

Deposit Insurance Around the Globe: Where Does It Work?

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ABSTRACT

Explicit deposit insurance has been spreading rapidly in recent years, even to countries with low levels of financial and institutional development. This paper documents the extent of cross-country differences in deposit-insurance design and reviews empirical evidence on how particular design features affect private market discipline, banking stability, financial development, and the effectiveness of crisis resolution. This evidence challenges the wisdom of encouraging countries to adopt explicit deposit insurance without first stopping to assess and remedy weaknesses in their informational and supervisory environments.

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During the last two decades, waves of systemic banking crises have affected most of the countries around the globe. The waves have struck developed and developing countries alike, resulting in 112 episodes of systemic crisis in 93 countries and 51 episodes of borderline crisis in 46 countries (Caprio and Klingebiel, 1999).

Large-scale banking crises are costly and disruptive. Using increases in the stock of public debt to GDP in the crisis year as a measure, total fiscal costs incurred in the 1997 Thai and Korean banking crises exceeded 30 percent of GDP, and in Indonesia budgetary costs for the banking crises approached 50 percent of GDP (World Bank, 2001).

But the full costs of these crises go beyond direct fiscal costs. Depositors lose access to their funds, even good borrowers can lose access to credit and be forced into bankruptcy, and some sound banks may be driven out of business. When a crisis spreads beyond the banking sector, it triggers a full-fledged financial crisis. Would-be issuers of debt and equity instruments find that financial markets have dried up. The most recent example of this occurred in Turkey where weaknesses in the banking system triggered a crisis of confidence in other domestic financial institutions and led to a large-scale flight of foreign capital and a severe currency crisis. Additional consequences of a severe banking crisis can include derailed macroeconomic stabilization programs, growth slowdowns and increased poverty.

In every country, policymakers erect a financial safety net to make systemic banking breakdowns less likely and to limit the disruption and fiscal costs generated when they occur. This safety net includes implicit and explicit deposit insurance, lender-of-last-resort facilities at the central bank, procedures for investigating and resolving bank insolvencies, strategies for regulating and

supervising banks, and provisions for accessing emergency assistance from multinational institutions such as the IMF.

Explicit deposit insurance has spread rapidly in recent years; indeed, the number of countries offering explicit deposit insurance guarantees has almost tripled during the last quarter-century, rising from 12 in 1974 to 71 in 1999. Establishing explicit deposit insurance has become a principal feature of policy advice on financial architecture that outside experts give to developing countries (Folkerts-Landau and Lindgren, 1997; Garcia, 1999). In 1994, deposit insurance was incorporated into the newly created single banking market of the European Union. Today, most OECD countries and an increasing number of developing countries feature some form of explicit depositor protection.

It is not hard to see why explicit deposit insurance schemes appeal to policymakers. In the short run, since no immediate budgetary expenditure needs to be booked, they represent a seemingly costless approach to reducing the risk of bank runs or panics. Besides stabilizing the financial sector, an insurance scheme may promote other political values, such as protecting small depositors and improving opportunities for small banks to compete with larger institutions for deposits by alleviating potential concern about the fragility of small banks.

However, because deposit insurance reduces the incentive of depositors to monitor banks, it can also encourage excessive risk-taking. Banks can offer high interest rates to depositors, and then try to earn the money to pay those high interest rates by making high-risk loans. In this manner, both banks and depositors can engage in imprudent banking practices, secure in the knowledge that if the high-risk loans do not pay off, their principal is protected by deposit insurance. This pattern is an example of moral hazard: those who are sheltered by insurance from the negative consequences of risks have an incentive to take greater risks. This insight has been persistently emphasized by academics, but mostly

dismissed or denigrated by policymakers. However, perhaps one of the most persuasive arguments in favor of establishing explicit deposit insurance is that many governments already provide implicit deposit insurance, since depositors may expect to exert enough political pressure to force taxpayers to supply unlimited deposit guarantees in the case of bank failures. In this case, shifting from implicit to explicit deposit insurance, with explicit limits on coverage, may be a way to limit the government's commitment to depositors.

The United States was the first country to introduce a national deposit insurance system. After decades of debate and largely adverse experience with moral hazard in state-level schemes, federal deposit insurance was enacted in 1933, in the midst of a banking crisis. Its goal was more to restore confidence in the liquidity of bank deposits than to protect small depositors (Golembe, 1960). For the first four decades after the establishment of deposit insurance in the 1930s, the absence of failures among large institutions fostered an illusion that deposit insurance is a low cost way of preventing banking crises. But the ripening of the savings and loan mess in the 1980s dispelled this illusion, revealing how substantially deposit insurance had exposed taxpayers to loss from risk-taking at insured institutions (Kane, 1989). The waves of banking crises around the globe in the last two decades, many of which involved taxpayers becoming responsible for bad loans through explicit or implicit deposit insurance, have driven home the potential dangers of deposit insurance with sledgehammer force.

The key insight of this paper is that whether to adopt an explicit deposit insurance system and how to design it depends on the financial and supervisory environment in which it must function. Modern theorists view deposit insurance design as a multiparty principal-agent contracting problem that includes banks, depositors, supervisors, politicians, and taxpayers (Kane, 1995; Calomiris, 1996). If bank supervisors perform well, then banks will be shut down before substantial losses can

accumulate. In this case, depositors can be reimbursed out of the deposit insurance fund paid for by insurance premiums from the banks, and taxpayers will not need to bear losses.¹ But if bank supervisors perform poorly, then deposit insurance can impose huge costs, both on taxpayers and in terms of extreme financial and economic disruption from a banking crisis. Deposit insurance should be evaluated in a broader institutional context. But all too often, the experts who recommend deposit insurance either assume countries have an appropriate institutional infrastructure or ignore the impact of imperfections in their contracting environments. Many of the countries that have recently adopted deposit insurance may be risking severe consequences.

