On the resolution of banking crises: theory and evidence

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Working Paper no. 229

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The views expressed are those of the authors and do not necessarily reflect those of the Bank of England, the US Federal Deposit Insurance Corporation or the University of Birmingham. We would like to thank participants at the conference on Crisis Resolution held at the Centre for Central Banking Studies, Bank of England (December 2002) for helpful comments and, in particular, E P Davis and Patricia Jackson as well as two anonymous referees.

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The Bank of England's working paper series is externally refereed.

ISSN 1368-5562

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Abstract

This paper reviews the merits of the various techniques used by authorities when resolving individual or widespread bank failures in developed and emerging market economies. In particular, the various banking crisis resolution techniques available to the authorities are classified and then compared with the techniques that have been used in practice, drawing on both the available evidence and our own analysis.

With *individual* bank failures the authorities usually first seek a private sector solution. Any losses are passed on to existing shareholders, managers and sometimes uninsured creditors, and not to taxpayers. But policy options are more limited in *systemwide* crises. In most recent systemwide crises, early on central banks have provided liquidity to failing banks and governments have given blanket guarantees to depositors. In nearly all cases, investor panics have been quelled but at a cost to the budget and increasing the risk of future moral hazard. *Open-ended* central bank liquidity support seems to have prolonged crises, thus increasing rather than reducing the output costs to the economy. Bank restructuring has usually occurred through mergers, often government assisted, and some government capital injection or increase in control. Bank liquidations have been rare and creditors – including uninsured ones – have rarely made losses. In systemwide crises, resolution measures have been more successful in financial restructuring than in restoring banks' ongoing profitability or credit to the private sector. In most cases bank lending has remained subdued for years after a banking crisis.

Summary

Over the past quarter of a century, unlike in the preceding 25 years, there have been many large bank failures around the world. Moreover, cross-country estimates suggest that output losses during banking crises have been, on average, large – over 10% of annual GDP.

This paper reviews the merits of the various techniques used by authorities when resolving individual or widespread bank failures in developed and emerging market economies. In particular, the various banking crisis resolution techniques available to the authorities are classified and then compared with the techniques that have been used in practice, drawing on both the available evidence and our own analysis.

There is a range of options for dealing with insolvent banks. At one extreme, a bank can be kept open through an injection of capital. At the other extreme, a bank can be closed with its assets sold and depositors and possibly other creditors paid off. Between these extremes, a bank's licence may be removed but the bank may be sold off to another bank, in full or part, to preserve its activities. The extent of involvement of the authorities may also vary. It may be limited to encouraging or organising private sector support, or extended to official financial support, in the limit through government takeover.

Faced with a banking crisis the authorities often face a trade-off between maintaining financial stability today through intervention and jeopardising future financial stability through increasing moral hazard later on. To the extent that the public sector becomes involved in crisis resolution, moral hazard and the resolution costs can be limited by ensuring that bank 'stakeholders' – shareholders, managers, depositors and other creditors – share at least some of the losses. Clarity and transparency over restructuring programmes may also speed up the resolution process and reduce both present costs and future risks.

In practice, faced with *individual* bank failures the authorities have usually first sought a private sector solution. Any losses have been passed on to existing shareholders, managers and sometimes uninsured creditors, and not to taxpayers. Most recent systemic crises have typically been caused by an adverse macroeconomic shock weakening the whole financial system, rather than resulting from the impact of contagion following the failure of just one individual bank. In these cases policy options have often been limited. Finding a domestic private sector solution has often been difficult, so there has been more reliance on foreign takeovers and government intervention. Also, the authorities have been faced with the dilemma that imposing losses on to the banks' stakeholders could exacerbate rather than ameliorate the liquidity crisis.

In practice, in most recent systemic crises:

– early on central banks have provided liquidity to failing banks and governments have given blanket guarantees to depositors. In nearly all cases investor panics have been quelled but at a cost to the budget and increasing the risk of future moral hazard;

– *open-ended* central bank liquidity support seems to have prolonged crises, thus increasing rather than reducing the output costs to the economy;

– bank restructuring has usually occurred through mergers, often government assisted, and some government capital injection or increase in control. Bank liquidations have been used only occasionally, and typically for smaller institutions. Shareholders have usually lost their capital and senior managers their jobs, but creditors, including uninsured ones, have rarely made losses; and

– resolution measures have been more successful in improving banks' balance sheet positions than in restoring their profits or credit to the private sector. In many cases, bank lending and profitability have remained subdued for years after a banking crisis. However banking crises are handled, the adverse effects on the economy are likely to be large. This suggests that ensuring that the financial system is robust in the face of even substantial shocks should be a key objective of financial stability policy.

1. Introduction

Over the past quarter of a century, unlike in the preceding 25 years, there have been many large bank failures around the world. Caprio and Klingebiel (2003), for example, document 117 episodes of systemic crises and 51 cases of borderline or non-systemic crises in developed and emerging market countries since the late 1970s.[1] Moreover, cross-country estimates suggest that output losses during banking crises have been, on average, large – over 10% of annual GDP[2] – and that bank lending and profitability have often remained subdued for years afterwards.

Faced with a banking crisis the authorities clearly need to take some remedial action but they must also consider how their intervention affects the future behaviour of the private sector. One goal of crisis resolution is to reduce the disruption to the payments system and damage to confidence in the financial system as a whole. Authorities could also be concerned with the knock-on effects on the supply of credit to the private sector. The potential systemic threat to the economy of bank failures will vary with the size of bank intermediation in the economy and whether borrowers have other sources of credit.

But actions to deal with these aspects can clearly lead to future moral hazard. If any protection provided to banks in a crisis is greater than they expected, this could increase their risk-taking in the future. In a widespread crisis the authorities are therefore likely to face a trade-off between maintaining financial stability today – through offering protection to failing banks – and jeopardising future financial stability through increasing moral hazard, later on, if today's actions make future assistance appear more likely. As Bagehot put it, 'any aid to a present bad bank is the surest mode of preventing the establishment of a future good bank'.[3]

Governments also wish to limit the fiscal costs of crisis resolution. Although these costs might simply be a transfer of income from current and future taxpayers to bank 'stakeholders', particularly depositors, raising (non-lump sum) taxes can have a large distortionary impact on economic welfare.

This paper reviews the merits of the various techniques used by authorities when resolving individual or widespread bank failures in developed and emerging market economies.[4] In particular, the various banking crisis resolution techniques available to the authorities are classified and then compared with the actual techniques that have been used in practice drawing on both the available evidence and our own analysis.

