Determinants of Deposit-Insurance Adoption and Design*

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Determinants of Deposit-Insurance Adoption and Design

Abstract: This paper identifies factors that influence decisions about a country's financial safety net, using a comprehensive dataset covering 180 countries during the 1960-2003 period. Our analysis focuses on how private interest-group pressures, outside influences, and political-institutional factors affect deposit-insurance adoption and design. Controlling for macroeconomic shocks, quality of bank regulations, and institutional development, we find that both private and public interests, as well as outside pressure to emulate developed-country regulatory schemes, can explain the timing of adoption decisions and the rigor of loss-control arrangements. Controlling for other factors, political systems that facilitate intersectoral power sharing dispose a country toward design features that accommodate risk-shifting by banks.

JEL Classifications: G21, G28, P51

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Introduction

Financial safety nets differ markedly across countries. This paper examines government decisions about the design of a country's financial safety net. It tests and confirms the hypothesis that across countries salient differences in safety net design can be explained to an important degree by differences in economic and political circumstances. Our analysis seeks particularly to determine what factors influence two issues in safety net design: (1) a country's decision on whether or not to adopt a system of explicit deposit insurance; and (2) for countries that adopt explicit deposit insurance, the type of design features embedded in their deposit insurance system. We focus on the extent of deposit insurance coverage, but also include other design features that could control the banking sector's ability to extract net rents from other sectors. We investigate these issues using a newly collected dataset on deposit insurance schemes and selected design features for a large sample of countries.

Cross-country differences in political arrangements are bound to affect both kinds of decisions. The presence of an explicit deposit insurance system and how it is designed affects many constituencies, especially banks, depositors, creditors, specialized bureaucracies, and taxpayers. Because individual constituencies have conflicting interests, the political process governing adoption and design decisions can be complex.

Economists presume that political dealmaking serves both public and private interests. Public-interest rationales for deposit insurance focus on protecting small, uninformed depositors and assuring the stability of the banking system (Diamond and Dybvig, 1983). Private-interest rationales portray regulatory decisions as the outcome of interest-group competition, in which well-organized or powerful groups compete with voters to pressure public-spirited, but opportunistic politicians and regulators for regulatory interventions that enable sponsoring groups to capture rents from other sectors (Stigler, 1971; Peltzman, 1976; Becker, 1983).

Deposit insurance subsidizes banks that are prepared to exploit weaknesses in supervisory risk control to extract value from taxpayers and safer banks. Safety-net subsidies may be defined as implicit risk capital that the government administers in helping to recapitalize banks when they become deeply insolvent. It is natural to hypothesize that differences in the distribution of political clout would influence safety net design. Financial institutions regularly lobby for "reforms" that promise to increase their franchise value (Kroszner and Stratmann, 1998). The more a country's political system allows sectors to share power, the better narrow private interests can make their concerns felt.

An extensive literature analyzes the public and private benefits and costs of explicit deposit insurance and explores theoretically the challenges of designing an optimal deposit insurance system (e.g., Diamond and Dybvig, 1983; Pennacchi, 1987; Kane, 1995; Bhattacharya et al., 1998; Pennacchi, 2006). Our paper is part of an emerging, complementary body of empirical research. Demirgüç-Kunt and Detragiache (2002) and Demirgüç-Kunt and Huizinga (2004) show that deposit insurance design features affect banking system fragility and market discipline. Demirgüç-Kunt and Kane (2002), Laeven (2002), and Hovakimian et al. (2003) show that weak institutional environments undermine deposit insurance design.

Studies of how political factors affect deposit insurance reform focus predominantly on the United States. Calomiris and White (1994) argue that federal deposit insurance benefited predominantly small and poorly diversified unit banks and that, had not the Great Depression reduced confidence in the banking system as a whole, their pleas for federal insurance could not have overcome the opposition of politically stronger large banks. Kane and Wilson (1998) show that, in the face of the Great Depression, large banks' wish list changed and that their share prices benefited greatly from introducing deposit insurance precisely because depositors had lost confidence in banks of all sizes. Kroszner (1998) argues that deposit insurance is favored by

riskier banks because they can extract a net subsidy at the expense of safer banks in the presence of an insufficiently risk-sensitive premium structure. He shows that lobbying by small, risky banks in the U.S. has historically accorded with the private interests of this sector. Similarly, Economides et al. (1996) argue that in the U.S. deposit insurance was instituted for the benefit of the small, unit banks. Kroszner and Strahan (2001) study whether interest-group pressures can explain voting outcomes in the U.S. House of Representatives on the Wylie Amendment on limiting deposit insurance to a single account per bank. They find that limits to deposit insurance were opposed by representatives from states where small banks had a large share of the market and by states with a large proportion of elderly people. The amendment was favored by representatives of states where banks could sell insurance products and where the insurance industry was relatively large.

Our paper is most closely related to Laeven's (2004) investigation of how political arrangements affect coverage levels across countries. Our more comprehensive dataset lets us model simultaneously decisions about adoption and numerous aspects of system design. It is important to investigate how different country characteristics, including differences in political systems, affect political support for deposit insurance. Laeven (2004) is able to study only one element of deposit insurance design in a cross-country context (deposit insurance coverage) and uses single-equation methods to explain this variable for only one date (the year 2000). Using a two-equation framework that controls for how country characteristics influence the logically prior decision to adopt deposit insurance, we are able to study how the evolution of characteristics over time affects the adoption of a series of loss-control features. Like Laeven (2004), we find that deposit insurance coverage is higher in countries where poorly capitalized banks dominate the market, but we are able to show that risky banks lobby against efforts to control risk-shifting in other ways as well.

Our paper offers two advances. First, we create a new dataset of deposit insurance design features that (unlike previous studies) covers all countries that offer explicit deposit insurance and tracks changes in design features across time in every country. Second, we use this comprehensive database to generate cross-country evidence on the determinants of the adoption and design of deposit insurance systems.

We use discrete choice and proportional hazard models to analyze the adoption of deposit insurance. To study deposit insurance design, we use two-stage selection models that account for selection bias by including countries that lack explicit deposit insurance. We find that external pressures and internal politics play significant roles in adoption and design decisions. Other things equal, the more contestable a country's political system, the more likely it is both to adopt explicit deposit insurance and to adopt inadequate risk controls. We confirm that private interests, particularly the relative importance of risky banks in the country, exercise an important but not exclusive influence on adoption and design decisions.

The rest of the paper proceeds as follows. Section 2 describes some recent trends in deposit insurance adoption and design. Section 3 introduces testable hypotheses about the nature of interest-group bargaining, defines the main variables used in the empirical analysis, describes the sources used to construct these variables, and presents summary statistics for all included variables. Section 4 specifies and estimates statistical models of the adoption decision. Section 5 explains how selection models can be used to explain deposit insurance design and offers empirical estimates of two-stage models of adoption and design. Section 6 concludes.

2. Adoption and Design Features of Deposit Insurance

The first national system of deposit insurance was introduced in 1934 in the United States. Since then, many countries have followed suit. The 1990s saw a particularly rapid spread of explicit

deposit insurance. In 1995, only 49 countries offered explicit deposit insurance, but by 2003 this number had surged to 87 countries, an increase of almost 80%. Although much of this recent surge can be attributed to transition countries of Eastern Europe, recent adopters can be found on every continent.

Besides adoption dates, we compile information about specific design features of the particular scheme that each adopting country installs. Since deposit insurance reduces depositor incentives to monitor banks and increases stockholder incentives to increase bank risk taking, deposit insurance design should seek to counterbalance these adverse incentives (Kane, 1995; Bhattacharya et al., 1998).

Depositor and other private discipline are improved by: (i) limiting coverage, (ii) excluding particular types of deposits (such as foreign-currency or interbank deposits) from the system, (iii) introducing coinsurance by depositors, and (iv) setting coverage limits per depositor rather than per account, so that depositors cannot simply increase coverage by spreading deposit balances across multiple accounts. Stockholder discipline can be improved by introducing risk-sensitive premia, so that banks that take more risk are "penalized" by higher premiums.[1]

Regulatory discipline is also key to a well-functioning deposit insurance regime. Regulatory discipline can be improved by private-sector involvement in the management of the deposit insurance system, because private parties are generally considered to be better at monitoring banks and banks are apt to solicit better information with which to monitor one another than government officials can. It also matters whether membership in a country's scheme is compulsory or voluntary. Compulsory membership reduces adverse selection among banks and forces strong banks to lobby for effective risk-shifting control (Demirgüç-Kunt and Detragiache, 2002).

Our analysis focuses not only on decisions about individual design features, but looks also at how features interact in indices of overall risk control described in section 4.

3. Hypotheses and Definitions

Our goal is to assess the relative importance of public interests, private interests, external pressures, and internal institutional and political environments in influencing a country's decision to adopt deposit insurance and follow-on decisions it makes about safety-net design, specifically about the extent of deposit insurance coverage and other risk-shifting controls.

We pattern our tests as closely as possible on models others have used to explain adoption and coverage decisions (Kroszner and Strahan, 2001; Laeven, 2004). However, differences in data availability across countries obviously constrain the span of variables we can include. Public and private benefits cannot always be separated and many variables can only be observed for a few points in time. To include time-invariant country-level variables in the analysis, we experiment with country fixed effects.

The next two sub-sections develop testable hypotheses about the roles of public interests, private interests, and internal and external political and institutional forces, and explain the data sources from which particular variables are constructed.

A. Hypotheses

Banking structure

Social costs of deposit insurance are apt to grow with the size and riskiness of the protected sector. Social costs arise from deadweight costs of intervention, from the displacement of market discipline, and from moral hazard effects on insured banks. Small and undercapitalized banks have traditionally been cast as supporters of deposit insurance (Kroszner and Strahan, 2001;

[1] The risk-controlling potential of *ex ante* risk-based deposit insurance premiums may be limited (Chan et al., 1992;

Laeven, 2004).[2] These banks' private interests are best served when deposit insurance is adopted earlier and entails fewer risk-shifting controls. This leads us to investigate whether it makes a difference if the market share of small (or undercapitalized) banks is large relative to that of large (or well-capitalized) banks. Where small or undercapitalized banks are relatively important, public interests would be best served if deposit insurance were adopted late and were to incorporate rigorous risk-shifting control.

Banks relative to other providers of financial services

A number of countries permit banks to sell insurance products. In such countries, one would expect insurance firms to oppose the adoption of deposit insurance for fear that government backing would make it easier for banks to take business away from them. Where banks can underwrite insurance products and the insurance industry is important relative to the banking industry, insurers might be able to delay deposit insurance adoption and to impose more-rigorous risk-shifting controls. On the other hand, the public interest would favor adoption if deposit insurance makes it easier for banks to exploit economies of scope. In this case, efficiency gains would rise with the size of bank insurance offerings and the public interest would entail early adoption in countries where banks already sell insurance and the insurance sector is large.

Demographics

As a block, elderly people generally have more financial assets than younger people and often employ bank deposits as their main savings vehicle. This would dispose them to favor deposit insurance. Their private interests would seem to be better served when deposit insurance is adopted earlier. However, rigorous risk-shifting control also seems more likely to emerge in countries with a relatively large share of elderly people. To the extent that elderly people are less

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Pennacchi, 2006).

