

DEPOSIT INSURANCE AND BANKING STABILITY

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Many financial systems were plagued by bank runs or subject to the risk of contagion when the recent financial tsunami unfolded. The runs on the U.S. banks Countrywide and IndyMac, Britain's Northern Rock, and Hong Kong's Bank of East Asia, among others, occurred about a few years ago, but they are still vivid to us. These runs were, of course, the symptoms rather than the root cause of the financial tsunami. In response to the most severe systemic global financial crisis since the Great Depression, policymakers and regulators in many countries have implemented various drastic regulatory measures to rescue the financial systems from meltdowns and to avert deep economic downturns. Such measures vary from country to country, but generally speaking they include governments' takeovers of banks or capital injections, quantitative easing techniques, provisions of liquidity by lax lender-of-last-resort lending, lower discount rates, and more generous deposit insurance.

In the case of deposit insurance, many countries have raised deposit insurance coverage while some even have provided full coverage in order to curb bank runs. For example, in October 2008, the U.S. Federal Deposit Insurance Corporation (FDIC) temporarily raised its coverage from \$100,000 to \$250,000, whereas the British government lifted the compensation ceiling on savings accounts from £35,000 to £50,000. Following the passage

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of the Dodd-Frank Bill in July 2010, the limit of deposit insurance coverage in the United States has now been permanently raised to \$250,000. On the other hand, Hong Kong's Deposit Protection Scheme guarantees full repayment of all customer deposits until the end of 2010 as a temporary measure and will raise the coverage from the original HK\$100,000 to HK\$500,000 effective January 1, 2011. Other countries that have adopted full deposit guarantee as a temporary precautionary measure against financial turbulence include Germany, Indonesia, Ireland, Malaysia, and Singapore, to name just a few. Even countries like Australia and New Zealand where there were no explicit deposit insurance schemes before the financial tsunami have also jumped on the bandwagon to offer full deposit insurance coverage. On the surface, these measures of higher or full deposit insurance coverage have succeeded in containing bank runs, at least temporarily.

Following the historical \$700 billion bailout plan by the U.S. federal government, there is a proliferation of comments on and analyses of causes of the financial tsunami and shortcomings of the rescue plan.¹ To make the task manageable, I focus on the relation between deposit insurance coverage and financial stability in this study. Although there is a voluminous literature on the impact of deposit insurance on banking stability and many closely related issues (for an excellent collection of the recent contributions, see Demirgüç-Kunt, Kane, and Laeven 2008a), the desirability of deposit insurance remains controversial. Notwithstanding ample empirical evidence indicating the failure of deposit insurance in maintaining banking stability because of the notorious moral hazard problem (see, for example, Keeley 1990 for the United States, Carr, Mathewson, and Quigley 1995, and Wagster 2007 for Canada, and Demirgüç-Kunt and Detragiache 2002 for a panel of 61 countries), the global trend of instituting explicit deposit insurance schemes keeps going under momentum (Demirgüç-Kunt, Kane, and Laeven 2008a). Not only has the number of deposit insurance schemes gone up, but also the coverage is higher than before. Some studies justify the recent trend of higher coverage on the grounds that deposit insurance schemes with low

¹See, for example, the special issues Financial Regulation, Financial Crisis, and Bailout in *Economists' Voice*, 2008, Vol. 5, Issue 5, and Lessons from the Financial Crisis, *Cato Journal*, 2009, Vol. 29, No.1, among many others.

coverage or partial coverage may be ineffective in preventing bank runs (e.g., Carse 2008, Schih 2008). The empirical support for this justification is, however, based mainly on the recent bank runs like the case of Northern Rock. This article will examine in a more systematic way the effectiveness of deposit insurance coverage in maintaining banking stability. More specifically, in the next section I argue that raising deposit insurance coverage in an attempt to eradicate bank runs is not necessarily the optimal policy because bank runs, though commonly perceived as instability when they take place, have their positive role to play in reinforcing banking stability in the longer run. Then I examine empirically the impact of higher deposit insurance coverage on promoting banking stability based on recently released cross-country databases. An explanation for the empirical results is given before the article concludes with the policy implication.

