

Deposit Insurance in Times of Crises: Safe Haven or Regulatory Arbitrage?

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Abstract: This paper examines the impact of deposit insurance (DI) schemes on bilateral cross-border deposits. Our results suggest that not only the existence of explicit DI, but also DI design features, which reflect its credibility have an impact on cross-border deposits, and that the relative differences between reporting and depositor countries also matter. However, in times of crises, DI acts primarily as a “Safe Haven” and stimulates “Regulatory Arbitrage” only to a limited extent. During the global financial crisis of 2008/09 the emergency actions of bank country governments, which supply and maintain these safe havens, have led to substantial relocations of cross-border deposits.

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JEL codes: F34; G18

1 Introduction

Until the 2008/09 financial crisis, cross-border depositing increased rapidly not only in the interbank market, but also in the retail market. After a short period of retrenchment during the crisis, cross-border depositing started growing again and by September 2014 rose to US\$26 trillion, of which US\$8 trillion constitute cross-border liabilities to non-banks.¹ Global deregulation, regional integration initiatives such as the introduction of the euro, and the elimination of capital controls in many developing countries enabled banks to expand cross-border financial services rapidly. For customers, foreign deposit markets offer not only return opportunities and product diversity but foreign deposit insurance (DI) schemes also provide cross-border depositors with an opportunity for regulatory arbitrage and access to a safe haven, especially during financial crises. This paper provides an in-depth investigation of the relationship between cross-border retail depositing and national DI schemes in tranquil and crisis times. By evaluating the impact of the emergency actions taken during the 2008/09 global financial crisis, we also provide a unique analysis of the impact of crisis policies on cross-border banking.

The existence of a DI can make a banking market more attractive to cross-border depositors in two ways: First, depositor's funds are guaranteed by the DI agency. Second, a DI scheme may contribute to a more stable banking system by preventing bank runs as argued by Diamond & Dybvig (1983). However, this effect is disputed as moral hazard can induce banks to engage in riskier activities thereby increasing the likelihood of a banking crisis (Demirgüç-Kunt & Detragiache, 1997, 2002; Rossi, 1999). The empirical literature does not yet offer any unambiguous evidence on the relevance of DI for cross-border depositing. For example, Lane & Sarisoy (2000) examine the relationship between an explicit DI and several measures of private capital inflows to developing countries but find no significant link. However, their measures of capital inflows are mainly composed of funds that are not insured.² Huizinga & Nicodème (2006) focus more closely on international liabilities including deposits.³ While they find that non-bank external liabilities increase after introduction of an explicit DI, they do not find any role for specific DI features. Similar to Lane & Sarisoy (2000), their results are at least in part driven by the inclusion of uninsured liabilities. Furthermore, due to the aggregate level of their data at the bank country level, they are only able to investigate whether a DI system makes a given country more attractive to all foreign depositors in general.

By contrast, our paper employs a uniquely suitable data set of *bilateral cross-border retail deposits* provided confidentially by the Bank for International Settlements (BIS). Our data are based on the BIS's Locational Banking Statistics and cover cross-border deposits between 131 depositor countries and 22 bank countries for the period from 1998 to 2011. We are – to the best of our knowledge – the first to use such a detailed dataset and are

¹ As reported by the Bank for International Settlements' Locational Banking Statistics.

² Lane & Sarisoy (2000) focus on developing countries in 1990s and analyze gross private capital flows, net private capital flows, international syndicated loans, and international bond issues.

³ Huizinga & Nicodème (2006) focus on developed countries from 1983 to 1999 and analyze the impact of the existence of an explicit DI scheme on external liabilities. Their data differentiate interbank and non-bank liabilities and originate from the BIS's International Banking Statistics. Note however that (1) interbank liabilities are generally not insured and (2) non-bank liabilities include insured deposits but also a certain amount of uninsured funds.

therefore able to contribute to the understanding of the role of DI schemes for cross-border depositing in numerous ways. First, our study extends the literature by analyzing retail deposits, e.g. deposits of households and non-financial corporations that are actually covered by DI schemes. As such, we can investigate the direct insurance effects and do not need to make any interference about the implications of DI systems on financial systems. Second, we investigate not only the attractiveness of the bank countries' DI, but also the importance of DI differences between the depositor's home country and the bank country. Analyzing the role of bank countries' regulations builds on the existing literature and inquires whether DI provides a "Safe Haven". The analysis of DI differences across countries adds to the literature and is informative about "Regulatory Arbitrage". Third, we investigate not only the effect of an explicit DI but also consider its specific features. As argued by Eisenbeis & Kaufman (2015) the effectiveness of a DI depends crucially on its design and implementation. Despite deposit market internationalization, significant heterogeneity still exists across national DI schemes⁴ potentially increasing the relative attractiveness of a deposit market. As our analyses will cover regulatory differences across countries we can provide in-depth insights into which features of a DI scheme can induce regulatory arbitrage.⁵ Fourth, we provide an analysis of the potentially changing importance of safe havens and regulatory arbitrage during stable versus crisis times using the Laeven & Valencia (2008, 2010, 2012) financial crisis database. Here we build on Kleimeier, Sander, & Heuchemer (2013) who find that during systemic banking crises, depositors discipline their home banking system by re-locating deposits to foreign safe havens.⁶ Fifth and finally, we investigate the impact and efficiency of emergency actions taken by many countries in response to the severity of the 2008/09 crisis, which included explicit and often enhanced government guarantees over and above the regular DI coverage. We find that both, the quest for safe haven and regulatory arbitrage are important drivers of cross-border depositing in stable times. Conversely, in times of financial crisis, the safe haven motive persists while regulatory arbitrage can only be observed with respect to a few specific DI design features. This safe haven motive is particularly important during the financial crisis of 2008/09. We also provide evidence that the emergency actions taken in bank countries, in particular the introduction of government guarantees, are major drivers of global retail deposit relocations towards safe havens.

The plan of the paper is as follow. In section 2 we develop our gravity model for analyzing the impact of DI on cross-border deposits by formulating five hypotheses and the

⁴ See Dale, Bruni, & De Boissieu (2000), Eisenbeis & Kaufman (2006, 2008).

⁵ We thereby contribute indirectly to the literature on DI design including optimal DI schemes and implications on the banking systems and financial markets. See Anginer, Demirgüç-Kunt, & Zhu (2014); DeLong & Saunders (2011); Demirgüç-Kunt & Detragiache (2002); Demirgüç-Kunt, Kane, & Laeven (2008, 2014); Demirgüç-Kunt, Karacaovali, & Laeven (2005); Demirgüç-Kunt & Sobaci (2001); Engineer, Schure, & Gillis (2013); Garcia (1999); Hardy & Nieto (2011); Hoelscher, Taylor, & Klueh (2006); Ioannidou & Penas (2010); Laeven & Beck (2006); Lambert, Noth, & Schüwer, (2015).

⁶ Kleimeier, Sander, & Heuchemer (2013) build on the literature on the disciplining role of (domestic) depositors pioneered by Berger (1991). Later contributions e.g. report evidence for a "flight to quality (safety) by depositors" during the Asian crisis of 1997/08 (Ding, Domac, & Ferri, 1998). Rochet (2004) reports empirical evidence for direct market discipline in crisis periods when depositors are able to "vote with their feet". Park & Peristiani (1998) and Martínez Pería & Schmukler (2001) find similar effects during the banking crises in USA in the 1980s and Argentina, Chile, Mexico in the 1980s and 1990s, respectively.

corresponding specifications of the gravity model. Section 3 details the various extensive databases we are using. Section 4 reports the results. Section 5 concludes.

2 A Gravity Model of Cross-Border Deposits

We apply a gravity model framework to empirically analyze the impact of DI on bilateral cross-border deposits. Based on Tinbergen (1962) and Pöyhönen (1963), the gravity model has been proven successful in explaining international trade and, in its basic form, explains bilateral trade with the trading partners' economic masses and geographical distance (Baltagi, Egger, & Pfaffermayr, 2003; Helpman & Krugman, 1985; Krugman, 1980). Later studies extend this basic model to capture additional bilateral characteristics more precisely, including joint trade agreements, common currency membership, or cultural distance (Baxter & Kouparitsas, 2006). In line with Portes & Rey (2005), who argue that gravity models could at least work as well in explaining asset trades as good trades, gravity modelling has more recently extended to the realm of international finance as well (Aviat & Coeurdacier, 2007; Buch, 2005; Buch & Lipponer, 2007; Coeurdacier & Martin, 2009; Heuchemer, Kleimeier, & Sander, 2009; Kleimeier, Sander, & Heuchemer, 2013; Lane & Milesi-Ferretti, 2008; Martin & Rey, 2004; Okawa & Van Wincoop, 2012; Portes & Rey, 2005; Sander, Kleimeier, & Heuchemer, 2013, 2016). The bilateral character of the dependent variable makes the gravity approach the model of choice to analyze both, the safe haven behavior and, in particular, regulatory arbitrage behavior.

We start with the investigation of safe haven behavior and employ the following gravity model that tests the relationship between DI schemes in the bank countries and cross-border deposits:

$$Dep_{ijt} = \alpha_{ij} + \alpha_i + \alpha_j + \alpha_t + \beta_1 DI_{it} + \beta_2 size_{ijt} + \delta X_{ijt} + \varepsilon_{ijt} \quad (1)$$

where Dep_{ijt} are the exchange rate adjusted stocks of cross-border deposits from depositors in country j to banks in country i in year t . $Size_{ijt}$ refers to the economic masses of bank country i and depositor country j in year t , which equals to the sum of logarithmic GDP of the two countries. X_{ijt} represents other control variables commonly used in gravity models, including proxies for de facto and de jure openness (e.g. bilateral trade, financial openness, and a globalization index) augmented by banking market characteristics (e.g. banking market size, bank competition, and foreign banks), currency unions and free trade agreements. Following Baldwin & Taglioni (2006) and in accordance with Bekaert, Harvey, Lundblad, & Siegel (2013) we use a full set of country pair, bank country, depositor country, and year fixed effects given by α_{ij} , α_i , α_j and α_t , respectively. Thus, instead of adding controls for transactional frictions such as geographical and culture distance, legal origin, and common language, we employ country pair fixed effects to control for all these time-invariant variables that may affect cross-border deposits.⁷ Country pair fixed effects can

⁷ Our focus does not lie on the general determinants of international deposits. Regarding specific determinants of cross-border deposits, Grilli (1989) finds that non-bank deposits are driven by interest taxes and bank secrecy, while interbank deposits are determined by dividend taxes and economic size. Alworth & Andresen (1992) use a gravity model to explain cross-border deposits with reserve ratios. Huizinga & Nicodème (2004) find a weak linkage between bilateral bank liabilities held by non-banks and income taxes. Sander, Kleimeier, & Heuchemer (2016) find that cultural differences act as barriers to cross-border depositing in the Eurozone.

control for bilateral trade resistance which is the size of the barriers to trade between countries i and j . In addition, we follow Anderson & Van Wincoop (2003) and include bank and depositor country fixed effects to control for multilateral trade resistance, which refers to the barriers which each country i and j faces in their trade with all their trading partners (including domestic and internal trade). Finally, we employ year fixed effects to control for common time-varying factors. DI_{it} is our variable of interest and captures the different features of the bank country's DI scheme. In its simplest form, it represents a dummy variable equal to 1 when an explicit DI exists in the bank country i in year t but we also explicitly measure various design features of the DI scheme in the bank countries.