[2] On the other hand, Kane and Wilson (1998) find evidence that large banks benefited most from the introduction of deposit insurance in the United States. If this were true in other countries as well, then large-bank interests might dominate adoption and decision decisions.

sophisticated and exert less depositor discipline on banks, the public interest would call for early adoption and rigorous risk control.

External political pressure and financial crises

Outside pressure may be generated in several ways. We hypothesize that, when deciding whether to adopt deposit insurance, policymakers are influenced by choices made by policymakers in other countries. As explicit deposit insurance becomes widespread, it becomes a hallmark of regulatory best practice, and countries become more likely to adopt it (Demirgüç-Kunt and Detragiache, 2002).

In some countries, the restraining influence of internal economic and political determinants may have been overcome by domestic and foreign pressure to emulate safety-net arrangements in other countries, without adequately tailoring the design features to differences in public and private contracting environments. To test this hypothesis, we estimate models of deposit insurance adoption and design that include proxies for outside pressure.

Outside pressure may come directly from supranational agencies. Starting in the 1990s, IMF crisis-management advice recommended adopting explicit deposit insurance as a way either of containing crises or of formally winding down crisis-generated blanket guarantees (Folkerts-Landau and Lindgren, 1998; Garcia, 2000). The World Bank and European Union (EU) have endorsed explicit deposit insurance as well.

External political pressure is particularly effective during times of financial crises. The adoption of deposit insurance is more likely during banking crises because one of the public rationales for deposit insurance is to prevent bank runs and ensure financial stability (Diamond and Dybvig, 1983). This leads us to investigate whether and how the occurrence of a financial crisis might affect the timing and character of deposit insurance decisions.

Political and legal institutions

In addition to identifiable private and public interests, specific political, legal, and economic factors are likely to affect the timing and character of deposit insurance decisions. Demirgüç-Kunt and Kane (2002) argue that countries have different contracting environments, and that these differences must be taken into account when designing a country's financial safety net.

To separate economic from political and legal influences, all regressions control for the level of economic development. We also control for differences in political environments. In political systems that are more democratic, the voices of minority interest groups can express themselves more forcefully. Forces that lobby for deposit insurance can be more effective in democracies (Kroszner and Strahan, 1999). We test the hypothesis that, *ceteris paribus*, deposit insurance is adopted earlier and with fewer risk-shifting controls in more-democratic countries.

Because moral hazard is exacerbated in countries with poor legal institutions (Demirgüç-Kunt and Kane, 2002), the quality and enforcement of applicable laws may affect the adoption and design of deposit insurance. In countries where the quality of legal institutions is poor, the potential for corruption and abuse is higher. This is apt to generate opportunities for risk-shifting by insured banks. In countries with poor legal institutions, the public interest would be better served if deposit insurance were adopted later and imposed stronger risk-shifting controls.

Bank regulation and supervision

Increases in the rigor of bank regulation and supervision are apt to reduce the budgetary cost of providing deposit insurance. The pre-existence of expense-saving forms of regulatory discipline is likely to encourage the decision to install an explicit deposit insurance scheme. At the same time, the rigor of bank regulation is probably controlled by the very same political and economic factors that affect deposit insurance adoption and design (Barth et al., 2006). To investigate this issue, we examine the influence exerted by four aspects of bank regulation and supervision: stringency of capital regulations, restrictions on the activities banks can engage in (including

securities underwriting, insurance, and real estate), entry restrictions, and official supervisory power (including whether the supervisory framework supports prompt corrective action).

Macroeconomic environment

Finally, we introduce variables that capture macroeconomic developments that may affect the quality of bank assets, particularly the rate of growth of real GDP and the rate of inflation. These variables were used previously by Demirgüç-Kunt and Detragiache (2002) to explain the incidence of banking crises. Our regressions also include the size of a country's fiscal deficit. High inflation often results from budget deficits that a government finances predominantly through money creation. A government may decide against introducing explicit deposit insurance when the contingent liabilities it creates cannot be tax-financed.

B. Data Sources and Definitions of Included Variables

Our dataset is unique in covering design features for all countries that had adopted explicit deposit insurance through yearend 2003. The data were collected both from official country sources and supplemented by information from World Bank country specialists. We also contacted deposit insurance agencies to extend data availability where necessary.[3]

Our work expands an earlier Demirgüç-Kunt and Sobaci (2001) database in two ways. First, we update the endpoint to 2003 to incorporate data on recent adopters. Second, we create a time series of individual-country design features. Whereas the 2001 database provided data on coverage only for the year 2000, we track coverage levels for every year in which an explicit deposit insurance scheme existed.[4] The complete database covers 181 countries. Of these countries, 87 (or 48%) have explicit deposit insurance (as of end-2003). This includes countries with blanket guarantees. Interestingly, although deposit insurance schemes can be found in all

[3] A detailed list of data sources can be found in the working paper version of this paper, available from the following website: http://siteresources.worldbank.org/DEC/Resources/DeterminantsOfDepositInsurance.pdf.

[4] For example, coverage levels in the United States have increased five times: from US$ 5,000 at adoption in 1934, to 10,000 in 1950, to 15,000 in 1966, to 20,000 in 1969, to 40,000 in 1974, and finally to 100,000 in 1980.

parts of the world, we find that explicit deposit insurance schemes are observed more frequently in developed countries than in developing countries.[5]

For all countries with explicit deposit insurance, we compile time-series information on eight design features: (i) the coverage ratio (*Coverage ratio*), which we define as the ratio of the coverage limit on insured deposits to per capita GDP; (ii) whether or not foreign currency deposits are covered (*Foreign currency deposits*); (iii) whether or not interbank deposits are covered (*Interbank deposits*); (iv) whether or not there is coinsurance (*Coinsurance*); (v) whether coverage applies per account or per depositor (*Payment*); (vi) whether premiums are flat or risk-adjusted (*Premiums*); (vii) whether or not the administration of the scheme is exclusively publicly managed (i.e., without participation from the private sector) (*Administration*); and (viii) whether or not membership is voluntary (*Membership*). We calibrate each indicator variable so that a higher score denotes an increased potential for risk-shifting. We also aggregate these individual features to form indices of the overall rigor of risk-shifting control.

We first investigate the determinants each index component separately. "Moral hazard indices" (*Moral hazard*) combine the eight individual features in different ways. The pre-eminent index is the first principal component of the variance-covariance matrix of the eight features. As robustness tests, we also experiment with alternative moral hazard indexes that either include additional principal components or simply average the values of individual indicators. Table 1 lists adopting countries, the year explicit deposit insurance was introduced, and the design features we investigate.

We also collect data on the political and economic variables needed to test the hypotheses mentioned earlier. For all variables, time-series data cover the period 1960-2002, unless otherwise noted. We proxy the political clout of small banks by *Small Bank*s, the fraction of

[5] Using the World Bank definition of a high-income and low-income country, we find that 78% of high-income

banking assets in small banks in the country. A bank is considered small if its total assets are below 1 billion U.S. dollars. To proxy the clout of undercapitalized banks, we use *Undercapitalized Banks*, the fraction of a country's banking assets in banks showing a below-median capital to asset ratio. Data on bank size and capital come from Bankscope, a database containing financial data on international banks. Both variables are based on 1995-99 averages. To express the clout of the insurance sector, we use *Insurance penetration*. This variable expresses gross insurance premiums underwritten as a share of GDP. This information is collected from the World Bank's World Development Indicators (WDI). Because data on insurance penetration starts in 1987, we use the mean value for 1987-2002.

To represent the clout exercised by elderly people, we use *Pop65*, which is the share of the population age 65 and over. These data also come from the World Bank's WDI database.

To proxy outside pressure, we use several variables. *Contagion* is the fraction of countries in the sample that has adopted explicit deposit insurance at each point in time. This variable proxies the extent to which deposit insurance is believed to be a universal best practice. As more and more countries adopt deposit insurance, this nonlinear trend variable increases in value. *IMF Pressure* is a zero-one indicator whose value is one from 1999 on. In 1999, the IMF published a best-practice paper on deposit insurance and its design, which recommended explicit deposit insurance for developing countries (Garcia, 2000). The World Bank also recommended explicit deposit insurance for specific developing countries during the sample period. *World Bank Loan* is an indicator variable that has the value one for countries starting in the year the World Bank began an adjustment lending program that entailed installation of explicit deposit insurance. Data on World Bank lending programs that support deposit insurance come from World Bank (2004). The EU Directive on Deposit Insurance (which came into force in 1994)

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countries, but only 16% of low-income countries offer explicit deposit insurance by year-end 2003.

also encouraged deposit-insurance adoption, particularly for the EU accession countries. The 10 countries that joined the EU in 2004 had no choice but to adopt the minimum coverage set forth by the Directive. Prior to accession, these countries all established an explicit deposit insurance scheme. To capture this influence, we construct a variable, *EU candidacy,* that for EU candidate countries only, takes a value of one from 1994 on.

To represent banking crises, we construct a binary variable, *Crisis*, whose value is one in years that a given country is experiencing a systemic banking crisis, and is zero otherwise. Data on the timing of banking crises come from Caprio et al. (2005). A banking crisis is defined as a situation in which significant segments of the banking sector become insolvent or illiquid, and cannot operate without special assistance from monetary or supervisory authorities.

To characterize the political environment of a country, we focus on *Polity score,* an index that ranges from –10 to 10. Negative scores are assigned to countries that are autocracies and positive values to democracies. As a robustness check, we use three other proxies. *Democracy* is a variable that ranges from 0 to 10, with higher scores assigned to countries that are more democratic. *Executive constraints* is an index that measures the extent to which a country's institutions constrain the decision-making powers of the country's chief executive in ways that create other "accountability groups." This index ranges from 1 to 7. Higher values indicate stronger restrictions on executive authority. Finally, *Political competition* ranges from 1 to 10, with higher scores representing increased political competition. This index tracks the extent to which non-elites access institutional structures for political expression. These data come from the Polity IV database of the University of Maryland. We presume that minority interest groups exercise more influence in political systems that are democratic, that place constraints on the executive power, and that are politically competitive.

To capture the contracting environment of the country and the development of economic institutions more generally, we use the we use *GDP per capita*, and indices for *Bureaucracy* and *Law and Order*. *Bureaucracy* ranges from 0 to 4, increasing with strength and quality of the bureaucracy. *Law and Order* expresses the quality of country's legal system and rule of law. It ranges from 0 to 6, where high scores indicate a high level of law and order. Because data on the quality of bureaucracy and law and order do not start until1984, we average data for these two variables over 1984-2002.

We represent differences in the macroeconomic environment by the following variables: *GDP growth*, *Inflation*, and *Fiscal deficit*. Movement in these variables captures the size of internal and external macroeconomic shocks a country experiences. *GDP growth* is the growth rate in real GDP. *Inflation* is defined as the annual rate of inflation. *Fiscal surplus* is the ratio of fiscal surplus to GDP, where negative values denote fiscal deficits and positive values denote fiscal surpluses. These data come from the World Bank's WDI database. Because data on fiscal deficits are sparse (in particular, data are lacking for the last years in our sample period for many countries), our fiscal-deficit variable averages data over whatever sample is available.