2. Choice of resolution strategies

To the extent that the public sector becomes involved in crisis resolution, moral hazard and the resolution costs can be limited by ensuring that bank 'stakeholders' – shareholders, managers, depositors and other creditors – share at least some of the losses. Clarity and transparency over

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[1] Systemic is defined here as relating to cases where all or most of the capital in the banking system has been exhausted.
[2] See for example IMF (1998), Bordo, Eichengreen, Klingebiel and Martinez-Peria (2001) and Hoggarth and Saporta (2001).
[3] There is an analogy here with lending by the IMF in sovereign crises which may affect the risk-taking incentives of creditors and debtors (see Haldane and Taylor (2003)).
[4] See also BIS (2002) on resolving individual banking problems, and Hoelscher and Quintyn (2003) on resolving recent systemic crises.

restructuring programmes may also speed up the resolution process and reduce both present costs and future risks.

Notwithstanding these desirable features to minimise the net costs of resolution, in practice the choice of strategy is circumscribed. A clear legal framework can have an important bearing on both the range and effectiveness of the policy options in resolving crises. For example, in some countries the supervisory agency may lack the power to write down capital, force a merger or close an institution; and if it does, may face prosecution by creditors and owners for damages. In other countries the authorities have the full range of options – they can replace managers and the board of directors, close a bank, inject capital and nationalise. Bankruptcy procedures also vary but have a large bearing on resolution. If they are slow, they can seriously delay the resolution process. The political and social context may also influence the options in practice.

There is a range of options for resolving insolvent banks. At one extreme, a bank can be kept open through an injection of capital. At the other extreme, a bank can be closed with its assets sold and depositors and possibly other creditors paid off. Between these extremes, a bank's licence may be removed but with the bank sold off to another bank, in full or part, to preserve the bank's activities. The extent of involvement of the authorities may also vary. It may be limited to encouraging or organising private sector support, or extended to official financial support, in the limit through government takeover.

When a bank is financially distressed there is usually a preference to encourage a private sector solution. It is likely to place existing capital holders in a first-loss position, and impose no direct costs on the taxpayer. Where a bank is, or is close to, insolvent, existing shareholders or creditors could be asked by the supervisor to provide the capital shortfall. This has the advantage of attempting to keep the bank alive as a going concern, while levying a charge on those that have most to gain from the bank's survival. If a failing bank is taken over by another stronger bank this usually has the advantage of penalising incumbent managers and shareholders. The senior managers are likely to be replaced while existing shareholders would lose all, or part, of their investments.

If an unassisted private sector solution cannot be found, a decision would next be made about whether to liquidate the bank or provide some form of government assistance (see Diagram 1). In exceptional circumstances, if there were a systemic threat, governments might consider a takeover or guarantee to a failed bank, as an interim measure.

These options are reviewed below in turn.

2.1 Unassisted resolutions

Bank status unchanged

When a bank supervisor discovers that a bank is at, or close to, the point of insolvency, the first response is to see whether the bank can be rehabilitated without government assistance. There are often several steps here. The bank can be instructed to curtail lending, either in a specific line of business or across the board. A request (demand) for additional capital from existing shareholders or other interested parties is often issued; management changes can be required; and operational changes are almost always undertaken.

Bank status changed – private sector merger

If a capital infusion from existing shareholders or other interested parties is not available, an unassisted merger with another healthy financial institution is usually the next course of action. For an unassisted merger to occur, the extent of losses must be transparent to the prospective acquirer. Therefore, supervisors should examine the troubled bank to determine the size of losses to ensure that the acquiring institution has sufficient capital to absorb potential losses in the failing institution.

A number of factors may affect the likelihood of a private sector merger or takeover. As financial systems have become more competitive, the willingness of a group of banks to organise a rescue so as to preserve the stability of the industry as a whole may have diminished, so a bank may involve itself in rescuing another bank only if it is demonstrably in its own self interest to do so. The size of the firm (relative to the financial system of a whole) may also affect the ability to achieve a private sector solution. The failure of a large financial institution may have a large adverse impact on other firms either through direct exposures or the impact on asset prices of unwinding its positions. So some institutions may be 'too big to fail' for the private sector. The rescue of LTCM may be a case in point (see Herring (2002)).[5] It is also easier to coordinate a rescue with fewer counterparties. On the other hand, in a financial system that is already highly concentrated, the authorities may be reluctant to allow further consolidation for competition reasons.

2.2 Liquidation

If an unassisted private sector merger is not possible, a decision is often made to liquidate the bank. In a liquidation, the bank is declared insolvent, closed, and depositors paid off. The restructuring authority then liquidates all assets. In most cases uninsured depositors and other creditors are only covered if sufficient funds are available after liquidation. Liquidation exerts a strong financial discipline on the various stakeholders. But when a liquidation occurs it may affect other banks through direct exposures or changes in financial market prices.

Moreover, reimbursing depositor and creditor claims, from the sale of the failed bank's assets, can be a long and disruptive process that locks-up people's wealth for months or even years and has knock-on effects throughout the economy.

2.3 Assisted resolutions

If some form of government intervention is considered, various forms are available.

Bank status unchanged

As regards the lender of last resort (LOLR) function, central banks usually only provide emergency liquidity assistance in potentially systemic situations and only for a limited period. Liquidity support to individual institutions can buy time to assess the underlying solvency

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[5] In the case of LTCM, 14 of its largest creditors injected $3.6 billion. If LTCM had been allowed to fail this would have automatically triggered the closeout of netting arrangements. The major creditors feared that an unwinding of LTCM's positions may have resulted in a marked decline in asset prices. This, in turn, may have resulted in losses for these counterparties (and others) that held similar positions.

position and to assess alternative resolution strategies.[6] Although LOLR is intended for illiquid but fundamentally solvent banks, in practice it may be difficult, in the time available, to distinguish between a liquidity and a solvency problem. Mechanisms should be put in place to ensure that such lending is time-limited and conditional, and that the central bank protects itself from incurring losses, in particular through taking collateral (see George (1994) for the principles underlying the provision of LOLR in the United Kingdom).

Open bank assistance occurs when the government provides financial assistance to a distressed bank without taking over the bank or eliminating the current stockholders' position entirely. The assistance can be in the form of the provision of capital or through purchasing non-performing assets from the bank. This allows the operations of the bank to continue uninterrupted. However, there are potential weaknesses with open bank assistance. Most important, if the bank's management is left in place, and the existing shareholders' investment protected, this will seriously increase moral hazard. Making government support conditional can reduce this problem, for example, through replacing management, eliminating or downgrading existing shareholders' interests, or mandating an infusion of private sector capital. Open bank assistance has often required repeated capital injections before problems have been solved, resulting in large fiscal costs of resolution.

