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Article

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Deposit Insurance

Deniz Anginer and Ata Can Bertay Deposit Insurance Design and Institutional Environment

Deposit insurance is a widely used and integral part of the financial safety net provided by states across the globe. According to the Bank Regulation and Supervision Survey (BRSS) conducted by the World Bank, over 107 countries have some form of explicit deposit insurance scheme in place as of 2016. This number has increased substantially from 93 in the year 2013.

During and after the global financial crisis (GFC), some countries introduced new deposit insurance schemes and others extended the scope and coverage of their existing schemes to restore confidence in their banking systems. For instance, Australia and Singapore introduced explicit deposit insurance to their banking systems for the first time, whereas Spain and the US increased the limit on the amounts that are covered by deposit insurance. Other countries increased the scope of securities and bank liabilities guaranteed. Most notably, Ireland extended deposit insurance to most bank liabilities, essentially offering a blanket guarantee on bonds, subordinated debt, and interbank deposits. The significant expansion of explicit deposit insurance during the crisis rekindled the debate about the efficacy of deposit insurance schemes and the inevitable moral hazard problems associated with providing state guarantees.

A vast empirical literature established that deposit insurance brings economic benefits by ensuring depositor confidence and preventing bank runs. At the same time, deposit insurance also comes with the unintended consequence of encouraging banks to take on excessive risk. This standard moral hazard problem arises because deposit insurance distorts incentives for bank managers, shareholders, and depositors. Bank managers and shareholders are incentivized to take on higher risk, as they privately capture the upside returns but do not internalize downside losses, which are socialized through the deposit insurance fund. By limiting downside risk, deposit insurance naturally incentivizes greater risk-taking. Depositors also have less of an incentive to be careful in the initial selection of their bank and monitoring its financial condition, as they are protected against losses when there is a bank failure.

As with other financial safety net measures, there is a natural economic trade-off associated with deposit insurance. While it can enhance depositor confidence and reduce the likelihood of bank runs during crisis periods, deposit insurance can also increase moral hazard and make financial systems more vulnerable to crises during good times. From a public policy perspective, it is essential to know the factors and design features that will enhance the stabilization effects of deposit insurance while reducing the inevitable adverse effects. Recent literature suggests that deposit insurance design and implementation can affect how well deposit insurance schemes perform in practice (see Anginer and Demirgüç-Kunt 2018 for a literature review). For instance, limiting coverage and scope and implementing risk-based pricing can help to alleviate moral hazard problems and to internalize banks' risk-taking.

The recent research also emphasizes the role that the larger institutional environment plays in how effective deposit insurance schemes are in practice as well as specific design features that are implemented. In particular, the research suggests that it is vital for countries to cultivate an environment that provides the right set of incentives for supervisors and regulators on the one hand, and private market participants (such as large uninsured depositors, shareholders, and other creditors), on the other, to monitor the banks they invest in. Thus, strong institutions and the rule of law can be crucial for effective public and private monitoring. In this short article, we discuss how the larger institutional environment affects the design, adoption, and performance of deposit insurance schemes using the results from the recent Bank Regulation and Supervision Survey (BRSS) conducted by the World Bank.

In particular, we categorize economies into two groups using a composite measure of institutional quality calculated as the average estimated index of six indicators drawn from the World Governance Indicators. These capture various dimensions of institutional quality such as accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. We compute the average institutional quality on a rolling basis for the years 2005, 2010, and 2016, thus including both the pre- and post-GFC periods. Table 1 provides a list of countries that are covered in the analyses. We classify countries as having high (above median) institutional quality if their composite institutional quality score is above the median of all countries in a given year. Likewise, countries are classified as having low (below median) insti-



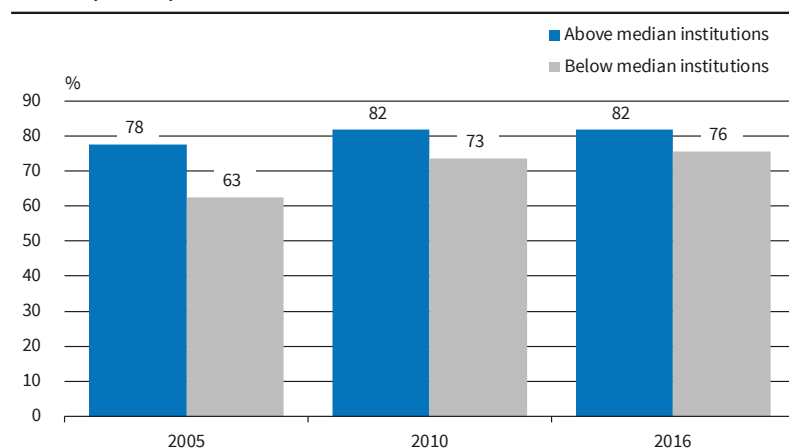
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The World Bank.