To measure the quality of bank regulation, we use four different variables. These variables are taken from the Barth et al. (2006) database and refer to data for the year 2003. In all cases, higher scores denote greater restrictiveness. *Capital regulatory index* measures the stringency of capital regulations in the banking system. The index ranges from 0 to 7. *Activity restrictions* measures the degree to which banks can engage in securities underwriting, insurance, and real estate. The index ranges from 3 to 12. *Entry restrictions* captures regulatory requirements to set up a bank. The index ranges from 0 to 8. *Official supervisory power* is an index of the power supervisors have to discipline banks. The index ranges from 0 to 14. Barth et al. (2006) provides details on the construction of each variable.

Table 2 presents summary statistics for the variables used in our study. The unit of observation is a country-year. For each variable, detailed definitions and sources are provided in Appendix 1. The first part of Table 2 lists a series of endogenous design features. The mean value of the deposit insurance indicator variable, *Deposit insurance,* states the proportion of country-years in which the countries in our sample included explicit deposit guarantees in their safety net. This turns out to be only 17%, since many countries adopted deposit insurance relatively recently. The mean value of indicator variables for specific design characteristics indicates what proportion of explicit deposit insurance schemes incorporates each particular characteristic. Design variables are coded so that higher values indicate an increased exposure to risk-shifting, meaning that moral hazard is less rigorously controlled by that particular design feature.

Table 3 reports the correlation matrix of deposit insurance variables and country characteristics across the years and countries for which data are available for each pair of variables**.** The presence of explicit deposit insurance is positively associated with economic development (as measured by GDP per capita), external pressure indicators, crisis experience, and constraints on executive authority. For countries with explicit insurance, we find that coverage levels and exposures to moral hazard are higher when per capita GDP and constraints on executive authority are low, and during periods of increased external pressure. Coverage levels prove higher in countries where government ownership of banks is more extensive. Because we expect that the same variables would influence adoption and design, design decisions must be modeled simultaneously with adoption. To avoid selection bias, regressions seeking to explain design decisions are estimated simultaneously with a selection model of the adoption decision.

4. Statistical Models of the Adoption Decision

Using a hazard model, we first estimate how the political and economic variables we consider influence the timing of deposit insurance adoption. To explore the robustness of the inferences we make, we explore alternative models, including Probit models with time-fixed effects.

A. Hazard Model of the Adoption Decision

A powerful way to analyze adoption timing is to estimate a hazard model. The hazard rate $\lambda(t)$ estimates the probability that a country adopts deposit insurance in year t, given that it had not yet done so when the year began (Kiefer, 1988). Hazard models surmount the missing-data problem created by right-censored data. Adoption dates for countries that had not yet adopted deposit insurance by 2003 are estimated by a synthetic adoption date extrapolated from the transitions observed for countries that did adopt during the sample period.

We employ two widely used models of the hazard rate. The first is the Cox proportional hazards model, which expresses the hazard rate as:

$$\lambda^{i}(t) = \lambda(t) \exp(\beta' x_i), \quad (1)$$

where x is any specified vector of potential explanatory variables. The second is the Weibull model, which specifies that $\lambda(t)$ in (1) evolves as:

$$\lambda(t) = \lambda\alpha t^{\alpha-1}. \quad (2)$$

The evolutionary parameter α determines whether the hazard rate is increasing ($\alpha > 1$), decreasing ($\alpha < 1$), or constant ($\alpha = 1$) over time. We report robust standard errors following Lin and Wei (1989).

We designate the Weibull model as our preferred specification because it allows us to estimate the evolutionary parameter α. High and significant values of α denote positive duration dependence and can be interpreted as evidence of external influence or emulation. When employing duration-model techniques, our dataset reduces to a cross section of durations. The

Weibull model lets us compare alternative specifications (focusing specifically on the values of α) to investigate the presence of external influence rather than either estimating a time trend or including *Contagion* as an explanatory variable.

Assuming the availability of data for our explanatory variables, our sample period consists of the period 1960-2002. We exclude countries that adopted deposit insurance before 1960 (i.e., the United States) from our analysis. Our initial sample consists of 180 countries, of which 86 adopted deposit insurance during the period 1960-2002.

We calculated the Kaplan-Meier nonparametric estimates of how the hazard function varies over time. The hazard function is relatively flat in the early years and then grows steeper in the later years. A particularly large increase is observed in the hazard function during the 1990s. This coincides with the period that the IMF and the WB began to urge deposit insurance adoption. EU pressure towards EU accession countries probably also helped to increase the hazard function in the second part of the 1990s. During the period covered by the EU Directive on Deposit Insurance, 1994-2003, 42 countries introduced deposit insurance systems. Fourteen of these (i.e., one-third) are EU accession countries.

B. Weibull Hazard Models of the Adoption Decision

Table 4 presents regression results for the Weibull hazard model. We first present regressions that exclude the bank regulatory variables, the institutional variables, and the insurance-penetration variable because information on these variables is missing for many countries. We designate the main specification as regression (1). It uses Polity scores to proxy differences in political environments. Regressions (2) to (4) consider Democracy, Executive Constraints, and Political Competition as alternative proxies. Regression (5) adds the insurance-penetration variable and bank regulatory variables. Regression (6) introduces proxies for the quality of the bureaucracy and the law-and-order tradition in the country. Regressions (7) to (10) include the

external-influence indicators WB Loan and EU Candidacy, using alternative proxies for political institutions.[6] Because explanatory variables enter exponentially, the coefficients reported in Table 4 are the logarithms of the underlying relative hazard coefficients. The relative hazard coefficients can be calculated as the antilog of the reported coefficients. The exponent of each coefficient estimate shows the proportional increase in the hazard rate that occurs when the focal explanatory variable increases by one unit.

We find that our proxy for the clout of small banks delays the introduction of deposit insurance. This result runs counter to the narrow private-interest view that presumes that small banks are invariably riskier than large ones and would lobby strongly for the adoption of deposit insurance. On the other hand, the result parallels the evidence presented by Kane and Wilson (1998) who show that large banks benefited most from the introduction of deposit insurance in the United States. The result is also consistent with public-interest theories that predict that deposit insurance should be adopted later in countries where small, risky banks are relatively important. We also find that deposit insurance is adopted earlier in countries where undercapitalized banks have substantial clout. This is consistent with these banks' private interests and with the findings of Laeven (2004).

Both banking-structure effects are economically important. For example, regression (1) indicates that a one-standard deviation (22.5%) increase in *Undercapitalized Banks* would increase the hazard rate for adopting deposit insurance by exp(0.013*22.5) = 1.34 points (or an increase of about 34%). This implies that countries with higher levels of *Undercapitalized Banks* are more likely to adopt sooner.

Banking crises also raise the probability of early adoption. This is consistent with the notion that external political pressure to adopt deposit insurance may be particularly effective

[6] We do not include the *IMF* and *Contagion* variables because these variables do not display cross-country variation

during financial crises, when the public rationales for deposit insurance spelled out by Diamond and Dybvig (1983) – i.e., to prevent bank runs and re-establish financial stability – gain ground.

We do not find that the share of elderly people significantly influences the probability of early adoption. While the regressions usually generate a positive coefficient for *Pop65* (consistent with the private interests of the elderly), the effect is never statistically significant.

Differences in the political environment of sample countries appear highly relevant. No matter how we proxy the quality of democratic institutions in the country, we find that increases in the political contestability of government control significantly raise the probability of early adoption. For example, in regression (1) the coefficient on *Polity* suggests that a one-standard deviation (7.6) increase in *Polity* would increase the hazard rate for adopting deposit insurance by exp(0.058*7.6) = 1.55 points (or an increase of about 55%). This result accords with Kroszner and Strahan (1999) who hold that the political lobby for deposit insurance is more effective in democracies where minority interest groups are more likely to be heard.

Differences in macroeconomic environment do not seem to matter much, although we find some weak evidence that countries are more likely to adopt deposit insurance when they run a fiscal surplus. This finding supports the view that in countries with persistent fiscal deficits governments may be unable or unwilling to introduce schemes that create contingent liabilities for the government.

The bank regulatory and supervisory framework also does not appear to be an important factor in the adoption decision, although when we seek to control for bank regulatory and supervisory differences, our tests lose power. The usable sample shrinks to 1808 observations for 72 countries. We find weak evidence that deposit insurance is introduced earlier in countries that allow banks to engage in a variety of activities, including securities, insurance, and real estate

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and would therefore drop out of a Cox proportional hazards model.

business. This finding challenges private-interest explanations that predict that adoption would be delayed in countries where banks can engage in nonbanking activities, such as the sale of insurance products. However, the result is consistent with the public-interest theories that predict that adoption should occur earlier in jurisdictions where banks offer insurance.

Efforts to control for the quality of the bureaucracy and the law-and-order tradition serve mainly as robustness checks. Proxies for the quality of legal institutions do not add to the explanatory power of the model. They leave our main results unaltered and even increase the importance of the *Polity* variable, although the significance of the increase is undermined by the reduction in sample size.

Finally, regressions (7) to (10) confirm the commonsense expectation that external pressure from the EU encouraged earlier adoption of deposit insurance by EU accession countries. On the other hand, World Bank endorsement does not seem to have wielded a significant influence.

We also obtain a positive and significant estimate for the evolutionary parameter α . This tells us that the hazard function for adopting deposit insurance increases during our sample period 1960 – 2002. To show how quickly, we compare the hazard rates for the years 1980 and 2000. Focusing on the estimate of α in regression (1), we find that for a typical country:

$$\frac{\lambda(Year\ 2000) = \lambda(40) = \lambda\alpha(\lambda 40)^{\alpha-1}}{\lambda(Year\ 1980) = \lambda(20) = \lambda\alpha(\lambda 20)^{\alpha-1}} = (40/20)^{\alpha-1} = (40/20)^{2.16-1} = 2.23.$$

This tells us that such a country is more than 2 times more likely to adopt deposit insurance in 2000 than in 1980. This nonlinear trend approximates the emulation effect that we go on to estimate directly using the *Contagion* variable in Probit specifications.[7] That significant positive values are found for α in all Weibull specifications supports our contention that external

[7] The impact of the external pressure variables *Contagion* and *IMF* are already captured by the evolutionary trend α.

influence is important. The likelihood of adoption at time *t*, conditional upon nonadoption prior to time *t*, increases over time.

C. Robustness Tests Employing Cox and Probit Models of the Adoption Decision

Table 5 shows that results are similar if we use the Cox model rather than the Weibull model of the hazard rate. Because the Cox model excludes time variation in the hazard rate, it is impossible to include *Contagion* and *IMF* external pressure as potential determinants. In this model too [regressions (1) and (2)], deposit insurance is adopted earlier in countries that show a greater clout for large banks, that show greater clout for undercapitalized banks, that undergo financial crises, that are more democratic, and that are (former) EU accession countries.

As a further robustness check, we also estimate Probit models of the adoption decision. The endogenous variable has the value one in years when the country has explicit deposit insurance, but is zero otherwise. We allow for correlation among errors for each country by estimating Probit regressions using clustered errors at the country level. Probit models accommodate the time-varying external pressure variables *Contagion* and *IMF*. Regressions (3) and (4) are Probit regressions of the adoption decision. These equations include year-fixed effects to control for unobserved common elements that make deposit insurance more desirable in countries as time goes by (other than those captured by the WB and EU Candidacy variables).