Bank status changed

Resolution of a bank failure often involves an assisted merger or acquisition. The transaction can be completed with another bank or, if permitted by law, another type of institution. A merger provides business continuity for both borrowers and depositors. It can be structured in many different ways, depending on the size and complexity of the distressed bank, the funding constraints of the resolution authority, and the amount of time until failure. Banks can also be split up, with the deposits, branches and assets sold off separately.

Assisted mergers are sometimes accomplished using purchase and assumption transactions (P&A). In an assisted P&A the acquirer purchases the assets and assumes the liabilities, in whole or part, of the failed bank, with the resolution authority compensating for the difference. Here, existing shareholders lose all of their investments. Uninsured creditors, too, may lose part of their investment if the P&A is only partial.

Bridge banks are a form of temporary government ownership.[7] A number of industrialised countries with systemic crises, such as Finland and Sweden, have assumed temporary ownership of troubled large banks, to permit restructuring and subsequent sale to a private institution. Bridge banks offer a holding period so that a final resolution strategy can be effected. While the

[6] Liquidity assistance discussed here refers to lending to individual institutions rather than in the Bagehot sense of lending to the banking system as a whole. For a review of the literature on LOLR see Freixas, Giannini, Hoggarth and Soussa (1999) and Wood (2000).

[7] Under this resolution technique the weak bank is closed by the chartering authority and placed under liquidation. A new bank – the 'bridge bank' – is chartered and controlled by the liquidator according to statutory or legislative provisions.

Diagram 1: Decision tree in crisis resolution

government can maintain the business operation of the bank, the set time period forces the resolution authority to focus on cleaning up the bank's balance sheet in preparation for selling it.[8]

Outright government ownership (where allowed) has typically occurred when a very large bank fails. The government authorities take over the bank by nationalising it, usually eliminating the stockholders' interest but protecting depositors and other creditors. One problem with outright nationalisation, however, is that government managers do not have the same incentives as private bank managers. In market economies, private sector banks are essential for efficiently allocating credit. Evidence suggests that countries with higher shares of state-owned banks tend, on average, to have a higher share of non- performing loans and higher operating costs (Goldstein and Turner (1996)).[9]

Estimating the loss in a distressed bank is a key step in a bank resolution. One technique used to determine whether it is better to liquidate a bank or keep it alive with some official assistance, is to estimate the liquidation value of the bank's assets, the total value of the insured liability holders' claims and the related administrative expenses involved. These costs of liquidation can then be compared to the subsidy required to assist in a takeover or a P&A by another bank, to determine the 'least cost' solution. The higher the value of the bank as a going concern relative to its break up value, the greater the case for providing official support rather than liquidating the bank. But if a large part of the bank's liabilities are uninsured, liquidation might be cheaper, at least from the viewpoint of the deposit insurer.

However, such cost comparisons only consider the direct financial costs of different resolution strategies to the deposit insurer. This calculation may understate the cost of liquidation in systemic crises, as it ignores any knock-on effects on the rest of the financial system. On the other hand, the cost of official support to the economy may be understated to the extent that bank restructuring protects the investments of uninsured depositors and other creditors and thus potentially increases moral hazard.[10]

It is particularly important that the way a current crisis is resolved should not make banks, and their creditors, raise their estimate of the chance of bailout in future crises. That would make future crises more frequent. Furthermore, the calculation of benefits and costs should allow for the fact that any budgetary costs are financed, sooner or later, from distortionary taxation.

Table A shows the losses imposed on different stakeholders at the moment the crisis is resolved by type of resolution strategy. As the table shows, these losses vary with the method of resolution, and will usually impinge differently on the relevant stakeholders. But there are also *subsequent effects* to consider, both immediate ones that can arise very quickly in the aftermath of the resolution, and effects that may persist for many years.

The most striking immediate post-resolution losses follow from any revision to the probability of a run on other banks. If the way the crisis is resolved is perceived as being fully in accordance with

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[8] To limit moral hazard Mayes, Halme and Liuksila (2001) suggest that the government should impose the same losses on shareholders and uninsured creditors that they would have faced had the bank been immediately liquidated. Such a scheme, however, could still induce contagion. As banks with large deposits at the failed bank may face substantial losses, it may result in a disruption to financial markets and payments system more generally and it could trigger creditor runs at other banks.

[9] But causation here could also run in the opposite direction.

[10] This risk of moral hazard can be eliminated by forcing uninsured depositors and other creditors to take the same 'haircut' in an assisted sale as they would in a liquidation.

how the authorities and other relevant parties had been expected to behave, then no change in the likelihood of a bank run would be expected on the part of *well informed* agents.

For the general public, however, a bank run is a panic that, once begun, feeds on itself. It may not be amenable to standard arguments built on rational expectations and publicly available information. So liquidating a bank that is seen to be insolvent by all the main players may trigger a sudden fear, among depositors, that the same thing could happen with other banks which the authorities and other informed parties know full well to be currently sound. This is especially a cause for concern when deposit insurance is absent or coverage is very restrictive.

Table A: Alternative resolution strategies for failed banks: who bears the losses?

	Shareholders (lose money)	**Managers (lose job)**	**Creditors (lose money)**	**Employees (lose jobs)**
Bank status unchanged				
Shareholders capital injection	No	No	No	No
Government injection[(a)]	Probably, partly	Probably	Possibly, partly	Probably
Bank status changed				
Nationalisation/bridge bank[(c)]	Yes, partly	Probably	Possibly	No
Merger and acquisition[(b)]	Probably, partly	Possibly	Possibly, partly	Possibly
Purchase and assumption[(b)]	Yes	Possibly	Yes if P&A partial	Possibly
Liquidation	Yes	Yes	Yes, uninsured	Yes

(a) Government injection is usually conditional on changes in senior management; some losses to shareholders and restructuring often results in job losses. It may also be preceded by financial restructuring whereby uninsured creditors accept some losses.
(b) A private sector M&A would typically replace managers if there are large business overlaps between the acquirer and the acquired. A write-down of existing shareholders' capital is likely beforehand and there may be some losses to uninsured creditors. In a P&A, existing shareholders will be wiped out and uninsured creditors will make losses if the acquirer assumes only some of the original banks' liabilities. Mergers often result in the consolidation of bank operations that result in staff reductions.
(c) Nationalisation usually wipes out the stockholders, however there are cases where stockholders are left with a subordinated residual claim.

The immediate effects of liquidation are not limited to the possibility of creditor bank runs. In order to maintain or attract depositors, banks may have to pay out more in interest to creditors, particularly if uninsured, although the consequences on banks' revenue outflows may take time to show up if these consist largely of loans at fixed interest. So the (weighted) cost of finance to banks will rise. Also, the equity values of all other banks are liable to fall once the liquidation is announced, if only because financial intermediary stock will be seen, temporarily at least, as riskier than previously thought.

