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ABSTRACT

The EU Deposit Insurance Directive: Does One Size Fit All?

The EU deposit insurance directive requires member states to maintain deposit insurance with a minimum insured amount of 20,000 euros. This paper reviews the rationale for international coordination of deposit insurance policies. For international externalities of deposit insurance policies to exist, there has to be international ownership of either bank deposits or bank shares. On both counts, EU banking markets are currently highly integrated. The minimum coverage of 20,000 euros imposes costs if it forces some countries to 'overinsure' deposits. From a national perspective, the deposit insurance directive does not appear to result in overinsurance in the EU-15, but there may be overinsurance in several of the new member states.

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1. Introduction

Over time the number of countries that has adopted an explicit system of deposit insurance has steadily increased.[1] To explain this, Demirgüç-Kunt, Kane and Laeven (2005, henceforth DKL) estimate a binary choice model of deposit insurance adoption. Rising income levels and an apparent desire to emulate best practice may have led many countries to opt for explicit deposit insurance. For EU member states, however, the adoption of explicit deposit insurance is an obligation of EU membership rather than a choice, following the EU Directive on Deposit-Guarantee Schemes of 1994 (see European Commission (1994)). Specifically, the 10 countries that joined the EU in 2004 have had no choice in this area and leading up to accession all adopted explicit deposit insurance schemes. A main feature of the Directive is the minimum insured amount of 20,000 euros per depositor per financial institution. Per capita income levels in Eastern Europe are about a quarter of those in the EU-15, and hence the minimum insured amount of 20,000 euros is relatively high in these countries.

Following a slate of banking crises in Asia and elsewhere in the 1990s, deposit insurance policies have caught the attention of researchers and policy makers alike. Among other things, researchers have addressed the potential for explicit deposit insurance to contribute to financial fragility (see, for instance, Eichengreen and Arteta (2000) and Demirgüç-Kunt and Detragiache (2002)) and to reduce the market discipline imposed on insured banks (see, for instance, Martinez-Peria and Schmukler (2001) and Demirgüç-Kunt and Huizinga (2004)).[2] Policy makers, gathered in the Financial Stability Forum, have addressed the issue of deposit insurance adoption as well, resulting in a set of recommendations on what constitutes best practice in the area (see Financial Stability Forum (2001) for a report). In all of this, deposit insurance adoption is primarily seen as a national responsibility. Against this background, the

[1] Comments on a previous draft by Aslı Demirgüç-Kunt and Luc Laeven are gratefully acknowledged.
[2] See Demirgüç-Kunt and Kane (2002) for a survey.

EU is unique in imposing far-going harmonization of deposit insurance policies on its member states through the Directive of 1994.

In evaluating the EU Directive, a main question is whether it makes sense at all to harmonize deposit insurance policies internationally. Why, in fact, would national deposit insurance policies that are best for the adopting countries also not be best for other countries? If banking markets were characterized by full information and perfect competition, it would probably be difficult to argue in favor of such harmonization. Banking markets, however, are often opaque – at least to banking customers – and often far from competitive.[3] Lack of information could be a reason to adopt minimum deposit insurance coverage EU-wide – to offer adequate protection to ill-formed international depositors. Similarly, lack of bank competition could motivate common restrictions on deposit insurance policies – for instance in the form of a minimum deposit insurance premium – to dull international regulatory competition to favor national banking systems. At any rate, a necessary condition for the harmonization of international deposit insurance policies to make sense is that banking markets are internationally integrated. Banking market integration means that banks have international customers and perhaps that their ownership is international as well. Banking market integration thus implies that foreign residents are directly affected by national deposit insurance policies. In both the customer and ownership categories, banking markets in the Europe are already well integrated as shown in this paper.

Any benefits of deposit insurance policy harmonization have to be balanced against the costs of forcing the same policy on countries that differ widely in their states of overall and financial development. DKL find that richer countries are more likely to adopt explicit deposit

[3] According to Morgan (2002) the pattern of disagreement among bond raters offers evidence that banks are inherently more opaque than other types of firms. Demirgüç-Kunt and Huizinga (1999) find that bank concentration is positively related to bank profitability as evidence of uncompetitive behavior. Claessens and Laeven (2004) construct a measure of bank competition that reflects the sensitivity of revenues to input prices. Banking systems with greater foreign bank entry and fewer entry and activity restrictions are found to be more competitive.

insurance, and that richer countries tend to provide broader insurance coverage given deposit insurance adoption. The EU chose the 20,000 euros coverage minimum to fit the needs and circumstances of the relatively wealthy Western EU member states. This suggests that the 20,000 euros minimum may be considerably higher than the insurance that the Eastern member states would offer, if any, in the absence of the Directive. If so, the Directive could impose considerable costs on these countries. These costs can take several forms. The adoption of explicit deposit insurance with a relatively high insurance coverage can increase the likelihood of a banking crisis (see, for instance, Demirgüç-Kunt and Detragiache (2002)). This reflects that generous insurance may cause moral hazard and increased risk-taking on the part of some or all insured banks. Efficiency may be hampered if generous deposit insurance brings about the cross-subsidization of weak banks by the strong banks through the premium payments. In addition, generous deposit insurance can impose high fiscal costs if a crisis were to occur.