Deposit Insurance and Bank Runs

Most people, regulators in particular, view bank runs as bad and signs of financial instability because bank runs are costly and economically inefficient as they interrupt financial intermediation and hence adversely affect aggregate economic activity and growth. A major argument in favor of deposit insurance is that it maintains and promotes financial stability by preventing inefficient bank runs arising from asymmetric information and self-fulfilling prophecies (Diamond and Dybvig 1983). Simply put, depositors, small depositors in particular, have at best incomplete information about banks' financial conditions and hence they may run on their banks in anticipation of runs. Indeed, there is empirical evidence indicating that both good and bad banks are likely to suffer from massive deposit withdrawals during large-scale financial crises like the Great Depression (see Calomiris and Mason 1997, 2003 for details). More recently, Iyer and Puri (2008) show that the collapse of a major bank in India in 2001 triggered depositors to run on a solvent bank unrelated to the collapsed bank. Despite their finding of contagion, the authors conclude that deposit insurance is only partially effective in preventing bank runs and instead stronger and longer banker-depositor relationships may be more effectual. They also find that the damage of a bank run can be severe and long-lasting as the bank's overall deposit balance did not recover even six months after the

run. While their findings will mostly be interpreted as bad effects of a bank run because it adversely affects the bank's profitability and interrupts financial intermediation, we will realize very shortly below that bank run actually has good effects as well.

The above findings are, however, unlikely to settle the controversy on whether bank runs are panic-driven and contagious because some studies, both theoretical and empirical, indicate that bank runs are information-based and related to economic outlooks or business cycles (e.g., Chari and Jagannathan 1988 and Gorton 1988). While the possibility of contagious runs cannot be entirely ruled out, the bad effects of bank runs are sometimes exaggerated. Historical evidence indicates that bank contagions are not widespread or long-lasting, at least in the United States (Kaufman 2000) and Canada (Carr, Mathewson, and Quigley 1995). On the contrary, a good effect of bank runs—strong market discipline on banks to maintain prudence and to avoid bank failures—is usually understated or even overlooked, particularly by regulators. From this perspective, the potential of bank runs can be efficient in maintaining banking stability.

It is important to recognize both the bad and good effects of bank runs and to distinguish between a run on an individual bank and a system-wide run (Kaufman 1996). As long as a run is on an individual bank but not on the banking system as a whole, deposits are just redistributed from the bank that is perceived by depositors as more risky, and hence run on, to other safer and financially sound banks. In this case, the run helps to drive out the economically insolvent or ill-managed bank, thus maintaining a financially healthy banking system. Although bank runs are socially costly as they interrupt financial intermediation, the potential of bank runs has a social benefit as it provides incentives for prudential and good banking practices. No bank likes runs because they blemish its reputation and harm its long-term profitability. Unfortunately, regulators often fail, deliberately or not, to recognize the above distinction in their practice and they tend to implement policies, such as deposit insurance, that aim at eradicating bank runs. Their policy decisions may not necessarily be in the best interest of society because regulators have their own career objectives as well (Kane 1990).

Let us consider the latest bank run in Hong Kong as an example to illustrate the above ideas. The Hong Kong case is highly relevant and should have policy implications for regulators in other countries

as well. First, Hong Kong offers full deposit insurance coverage as a temporary measure to alleviate the adverse impact of the financial tsunami. Second, it will accept the proposal to raise its coverage when the current temporary measure expires by the end of 2010 (Carse 2008). For regulators in Hong Kong, there is an additional reason to regard bank runs as bad and to eliminate them because they are deemed to tarnish Hong Kong's image and jeopardize its status as an international financial center. The run on the fifth largest bank—the Bank of East Asia (BEA)—in 2008, however, was not entirely bad at all from the perspective of efficient bank run. It can be interpreted as reflection of the fundamental soundness and stability of the Hong Kong banking system. First of all, the run was not contagious as it did not spread to other healthy banks and trigger a systemic panic. Instead, it was an efficient run that exercised strong market discipline for enhancing overall banking stability in the longer run. This is of course not to imply that BEA's financial conditions were entirely unsound.² But unfortunately information asymmetry is simply a fact of life—depositors did not have complete information about the bank's financial strength. One can of course argue that unfounded malicious rumors were the culprits causing the run and point the finger at rogue speculators. But the run was not entirely baseless. Whether the depositors' assessment of BEA's financial strength was right or wrong at that time, the run was just their rational response based on the information they had. As a matter of fact, BEA had extended loans to Lehman Brothers and American Insurance Group Inc., not to mention its losses from trading in derivatives and structured products; and shortly after the run, the bank announced a profit warning, the first time in its 90-year history, of an expected loss of HK\$2.2 billion partly due to trading in collateral debt obligations (CDOs). Apparently, depositors, even small depositors, are not necessarily as naïve and totally uninformed as regulators would have us believe.

Despite imperfect and asymmetric information, there was no apparent market failure in the BEA incident. On the contrary, it revealed a fairly high degree of informational efficiency and market

² The subsequent financial data revealed by both BEA and the Hong Kong Monetary Authority (HKMA) as well as the development following the run indicate that the bank was able to weather the financial storm. As Hong Kong and other countries' experiences indicate, it is rarely the case that a run will force a financially sound bank into insolvency.

discipline. To be sure, when the global economy gets a cold because of the financial tsunami, Hong Kong will sneeze. In fact, in its course of evolving into an international financial center, Hong Kong has experienced a handful of bank runs. The banking crises in 1965 and in 1983–86 are the most celebrated for not only their scale but also their impact on the subsequent regulatory reforms (see Jao 1974, 1989 for details of these two crises). Nevertheless, Hong Kong has been able to successfully evolve into an international financial center despite occasional bank runs.