Probit models assume that a country makes each year a decision about changing its deposit-insurance status. However, once explicit insurance is in place, countries rarely jettison it. To parallel hazard models, we drop all post-adoption observations. Although the Probit approach uses right-censored observations that potentially bias the results, the Probit results turn out to be broadly similar to those obtained from the hazard models.

Probit regressions (5) and (6) replace the time dummies by the time-varying external pressure variables *Contagion* and *IMF*. *Contagion* proxies how widely deposit insurance is

believed to be a universal best practice. Consistent with this interpretation, we find that as more and more countries adopt deposit insurance, countries without deposit insurance become more likely to follow their lead. Although *Contagion* is strongly significant, *IMF* does not enter significantly once we control for the other sources of external influence.

Overall, these results confirm the hypothesis that domestic private and public interests and external influence play important roles in adoption decisions.

5. Explaining Deposit Insurance Design

We next use Heckman's two-stage selection framework to investigate whether and how political and economic factors influence the design of deposit insurance systems in adopting countries. We test hypotheses about the "liberality" of system design. By the liberality of a design feature, we mean the extent to which empirical evidence summarized in Demirgüç-Kunt and Kane (2002) indicates that it is likely to promote moral hazard and risk-shifting by banks. To recognize that particular combinations of features might mute or reinforce the impact of some of the others, we construct a covariance matrix of design features in which each variable is standardized to have a mean of zero and a standard deviation of one. We define the first principal component of the covariance matrix of the eight features listed in section 2 as the *Moral Hazard* index.

The first-stage equation is a selection model for adoption. It uses the same set of regressors used in the hazard models of Section 4. The second-stage models incorporate a regressor called Heckman's Lambda that accounts for the sample-selection bias that would emerge if one sought to explain design features in a single-equation context. As an inverse measure of the odds of adopting, this variable measures the degree to which adoption proves surprising. A positive and significant coefficient for Heckman's Lambda indicates that latent characteristics that make adoption surprising also encourage liberality in design.

We employ two versions of Heckman's two-step selection models.[8] First, we estimate a model using identical regressors in both stages. This model is identified only by the fact that Heckman's Lambda is a nonlinear function of the regressors. Second, we estimate a model that excludes the selection variable *Contagion* from the second-stage regression. As shown in the previous section, *Contagion* is an important determinant of adoption. This variable satisfies the exclusion restriction if *Contagion* partly explains adoption (as shown in Section 4), but does not wield much influence on decisions about the design features of deposit insurance.

Regression (1) of Table 6 uses the first principal component of the vector of design features as the endogenous variable in the second stage. Heckman's Lambda receives a positive coefficient, indicating that latent characteristics that make adoption less likely also encourage liberality in design, but this variable is not statistically significant. We find that design features are more liberal in countries where insurance markets are relatively large. This is inconsistent with the view that the private interests of a powerful insurance lobby seeking to promote loss-control features so as to make it harder for banks to compete with the insurance industry. If banks enjoy efficiency gains from economies of scope that rise with the size of the insurance markets, this sign would indicate pursuit of public benefits.

We also find more risk controls in countries showing larger shares of elderly people. This is inconsistent with this demographic bloc's private interests unless elderly people lobby for extensive risk controls to contain bank risk-shifting for fear that safety-net subsidies would end up being captured by people younger than themselves.

The results also indicate that countries with higher levels of per capita income are more apt to adopt design features that mitigate moral hazard behavior by banks. This may be because

[8] We obtain qualitatively similar results when using maximum likelihood to estimate the Heckman selection model.

sophisticated risk-control features such as coinsurance and risk-adjusted premiums are more readily understood and easier to enforce in economically developed countries.

We also find that countries are apt to adopt better risk controls if they also have more stringent capital regulations. This supports the view that capital requirements are complementary ways to limit risk-shifting.

Finally, we find that countries that impose strict entry restrictions on banks tend to adopt a more-liberal deposit insurance scheme. This suggests that the banking industry has extraordinary political clout in such countries, since entry restrictions and generous deposit insurance both enhance the franchise value of incumbent banks.

Regression (2) includes year-fixed effects to control for unobserved elements that might make deposit insurance become more desirable in countries as time goes by. This regression confirms that countries with large shares of undercapitalized banks adopt more liberal deposit insurance. This is consistent with the private interests of risky banks, who can benefit from extensive deposit insurance coverage and few risk controls.

These regressions also show that more-democratic countries adopt more-liberal deposit insurance. This result is consistent with the private-interest view that the lobbying for deposit insurance subsidies is more effective where minority interest groups have better access to power. We also find that countries with high inflation rates and wide supervisory authority tend to have less generous deposit insurance schemes. The regression confirms the positive (and now statistically significant) sign accorded Heckman's Lambda. Latent characteristics that make adoption less likely also encourage liberality in design. This result underscores the value of making inferences about design in a two-stage framework.

Regression (3) drops the time-fixed effects included in the previous regression and instead includes *Contagion* as selection variable in the first-stage regression. As before, the first-

stage regression indicates that as time goes by and more countries adopt deposit insurance, other countries become more likely to adopt deposit insurance. A positive and significant coefficient continues to be assigned to Heckman's lambda.

These findings are broadly consistent with those obtained using time-fixed effects, except that we now find that countries that run fiscal deficits seem less likely to impose risk controls and more likely to load contingent liabilities on the government.

Regression (4) explores the effects of introducing the external pressure variables *WB* and *EU Candidacy* into the model, when excluding *Contagion* from the second stage. While we found earlier that external pressure by the WB and EU can lead countries to adopt deposit insurance earlier, this regression indicates that these same pressures dispose countries to adopt schemes that include better risk controls. Expert advice that accompanies international pressure is likely to lead to more prudent design of deposit insurance. We also find that, consistent with private-interest origins, countries with a larger proportion of small banks tend to prefer more liberal deposit insurance.

Regressions (5) through (7) use alternative moral-hazard indices as the endogenous variable in second-stage regressions. The covariates included in these robustness checks and the first-stage regressions are the same as those in regression (4). The endogenous variable in regression (5) is a moral-hazard index based on the first *two* principal components of design features. Regression (6) uses the moral-hazard index based on the first *three* principal components of the design features. The endogenous variable in regression (7) is the simple average of the individual design-feature scores. While the results are broadly similar across the alternative specifications, a few differences emerge. In particular, the role of inflation and fiscal deficits lacks robustness again.

Although not reported here, we also experimented with specifications including the alternative political-environment variables (*Democracy*, *Executive Constraints*, and *Political Competition*). These experiments show much the same results as those obtained when political institutions are proxied by *Polity*.

Table 7 presents Heckman selection regressions for each of the design features that make up the composite moral hazard indices. First-stage coefficients are virtually identical to those reported in columns 4 to 8 of Table 6 (not reported). While second-stage estimates are similar across specifications, a few noticeable differences emerge. For example, while countries with a large proportion of small banks generally adopt fewer risk controls, they tend not to cover foreign-currency deposits. This may be because foreign-currency deposits flow largely to a country's largest banks, so that small banks have little incentive to lobby for this form of coverage. Also, whereas previous regressions indicated that moral-hazard indices were not significantly influenced by the occurrence of banking crises, in this regression coverage tends to increase in countries that experience banking crises. This finding is consistent with evidence presented by Hovakimian et al. (2003) that systems adopted in crisis circumstances tend to be poorly designed.

6. Conclusions

Analyzing data covering the experience of up to 180 countries over the past four decades, this paper studies determinants of the adoption and design of explicit deposit insurance systems. Regression results confirm that the interplay of private and public interests influences the adoption and design of deposit insurance schemes. Within countries, outside influences and internal political factors significantly modify the intersectoral contracting process.

Three principal findings emerge. First, countries with more-democratic environments and countries with a larger proportion of risky banks are more likely both to adopt deposit insurance and to design it with fewer risk controls. Other things equal, systems that allow sectoral interests to negotiate more openly with one another appear more likely both to adopt deposit insurance and to design it poorly. Second, deposit insurance is more likely to be adopted during financial crises, presumably because representatives for sectoral interests find it easier to negotiate regulatory reform in distressed circumstances. Third, external pressures from institutions such as the International Monetary Fund, the World Bank and the European Union influence the domestic decision-making process. Pressure to emulate developed-country regulatory frameworks appears to promote adoption of deposit insurance, but when accompanied by expert advice, also to dispose a country toward better design. These inferences prove robust to a host of different statistical methods and control variables.

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Table 1. Explicit deposit insurance systems at year-end 2003

This table lists the countries that adopted explicit deposit insurance systems by year-end 2003. All data refer to year-end 2003. We refer to the data section of this paper for details about the data sources and variable definitions. GDP per capita are from International Financial Statistics (IFS). The following "non-adopting" countries are included in our sample: Afghanistan, Angola, Armenia, Australia, Azerbaijan, Barbados, Belize, Benin, Bhutan, Bolivia[e], Botswana, Brunei, Burkina Faso, Burundi, Cambodia, Cameroon[g], Cape Verde, Central African Republic[g], Chad[g], China, Comoro Islands, Costa Rica, Cote d'Ivoire, Cuba, Djibouti, Egypt, Equatorial Guinea[g], Eritrea, Ethiopia, Fiji, Gabon[g], Gambia, Georgia, Ghana, Grenada, Guinea, Guinea-Bissau, Guyana, Haiti, Hong Kong (China), Iran, Iraq, Israel, Kiribati, Kyrgyz Republic, Laos, Lesotho, Liberia, Libya, Madagascar, Malawi, Maldives, Mali, Mauritania, Mauritius, Moldova[d], Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, New Zealand, Niger, Pakistan, Panama, Papua New Guinea, Qatar, Republic of Congo[g], Rwanda, Saudi Arabia, Senegal, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, St. Lucia, Sudan, Suriname, Swaziland, Syria, Tajikistan, Togo, Tunisia, United Arab Emirates, Uruguay[f], Uzbekistan, Vanuatu, W. Samoa, Yemen, Zaire, Zambia. Total sample consists of 181 countries.