How important is a country's institutional environment in determining the impact of deposit insurance? Empirical guidance from cross-country experience should help to answer these questions, but until recently, such a database did not exist. However, a recent World Bank research project developed such a database for researchers worldwide.²

This paper challenges the wisdom of encouraging countries to adopt deposit insurance without first remedying observable weaknesses in their institutional environment. We buttress this challenge by reviewing cross-country empirical evidence on deposit insurance and bank regulation, addressing questions about how explicit deposit insurance affects financial stability, how markets discipline risk-taking by banks, and how a financial system can develop safely and productively.

A Portrait of Deposit Insurance Around the World

The design of deposit insurance schemes varies substantially across countries.³ The high degree of variation suggests that an optimal worldwide blueprint is not likely to be found. But precisely

because the range of design features is so extensive, the data set can permit analysts to compare and contrast how well different features work in different circumstances.

Figure 1 shows the how the number of countries with explicit deposit insurance has expanded over time. The 1990s saw a rapid spread in the transitional countries of central and Eastern Europe -- perhaps partly motivated by their long-term interest in joining the European Union - and in some African countries (Table 1). A number of countries adopted or expanded their deposit insurance scheme during crises; for example, Thailand, Malaysia, and Korea all created such programs between 1996 and 1998. Countries that adopted deposit insurance in 1999 are Ecuador, El Salvador, and as part of the Central African Currency Union, Cameroon, Central African Republic, Chad, Equatorial Guinea, Gabon, and Republic of Congo.

One key feature of deposit insurance is its coverage limits, which refers to how large the deposits are that are guaranteed by the program. As can be seen in Table 2, account coverage varies from unlimited guarantees to tight coverage limits. On one end of the spectrum, Columbia, Ecuador, Indonesia, Japan, Korea, Malaysia, Mexico, Thailand and Turkey promise 100 percent depositor coverage. One way to standardize the coverage ratio across countries is to divide the amount by per capita GDP. By this measure, many high-income countries fall at the other end of the spectrum, extending deposit insurance only to amounts that are equal to or less than their per capita GDP. Examples are Austria, Belgium, Denmark, Finland, Germany, Netherlands, Portugal, Spain, Sweden, Switzerland, and United Kingdom. Some developing countries such as Chile, Gabon and Lebanon also follow this example. Compared to the relatively modest protection in high-income countries, some of the poorest countries offer very generous protection going well beyond the scale of the deposits owned by the poor. For example, Cameroon, Central African Republic, Chad, Oman, Peru, which are

countries that have established deposit insurance in recent years, have coverage ratios that exceed 8. However, the very low level of average income in countries like Chad needs to be kept in mind to put their coverage in perspective.

Besides setting a maximum level of coverage, some countries insist that accountholders "coinsure" a proportion of their deposit balances. Coinsurance means that depositors are contractually required to bear a share of their bank's accrued losses when their bank fails. One common form of coinsurance is for the insurer to cover a fixed fraction of the deposited amount. Coinsurance provisions are still relatively rare. In the World Bank database, only 17 of the 71 countries with explicit deposit insurance have coinsurance. However, coinsurance has become more frequent in recently adopted deposit insurance schemes. For example, 13 of the 17 countries with coinsurance provisions have either adopted deposit insurance for the first time or substantially revised their systems since 1995, including Austria, Estonia, Germany, Gibraltar, Iceland, Ireland, Lithuania, Macedonia, Oman, Poland, Portugal, United Kingdom.

Another way to limit coverage is to categorically exclude particular kinds of accounts or accountholders. Although many countries cover deposits denominated in foreign currency; most deposit insurance schemes exclude interbank deposits.

Deposit insurance obligations are typically advance-funded, most commonly from a mixture of government and bank sources. To allow the insurer to build and maintain an appropriate fund of reserves against its loss exposures, in such countries banks are generally assessed an annual premium that is based entirely or in large part on the amount of their insured deposits. The typical practice in most countries is to cover current expenses and build up a permanent fund out of which losses can be paid. However, a healthy if small minority of countries run their deposit insurance systems without a

permanent fund. Examples include Austria, Chile, France, Italy, Netherlands, Switzerland and the United Kingdom.

The funding of deposit insurance programs can come from official sources, private sources, or a combination of the two. By far the most common pattern is to combine private and government sources. For example, the United States has a jointly-funded scheme because the government provided the initial capital, absorbed the losses of the defunct federal Savings and Loan Insurance Corporation, and may lend to the insurance agencies in crisis situations. The only country in the world which funds its deposit insurance completely from official sources is Chile.

Private sources of funding typically take the form of premiums paid by banks. The typical premium lies in the range of .1 to .5 percent of the insured deposits. However, in a few countries where the level of financial risk is high (e.g., in Lithuania and Macedonia), deposit insurance premiums exceed 1 percent of the insured deposits.

In recent years there have been efforts to make these deposit insurance premiums sensitive to the risk exposure of the bank. Indeed, 21 countries now use some form of risk-based deposit insurance premium, including Argentina, Bulgaria, Italy, Hungary, Nigeria, Peru, Sweden, Turkey, and the United States. A typical mechanism countries use to determine risk-based deposit insurance premiums is to impose an additional insurance charge which is determined as a percentage of the bank's non-performing loans.

The administration of a deposit insurance scheme can be official, private, or joint. The most common pattern is official administration. This pattern is found in 33 of the 68 countries for which the World Bank database provides organizational details. However, in 24 other countries administration is shared jointly between the official and private sector, including Denmark, Greece, Hungary, Japan, Peru

and Spain. In another 11 countries, deposit insurance was run privately. These countries include Argentina, Austria, Brazil, France, Germany, Norway, Switzerland, and United Kingdom.

Finally, in almost all countries, membership in the deposit insurance program is compulsory for chartered banks. The most notable country in which banks need not participate in deposit insurance is Switzerland.

Deposit Insurance Design: Transparency, Deterrence, Accountability

Deposit insurance is spreading rapidly around the world, especially in developing countries. The primary desired benefit of establishing a deposit insurance scheme is to reduce or eliminate the threat of sudden financial panic. A number of secondary advantages are related to this primary goal. Authorities may hope that explicit deposit insurance can cap the government's future commitments to depositors of insolvent institutions, rather than leaving an open-ended implicit possibility that the government might decide to bail out all depositors. Offering deposit insurance may allow a government to negotiate increased rights to intervene in a timely fashion into the affairs of insolvent institutions. Other secondary benefits include protecting unsophisticated small depositors and helping small banks to compete with large ones.