It is not only liquidation that could induce these effects. Any crisis resolution method that involves some loss to shareholders and/or uninsured creditors, could have some negative impact on the market value of other banks. In the absence of deposit insurance, at least, news of a haircut for the depositors of today's distressed bank could conceivably provoke flight from others, although the possible size and chances of this are presumably far lower than with liquidation.

In the *longer run*, the way today's crisis is resolved can bring gains and losses by its effects on *incentives* for future action. Injections of capital, whether official or by shareholders, do not alter the bank's status, and the only direct loss at the time may be some drop that dilution implies for the value of existing shareholders' equity. If this solution accords with expectations, no moral

hazard consequences should ensue. However, if capital support is more than expected it might increase moral hazard in the future.

Government recapitalisation, in particular, is likely to result in long-term costs since it will be expected to affect the behaviour of the banking system as a whole and not just the bank that receives the support. Bank managers at the supported bank and other banks will take less care to try to prevent those difficulties later on. Loans may be granted more freely and with less attention to due diligence and borrower appraisal. Banks perceived as relatively vulnerable will find that they can borrow more cheaply.

With less assiduous management, less pressure on costs, cheaper deposits and an enhanced equity valuation, such banks may avoid subsequent threats to their solvency. Furthermore, one can argue that financial regulators should be aware of increased risks of trouble, and hence that sufficiently close monitoring might prevent it. Nonetheless, there may well be an increase in the probability of crises for these weaker banks in future, as a result of behavioural changes encouraged by the adoption of an unanticipatedly 'soft' resolution taken now. If, at the worst, managers come to think that they will always be rescued, their attitude to risk taking will become one of 'heads I win, tails they lose', and regulators may be in no position to stop them from exploiting it.

Subject to the foregoing qualifications – about what regulatory monitoring can achieve on its own, the unpredictability of reactions that might provoke bank runs, the possibility of nipping a run in the bud, the paucity of firm econometric evidence, and the extent and character of depositor protection – it appears that, of all the different ways of resolving a crisis now, the expected subsequent cost of liquidation is greatest in the short run and smallest in the long run. The costs of a run are borne by all the stakeholders in Table A, and may generate serious repercussions throughout the economy. No-change-in-status resolutions promise the least short-run cost, given that they are likeliest to prevent runs, but if recapitalisation is by the government rather than the private sector they could well prove the costliest later on. These further future costs would be borne principally by the shareholders of banks that became distressed as a result of bad luck and the heightened incentive for their managers to take risks. Of the three status-change solutions, purchase and assumption, in many respects the least lenient, would come closest to liquidation in terms of the time pattern of expected net costs. Mergers and temporary nationalisation would lie between P&A, and no-change-in-status in these respects. A final point to stress in this connection is that what matters most is not what particular method of resolving a present crisis is adopted, because that choice must depend on the precise circumstances, but rather on whether the method selected alters the private sector's beliefs about how the authorities and other parties would react to future crises.

3. Evidence on crisis resolution

3.1 Systemic versus non-systemic crises

The policy options available in a banking crisis are, in practice, sensitive to the type and size of shock affecting the financial system, in particular whether failures are thought systemic.

If the situation is non-systemic, the focus of the resolution is on the individual failed bank's balance sheet. In this case the failed bank will either be merged with a healthy bank or liquidated. In a systemic situation, however, the immediate aim of the authorities is usually to restore financial stability of the system as a whole, restore public confidence and avoid bank runs. Here guarantees are likely to be given to liability holders at the failed bank(s), and perhaps to the

financial system as a whole to avoid or reduce panic. So the aim is first to stabilise the liabilities of the banking system, before restructuring the assets of the failing banks.

Most recent systemic crises have typically been caused by an adverse macroeconomic shock weakening the whole financial system, rather than resulting from the impact of contagion following the failure of just one individual bank (see Borio (2003)).

This has restricted the available policy options. In a systemic crisis, no well-capitalised domestic private banks may be found to buy the failed banks, leaving takeovers by foreign banks or the government as the only option. In recent systemic crises, some countries have relaxed rules on foreign entry to allow takeovers by foreign banks – such as in Finland and Mexico – while others have relied more on government ownership. For example, following the banking crisis in Norway, and more recently in South Korea, the government became owner of more than half of the banking system.

It may also be more difficult to penalise some stakeholders. In principle, existing shareholders' capital can, and should, still be written down during system-wide crises. However, evaluating the underlying value of impaired assets may be harder than during normal market conditions. Estimates of cash flows, interest rates and underlying business conditions will be uncertain, as will the value of collateral. This may lead to an understatement of losses, thus imposing costs on taxpayers rather than on existing shareholders. Such understatement occurred recently in Mexico and Indonesia.

With a non-systemic bank failure, the existing safety net will apply, so only insured depositors will be protected and access to central bank finance is on normal terms. But in extensive crises, imposing losses on uninsured depositors or other creditors could exacerbate the liquidity crisis. Often the central bank provides emergency liquidity and the government may provide a temporary blanket government guarantees to depositors and other creditors to maintain confidence. Liquidations have rarely been used immediately in system-wide crises because of the enhanced risk of bank runs. However, in highly dollarised banking systems, LOLR is limited by the level of international reserves and offering guarantees to holders of foreign currency deposits may not be credible. More generally, the credibility of a blanket guarantee may be undermined if the government has a large debt burden.[(11)]

Often a system-wide banking crisis is accompanied by a currency crisis. This may increase banking system losses if banks, or their customers, have large net foreign currency exposures. If the government assumes banks' bad debts, the currency crisis could deepen further, opening up a vicious circle that appears to have characterised many of the difficulties recently faced in the east Asian crisis. In a currency crisis the authorities may respond by increasing interest rates to defend the exchange rate, rather than by reducing rates to help alleviate pressure on the banking system.

3.2 Short-run impact of banking crises

Based on responses to a questionnaire, the OECD (2002a) recently compared the techniques and practices used in member countries faced with large bank failures. In addressing problems, the central bank or government agency typically intervened soon after the onset of the crisis to supply liquidity. In most cases this helped to avert a panic by liability holders. Most governments

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[(11)] See Hoelscher and Quintyn (2003) for a discussion of resolution policies in economies with highly dollarised banking systems and large government debt burdens.

protected depositors, in whole or part, up to the statutory minimum. Liquidations were used only occasionally and typically only for smaller institutions or where only a small part of the banking system was impaired. When large commercial banks have been in trouble, problems have usually been resolved through mergers and some mix of government capital injection and increased government control. Existing shareholders' capital has been written down.[12] In most countries, government ownership only lasts for a short period until a private buyer is found. But after some episodes, such as in Norway, banks remained nationalised for years.