We postulate that depositors are attracted to a given bank country when its DI provides depositors with a safe haven. As banks transform deposits into risky loans and other risky assets, depositors are exposed to the bank's credit risk. However, depositors prefer to reduce or even eliminate their exposure to bank risk and thus value the protection provided by DI. However, only a well-designed DI scheme can provide depositors with effective risk reduction and avoid moral hazard problems (Diamond, 1986; Diamond & Dybvig, 1983; Merton & Thakor, 2015). As such, specific features of the DI scheme such as coverage limit or intensity, repayment history, moral hazard mitigation, or power of the DI agency should matter to depositors. These considerations lead to our first hypothesis:

H1: Safe Haven Hypothesis

Compared to bank countries without an explicit DI, the existence of an explicit DI makes a bank country more attractive for cross-border depositors. In addition, the attractiveness of a bank country for cross-border depositors increases with the strength of its DI scheme relative to the strength of other bank countries' DI schemes.

As countries also have their own freedom to design their DI schemes, this provides room for international regulatory competition and thus for regulatory arbitrage by depositors. Specifically, the differences in DI schemes between bank and depositor countries may matter in a relative way, with the DI scheme in the depositor country serving as a benchmark. Thus, besides the absolute quality of a DI scheme in the bank country, depositors may also care about the relative quality of a DI scheme in the bank country, taking into account other variables such as physical and cultural proximity or the existence of joint trade agreements or a joint currency. This leads to our second hypothesis.

H2: Regulatory Arbitrage Hypothesis

The existence of an explicit DI makes a bank country attractive for cross-border depositors from countries that lack an explicit DI. In addition, the attractiveness of a bank country for cross-border depositors increases with the strength of bank country's DI scheme relative to the strength of depositor country's DI scheme.

In order to test the Regulatory Arbitrage Hypothesis, we adjust model (1) to allow for the differences in DI schemes across bank and depositor countries, as shown by DI_{ijt} below.

$$Dep_{ijt} = \alpha_{ij} + \alpha_i + \alpha_j + \alpha_t + \beta_1 DI_{ijt} + \beta_2 size_{ijt} + \delta X_{ijt} + \varepsilon_{ijt} \quad (2)$$

But do the effects postulated in the Safe Haven and Regulatory Arbitrage Hypotheses hold when the depositor experiences a banking crisis at home⁸, and if so, which effects are more pronounced? For instance, depositors from countries that are undergoing a systemic banking crisis may search for better DI abroad either in the relative sense of regulatory arbitrage or in the absolute sense of a safe haven. However, it may also be possible that depositors totally lose faith in the banking sector and its DI and as a result the relationships between DI and cross-border depositing diminish or even disappear. Thus we formulate two hypotheses with respect to financial crises in depositor countries:

H3: Safe Haven in Crisis Hypothesis

The importance attributed by cross-border depositors to the existence and strength of the bank country's DI increases when depositors experience a banking crisis at home.

H4: Regulatory Arbitrage in Crisis Hypothesis

The importance attributed by cross-border depositors to the existence and strength of the bank country's DI relative to the depositor country's DI increases when depositors experience a banking crisis at home.

To test these hypotheses, we estimate the following two regressions, with model (3) focusing on the bank country features and thus testing the Crisis Hypothesis in the context of our safe haven argument and model (4) focusing on the differences across countries and thus testing the Crisis Hypothesis in the context of regulatory arbitrage:

$$Dep_{ijt} = \alpha_{ij} + \alpha_i + \alpha_j + \alpha_t + \beta_1 DI_{it} * stable_{jt} + \beta_2 DI_{it} * crisis_{jt} + \beta_3 size_{ijt} + \delta X_{ijt} + \varepsilon_{ijt} \quad (3)$$

$$Dep_{ijt} = \alpha_{ij} + \alpha_i + \alpha_j + \alpha_t + \beta_1 DI_{ijt} * stable_{jt} + \beta_2 DI_{ijt} * crisis_{jt} + \beta_3 size_{ijt} + \delta X_{ijt} + \varepsilon_{ijt} \quad (4)$$

where $stable_{jt}$ is a dummy variable equal to 1 when there is no systemic banking crisis in depositor country j in year t . Similarly, $crisis_{jt}$ is a dummy variable equal to 1 when there is a systemic banking crisis in depositor country j in year t . An insignificant β_2 implies that DI does not matter for cross-border depositors during a crisis. Similarly, if β_2 is significantly smaller than β_1 or has the opposite sign, a banking crisis destroys the faith in DI systems and thus diminishes or even eliminates the relationships. However, a β_2 that is significantly larger in absolute values and has the same sign as β_1 suggests that depositors trust foreign

⁸ We would also like to investigate what happens when a bank country experiences a crisis. As described in the next section, our sample period ranges from 1998 to 2011 and covers 22 bank countries and 131 depositor countries. However, we observe systemic banking crises only in depositor countries with a single exception: The 2008/09 crisis also affected bank countries. Due to its unique features, i.e. the fact the countries adjusted their DI schemes in response to the crisis, we will study the 2008/09 crisis separately in the context of our Emergency Actions Hypothesis. Therefore, our main analysis will focus on the period from 1998 to 2007, when systemic banking crises only occur in the depositor countries.

DI schemes during crises, which supports either the Safe Haven in Crisis Hypothesis or Regulatory Arbitrage in Crisis Hypothesis or both.

The two crisis hypotheses as outlined above are applicable to the majority of historic banking crises as these are country specific. The 2008/09 banking crisis which started in the US is however different as it spilled over into numerous countries and became an almost global crisis. In response to the severity of the crisis, many countries revised their DI schemes. According to International Association of Deposit Insurers (IADI), at least 49 countries enhanced depositor protection, including 20 countries with maximum coverage increases (e.g. full guarantees), 22 countries with permanent coverage increases and seven countries with temporary coverage increases. These actions were initiated in Europe but quickly spread to nearly every continent, e.g. most revisions took effect between September 2008 and March 2009. These emergency actions to enhance DI systems provide us with a great opportunity to more specifically examine how the changing design features of DI impact cross-border deposits. Before the 2008/09 crisis, the main goal of DI agencies was protecting small depositors, as they did not have the ability to understand and monitor the risks taken by financial institutions. However, after the crisis, maintaining and strengthening the stability of the financial system has been set as the primary goal delegating the protection of small depositors to secondary importance (Bernet & Walter, 2009). Thus our fifth and final hypothesis postulates the following:

H5: Emergency Actions Hypothesis

The emergency actions taken by the bank country regarding its explicit DI ensure that the bank country remains an attractive safe haven for cross-border depositors.

To empirically test this hypothesis, we will employ a difference in difference analysis within our gravity model setting:

$$Dep_{ijt} = \alpha_{ij} + \alpha_i + \alpha_j + \alpha_t + \beta_1(emergency\ action * 2008/09\ crisis\ period)_{it} + \beta_2 size_{ijt} + \delta X_{ijt} + \varepsilon_{ijt} \quad (5)$$

where *emergency action* is a dummy variable equal to 1 if a bank country adopted various emergency actions to enhance its DI, and 0 otherwise. These emergency actions include an *explicit DI introduction* or the extension of an *official government guarantee, limited government guarantee or unlimited government guarantee*. *2008/09 crisis period* is a dummy variable equal to 1 for the period from 2008 to 2011 when emergency actions are taken. Our model already includes bank country fixed effects and year fixed effects, thus the separate effects of these two variables are already included. β_1 represents the treatment effect, which measures the impact of these emergency actions on cross-border deposits.

3 Data

Our paper is -to the best of our knowledge- unique in that it utilizes all major recent databases on global DI in a systematic manner and investigate their effects on cross-border retail depositing using a custom made, confidential, and bilateral country-level data set provided by BIS. Using bilateral data allows us to examine cross-border depositing for all

pairs of bank and depositor countries. Furthermore, we only consider non-bank deposits, which are mainly held by individuals and businesses as DI schemes tend to only cover non-bank deposits but exclude interbank deposits from coverage. The BIS Locational Banking Statistics are perfectly suited to analyze such cross-border banking activities as they are compiled using principles that are consistent with the balance of payments and thus the principle of residence. However, the publicly available data can only be disaggregated either by bank country or by depositor country, instead of being disaggregated bilaterally by both at the same time. Therefore, our paper uses a customized and confidential data set made available by BIS, which exactly provides this bilateral disaggregation. Although the BIS Consolidated Banking Statistics publicly provide bilateral data, these data only report foreign claims and not deposits. Furthermore, the consolidated data are based on the principle of nationality instead of residence. In conclusion, the BIS Locational Banking Statistics are preferable.

A cross-border deposit is made when a customer who resides in country A deposits money at an office of a bank that is located in country B. As long as the bank's office is located in country B, such a deposit is cross-border, independent of whether the headquarters of the bank is located in country A or B. Similarly, as long as the depositor resides in country A, such a deposit is cross-border, independent of whether the depositor is a national of country A or B. Critically, our definition is based on the residence and not the nationality of the bank and depositor. Therefore, residents' deposits in local branches of foreign banks are counted as domestic deposits. Thus, we are exactly examining those cases where a depositor crosses a national border.⁹

Our sample covers 22 bank countries and 131 depositor countries from 1998 to 2011 but not all bilateral cross-border deposits X_{ijt} are available for all years.¹⁰ As such our panel is unbalanced. When testing the Safe Haven, Regulatory Arbitrage and Crisis Hypotheses, we only consider a sample period from 1998 to 2007. When testing the Emergency Actions Hypothesis, we rely on a sample period of 1998 to 2011.¹¹ The BIS reports unadjusted stocks and exchange rate adjusted flows of cross-border deposits. In order to eliminate any

⁹ While banks need to adhere to anti money laundering rules and know-your-customer obligations, depositors are generally able to open a deposit account from abroad without being physically present at the bank. Subsequently, cross-border deposits can be managed via internet banking, phone banking, or in person.

¹⁰ The 22 bank countries are Australia, Austria, Belgium, Brazil, Chile, Denmark, Finland, France, Germany, Greece, India, Ireland, Italy, Luxembourg, Macao SAR, the Netherlands, Panama, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Note that the following countries start reporting to the BIS only after 1998: India (2002); Brazil, Chile and Panama (2003); Greece and Macao SAR (2004). For our analyses of hypotheses H1 to H4, our maximum possible sample would amount to 28,820 observations (22 bank countries * 131 depositor countries * 10 years). However, our largest sample includes only 20,820 observations due to (1) post-1998 reporting by Brazil, Chile, Greece, India, Macao SAR, and Panama, (2) missing values for our control variables or DI proxies. The latter is the case when depositor countries do not participate in the DI surveys. Our 131 depositor countries are shown in Figure 4 and a list of these countries is available upon request.

¹¹ During the 2008/09 financial crisis, many emergency actions have been taken to enhance the DI schemes, both permanently and temporarily. Thus we end our first sample by the third quarter of 2007 and analyze the impact of these emergency actions in 2008 in the following section. Another reason to end our first sample period in 2007 is that before the 2008/09 financial crisis, systemic banking crises only occurred in depositor countries, not in bank countries, in our BIS sample. Thus leaving out the post-2007 period enables us to separate the "old" crises from the "new" crisis, which is more complicated and also occurred in the bank countries in our sample.

potential exchange rate valuation effects, we calculate annual exchange rate adjusted stocks by taking the initial nominal stocks and successively adding the exchange rate adjusted flows. Figure 1 provides a first impression of the evolution of cross-border deposits over time. Both unadjusted and adjusted stocks show high growth from US\$ 1.3 trillion in 1998 to around US\$ 5 trillion in 2008 before dropping by as much as 25% as a consequence of the 2008/09 banking crisis. Importantly, about 16% of the deposit stock volume in 2008 can be attributed to exchange rate valuation effects. Therefore, it is necessary and important to adjust for exchange rate valuation effects. Furthermore, our sample is quite heterogeneous as it covers a wide range of countries with different levels of economic and financial development. Figure 2 plots the total annual volume of cross-border deposits that a given bank country receives from all depositor countries, averaged across years. Figure 2 reveals how substantial the differences across countries are. In the average year, Chile receives the least cross-border deposits, amounting to only US\$ 307 million from all depositor countries combined. In contrast, banks in the United Kingdom receive the most cross-border deposits amounting to US\$ 607 billion.