For costs of this kind to be relevant, the minimum coverage of 20,000 euros indeed has to be binding for some EU member states. To see whether this is the case, we need to know what coverage EU member states would have been likely to adopt in the absence of the EU Directive. For this purpose, we adopt the approach of DKL of estimating a two-stage Heckman (1979) selection model of deposit insurance adoption and minimum coverage determination. After estimating this model with data for non-EU countries, we can predict 'out-of-sample' the probability of deposit insurance adoption of EU member states as well as their expected insurance coverage. On the basis of these estimates, we find that the EU Directive may not much constrain deposit insurance policies in the EU-15 (because the probabilities of deposit insurance selection are relatively high and the predicted coverage amounts are well above 20,000 euros). The EU Directive, however, deviates considerably from the estimated preferred policies in Eastern Europe (as predicted adoption probabilities are considerably less than one and expected coverage amounts in several instances less than 20,000 euros). This does not

prove that the EU Directive is the wrong policy, precisely because there may be (positive) external effects of deposit insurance adoption and high coverage levels that would not be reflected in countries' own preferred (and predicted) policies. Nonetheless, the evidence of this paper casts doubt on the wisdom of an across-the-board minimum coverage of 20,000 euros for the entire EU.

In the remainder, section 2 describes some main features of deposit insurance policies in the EU as in part determined by the Directive. Section 3 turns to the international aspects of deposit insurance. First, it discusses conceptually under what circumstances international co-ordination or even harmonization of deposit insurance policies may be beneficial. Co-ordination of deposit insurance policies would limit or eliminate international regulatory competition in this area. To see whether national deposit insurance policies potentially have international ramifications, the section also (i) provides some evidence on the current level of international banking market integration in the EU and (ii) reviews some evidence on how national deposit insurance policies may affect international flows of bank deposits. Section 4 turns to the question of whether the EU Directive imposes binding constraints on policy making in EU member states regarding insurance adoption and minimum coverage. Section 5 concludes

2. Deposit insurance policies in the EU

The EU deposit insurance Directive of 1994 imposes minimum standards on national deposit insurance policies. As with all EU banking regulation, the principles of home country control and mutual recognition assign regulatory responsibilities in the case of internationally active banks. Foreign branches thus are affected by parent-country deposit insurance, while foreign subsidiaries are subject to host country policies. The main objectives of the EU Directive appear to be to increase the stability of the banking system and to protect depositors.

To further these objectives, the Directive requires the adoption of an explicit system of deposit insurance with a minimum coverage of 20,000 euros.[4] Table 1 provides information on actual coverage levels for the EU-15 in Panel A and for the 10 accession countries in Panel B. Seven of the 15 countries in Panel A in fact have a coverage limit exceeding 20,000 euros in 2002, with the highest coverage of 103,291 euros in Italy. The average coverage level of 33,656 euros is much higher than the minimum of 20,000 euros. The average per capita income in the EU-15 is 26,396 euros, while the average ratio of the coverage limit to per capita GDP is 1.414. In Panel B, we see that the average coverage limit in the accession countries is 14931 euros in 2002. Note that Malta only adopted explicit deposit insurance in 2003. The average per capita GDP in the accession countries is only 7,508 euros, while the mean coverage ratio (to per capita GDP) at 2.17 is much higher than in the EU-15.

In designing the Directive, EU policy makers do not appear to have been concerned greatly with limiting potential regulatory competition in the area of deposit insurance. Perhaps this explains that the Directive does not prescribe a minimum deposit insurance premium. This leaves countries free to determine the deposit insurance premium, if any, and in practice we see that deposit insurance premiums are rather low. As seen in the two panels of Table 1, many EU member states charge a deposit insurance premium on an ex post or on demand basis, which means that effectively the deposit insurance premium is zero. The Directive similarly is agnostic on several key deposit insurance design elements. For instance, there are no prescriptions as to whether a permanent fund should be established, and on the public/private mix of the funding and on scheme administration.[5]

[4] Until the end of 1999, maximum insured amounts less then 20,000 euros (but not less than 15,000 euros) were grandfathered. The directive allows, but does not prescribe, co-insurance with the depositor up to a share of 10 percent. At the same time, the directive explicitly excludes interbank deposits, but it provides member states with options regarding whether to insure the deposits of authorities, insurance companies, pension funds, and deposits in non-EU currencies.