The most obvious direct costs of deposit insurance are the budgetary costs of running an insurance enterprise, but these costs are relatively unimportant compared to the potential indirect costs. The major indirect cost of deposit insurance comes from its potential to subsidize inefficient types of bank risk-taking. Deposit insurance undermines the incentives of depositors to monitor and police bank risk-taking. This is the problem of moral hazard: when insurance exists against negative outcomes,

parties will take more risk. To control the exposure of taxpayers to moral hazard, the insurer must involve itself (or surrogate parties) in monitoring and disciplining banks.

The balance of benefits and costs engendered by individual deposit insurance will vary with the ability of the insurer to reduce the chance of risk-taking, and how the actions of the insurer interacts with the informational and contracting environments of individual countries.

Controlling bank risk-taking requires three characteristics: transparency deterency, and accountability (Kane, 2000). Complete transparency is obtained when institutions disclose information that perfectly and costlessly informs either bank creditors or supervisors about changes in a bank's financial condition and risk-taking. Perfect deterency describes a situation where individual creditors or supervisors can immediately understand the implications of information flows and can protect themselves completely and costlessly from any adverse consequences. Perfect accountability occurs when taxpayers can identify the actions of government officials and hold them fully responsible for the outcomes their actions engender.

While perfect transparency, deterency and accountability are of course unlikely, each country's institutional environment can perform better or worse along these dimensions. High readings on these dimensions assure that parties in the private and public sectors can be expected to enforce appropriate bank behavior by evaluating bank activities, disciplining their risk-taking, and resolving their financial difficulties promptly. Around the globe, large differences exist in each of these contracting features. Across countries and cultures, proxies for transparency, deterency and accountability tend to increase with per capita GDP (Kane, 2000) -- but other elements of social capital play a role as well.

Deposit insurance arrangements -- and other elements of the regulatory safety net -- must address the weaknesses that exist in the institutional environment of individual countries. In broad

terms, institutional environments for financial markets are fairly similar in high-income countries of the world. But as per capita income falls, the contracting environments tend to become more diverse. This diversity of institutional circumstances suggests that any proposed combination of "best-practice" design features for deposit insurance may generate counterproductive consequences in more than a few developing countries. Indeed, for countries in which transparency, deterrence and accountability are very weak, implementing an efficient explicit deposit insurance scheme may simply be impossible.

Every country's deposit-insurance system has three dimensions: the extent to which the system relies on private management and/or private funding; the breadth of its formal and informal coverages; and its susceptibility to hidden risk-shifting by insolvent banks. In moving to a system of explicit deposit insurance guarantees, conscientious government officials must adopt coverage, funding, and managerial structures that mitigate the particular weaknesses in transparency, deterrence, and accountability that left their country vulnerable to financial crises in the past.

For example, in environments that combine low transparency with low deterrence, it has made sense to require bank stockholders' personal assets, as well as large depositors and substantial nondeposit creditors, to coinsure other stakeholders' losses (Kane and Wilson, 2001). If these parties not only risk losing their own funds, but also being forced to cover other losses of the bank, they will be more likely to demand transparency, and to intervene when necessary. In low-accountability environments, deposit-insurance managers need contractual incentives to optimize the degree of transparency and deterrence that they, minority shareholders, and coinsuring depositors receive. In environments that are low in accountability and transparency, private participation in funding and management can help to create the incentives needed to discipline safety-net loss exposures. To the extent that insurer performance can be measured meaningfully, it can be useful to establish a fund of

deferred compensation for top managers with the payoffs tied to appropriate measures of deposit-insurance performance during their particular term in office.

As transparency, deterrence, and accountability evolve through time, so should the design features of a country's safety net. The system must respond to fluctuations in private and government regulators' capacity for valuing institutions, for disciplining risk-taking and resolving insolvencies promptly, and for being appropriately rewarded or chastised for how well they perform these tasks.

Finally, it is important to make the decisions about deposit insurance before a banking crisis happens, because installing a deposit insurance system as a way of dealing with a banking crisis can be very risky (Kane, 2000). In managing a crisis, the urgency of stopping a panic must not override the need to identify hopelessly insolvent institutions and cut off their opportunities to expand their risk-taking. To end a panic efficiently, liquidity must be offered only to potentially solvent institutions. Indiscriminately issuing government guarantees and other forms of bailout support rewards bad bankers and penalizes good ones. Such a policy perverts market discipline and risk-taking incentives, imposes unbooked obligations on the national treasury, and promises new and deeper crises in years to come.

Deposit Insurance: Theory and Empirical Evidence

An extensive theoretical literature analyzes the benefits and costs of deposit insurance and explores the challenge of balancing these benefits and costs to produce an optimal deposit-insurance system. This literature has been summarized by Kane (2000, 1995), Calomiris (1996), and others. However, cross-country empirical evidence on the efficiency of real-world deposit-insurance systems

has been harder to come by.

In this section, we pose four empirical questions whose answers indicate how effective an individual country's deposit-insurance system happens to be, relating deposit insurance to issues of bank stability, market discipline, financial development, and managing crises. For each question we identify pertinent literature and review empirical evidence on how the answer varies across different countries and contracting environments.

How Does Explicit Deposit Insurance Affect Bank Stability?

Economic theory offers a mixed message about the consequences of deposit insurance. On the one hand, credible deposit insurance contributes to financial stability by making depositor runs less likely. On the other hand, unless capital positions and risk-taking of insured institutions are supervised carefully, deposit insurance may lead to excess risk-taking and undermine bank stability in the long run. Because deposit-insurance theory embraces good and bad outcomes, it is critical to explore empirical evidence.