We certainly do not like bank runs, but bank runs recur from time to time in a growing financial system (e.g., Kindleberger and Aliber 2005, and more recently Reinhart and Rogoff 2009). Regulators' attempts to eradicate bank runs by various measures are highly unlikely, if possible at all, to be successful and sustainable over time. Instead, they should recognize the positive role of bank runs and tolerate their existence as long as the stability of the entire financial system is not jeopardized. Bank runs, actual or potential, not only enforce market discipline, they also put bankers and regulators on full alert. In the absence of the latest run, BEA and the Hong Kong Monetary Authority (HKMA), the *de facto* central bank in Hong Kong, might not have promptly taken the initiative to disclose more financial information to the public in order to reassure depositors' confidence. Disclosures of relevant information to the public are indispensable for better corporate and public governance. More important, the run is expected to bring about further improvements in both bank management and regulation, thus enhancing stability of the Hong Kong banking system in the longer run.

However, as financial history reveals, tighter regulation and a larger financial safety net are regulators' common, if not kneejerk, reactions to bank runs or financial crises. Hong Kong is no exception this time after the run on BEA. Shortly after the run, the HKMA instructed the Hong Kong Deposit Protection Scheme to guarantee full repayment of all customer deposits held with all authorized institutions—namely, licensed banks, restricted licensed banks, and deposit-taking companies—until the end of 2010. Thereafter, the HKMA will adopt a proposal put forward by the Carse Report (2008) to raise the original level of deposit coverage under the Deposit Protection Scheme to HK\$500,000 effective January 1, 2011.³

³The original proposed coverage in the Carse Report was HK\$200,000.

Experiences of many other countries have unambiguously indicated that deposit insurance or protection does not avert bank runs at all. Ironically, the run on BEA means that Hong Kong had a run on its fifth largest bank—its worst bank run in more than a decade—shortly after the launch of its Deposit Protection Scheme in September 2006. Even if small depositors do not have incentives to run on banks under an explicit deposit insurance or protection scheme because their deposits are fully covered, uninsured large depositors still have incentives to do so. The collapse of Continental Illinois in 1984 is a classic example.

It is well recognized that deposit insurance has therapeutic effects in curtailing banking crises in the short run, as evidenced by the creation of federal deposit insurance—the Federal Deposit Insurance Corporation and the now defunct Federal Savings and Loan Insurance Corporation—in 1934, which was successful in restoring stability and confidence in the U.S. banking system shortly after the Great Depression (Friedman and Schwartz 1963). Like other countries, Hong Kong's recent full deposit guarantee has apparently also succeeded in stabilizing its banking system. Despite its stabilizing effect in the short run, deposit insurance has an adverse effect of raising systemic risk in the long run (Chu 2003). The moral hazard problem associated with deposit insurance is well recognized as one of the major factors contributing to the U.S. savings and loan debacle in the 1980s.

Of course, one may argue that the past failures of explicit deposit insurance schemes in stabilizing the banking systems are due to factors such as non-risk rated deposit insurance premiums and inadequate coverage; and hence higher coverage would prevent bank runs. The absence of bank runs may mean financial stability, but it may also mean a time bomb is ticking when depositors have no incentives to monitor banks. Higher deposit insurance coverage tends to undermine market discipline and exacerbate the notorious moral hazard problem by inducing banks toward taking excessive risk. The lack of market discipline allows bankers and regulators to sweep their problems under the carpet. And it will be too late for the public to find out when there is a financial meltdown due to mismanagement and regulatory forbearance.

As full deposit insurance coverage is an entirely new and temporary policy for Hong Kong, its long-term impact on the stability of the banking system has yet to be seen. But some

countries like Finland, Iceland, Japan, Kuwait, Mexico, Norway, and Turkey have provided full deposit insurance coverage since the 1990s or even earlier.⁴ In the next section, we will examine the impact of higher or full deposit insurance coverage on banking stability by applying contingency table analysis to a sample of 52 countries.