In most systemic banking crises during the 1990s, the central bank has provided liquidity support to problem banks, to offset withdrawals by depositors and other creditors. Central banks have often made losses on this lending for the banks that turned out to be insolvent. Blanket guarantees to depositors and other creditors have also been provided, albeit sometimes temporarily. Confidence in the banking system has usually revived quickly. However, in the more recent Argentinian crisis (2001-2002) a blanket guarantee to liability holders was not given. Such guarantees would not have been credible given that the source of the crisis was the unsustainability of the fiscal position. Instead, to prevent bank runs, a temporary deposit freeze was imposed.

In a study of the recent crises in east Asia, Lindgren *et al* (1999) found that the announcement of temporary blanket guarantees to all depositors and other creditors succeeded in stopping runs by domestic depositors although not in securing rollover of foreign liabilities. De Luna-Martinez (2000) found no cases of depositor bank runs during the Korean and Mexican crises once blanket guarantees were provided to depositors and other creditors, and central bank liquidity was provided for a short period. So blanket guarantees, usually provided in systemic crises, could have stopped banking system runs. But an alternative view is that broad guarantees were not needed, and depositors would in any case have simply shifted from banks seen as weak to strong ones. At first blush, the recent Indonesian situation appears to provide evidence for the first interpretation. It was only after its central bank shifted from a limited to a full guarantee that liquidity runs were stemmed.[13] However, Goldstein (2000) argues that a limited deposit insurance scheme could have avoided a bank run had the public been convinced at the time that all, not just a few, of the system's insolvent banks were being closed.

More generally, Demirgüç-Kunt, Detragiache and Gupta (2000) found, in a sample of 36 developed and emerging-country banking crises, that at the outset of crises, deposits in the banking system as a whole did not decline.

Direct cross-country evidence on official support suggests that open-ended liquidity support and blanket guarantees have been associated with higher fiscal costs of crisis resolution (Table B).[14] However, this does not necessarily imply causation. Fiscal costs are likely to be higher, the larger the adverse shock to the banking system. But in the face of such a potential systemic threat it is more likely that the authorities would also provide liquidity support and guarantees to liability

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[12] In some countries, shareholders have been left with nominal amounts because of legal restrictions on full write-downs or to avoid costly legal challenges by existing shareholders.

[13] According to Lindgren *et al* (1999) the run occurred because depositors thought they would only receive limited protection (up to the equivalent of US$2,000) as was announced for the first round of 16 banks that were initially liquidated in November 1997.

[14] Open-ended liquidity support is defined as liquidity support provided for more than twelve months which is greater than the aggregate capital of the financial system. Blanket guarantees are either explicit government guarantees or implicit ones proxied by where state banks account for more than 75% of the banking system's assets, source Honohan and Klingebiel (2003).

holders. Yet fiscal costs still appear higher after allowing for quantifiable proxies for the size of the shock to the banking system. Honohan and Klingebiel (2003) find that, after controlling for other factors that are likely to impact on resolution costs in a sample of 40 developed country and emerging market crises, open-ended liquidity support and blanket guarantees increase the direct fiscal costs of crisis resolution.[15]

But any fiscal outlays arising from widening the safety net need to be weighed against the potential benefits to the economy as a whole from avoiding more widespread bank failures. For example, in the United States' banking crisis in the early 1930s, the absence of depositor guarantees and liquidity support kept the fiscal costs low, but the adverse consequences to the broader economy were severe with output falling by some 30% from peak to trough.

Charts 1 and 2 suggest that controlling for the importance of bank intermediation in the economy (measured by bank credit/GDP), open-ended liquidity support is associated with larger declines in output during a banking crisis.[16] This still appears true after allowing for other factors that may affect output losses such as whether a currency crisis also occurs (Table C equation **(1)**). But there is no evidence, either positive or negative, of association between deposit guarantees and the output losses of crises (Table C equation **(2)** and Charts 3 and 4).

Bordo *et al* (2001) also found, in a sample of 29 countries over the 1973–97 period, that banking crises were associated with much bigger output losses when open-ended liquidity support was provided (but blanket depositor guarantees had no effect either positive or negative). They argue that the provision of open-ended liquidity support may testify to some countries' reluctance to allow banks to fail. Support was in some cases given to insolvent banks, not just those that were fundamentally sound but illiquid. This may have increased moral hazard, enabled some banks to gamble for resurrection, and facilitated continuing financing for loss-making borrowers.

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[15] Fiscal costs reflect the various direct types of expenditure involved in rehabilitating the financial system, including liquidity support, purchases of non-performing loans, bank recapitalisation and payments made to depositors and other creditors, either implicitly or explicitly through government-backed deposit insurance schemes. These estimates may not be strictly comparable across countries. They also exclude, for example, any widening in bank spreads faced by depositors and borrowers and more generally any impact on inflation and output.

[16] Output losses are measured as either the sum of growth rates (output losses 1) or output levels (output losses 2) during the banking crisis from the pre-crisis ten-year trend. For a discussion of the issues in measuring the output costs of banking crises see Hoggarth and Saporta (2001).

Table B: Liquidity support, depositor guarantees, fiscal costs and the output losses of banking resolution in 33 systemic banking crises 1977-2002[a]

	Number of crises	Length of crisis (years), average	Non-performing loans (per cent of total loans),[b] average	Bank credit/ annual GDP (per cent),[c] average	GNP per head (US$ 000s, PPP basis) at the start of the crisis, average	Cumulative fiscal costs of banking resolution (per cent of GDP),[d] average	Output losses 1[e] (per cent of GDP), median	Output losses 2[e] (per cent of GDP), median
All countries	33	4.3	26.7	44.2	6.6	15.0	7.1	23.1
LOLR (open ended) [f]								
– Yes	21	4.8	31.1	47.1	6.7	17.3	13.9	37.0
– No	12	3.4	19.3	39.1	6.4	10.9	3.8	9.1
Blanket deposit guarantee[f]								
– Yes	22	4.3	29.3	47.8	7.9	16.6	9.8	28.7
– No	11	4.3	17.3	37.0	4.0	11.8	5.0	15.7
Banking crisis alone	10	4.6	23.7	44.9	7.3	7.8	2.4	15.7
Banking and currency crisis[g]	23	4.2	28.2	43.9	6.3	17.4	11.6	32.2
of which:								
– with LOLR	16	4.5	32.9	45.1	5.9	18.9	17.0	43.9
– without LOLR	7	3.4	17.5	41.3	7.3	14.1	4.8	13.2
of which:								
– with blanket deposit guarantee	16	3.9	29.7	46.9	7.5	19.4	17.0	37.2
– without blanket deposit guarantee	7	4.9	19.5	37.1	3.6	12.8	4.8	24.7

Sources: Caprio and Klingebiel (2003), Hoelscher and Quintyn (2003), Hoggarth and Saporta (2001), Honohan and Klingebiel (2003), OECD (2002), IMF, World Bank and Bank calculations.