[Insert Figures 1 and 2 about here]

The main DI data source that we rely on to test our Safe Haven and Regulatory Arbitrage Hypotheses is 'Chapter 8: Depositor (Savings) Protection Schemes' in the World Bank's Bank Regulation and Supervision Database due to its indicator consistency and high survey frequency (see also Barth, Caprio, & Levine, 2001; Cihak, Demirgüç-Kunt, Martínez Pería, & Mohseni-Cheraghrou, 2012). Regarding indicator consistency, we are able to not only measure D_{jt} and D_{ijt} as the existence of an explicit DI but are also able to obtain proxies for specific DI characteristics. Regarding the survey frequency, we fill the gap between two consecutive surveys. Specifically, 1998-2001 is filled with data in the survey that was started in 1998. Similarly, 2002-2005 and 2006-2007 are filled with data from the surveys that were conducted in 2002 and 2006 respectively. We only expand the survey data forward so that cross-border deposits are regressed on pre-determined designs of DI systems.

Our proxies for specific DI characteristics capture the insurance benefits for the depositor as well as the moral hazard problem introduced by a poorly designed DI scheme. As argued by Barth, Caprio, & Levine (2004), the existence of a DI can induce banks to increase their risk taking and a moral hazard problem arises when risk levels become excessive. However, a DI scheme can be designed to limit moral hazard for example by introducing bank funding or risk-based insurance fees. We consider the existence of an *explicit DI*, the *DI power*, *DI moral hazard mitigation*, *DI coverage intensity*, *DI coverage limit* and *DI repayment history* as core features of a DI scheme and will thus focus on them in our empirical analyses.¹²

Among these six DI proxies, the existence of an *explicit DI* is our most fundamental measure. It is defined as a dummy variable equal to one if a bank country has an explicit DI in place and zero if no DI or only an implicit DI exists in the bank country.

As our second proxy, we include Barth, Caprio, & Levine's (2004) *DI power* measure. This index considers whether the DI agency has the power to make the decision to intervene in a bank or to cancel/revoke deposit insurance for any participating bank, has the power to take

¹² Detailed variable definitions and sources are provided in Tables A1 and A2 in the Appendix.

legal action against bank directors or officials, or has ever taken any legal action against bank directors or officers. The index ranges from zero to four, depending on whether the DI agency has none or all four of these powers. A DI agency without these powers might be ineffective, i.e. in cases of political interference or weak relationships between DI agency and the bank supervisors, who instead of the DI agency have the power to resolve bank failures (Garcia, 1999). Note that we code *DI power* as a missing value for countries without an explicit DI. The same applies to our other proxies for DI design features.

Third, we combine some of the individual DI features to generate a *DI moral hazard mitigation* index. Here we follow Demirgüç-Kunt & Detragiache (2002) and consider whether a DI scheme is funded by the banks themselves rather than the government and whether the insurance fees charged to banks vary based on risk assessment. In each case, a value of one is assigned such that the *DI moral hazard mitigation* index can range from 0 to 2. Demirgüç-Kunt & Detragiache (2002) argue that moral hazard is stronger under government funding but weaker under bank funding as banks do not bear the cost of their moral hazard. Thus, higher values for the *DI moral hazard mitigation* index imply greater ability to mitigate moral hazard.

Our remaining DI proxies measure to what extent depositors are covered by the DI scheme. On the one hand, Garcia (1999) argues that limited or restricted DI coverage reduces moral hazard as large, sophisticated depositors remain uninsured and thus have an incentive to monitor and discipline banks by demanding higher deposit rates or refusing to deposit funds altogether. On the other hand, depositors might be more attracted to a banking market where DI coverage is more extensive as the responsibility for monitoring and disciplining is shifted to the DI agency. Thus as our fourth proxy, *DI coverage intensity* reflects whether there is a coverage limit, whether formal coinsurance explicitly insures depositors for less than 100% of their deposits and whether foreign currency deposits are excluded. In each case, a value of one is assigned if coverage is not limited. As such, that the *DI coverage intensity* index can range from 0 to 3. Fifth, for those DI schemes that have a coverage limit, we measure *DI coverage limit* as the natural logarithm of US dollar amount at which coverage is limited. Sixth, *DI repayment history* measures the compensation that depositors received in the past. Looking at prior bank failures, we consider whether insured depositors were fully compensated and whether uninsured depositors were compensated. In each case, a value of one is assigned such that the *DI repayment history* index can range from 0 to 2.

DI schemes change over time even before the 2008/09 crisis and vary across countries as the heat maps in Figure 3 and the summary statistics in Table A3 in the Appendix indicate. Panel A of Figure 3 reveals that the number of countries with an *explicit DI* increases from 62 in 1998 to 75 in 2006. None of our 131 sample countries removed its *explicit DI* scheme. For those countries with an *explicit DI*, we are able to measure our DI design features. Panels B to F reveal that depositor protection has generally increased over time. There are however country specific trends. For example, in Sweden *DI moral hazard mitigation* steadily decreased over time while *DI power* increased between 1998 and 2002 only to decrease again by 2006. While a detailed investigation of these country specific trends is beyond the scope and focus of this study, we conclude that variations in DI across countries and over time are substantial enough to investigate their potential effect on cross-border depositing.

[Insert Figure 3 about here]

In times of banking crisis or failures, countries might provide implicit DI or increase existing insurance. In particular, during the 2008/09 financial crisis, many countries responded by quickly taking emergency actions in 2008. All emergency actions enhance DI coverage. The data are taken from World Bank's Deposit Insurance Database (see Demirgüç-Kunt, Kane, & Laeven, 2014) and in line with the IADI's categorization, we differentiate between the introduction of an explicit DI and the provisions of a government guarantee, regardless of the guaranteed amount. Demirgüç-Kunt, Kane, & Laeven (2014) cover 20 of our 22 bank countries and we thus need to drop Panama and Macao from our sample of bank countries. As Table A4 in the Appendix shows, 15 of these 20 countries have undergone the 2008/09 financial crisis. Australia introduced an explicit DI on October 12th, 2008. During the 2008/09 financial crisis, six countries (namely Australia, Austria, Denmark, Germany, Ireland, and the United States) extended official guarantees on deposits which are limited in Germany and United States but unlimited in the other four countries.

To test the effects of crises on cross-border deposits, we employ the Systemic Banking Crises Database by Laeven & Valencia (2008, 2010, 2012) which identifies three types of crises, namely banking, currency and sovereign debt crises. A banking crisis is defined as a situation where "a country's corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted". We consider all systemic banking crises during our sample period, that is, 1998-2007. Table A5 in the Appendix shows the frequency of banking crises over time and indicates that banking crises are more frequent in 1998-1999 which at least partly reflects the Asian crisis. During the following years, the number of systemic banking crises fluctuates on a relatively low level. The Systemic Banking Crises Database also includes information on the starting and ending year of the systemic banking crises which enables us to cover not only the start of the crises, but also the whole period of it.

Finally, we include a set of control variables that are specific for the bank and depositor country pair and vary over time. $Size_{ijt}$ is based on the total GDP of both countries obtained from the World Bank's World Development Indicators Database. From the IMF's International Financial Statistics we obtain our proxy for $credit_{ijt}$, e.g. the size of the banking market measured as the two countries' aggregate domestic credit to the private sector as percent of GDP. We employ four measures of openness. First, the KOF Index of Globalization serves as a proxy for de jure openness ($globalization_{ijt}$). Second, we measure de facto openness via $trade_{ijt}$ which reflects the imports and exports between the bank and depositor country and is obtained from the STAN Database. Third, we also control specifically for $financial\ openness_{ijt}$ utilizing the Chinn-Ito index to measure a country's degree of capital account openness. Fourth, we include a dummy variable set to one if both countries belong to the same free trade area (FTA_{ijt}) and we control for exchange rate risk by coding a dummy variable equal to one if the bank and depositor country belong to the same $currency\ union_{ijt}$. FTA and currency union data are obtained and updated from Sander, Kleimeier, & Heuchemer (2013) with the original definitions following Rose (2005) and Ilzetzki, Reinhart, & Rogoff (2008), respectively. Furthermore, we recognize differences in rates of return on deposits as an important determinant of cross-border deposits. Our

*deposit rate*_{ijt} proxy controls for the difference between foreign and domestic deposit interest rates, with higher values indicating higher returns when depositing abroad. Annual deposit rates are obtained from the IMF's International Financial Statistics. We also include *internet*_{ijt} access. Sander, Kleimeier, & Heuchemer (2016) argue that in countries in which a high percentage of the population has internet access, banks have a strong incentive to develop internet banking portals and depositors have low bank transaction costs and can easily and inexpensively deposit across borders. To capture both the bank and depositor side, we obtain data regarding the percentage of individuals with internet access from the UN's World Telecommunication/ITC Indicators dataset and measure *internet*_{ijt} as the product of the bank and depositor country. In addition, *governance*_{ijt} captures differences in institutional quality between bank and depositor country with data based on the World Bank's Worldwide Governance Indicators and with higher values indicating better institutional quality abroad. Finally, we control for banking market characteristics including the share of *foreign banks*_{ijt} and *net interest margin*_{ijt}. Heuchemer, Kleimeier, & Sander (2009) investigate the role of foreign banks in promoting or substituting cross-border banking and find that foreign banks promote cross-border lending within the Eurozone. To capture both the bank and depositor side, we obtain data regarding the number of foreign banks in percent of total banks from the World Bank's Global Financial Development Database and measure *foreign banks*_{ijt} as the product of the bank and depositor country. *Net interest margin*_{ijt} serves as a proxy of banking market competition. We obtain our proxy from the World Bank's Global Financial Development Database and measure it as the difference between the bank and depositor country. In sum, this large set of control variables serves two purposes. First, it captures potential determinants of cross-border depositing. Second, it controls for the fact that a country's choice of DI might well be endogenous to the country's economic, political or financial characteristics.

4 Results

4.1 Safe Haven and Regulatory Arbitrage in Cross-Border Depositing

In this section we examine the impact of various DI designs on cross-border deposits. We assume that not only the design of the DI system in the bank country matters, but that also the differences in DI design between bank and depositor country matter. In other words, we investigate both the Safe Haven and Regulatory Arbitrage Hypotheses.