[5] In practice, we see some variation in the EU regarding these design elements. See Demirgüç-Kunt and Sobaci (2001).

The writers of the Directive were not totally free of fear of international regulatory competition, however, as the Directive contains three paragraphs that appear to aim to limit the scope for such competition. First, the Directive includes an 'advertising prohibition' that prohibits banks from using differences in their deposit insurance schemes in their commercial ads (article 9, paragraph 3). Second, there was the 'export prohibition' provision that limited the coverage of the insurance of EU foreign branches to the level of the deposit insurance scheme of the host member state (article 4, paragraph 1). This provision was allowed to expire at the end of 1999 after review by the European Commission (1999) on the grounds that the 'export prohibition' had only been necessary during a transitory period (with some countries imposing temporarily low coverage limits below 20,000 euros). Third, there still is the 'topping up' clause that makes it possible for foreign EU branches to top up their insurance coverage to the level of the EU host member state by joining the host country deposit insurance scheme (article 4, paragraph 2). The operation of the 'topping up' clause was also reviewed by the European Commission (2001). This report indicates that the practical importance of the 'topping up' clause has been small, as only the Danish and British deposit insurance schemes have ever concluded 'topping up' agreements with bank branches from European Economic Area (EEA) countries operating within their territories. All the same, the Commission recommended that the 'topping up' provision is maintained to enable branches of banks in accession countries – with still relatively low coverage levels in 2001 – to compete in the EU-15. Hence, it is fair to say that concerns about potential regulatory competition in the area of deposit insurance policies are reflected in the Directive.

3. The international repercussions of deposit insurance

3.1 Does it make sense to harmonize deposit insurance policies?

Several authors have started to analyze potential international competition among bank regulators and the scope for international policy co-ordination in this area. A rather general treatment of the problem is offered by Dell'Ariccia, Giovanni and Robert Marquez (forthcoming). These authors consider two countries with different (relative) preferences over banking profits and banking system stability. National bank regulation in one country – for instance, in the form of deposit insurance or capital requirements - lowers banking profits in that country, but it serves to increase banking system stability in both countries. Acting independently, national bank regulators fail to take into account that higher domestic regulation also leads to increased banking system stability in the other country. Hence, in the absence of policy co-ordination there will be 'underregulation' in this two-country world. Co-ordination of bank regulation in this analysis is taken to imply the introduction of a common, harmonized regulation in both countries. The question is then whether both countries can benefit from the international co-ordination of bank regulatory policies. The answer depends on how different are regulators' preferences over banking profits and banking system stability. If these preferences are the same or very similar in the two countries, then the introduction of a common regulatory policy can be beneficial. If preferences are rather dissimilar, however, there may exist no harmonized regulatory policy that makes both countries better off. Along similar lines, Sinn (2003, Chapter 7) analyzes international bank regulatory competition in the area of capital standards. Adding some realism, he argues that the foreign share in bank deposits and international bank ownership are key parameters in the transmission of national

capital standards to foreign welfare. Equally important is whether international depositors can distinguish among different countries on the basis of capital adequacy requirements.[6]

International competition in the area of deposit insurance policies, if it exists, could provide a rationale for international co-ordination or harmonization of deposit insurance policies, as we see in the form of the EU Directive. Along the lines of Dell'Ariccia, Giovanni and Robert Marquez (2001), EU member states can be expected to have different preferences over deposit insurance coverage. The introduction of a 20,000 euros common minimum coverage can be expected to impose some costs on some member states. The question is whether the introduction of explicit deposit insurance - along the lines of the Directive - introduces sufficient offsetting benefits by limiting policy competition in this area.

What are the external international effects created by deposit insurance introduction? These importantly depend on how deposit insurance is priced and how banks respond to deposit insurance. In an idealized world, we could assume there are (i) sophisticated bank depositors that value deposit insurance appropriately, (ii) fair deposit insurance premiums just sufficient to cover expected deposit insurance pay-outs, and (iii) risk-based deposit insurance premiums so that the introduction of deposit insurance does not create moral hazard. Under these rarefied assumptions, the main effects of deposit insurance would be to eliminate the possibility of costly bank-runs not based on fundamentals. Financial stability no doubt is a common good prized by all countries. Hence, international co-ordination of deposit insurance policies that mainly increased financial stability will be to the benefit of all countries.