(a) A systemic crisis is defined as when all, or nearly all, the capital in the banking system is eroded. The crises are Finland (1991–93), Japan (1992–), Norway (1988–92), South Korea (1997–2000), Spain (1977–85), Sweden (1991), Argentina (1980–82), Argentina (1995), Brazil (1994–96), Bulgaria (1996–97), Chile (1981–83), Colombia (1982–87), Côte d'Ivoire (1998–91), Czech Republic (1989–91), Ecuador (1996–2001), Ghana (1982–89), Hungary (1991–95), Indonesia (1997–), Malaysia (1997-2000), Mexico (1994–95), Paraguay (1995-99), Philippines (1981–87), Philippines (1998–2000), Poland (1992–95), Senegal (1988–91), Slovenia (1992–94), Sri Lanka (1989–93), Thailand (1983–87), Thailand (1997–2000), Turkey (1982–85), Turkey (2000–), Uruguay (1981–84), Venezuela (1994–95).

(b) Estimated at peak. Data available for 19 countries only. Comparisons should be treated with caution since measures are dependent on country-specific definition of non-performing loans and often non-performing loans are under-recorded.

(c) At the beginning of the crisis. Credit to the private sector from deposit money banks (IFS code 22d) as a share of annual nominal GDP (IFS code 99b).

(d) Bank recapitalisation, government payouts to liability holders and public sector purchases of non-performing loans.

(e) Output losses1 is the cumulative deviation in the *growth* of output during the crisis period from its pre-crisis ten-year trend. Crisis ends when GDP growth returns to pre-crisis trend or if not occurred estimated up until 2002. Output losses2 is the cumulative deviation in the *level* of output during the crisis from its ten-year pre-crisis trend. Crisis end based on qualitative judgment of country experts, see Hoggarth and Saporta (2001). Data exclude Côte d'Ivoire. Because of data limitations, a three-year and six-year pre-crisis trend was used for Czech Republic and Slovenia respectively.

(f) Open-ended LOLR is where central bank liquidity support is given for more than one year that is greater than the aggregate capital of the banking system. Blanket government guarantee is either explicit or where state banks account for 75% or more of banking system assets.

(g) A currency crisis is defined, as in Frankel and Rose (1996), as a nominal depreciation in the domestic currency (against the US dollar) of 25% combined with a 10% increase in the rate of depreciation in any year of the banking crisis period. The latter condition is designed to exclude from currency crises high inflation countries with large *trend* rates of depreciation.

Table C: Impact of liquidity support and government guarantees on output losses

1. YLOSSES1[(a)]

	A. Liquidity support (LOLR) (1)		B. Blanket guarantee (GUAR) (2)	
LOLR[(b)]	4.5	(1.2)		
GUAR[(c)]			0.7	(0.2)
CRGDP[(d)]	0.34	(5.6)	0.35	(5.6)
CUR[(e)]	9.4	(2.3)	10.5	(2.6)
R^{-2}	0.56		0.54	
DW	2.0		1.9	
Number of observations	32		32	

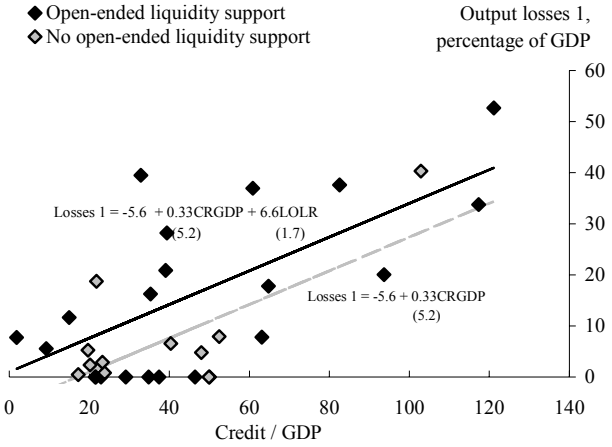
2. YLOSSES2 [(f)]

	A. Liquidity support (LOLR) (1)		B. Blanket guarantee (GUAR) (2)	
LOLR[(b)]	28.2	(1.9)		
GUAR[(c)]			-12.4	(0.8)
CRGDP[(d)]	0.99	(4.3)	1.1	(4.5)
R^{-2}	0.42		0.36	
DW	2.7		2.4	
Number of observations	32		32	

Sources: Honohan and Klingebiel (2003), IMF and Bank calculations.
t-statistics in parentheses.
(a) YLOSSES1: Cumulative deviation in the *growth* of output during the crisis period from its ten-year pre-crisis trend.
(b) LOLR: one where liquidity support provided for more than twelve months that is greater than the aggregate capital of the banking system, 0 otherwise.
(c) GUAR: one where explicit government guarantee or implicit one (where state banks account for 75% or more of banking system assets), 0 otherwise.
(d) CRGDP: Bank credit to the private sector/annual GDP (%) at the outset of the crisis.
(e) CUR: one where currency crisis, 0 otherwise. Currency crisis is a nominal depreciation (against the US dollar) of 25% combined with a 10% increase in the rate of depreciation in any year of the banking crisis period.
(f) YLOSSES2: Cumulative deviation in the *level* of output during the crisis period from its ten-year pre-crisis trend.

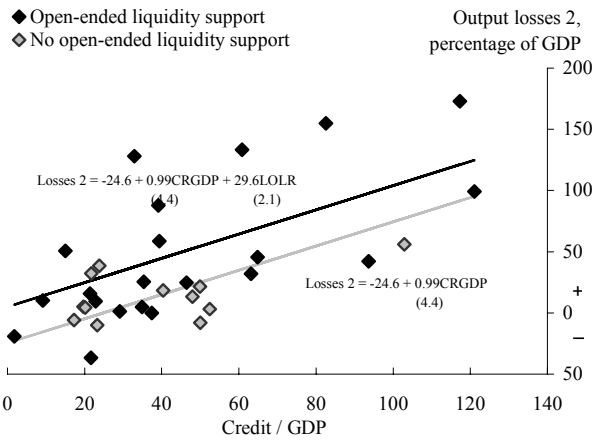
Types of official intervention and output losses during recent systemic banking crises 1977-2002