Demirgüç-Kunt and Detragiache (forthcoming) are the first to use the World Bank's new cross-country database to study the link between deposit insurance and financial crises. They use data from 61 countries for the period 1980-1997 to estimate a model of banking crisis. Their model uses a binary dependent variable which takes the value one if there is a systemic banking crisis and zero otherwise. They use a variety of measures of different aspects of deposit insurance for independent variables. Their analysis also includes a number of control variables for economic conditions: growth, change in terms of trade, real interest rates, inflation, money supply to foreign exchange reserves, depreciation, past

credit growth, and GDP per capita.⁴

Table 3 reports results for several specifications of the model, showing only the influence of deposit insurance variables. In the first column, the deposit insurance variable is a simple dummy, taking the value one if the country has an explicit scheme. The coefficient is positive, indicating that explicit insurance makes banking crises more likely, but it is barely significant at 10 percent. The results become much stronger when design features are taken into account. In the second column, the variable is the explicit coverage limit defined as the coverage limit divided by bank deposits per capita in the previous period. This coefficient is positive and very significant, indicating that schemes with expanded coverage have a greater probability of crisis, a finding that is consistent with moral hazard concerns. The estimated effect on fragility of a change in coverage is not trivial. The results indicate that the countries with highest coverage limits in the sample (limits that are more than four times per capita GDP) are five times more fragile than the countries that impose the lowest coverage limits (less than per capita GDP).

The third column uses a dummy variable of zero if deposit insurance is only implicit, 1 if there is explicit deposit insurance but no insurance fund, and 2 if there is a fund. The positive and significant coefficient suggests that when authorities amass a fund of explicit reserves and earmark it for insolvency resolution, insolvencies tend to occur. The fourth column focuses on management of the fund and uses dummy variables for whether management is official, joint, or private. It appears that where the scheme is administered by government officials rather than jointly or in the private sector, banking crises are more likely.

Instead of looking at different deposit insurance design features in isolation, the final column uses a moral hazard index, which is an aggregate index built up from a variety of design features using

principal components analysis. The features included are indicators for lack of coinsurance, scope and level of coverage, type and source of funding, official management and voluntary membership. The index is constructed so that higher values mean a greater opportunity for moral hazard and therefore systems which incorporate more of the features associated with moral hazard (i.e., higher values of the index) are expected to be more vulnerable to banking crises. Indeed, the results indicate that the index is positively correlated with the likelihood of banking crises.

Overall, Demirgüç-Kunt and Detragiache (forthcoming) find that explicit deposit insurance, particularly if its design embodies features intensify moral hazard, can increase the likelihood that a country will experience a banking crisis. They also test to see if the moral hazard introduced by deposit insurance is mitigated if the country has a strong institutional environment, using indicators such as bureaucratic quality, bureaucratic delay, lack of corruption, the quality of contract enforcement and legal efficiency. When they introduce additional regressors that interact these institutional proxies – each of which increases with the quality of institutions – with deposit insurance variables, they find the influence of deposit insurance variables to be positive and significant as before, but the interactions are negative and significant. These results imply that the contribution of deposit insurance to bank fragility is significant in poor institutional settings, but that this effect is offset in countries whose environment is strong. Thus, where the contracting environment controls incentive conflict, effective prudential regulation and supervision can offset the adverse incentives created by deposit insurance so that moral hazard need not be worrisome. Another important implication of this study is that there is no evidence that explicit systems truly “cap” implicit guarantees and reduce moral hazard. If this were the case, we would expect to see a negative and significant coefficient for the deposit insurance dummy.

Finally, these findings do not appear to be driven by reverse causality. The countries that

introduce deposit insurance as a result of a crisis do not drive these results, because observations for the crisis period are dropped from the sample. Nevertheless, the authors go on to estimate a two-stage model where they first estimate the probability of adopting explicit deposit insurance and employ this estimated variable in a second-stage crisis equation. The first-stage results indicate that countries in the sample decide to adopt deposit insurance because other countries adopt it, as it becomes perceived to be a best practice.⁵ In the second-stage, the deposit insurance variables become even more significant, indicating that allowing for potential endogeneity does not alter the inferences to be drawn.

The Demirgüç-Kunt and Detragiache (forthcoming) study has spurred additional work in this area. For example, Eichengreen and Arteta (2000) find that if developed countries are omitted from the sample, the simple deposit insurance dummy loses its statistical significance. This finding is consistent with the results shown in Table 3 and further clarifies how important it is to account for the influence of weak deposit insurance design features.

Demirgüç-Kunt and Detragiache (2000) recognize that they control imperfectly for other components of a nation's financial safety net, particularly for variation in the quality of regulatory and supervisory enforcement. Barth, Caprio and Levine (2001) construct a cross-country database that measures variation in systems for regulating and supervising commercial banks. Using this database to control for variation in the character of government oversight, they confirm the Demirgüç-Kunt and Detragiache findings.

Policymakers should view the positive correlation between poorly-designed deposit insurance and banking crises as a wakeup call. Deposit insurance will, by its nature, tend to reduce monitoring of banks by private parties. The issue is how well the reduction in private monitoring is replaced by official regulatory and supervisory discipline. The next section turns to the issue of how deposit insurance

affects market discipline.

How Does Deposit Insurance Affect Market Discipline?

In high-transparency financial environments, depositors can discipline banks that engage in excessive risk-taking by demanding higher deposit interest rates or by withdrawing their deposits. However, to the extent that deposit insurance reduces the stake that depositors have in monitoring and policing bank capital and loss exposures, it shifts responsibility for controlling bank risk-taking to the regulatory system. Wherever deposit-insurance managers displace more discipline than they exert, bank performance is undermined. To explore how deposit insurance affects market discipline, we look at the manner in which depositors exert market discipline – i.e., by demanding higher interest rates or by withdrawing deposits- and how deposit insurance lessens these disciplinary activities.

Evidence of market discipline is reflected in bank interest costs to the extent that riskier banks need to pay higher interest rates to attract depositors. Most of this evidence comes from U.S. experience. Flannery (1998) surveys research on how the interest cost of uninsured bank deposits and other debt instruments in the United States responds to observable measures of default risk. In the United States, balances in excess of \$100,000 are not insured. Typically, researchers find that interest rates paid on partially insured instruments, such as certificates of deposits (CDs) increase significantly with bank riskiness (Baer and Brewer, 1986; Hannan and Hanweck, 1988; Brewer and Mondschean, 1994). Linking movements in CD rates to bank-specific news embedded in movements in stock prices, Ellis and Flannery (1992) show that bank CD rates respond to market perceptions of bank-specific risks.

