely to affect the use of safety-net instruments is **consolidation**. This has implications for the cross-sectoral scope of financial institutions and for market concentration, both of which affect the likelihood of problems requiring public sector solutions. In addition, interactions between the effects of consolidation and the problems arising from marketization and globalization give further grounds for belief in a growing exposure to more extensive use of public safety-net instruments.

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58. For a review of some of this literature, see White (2000).

Concerning cross-sectoral activity, it is clear that the universal bank model in which traditional banking functions are combined with investment banking functions is now well advanced. This would seem to threaten an inadvertent extension of the safety net to a type of activity (investment banking) that is, by its nature, more risky than traditional retail banking. While cross-sectoral activity involving banks and insurance companies is much less well advanced, similar concerns about an inadvertent extension of the safety net could be raised in this case as well. The traditional answer to this problem would be enhanced supervision, but this is easier said than done. At the national level, concerns about cross-sectoral activities and the need for level playing fields have induced a series of mergers among regulatory agencies. These have proved time-consuming and, in the end, not always efficient. At the international level, the issue of cross-sectoral conglomerates has received ongoing attention for a decade.[59] Nevertheless, there remain concerns that the official community has not yet fully come to grips with the complex problems they pose and with the size of their potential cost to the public purse.

As financial firms become larger, the "too big to fail" issue comes to the fore. There are a number of dimensions here, but all seem to point in the direction of an enhanced likelihood of public sector involvement in case of difficulties. The first dimension is the traditional one: the failure of a big firm increases the likelihood of a disruptive interference in the direct flow of funds between lenders and borrowers. Indeed, Freixas and Santomero (2002, 18) contend that there is already evidence of a pattern of systematic rescue for big banks. Belief in such an outcome could generate moral hazard if management were to behave less prudently. A counter-argument is that this is less likely if the management is punished whenever public sector intervention is required. Moreover, Davies (2003) contends that large firms are in any event protected by the diversity of their income streams, and are more able to afford and more likely to use the most sophisticated risk-management systems available. While there is clear evidence of a greater attention to risk on the part of large institutions, whether they will prove

59. See, in particular, the publications of the Joint Forum under the auspices of the Basel Committee, International Organization of Securities Commissions (IOSCO), and the International Association of Insurance Supervisors (IAIS).

adequately resistant to potential disturbances still remains to be seen.[60] On balance, ever larger institutions could increase the potential for the use of safety-net instruments.

A second and newer dimension, noted in the section on marketization, is that the large financial institutions are now very active, indeed often dominant players in a number of financial markets. They rely on the markets, and the markets rely on them. Given this symbiotic relationship, the likelihood of a systemic problem arising from a disruption at whatever level (either institutional or market) would seem materially enhanced. The fact that large firms operating in financial markets commonly trade with other large firms increases these interrelationships. This line of thought leads not only to the advantages of a system based on multiple channels of credit, but also to its potential systemic vulnerabilities. If both intermediation and the operation of markets depend on the same capital base,[61] then a disruption could lead to all channels closing simultaneously. This would be a similar outcome to the collapse of the Japanese convoy system, though the market component would clearly ensure a much faster response.[62] Since such an outcome would not be acceptable, the implication is that more forbearance might be likely in the first place, followed by a more substantial, and potentially costly, public sector involvement over time.

A third dimension has to do with institutions being "too complex to fail." This would particularly affect large, global banks with significant dealings in financial markets. The fact that no one could establish in advance the fallout from such an event implies that the public sector would want to take significant steps to ensure that it did not happen. This concern seems to have provided the motivation for a degree of public sector involvement in the winding down of LTCM in the United States and Long-Term Credit Bank (LTCB) in Japan.[63] The problem in such cases could be less the will to act than the capacity to do so. As noted in the section on globalization, the allocation of international responsibilities for dealing with internationally active firms is not straightforward. The problems would be compounded if the home authority, likely to have primary responsibility, found that its

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60. The recent CGFS study on stress testing at large institutions was informative but also worrisome. Different institutions had widely different views on the kind of stresses to which they might be subjected. None apparently had the capacity to analyze the effects of joint events, for example, when market risk, credit risk, and liquidity risk all increase at the same time. See CGFS (2001).