Potential international conflicts of interest over deposit insurance policies, however, arise if we relax one (or more) of these three assumptions. To start, unsophisticated international depositors may not be able to distinguish sufficiently between countries with and without deposit insurance. In this instance, depositors will undervalue deposit insurance. This implies

[6] A separate issue is how deposit insurance affects bank competition within a single banking market. See

that they may not accept lower deposit interest rates in countries with deposit insurance, even if banks in these countries have to pay a deposit insurance premium. Deposit insurance then benefits international depositors at the expense of (mostly domestic) bank shareholders. This could make the introduction of deposit insurance undesirable from a national perspective. Hence, international co-ordination of deposit insurance policies could be called for to ensure its introduction in all concerned countries.

Alternatively, we can assume deposit insurance is not fairly priced, but instead implies a net subsidy to the banking system (because the premium payment is less than the expected deposit insurance pay-out).[7] Lowly priced deposit insurance can be interpreted as 'strategic trade policy' along the lines of the analysis of export subsidies in Brander and Spencer (1985). Thus, domestic regulators could introduce cheap domestic deposit insurance to help domestic banks gain market share at the expense of foreign banks.[8] Needless to say, international regulatory competition on the basis of deposit insurance prices is harmful and policy co-ordination can play a useful role in limiting such competition. As indicated before, the EU deposit insurance Directive currently does not regulate deposit insurance pricing.

Finally, we could assume that the pricing of deposit insurance is not risk-based and hence does not fully reflect the riskiness of banking assets. Deposit insurance then introduces or enhances the problem of moral hazard in that banks are induced to finance relatively risky projects with a high probability of default and a low expected return to the bank. For given deposit premium rates, this mechanism serves to transfer resources from the deposit insurance agency to bank shareholders. As long as we maintain that deposit insurance premiums are fair,

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Cordella and Yeyati (2002).

[7] Laeven (2002) calculates 'fair' deposit insurance premiums for a large set of countries and compares these to actual premiums. In particular in Germany, deposit insurance premiums - both public and private – are calculated to be lower than the fair benchmark.

[8] The domestic banks that benefit from low domestic deposit insurance include domestically located banks and the branches of domestic banks located abroad in the EU Directive. The impact on foreign welfare would depend on the market structure, the mode of competitive interaction and on the international ownership of deposits and banking firms.

however, these premiums would have to rise to make up for the higher probability of bank failure. In the end, banks' predilection for risky, low-return projects would therefore be self-defeating. If so, bank shareholders would stand to lose and perhaps depositors as well, if inefficiently operating banks can only pay lower deposit rates. The international external effects of mispriced deposit insurance in one country depend on the international ownership of bank deposits and bank stocks as well as on the way domestic banks and foreign banks compete. At any rate, mispriced deposit insurance is likely to have large net costs, which suggests that international co-operation so as to introduce 'best practice' in this area should only be beneficial. The EU Directive, however, is silent on all aspects of the deposit insurance premium, and hence also on whether it should be risk-based.

To summarize, countries have a common interest in introducing deposit insurance with some minimum coverage insofar as this prevents unwarranted bank runs. Countries may have diverging interests regarding the level of the deposit insurance premium, as a low deposit insurance premium can benefit national banks at the expense of foreign banks. Finally, countries have a common interest in eliminating deposit insurance premiums that are not appropriately risk-based to prevent moral hazard on the part of banks. Reflecting concerns about financial stability, the EU Directive requires explicit deposit insurance. The deposit insurance premium, however, is not regulated, as regulatory competition in this area is apparently not a serious concern for policy makers.

3.2 The internatinalization of banking in the EU

This section reviews some evidence on two key measures of banking integration in the EU: the magnitude of external deposits and the foreign ownership share of the banks themselves. To start, Table 2 provides figures on the external deposits of EU banking systems, defined as deposits owned by non-residents, from the Bank of International Settlements in

2003. Unfortunately, BIS membership in Europe is limited to the EU-15. Total external deposits in the EU-15 are 6.2 trillion euros. The United Kingdom has by far the largest external deposits at 2.3 trillion euros, followed by Germany with 0.9 trillion euros. As a percent of GDP, external deposits are largest in Luxembourg at 1,479 percent. External deposits exceed GDP as well in Belgium, Ireland and the United Kingdom. External deposits as a share of GDP are higher in each EU-15 country than in either Japan or the United States, which shows that EU banking markets are relatively international. Total external deposits can be divided into non-bank external deposits and bank-owned external deposits. Non-bank external deposits are external deposits held by individuals, businesses and public authorities.[9] In the table, we see that non-bank external deposits amount to 1.6 trillion euros in the EU-15. As a share of total deposits, non-bank external deposits are relatively high in Luxembourg and Spain at 36 and 41 percent, respectively. On average, the share of non-bank external deposits in total external deposits is 26 percent in the EU-15.