Country	Date enacted	Unlimited guarantee (1=Yes; 0=No)	Coverage limit (in US$)	GDP per capita (in US$)	Coverage limit to per capita GDP	Foreign deposits covered (1=Yes; 0=No)	Interbank deposits covered (1=Yes; 0=No)	Coinsurance (1=No; 0=Yes)	Payment (1=Per account; 0=Per depositor)	Funded (1=Yes; 0=No)	Risk-adjusted premiums (1=No; 0=Yes)	Public administration (1=Yes; 0=No)	Public funding (1=Yes; 0=No)	Compulsory Membership (0=No; 1=Yes)
Albania	2002	0	6,568	1,811	3.6	1	0	0[h]	0	1	1	1	0	0
Algeria	1997	0	8,263	2,135	3.9	0	0	0	1	1	1	0	0	0
Argentina	1979	0	10,327	3,410	3.0	1	0	1	1	1	0	0	0	0
Austria	1979	0	25,260	31,429	0.8	1	0	0	1	0	1	0	0	0
Bahamas	1999	0	50,000	17,497	2.9	0	0	1	1	1	1	1	0	0
Bahrain	1993	0	39,894	13,741	2.9	1	0	1	1	0	1	0	0	0
Bangladesh	1984	0	1,021	380	2.7	0	0	1	1	1	1	1	0	0
Belarus	1996	0	1,000	1,805	0.6	1	0	0[i]	1	1	0	1	0	0
Belgium	1974	0	25,260	29,320	0.9	1	0	0	1	1	1	0	0	0
Bosnia-Herzegovina	1998	0	3,228	1,812	1.8	1	1	1	1	1	1	1	0	0
Brazil	1995	0	6,925	2,788	2.5	0	0	1	1	1	1	0	0	0
Bulgaria	1995	0	9,686	2,549	3.8	1	0	1	0	1	0	0	0	0
Canada	1967	0	46,425	27,080	1.7	0	1	1	1	1	1	1	0	0
Chile	1986	0	3,764	4,620	0.8	1	0	0[i]	0	0	1	1	1	0
Colombia	1985	0	7,192	1,796	4.0	0	1	0	0	1	1	1	0	0
Croatia	1997	0	16,343	6,484	2.5	1	0	1	0	1	1	1	0	0
Cyprus	2000	0	25,260	16,134	1.6	0	0	0	0	1	1	0	0	0
Czech Rep.	1994	0	31,575	8,881	3.6	1	0	0	0	1	1	1	0	0
Denmark[c]	1988	0	40,296	39,182	1.0	1	0	1	0	1	1	0	0	0
Dominican Republic	1962	1	Full	1,889	n.a.	1	0	1	n.a.	1	1	0	0	1
Ecuador	1999	1	Full	2,232	n.a.	1	0	1	0	1	1	1	n.a.	0

Country	Date enacted	Unlimited guarantee (1=Yes; 0=No)	Coverage limit (in US$)	GDP per capita (in US$)	Coverage limit to per capita GDP	Foreign deposits covered (1=Yes; 0=No)	Interbank deposits covered (1=Yes; 0=No)	Coinsurance (1=No; 0=Yes)	Payment (1=Per account; 0=Per depositor)	Funded (1=Yes; 0=No)	Risk-adjusted premiums (1=No; 0=Yes)	Public administration (1=Yes; 0=No)	Public funding (1=Yes; 0=No)	Compulsory Membership (0=No; 1=Yes)
El Salvador	1999	0	4,720	2,265	2.1	1	0	1	0	1	0	1	0	0
Estonia	1998	0	8,058	6,790	1.2	1	0	0	0	1	1	0	0	0
Finland	1969	0	31,863	31,034	1.0	1	0	1	0	1	0	0	0	0
France	1980	0	88,410	29,805	3.0	1	0	1	0	0	1	0	0	0
Germany	1966	0	25,260	29,602	0.9	1	0	0	0	1	1	0	0	0
Gibraltar	1998	0	25,260	n.a.	n.a.	1	0	0	0	0	1	0	0	0
Greece	1993	0	25,260	15,700	1.6	1	0	1	0	1	1	0	0	0
Guatemala	1999	0	2,487	2,074	1.2	1	1	1	0	1	1	1	0	0
Honduras	1999	0	9,297	996	9.3	1	1	1	0	1	1	0	0	0
Hungary	1993	0	14,429	8,209	1.8	1	0	1	0	1	0	0	0	0
Iceland	1985	0	29,455	35,905	0.8	1	0	1	0	1	1	1	0	0
India	1961	0	2,193	564	3.9	1	0	1	0	1	1	1	0	0
Indonesia	1998	1	Full	1,106	n.a.	1	n.a.	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ireland	1989	0	25,260	38,074	0.7	1	0	0	0	1	1	1	0	0
Isle of Man	1991	0	35,694	29,424	1.2	1	0	0	0	0	1	1	0	0
Italy	1987	0	130,457	25,471	5.1	1	0	1	0	0	0	0	0	0
Jamaica	1998	0	4,957	3,131	1.6	1	0	1	0	1	1	1	0	0
Japan	1971	0	93,371	33,637	2.8	0	0	1	0	1	1	0	0	0
Jordan	2000	0	14,104	1,979	7.1	0	0	0	0	1	1	1	0	0
Kazakstan	1999	0	2,774	2,068	1.3	1	0	0	0	1	0	1	0	1
Kenya	1985	0	1,313	459	2.9	1	1	1	0	1	1	1	0	0
Korea	1996	0	41,925	12,710	3.3	0	0	1	0	1	1	1	0	0
Kuwait	1982	0	Full	19,279	n.a.	1	n.a.	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Latvia	1998	0	5,545	4,810	1.2	1	0	1	0	1	1	1	0	0
Lebanon	1967	0	3,317	5,703	0.6	0	1	1	0	1	1	0	0	0
Liechtenstein	1992	0	25,260	n.a.	n.a.	1	0	1	0	0	1	1	0	0
Lithuania	1996	0	16,293	5,369	3.0	1	0	0[k]	0	1	1	1	0	0
Luxembourg	1989	0	25,260	60,092	0.4	1	0	0	0	0	1	0	0	0
Macedonia	1996	0	25,260	2,285	11.1	1	0	0[l]	0	1	0	0	0	1
Malaysia	1998	1	Full	4,254	n.a.	1	n.a.	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Country	Date enacted	Unlimited guarantee (1=Yes; 0=No)	Coverage limit (in US$)	GDP per capita (in US$)	Coverage limit to per capita GDP	Foreign deposits covered (1=Yes; 0=No)	Interbank deposits covered (1=Yes; 0=No)	Coinsurance (1=No; 0=Yes)	Payment (1=Per account; 0=Per depositor)	Funded (1=Yes; 0=No)	Risk-adjusted premiums (1=No; 0=Yes)	Public administration (1=Yes; 0=No)	Public funding (1=Yes; 0=No)	Compulsory Membership (0=No; 1=Yes)
Malta	2003	0	25,260	12,169	2.1	1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Marshall Islands	1975	0	100,000	2,171	46.1	1	1	1	0	1	0	1	0	1
Mexico	1986	0	2,871,337	6,327	453.9 [a]	1	0	1	0	1	1	1	0	0
Micronesia	1963	0	100,000	2,132	46.9	1	1	1	0	1	0	1	0	1
Netherlands	1979	0	25,260	31,601	0.8	1	0	1	0	0	1	1	0	0
Nicaragua	2001	0	20,000	779	25.7	1	0	1	0	1	1	1	0	0
Nigeria	1988	0	366	463	0.8	0	1	1	1	1	1	1	0	0
Norway	1961 [b]	0	299,401	48,193	6.2	1	0	1	0	1	1	0	0	0
Oman	1995	0	52,016	8,600	6.0	1	0	0 [m]	0	1	1	1	0	0
Paraguay	2003	0	10,500	1,026	10.2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Peru	1992	0	19,773	2,238	8.8	1	0	1	0	1	0	0	0	0
Philippines	1963	0	1,800	1,004	1.8	1	1	1	0	1	1	1	0	0
Poland	1995	0	28,418	5,669	5.0	1	0	0 [n]	0	1	1	0	0	0
Portugal	1992	0	31,575	14,108	2.2	1	0	1	0	1	0	1	0	0
Romania	1996	0	3,842	2,737	1.4	1	0	1	0	1	0	0	0	0
Russia	2003	0	6,098	2,984	2.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Serbia and Montenegro	2001	0	87	2,535	0.0	1	0	0	0	1	1	1	0	0
Slovak Republic	1996	0	25,260	6,072	4.2	1	0	0	0	1	1	0	0	0
Slovenia	2001	0	26,931	14,065	1.9	1	0	0	0	0	1	1	0	0
Spain	1977	0	25,260	20,974	1.2	1	0	0	0	1	1	0	0	0
Sri Lanka	1987	0	1,034	948	1.1	0	0	1	0	1	1	1	0	1
Sweden	1996	0	34,364	33,670	1.0	1	0	1	0	1	0	1	0	0
Switzerland	1984	0	24,254	43,848	0.6	0	0	1	0	0	1	0	0	1
Taiwan	1985	0	29,420	13,288	2.2	0	0	1	1	1	1	1	0	1
Tanzania	1994	0	235	279	0.8	0	0	1	0	1	1	0	0	0
Thailand	1997	1	Full	2,263	n.a.	1	1	1	1	0	n.a.	n.a.	n.a.	n.a.
Trinidad & Tobago	1986	0	7,937	8,297	1.0	0	0	1	0	1	1	1	0	0
Turkey	1983	1	Full	3,399	n.a.	1	0	1	1	1	0	1	0	0
Uganda	1994	0	1,550	233	6.7	0	0	1	0	1	1	1	0	0
Ukraine	1998	0	281	1,049	0.3	1	0	1	0	1	1	1	0	0

Country	Date enacted	Unlimited guarantee (1=Yes; 0=No)	Coverage limit (in US$)	GDP per capita (in US$)	Coverage limit to per capita GDP	Foreign deposits covered (1=Yes; 0=No)	Interbank deposits covered (1=Yes; 0=No)	Coinsurance (1=No; 0=Yes)	Payment (1=Per account; 0=Per depositor)	Funded (1=Yes; 0=No)	Risk-adjusted premiums (1=No; 0=Yes)	Public administration (1=Yes; 0=No)	Public funding (1=Yes; 0=No)	Compulsory Membership (0=No; 1=Yes)
United Kingdom	1982	0	19,611	30,173	0.6	1	0	0 [o]	0	0	1	1	0	0
United States	1934	0	100,000	37,658	2.7	1	1	1	1	1	0	1	0	0
Venezuela	1985	0	6,258	3,250	1.9	0	0	1	0	1	1	1	0	0
Vietnam	2000	0	1,948	488	4.0	n.a.	n.a.	1	0	n.a.	n.a.	n.a.	n.a.	n.a.
Zimbabwe	2003	0	3,640	615	5.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

[b] In Norway, a private guarantee fund for savings banks with voluntary membership had been in place since 1921, with membership becoming obligatory in 1924. A private guarantee fund for commercial banks was first introduced in 1938. Both guarantee funds were not pure deposit insurance schemes but had wide mandates to support member banks in liquidity or solvency crisis.

[c] Banks in Greenland with Danish ownership are covered by the Danish deposit insurance scheme.

[d] Moldova has adopted deposit insurance in 2004.

[e] While Bolivia does not have a formal deposit insurance system, it has a Financial Restructuring Fund set up in December 2001 that acts as deposit insurance.

[f] Uruguay has established a deposit insurance system in 2002 (Law on protection of bank deposits was enacted on December 27, 2002, creating a bank deposits collateral fund and a Superintendency of Bank Savings Protection), but it is not yet regulated.

[g] A proposal for explicit deposit insurance was drafted in 1999 by these 6 Francophone African countries but the proposal has only been ratified by 2 out of the 6 Communauté Économique et Monétaire de l'Afrique Centrale (CEMAC) countries: Cameroon, Central African Republic, Chad, Equatorial Guinea, Gabon, and Republic of Congo.

[h] Coinsurance of up to 15% (up to 350,000 Lek full insurance, and from 35,000 to 700,000 insurance at 85%).

[i] The equivalent of USD 2000 (per person per bank) is fully covered by insurance. 80% coverage is provided for the next USD 3000 (that is from USD 2000 to USD 5000). Amounts exceeding the equivalent of USD 5000 per person per bank are not insured.