61. For a more in-depth discussion of this issue, see BIS (2003a, 140–2).

62. In the light of such complications, other large market players might also have to be supported.

63. The U.S. action did not cost the taxpayers anything. In contrast, the government of Japan did pay the costs of winding down LTCB.

domestic fiscal resources were inadequate to the task at hand: the problem of "too big to save." Whatever the short-term costs of such an extreme set of circumstances, it would certainly help reduce concerns about moral hazard.

5 Dealing with the Moral-Hazard Problem

While moral hazard is always a problem in principle, there remain uncertainties as to its importance in practice. Indeed, there is something of an international divide here, with continental European policy-makers tending to emphasize potential moral-hazard effects more than others do. The first issue addressed in this part of the paper is whether the intertemporal problem is a significant one. The second issue is the extent to which safety nets might be designed to mitigate the problem.

5.1 Is moral hazard an issue of practical importance?

As discussed above, there is a presumption that financial crises have externalities, and that safety-net instruments can mitigate the damage. At the same time, policy-makers face a moral-hazard problem. That is, safety-net instruments could subvert the normal processes through which market discipline acts to temper risk taking. Or, to put this another way, safety-net instruments subsidize risk-seeking behaviour, leading to bad resource allocation. This potentially makes future financial crises more likely, not less likely. However, as with judging the efficacy of safety nets in managing crises, these assertions about moral hazard require empirical support before they can be allowed to exert a significant restraining effect on current policy.

First, what is the empirical evidence that market discipline is effective, thus creating the potential for safety nets to subvert the system? On the one hand, there is much evidence that relatively risky borrowers are systematically charged higher rates of interest than less risky borrowers.[64] Nier and Baumann (2003), in an important study, also demonstrate that banks' capital ratios rise (and their willingness to take on risk falls) with the proportion of uninsured liabilities and with banks' level of market disclosure. Both these results are consistent with what would be expected if market discipline were effective. On the other hand, there are also skeptics. Bliss and Flannery (2002) note that effective market discipline requires both the capacity to assess behaviour (disclosure, at a minimum) and the capacity for the market to influence subsequent managerial decisions. On the basis of their research,

64. The relationship between credit ratings and bond spreads is well known. As well, a recent study by Altunbas and Gadanecz (2003) is based on a sample of over 5,000 syndicated loans. It provides strong evidence that loans "with riskier characteristics or granted to riskier borrowers are found to be more expensive than others."

they conclude, “Day-to-day market influence remains, for the moment, more a matter of faith than empirical evidence.”

Borio et al. (2001, 2003b) consider a rather different problem. They stress the difference between the markets’ capacity to evaluate relative risks at a moment in time, as considered above, and the capacity to determine changes in absolute risk over time. They provide evidence to show that loan loss provisioning, internal credit ratings, external credit ratings, and credit spreads move procyclically. That is, they move in such a way as to increase the amplitude of cycles in spending, leading in the limit to “boom and bust” behaviour often culminating in financial crises. Observations of this sort lead to the conclusion that market discipline is not very effective in encouraging prudent market behaviour. However, it does not then necessarily follow that safety-net instruments can be used without concern to mitigate such tendencies. It remains possible that the application of such policies could conceivably make procyclical tendencies worse still. This issue is returned to below.

A second empirical issue is whether safety nets do, in fact, cause lenders and borrowers to behave less prudently. Statistical evidence concerning the behaviour of private sector lenders does seem to indicate that moral hazard is a problem attendant to the use of each of the micro instruments referred to above. Demirgüç-Kunt and Detragiache (2000) establish a positive relationship between the existence of explicit deposit insurance schemes and subsequent bank fragility. Altunbas and Gadanecz (2003) also find evidence that syndicated loans involving participation by Japanese banks and German Landesbanken were made available at significantly lower rates, after controlling for loan and borrower characteristics. Recall that both these sets of banks are generally thought of as having government guarantees.[65] Nier and Baumann (2003) also find that implicit and explicit government guarantees lead banks to choose lower capital ratios and to take on more risks. Concerning exit policies, Furfine (2001) provides evidence that, after the resolution of the LTCM affair in 1998, even large and complex banks not