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The World Bank.

Figure 1

Use of Explicit Deposit Insurance



Note: The figure presents the percentage of countries with an explicit deposit insurance protection system for banks.
Source: Authors' calculations from BRSS and WGI (2019). © ifo Institute

tutional quality if their composite score is below the median. Countries highlighted in bold in Table A1 are developing countries, indicating that income groups (i.e., high-income vs. developing countries) are not fully capturing the institutional quality differences.

Figure 1 shows how the explicit deposit insurance coverage evolved during the last decade for these two sets of countries. Explicit deposit insurance was quite extensive even before the GFC: 78% of countries with high-quality institutions had it in 2005, compared to 63% of countries with low-quality institutions. After the GFC, explicit deposit insurance became more common across the world, and the adoption rate in low institutional quality countries almost caught up with that of the high-quality institutions group in 2016.

Cross-country analyses of deposit insurance schemes show that in settings with low institutional quality, deposit insurance can be destabilizing and can have adverse consequences for market discipline. Focusing on the rule of law plus the supervision and strength of the legal system, Demirgüç-Kunt and Detragiache (2002) examine how various measures of institutional quality affect how well deposit insurance works in different countries. They find that, on average, the existence of explicit deposit insurance increases the probability that a country will experience a banking crisis. However, using the institutional quality measures mentioned above, they find that the probability that deposit insurance will result in a crisis is significantly lower in countries with higher levels of institutional quality.

Angkinand (2009) and Angkinand and Wihlborg (2010) analyze the impact of institutional variables such as the rule of law, corruption, and shareholder rights on the relationship between deposit insurance and financial stability. The authors find that institutional environments that incentivize effective public and private monitoring can alleviate moral hazard effects associated with deposit insurance. Focusing on financially

and economically developed countries, Dewenter, Hess, and Brogaard (2018) examine how levels of economic freedom, rule of law, and corruption in a given bank's home country affect moral hazard. Even in a set of institutionally comparable countries, the authors find that in most cases, better institutions help mitigate problems associated with deposit insurance. Focusing on developing countries, Cull, Senbet, and Sorge (2004) show that in weak institutional environments, deposit insurance reduces economic growth and financial development.

More importantly, empirical evidence suggests that weak institutional environments can prevent optimal deposit insurance design. In particular, the rule of law and other private and public contracting environment features proved important in deposit insurance adoption and design (Demirgüç-Kunt and Kane 2002; Hovakimian, Kane, and Laeven 2003). These, in turn, impact how well deposit insurance schemes function in a given country. Key design features are credible limited coverage, co-insurance, and risk-based pricing.

Co-insurance systems, in which deposit insurance covers less than 100 percent of a depositor's account balance, are one way to incentivize depositors to monitor banks and make more prudent bank choices in their deposit decision. Over the past decade, co-insurance systems have been largely removed as it is now believed that partial payments in the event of bank failures can increase the likelihood of bank runs. Co-insurance as a design element declined in both the high and low institutional quality countries. In particular, the percentage of countries with high-quality institutions using some form of co-insurance was 38 percent in 2005, and this percentage declined to eight percent by 2016. In low institutional quality countries, the percentage likewise declined from 39 percent in 2005 to six percent in 2016.

Charging banks risk-adjusted premiums for deposit insurance coverage is another way to alleviate moral hazard problems. The premiums charged to banks can either be a flat fee, or they can be based on the risk a bank poses to the deposit insurance fund. Under such a system, banks with higher asset or loan risk (and thus more likely to fail) would be charged higher insurance fees. Risk-based pricing can help internalize the cost of risk-taking by bank managers and shareholders, which in turn would curb the excessive risk-taking that results from moral hazard. Although there are issues related to figuring out the actuarially fair value of fees, the empirical evidence

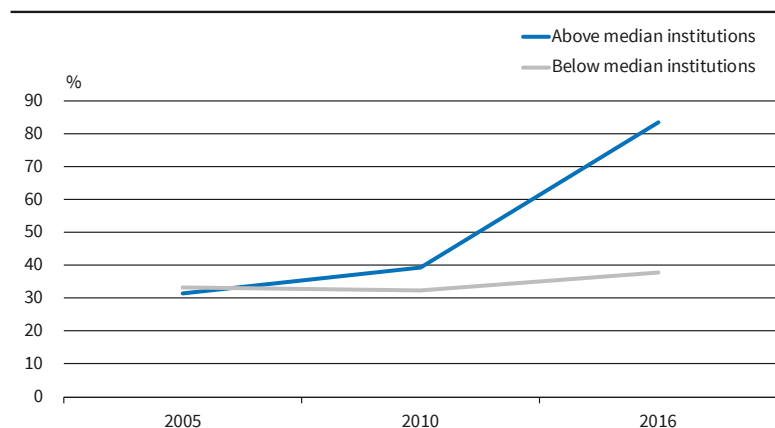
shows that risk-adjusted premiums perform better than flat-rate premiums in reducing bank risk (Demirgüç-Kunt and Detragiache 2002; Hovakimian, Kane, and Laeven 2003).