Moving beyond depositor reactions, Flannery and Sorescu (1996) study market yield spreads

between uninsured bank debentures (bonds issued by banks that are backed only by the general credit of the bank rather than by specific assets) and callable Treasury bonds (bonds that the U.S. Treasury may pay off in advance if interest rates fall). These spreads showed significant sensitivity to bank risk during the years 1989-1991 when the savings and loan mess was being cleaned up and concern had arisen as to whether the mess would spill over into the banking industry, too. Conversely, in studying the interest rates paid on bank derivatives in the less stressful years of 1983-1984, Avery, Belton and Goldberg (1988) and Gorton and Santomero (1990) failed to uncover any risk sensitivity. Apparently, market discipline on deposit interest rate intensifies when doubts arise about the insurer's ability to cover its guarantees. Such doubts are endemic to developing countries and can accelerate quickly (Mishkin, 1996).

Evidence on whether the deposit growth of banks is retarded by higher risk premiums is available from a wide spectrum of countries and time periods. Gorton and Pennacchi (1990) explain why we should expect deposit growth to slow at a troubled institution. Statistical analysis uncovers similar patterns around the world. Martinez-Peria and Schmukler (1998) find that deposits at banks in Argentina, Chile and Mexico respond negatively to risk measures generated from accounting data. They also show that in Chile, where deposit insurance appeared most credible, uninsured depositors acted as effective monitors of bank risk.

Examining a sample of New York City banks in the 1920s and 1930s, Calomiris and Wilson (1998) show that depositors successfully discriminated among banks on the basis of their riskiness and tended to shift funds to safer havens. Similarly, Kane (1987) reports that when the Ohio Deposit Guarantee Fund lapsed into crisis in 1985, Ohio depositors removed funds only from state-insured institutions. Park (1995) and Park and Peristiani (1998) show that, during the 1980s, deposit growth

at individual U.S. thrifts was negatively related to their estimated probability of default, so that riskier institutions experienced slower deposit growth.

Demirgüç-Kunt and Huizinga (2000) examine the disciplinary role of interest rates and deposit growth in a bank-level dataset covering 43 countries over 1990-1997. They show that explicit insurance lowers banks' interest expense and renders this expense less sensitive to bank risk and liquidity. However, regardless of the character of a country's safety net, some market discipline survives. Interest rate and deposit growth respond qualitatively to gaps in coverage, weaknesses in the credibility of the guarantees, and delays and other costs entailed in recovering funds from the guarantor.

The design characteristics of deposit insurance affect the extent of market discipline. Demirgüç-Kunt and Huizinga (2000) find that market discipline is stronger in countries with higher levels of institutional development, as measured by indicators such as bureaucratic quality, bureaucratic delay, lack of corruption, the quality of contract enforcement and legal efficiency. However, they also find that even in countries whose institutional development is strong, market discipline can be curtailed by deposit insurance schemes that set high coverage limits, extend coverage to interbank deposits, establish a standing fund of reserves, fund reserves from government sources, and operate with purely public management. On the other hand, market discipline can be enhanced by such features as coinsurance provisions, covering foreign currency deposits, and establishing private or joint management of the insurance enterprise.

The value that deposit insurance offers banks and their creditors can be measured by estimating the extent to which it reduces required interest rates. Society pays for increases in the perceived safety of deposits by accepting both the administrative costs of supervising banks and the consequences of

any net reduction in discipline. "Correct" pricing would align deposit insurance premiums with the level of risk taken at each bank so as to eliminate risk shifting, but setting such a price schedule would be politically and administratively difficult, especially in a developing country.

One way of determining the correct price would be to estimate the value of subsidy that each bank receives. Using Ronn and Verma's (1986) option pricing approach, Laeven (2001) extracts an estimate of the annual implicit subsidy a bank receives from data on its stock price. Combining deposit insurance data and bank-level information for 14 countries, he finds that the subsidies banks receive are higher in countries that explicitly insure deposits. Laeven also finds that while explicit deposit insurance increases subsidies, the presence of a strong regulatory environment reduces this adverse effect. Laeven shows that German banks in particular take very low risks and accrue the smallest gross subsidies from deposit insurance. This supports the findings of Beck's (2001) case study of German deposit insurance. Beck finds that private management, mutual liability and an anti-bankruptcy bias curb risk-taking incentives at German banks.⁶ Existence of a very concentrated banking system and strong institutional environment are also important characteristics of the German system.

These studies indicate that deposit insurance displaces market discipline everywhere, even in advanced countries. However, in countries with a sound regulatory structure the loss of market discipline may be more than offset by strong regulation and supervision. Countries with poor contracting environments are likely to suffer adverse consequences from deposit insurance.

Some argue that in institutionally underdeveloped countries, explicit deposit insurance may have ancillary advantages that offset its negative effects on market discipline and systemic stability. For example, Folkerts-Landau and Lindgren (1998) maintain that a substantial benefit of deposit insurance is to provide a risk-free asset to small savers. Critics of this view point out that this benefit may be

obtained at lower cost—i.e., without increasing the risk of financial destabilization –either by enabling small savers to purchase government-guaranteed assets, such as "postal savings" or money-market funds backed by government debt (Calomiris, 1990; Stiglitz, 1992), or by insisting that banks issuing insured deposits be constrained to be "narrow banks" empowered to invest only in safe assets. A second view posits evolutionary benefits, maintaining that in countries with underdeveloped institutions, deposit insurance can act as a launching pad for improving the banking system, allowing it to perform financial intermediation more efficiently. The next section shows that this view is not supported by empirical evidence about the influence of deposit insurance on financial evolution.

How Does Deposit Insurance Impact Financial Development?