We start with the Safe Haven Hypothesis by investigating the impact of the existence of an *explicit DI* in the bank country and its characteristics on cross-border deposits based on our gravity model of equation (1). Results are shown in Table 1. Regressions (1) to (6) provide a parsimonious specification in which we only control for *size* in addition to our various fixed effects. The specification of regressions (7) to (12) is more profligate with a more complete set of control variables. As during our sample period *explicit DI* does not change over time for any given bank country, we can only include depositor country and year fixed effects in regressions (1) and (7). To compensate for the lack of country pair fixed effects, we instead add gravity country pair controls, e.g. proxies for geographical distance, common border, common language, colony and common legal system. In regression (1), the impact of an *explicit DI* is highly significant and as expected positive, indicating that bank countries with an explicit DI attract more cross-border deposits than bank countries without an explicit DI. Results regarding the DI agency's power and actions taken to mitigate moral hazard in the

DI systems affect cross-border deposits are reported in regressions (2) and (3) and indicate that more deposits flow to countries whose DI agency have more power or take more actions to mitigate moral hazard. Regarding the coverage provided by the DI scheme, regressions (4) to (6) indicate that countries with a higher coverage limit are more attractive to cross-border depositors and there is marginal evidence that depositors care about the DI's coverage intensity. In contrast, repayment history does not matter. Our results are not only statistically significant but also economically relevant. For example, the existence of an *explicit DI* is associated with 80% higher cross-border deposits. As the shift from an implicit or non-existent to an *explicit DI* constitutes a fundamental change in the country's banking system, such a substantial difference in cross-border deposits is not surprising. Furthermore, a one unit increase in the DI's power, moral hazard mitigation and coverage intensity increases cross-border deposits by 4.1%, 6.2% and 3%, respectively. Given the size of the average bilateral cross-border deposits of \$ 18 million, these percentages reflect an increase in bilateral cross-border deposits by \$ 0.7 million, \$1.1 million and \$ 0.5 million respectively. Finally, a 1% increase in the coverage limit increases cross-border deposits by 0.55%. This is economically meaningful considering that a one standard deviation change in the coverage limit can be associated with a 6.2% change in cross-border deposits. In regressions (7) to (12) we add more control variables but our DI results are robust with very similar coefficients and significance levels.¹³

However, the introduction of an *explicit DI* and the relative strength of a DI in terms of its design features may be endogenous. To address this issue, we instrument both *explicit DI* and the DI design features. Critically, a valid instrument for DI should not be directly correlated with bilateral cross-border deposits. In their seminal study, Demirgüç-Kunt, Kane, & Laeven (2008) explore how interest-group pressures, outside influences, and political-institutional factors affect DI adoption and design. However, not all DI determinants identified by Demirgüç-Kunt, Kane, & Laeven (2008) are suitable instruments. In particular, a country's financial, political or legal institutions are likely to be correlated with cross-border deposits. Therefore we select a country's population aged 65 and above as a percentage of the total population as our instrument. Importantly, this measure has been shown to be a significant determinant for DI adoption *and* design by Demirgüç-Kunt, Kane, & Laeven (2008) and we can thus use it as a single instrument for all our DI proxies.¹⁴ In addition, the percentage of population aged 65 and above is not likely to be a direct determinant for cross-border deposits. Therefore, the instrument is arguably valid. The first-stage instrumental variable regressions are reported in Table A6 in the Appendix. Notably, the coefficients of our instrumental variable are significant and the test statistics for the weak instrument test are clearly above the critical value. Thus, we indeed have a single, strong, and empirically valid instrument for all DI proxies. In line with the findings of Demirgüç-Kunt, Kane, & Laeven (2008), an *explicit DI* is more likely to be adopted in countries with a relatively larger share of elderly people. One possible explanation is that compared to younger people, elderly people usually have more financial assets and are more likely to employ bank deposits as their main savings vehicle. Therefore, elderly people have more

¹³ The unreported control variables generally show the expected coefficients. In particular, cross-border deposits are higher when bank and depositor country are larger, are linked by trade flows or share a common currency. Detailed results are available upon request.

¹⁴ We do not instrument *DI repayment history* due to the fact that this measure is based on historical bank failures. Thus, endogeneity is of limited concern.

demand for *explicit DI*. Regarding the DI design features, we find that lower power, less moral hazard mitigation, lower coverage intensity and limit are more likely to emerge in countries with more elderly people. This is due to the fact that these safety net subsidies are more likely to be captured by younger people (Demirgüç-Kunt, Kane, & Laeven, 2008).

The second-stage results are shown in regressions (13) to (17) in Table 1. After correcting for potential endogeneity, be it reverse causality or omitted variables, the effects of DI typically come out with more economic and (partially) statistical significance. Thus with the exemption of *DI repayment history*, the results are in line with our Safe Haven Hypothesis: The existence of explicit DI systems and the strength of the features of the DI schemes attract more cross-border deposits to that country.¹⁵

[Insert Table 1 here]

So far we only examine how the DI systems in the bank countries would impact cross-border deposits. However, the differences in DI schemes between any pair of bank country and depositor country may also matter in a relative way. In this sense, the DI system in the depositor country may serve as a benchmark. Next to the absolute quality of the DI system in the bank country, depositors also care how much better the DI in the bank country is relative to their home country. To test for the Regulatory Arbitrage Hypothesis, we take differences of all the DI measures between all pairs of bank countries and depositor countries and regress cross-border deposits on these differences in DI schemes as indicated by model (2).

Results are shown in Table 2 and we can conclude that depositors hold more funds in bank countries with better DI schemes than they can find in their home country. Specifically, depositors from countries without *explicit DI* tend to deposit their money in bank countries with *explicit DI* while depositors from countries with *explicit DI* are less likely to deposit their money in bank countries without *explicit DI*. Also relevant in terms of statistical significance are the results that bank countries whose DI authorities have relatively stronger power than the DI authorities in the depositor countries and bank countries with DI schemes designed to mitigate moral hazard more effectively than DI schemes in the depositor countries attract more cross-border deposits. The coefficients of the coverage related DI features are insignificant in the baseline and extended regressions, but both *DI coverage intensity* and *DI coverage limit* become significantly positive in the instrumental variable regressions. Hence, the purely exogenous changes in relative DI features as presented in our IV regressions do matter for cross-border depositing. Therefore with the exemption of *DI repayment history*, the results are overall in accordance with the Regulatory Arbitrage Hypothesis.

[Insert Table 2 here]

¹⁵ We conduct robustness checks to allow for the possibility that our match of annual cross-border deposit data to DI data from surveys in 1998, 2002 and 2006 is inaccurate. We therefore restrict our sample period to the three years in which the DI surveys took place. Results are shown in Table A7 in the Appendix and are mostly robust. Corresponding robustness checks for Tables 2, 3, and 4 can be found in Tables A8, A9, and A10 in the Appendix and also here results are generally robust.

4.2 Cross-Border Banking and Home Country Banking Crisis

In this section we investigate whether the relationships between DI schemes and cross-border deposits change when depositor countries experience a systemic banking crisis. Depositor country banking crises are modelled as indicated in equations (3) and (4) and reported in Tables 3 and 4.

In Table 3 we examine the Safe Haven in Crisis Hypothesis and utilize F-tests to assess the null hypothesis of equal DI coefficients for stable and crisis periods. For all three regression specifications – the baseline, extended, and instrumental variable regressions – the F-statistics for *explicit DI* and *DI moral hazard mitigation* are at best marginally significant. Thus, these two DI characteristics are equally important during stable and crisis periods and indicate that depositors still trust the foreign DI systems when their home country is undergoing a systemic banking crisis. The F-statistics for the remaining DI design features are statistically significant and indicate that these DI features become more important during a crisis. Next to the statistical significance, the economic significance of our results is most pronounced for *DI power* and *DI repayment history*. Firstly, regression (8) indicates that one unit stronger *DI power* is associated with 7.3% more cross-border deposits during crisis times compared to only 3.0% during stable times.¹⁶ Secondly, during a systemic banking crisis, depositors pay attention to the historical record of the DI system as the switch from an insignificant coefficient to a significantly positive coefficient for *DI repayment history* between stable and crisis times shows. Based on regression (12), a one unit increase in the *DI repayment history* index is associated with 5.1% more cross-border deposits during crisis times. When experiencing a crisis in their home countries, depositors thus do not only care about the current features of the DI scheme but also about the historical record of the DI agency during prior bank failures. In sum, these results lend partial support to our Safe Haven in Crisis Hypothesis and indicate that depositors value safe havens at least equally if not more when their home countries are undergoing a systemic banking crisis.

[Insert Table 3 here]

Using model (4) to test our Regulatory Arbitrage in Crisis Hypothesis, Table 4 reports the results during stable and crisis times for the differences in DI between bank and depositor countries. Our preferred instrumental variable regressions in Table 4 reveal that depositors are willing to chase better *explicit DI*, *DI moral hazard mitigation*, and *DI coverage limit* in stable and crisis times. In contrast, *DI power* and *DI coverage intensity* only matter during stable times. This result stands in contrast to the results for Safe Haven in Crisis Hypothesis in Table 3 where effects tend to become stronger rather than weaker during a crisis. One possible explanation could be that depositors consider regulatory arbitrage during stable times, but when they are hit by a crisis, they care less about the arbitrage opportunities and

¹⁶ We estimate the economic impact for our DI design features based on the coefficients estimated in the extended regressions. While we prefer the instrumental variable regressions for their technical correctness, we rely on the extended regressions and their estimated OLS coefficients due to their simplicity of economic interpretation. In contrast to OLS coefficients, coefficient estimates from instrumental variable regressions capture local average treatment effects. As the estimated coefficients of our instrumental variable regressions exceed those of the extended regression, we are certain not to overestimate importance of the economic impact by resorting to the latter.

only care whether their deposits are safe. Overall, Table 4 therefore suggests that regulatory arbitrage behavior partially disappears or becomes less important in times of crisis, i.e. depositors no longer search for better *DI power* and *DI coverage intensity*.

[Insert Table 4 here]

In sum, the evidence provided here indicates that safe havens remain important during crisis times while regulatory arbitrage mostly occurs during stable times. One might say, that depositors still search for the best protection in time of crisis and thus locate deposits to safe havens. Only during stable times are depositors willing to consider regulatory arbitrage.

4.3 The Role of Emergency Actions during Global Financial Crisis

Our analysis so far suggests that during a banking crisis in the home country, foreign safe havens become important to depositors. However, during the 2008/09 financial crisis safe havens were in short supply as bank countries which during our early sample period from 1998 to 2007 had not experienced a banking crisis are now subject to a crisis as well. As a consequence, many bank countries took emergency actions by implementing explicit DI schemes or enhancing government guarantees. To examine the impact of such emergency actions on cross-border deposits, we employ a difference in difference analysis as outlined in model (5) and thereby test our Emergency Actions Hypothesis. However, before presenting the estimates, we point to Figure 4, which provides a vivid illustration comparing cross-border deposit volumes of bank countries that later extend government guarantees to those of bank countries that do not extend such guarantees. Before 2008, both groups of countries show a similar and parallel trend in cross-border deposits. Since 2008, however, the extensions of government guarantees have resulted in a substantial increase in cross-border deposits for countries that extended such government guarantees.

[Insert Figure 4 here]

Regression results are shown in Table 5. It is important to note that we do not only rely on the full sample of country pairs involving all bank countries, but also conduct the difference in difference analysis with a subsample containing only those country pairs for which the bank countries have experienced the 2008/09 crisis. By doing this, we can further narrow down our control groups, thus making our results more precise, i.e. countries that have undergone the 2008/09 crisis have similar characteristics and this similarity is higher within this subgroup than compared to countries that were not exposed to the 2008/09 crisis. We start with regression (1) where we examine the impact of an *explicit DI introduction* and show that this emergency measure significantly increases cross-border deposits. Similarly regressions (2) to (4) show that cross-border deposits increase when government guarantees, whether limited or unlimited, are extended. Regressions (1) to (4) are based on our full sample of country pairs based on all 20 bank countries. Regressions (5) to (7) are based on the subsample of country pairs for which the bank countries have experienced the 2008/09 crisis but we find almost the identical results as in regressions (2) to (4), indicating that our control groups are unbiased. In addition, besides the full time period from 1998 to 2011, we also check the treatment effect with a narrower time window from 2006 to 2009 which captures the 4 years surrounding the introduction of emergency actions in 2008. Results are shown in regressions (8) to (14) and are robust albeit with smaller coefficients.