Risk-based pricing was initially pioneered in the US in the early 1990s and quickly spread to other countries. In 1997, only four countries (Finland, Peru, Sweden, and the US) used risk-based pricing for deposit insurance fees (Demirgüç-Kunt and Huizinga, 1999). As of 2016, this number has increased to 55. Figure 2 shows that use of risk-based premiums for deposit insurance in high institutional quality countries has increased substantially in recent years. As of 2016, 83 percent of countries in this group reported charging premiums based on risk. Although there has been an increase in the low institutional quality group, it is still well below the high institutional quality countries: only 38 percent in 2016.

Implementing credible limited coverage ex ante is another crucial design factor for deposit insurance to work effectively. In theoretical models of deposit insurance, bank runs happen as a result of self-fulfilling phenomena (see, for instance, Diamond and Dybvig 1983 and extensions). Lack of confidence in the banks causes investors to rush to be the first in line to withdraw their funds. If depositors believe that other investors will not run, then only investors with real liquidity needs withdraw their funds. The bank can meet these demands without costly liquidation of assets. Nevertheless, if everyone believes that a run will occur, then it becomes a self-fulfilling prophecy as depositors run to avoid being last in line. The bank is then forced to liquidate its long-term assets in a costly way. This results in unnecessary economic losses as an otherwise solvent bank is forced to liquidate. In these models, the effectiveness of deposit insurance relies heavily on depositors' confidence that the insurance is credible. Even if there is a small chance that the deposit insurance scheme will run out of funds, then it is rational for depositors to run to the bank and withdraw their funds. Thus, deposit insurance schemes must be credible ex ante in order to stop contagious runs (Bonfim and Santos 2017; Calomiris and Powell 2001).

Figure 2

Use of Risk-Based Premiums



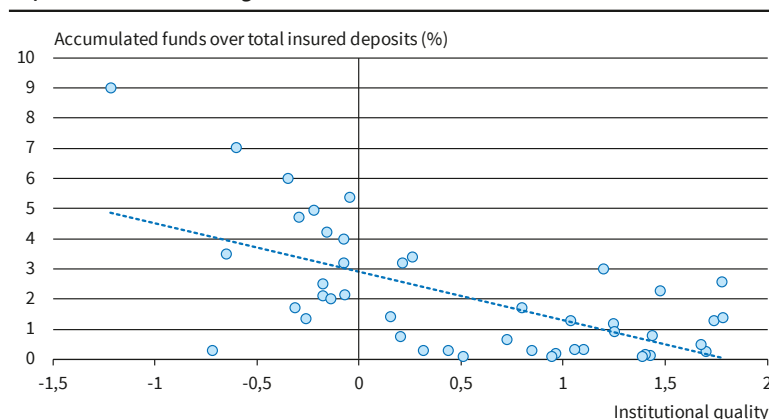
Note: The figure presents countries, in which deposit insurance fees/premiums charged to banks vary based on some assessment of risk.

Source: Authors' calculations from BRSS and WGI (2019).

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Figure 3

Deposit Insurance Funding



Note: The figure presents how the ratio of accumulated funds to total insured deposits is correlated with the institutional quality index in 2016.

Source: Authors' calculations from BRSS and WGI (2019).

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The recent experiences with deposit insurance in Cyprus and Iceland illustrate the importance of adequate funding for deposit insurance for it to be credible. In a sense, all insurance schemes are underfunded, as it is impossible to have funds in place to fully cover all potential losses of depositors. Yet depositors expect the government to step in during a crisis and provide a full backstop. However, this type of intervention requires the government to have the political will—and more importantly, the economic resources—to do so. In countries where the institutions have deteriorating and poorly governed finances, intervention is not always a viable option, and underfunding can be a real possibility. These countries tend to also suffer from political instability, and it may be challenging to bring different stakeholders together to agree on providing funds to a dispersed group of depositors.