Countries adopt deposit insurance for different reasons. However, a common reason is to increase the flow of bank credit by increasing the confidence that the general public has in the formal banking system without having to raise or expend current fiscal resources. To the extent that deposit insurance bolsters depositors' faith in the stability of the banking system, it may mobilize household savings for use by the financial system. The question is whether or not the funds mobilized go on to support improved patterns of real investment and sustainably higher rates of aggregate economic growth.

Recent adopters of deposit insurance have included African and Latin American countries with low levels of financial development. To investigate whether and how explicit deposit insurance contributes to financial development, Cull, Senbet and Sorge (2001) examine time-series data for 58 countries. These authors find that explicit deposit insurance favorably impacts the level of financial activity and its volatility only in the presence of strong institutional development. If deposit-insurance

arrangements do not include a regulatory scheme that can overcome weaknesses in the institutional environment, instability is fostered and subsequent financial development is harmed. In another analysis, examining a cross section of 49 countries, Cecchetti and Krause (2000) show that deposit insurance retards the evolution of nonbank financing mechanisms. Countries with more extensive deposit insurance for banks tend to have smaller capital and financial markets and a lower number of publicly traded firms per capita.

Thus, in institutionally weak environments, deposit insurance appears to retard financial development rather than to foster it. This finding should serve as a caution flag for any official who is being urged to adopt deposit insurance in the hope of speeding institutional evolution. The first step should be to conduct an audit of the degree of transparency, deterrence, and accountability present in their institutional framework. Good safety-net design must adapt to these variables and does not consist of merely copying selected elements of successful schemes in developed countries.

What Role Does Deposit Insurance Play in Managing Crises?

It is common practice to issue blanket deposit insurance guarantees to arrest a banking crisis. Countries recently adopting this strategy include Sweden (1992), Japan (1996), Thailand (1997), Korea (1997), Malaysia (1998), and Indonesia (1998). More recently, Turkey tried to halt its financial panic by guaranteeing not just bank depositors, but all domestic and foreign nondeposit creditors of Turkish banks.

Advocates of using blanket guarantees to halt a systemic crisis argue that sweeping guarantees can be helpful, even essential, in stopping the flight of depositors to less risky assets. This is of course true if the crisis entails a series of self-fulfilling depositor runs, as envisioned in Diamond and Dybvig

(1983). However, most bank runs are driven instead by fundamental weaknesses in economic balance sheets. In this case, it must be recognized that the putative short-term benefits of guarantees will vary with the fiscal strength of the guaranteeing government. To hasten the end of an insolvency-driven banking crisis and to constrain the spread of insolvency in the short term, the government must manifest a substantial loss-absorption capacity.

It is clear that a policy of credibly extending blanket guarantees can stop depositor runs during a banking crisis. What is seldom clear is whether in the midst of a crisis governments in developing countries can extend such guarantees in a credible manner. Depending on the depth of the systemic insolvency, the fiscal cost of making good on blanket guarantees may be enormous. The unbooked future spending and unbooked debt guarantees generate subtly undermine the country's foreign-exchange reserves. In countries whose fiscal capacity is weak, financially sophisticated parties may shrug off the government's promises and continue to move wealth offshore. In this case, blanket deposit insurance guarantees cannot work even in the short run.

Honohan and Klingebiel (2000) analyze the impact that blanket deposit insurance guarantees and other crisis-management strategies have on the ultimate fiscal cost of resolving banking-system distress. Data covering 40 crises around the world indicate that unlimited depositor guarantees, open-ended liquidity support, and regulatory forbearance significantly increase the ultimate fiscal cost of resolving a banking crisis. Moreover, these authors find no trade-off between fiscal costs and the speed of economic recovery; that is, a bailout that costs more does not bring a faster recovery. In their sample, depositor guarantees and regulatory forbearance fail to significantly reduce either crisis duration or the crisis-induced decline in aggregate real output. Providing liquidity support for insolvent institutions appears to prolong a crisis by destabilizing bank-lending incentives so extensively that

healthy adjustments are delayed and additional output loss is generated.

An additional problem is that blanket guarantees create an expectation of their repeated use in similar future circumstances. This expectation threatens to undermine market discipline in the long run and to destabilize the financial system over longer periods. Advocates of blanket guarantees must concede that after a crisis has receded, it is difficult to scale back informal coverage in a credible manner. Indeed, the widespread broadening of deposit insurance guarantees during a banking crisis -- and the fact that this remedy is enthusiastically approved by foreign and multinational institutions -- means that every country promises a degree of implicit deposit insurance, whether or not it has formally pledged its backing. This makes it difficult and disruptive to convincingly roll back formal deposit insurance coverages after the banking crisis has passed.

Even in the midst of a crisis, it is inefficient to completely set aside long-term goals to resolve immediate pressures. Efficient crisis management begins with triage. Hopelessly insolvent institutions must be identified and their risk-taking brought under control. Providing open-ended liquidity support to moribund institutions and extending blanket guarantees to their creditors is apt to spawn new and more-virulent crises down the line. Even when conceived entirely as a temporary emergency measure, blanket deposit-insurance guarantees engender high fiscal costs. Incurring these costs is unlikely to speed the recovery of the real economy from banking crisis or to lessen the nation's loss of aggregate output.

Conclusions and Implications

The empirical research discussed here indicates that officials in many countries should close

their ears to the siren call of explicit deposit insurance. In institutionally weak environments, it is hard to design deposit-insurance arrangements that will not increase the probability and depth of future banking crises. Although government officials might reasonably believe that deposit insurance helps to develop a robust financial system, they must understand that deposit insurance can do this only in an economy whose contracting environment offers reliable institutions of loss control. For countries with weak institutions, adopting explicit deposit insurance promises to spur financial development only in the very short run, if at all. Over longer periods, it is more likely to undermine market discipline in ways that reduce bank solvency, destroy real economic capital, increase financial fragility and deter financial development. This policy advice is disturbing because many of the countries recently adopting explicit deposit insurance are known to have poor contracting environments.

For countries that have installed or are in the process of adopting explicit deposit-insurance schemes, cross-country empirical research offers lessons about program design. Even in favorable circumstances, deposit insurance impacts financial fragility by reducing the degree of private market discipline that banks experience. Appropriate design features must be included to control and offset these effects.