Next, we consider the international ownership of the banks themselves in the EU. Table 3 provides information on the importance of foreign banks in the EU-15 taken from European Central Bank (2003). At one extreme, all banks in Luxembourg appear to be foreign-owned. At the other end of the spectrum, foreign-owned banks hold less than 10 percent of banking assets in Finland, Germany and Italy. The table makes a distinction between foreign-owned banks with parent companies in the EEA and elsewhere. This reveals that foreign banks in the EU in fact mostly originate from EEA countries (as measured by assets). The table provides a further breakdown into foreign branches and foreign subsidiaries. Here we see that foreign banks from EEA and non-EEA countries are mostly organized as subsidiaries.[10] Finally, the table provides some information on the overall importance of banking markets in the EU as

[9] These businesses include non-bank financial firms such as mutual funds, hedge funds and insurance companies.

[10] See Dermine (2003) for a discussion of a bank's organizational choice between foreign branches and subsidiaries in the EU.

measured by banking assets relative to GDP. On average, the ratio of banking assets to GDP amounts to 4.74 in the EU. This ratio is more than 30 for Luxembourg, while it is less than 2 for Finland, Greece and Italy.

Table 4 provides some information on the foreign ownership of banks in Eastern Europe as calculated by Bonin, Hasan and Wachtel (2003) from Bankscope data. The average foreign ownership share in 8 EU member states in Eastern Europe over the 1996-2000 period is calculated as 68 percent. In Estonia, all banks are reported to be foreign-owned. Slovenia has the lowest foreign ownership rate of these 8 countries at a still considerable 29 percent. Any international ramifications of EU deposit insurance policies are thus expected to be rather important in Eastern Europe.

3.3 The impact of insurance on international deposit flows and banking organization

Depositors potentially shop around internationally to obtain the best deposit insurance conditions. Similarly, internationally active banks may choose their international organizational structure, and in particular whether they operate foreign branches or subsidiaries, with a view to obtain the best possible deposit insurance conditions. The EU Directive in principle opens the door to the latter type of arbitrage by stipulating that foreign branches and subsidiaries are subject to home and host country deposit insurance regimes, respectively. Arbitrage by either bank customers or the banks themselves implies that international differences in deposit insurance regimes distort economic behavior. In this section, we discuss whether there is any evidence for either type of arbitrage.

Two papers have addressed whether capital flows are affected by deposit insurance policies.[11] First, Lane and Sarisoy (2000) examine the impact of deposit insurance on several

[11] Several studies have examined policy determinants of deposit location other than deposit insurance. Grilli (1989) finds some evidence of that aggregate non-bank deposits are affected by the non-resident interest withholding tax and by bank secrecy. Alworth and Andresen (1992) conclude that bilateral non-bank deposit outflows are positively related to the difference between the reserve ratios of the deposit and

measures of private capital inflows (gross and net private capital inflows and capital inflows in the form of syndicated loans and international bonds) for a cross–section of 27 countries over the 1990-1995 period. The authors fail to find a significant impact of explicit deposit insurance, which perhaps is not surprising given that their capital inflow measures include many financial instruments other than the banks deposits that are covered by deposit insurance. Refining this work, Huizinga and Nicodème (forthcoming) examine whether explicit deposit insurance affects bilateral stocks of external bank liabilities for a sample of 16 BIS reporting countries during the 1983-1998 period. A distinction is made between external non-bank liabilities and external bank-owned liabilities. External non-bank deposits are generally covered by any deposit insurance, while bank-owned or interbank deposits are typically excluded. In line with this, Huizinga and Nicodème (forthcoming) find that deposit insurance is relatively attractive to non-bank owners of external bank liabilities. The introduction of deposit insurance specifically is estimated to increase non-bank external deposits by 31 percent, while bank-owned external deposits increase by about a third of this. This evidence suggests that in principle countries can compete in the area of deposit insurance adoption. In the past, they may indeed have introduced deposit insurance with a view to attracting additional international deposits. In the EU, the Directive has made a system of explicit deposit insurance compulsory, and hence competition regarding deposit insurance adoption can no longer exist in the EU. The EU Directive allows countries to set their own deposit insurance premium, and in principle counties can still compete in this area to attempt to attract international depositor customers. Huizinga and Nicodème (forthcoming), however, fail to find any impact of the deposit insurance premium on the international location of non-bank or bank-owned external bank liabilities.

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the bank countries. Huizinga and Nicodème (2003) provide some evidence that bilateral deposits are related to income taxes and to bank reporting of domestic interest payments to the tax authorities.