Deposit Insurance Coverage and Banking Crises

Honohan and Laeven (2005) and Laeven and Valencia (2008) have recently compiled a comprehensive database covering the major banking crises—both systemic and non-systemic—in the world during the years 1970–2007. On the other hand, Demirguc-Kunt, Kane, and Laeven (2008b) provide an extensive database on design of deposit insurance systems.⁵ From the detailed information provided by these databases, the relation between deposit insurance coverage as of 1996 and banking crises in subsequent years up to the end of 2007 is examined. There are a couple of reasons for choosing 1996 as the base year. First, for the purpose of analysis there are more observations for the 1990s and after than for previous years. Although instituting explicit deposit insurance schemes has been a global trend since the mid-1980s, many countries did not set up such financial safety nets until the mid-1990s following the International Monetary Fund's endorsement of explicit deposit insurance schemes as "best practice."⁶ Second, following the U.S. savings and loans debacle, pre-existing deposit insurance schemes have been reformed and newly instituted schemes are better designed to address the moral hazard problem associated with deposit insurance.⁷ For example, risk-based insurance premiums

⁴For example, Japan and Turkey introduced full deposit insurance coverage in the mid-1990s whereas Finland and Norway had full coverage as early as the 1960s. These six countries have provided full coverage since 1996. Among the recent establishment of deposit insurance schemes (i.e., introduced after 1996), Ecuador, Indonesia, Malaysia, and Thailand also provide blanket coverage (see Demirguc-Kunt, Kane, and Laeven 2008a: 4, Table 1.1 for details). All deposit insurance schemes introduced after 1996, however, are not included in our empirical analysis in the next section.

⁵These databases are downloadable at www.luclaeven.com.

⁶A total of 21 deposit insurance schemes were introduced after the Asian Currency Crisis in 1997.

⁷According to Garcia (2000), 33 countries reformed their deposit insurance schemes during the 1990s to improve the incentive structure.

were introduced in 1995 and subsequent years.⁸ Hence, any banking instability can be attributable more to inadequate deposit insurance coverage than to other institutional deficiencies of the explicit deposit insurance schemes.⁹

For the method of investigation, I do not attempt to apply sophisticated econometric techniques, such as logit or hazard rate analysis, to analyze the data or to estimate the probability of banking crisis to occur due to changes in deposit insurance coverage. There are a couple of reasons for this choice. The main reason is that the variables of interest to us are not precisely measurable on a cardinal scale, like length. When deposit insurance coverage changes from low to high or vice versa, we may quantify the change to provide an idea of the extent of change. But some conceptual difficulties exist such that meaningful comparisons and interpretations may not be possible in the case of full coverage. For example, both Japan and Turkey extended their safety nets from partial coverage, respectively 2.7 and 5.6 in terms of the ratio of coverage to deposits per capita, in 1990 to full coverage in 1996. What are the percentage changes in the coverage in these two countries and how can these figures be compared in a meaningful way?¹⁰ By the same token, non-systemic banking crises cannot be quantitatively comparable to systemic banking crises even though we conceptually recognize that the latter are more severe. In sum, these limitations mean that we are unlikely to be able to estimate precisely the quantitative changes in the probability of a banking crisis to occur due to changes in the deposit insurance coverage.

Second and more important, banking crises are complex phenomena, like other complex phenomena of life, of mind, and

⁸According to Demirguc-Kunt, Kane, and Laeven (2008b), 20 countries use risk-adjusted premiums and 22 countries have coinsurance provisions to discourage excessive risk taking.

⁹Ideally a control experiment should be conducted to examine the impact of deposit insurance coverage on banking stability, but this is obviously impossible in practice. Alternatively, one may follow the commonly adopted empirical approach by conducting multivariate regression analysis, treating *as if* the impacts of variables other than deposit insurance coverage on banking stability are being controlled for. As will be explained below, this article does not apply sophisticated econometric techniques.

¹⁰By full coverage the deposit insurer provides unlimited protection to depositors. Thus, the change from partial coverage to full coverage implies a change from a finite number to infinity. Our problems arise because it is well known in mathematics that infinity is not a real number.

of society, that are beyond our reach to know all the details that link the cause and effect and hence to make precise predictions as in the physical sciences (Hayek [1955] 1967a, [1964] 1967b). Nevertheless, theory can in principle allow us to discover from a certain number of distinct variables of a formula or model, or from data, the characteristic pattern of a complex system.

Therefore, I do not attempt to estimate the incremental impact on the probability of banking crisis due to a change in deposit insurance coverage. Instead, I apply contingency table analysis to the available data in an attempt to falsify the maintained hypothesis of no relation between deposit insurance coverage and banking stability,¹¹ and to identify the systematic pattern, if any, between these two variables.

In 1996, seven countries offered full deposit insurance coverage.¹² The other countries offered deposit insurance coverage ranging from as low as US\$288 in Portugal to as high as US\$146,359 in Czech Republic.¹³ These coverage figures in dollar terms, however, may not be appropriate in reflecting the extent of protection to depositors because the same coverage, say, \$100,000, may be regarded as insufficient protection to depositors in rich countries but it may already provide protection to virtually all depositors in poor countries. To control for the fact that rich countries tend to have higher levels of deposits on a per capita basis, the coverage to deposits per capita ratio (i.e., the monetary value of deposits covered by deposit insurance divided by per capita deposits) is used to measure the extent of deposit insurance coverage.¹⁴ Even though data on deposits per capita are not available for a few countries, a total of 52 countries are included in the sample, about 90 percent of the 58 deposit insurance schemes in 1996. These

¹¹This is the maintained hypothesis in terms of statistical testing using the contingency table analysis. The hypothesis of interest from a policymaker's point of view is, of course, whether a higher deposit insurance coverage leads to a more stable banking system.