[j] Full guarantee on time deposits; 90% coverage of savings deposits up to a limit of 120 Unidades de Fomento. (1 Unidad de Fomento = US$ 24).

[k] Coverage of 100% up to LTL 10,000 and the balance at 90%.

[l] Coverage of 100% up to 10,000 Euro; 90% next 10,000 Euro.

[m] Coverage is RO 20,000 or 75% of net deposits, whichever is less.

[n] Coverage is 100% of deposits up to 1000 Euro; and 90% from 1000 to 18000 Euro.

[o] Coverage is 100% of the first £2000, and 90% of the next £33,000.

Table 2. Summary statistics

This table presents summary statistics for the endogenous and explanatory variables used in the regressions. See Appendix 1 for a detailed explanation of variables and data sources.

Variable	Mean	Median	Std. dev.	Min	Max	No. obs
Endogenous						
Deposit Insurance	0.17	0.00	0.37	0.00	1.00	7964
Coverage ratio	6.24	2.46	13.72	0.05	117.86	920
Foreign currency deposits	0.75	1.00	0.43	0.00	1.00	1256
Interbank deposits	0.24	0.00	0.43	0.00	1.00	1256
Coinsurance	0.74	1.00	0.44	0.00	1.00	1221
Payment	0.24	0.00	0.42	0.00	1.00	1221
Premiums	0.76	1.00	0.43	0.00	1.00	1250
Administration	0.55	1.00	0.50	0.00	1.00	1250
Membership	0.14	0.00	0.35	0.00	1.00	1250
Moral-hazard composite	0.00	-0.10	1.00	-1.25	4.63	912
Explanatory						
Small Banks	49.88	38.57	43.70	0.00	100.00	7084
Undercapitalized Banks	65.22	66.49	22.46	7.67	98.08	6380
Insurance penetration	3.80	2.45	3.34	0.47	15.95	4400
Pop65	5.78	4.04	3.85	1.00	19.33	7571
Crisis	0.06	0.00	0.24	0.00	1.00	7964
Polity score	-0.20	-3.00	7.64	-10.00	10.00	5667
Democracy score	3.76	1.00	4.20	0.00	10.00	5667
Executive Constraints	3.88	3.00	2.34	1.00	7.00	5667
Political Competition	4.87	3.00	3.77	1.00	10.00	5667
Log of GDP per capita	0.57	0.44	1.55	-3.01	4.03	5847
Bureaucracy	2.13	2.00	1.08	0.00	4.00	6116
Law & Order	3.69	3.58	1.29	0.95	6.00	6116
GDP Growth	3.64	3.89	5.82	-34.86	34.31	5811
Inflation	13.82	6.51	22.33	-31.91	100.00	5788
Fiscal Surplus	-3.18	-2.75	3.21	-18.42	8.81	6336
Capital stringency	4.08	4.00	1.52	1.00	7.00	5500
Restrict	7.28	7.00	2.02	3.00	12.00	5940
Entry	7.46	8.00	1.15	0.00	8.00	5896
Official	10.75	11.00	2.79	4.00	14.00	5940
Contagion	0.16	0.10	0.14	0.01	0.48	7964
IMF	0.11	0.00	0.32	0.00	1.00	7964
WB Loan	0.01	0.00	0.10	0.00	1.00	7964
EU Candidacy	0.01	0.00	0.12	0.00	1.00	7964

Table 3. Correlation matrix

This table shows the bivariate correlation between the variables used in the regressions and the significance level of each correlation coefficient. * indicates significance at the 5% level.

	Deposit insurance	Coverage ratio	Moral hazard composite	Small banks	Undercapitalized banks	Insurance penetration	Pop65	Crisis Dummy	Polity Score	Exec. constraints	GDP per capita	GDP Growth	Inflation	Fiscal surplus	Capital stringency	Restrict	Entry	Official	Contagion	IMF	World Bank Loan
Moral hazard composite		.76*																			
Small banks	-.31*	.10*	.17*																		
Undercapitalized banks	.21*	-.13*	-.14*	-.33*																	
Insurance penetration	.15*	-.28*	-.12*	-.27*	.10*																
Pop65	.29*	-.30*	-.43*	-.41*	.25*	.43*															
Crisis Dummy	.10*	-.01	.02*	.01	.00	-.05*	-.04*														
Polity score	.42*	-.22*	-.21*	-.30*	.22*	.49*	.51*	.04*													
Exec. constraints	.40*	-.23*	-.25*	-.34*	.24*	.49*	.52*	.03	.95*												
GDP per capita	.36*	-.25*	-.33*	-.64*	.26*	.56*	.69*	-.09*	.52*	.54*											
GDP Growth	-.02	.02	.04	-.10*	.04*	.00	-.05*	-.12*	-.06*	-.06*	.02										
Inflation	-.07*	-.05	-.03	.06*	-.03*	-.18*	-.05*	.18*	-.02	-.04*	-.12*	-.26*									
Fiscal surplus	.10*	-.05	-.06	-.09*	.00	.03	.10*	.01	-.03	-.04*	.21*	.03*	-.09*								
Capital stringency	.06*	-.02	-.24*	-.06*	.09*	.11*	.01	-.04*	.04*	.05*	.05*	.04*	-.04*	.12*							
Restrict	-.12*	.31*	.35*	.28*	-.08*	-.15*	-.27*	.00	-.02	-.03	-.32*	.04*	.06*	-.25*	.05						
Entry	-.06*	.06	.18*	.23*	-.01	-.14*	-.08*	.04*	-.20*	-.21*	-.21*	-.04*	-.04*	.07*	.05*	.09*					
Official	-.04*	.12*	.20*	-.01	-.04	-.10*	-.16*	.04*	-.22*	-.20*	-.09*	.07*	-.03	-.04*	.04*	.06*	.19*				
Contagion	.37*	-.11*	-.12*	.00	.00	.00	.01	.15*	.24*	.21*	.04*	-.11*	.05*	.00	.00	.00	.00	.00			
IMF	.28*	-.10*	-.08*	.00	.00	.00	.01	-.01	.15*	.13*	.02	-.02	-.07*	.00	.00	.00	.00	.00	.74*		
World Bank Loan	.15*	-.04	-.07*	.00	-.01	-.07*	.05*	.02	.09*	.07*	.01	.00	.00	.02	-.08*	.00	.01	.01	.19*	.18*	
EU Candidacy	.16*	-.08*	-.17*	-.03*	-.05*	-.06*	.18*	.05*	.15*	.16*	.07*	.00	.02	.06*	-.05*	-.03	.02	.04*	.19*	.14*	.26*

Table 4. Hazard models of deposit-insurance adoption

This table presents hazard regressions seeking to explain the hazard rate of adopting explicit deposit insurance over the period 1960-2002. The model considers the adoption of deposit insurance as a "transforming event." The endogenous variable is the number of years between 1960 and the adoption date. The assumed distribution of the hazard function is Weibull. The coefficients reported are the logarithms of the underlying relative-hazard coefficients. Regressions 2 to 4 consider alternative proxies for political institutions. Regression 5 controls for the scope and quality of bank regulations and supervision. Regression 6 includes additional proxies for the institutional environment of the country. Regressions 7 to 10 add external influence variables, using alternative proxies for political institutions. The number of adopting countries is the number of countries that have adopted deposit insurance during the observation period. An intercept is used but not shown. Lin and Wei (1989) standard errors are shown in brackets. The standard errors are adjusted for clustering at the country-level. *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Small Banks	-0.013**	-0.013**	-0.012**	-0.013***	-0.015**	-0.017***	-0.016**	-0.017**	-0.016**	-0.016**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Undercapitalized Banks	0.013**	0.013*	0.012*	0.013**	0.016**	0.015*	0.015**	0.015**	0.015**	0.016**
	(0.007)	(0.007)	(0.006)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Pop65	0.053	0.053	0.057	0.046	0.040	0.031	-0.007	-0.005	0.003	-0.005
	(0.045)	(0.045)	(0.043)	(0.046)	(0.051)	(0.052)	(0.055)	(0.055)	(0.053)	(0.056)
Crisis	1.220***	1.227***	1.192***	1.237***	1.104***	1.084***	0.751	0.773	0.758	0.781*
	(0.304)	(0.307)	(0.309)	(0.296)	(0.410)	(0.415)	(0.495)	(0.501)	(0.505)	(0.474)
Polity	0.058**				0.098**	0.101***	0.091**			
	(0.027)				(0.039)	(0.039)	(0.039)			
Democ		0.102**						0.164**		
		(0.049)						(0.066)		
Executive constraints			0.181**						0.292**	
			(0.085)						(0.114)	
Political competition				0.133**						0.170**
				(0.055)						(0.073)
Log of GDP per capita	-0.026	-0.044	-0.015	-0.044	-0.269	-0.277	-0.168	-0.237	-0.188	-0.204
	(0.178)	(0.182)	(0.176)	(0.176)	(0.271)	(0.280)	(0.290)	(0.292)	(0.284)	(0.299)
Real GDP growth	-0.016	-0.016	-0.015	-0.017	-0.003	-0.001	-0.032	-0.028	-0.025	-0.032
	(0.027)	(0.026)	(0.026)	(0.027)	(0.032)	(0.031)	(0.034)	(0.033)	(0.031)	(0.034)
Inflation	-0.007	-0.006	-0.006	-0.007	-0.017*	-0.018*	-0.018	-0.017	-0.017	-0.017
	(0.006)	(0.006)	(0.006)	(0.006)	(0.010)	(0.010)	(0.012)	(0.011)	(0.011)	(0.011)
Fiscal surplus	0.070*	0.072*	0.069*	0.075*	0.094	0.081	0.046	0.057	0.054	0.055
	(0.041)	(0.042)	(0.041)	(0.041)	(0.069)	(0.068)	(0.067)	(0.065)	(0.063)	(0.066)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Insurance penetration					-0.102	-0.070	-0.045	-0.044	-0.048	-0.030
					(0.065)	(0.066)	(0.067)	(0.067)	(0.068)	(0.063)
Capital Stringency					0.015	0.032	0.013	0.010	0.016	0.021
					(0.094)	(0.093)	(0.093)	(0.094)	(0.091)	(0.095)
Restrict					-0.178*	-0.177*	-0.141	-0.140	-0.127	-0.125
					(0.095)	(0.095)	(0.099)	(0.099)	(0.099)	(0.093)
Entry					-0.067	-0.062	-0.032	-0.036	-0.046	-0.036
					(0.093)	(0.087)	(0.090)	(0.089)	(0.089)	(0.090)
Official					0.011	0.002	0.025	0.022	0.013	0.010
					(0.054)	(0.055)	(0.067)	(0.067)	(0.067)	(0.064)
Bureaucracy						-0.355	-0.257	-0.261	-0.304	-0.233
						(0.284)	(0.316)	(0.317)	(0.320)	(0.314)
Law and Order						0.177	0.147	0.154	0.181	0.143
						(0.230)	(0.232)	(0.233)	(0.240)	(0.228)
WB							0.775	0.755	0.883	0.572
							(0.586)	(0.606)	(0.572)	(0.552)
EU Candidacy							1.092***	1.015**	0.922**	1.244***
							(0.411)	(0.426)	(0.422)	(0.423)
Observations	3175	3175	3175	3175	1808	1786	1786	1786	1786	1786
Number of countries	119	119	119	119	72	71	71	71	71	71
Number of adopting countries	63	63	63	63	50	50	50	50	50	50
Model χ^2	92.73	92.21	87.31	96.87	60.94	67.53	101.18	99.66	99.28	106.95
Evolutionary parameter α	2.16	2.17	2.15	2.14	2.29	2.31	2.06	2.10	2.08	2.05