In theoretical models, the economic cost of deposit insurance is zero, since deposit insurance eliminates an equilibrium in which everyone runs. If deposit

insurance is credible and depositors do not run, then taxes do not have to be imposed ex ante to fund the deposit insurance scheme. However, as credibility can be an issue in low institutional quality countries, deposit insurance schemes have to be sufficiently funded to assure depositors that there will be resources available to cover the losses should their bank fail. Accumulating funds to assure this confidence can be highly costly, but it is necessary in low institutional quality countries. Consistent with this notion, the empirical evidence from the BRSS survey shows that the size of accumulated funds with respect to total insured deposits is negatively related to institutional quality. Figure 3 shows the relationship between the insurance funding ratio (accumulated funds divided by total insured deposits) and institutional quality. We see that low institutional quality countries tend to accumulate more funds ex ante, possibly to build credibility. In particular, a one standard deviation increase in institutional quality (0.81 points increase in the index) is related to a 1.3 percent reduction in the deposit insur-

ance funding ratio in the univariate analysis. We also find that deposit insurance coverage indexation (with respect to, for example, prices or per capita GDP) is much more common in low institutional quality countries. In 2016, 44 percent of the countries in the low institutional quality group had some form of indexation, up from 11 percent in 2010. The percentage of countries in the high institutional quality group that had indexation was only 16 percent in 2016, up from ten percent in 2010. This observation also supports the idea that low institutional quality countries are trying to keep their deposit insurance coverage credible by automatically adjusting the coverage in response to higher inflation or per capita income.

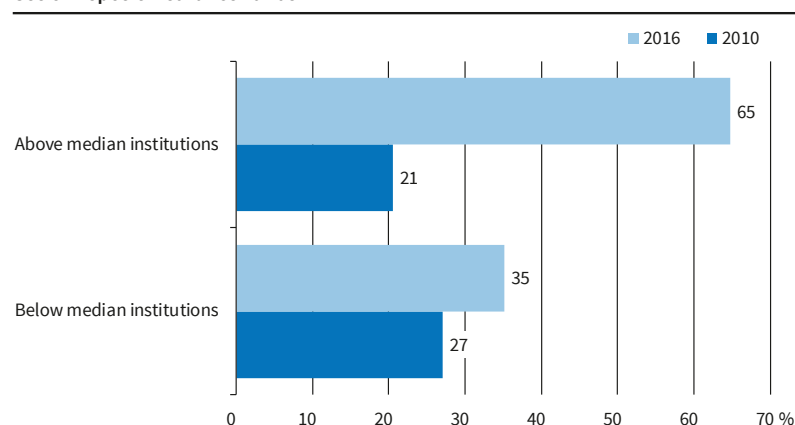
Although adequate funding of insurance schemes is important for deposit insurance to be credible, during the GFC, many countries substantially expanded both the scope and the coverage of deposit insurance in order to restore stability in their banking sectors. Setting clear and limited commitments ex ante is just as crucial as credibility for deposit insurance to work

effectively. Expanding coverage beyond what was promised to depositors during the crisis had the effect of reinforcing market expectations that the government will step in to bail out banks and depositors should the need arise. These types of expansions reduce market discipline and can lead to greater risk-taking by banks. Consistent with this notion, a number of papers have shown that more generous deposit insurance coverage and scope result in greater moral hazard (Honohan and Klingebiel 2000; Demirgüç-Kunt and Detragiache 2002).

Moreover, limited ex ante commitment by governments also reduces the costs that arise from providing insurance during times of distress. As bank runs often coincide with deteriorating economic conditions and declining asset values, ex post expansion of guarantees can be very costly for taxpayers (Allen, Babus, and Carletti 2009). Since fiscal costs are limited, ex ante commitment not to expand insurance can improve the reliability and credibility of deposit insurance schemes. Limited commitment also ensures that deposit insurance schemes are

Figure 4

Use of Deposit Insurance Funds



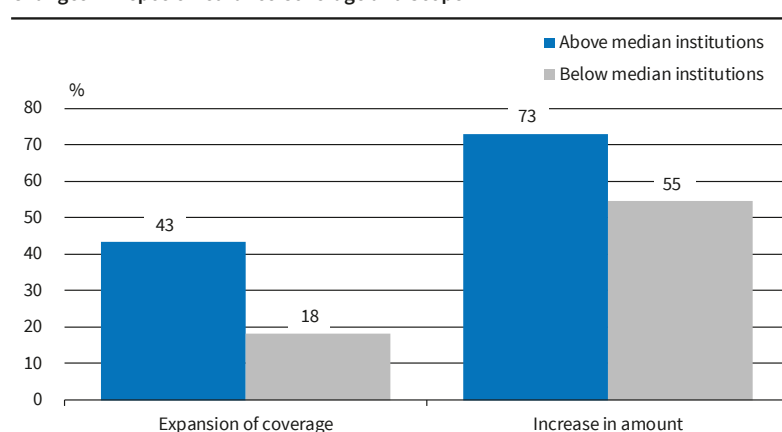
Note: The figure presents countries, in which the deposit insurance fund is used for purposes other than depositor protection.