65. As noted above, another interesting set of institutions are the government-sponsored enterprises (Fannie Mae, Freddie Mac, etc.) in the United States. These do not have explicit government guarantees but are generally treated by the market as if they did. There is no clear evidence that these institutions have behaved imprudently in consequence. However, it is a fact that they have grown extremely rapidly, that the upfront transaction costs (discount points) of refinancing mortgages have come down significantly in recent years, and that these institutions now have a larger percentage of bought mortgages on their balance sheets than ever before. Perhaps in consequence, the GSEs have recently been the subject of numerous inquiries, both public and private. In June 2003, the senior management team of Freddie Mac was forced to resign amid allegations of accounting irregularities.

involved in the rescue package began to have access to lower overnight borrowing rates. All this evidence justifying concern about moral-hazard problems is made weightier by the further findings of Nier and Baumann, that the influence of market discipline declines in a non-linear way as the influence of safety nets increases.

Turning now to the use of macroeconomic instruments, the empirical evidence about the potential moral hazard associated with generalized infusions of liquidity is less rigorous but still persuasive. Figure 15 indicates that, for almost a decade, the appetite for risk fell during crises only to be revived as policy rates fell in response. If this encouragement of risk taking were now to be judged excessive, in the light of the resulting balance-sheet exposures emphasized in the literature referred to above, then it could be concluded that the effective management of individual crises might have the potential to heighten vulnerabilities over the longer run. This implies a problem similar to that of "instrument instability" in the more traditional macro literature. Note that this line of reasoning, that monetary authorities may ease too readily in the face of downturns and thus exacerbate future problems, is rather different from the issue of whether they tightened too little during upturns.[66]

Whether or not sovereign lending by the IMF encouraged excessive capital flows to emerging-market countries also deserves attention, particularly given the number of financial crises in such countries in recent years. Moral hazard could affect either sovereign borrowers or lenders. The evidence with respect to the former is not very convincing. Mussa (2002, 7) argues vigorously that "it is absurd to suggest that such expectations [of an implicit subsidy coming from the IMF] motivated these countries to undertake substantial risks of the highly damaging financial crises that actually engulfed them." In effect, Mussa argues that the costs of crises were too big, and the implicit subsidy too small. The reason for this outcome is essentially that the Fund provides loans at interest that must be repaid. This is completely different from offering grants or bailouts as often happens at the national level. However, Bordo (1998) and Bordo and Schwartz (2000) come to a different conclusion.

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66. There was a debate about such issues in the 1920s and 1930s. Keynes and others seemed to be of the view that not much could be done to lean against asset-price increases and associated expansionary phenomena, but that vigorous easing was both desirable and effective in the face of downturns. This seems rather similar to the position taken by many central banks, particularly the Federal Reserve, in recent years. In sharp contrast, Hayek and the Austrian school felt that "bubbles" could be resisted through contractionary policy, but that downturns should be left to work themselves out. Their general logic seemed to be that, once imbalances had been allowed to enter into the economic system, they needed to be purged as quickly as possible. Policy interventions would only make the imbalances worse. See Laidler (2003).

The evidence against creditor moral hazard seems only marginally less clear-cut, given that the same small degree of implicit subsidy is in question.[67] While creditors' ex ante expectations could in some cases deviate from the ex post realities, hundreds of billions of dollars have been lost through lending in such markets in recent years. The contrast between this reality and the fact that the Fund has been repaid fully, almost without exception, cannot have escaped investor attention. The fact that Indonesia received so much credit prior to the Asian crisis is also of interest in this regard. The Indonesian government essentially prohibited such lending through banks, implying direct lending to corporations. That this did not deter inflows, even though the borrowers could not rationally have been thought likely to be bailed out, also implies that creditor moral hazard was not the dominant factor in play.

All this said, one cannot deny that there was a growing sense of unease in the official community about the significant changes observed in the way the Fund approached problems of crisis management after the mid-1990s.[68] Indeed, the much tougher stance adopted by the Fund in the Russian crisis of 1998 and the Argentine crisis of 2001 also indicates concern about earlier practices. It is also notable, and consistent with such concerns, that the attention of officials has recently shifted away from methods of crisis management to crisis resolution, with the latter defined to include debt restructuring. Whether this shift of interest has primarily reflected concerns about moral hazard, the potential unavailability of adequate financing to support further large packages or other reasons remains unclear. Two important initiatives can be highlighted. First, the Fund itself proposed a new Sovereign Debt Resolution Mechanism, though its proposal was subsequently withdrawn. Second, after some years of encouragement from the official sector in the industrial countries, a number of sovereigns have also agreed to introduce collective action clauses into the bonds they issue internationally. The motivation for both initiatives has been to make debt restructuring more orderly, such that it could stand as a viable option to increased Fund lending. As a recent publication (see Sgard 2002) reminds

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67. Mussa estimates the maximum possible subsidy as being equivalent to a 25-basis-point reduction in the cost of credit for an average borrower from an emerging-market country. This compares to an average spread over Libor over the last decade of 600 basis points. Summers (2000, 13) also feels that "it is hard to make the case that investments in emerging markets have been heavily influenced by the expectation of the availability of official resources for bailouts."