Table 5. Alternative models of deposit-insurance adoption

This table presents regressions that explain the adoption of explicit deposit insurance over the period 1960-2002. Regressions 1 and 2 are based on a proportional Cox (1972) hazard model. The endogenous variable is the number of years between 1960 and the adoption date. Regressions 3 and 4 are based on a Probit model with year-fixed effects. Regressions 5 and 6 are based on a Probit model without year-fixed effects. The endogenous variable is the explicit deposit-insurance indicator. We drop observations after deposit insurance is adopted in the country. An intercept is used but not shown. For regressions 1 and 2, Lin and Wei (1989) standard errors are shown in brackets. For regressions 3 to 6, White standard errors are shown in brackets. The standard errors are adjusted for clustering at the country-level. *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Small Banks	-0.014***	-0.018**	-0.007***	-0.010***	-0.006***	-0.009***
	(0.005)	(0.007)	(0.002)	(0.003)	(0.002)	(0.003)
Undercapitalized Banks	0.014**	0.017**	0.008**	0.010***	0.008***	0.009**
	(0.006)	(0.007)	(0.003)	(0.004)	(0.003)	(0.004)
Pop65	0.066	-0.009	0.033	-0.008	0.009	-0.009
	(0.042)	(0.054)	(0.020)	(0.026)	(0.020)	(0.025)
Crisis	1.097***	0.771	0.520***	0.411	0.476***	0.427*
	(0.318)	(0.491)	(0.173)	(0.253)	(0.179)	(0.245)
Polity	0.048*	0.088**	0.020*	0.041***	0.017	0.035**
	(0.028)	(0.039)	(0.011)	(0.016)	(0.011)	(0.015)
Log of GDP per capita	0.023	-0.199	0.013	-0.110	0.033	-0.076
	(0.177)	(0.306)	(0.082)	(0.135)	(0.079)	(0.131)
Real GDP growth	-0.031	-0.031	-0.010	-0.009	-0.014	-0.009
	(0.025)	(0.034)	(0.012)	(0.015)	(0.011)	(0.015)
Inflation	-0.003	-0.013	-0.000	-0.004	-0.001	-0.004
	(0.006)	(0.011)	(0.003)	(0.004)	(0.003)	(0.004)
Fiscal surplus	0.069	0.049	0.035*	0.024	0.024	0.019
	(0.045)	(0.073)	(0.021)	(0.031)	(0.019)	(0.029)
Insurance penetration		-0.039		-0.017		-0.023
		(0.069)		(0.036)		(0.034)
Bureaucracy		-0.273		-0.181		-0.130
		(0.332)		(0.160)		(0.162)
Law and Order		0.206		0.117		0.093
		(0.250)		(0.119)		(0.114)
Capital Stringency		-0.001		0.009		0.013
		(0.093)		(0.045)		(0.043)

Restrict		-0.150		-0.081		-0.065
		(0.103)		(0.050)		(0.046)
Entry		-0.019		-0.013		-0.019
		(0.091)		(0.040)		(0.040)
Official		0.020		-0.006		-0.007
		(0.071)		(0.030)		(0.028)
WB		0.563		0.631*	0.808**	0.594
		(0.580)		(0.371)	(0.331)	(0.374)
EU Candidacy		1.135**		0.820***	0.737***	0.663***
		(0.495)		(0.279)	(0.201)	(0.212)
IMF					-0.318	-0.523
					(0.249)	(0.327)
Contagion					2.900***	3.356***
					(0.675)	(0.819)
Observations	3175	1786	2087	1062	3176	1062
Countries	119	71	119	71	119	71
Number of adopting countries	63	50	63	50	63	50
Chi-squared	87.24	61.07	126.29	168.60	154.56	168.60
Pseudo-R2	--	--	0.17	0.16	0.20	0.16

Table 6. Heckman two-step selection model for deposit-insurance coverage and other design features

This table reports a series of Heckman two-stage selection regressions for design features. The endogenous variable in the first-stage regression (selection equation) is the explicit deposit insurance indicator. The endogenous variable in the second-stage (design equation) is a composite moral hazard index. In regressions (1) to (4), we use the moral hazard index based on the first principal component of following design features: Coverage ratio, Foreign currency deposits, Interbank deposits, Coinsurance, Payment, Premiums, Administration, and Membership. In regression (5), we use the moral hazard index based on the first two principal components of the design features. In regression (6), we use the moral hazard index based on the first three principal components of the design features. In regression (7), we use the moral hazard that is the simple average of the design feature variables. All design features have been transformed to standardized variables (with mean zero and standard deviation of one) for the principal component calculations. We report Heckman's (1979) two-step efficient estimates. Model (2) includes year-fixed effects in both the first-stage and second-stage regression. Model (3) adds the Contagion variable as selection variable to the first-stage regression. Models (4) to (7) add the external influence variables to the first-stage and second-stage regressions. Standard errors are shown in brackets and *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Second-stage: Design							
Small Banks	-0.000	-0.003	0.003*	0.005***	0.019***	0.012***	0.014***
	(0.004)	(0.003)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)
Undercapitalized Banks	0.006	0.009***	0.004**	0.000	0.005*	0.012***	0.030***
	(0.005)	(0.003)	(0.002)	(0.001)	(0.003)	(0.004)	(0.005)
Insurance penetration	0.088**	0.078***	0.095***	0.084***	0.127***	0.099***	0.115***
	(0.037)	(0.019)	(0.014)	(0.013)	(0.022)	(0.031)	(0.042)
Pop65	-0.058***	-0.048***	-0.055***	-0.028***	-0.124***	-0.114***	-0.140***
	(0.009)	(0.011)	(0.008)	(0.008)	(0.013)	(0.019)	(0.026)
Crisis	0.197	0.138	0.055	0.081	0.156	0.033	0.112
	(0.237)	(0.110)	(0.077)	(0.070)	(0.117)	(0.170)	(0.231)
Polity	0.047	0.055***	0.024***	0.021***	0.050***	0.058***	0.038*
	(0.047)	(0.019)	(0.007)	(0.006)	(0.010)	(0.015)	(0.021)
Log of GDP per capita	-0.202***	-0.305***	-0.188***	-0.263***	-0.315***	-0.537***	-1.346***
	(0.034)	(0.077)	(0.031)	(0.029)	(0.049)	(0.071)	(0.097)
Bureaucracy	-0.065	-0.007	-0.079	-0.167***	0.180**	-0.052	0.199
	(0.061)	(0.076)	(0.054)	(0.050)	(0.084)	(0.122)	(0.165)
Law and Order	0.021	0.050	0.042	0.137***	0.054	0.560***	0.744***
	(0.059)	(0.048)	(0.038)	(0.036)	(0.060)	(0.087)	(0.118)
Real GDP growth	-0.010	-0.006	-0.002	0.008	0.009	0.007	0.047**
	(0.017)	(0.009)	(0.008)	(0.007)	(0.012)	(0.017)	(0.023)
Inflation	-0.006	-0.007**	-0.003*	-0.002	-0.006**	-0.001	-0.021***
	(0.007)	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)	(0.005)

Fiscal surplus	-0.029*	-0.020	-0.035***	-0.017*	0.028	0.040	0.071**
	(0.016)	(0.016)	(0.011)	(0.011)	(0.018)	(0.026)	(0.035)
Capital Stringency	-0.160***	-0.166***	-0.163***	-0.213***	-0.459***	-0.523***	-0.470***
	(0.018)	(0.021)	(0.016)	(0.016)	(0.026)	(0.038)	(0.052)
Restrict	0.020	0.005	0.052***	0.063***	0.058***	0.032	-0.113***
	(0.056)	(0.030)	(0.014)	(0.013)	(0.022)	(0.031)	(0.043)
Entry	0.186***	0.181***	0.176***	0.193***	0.343***	0.436***	0.496***
	(0.018)	(0.021)	(0.016)	(0.014)	(0.024)	(0.035)	(0.047)
Official	0.041	0.041**	0.027***	0.028***	0.093***	0.255***	0.142***
	(0.030)	(0.016)	(0.011)	(0.010)	(0.016)	(0.023)	(0.032)
WB				-0.599***	-0.842***	-1.225***	-1.225***
				(0.107)	(0.181)	(0.263)	(0.357)
EU Candidacy				-0.736***	-1.827***	-2.243***	-3.092***
				(0.095)	(0.161)	(0.233)	(0.316)
Heckman's lambda	0.571	0.848***	0.284***	0.129**	0.233**	0.273**	0.506***
	(0.644)	(0.287)	(0.058)	(0.055)	(0.093)	(0.136)	(0.183)
First-stage: DI							
Small Banks	-0.009***	-0.019***	-0.018***	-0.018***	-0.018***	-0.018***	-0.018***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Undercapitalized Banks	0.012***	0.018***	0.018***	0.018***	0.018***	0.018***	0.018***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Insurance penetration	-0.081***	-0.032*	-0.040**	-0.040**	-0.040**	-0.040**	-0.040**
	(0.015)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Pop65	-0.000	0.015	0.005	0.001	0.001	0.001	0.001
	(0.011)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Crisis	0.542***	0.306**	0.412***	0.405***	0.405***	0.405***	0.405***
	(0.114)	(0.124)	(0.121)	(0.121)	(0.121)	(0.121)	(0.121)
Polity	0.101***	0.100***	0.095***	0.095***	0.095***	0.095***	0.095***
	(0.006)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Log of GDP per capita	0.006	-0.394***	-0.306***	-0.297***	-0.297***	-0.297***	-0.297***
	(0.042)	(0.054)	(0.051)	(0.052)	(0.052)	(0.052)	(0.052)
Bureaucracy	0.014	0.132	0.167**	0.174**	0.174**	0.174**	0.174**
	(0.073)	(0.086)	(0.085)	(0.086)	(0.086)	(0.086)	(0.086)
Law and Order	-0.085*	0.043	0.014	0.010	0.010	0.010	0.010
	(0.048)	(0.056)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
Real GDP growth	-0.034***	-0.011	-0.014	-0.015*	-0.015*	-0.015*	-0.015*

	(0.007)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Inflation	-0.015***	-0.012***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Fiscal surplus	0.024*	0.056***	0.047***	0.045***	0.045***	0.045***	0.045***
	(0.014)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Capital Stringency	0.005	-0.011	-0.012	-0.011	-0.011	-0.011	-0.011
	(0.021)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Restrict	-0.126***	-0.149***	-0.141***	-0.141***	-0.141***	-0.141***	-0.141***
	(0.019)	(0.022)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Entry	0.008	0.032	0.028	0.028	0.028	0.028	0.028
	(0.021)	(0.025)	(0.025)	(0.024)	(0.024)	(0.024)	(0.024)
Official	0.065***	0.066***	0.066***	0.066***	0.066***	0.066***	0.066***
	(0.014)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
WB				0.076	0.076	0.076	0.076
				(0.227)	(0.227)	(0.227)	(0.227)
EU Candidacy				0.155	0.155	0.155	0.155
				(0.180)	(0.180)	(0.180)	(0.180)
Contagion			5.999***	5.907***	5.907***	5.907***	5.907***
			(0.301)	(0.317)	(0.317)	(0.317)	(0.317)
Observations	2450	2450	2450	2450	2450	2450	2450
Censored observations	1739	1739	1739	1739	1739	1739	1739