The EU Directive follows the principle of home country control in assigning responsibilities for internationally active banks. This provides international banks with an incentive to operate foreign branches if the home deposit insurance premium is lower than the host country premium, and vice versa. Do banks in the EU respond to this incentive? To see this, we can relate the data on the assets of foreign branches and subsidiaries in the EU-15 from the European Central Bank (2003, Tables 18 and 20) with information on the deposit insurance premium in Panel A of Table 1. Specifically, the ECB data is used to construct the ratio of foreign-subsidiary assets to foreign-branch assets of banks from EEA countries in individual EU member states. From Table 1, we take the highest explicitly stated deposit insurance premium (hence excluding premiums that are determined ex post or on demand). In Figure 1, we plot the foreign subsidiary/branch assets ratio against the maximum explicit premium.[12] There appears to be a negative relationship indeed suggesting that foreign subsidiaries are less important in high-premium countries. Notably, Greece, the country with the highest explicit deposit insurance premium of 0.3 percent per annum, has no foreign bank subsidiaries. The figure thus offers some evidence that bank organizational choices in the EU are distorted by the Directive's provision deposit insurance is subject to home country control

4. Does the EU Directive lead to overinsurance?

The EU deposit insurance Directive forces member states to adopt a system of explicit deposit insurance with a minimum coverage of 20,000 euros. This section examines whether these two main features of the Directive appear to constrain policy making in EU member states. Specifically, we first ask whether EU member states would have been likely to adopt explicit deposit insurance without the directive. Second, we examine whether the minimum coverage of 20,000 euros exceeds the expected coverage in the absence of the Directive. To

[12] Data are plotted for Belgium, Denmark, France, Germany, Greece, Ireland, Portugal and Spain.

address these issues, we use the two-stage Heckman (1979) selection model of deposit insurance adoption and coverage determination of DKL.[13] In this approach, a first-stage regression explains deposit insurance adoption with a logistic probability model. A second-stage regression explains the ratio of the maximum coverage to per capita GDP in case explicit deposit insurance is adopted in the first stage. The Heckman two-stage model takes into account that some of the unobserved factors (or 'errors') that affect the deposit insurance choice also affect the coverage ratio in case of adoption to ensure unbiased parameter estimates in the second-stage regression. The sample consists of a large set of developing and developed countries over the 1961-2002 period.

Among the variables included in both regressions are three macro variables: inflation, GDP growth and GDP per capita. Next there is the External Pressure variable which is a dummy variable that takes on a value of 1 for the years 1999 and onwards. This reflects that 1999 was the year in which the IMF starting expressed support of explicit deposit insurance as evidenced by a paper on best practice and guidelines regarding deposit insurance. Next, the Executive constraints variable is an index measuring the extent of institutionalized constraints on decision-making powers of chief executives. This variable is included to test whether countries with more democratic political systems are more likely to adopt deposit insurance. Finally, the crisis dummy variable equals one if a deposit insurance system was adopted between 0 and 3 years following a systematic banking crisis. This variable is allows us to see whether deposit insurance systems tend to be adopted following a banking crisis.

In Table 5, there are two pairs of regressions: pair 1 is based on a sample that excludes all 25 EU member states, while pair 2 only excludes the accession countries. Closely mirroring DKL, in the two first-stage regressions we see that deposit insurance adoption is more likely given (i) a low inflation, (ii) a high per capita GDP, (iii) the period from 1999 onwards, (iv) a

[13] Specifically, we start from regression 1 in Panel A of Table 12 in DKL.

more democratic political system (a high value for the executive constraints index), and (v) the occurrence of a financial crisis. The two second-stage regressions of the coverage ratio reveal that the same factors that make deposit insurance adoption more likely also work towards a higher coverage ratio.

The estimated parameters in Table 5 can be used to estimate the probability of deposit insurance adoption and the expected coverage ratio. To construct the expected coverage ratio, the coverage ratio is taken to be zero in case deposit insurance is not adopted. Specifically, regression 1 in Table 5 is used to estimate 'out-of-sample' adoption probabilities and coverage ratios for all 25 EU countries for the year 2002. In addition, regression 2 in Table 5 is used to produce 'out-of-sample' adoption probabilities and expected coverage ratios for the accession countries only for 2002.

In Table 6, Panel A gives the results for the EU-15 - based on regression pair 1 of Table 5. The average probability of adoption is estimated to be 0.59, which suggests that by 2002 the majority of EU-15 countries would have adopted explicit deposit insurance even without the directive.[14] Relatively low probabilities of adoption are estimated for Greece and Portugal at 0.47 and 0.45, respectively. As seen in Table 1, Greece and Portugal were rather late adopters of explicit deposit insurance in 1993 and 1992, respectively. Hence, it is likely that these two countries were forced into deposit insurance adoption by the prospect of the EU Directive taking effect in 1994. Next, the average predicted coverage ratio is 3.96. Interestingly, this is far higher than the average actual coverage ratio for the EU-15 that is seen to be 1.41 in Table 1.[15] The model may overpredict EU-15 coverage ratios as the United States and Japan – countries with similar levels of economic development to the EU-15 – have coverage ratios of

[14] Note that the predicted adoption probability for a country summarizes the impact of country-specific circumstances (such as whether the country has suffered a systematic banking crisis) on the likelihood of insurance adoption. It does not imply whether a country in fact should adopt deposit insurance, not least because deposit insurance can have international external effects as argued in section 3.1.