¹²They were Finland, Iceland, Japan, Kuwait, Mexico, Norway, and Turkey.

¹³The coverage in each country, originally expressed in terms of the local currency, is converted into U.S. dollars based on the relevant exchange rate in 1996.

¹⁴Nevertheless, I have carried out the contingency table analysis using the data on deposit insurance coverage in monetary terms. The results suggest that the null hypothesis of independence between deposit insurance coverage and banking crises *not* be rejected. Put differently, there is no evidence indicating that higher deposit insurance coverage promotes banking stability.

countries are classified into three groups. The first group includes those seven countries that offered full deposit insurance coverage. The remaining 45 countries are classified into two groups—high and low coverage—depending on whether the coverage ratio of a country is higher or lower than the sample median.¹⁵

Based on the banking stability in the subsequent years up to the end of 2007,¹⁶ the sample countries are classified into three groups—namely, countries with (1) no banking crisis, (2) non-systemic crises, and (3) systemic crises. The classification results based on deposit insurance coverage and banking stability are tabulated as Table 1. As shown, deposit insurance is no panacea for banking instability as some of these countries with deposit insurance schemes still experienced banking crises irrespective of the extent of their deposit insurance coverage.

This observation, however, does not necessarily mean that deposit insurance coverage and banking crises are independent of each other. Formally, the χ^2 statistic of 10.98 from the contingency table analysis suggests an association between the two. This finding is also supported by Fisher's exact test.¹⁷ Therefore, the assertion that higher deposit insurance coverage can induce a more stable banking system might still be empirically valid. Yet a further examination of the data indicates that the opposite is actually the case in reality. Deposit insurance schemes with low coverage

¹⁵The median of the coverage ratio for the remaining countries in the sample is 6.61, with a range from 0.13 for Luxembourg to 108.99 for Uganda.

¹⁶The financial tsunami is not fully covered in our study because official data are not yet available. Except the United Kingdom and the United States where their financial crises emerged in late 2007, the impacts of the financial tsunami on other countries are not officially documented in the database by Laeven and Valencia (2008). The United States is already included in our study, whereas the United Kingdom is excluded because data on the coverage ratio are unavailable. Iceland is another country well known to have suffered from systemic crises later due to the financial tsunami. If included, it would reinforce our findings and conclusion, to be reported below, regarding the relation between deposit insurance and banking stability because Iceland has full coverage.

¹⁷In statistics, the χ^2 may not be a good approximation for the null distribution when the expected frequencies are small, as in our case here—both the sample size and the number of banking crises are small. Fortunately, the advancement in computer technology enables the application of Fisher's exact test (Freeman and Halton 1951) to our case of a 3x3 contingency table. The p-value of the test statistic is 0.016, which also suggests rejection of the null hypothesis of independence between deposit insurance coverage and banking crises at the conventional 5 percent level.

actually had fewer banking crises in terms of both absolute number and proportion—only one systemic crisis among 22 countries. This country is South Korea, which suffered a systemic crisis during 1997–2002 as a result of the Asian currency crisis. In contrast, schemes with high coverage had the highest numbers of banking crises: three non-systemic and six systemic. In terms of proportion, the seven schemes with full coverage had the worst performance. Three or nearly half of them registered systemic banking crises.

To clearly reveal the relation between deposit insurance coverage and banking crises, the adjusted residuals of the contingency table results are formally analyzed (Haberman 1973). As shown in Table 2, the signs and magnitudes of the adjusted residuals indicate that low-coverage schemes are apparently more likely to have no banking crises, as indicated by the adjusted residual of 2.92. Even though systemic banking crises are not entirely absent, its occurrence is lower than expected. By stark contrast, high-coverage schemes are less likely to have no banking crisis and the frequency of non-systemic banking crises to occur is higher than expected. The performance of the full-coverage schemes is mixed. The adjusted residual of 1.70 tends to suggest that systemic crises are more likely to occur, but it is only marginally significant around the 10 percent

TABLE 1
HIGHER DEPOSIT INSURANCE COVERAGE IN 1996 MORE
LIKELY TO INDUCE BANKING CRISES IN SUBSEQUENT YEARS

Deposit Insurance Coverage in 1996	Banking Crises in Subsequent Years			
	No	Non-Systemic	Systemic	Total
Low	21	0	1	22
High	14	3	6	23
Full	4	0	3	7
Total	39	3	10	52

NOTES: For hypothesis testing the χ^2 with four degrees of freedom is 10.98, higher than the critical value of 9.49 at the 5 percent level. Thus, the null hypothesis of no association between deposit insurance coverage and banking crises can be rejected. The same conclusion in hypothesis testing is obtained if Fisher’s exact test is applied. For measurement of association the Cramer’s V is 0.3249, suggesting a fairly strong association between deposit insurance coverage and banking crises.