Table 7. Heckman two-step selection model for deposit-insurance design features: individual design features

This table reports a series of Heckman two-stage selection regressions for design features. The endogenous variable in the first-stage regression (selection equation) is the explicit deposit insurance indicator. The endogenous variable in the second-stage (design equation) is one of the following design features that make up the moral hazard index: Coverage ratio, Foreign currency deposits, Interbank deposits, Coinsurance, Payment, Premiums, Administration, or Membership. All design features have been transformed to standardized variables (with mean zero and standard deviation of one). We report Heckman's (1979) two-step efficient estimates. All models include the Contagion variable as selection variable in the first-stage regression. We do not report the first-stage regressions as the output is very similar to the first-stage regressions reported in columns (4) to (8) of Table 6. Standard errors are shown in brackets and *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Second-stage: Design	(1) Coverage ratio	(2) Foreign currency deposits	(3) Interbank deposits	(4) Coinsurance	(5) Payment	(6) Premiums	(7) Administration	(8) Membership
Small Banks	-0.021**	-0.007***	0.002***	0.002***	-0.000	0.004***	0.004***	0.001***
	(0.010)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Undercapitalized Banks	0.005	0.000	0.004***	-0.004***	0.004***	0.007***	0.002***	0.000
	(0.012)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Insurance penetration	-0.288***	-0.019**	-0.008	0.039***	-0.048***	-0.004	0.075***	0.007***
	(0.103)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.003)
Pop65	0.075	0.031***	-0.011**	-0.021***	-0.020***	-0.019***	-0.023***	-0.001
	(0.063)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.002)
Crisis	1.932***	-0.028	0.072*	0.070	0.044	0.011	-0.178***	0.007
	(0.564)	(0.039)	(0.040)	(0.044)	(0.041)	(0.041)	(0.043)	(0.014)
Polity	0.097*	-0.015***	0.010***	0.003	0.005	0.001	0.010***	-0.000
	(0.050)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)
Log of GDP per capita	-0.277	-0.149***	-0.077***	-0.157***	0.032*	0.009	-0.293***	0.019***
	(0.235)	(0.018)	(0.019)	(0.020)	(0.019)	(0.019)	(0.019)	(0.007)
Bureaucracy	1.623***	-0.172***	0.158***	-0.194***	0.102***	0.243***	-0.094***	0.003
	(0.404)	(0.031)	(0.032)	(0.035)	(0.032)	(0.032)	(0.033)	(0.011)
Law and Order	-1.687***	0.232***	-0.064***	0.226***	0.145***	-0.200***	0.133***	-0.050***
	(0.286)	(0.022)	(0.022)	(0.024)	(0.023)	(0.022)	(0.023)	(0.008)
Real GDP growth	0.036	0.003	-0.000	-0.002	0.000	0.001	0.013***	0.003*
	(0.056)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.001)
Inflation	-0.033***	0.001*	-0.003***	0.002*	0.005***	-0.007***	0.000	-0.001***
	(0.013)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Fiscal surplus	0.116	0.000	0.058***	-0.022***	-0.021***	0.045***	0.004	-0.029***
	(0.085)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.002)

Capital Stringency	-0.309**	0.104***	-0.094***	-0.098***	-0.041***	0.019*	-0.112***	0.001
	(0.126)	(0.009)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)	(0.003)
Restrict	0.400***	-0.035***	-0.023***	0.024***	0.001	-0.045***	0.004	0.011***
	(0.104)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)	(0.003)
Entry	0.317***	-0.047***	0.082***	0.085***	0.061***	-0.038***	0.033***	0.018***
	(0.116)	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.009)	(0.003)
Official	0.179**	-0.012**	0.039***	-0.044***	0.069***	0.007	0.028***	-0.020***
	(0.078)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.002)
WB	0.957	0.028	-0.263***	-0.441***	-0.043	0.202***	-0.116	-0.002
	(0.881)	(0.068)	(0.071)	(0.076)	(0.071)	(0.070)	(0.072)	(0.024)
EU Candidacy	-1.329*	0.187***	-0.298***	-0.381***	-0.364***	-0.003	-0.628***	0.039*
	(0.775)	(0.059)	(0.061)	(0.066)	(0.062)	(0.061)	(0.063)	(0.021)
Heckman's lambda	2.378***	-0.077**	0.215***	0.037	0.052	-0.023	-0.128***	0.005
	(0.443)	(0.034)	(0.034)	(0.038)	(0.036)	(0.035)	(0.036)	(0.012)
Observations	2450	2519	2519	2519	2519	2513	2513	2513
Censored observations	1739	1739	1739	1739	1739	1739	1739	1739

Appendix 1. Variable definitions and data sources

Whenever we indicate the data source as "Authors' calculation", we refer to the data section of this paper for details about the data sources and variable definitions.

Variable	Definition	Source
Deposit Insurance	Equals 1 if the country has explicit deposit insurance (including blanket guarantees), and 0 if it has implicit deposit insurance.	Authors' calculation
Coverage ratio	Coverage limit of deposit insurance scheme in local currency divided by GDP per capita. Missing for countries with full coverage.	Authors' calculation
Foreign currency deposits	Equals 1 if foreign deposits are covered by the deposit insurance scheme, and 0 if they are not covered.	Authors' calculation
Interbank deposits	Equals 1 if interbank deposits are covered by the deposit insurance scheme, and 0 if they are covered.	Authors' calculation
Coinsurance	Equals 1 if deposit insurance scheme has no coinsurance, and 0 if it has coinsurance.	Authors' calculation
Payment	Equals 1 if coverage is per account, and 0 if coverage is per depositor.	Authors' calculation
Premium	Equals 1 if deposit insurance premiums are flat, and 0 if premiums are risk-adjusted.	Authors' calculation
Administration	Equals 1 if the administration of the deposit insurance scheme is public, and 0 if it is private or jointly public and private.	Authors' calculation
Membership	Equals 1 if membership to the deposit insurance scheme is voluntary, and 0 if it is compulsory to all banks.	Authors' calculation
Moral hazard	Principal component of the variables coverage ratio, foreign deposits, interbank deposits, coinsurance, payment, premium, administration, and membership. All variables are standardized with mean of zero and standard deviation of one before conducting the principal component analysis.	Authors' calculation
Small banks	Share of banks in the country with total assets less than US$ 1 billion. Average over the period 1995-99.	Bankscope
Undercapitalized banks	Share of banks in the country with capital-to-asset ratio less than the median capital-to-asset ratio in the country. Average over the period 1995-99.	Bankscope
Insurance penetration	Gross insurance premiums underwritten as a share of GDP. Average over the period 1987-2002.	WDI
Pop65	Share of population age 65 and over.	WDI
Contagion	Fraction of countries in the sample that has adopted explicit deposit insurance at each point in time.	Authors' calculation
IMF	Equals 1 for the years 1999 and onwards (the year 1999 being the year that the IMF endorsed deposit insurance by publishing a paper on best practices and guidelines in deposit insurance), and 0 otherwise.	Garcia (2000)
WB loan	Equals 1 during and following the year that the World Bank started an adjustment lending program with the country for reforms to establish deposit insurance (in addition to possibly other objectives), and 0 otherwise. Equals 1 for the following countries and periods (starting dates between brackets): Albania (2002), Bolivia (1998), Bosnia-Herzegovina (1996), Croatia (1995), El Salvador (1996), Jordan (1995), Lithuania (1996), Nicaragua (2000), Poland (1993), Romania (1996), Russia (1997), Ukraine (1998).	World Bank (2004)
EU Candidate	Equals 1 for the years 1994 and onwards for EU candidate countries only (i.e., Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, Slovenia), and 0 otherwise. The year 1994 was the year when the EU Directive on Deposit Insurance came into force.	European Commission (1994)
Crisis	Equals 1 in years that the country is experiencing a systemic banking crisis, and 0 otherwise.	Caprio et al. (2005)

Variable	Definition	Source
Polity Score	Index combining democracy and autocracy scores. It ranges from –10 to 10, where negative scores are assigned to countries under autocracies and positive values to countries under democracies and –10 and 10 are the extreme cases of these two systems. Autocracies sharply restrict or suppress competitive political participation. Their chief executives are chosen in a regularized process of selection within the political elite, and once in office they exercise power with few institutional constraints.	Polity IV database
Democracy	Index of democracy. It ranges from 0 to 10, with higher scores denoting more democratic systems.	Polity IV database
Executive Constraints	Index measuring the extent of institutionalized constraints on the decision-making powers of chief executives. Such limitations may be imposed by any accountability group. The index ranges from 1 to 7, where 1 represents unlimited authority and 7 Executive parity or subordination.	Polity IV database
Political Competition	Index combining regulation of participation and competitiveness of participation scores. It ranges from 1 to 10, where higher scores represent more political competition. Participation is regulated to the extent that there are binding rules on when, whether, and how political preferences are expressed. The competitiveness of participation refers to the extent to which alternative preferences for policy and leadership can be pursued in the political arena.	Polity IV database
GDP per capita	GDP per capita (constant 1995 thousands of US$).	WDI
Bureaucracy	Index of the institutional strength and quality of the bureaucracy. It ranges from 0 to 4. High points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. Average over the period 1984-2002.	International Country Risk Guide (ICRG)
Law & Order	Index of the quality of a country's legal system and rule of law. Index ranges from 0 to 6, with a higher score indicating higher level of law and order. Average over the period 1984-2002.	International Country Risk Guide (ICRG)
GDP Growth	Real GDP growth rate (in %).	WDI
Inflation	Inflation, GDP deflator (annual %).	WDI
Fiscal surplus	Fiscal surplus to GDP (in %). Negative values denote fiscal deficits. Average over the period 1960-2002.	WDI
Capital regulatory index	Index of the stringency of capital regulations in the banking system, capturing whether the capital requirement reflects certain risk elements and deducts certain market value losses from capital before minimum capital adequacy is determined. Index ranges from 0 to 7. Higher values denote greater stringency. Data refer to the year 2003.	Barth et al. (2006)
Activity restrictions	Index of the degree to which banks can engage in securities underwriting and dealing, insurance underwriting and selling, and real estate investment and management. Index ranges from 3 to 12. Higher scores denote more restrictiveness. Data refer to the year 2003.	Barth et al. (2006)
Entry restrictions	Index of regulatory requirements to obtain a license to set up a bank. Index ranges from 0 to 8. Higher scores indicate greater stringency. Data refer to the year 2003.	Barth et al. (2006)
Official supervisory power	Index of the extent to which supervisory authorities have the authority to discipline banks by taking specific actions to prevent and correct problems. Index ranges from 0 to 14. Higher scores denote greater power. Data refer to the year 2003.	Barth et al. (2006)