[15] The average coverage ratio in Panel A of Table 1 rises to 1.49 if Luxembourg is excluded to make the numbers fully comparable.

2.78 and 2.54 that are much higher than the EU-15 average.[16] In absolute numbers, the EU-15 are expected to have an average coverage limit of about 100,000 euros as seen in the table. For each of the EU-15 countries, the expected coverage limit in fact exceeds the minimum coverage of 20,000 euros by a wide margin. Effectively taking the United States and Japan as comparator countries, the model thus suggests that the EU Directive does not bind choices as to the coverage limit in the EU-15. If this is true, however, it is surprising that 8 countries among the EU-15 set their coverage limits to exactly 20,000 in 2002 (see Table 1). This apparent contradiction just underscores that it may not be correct to take coverage levels in the United States and Japan – rather high among developed countries – to be the norm for the EU-15.

Given our model, we can next calculate the predicted adoption probabilities and coverage limits for the accession countries based on regression pair 1 in Table 5. The average predicted adoption probability for these countries is seen to be relatively low at 0.48 (see Panel B of Table 6). In line with this, the predicted adoption probability is less than half in the Czech Republic, Estonia, the Slovak Republic and Slovenia. Similar results are reported in Panel C of Table 6 – on the basis of regressions that include the EU-15 in the sample.[17] By 2002, all accession countries apart from Malta had in fact adopted deposit insurance - with Malta falling in line in 2003. The EU Directive no doubt was a major catalyst in this development.

Panel B of Table 6 indicates that the average predicted coverage ratio is 2.95 for the accession countries, while Panel C reports an average predicted coverage ratio of 2.52.[18] These

[16] In unreported regressions, a squared per capita GDP variable was included to yield an even higher average predicted coverage ratios for the EU-15 of 4.27.

[17] Note that the first pair of regressions suggests that it is appropriate to include the EU-15 in the sample, as the EU Directive apparently does not constrain coverage levels for these countries. The EU Directive may similarly not be materially binding coverage levels in the EU-15 as these countries themselves supported the adoption of the Directive.

[18] Note that Slovenia has the highest predicted absolute coverage limit of 30,139 euros reflecting its relatively high per capita GDP.

numbers are not too far from the average actual average coverage ratio of 2.17.[19] Hence, in 2002 the regression model does a reasonable job of predicting actual coverage ratios for the accession countries. As in 2002 predicted coverage ratios exceeded the actual ones in the accession countries, the deposit insurance directive apparently was not yet constraining coverage policies in the accession countries.[20] This, of course, is not surprising as accession only took place in 2004. All the same, it is interesting to check whether the 20,000 euros limit would have been binding, if it were already in effect in 2002. The table indicates that for 6 countries - of the 8 for which we have data - the 20,000 euros minimum indeed exceeds the predicted coverage for 2002, which suggests that in these 6 countries the minimum of 20,000 euros would have been binding. For 5 of these 6 countries, actual coverage in 2002 was below the 20,000 euros minimum. For these 5 countries, the 20,000 euros minimum thus is likely to be binding after the Directive takes full effect. The same conclusion is reached in Panel C of Table 6 – based on regression 2 of Table 5.

The accession treaty grants three countries with predicted 'overinsurance', Estonia, Latvia and Lithuania, temporary derogations from the requirement to institute a minimum coverage level of 20,000 euros. Specifically, Estonia is allowed to maintain a coverage limit of 6,391 euros until the end of 2005, to be followed by a coverage limit of 12,782 euros during 2006 and 2007. For Latvia, the allowed coverage limit is 10,000 till the end of 2005, and 15,000 during 2006 and 2007. Finally, Lithuania can maintain a coverage limit of 14,481 till the end of 2006, and of 17,377 during 2007. Thus by the end of 2007, the three Baltic states will also have to comply with the minimum coverage of 20,000 euros as stipulated by the Directive.

[19] Excluding Cyprus from Panel B of Table 1 would yield a very similar average actual coverage ratio of 2.13.

[20] Nenovsky and Dimitrova (2003) assume that best practice implies an optimal coverage ratio of about 1 to 2 times GDP per capita. They note that the average coverage ratio in the accessions countries is higher than this best-practice level and also higher than the average coverage ratio in the euro area of 1.44 in 2002. On the basis of this, they conclude that there is overinsurance in the accession countries.