68. An unpublished central bank study, supported by the BIS, prepared a report on sovereign debt resolution in the wake of the Mexican crisis of 1994. This formed the basis of the G-10 Deputies' Report (see G-10 1996), whose recommendations were subsequently endorsed by the G-10 Ministers and Governors at the IMF meetings in Hong Kong in 1997.

us, this would be a return to roots. Debt restructurings were the typical response to financial crisis through most of the twentieth century.

To summarize the empirical evidence, it does appear that the moral-hazard problem associated with the use of both micro and macro instruments is generally a real one. While the case is less clear for Fund lending, there nevertheless remains a growing consensus that limits on Fund lending should be more strictly enforced.[69] One implication of all this is that safety-net measures taken to manage crises should be designed to ensure a proper balance against the risks of moral hazard. Unfortunately, a number of other design issues must also be taken into account that further complicate the design problem.

5.2 Could "good design" mitigate the moral-hazard problem?

Designing public financial safety nets is not easy. There are a large number of issues that should, in principle, be dealt with. Each raises its own difficulties, and trade-offs will be the norm rather than the exception. Practical matters are rendered still more difficult by the recognition that vested interests exist everywhere, and each will want the safety net designed to suit their purposes. Prima facie, these difficulties imply it may not be easy to use design features to mitigate the moral-hazard problem. Nevertheless, at least five sets of suggestions might be put forward.

Since a number of safety-net instruments exist, the first point to insist upon is the need for a **coherent package** of such instruments. This is because, in some respects, instruments can be both complements and substitutes. By way of an example, exit strategies involving prompt corrective action should, in principle, always ensure there will be enough funds to pay off all the depositors. In such circumstances, the need for deposit insurance might be considered less obvious. It is clearly not the intention of this paper to point out all the possible interactions between such instruments. Rather, it is simply to note that such interactions do exist and they should be taken into account when design changes are being proposed.[70] By the same token, there is no ideal package, since it will depend on a number of country-specific circumstances and should probably evolve over time. Since in practice, individual safety-net instruments are often designed in isolation rather than as part of such a package, the potential for reducing their longer-run economic costs may be accordingly reduced.

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69. An influential paper was produced jointly by the Bank of England and the Bank of Canada. See Haldane and Kruger (2000).

70. Garcia (2000, 10) provides a comprehensive list of such considerations that should be taken into account when designing a deposit insurance scheme.

A second point to insist upon, if moral hazard is to be reduced, is **transparency** in both the design and operation of safety-net instruments. Concerning the former, it is important that all those whose interests are likely to be affected by the application of these instruments should be able to contribute to their design.[71] Given the growing recognition of the strong interaction between financial stability and monetary stability (see BIS 2001; 2003a) and the attendant longer-run costs, this implies open access to the design process by treasuries, central banks, regulators, and deposit insurers. The views of private sector participants must also be factored in. As to operational questions, a clear ex ante allocation of responsibilities within the safety net is important. This is not just in the interests of transparency, but also to ensure that decisions can be taken in a timely way even though the various partners may disagree about what needs to be done.[72] When one considers the complexity of the current regulatory arrangements in the United States, the inter-agency rivalries in Japan, and the international dimension in the European Union,[73] it is evident that this is not a trivial matter. Communication is also key, and it should be clear ex ante what information will be made available to those official partners who request it. Instituting regular meetings of senior representatives of the various agencies would also have much to recommend it, to ensure that original understandings have not altered with the passage of time and changes in personnel.