TABLE 2
ANALYSIS OF ADJUSTED RESIDUALS FOR TABLE 1

Deposit Insurance Coverage in 1996	Banking Crises in Subsequent Years		
	No	Non-Systemic	Systemic
Low	2.92**	-1.53	-2.30*
High	-2.10*	2.00*	1.11
Full	-1.17	-0.70	1.70

NOTES: Under the null hypothesis that the variables forming the contingency table are independent of each other, the adjusted residuals are approximately distributed a standardized normal distribution. Hence, adjusted residuals with absolute values greater than two give evidence of departure from independence. Statistically significant values at the 5 percent and 1 percent levels are denoted by asterisk and double asterisk respectively. A positive sign represents the actual or observed frequency is higher than the expected frequency, whereas a negative sign means just the opposite. For more details, see Haberman (1973).

level. Nonetheless, there is no evidence at all that full coverage outperforms the other two schemes in maintaining banking stability. In sum, a comparison between the low- and high-coverage groups indicates clearly that lower deposit insurance coverage is more effective in maintaining banking stability. Furthermore, the diagonal elements tend to suggest a perverse relation between deposit insurance coverage and banking crises—the higher is the coverage, the more severe the banking crisis will be¹⁸—although we should be cautious in drawing a definite conclusion at this stage given the small sample size and the limitations in the empirical method.

It may not be possible here to explain the characteristic pattern as revealed by the diagonal elements in Table 2 in detail because banking crises vary from country to country, but it can still be explained in principle. Higher deposit insurance coverage

¹⁸In fact, this relation is reinforced and clearly supported if the sample is updated by taking Iceland's well-known systemic crisis into consideration, because the diagonal elements are all statistically significant. Furthermore, full coverage schemes are less likely to have no banking crises. The detailed results of the contingency table analysis are, however, not reported here for brevity and because it is not a formal analysis based on all officially updated data.

aggravates the moral hazard problems—depositors have little, if any, incentive to monitor banks while banks have an incentive to take excessive risks. In theory, risk-rated deposit insurance premiums can be effective in restraining banks from excessive risk taking if deposit insurance is fairly priced. The feasibility of fairly priced deposit insurance, however, remains controversial.¹⁹ In practice, notwithstanding the proliferation of sophisticated quantitative models to price deposit insurance (see, e.g., Laeven 2008, for details), the effectiveness of risk-rated deposit insurance in maintaining banking stability appears to be mixed at best. For example, both Canada and the United States have implemented risk-rated premiums. Canada outperformed many other industrial countries in maintaining banking stability as no Canadian banks failed or were subjected to runs during the financial tsunami. By sharp contrast, 140 U.S. banks failed in 2009 alone following the financial tsunami and the ordeal has been discussed so extensively that it needs no elaboration here.²⁰ Apparently, risk-based deposit insurance schemes are not entirely immune from banking instability. As long as deposit insurance is mispriced or the deposit insurance scheme is inadequately designed, moral hazard will exploit the opportunity to raise its ugly head. Higher or full deposit insurance coverage will only aggravate the moral hazard problem and inevitably entail banking crises in the long run.

Despite different datasets and empirical methods used, our findings are consistent with the results of many studies in the literature. Theoretically, Ioannidou and Dreu (2006) show that market discipline is entirely eliminated under full coverage and it is significantly reduced when coverage is over 60 percent. Empirically, Cebula and Belton (1997) find that the higher the extent of deposit insurance coverage, the higher is the bank failure

¹⁹It is not the place here to go into the detailed theoretical arguments. In a nutshell, Chan, Greenbaum, and Thakor (1992) show that it may be infeasible under asymmetric information and competitive, deregulated banking. The pricing scheme cannot be incentive-compatible because of adverse selection. Furthermore, there is a time lag between banks' portfolio decisions and the insurers' subsequent premium adjustments. Hence, heavily undercapitalized banks may still gamble for resurrection during this time lag. In contrast, Freixas and Rochet (1998) show that fairly priced deposit insurance can be viable but it is not optimal in terms of welfare.