Chart 1: Output losses 1 and credit/GDP: liquidity support



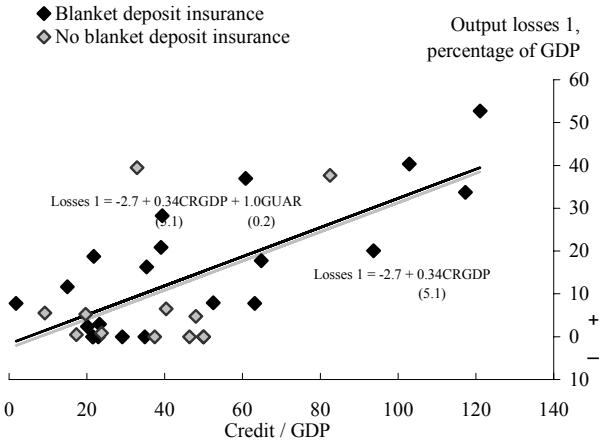
Sources: IMF, Honohan and Klingebiel (2003) and Bank calculations.
t-statistics in parentheses

Chart 2: Output losses 2 and credit/GDP: liquidity support



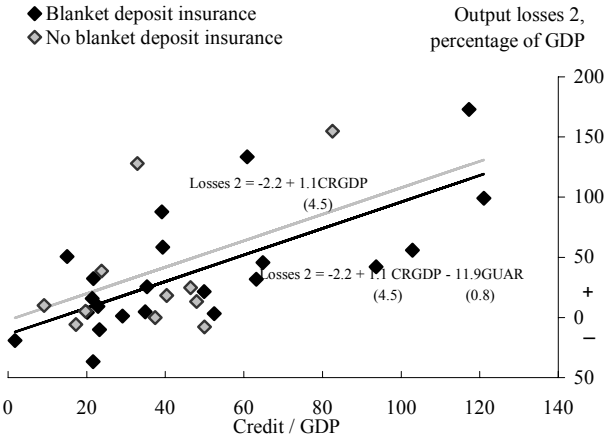
Sources: IMF, Honohan and Klingebiel (2003) and Bank calculations.
t-statistics in parentheses

Chart 3: Output losses 1 and credit/GDP: blanket deposit insurance



Sources: IMF, Honohan and Klingebiel (2003) and Bank calculations.
t-statistics in parentheses

Chart 4: Output losses 2 and credit/GDP: blanket deposit insurance

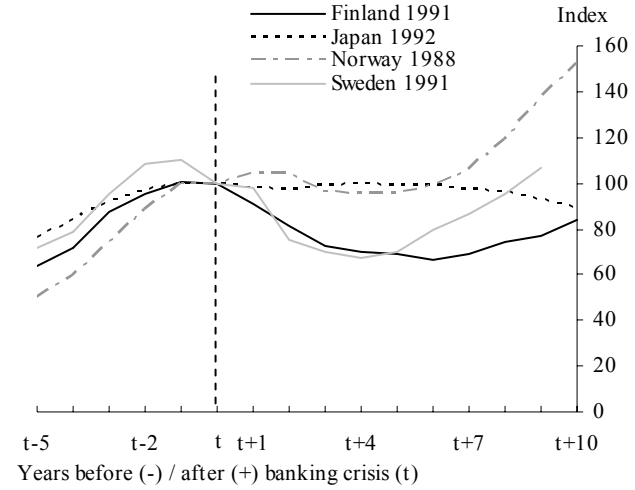


Sources: IMF, Honohan and Klingebiel (2003) and Bank calculations.
t-statistics in parentheses

3.3 Longer-run impact of banking crises

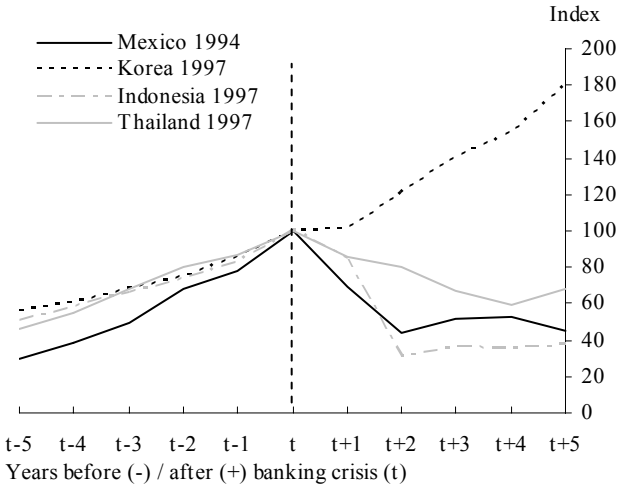
Have crisis resolution strategies been effective in getting banks to reintermediate again, and to return to profitability after a crisis? In a sample of 24 systemic banking crises, Dziobek and Pazarbasioglu (1997) found that resolution measures were more successful in improving the banking system's balance sheet (stock) positions than their profit (flow) performance. An injection of equity or swapping bonds for bad loans (financial restructuring) can improve balance sheets, but improving profitability is harder, as it needs policies that include restructuring the financial and operating position of bank borrowers.

Chart 5: Developed countries: Early 1990s
Real bank credit (t = 100)



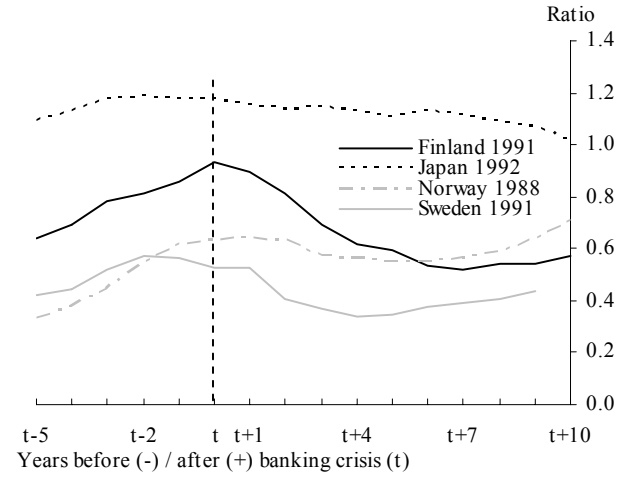
Sources: IMF and Thomson Financial Datastream.

Chart 6: Emerging market countries: Mid-late 1990s
Real bank credit (t = 100)



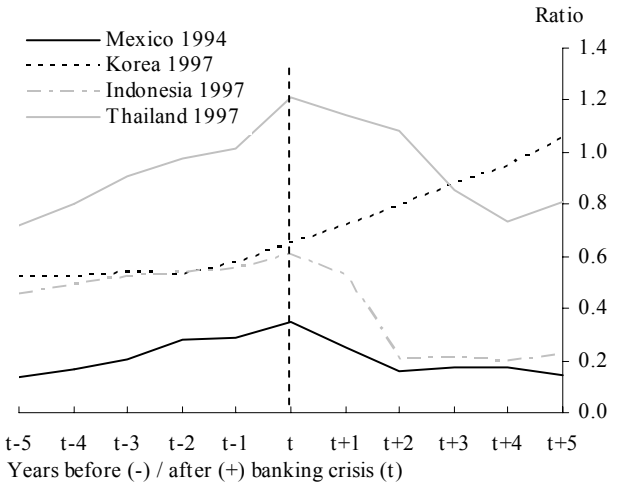
Sources: IMF and Thomson Financial Datastream.