Knowing who does what is one issue concerning transparency. Knowing in advance what public officials charged with certain responsibilities will actually do is another issue with potential implications for moral hazard. This raises the question of the trade-off between rules and discretion in the operation of the financial safety net. At first glance, there seems to be inconsistency in that rule-based procedures seem to have broader support with respect to some safety-net instruments, whereas discretion appears to be more favoured in the case of others. For example, most commentators seem to agree that an explicit deposit insurance scheme is preferable to an implicit one, for the reasons discussed above. Similarly, the literature

71. See Padoa-Schioppa (2002, 38) and White (1999, 379–80).

72. For example, supervisors might be more tempted to forbear (of which more below), while deposit insurers might be more inclined to close weak institutions down quickly before losses mount.

73. The problem of allocating responsibilities ex ante, including clarity about how decisions are to be taken, would seem of particular gravity in Europe. Most of the safety-net participants act at the national level, whereas the European Central Bank is essentially an international agency. In cases of dispute, there is currently no single minister who has the authority to make decisions and to ensure that they are carried out. These and other related issues are being actively pursued.

appears to broadly support exit policies for financial institutions that have clearly defined thresholds for regulatory action. In a similar vein, until the early 1990s, lending by the IMF was essentially rule-determined in that it was quota-based. In contrast, discretion appears favoured by those that support the doctrine of "constructive ambiguity" in the use of LOLR facilities. As well, it has often been found desirable to leave unclear whether certain obligations are subject to a government guarantee or not. A possible example is provided by the GSEs in the United States, where intermittent denials of public responsibility do not appear to have been widely believed in the marketplace. And, turning to macro instruments, generalized liquidity infusions have always been highly discretionary, whereas IMF lending became so after the Mexican crisis in 1994.

What could explain these apparent inconsistencies? One logical possibility is that different instruments, by their nature, are better suited to a rule, whereas others are better used with discretion. Perhaps more likely is that they reflect differences of view about how best to deal with the moral-hazard problem. Those advocating rules are conscious of the need, ex ante, to ensure that there will be no expectations of a "bailout." The danger, of course, is that the rule will have to be violated, in extremis, and the credibility of the authorities will then be more seriously compromised.[74] In contrast, those advocating discretion feel that expectations will gravitate towards "no bailout," while the danger is that the very opposite will happen. In sum, with respect to this aspect of the design problem, the right answer depends on how people react to the incentive systems put in place, and this could also vary over time and across countries.

A third issue in designing safety nets is to ensure **counterbalancing forces** to encourage prudent private sector behaviour, regardless. In effect, if public sector money is to be used to finance safety-net provisions, then the public sector has a legitimate interest in ensuring that those costs are not excessive. In its recent work, the Basel Committee on Banking Supervision has emphasized a "three pillars" approach to this problem as faced by banks (minimum capital requirements, supervision, and market discipline). This is consistent with a broader framework of incentives (self-interest, regulatory oversight, and market discipline) that has been suggested by the BIS (see BIS 2002, 148–50) to promote the good health of financial institutions, the proper functioning of financial markets, and the establishment of a sound

74. See Burki and Perry (1998), who describe rules in the form of "never-never" and "only if" legislation, as opposed to a "maybe-maybe not" approach. Clearly, credibility will not be lost if "only if" legislation is already in place, since the legislation itself specifies when the rule could be violated.

infrastructure[75] to support the financial system. As noted in section 2, the fact that there continue to be such a large number and wide range of financial problems indicates that the incentive structures put in place to date still have their limitations. Put otherwise, the restraining effects of the first two pillars have not proved sufficient given the fact that the third pillar, market discipline, may have had its influence attenuated by the existence of safety-net instruments.

As a rule, the moral hazard implicit in the existence of a micro safety-net instrument can be reduced if the private individuals responsible for triggering public sector intervention are made to pay a heavy personal price. Thus, there may be little harm done by government intervention to ensure the continued operation of a troubled bank, provided that the shareholders and the management responsible are held accountable. Unfortunately, this is not really possible in the case of macro instruments. When systemic concerns seem to make it desirable to flood the system with liquidity, there is generally no individual who can be judged responsible for the systemic problem having arisen in the first place. Similarly, when the Fund provides a support package, it is not common to call for the resignation of the government that oversaw the development of the problem to begin with.