This shorter period mitigates the time trend concern in the sense that the early years of the sample period (1998-2005) could be – for reasons unrelated to the crisis – substantially different than the more recent years and confirms our previous results. In sum, the emergency actions appear to be very successful in terms of providing the safe havens that depositors were looking for during a global financial crisis.

[Insert Table 5 here]

5 Conclusions

Our results indicate that the existence of an *explicit DI*, as well as other DI design features, affect cross-border depositing and thus the geography of global banking. The existence of an *explicit DI* is attractive to foreign depositors in the sense that it provides a higher level of deposit safety. But the design of the DI plays an important role, too. Eisenbeis & Kaufman (2015) argue that an effective DI system consists of a credible guarantee, effective monitoring by supervisors, and an efficient resolution mechanism. Our results show that the *DI power, moral hazard mitigation* which encompasses credibility and effective monitoring as well as coverage related DI features matter for cross-border depositing. Our findings regarding these specific DI design features further underline the importance of credibility as depositors identify safe havens as those banking markets with DI schemes that provide high coverage. We further demonstrate that the relationships between DI systems and cross-border deposits vary in stable times and in times of systemic banking crises in depositor countries. In crises times depositors have more incentives to chase a safe haven rather than to engage in regulatory arbitrage. When it comes to a global finance crisis it is the emergency actions of bank country governments, which supply and maintain these safe havens, that matter and can lead substantial relocations of cross-border deposits. As such, these actions do not only rescue the banks and domestic depositors of the countries taking these (credible) emergency actions. They also have measurable and sizeable effects on other countries in a financially interdependent world, which may call for coordinated emergency actions which take possible spillovers across countries into account. However, even in tranquil times, our results show that the design of an effective DI must take the DI's impact on cross-border activities of depositors into account. Our findings add therefore also to the debate on the design of macro prudential instruments in globalized financial markets. This discussion, currently focused on bank lending, questions their effectiveness when banks and borrowers are able to circumvent these measures via regulatory arbitrage and calls for coordination among national regulators (Houston, Lin, & Ma, 2012; Ongena, Popov, & Udell, 2013; Reinhardt & Sowerbutts, 2015). Likewise, our findings, documenting a novel pattern of save haven and regulatory arbitrage driven behavior by depositors, stresses the need for a coordinated regulatory strategy with respect to deposit insurance schemes.

Appendix

[Insert Tables A1 to A10 here]

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Table 1. Testing the Safe Haven Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Explicit DI	0.60*** (11.71)						0.69*** (12.38)						13.48*** (3.29)				
DI power		0.04*** (4.38)						0.03*** (3.44)						0.18*** (5.27)			
DI moral hazard mitigation			0.06*** (3.02)						0.05** (2.37)						0.86*** (5.09)		
DI coverage intensity				0.03* (1.75)						0.07*** (3.26)						1.36*** (4.71)	
DI coverage limit					0.55*** (12.85)						0.55*** (11.43)						4.37** (2.05)
DI repayment history						0.01 (0.92)						0.00 (0.09)					
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.553	0.945	0.945	0.945	0.951	0.945	0.607	0.946	0.946	0.946	0.952	0.946	0.314	0.945	0.941	0.931	0.928
Observations	20,820	18,870	18,870	18,870	16,460	18,870	17,874	16,135	16,135	16,135	14,063	16,135	17,874	16,135	16,135	16,135	14,063

Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country *j* to bank country *i* in year *t*. All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 2. Testing the Regulatory Arbitrage Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Explicit DI	0.44*** (10.09)						0.43*** (9.36)						4.62*** (3.09)				
DI power		0.03*** (3.20)						0.03*** (2.94)						0.16*** (3.29)			
DI moral hazard mitigation			0.08*** (4.22)						0.04* (1.96)						1.17*** (4.34)		
DI coverage intensity				0.00 (0.07)						0.01 (0.80)						2.15*** (4.53)	
DI coverage limit					0.01 (0.81)						0.01 (1.06)						1.11*** (3.55)
DI repayment history						-0.01 (-0.81)						-0.02 (-1.39)					
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.553	0.946	0.946	0.946	0.949	0.946	0.606	0.946	0.946	0.946	0.950	0.946	0.422	0.945	0.925	0.857	0.892
Observations	20,820	10,763	10,763	10,763	7,694	10,763	17,874	10,445	10,445	10,445	7,437	10,445	17,874	10,445	10,445	10,445	7,437

Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country j to bank country i in year t. All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 3. Testing the Safe Haven in Crisis Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
Explicit DI * Stable	0.59*** (11.50)						0.69*** (12.40)						13.82*** (3.24)					
Explicit DI * Crisis	0.73*** (8.41)						0.63*** (7.12)						13.47*** (3.23)					
DI power * Stable		0.04*** (4.13)						0.03*** (3.21)						0.18*** (5.31)				
DI power * Crisis		0.07*** (3.69)						0.07*** (3.30)						0.26*** (5.39)				
DI moral hazard mitigation * Stable			0.06*** (2.96)						0.05** (2.32)						0.86*** (5.11)			
DI moral hazard mitigation * Crisis			0.09*** (3.35)						0.08*** (2.76)						0.91*** (5.32)			
DI coverage intensity * Stable				0.03 (1.61)						0.06*** (3.10)						1.39*** (4.79)		
DI coverage intensity * Crisis				0.07*** (3.21)						0.11*** (4.29)						1.42*** (4.89)		
DI coverage limit * Stable					0.54*** (12.83)							0.55*** (11.45)					4.59** (2.06)	
DI coverage limit * Crisis					0.55*** (12.99)							0.56*** (11.57)					4.61** (2.06)	
DI repayment history * Stable						0.01 (0.72)											-0.00 (-0.07)	
DI repayment history * Crisis						0.06** (2.44)											0.05* (1.83)	
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic	3.7*	4.0**	3.6	9.1***	8.4***	5.25**	0.6	3.8**	2.2	8.0***	6.6**	4.4**	3.4*	6.7***	4.2**	3.0*	6.5**	
p-value	(0.055)	(0.046)	(0.104)	(0.003)	(0.004)	(0.022)	(0.449)	(0.050)	(0.143)	(0.005)	(0.011)	(0.036)	(0.066)	(0.010)	(0.040)	(0.083)	(0.011)	
Adjusted R-squared	0.553	0.945	0.945	0.945	0.951	0.945	0.607	0.946	0.946	0.946	0.952	0.946	0.288	0.945	0.941	0.930	0.926	
Observations	20,820	18,870	18,870	18,870	16,460	18,870	17,874	16,135	16,135	16,135	14,063	16,135	17,874	16,135	16,135	16,135	14,063	

Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country *j* to bank country *i* in year *t*. All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. The F-tests assess the null hypothesis of equal DI coefficients for stable and crisis periods. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 4. Testing the Regulatory Arbitrage in Crisis Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Explicit DI * Stable	0.43***						0.43***						4.76***				
	(9.62)						(8.98)						(3.01)				
Explicit DI * Crisis	0.52***						0.45***						2.28***				
	(4.90)						(4.18)						(2.99)				
DI power * Stable		0.03***						0.03***						0.17***			
		(3.32)						(3.07)						(3.73)			
DI power * Crisis		0.01						0.01						0.13			
		(0.37)						(0.24)						(1.46)			
DI moral hazard mitigation * Stable			0.08***						0.04*						1.23***		
			(4.21)						(1.93)						(4.47)		
DI moral hazard mitigation * Crisis			0.08**						0.05						1.54***		
			(2.02)						(1.31)						(4.88)		
DI coverage intensity * Stable				-0.00						0.01						1.14***	
				(-0.09)						(0.66)						(4.25)	
DI coverage intensity * Crisis				0.05						0.06*						0.01	
				(1.51)						(1.77)						(0.06)	
DI coverage limit * Stable					0.01						0.01						0.76***
					(0.81)						(1.06)						(3.25)
DI coverage limit * Crisis					0.02						0.02						0.67***
					(0.45)						(0.40)						(3.21)
DI repayment history * Stable						-0.01						-0.01					
						(-0.60)						(-1.21)					
DI repayment history * Crisis						-0.05											
						(-1.34)						(-1.28)					
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic for the difference	0.8	1.0	0.0	2.8*	0.0	1.32	0.0	1.1	0.2	2.5	0.0	0.8	7.7***	0.2	6.9***	18.7***	1.4
P-value	(0.380)	(0.314)	(0.876)	(0.094)	(0.835)	(0.250)	(0.882)	(0.293)	(0.637)	(0.115)	(0.928)	(0.364)	(0.006)	(0.673)	(0.009)	(0.000)	(0.238)
Adjusted R-squared	0.553	0.946	0.946	0.946	0.949	0.946	0.606	0.946	0.946	0.946	0.950	0.946	0.428	0.945	0.923	0.916	0.923
Observations	20,820	10,763	10,763	10,763	7,694	10,763	17,874	10,445	10,445	10,445	7,437	10,445	17,874	10,445	10,445	10,445	7,437

Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country j to bank country i in year t . All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. The F-tests assess the null hypothesis of equal DI coefficients for stable and crisis periods. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 5. Testing the Emergency Actions Hypothesis

	Sample period 1998-2011							Sample period 2006-2009						
	All bank countries				Bank countries in crisis			All bank countries				Bank countries in crisis		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Explicit DI Introduction	0.65*** * 2008/09 Crisis Period (7.55)							0.20*** (2.58)						
Official government guarantee	0.23*** * 2008/09 Crisis Period (8.96)				0.22*** (8.29)			0.10*** (3.27)				0.09*** (2.87)		
Limited government guarantee	0.24*** * 2008/09 Crisis Period (7.09)				0.27*** (7.92)			0.09** (2.30)				0.10** (2.57)		
Unlimited government guarantee	0.22*** * 2008/09 Crisis Period (7.09)				0.18*** (5.41)			0.11*** (2.87)				0.09** (2.18)		
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Gravity country pair controls	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Country pair fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.925	0.925	0.933	0.928	0.929	0.934	0.934	0.951	0.951	0.960	0.953	0.956	0.963	0.959
Observations	25,218	25,218	20,388	22,552	21,378	17,573	18,712	9,223	9,223	7,585	8,272	7,588	6,323	6,637

Note: This table presents the estimates from difference in difference regressions of cross-border deposits from depositor country j to bank country i in year t. Regressions (1)-(4) and (8)-(11) are based on a full sample of country-pairs including all 20 bank countries, while regressions (5)-(7) and (12)-(14) are based on a subsample of country-pairs including only those bank countries that have experienced the 2008/9 crisis. All variable definitions can be found in Table A1 in the Appendix. The coefficients are in the first row, the t-values are below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table A1. Variable Definitions and Sources