Chart 7: Developed countries: Early 1990s
Bank credit/GDP ratio



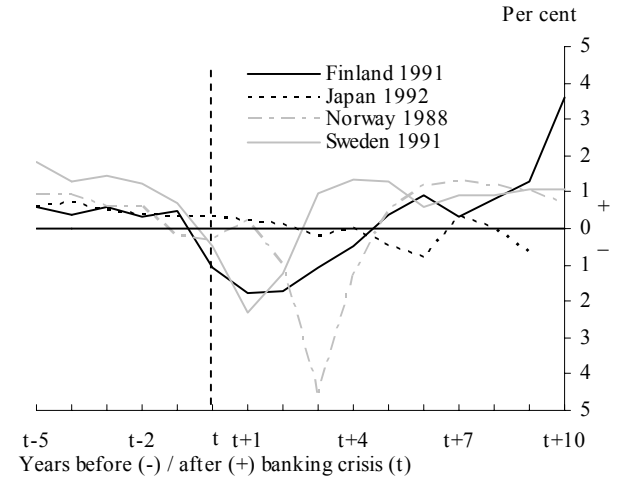
Sources: IMF and Thomson Financial Datastream.

Chart 8: Emerging market countries: Mid-late 1990s
Bank credit/GDP ratio



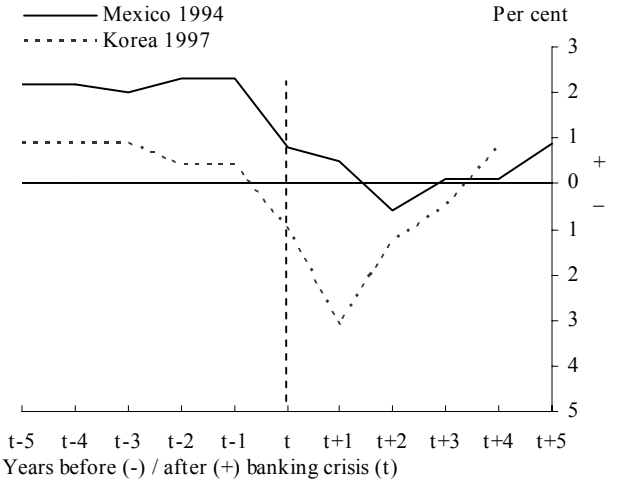
Sources: IMF and Thomson Financial Datastream.

Chart 9: Developed countries: Early 1990s
Commercial banks' profits before tax – % of total assets



Sources: OECD and Drees and Pazarbasioglu (1998).

Chart 10: Emerging market countries: Mid–late 1990s
Commercial banks' profits before tax – % of total assets



Source: OECD.

Demirgüç-Kunt, Detragiache and Gupta (2000) also find that real bank credit fell markedly in the first three years after crisis, despite some recovery in real output, as banks switched their portfolio into other assets. This highlights the difficulty of getting banks to intermediate again in the aftermath of a crisis, partly reflecting the persistence of low borrower credit worthiness and lack of good collateral.[17] Some banks may also have switched their portfolio into more liquid and safer assets. In many cases, liquidity was needed to stem runs by foreign depositors, while government bonds helped banks with depleted capital to meet their minimum required capital ratios since these carried a lower regulatory risk weight than loans. In Indonesia, for example, at end-2002 loans still accounted for less than 30% of total banking system assets, while government recapitalisation bonds represented 45% of assets.

Caution is needed in interpreting credit data during crises.[18] Nonetheless, in the aftermath of the most recent systemic crises, bank lending remained depressed for years (Charts 5–8). At the end of 2002, for example, real bank lending in Finland and Mexico was still 10% and 55% respectively below pre-crisis levels (respectively eleven and eight years previously). Mexico's lack of creditor rights, and weak bankruptcy laws, have deterred its banks from lending. Interestingly, lending held up most in Norway and South Korea – two countries that initially used nationalisation as a resolution method. In most banking crises, profits, too, have remained negative for years (Charts 9–10).

4. Conclusion

As evidence from the Great Depression shows, banking crises can have a dramatic adverse impact on the economy, in the absence of intervention.[19] But keeping the fiscal costs low, and avoiding moral hazard in the future, are also prime factors in determining the appropriate scale and character of intervention.

With individual bank failures, the authorities usually first seek a private sector solution. Any losses are first passed to existing shareholders, managers and, in some cases, uninsured creditors; and not to taxpayers. Restructuring policies are transparent with only viable institutions kept open while unviable ones are liquidated.

In system-wide crises, however, policy options are more limited. Finding a domestic private sector solution is hard. So there has been more reliance on foreign takeovers and government intervention. Temporary government assistance is often preferred to liquidation, to avoid selling bank assets at 'fire sale' prices. Also, because of concerns of widespread liquidity runs, blanket guarantees are usually given early to all bank creditors.

In most recent systemic crises the central bank or government agency has intervened early on, to provide liquidity to failing banks and blanket guarantees to depositors. In nearly all cases investor panics have been quelled but at a cost to the budget and from greater moral hazard in the future. It seems that open-ended liquidity support has prolonged banking crises, thus increasing not reducing the output costs to the economy. Restructuring has usually occurred through mergers, often government assisted, and some government injections of capital or increase in control.

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[17] There is a difficult identification problem of knowing the extent to which the decline in the amount of credit and its share of total assets reflects either (i) a desire for banks to reduce lending, (ii) a constraint, such as insufficient capital, on the ability of banks to lend, or (iii) a fall in loan demand by banks' customers.
[18] One problem in interpretation is that credit data include write-offs of bad loans.
[19] See, for example, Friedman and Schwartz (1963).

Shareholders have usually lost their capital and senior managers their jobs, but creditors, including uninsured ones, have rarely made losses. Liquidations have been used only occasionally, and typically for smaller institutions.

In recent systemic crises, resolution measures have been more successful in improving banks' balance sheet positions than in restoring their profits or credit to the private sector. In many cases, bank lending remained subdued for years after a banking crisis. However banking crises are handled, the adverse effects on the economy are likely to be large. This indicates that ensuring that the financial system is robust in the face of even substantial shocks should be a key objective of financial stability policy.

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