²⁰The figure is from the FDIC's failed bank list and another 86 banks were closed in the first half of 2010.

rate in the United States over the years 1963–91. Similarly, based on U.S. data for the period 1965–91, Saltz's (1997) results indicate that the percentage of bank deposits actually insured by FDIC and the bank failure rate are cointegrated, or positively related to each other. For other countries, Imai (2006) shows that market discipline is enhanced following a deposit insurance reform in which the Japanese government lifted a blanket guarantee of all deposits and limited the deposit insurance coverage on time deposits in 2002. In contrast, Onder and Ozyildirim (2008) recently show that, although borrowers and depositors reacted negatively to risky banks, full deposit insurance in Turkey induced banks toward moral hazard behavior, which ultimately resulted in a massive banking crisis in 2001.

The perverse impact of higher deposit insurance coverage on banking stability is therefore not completely unknown in the literature. The moral hazard problems associated with deposit insurance is widely recognized, if not a consensus, among academics. If so, then why do policymakers downplay the importance of the moral hazard problem and advocate higher coverage? Based on an extensive cross-country database, Laeven (2004) finds that deposit insurance coverage is significantly higher in countries where poorly capitalized banks dominate and depositors are poorly educated, but it is not significantly related to other political and institutional factors like the degree of democracy, executive constraints, per capita income, and property rights. This empirical result is attributed to the private-interest theory, namely, risky banks lobby for extensive deposit insurance coverage.

Conclusion

By applying contingency table analysis to 52 countries over the period 1996–2007, the empirical results of this study show clearly that low deposit insurance coverage outperforms both high and full coverage in maintaining banking stability. The findings also suggest that the higher the deposit insurance coverage, the more severe the banking crisis is. Higher coverage tends to undermine market discipline and aggravate the moral hazard problem associated with deposit insurance. Therefore, the recent measures or proposals in many countries to raise deposit insurance coverage or even to offer full coverage should not be espoused. As a matter of political

expedience, they are imposed by governments as temporary measures to curb bank runs and to alleviate the sharp pains due to the financial tsunami. Their effectiveness in promoting banking stability in the long term should not be taken for granted. More important, higher or full deposit insurance coverage is incompatible with the Basel II regulatory framework that consists of three pillars—capital adequacy, supervisory review process, and market discipline—because excessive coverage undermines market discipline. Needless to say, a three-legged stool is bound to collapse when one of its legs is weakened.

More than a century ago, Oliver Wendell Holmes Sr., an American physician and writer and father of a famous Supreme Court justice, gave us this famous advice: “Put not your trust in money, but put your money in trust.” However, we should not be misled and lured by such terms like higher coverage or even full coverage to uncritically put our trust in the recent measures or proposals regarding deposit insurance as more efficient and safer ways to manage our money. The hidden costs will sooner or later surface when governments have to use huge amounts of taxpayers’ money to bail out failed banks. Money and banking is so important to us that the banking system needs both proper regulations and market discipline to maintain and promote its stability.

References

- Calomiris, C. W., and Mason, J. R. (1997) “Contagion and Bank Failures during the Great Depression: The June 1932 Chicago Bank Panic.” *American Economic Review* 87: 863–83.
- _____ (2003) “Fundamentals, Panics and Bank Distress during the Depression.” *American Economic Review* 93: 1615–47.
- Carr, J. L.; Mathewson, F.; and Quigley, N.C. (1995) “Stability in the Absence of Deposit Insurance: the Canadian Banking System 1890–1966.” *Journal of Money, Credit and Banking* 27: 1137–58.
- Carse, D. T. R. (2008) *Review of the Hong Kong Monetary Authority’s Work on Banking Stability*. Hong Kong: Hong Kong Monetary Authority.
- Cebula, R., and Belton, B. (1997) “An Empirical Note on the Impact of Federal Deposit Insurance on Bank Failures in the U.S.” *International Advances in Economic Research* 3: 281–87.