A first step in the design of deposit insurance is to set enforceable coverage limits to ensure that large depositors, subordinated debtholders, and other banks understand that their funds are truly and inescapably at risk. Exposure to loss carries an incentive to monitor and police the risk-taking behavior of banks and their government financial regulators. It seems particularly appropriate to avoid insuring interbank deposits -- since such coverage would discourage banks from monitoring one another. Providing strong incentives for private parties to remain vigilant is critically important in weak contracting environments where private monitoring must overcome weaknesses in official supervision.

Coinsurance and related private loss-sharing arrangements such as subordinated debt and extended stockholder liability sharpen these incentives.

Requiring compulsory membership in the deposit insurance system for financial institutions increases the size of the insurance pool and prevents low-risk institutions from selecting out of the system. This too encourages solvent and well-managed banks to help officials to monitor and police high-flying institutions.

These two features illustrate a recurring theme: that, especially in weak contracting environments, it is vital for insurers to assign private parties a substantial role in loss control. This principle extends even to the identity of deposit-insurance managers. Empirical evidence indicates that deposit insurance schemes that involve the private sector in their day-to-day management more effectively control moral hazard and financial fragility. This argues for a tiered private and government management scheme. Having both sectors responsible for overseeing the effects of the scheme offers checks and balances that improve management performance.

Finally, although it may seem counterintuitive, the cross-country evidence indicates that countries establishing deposit insurance do better with a small pool of explicit liquid reserves than with a large one. In weak institutional environments, a large fund appears to intensify moral hazard by leading depositors and other counterparties to respond too weakly to accumulating evidence of individual bank insolvencies. As a result, whatever the level of prefunding, it seldom turns out to be large enough to absorb the unrecorded costs that weak and insolvent clients succeed in shifting onto these reserves before their insolvencies are addressed. The danger that a small pool of reserves poses is that the lack of liquid resources might delay authorities from dealing with insolvent institutions in a timely manner. But liquidity can be assured in other ways. The liquidity of an unfunded deposit-

insurance enterprise can derive instead from an unfettered line of credit with the national treasury, from reinsurance contracts written with reliable outside insurers, and from the power to collect special assessments from its client base.

Whether or not substantial reserves are held, it must be made clear that funds that ultimately cover bank losses will come principally from surviving banks. Taxpayer assistance should be expected only in the special case of a verifiable systemic crisis. Convincing the banking industry that it cannot routinely dump insurance losses on taxpayers will encourage healthy banks to support high-quality regulation and to monitor other banks. Conversely, to the extent that emergency funding is expected to be provided from government revenues, market discipline is compromised and financial fragility increased.

Depending on its design, deposit insurance is neither always good nor always bad. It can be a useful part of a country's overall system of bank regulation and financial markets. The research summarized here by no means implies that all countries with explicit systems should close them down at the first opportunity. Rather the research focuses attention on the need to identify and foster institutional prerequisites before adopting deposit insurance and to make a concerted effort to design and continually re-adapt the system appropriately. Like any strong medicine, users must ensure that the side effects of the prescription are not worse than the course of the disease they intend to treat.

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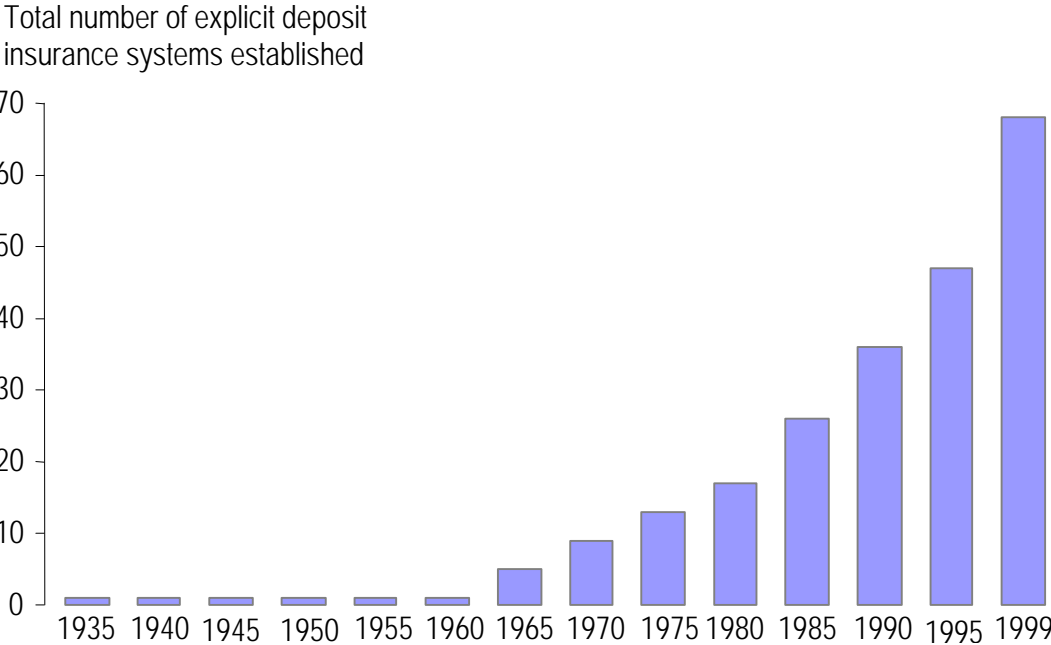
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Figure 1. The rise of deposit insurance around the world, 1934-99



Source: Demirgüç-Kunt and Sobaci (2001).

Table 1. Recent Establishment/Revision of Deposit Insurance Schemes

Year Adopted or Revised	Countries that have established an explicit scheme	Countries that have revised their existing scheme
1999	Cameroon, Central African Republic, Chad, Ecuador, El Salvador, Equatorial Guinea, Gabon, Republic of Congo	
1998	Estonia, Gibraltar, Indonesia*, Jamaica, Latvia, Malaysia*, Ukraine	Denmark, Finland, Germany
1997	Croatia, Thailand*	
1996	Korea, Lithuania, Macedonia, Romania, Slovak Republic, Sweden	Austria, Iceland, Italy, Spain
1995	Brazil, Bulgaria, Oman, Poland	Argentina, Belgium, France, Greece, Ireland, Netherlands, Portugal, United Kingdom

* Blanket coverage

Source: Demirgüç-Kunt and Sobaci (2001).