A fourth means through which moral-hazard problems can be reduced is through appropriate design features at the level of **individual instruments**. For example, concerns that the introduction of deposit insurance will dissuade depositors from monitoring their bank (and bankers) could be assuaged by legislated maximums for protection, and/or by adjusting the cost of deposit insurance for the riskiness of the financial institution involved. However, as noted above, design efforts of this sort must be developed coherently with other aspects of the safety-net apparatus.[76] Another possibility for limiting costs over time is to limit the scope of the safety-net instruments. One recommendation might be that instruments should be activated only when there is a truly systemic threat to the financial sector as a whole. The obvious difficulty with this is that it is very difficult to distinguish such situations with certainty. A closely related suggestion is that only banks should be covered. This is based on the hypothesis that only banks have sufficient potential (presumably via the payment system) to

75. This would include legal and judicial processes, payment and settlement systems, and accounting standards.

76. If deposit insurance were to be risk-weighted, and capital requirements were to be risk-weighted, and rating agencies were to base their ratings on similar judgments about the riskiness of assets, the possibility of interacting and procyclical effects would obviously be enhanced.

cause systemic damage. Whether this hypothesis is true is not obvious.[77] Moreover, as noted above, distinguishing between banks and other kinds of financial institutions is becoming increasingly difficult. In addition to limiting the scope of such schemes, the costs to the public sector can be limited to some degree by sharing them with the private sector. For example, deposit insurance schemes can be organized by the private banking sector and have premiums levied on private banks. In this case, the role of the public sector might be limited to providing liquidity when needed. The role of the Federal Reserve in the winding down of LTCM provides another example of how the costs of public sector intervention can be limited; the Fed organized a meeting of creditors but left them to arrange how the costs might be shared among themselves. However, a question that arises in all such cases is whether the suggested private sector solutions will, in fact, have the credibility required to avoid the systemic problems feared.

A last issue concerns **exit policies** and how regulatory forbearance might be reduced. It is well documented that the public sector often forbears too long before intervening, particularly when there is the possibility of having to face very significant upfront costs. Unfortunately, in the interim, the ultimate costs can rise markedly. Kane (2001) and Maclachlan (2001) document this latter point with respect to ailing banks, and Goodfriend (2001) does the same with respect to the S&L crisis in the United States. In Japan, it is now clear that most of the current non-performing loans reflect loans that were made well after the bubble period of the 1980s, by banks effectively having no capital to lose. In the same manner, general infusions of liquidity probably also contributed to "zombie firms" being kept alive, with the same unfortunate effects on longer-term economic costs. Mussa (2002) and the BIS (2002, 153) make the same point with respect to debt-resolution problems in emerging-market countries. Argentina waited far too long to face up to its problems, supported in part by continued IMF financing. While the Fund does seem likely to be paid back, the losses to bondholders and others are now expected to be much larger than if the need for restructuring had been accepted much earlier.

One motivation for forbearance is that public sector action (say, closing a bank) is tantamount to an indictment of the overseers. This is a significant problem that could be dealt with, perhaps by assigning the responsibility for action to someone other than the regulatory authority. It would also seem obvious that the actions of public officials in this area should be open to scrutiny and that they should be held accountable for their actions.[78]

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77. A number of commentators have recently suggested that the failure of large insurance companies could also have systemic implications through confidence effects and (in the case of Japan) cross-shareholdings with banks.

78. See, for example, International Monetary Fund (1999).

However, another motivation for forbearance is harder to deal with. There can be legitimate grounds for believing that, with time, troubled financial institutions can grow out of their problems. Presumably, this was the anticipation of many regulators in the industrial countries confronted with the exposure of their banking systems to emerging-market countries in the 1980s. Aided by Fund conditionality, which helped improve the viability of borrowers, this strategy worked. Whether or not the Japanese authorities in the 1990s were using this experience as a model is hard to say.[79] However, in the absence of any significant corporate restructuring to improve the viability of borrowers in Japan, the strategy has not worked to date, and the ultimate costs to the taxpayers could prove high.

Pointing out the limitations of safety-net features designed to reduce moral hazard, and the costs of public sector intervention over time, does not mean that such efforts should not be attempted. Every contribution to help resolve the problem is welcome. But the bottom line is that, if there are such limitations, policy-makers must recognize that their short-term policy interventions might also have less welcome longer-term implications as well.