Variable	Definition	Unit	Source
<i>Dependent variable</i>			
Cross-border deposits	Bank liabilities vis-à-vis non-bank sector (deposits) from depositor country to bank country, ln of amounts outstanding adjusted for exchange rate changes	US\$m/ln	BIS: Locational Banking Statistics, confidential dataset
<i>Independent variables</i>			
<i>Deposit insurance variables</i>			
Explicit DI	Dummy equal to 1 if an explicit deposit insurance exists in a country	1/0	World Bank: Bank Regulation and Supervision Surveys
DI power	Index to measure the power of the deposit insurance authority, higher values indicate more power	0-4	
DI moral hazard mitigation	Index to measure the degree to which actions are taken to mitigate moral hazard, higher values indicate greater mitigation of moral hazard	0-2	
DI coverage intensity	Index to measure the coverage intensity, higher values indicate better coverage for depositors	0-3	
DI coverage limit	ln of the coverage limit in US dollar	US\$	
DI repayment history	Index to measure the repayment history last time there was a bank run, higher values indicate better repayment history	0-2	
<i>Emergency actions</i>			
Explicit DI introduction	Dummy equal to 1 if a country introduced an explicit deposit insurance since 2008	1/0	World Bank: Deposit Insurance Database (Demirgüç-Kunt et al., 2014)
Official government guarantee	Dummy equal to 1 if a country's government extends an official guarantee since 2008	1/0	
Limited government guarantee	Dummy equal to 1 if a country's government extends a limited guarantee since 2008	1/0	
Unlimited government guarantee	Dummy equal to 1 if a country's government extends an unlimited guarantee since 2008	1/0	
<i>Instrumental variable</i>			
% Population 65+	Population aged 65 and above in percent of the country's total population	0-1	World Bank: World Development Indicators Database
<i>Time dummies</i>			
Stable	Dummy equal to 1 if a depositor country does not experience a systemic banking crisis in year t	1/0	IMF: Systemic Banking Crises Database (Laeven and Valencia, 2008, 2010, 2012)
Crisis	Dummy equal to 1 if a depositor country experiences a systemic banking crisis in year t	1/0	
2008/09 Crisis Period	Dummy equal to 1 for years 2008 to 2011		Authors' calculations
<i>Country-pair control variables</i>			
Size	Size of the two countries based on GDP, measured as the sum of the ln amounts for bank and depositor country	US\$m/ln	World Bank: World Development Indicators Database
Credit	Domestic credit to the private sector as percentage of GDP, measured as the product of bank and depositor country	0-1	IMF: International Financial Statistics

(continued)

Table A1 continued. Variable Definitions and Sources

Variable	Definition	Unit	Source
Trade	Bilateral trade between bank and depositor country, measured as the ln of the sum of export and imports	US\$mIn	OECD: STAN Bilateral Trade Database
Globalization	Overall globalization with higher value indicating more globalisation, measured as the sum of the ln amounts for bank and depositor country	0-100	KOF Index of Globalization, available at http://globalization.kof.ethz.ch/
FTA	Dummy equal to 1 if bank and depositor country belong to the same free trade area	1/0	Data provided on Andrew Rose's website at http://faculty.haas.berkeley.edu/arose/
Currency union	Dummy equal to 1 if bank and depositor country belong to the same currency union	1/0	Ilzetzki et al. (2008)
Deposit rate	Depository interest rate difference, measured as the difference between bank and depositor country	%	IMF: International Financial Statistics
Internet	Percentage of population that has internet connection, measured as the product of bank and depositor country	0-1	UN: World Telecommunication/ITC Indicators Data
Governance	Governance quality is measured as the average across the six individual governance indicators for Voice and Accountability, Political Stability & Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption; higher values indicate better governance, measured as the difference between bank and depositor country	-2.5-2.5	World Bank: Worldwide Governance Indicators
Financial openness	Chinn-Ito index (KAOPEN) to measure a country's degree of capital account openness, measured as the sum of bank and depositor country	-1.89-2.39	Data provided on Hiro Ito's website at http://web.pdx.edu/~ito/
Foreign banks	Number of foreign banks in percent of the country's total banks, measured as the product of bank and depositor country	0-100	World Bank: Global Financial Development Database
Net interest margin	Percentage of bank's net interest revenue as its average interest-bearing assets, measured as the difference between the bank and depositor country	%	
<i>Gravity country-pair control variables</i>			
Distance	Great circle distance between the capital cities of the bank and depositor country, measured as ln of the kilometer distance	km	Great Circle Distances Between Capital Cities, available at http://www.chemical-ecology.net/java/capitals.htm
Common border	Dummy equal to 1 if bank and depositor country share a land border	1/0	
Common language	Dummy equal to 1 if bank and depositor country share a language	1/0	Data provided on Andrew Rose's website at http://faculty.haas.berkeley.edu/arose/
Common colony	Dummy equal to 1 if the bank country ever colonized the depositor country or vice versa (colony after	1/0	
Common legal system	Dummy equal to 1 if bank and depositor country have the same legal system	1/0	

Note: All deposit insurance proxies are originally measured on a country- and year-level. For the Safe Haven analyses, the proxy for the bank country is used, e.g. Proxy_{it}. For the Regulatory Arbitrage analyses, the difference between the bank and depositor country is used, e.g. Proxy_{ijt} = Proxy_{it} - Proxy_{jt}.

Table A2. Deposit Insurance Indices

Variable	Questions	Index
DI power	(1) Does the deposit insurance authority make the decision to intervene a bank?	(1)+(2)+(3)+(4)
	(2) Does the deposit insurance authority have the legal power to cancel or revoke deposit insurance for any participating bank?	
	(3) Can the deposit insurance authority take legal action for violations against laws, regulations, and bylaws against bank officials?	
	(4) Has the deposit insurance authority ever taken legal action for violations against laws, regulations, and bylaws against bank officials?	
DI moral hazard mitigation	(1) Is the deposit insurance funded by banks?	(1)+(2)
	(2) Do deposit insurance fees charged to banks vary based on some assessment of risk?	
DI coverage intensity	(1) Is there a no limit per person?	(1)+(2)+(3)
	(2) Is there no formal coinsurance?	
	(3) Does the deposit insurance scheme include coverage of foreign currency deposits?	
DI repayment history	(1) Were insured depositors wholly compensated (to the extent of legal protection) the last time a bank failed?	(1)+(2)
	(2) Were any deposits not explicitly covered by deposit insurance at the time of the failure compensated when the bank failed?	

Note: If a question is answered with yes, a value of 1 is assigned. If a question is answered with no, a value of 0 is assigned. The index for each deposit insurance characteristic equals the sum of the values to all relevant questions.

Table A3. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Cross-border deposits	20,820	2.89	2.74	0	13.13
Bank country					
Explicit DI	20,820	0.91	0.29	0	1
DI power	18,870	1.10	0.95	0	4
DI moral hazard mitigation	18,870	1.28	0.55	0	2
DI coverage intensity	18,870	1.61	0.86	0	3
DI coverage limit	16,460	10.04	0.95	7.60	11.77
DI repayment history	18,870	0.99	0.63	0	2
% Population 65+	20,820	0.14	0.04	0.04	0.20
Country-pair differences					
Explicit DI	20,820	0.33	0.58	-1	1
DI power	10,763	0.02	1.51	-4	4
DI moral hazard mitigation	10,763	0.29	0.91	-2	2
DI coverage intensity	10,763	0.10	1.13	-3	3
DI coverage limit	7,694	0.36	1.97	-9.79	6.44
DI repayment history	10,763	0.10	0.97	-2	2
% Population 65+	20,820	0.05	0.07	-0.16	0.19
Size	20,820	23.53	2.78	14.12	35.37
Credit	20,820	0.57	0.55	0.00	5.95
Trade	20,820	5.19	2.88	0.00	13.25
Globalisation	20,820	8.49	0.41	5.06	9.07
FTA	20,820	0.07	0.26	0	1
Currency union	20,820	0.05	0.22	0	1
Deposit rate	20,820	-3.80	10.74	-202.63	27.73
Internet	20,820	0.08	0.11	0.00	0.71
Governance	20,820	1.04	1.09	-2.21	3.50
Financial openness	20,820	2.75	1.82	-3.79	4.78
Foreign banks	18,230	1062	1419	0	8640
Net interest margin	19,365	-2.56	3.49	-23.05	8.07
Explicit DI introduction	25,218	0.04	0.20	0	1
Official government guarantee	25,218	0.30	0.46	0	1
Limited government guarantee	25,218	0.11	0.31	0	1
Unlimited government guarantee	25,218	0.19	0.39	0	1

Table A4. Emergency Actions

Country	Experienced banking crisis	Explicit DI introduction	Official government guarantee	Limited government guarantee	Unlimited government guarantee
Australia	0	1	1	0	1
Austria	1	0	1	0	1
Belgium	1	0	0	0	0
Brazil	0	0	0	0	0
Chile	0	0	0	0	0
Denmark	1	0	1	0	1
Finland	0	0	0	0	0
France	1	0	0	0	0
Germany	1	0	1	1	0
Greece	1	0	0	0	0
India	0	0	0	0	0
Ireland	1	0	1	0	1
Italy	1	0	0	0	0
Luxembourg	1	0	0	0	0
Netherlands	1	0	0	0	0
Spain	1	0	0	0	0
Sweden	1	0	0	0	0
Switzerland	1	0	0	0	0
UK	1	0	0	0	0
United States	1	0	1	1	0

Note: This table lists our sample of bank countries for which emergency action data are available. Thus, in contrast to our full sample of 22 bank countries, Panama and Macao SAR are excluded here. All variable definitions can be found in Table A1 in Appendix.

Table A5. Systemic Banking Crises

Year	Number of countries in crisis
1998	16
1999	11
2000	9
2001	7
2002	3
2003	3
2004	2
2005	1
2006	0
2007	2
2008	22
2009	23
2010	23
2011	23

Note: Borderline systemic banking crises are included.

Table A6. First-Stage Instrumental Variable Regressions

	Safe Haven Hypothesis					Regulatory Arbitrage Hypothesis				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable	Explicit DI	DI power	DI moral hazard mitigation	DI coverage intensity	DI coverage limit	Explicit DI	DI power	DI moral hazard mitigation	DI coverage intensity	DI coverage limit
% Population 65+ (Bank Country)	0.34*** (3.59)	-40.45*** (-33.97)	-8.32*** (-16.23)	-5.27*** (-9.20)	-0.73*** (-2.92)	0.37*** (3.25)	-34.57*** (-15.74)	-7.59*** (-7.51)	-5.58*** (-4.99)	-2.70 (-1.37)
% Population 65+ (Depositor Country)						-2.15*** (-3.62)	10.46*** (4.99)	0.32 (0.33)	-2.37** (-2.22)	-8.53*** (-4.29)
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.367	0.684	0.820	0.906	0.987	0.749	0.725	0.839	0.873	0.882
Observations	17,874	16,135	16,135	16,135	14,063	17,874	10,445	10,445	10,445	7,437

Note: This table presents the first-stage instrumental variable estimates. All variable definitions can be found in Table A1 in Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table A7. Robustness Checks Regarding the Testing of the Safe Haven Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Explicit DI	0.55*** (5.94)						0.62*** (6.04)						12.81 (1.50)				
DI power		0.06*** (3.27)						0.05*** (2.77)						0.17*** (4.00)			
DI moral hazard mitigation			0.10** (2.43)						0.10** (2.08)						0.81*** (3.87)		
DI coverage intensity				0.02 (0.45)						0.04 (0.98)						1.52*** (3.35)	
DI coverage limit					0.62*** (6.53)						0.67*** (6.05)						17.93 (0.39)
DI repayment history						0.04* (1.65)						0.04 (1.20)					
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.547	0.924	0.924	0.924	0.932	0.924	0.601	0.925	0.925	0.925	0.934	0.925	0.366	0.924	0.919	0.891	0.333
Observations	6,246	5,661	5,661	5,661	4,964	5,661	5,275	4,759	4,759	4,759	4,172	4,759	5,275	4,759	4,759	4,759	4,172

Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country j to bank country i in year t . The sample period is restricted to the years 1998, 2002 and 2006. All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table A8. Robustness Checks Regarding the Testing of the Regulatory Arbitrage Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Explicit DI	0.41*** (5.25)						0.36*** (4.30)						2.89 (1.20)				
DI power		0.04** (2.17)						0.04** (2.22)						0.15** (2.55)			
DI moral hazard mitigation			0.11*** (3.06)						0.07* (1.86)						1.08*** (3.38)		
DI coverage intensity				-0.01 (-0.31)						0.01 (0.17)						3.16** (2.53)	
DI coverage limit					0.01 (0.52)						0.02 (0.73)						2.04** (2.35)
DI repayment history						0.03 (1.44)						0.03 (1.31)					
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.546	0.925	0.926	0.925	0.927	0.925	0.600	0.926	0.926	0.926	0.929	0.926	0.531	0.925	0.899	0.599	0.619
Observations	6,246	3,259	3,259	3,259	2,387	3,259	5,275	3,140	3,140	3,140	2,300	3,140	5,275	3,140	3,140	3,140	2,300

Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country *j* to bank country *i* in year *t*. The sample period is restricted to the years 1998, 2002 and 2006. All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table A9. Robustness Checks Regarding the Testing of the Safe Haven in Crisis Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Explicit DI * Stable	0.54*** (5.74)						0.62*** (6.00)						14.00 (1.42)				
Explicit DI * Crisis	0.77*** (4.88)						0.62*** (3.74)						13.37 (1.41)				
DI power * Stable		0.06*** (3.13)						0.05*** (2.64)						0.17*** (4.04)			
DI power * Crisis		0.09** (2.11)						0.09** (1.99)						0.33*** (4.12)			
DI moral hazard mitigation * Stable			0.10** (2.37)						0.09** (2.06)						0.80*** (3.86)		
DI moral hazard mitigation * Crisis			0.15*** (2.65)						0.15** (2.35)						0.90*** (4.19)		
DI coverage intensity * Stable				0.01 (0.27)						0.03 (0.78)						1.58*** (3.43)	
DI coverage intensity * Crisis				0.09* (1.93)						0.12** (2.26)						1.65*** (3.55)	
DI coverage limit * Stable					0.62*** (6.50)						0.66*** (6.03)						19.62 (0.37)
DI coverage limit * Crisis					0.63*** (6.62)						0.68*** (6.13)						19.65 (0.37)
DI repayment history * Stable						0.04 (1.49)						0.03 (1.08)					
DI repayment history * Crisis						0.11** (2.05)						0.10* (1.70)					
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.547	0.924	0.924	0.924	0.932	0.924	0.601	0.925	0.925	0.925	0.934	0.925	0.275	0.924	0.919	0.888	0.209
Observations	6,246	5,661	5,661	5,661	4,964	5,661	5,275	4,759	4,759	4,759	4,172	4,759	5,275	4,759	4,759	4,759	4,172

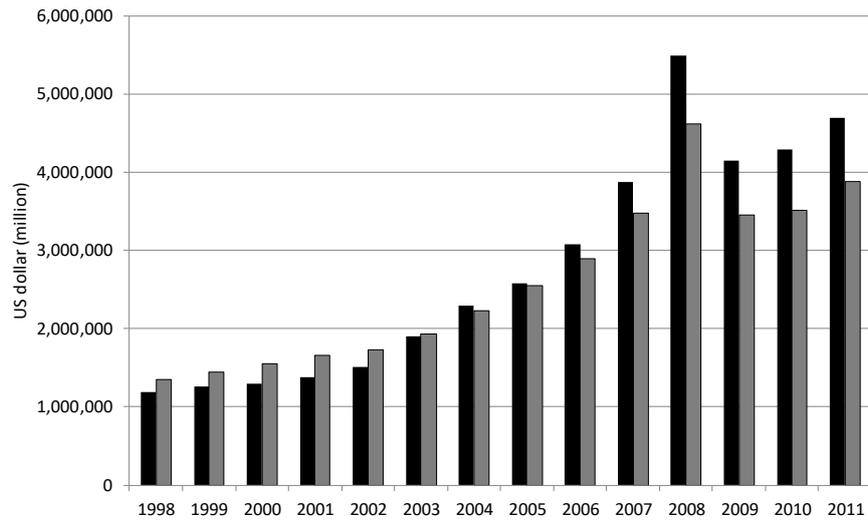
Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country j to bank country i in year t. The sample period is restricted to the years 1998, 2002 and 2006. All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table A10. Robustness Checks Regarding the Testing of the Regulatory Arbitrage in Crisis Hypothesis

	Baseline regressions						Extended regressions						Instrumental variable regressions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Explicit DI * Stable	0.40*** (4.89)						0.36*** (4.02)						3.77 (1.20)				
Explicit DI * Crisis	0.56*** (3.11)						0.41*** (2.20)						1.73 (1.21)				
DI power * Stable		0.04** (2.44)						0.05** (2.53)						0.14** (2.40)			
DI power * Crisis		-0.03 (-0.62)						-0.05 (-0.93)						0.12 (0.95)			
DI moral hazard mitigation * Stable			0.11*** (3.05)					0.07* (1.84)						1.17*** (3.82)			
DI moral hazard mitigation * Crisis			0.18* (1.92)					0.15 (1.48)						2.07*** (4.76)			
DI coverage intensity * Stable				-0.01 (-0.45)						0.00 (0.04)							0.41 (1.31)
DI coverage intensity * Crisis				0.07 (0.85)						0.09 (1.06)							0.08 (0.14)
DI coverage limit * Stable					0.01 (0.50)						0.02 (0.73)						2.31* (1.81)
DI coverage limit * Crisis					0.08 (0.83)						0.09 (0.74)						0.79* (1.65)
DI repayment history * Stable						0.04* (1.68)						0.04 (1.56)					
DI repayment history * Crisis						-0.08 (-0.92)						-0.10 (-1.10)					
Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gravity country pair controls	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country pair fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank country fixed effects	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Depositor country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.546	0.926	0.926	0.925	0.927	0.925	0.600	0.926	0.926	0.926	0.929	0.926	0.485	0.925	0.890	0.920	0.519
Observations	6,246	3,259	3,259	3,259	2,387	3,259	5,275	3,140	3,140	3,140	2,300	3,140	5,275	3,140	3,140	3,140	2,300

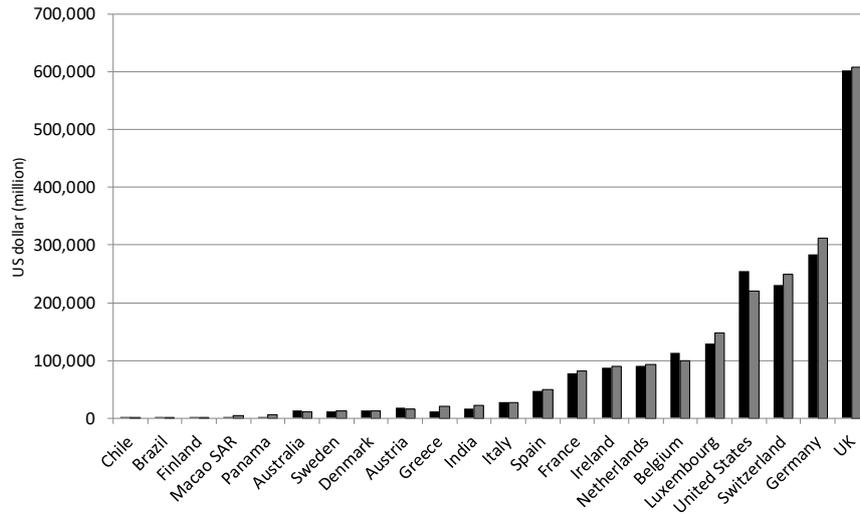
Note: This table presents the estimates of OLS and IV regressions of cross-border deposits from depositor country j to bank country i in year t. The sample period is restricted to the years 1998, 2002 and 2006. All variable definitions can be found in Table A1 in the Appendix. The coefficients are reported in the top row, t-values are reported below in brackets. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Figure 1. Cross-Border Deposits over Time



Note: This figure shows the total amount of cross-border deposits (CBD) between all 22 bank countries and all 131 depositor countries in our sample. Black bars represent unadjusted volumes of CBD, grey bars represent CBD volumes that are adjusted for exchange rate movements.

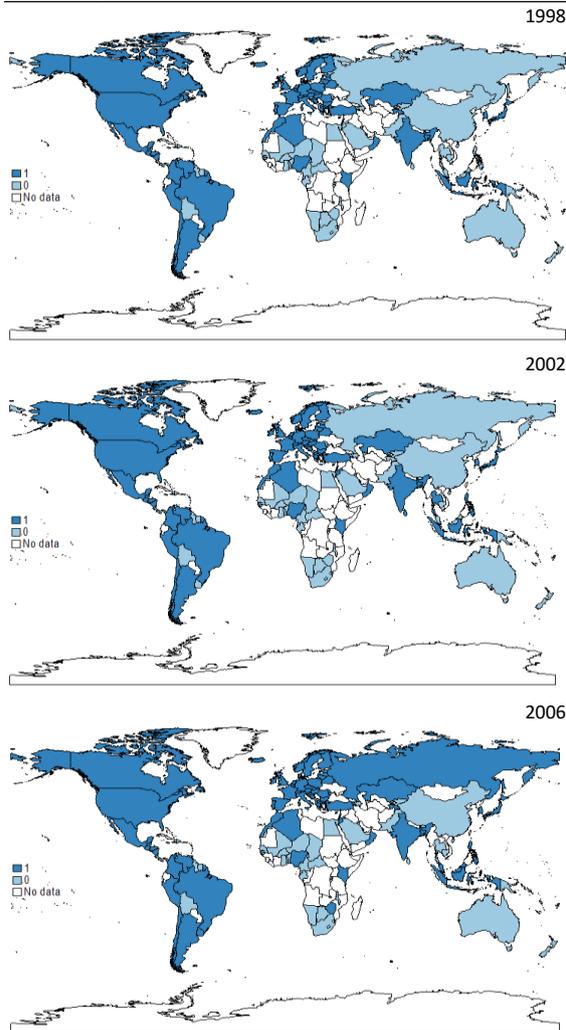
Figure 2. Cross-Border Deposit Volumes for Different Bank Countries



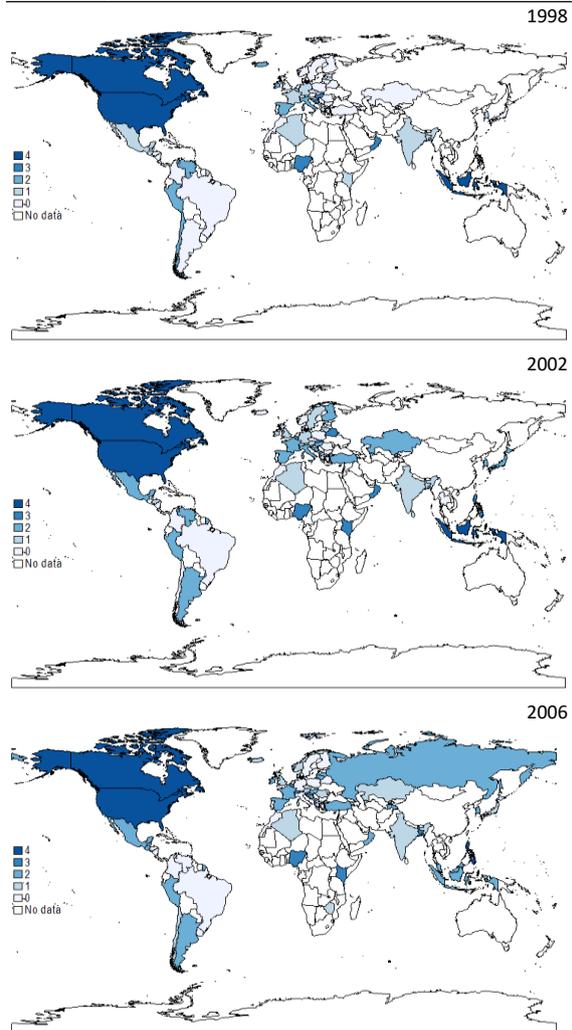
Note: This figure shows the average annual volume of cross-border deposits (CBD) that each of the 22 bank countries in our sample receives from all 131 depositor countries. Black bars represent unadjusted volumes of CBD, grey bars represent CBD volumes that are adjusted for exchange rate movements.