Source: Authors' calculations from BRSS and WGI (2019).

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Figure 5

Changes in Deposit Insurance Coverage and Scope



Note: The figure presents countries introducing changes to their deposit protection system as a result of the 2007-2009 global financial crisis.

Source: Authors' calculations from BRSS and WGI (2019).

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Table 1

List of Countries (Median Institutional Quality Is between Bulgaria and South Africa)

Above median institutions	Below median institutions
Australia	Angola
Austria	Argentina
Belgium	Armenia
Bhutan	Bahrain
Botswana	Bangladesh
Canada	Belarus
Cayman Islands	Belize
Chile	Bosnia and Herzegovina
Costa Rica	Brazil
Croatia	Bulgaria
Cyprus	Burundi
Denmark	Colombia
Estonia	Dominican Republic
Finland	El Salvador
France	Fiji
Germany	Ghana
Hong Kong SAR, China	Greece
Hungary	Guatemala
Iceland	Guyana
Ireland	Honduras
Israel	India
Italy	Indonesia
Jersey	Jordan
Korea, Rep.	Kenya
Latvia	Kyrgyz Republic
Liechtenstein	Lebanon
Lithuania	Lesotho
Luxembourg	Malawi
Macao SAR, China	Maldives
Malaysia	Mexico
Malta	Moldova
Mauritius	Morocco
Netherlands	Mozambique
New Zealand	Nicaragua
Norway	Nigeria
Oman	Pakistan
Poland	Panama
Portugal	Peru
Romania	Philippines
Seychelles	Russian Federation
Slovak Republic	Sri Lanka
Slovenia	Suriname
South Africa	Tajikistan
Spain	Tanzania
Switzerland	Thailand
Taiwan, China	Trinidad and Tobago
United Kingdom	Uganda
United States	Vanuatu
Uruguay	Zimbabwe

Source: WGI (2019).

harmonized across countries. This approach levels the playing field across different countries and helps to reduce regulatory arbitrage whereby investors move funds to countries where they expect the local authorities to increase coverage during times of stress.

Despite the benefits of limited commitment, during the GFC, there was a significant expansion of deposit insurance in both scope and coverage. As of 2016, around one-fourth of high institutional quality countries and one-third of low institutional quality countries reported compensating deposits that were not explicitly covered at the time of a bank failure. Moreover, deposit insurance funds have also been used for purposes other than covering specific depositor losses. Figure 4 shows the percentage of countries in each institutional quality group in which depositor funds were used for other purposes, such as liquidity support, bank resolution, or recapitalization of weak banks. In 2010, 27 percent of countries in the low-quality institutions group used deposit insurance funds for other purposes, compared to just 21 percent of countries in the high-quality institutions group. However, after the crisis, a higher percentage of countries in the high-quality institutions group used deposit insurance funds for other purposes—65 percent compared to 35 percent of countries in the low-quality institutions group.

Most of these changes came during the financial crisis. Figure 5 shows the percentage of countries in each institutional quality group that have made changes to their deposit insurance schemes in response to the GFC. Most countries, especially those in the high-quality institutions group, significantly increased both the limit and the type of accounts covered under deposit insurance. Specifically, 73 percent of the countries in the high-quality institutions group increased the coverage amount. In the US, for example, the guaranteed limit (per depositor, per bank) was increased from USD 100,000 to USD 250,000 in 2008 to restore confidence in the banking system at the height of the financial crisis. Of the countries in this group, 43 percent also increased the type of liabilities covered by deposit insurance. In Ireland, deposit insurance was expanded to cover all bank liabilities. There was also significant expansion in low institutional quality countries: 18 percent expanded the scope, and 55 percent increased the amount covered by deposit insurance. Although it is difficult to quantify the long-term effects of these expansions, they will nonetheless have an adverse impact on market discipline in the future.

In this article, we have shared some empirical snippets from the latest BRSS survey. Overall, the results in the survey reinforce the importance of the larger institutional environment in how well deposit insurance schemes are designed and function. It is important to emphasize that poorly designed schemes in lower-quality institutional environments can increase the likelihood of a banking crisis. Thus, it is possible for explicit deposit insurance to do more

harm than good for financial stability in countries with such environments.

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