Conclusion

Over the past two decades, the global financial system has changed profoundly. Underlying forces for change, in particular technological improvements and deregulation, have increased competition in the financial services industry. This, in turn, has put pressure on financial institutions to keep up rates of return and may have contributed to their greater willingness to take on risks. Manifestations of these underlying forces would include marketization (greater reliance on market-based financing), globalization (the internationalization of financial markets), and consolidation (cross-sectoral and more highly concentrated provision of financial services). In many respects, the financial world now resembles that prevailing prior to World War I, though there are significant differences as well. From the perspective of this paper, it is notable that the gold standard has been replaced by a fiat money system that allows a great deal more discretion in the conduct of monetary policy, including reacting to financial crises. The public sector safety net is also much wider now than it was before, but this must be set off against the significant strides that have been made in regulating and supervising the financial system.

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79. Recent experience with forbearance in Japan probably has less to do with the economic judgments of regulators than with the political support provided to the Labour Democratic Party by corporate borrowers dependent on bank loans for life support.

The incidence of financial crises does seem to have been increasing, certainly as compared to the 1950s and 1960s. Moreover, as documented in this paper, the modern financial system seems to be subject to a wide range of problems: operational disruptions, institutional insolvencies, short-term market volatility, medium-term misalignments, and contagion across countries and markets. It seems reasonable to suppose that these problems may be the price that must be paid to obtain the efficiencies that modern financial systems offer. However, this is not to say that these difficulties cannot be mitigated in various ways by public policy.

As defined in this paper, safety-net instruments are of both a microeconomic and a macroeconomic kind. Broadly speaking, the use of these instruments seems to have been increasing in recent years, with macroeconomic instruments increasingly being favoured to help temper financial disruptions. Changes in financial structure do seem to have made a material contribution, not only to the general increase in recourse to safety-net instruments, but also to the particular ways in which safety-net instruments have been used.

Marketization may have encouraged the use of generalized injections of liquidity (often similar to an easing of monetary policy) when financial disruptions threaten. In part, this is because banking systems now rely on markets as much as markets rely on the participation of banks. This may have added a new form of systemic vulnerability. The principal concern would be that lower interest rates in such circumstances might encourage debt accumulation that, over time, could make the economy more vulnerable to shocks. The IMF may also have been influenced by such developments. Market-based borrowing by emerging-market countries in the 1990s left them much more exposed to a disorderly and costly resolution of their debt problems. For a time, this led to the conclusion that large-scale Fund lending might be a preferred alternative. More recently, however, tighter lending criteria in certain cases, as well as the increased attention being paid to debt-resolution issues, indicate that a different path is now being considered.

Globalization significantly complicates the use of microeconomic safety-net instruments, particularly LOLR and the orderly winding down of financial institutions. Given the legal uncertainties involved, the difficulty in assembling facts, and the need to arrive at some international agreement among officials about how to react, forbearance (i.e., inaction) in the face of difficulties seems more likely. Eventually, this could also result in more costly bailouts or more damaging crises. Globalization also has implications for the generalized injection of liquidity in the face of financial difficulties. More arguably, it may induce national monetary authorities to react to international as opposed to purely domestic objectives. Less arguably,

domestic liquidity infusions in response to financial problems (whether global or domestic) could have unexpected and perhaps unwanted implications elsewhere in the international economy. Exporting difficulties in this way could have short-term benefits for the exporter, but negative feedback effects over time. The IMF has also responded to the possibilities of cross-country and cross-market contagion, fostered by globalization and securitization, by refocusing its activities on ways to avoid such outcomes.

Consolidation in the financial services area also poses challenges for policy-makers. As firms increasingly have cross-sectoral activities, the risk increases that safety nets will be inadvertently extended. Consolidation also implies that firms can become both too big to fail and too complex to fail. Again, forbearance becomes an increased problem with the longer-term costs of resolution rising in consequence. The fact that a small number of firms dominate some of the world's most important derivatives markets, and that they increasingly trade with each other, has further increased the likelihood of contagion effects in the financial system. This must, of course, be set against the fact that better risk management and more diversified revenue sources make initial problems less likely.

To the extent there has been growing recourse to the use of safety-net instruments, the question of moral hazard takes on greater importance. The risk is that measures taken to deal with short-term problems in the financial system may inadvertently make problems more difficult to deal with over time. It is argued in this paper that the moral-hazard issue remains one of practical significance. While "good design" of such instruments can be helpful to some degree, policy-makers still seem to be confronted with an important problem of intertemporal choice.

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