Table 2. Deposit Insurance Coverage Levels

Coverage Ratio (Coverage limit/GDP per capita)	
0-1	Austria, Bahrain, Belgium, Bulgaria, Chile, Denmark, Estonia, Finland, Gabon, Germany, Hungary, Iceland, Ireland, Latvia, Lebanon, Luxemburg, Macedonia, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, Ukraine, United Kingdom
2	Canada, Colombia, Czech Republic, El Salvador, Greece, Jamaica, Lithuania, Nigeria, Romania, Slovak Republic, Sri Lanka, Tanzania, Trinidad & Tobago, Venezuela
3-5	Argentina, Brazil, Croatia, Equatoria Guinea, France, Kenya, Philippines, Republic of Congo, Taiwán, United States
6-8	Bangladesh, Dominican Republic, India, Italy, Norway, Uganda
9-15	Cameroon, Oman, Peru, Central African Republic, Chad
Full	Colombia (until 2001 then 2), Ecuador (until 2001), Indonesia, Japan (until March 2001), Korea (until 2000), Malaysia, Mexico (until 2005), Thailand, Turkey

Source: Demirgüç-Kunt and Sobaci (2001).

Table 3. Deposit Insurance Design and Banking Crises

The dependent variable is a crisis dummy which takes the value one if there is a crisis and the value zero otherwise. A logit probability model is estimated. Variables are defined as follows: Deposit insurance dummy takes the value 1 if there is explicit insurance and 0 otherwise. Explicit coverage limit takes the value 0 if implicit insurance but equals coverage limit divided by deposits per capita lagged one period. Funding variable takes the value 0 if implicit insurance, 1 if explicit insurance with no fund, and 2 if explicit insurance with deposit insurance fund. Management variables take the value 1 if private, joint, or official management and zero otherwise, respectively. The moral hazard index is the first principal component of deposit insurance design features: coinsurance, coverage, scope of coverage, type of funding, source of funding, management, and membership. Each regression also includes the following control variables that are not reported below: growth, change in terms of trade, real interest rates, inflation, M2/reserves, depreciation, past credit growth, and gdp per capita. The regression omits the observations for the crisis period. % correct stands for the number of observations accurately classified as crisis or non-crisis observations given a cut-off criteria of crisis frequency in the sample. % crisis correct stands for the proportion of crisis observations that are accurately classified. Model Chi-square is a goodness-of-fit test, and the hypothesis tested is that all coefficients equal zero. Standard errors are given in parentheses. Source: Demirgüç-Kunt and Detragiache, forthcoming.

Deposit Insurance Dummy	.696*				
	(.397)				
Explicit Coverage Limit		.019***			
		(.006)			
Funding			.454**		
			(.203)		
Official Mgmt.				.800**	
				(.419)	
Joint Mgmt.				.617	
				(1.163)	
Private Mgmt.				.297	
				(.881)	
Moral Hazard Index					.161**
					(.074)
No. of Crises	40	34	40	39	40
No. of Obs.	898	827	898	869	898
% correct	74	78	75	75	78
% crisis correct	68	71	68	64	65
Model Chi Sq.	50.53**	47.03***	52.30***	50.32***	52.06***

*, ** and *** indicate significance at levels of 10, 5 and 1 percent respectively.

Endnotes

1. In the United States, for example, the Federal Deposit Insurance Corporation (FDIC) Improvement Act of 1991 imposes on U.S. bank regulators a duty to act promptly to resolve violations of capital standards. In 1993, Congress offered U.S. taxpayers additional protection by passing the Depositor Preference Act, which in future bank liquidations subordinates the claims of non-deposit creditors to those of the FDIC.
2. For a description of the research project, see Demirgüç-Kunt and Kane (1998). The data set and the papers of the research project are available on the project website:
<http://www.worldbank.org/research/interest/confs/upcoming/deposit_insurance/home.htm>.
3. This discussion builds on a complete database of the characteristics of deposit insurance around the world. See Demirgüç-Kunt and Sobaci (forthcoming) which builds on earlier studies by Kyei (1995) and Garcia (1999). The data set is available at
<http://www.worldbank.org/research/interest/confs/upcoming/deposit_insurance/home.htm>. The database includes information on 71 countries that have explicit deposit insurance, along with data on: when the program was enacted; whether it covers foreign currencies and interbank deposits; coverage limits; requirements for coinsurance; whether a permanent fund exists; how annual premiums are determined; whether the premiums are risk-adjusted; whether the funding and administration are public, private, or joint; and whether membership is compulsory.
4. The rate of growth of real GDP, the change in the terms of trade, and the rate of inflation capture macroeconomic developments that are likely to affect the quality of bank assets. Terms of trade changes are important determinants of general economic conditions in open economies and can be large for commodity exporters. Depreciations (which need not translate into equivalent terms of trade improvements) are also important since they affect bank balance sheets directly if there are open foreign currency positions, and indirectly through the exposures of bank customers. Vulnerability to sudden capital outflows is also measured by the ratio of M2 to foreign exchange reserves. High real interest rates hurt banks since they are accompanied by higher default rates. High rates of credit expansion may indicate an asset bubble. Finally, gdp per capita is a proxy for the quality of the institutional environment. For a discussion of these variables and their impact on crisis probabilities see Demirgüç-Kunt and Detragiache (forthcoming).
5. To capture this “fad” element in the deposit insurance adoption decision, Demirgüç-Kunt and Detragiache use the proportion of countries in the sample that has already adopted deposit insurance. They also include in the first stage all the exogenous variables from the crisis equation

and time dummies. The results show that only two variables develop significant coefficients: the “fad” variable and GDP/capita.

6. The first two factors can also explain the good performance of the U.S. scheme for insuring credit unions (Kane and Hendershott, 1996).