Figure 3. Heat Maps of Deposit Insurance Schemes

Panel A: Explicit DI



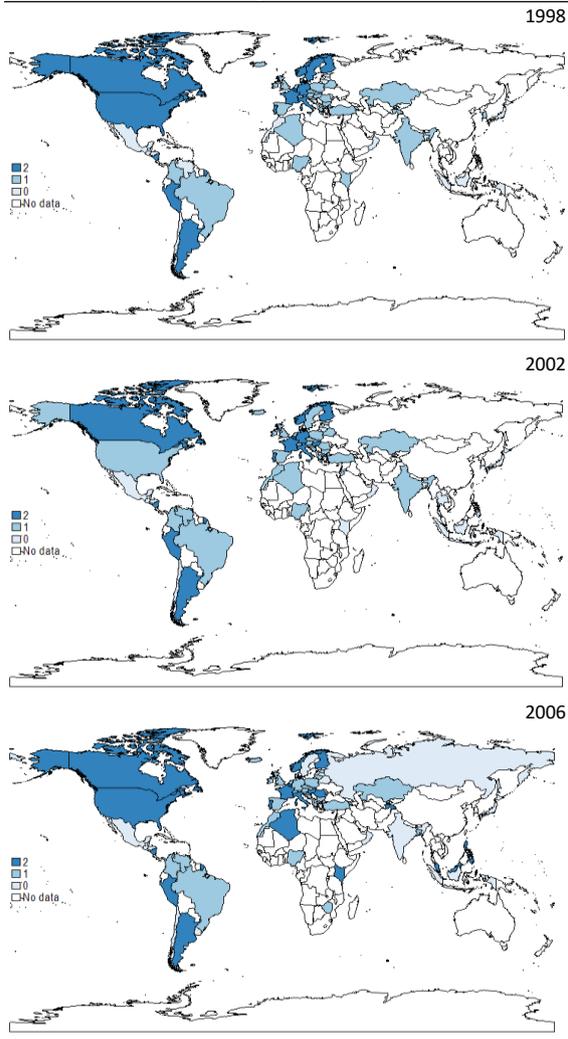
Panel B: DI power



Note: This figure shows heat maps of DI schemes in our 131 sample countries for 1998, 2002 and 2006 respectively. In Panel A, darker blue indicates a country has an explicit DI and lighter blue indicates a country without an explicit DI. In Panel B to Panel F, darker blue indicates higher values respectively for each of the DI design features.

Figure 3 continued. Heat Maps of Deposit Insurance Schemes

Panel C: DI moral hazard mitigation



Panel D: DI coverage intensity

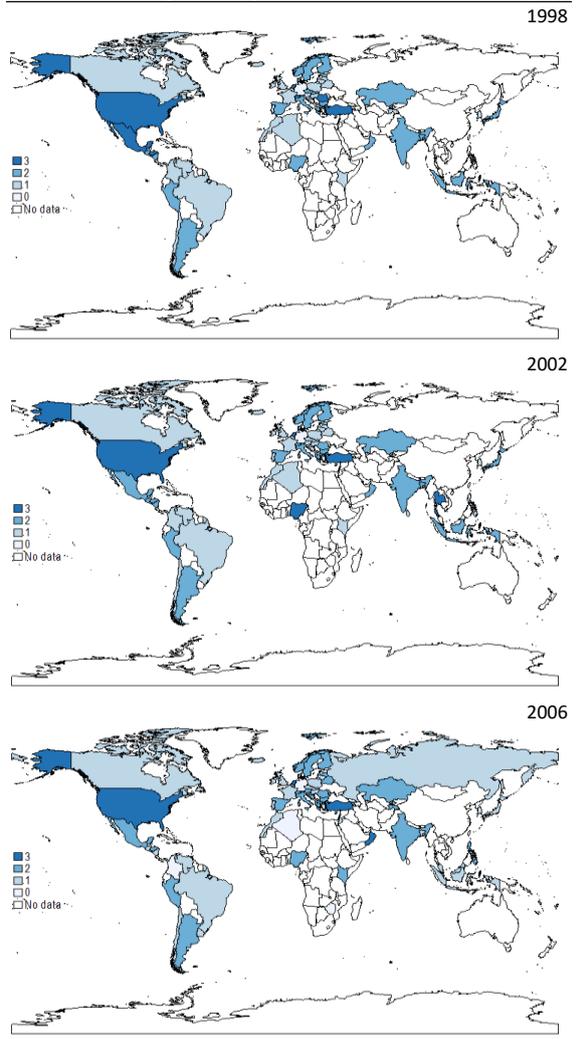
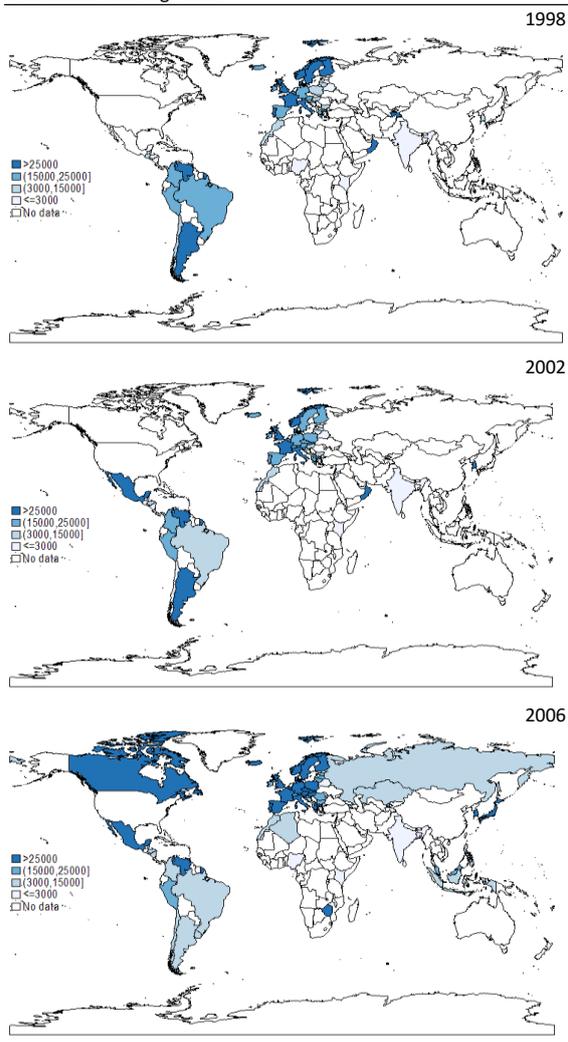


Figure 3 continued. Heat Maps of Deposit Insurance Schemes

Panel E: DI coverage limit



Panel F: DI repayment history

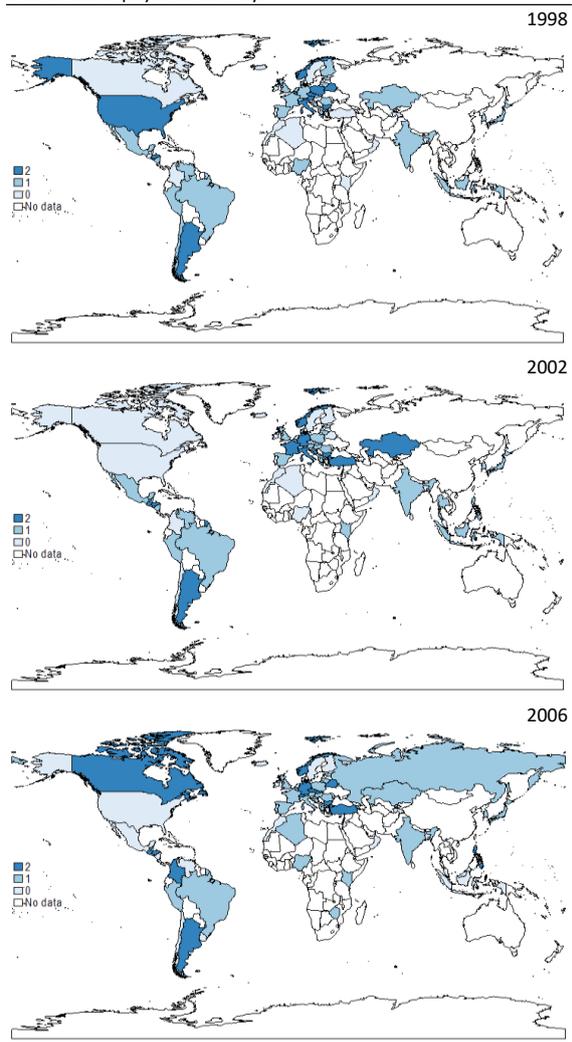
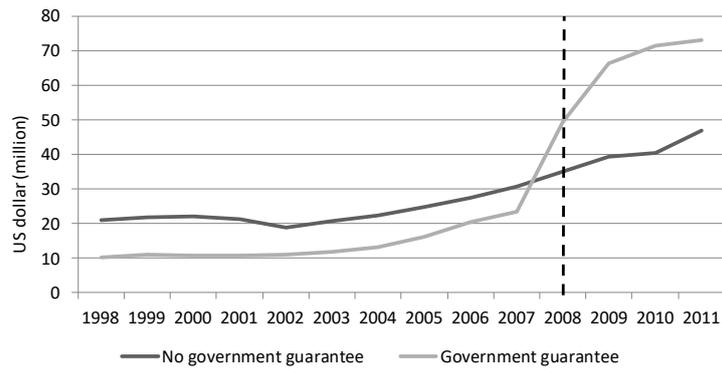
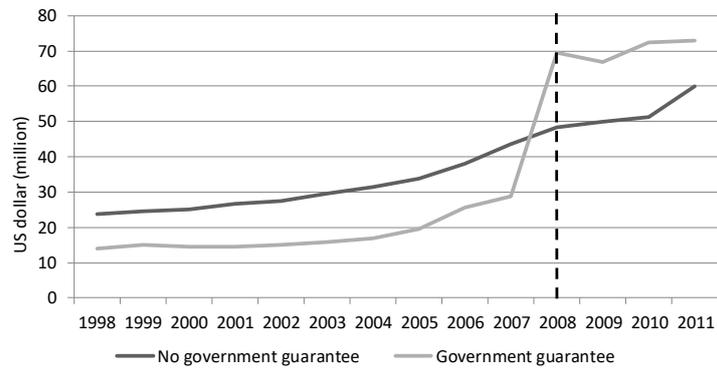


Figure 4. Cross-Border Deposits and Emergency Actions

Panel A: All bank countries



Panel B: Bank countries in crisis



Note: This figure visualizes the difference in difference setting for the emergency actions taken by national governments during the 2008/09 financial crisis. The black lines represent cross-border deposit volumes for countries that did not extend a government guarantee, the grey lines represent cross-border deposit volumes for countries that extended a government guarantee.