- Chan, Y. S.; Greenbaum, S. I.; and Thakor, A.V. (1992) "Is Fairly Priced Deposit Insurance Possible?" *Journal of Finance* 47: 227–45.
- Chari, V., and Jagannathan, R. (1988) "Banking Panics, Information, and Rational Expectations Equilibrium." *Journal of Finance* 43: 749–60.
- Chu, K. H. (2003) "Deposit Insurance and Banking Crises in the Short and Long Run." *Cato Journal* 23: 265–80.
- Demirgüç-Kunt, A., and Detragiache, E. (2002) "Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation." *Journal of Monetary Economics* 49: 1373–1406.
- Demirgüç-Kunt, A.; Kane, E.; and Laeven, L. (2008a) *Deposit Insurance around the World: Issues of Design and Implementation*. Cambridge, Mass.: MIT Press.
- _____ (2008b) "Determinants of Deposit Insurance Adoption and Design." *Journal of Financial Intermediation* 17: 407–38.
- Diamond, D., and Dybvig, P. (1983) "Bank Runs, Deposit Insurance, and Liquidity." *Journal of Political Economy* 91: 401–19.
- Freeman, G. H., and Halton, J. H. (1951) "Note on Exact Treatment of Contingency, Goodness of Fit and Other Problems of Significance." *Biometrika* 38: 141–49.
- Freixas, X., and Rochet, J. C. (1998) "Fairly Priced Deposit Insurance: Is It Possible? Yes. Is It Desirable? No." *Research in Economics* 52: 217–32.
- Friedman, M., and Schwartz, A. (1963) *A Monetary History of the United States 1867–1960*. Princeton, N.J.: Princeton University Press.
- Garcia, G. (2000) *Deposit Insurance: Actual and Good Practice*. IMF Occasional Paper No. 197, Washington: International Monetary Fund.
- Gorton, G. (1988) "Banking Panics and Business Cycles." *Oxford Economic Papers* 40: 751–81.
- Haberman, S. J. (1973) "The Analysis of Residuals in Cross-Classified Tables." *Biometrics* 29: 205–20.
- Hayek, F. A. ([1955] 1967a) "Degrees of Explanation." In *Studies in Philosophy, Politics and Economics*, 3–12. Chicago: University of Chicago Press.
- _____ ([1964] 1967b) "The Theory of Complex Phenomena." In *Studies in Philosophy, Politics and Economics*, 22–42. Chicago: University of Chicago Press.

- Honohan, P., and Laeven, L. (2005) *Systemic Financial Distress: Containment and Resolution*. Cambridge: Cambridge University Press.
- Imai, M. (2006) "Market Discipline and Deposit Insurance Reform in Japan." *Journal of Banking and Finance* 30: 3433–52.
- Ioannidou, V. P., and Dreu, J. (2006) "The Impact of Explicit Deposit Insurance on Market Discipline." Tilburg University, Centre for Economic Research, Discussion Paper No. 5.
- Iyer, R., and Puri, M. (2008) "Understanding Bank Runs: The Importance of Depositor-Bank Relationships and Networks." NBER Working Paper No. 14280.
- Jao, Y. C. (1974) *Banking and Currency in Hong Kong: A Study of Postwar Financial Development*. London: Macmillan.
- _____ (1989) "Recent Banking Crises in Hong Kong and Taiwan: A Comparative Perspective." in M. K. Nyaw and C. Y. Chang (eds.) *Chinese Banking in Asia's Market Economies*, 21–56. Hong Kong: Overseas Chinese Archives, CCAS, Chinese University of Hong Kong.
- Kane, E. (1990) "Principal and Agent Problems in S&L Salvage." *Journal of Finance* 45: 755–64.
- Kaufman, G. G. (1996) "Bank Failures, Systemic Risk, and Bank Regulation." *Cato Journal* 16: 17–45.
- _____ (2000) "How Real Is the Risk of Massive Banking Collapse? Evaluating the Latest Methods Proposed to Maintain Stability in International Financial Markets and to Minimize Systemic Risk." *Regulation* 23 (1): 25–30.
- Keeley, M. (1990) "Deposit Insurance, Risk, and Market Power in Banking." *American Economic Review* 80: 1183–1200.
- Kindleberger, C. P., and Aliber, R. (2005) *Manias, Panics and Crashes: A History of Financial Crises*. 5th ed. Hoboken, N.J.: John Wiley & Sons.
- Laeven, L. (2004) "The Political Economy of Deposit Insurance." *Journal of Financial Services Research* 26: 201–24.
- _____ (2008) "Pricing of Deposit Insurance." In Demirgüç-Kunt, A.; Kane, E.; and Laeven, L. (eds.) *Deposit Insurance around the World: Issues of Design and Implementation*, 81–148. Cambridge, Mass.: MIT Press.
- Laeven, L., and Valencia, F. (2008) "Systemic Banking Crises." IMF Working Paper No. 08/224, Washington: International Monetary Fund.

- Onder, Z., and Ozyildirim, S. (2008) “Market Reactions to Risky Banks: Did Generous Deposit Guarantee Change It?” *World Development* 36: 1415–35.
- Reinhart, C. M., and Rogoff, K. S. (2009) *This Time Is Different: Eight Centuries of Financial Folly*. Princeton, N.J.: Princeton University Press
- Saltz, I. (1997) “Federal Deposit Insurance Coverage and Bank Failures: A Co-integration Analysis with Semi-Annual Data, 1965–91.” *Journal of Economics and Finance* 21: 3–9.
- Schih, S. (2008) “Financial Turbulence: Some Lessons Regarding Deposit Insurance.” In *Financial Market Trends*, 55–79. Paris: OECD.
- Wagster, J. D. (2007) “Wealth and Risk Effects of Adopting Deposit Insurance in Canada: Evidence of Risk Shifting by Banks and Trust Companies.” *Journal of Money, Credit and Banking* 39: 1651–81.