Overall, the evidence suggests that the EU Directive appears forces deposit insurance on at least some of the accession countries and, in addition, is likely to lead to higher deposit insurance coverage than these countries would choose otherwise. This outcome may produce some benefits for the other EU countries if it reduces the likelihood of bank runs and protects depositors from these countries. This outcome, however, necessarily implies some costs for the accession countries (relative to their preferred outcome). A first cost of forced deposit insurance adoption and 'overinsurance' may be a reduction in financial stability in these countries. This is suggested by Demirgüç-Kunt and Detragiache (2002, Tables 2 and 3) who find that the likelihood of a financial crisis is positively related to the existence of explicit deposit insurance and to a higher explicit coverage limit. The reasoning is that explicit deposit insurance with high coverage limits may increase moral hazard and risk-taking on the part of banks, thus contributing to financial fragility.[21] If so, explicit deposit insurance adoption in the accession countries could well imply negative external effects for the EU-15. Demirgüç-Kunt and Detragiache (2002) have found that the potential link between explicit deposit insurance adoption and the likelihood of financial crises is stronger in countries with weaker institutional environments. This is relevant as the adoption of explicit deposit insurance in the accession countries is only part of the overall accession process. The accession countries in fact are led to adopt an entire 'acquis communautaire' relating to financial markets. This presumably leads to improved overall bank regulation and supervision, even if the upgrading of bank supervision in practice may take some time. Better bank regulation and supervision should reduce the scope for the adoption of explicit deposit insurance in developing countries to lead to a financial crisis. Finally, a second and related cost of high-coverage deposit insurance in the accession countries is the potential for high fiscal outlays if a financial crisis were to occur.

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[21] Deposit insurance could reduce financial stability by weakening market discipline of banks. See Demirgüç-Kunt and Huizinga (2004). Gropp and Vesala (2001), however, argue that the EU Directive has improved market discipline in the EU by excluding interbank deposits from coverage.

5. Conclusion

The EU deposit insurance Directive is unique in imposing minimum standards of deposit insurance policies on several countries. In essence, the Directive requires countries to adopt an explicit system of deposit insurance with a minimum coverage level of 20,000 euros. This reflects that the main objectives of the Directive appear to be to increase banking system stability and to protect depositors. The Directive certainly reduces the scope for bank runs and it protects small and unsophisticated savers. In an integrated financial area such as the EU, this is to the benefit of the entire EU. By its very nature, the Directive eliminates the scope for international competition in the area of deposit insurance adoption. Hence, it may have eliminated competitive advantages on account of explicit deposit insurance in countries that were early adopters of deposit insurance. Beyond its main coverage provision, the Directive leaves several key elements of deposit insurance design, and in particular the height of the deposit insurance premium, up to national policy makers. Hence, national policy makers in the EU in principle can compete in the area of deposit insurance design with a view to improving the competitive positions of their banking systems. The generally low levels of deposit insurance premiums in the EU may be an outcome of this.

The Directive was designed to fit the needs of the EU as it existed in 1994. Specifically, the relatively high minimum coverage of 20,000 euros is appropriate for the rather wealthy countries that made up EU membership in the 1990s. For the new member states, adopting deposit insurance systems along lines of the Directive was a requirement of EU membership, even if the accession treaty provides the three Baltic states temporary reprieve from the minimum coverage requirement of 20,000 euros. Evidence in this paper suggests that the accession countries as a group have relatively low probabilities of deposit insurance adopted and equally low expected coverage. Hence, as a group they adopt explicit deposit insurance

with a coverage of 20,000 euros because the EU deposit insurance directive forces them to do so. The adoption of deposit insurance thus is a cost of EU membership that the accession countries have to bear. The high coverage of 20,000 euros may lead to moral hazard an increased risk-taking on the part of banks and thus reduce financial stability. Also, the high coverage level may lead to rather high fiscal costs in case of a financial crisis. Perhaps the equally forced adoption of other aspects of the 'acquis communautaire' related to banks – leading to an overall better regulatory and supervisory environment – could serve to mitigate the potential costs of high-coverage deposit insurance in the new member states. Counterbalancing these costs would be any positive effects of explicit deposit insurance in the accession countries for the EU-15. On net, coverage levels in the accession countries as forced by the Directive will probably be too high.

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Table 1. Deposit insurance policies at end of 2002

Panel A. EU-15

Country	Date enacted	Coverage limit in euros	GDP per capita in euros	Coverage divided per capita GDP	Annual premiums
Austria	1979	20,000	26,635	0.75	Pro rata, ex post
Belgium	1974	20,000	25,266	0.79	0.02 + 0.04 of insured liabiliti
Denmark	1988	40,377	34,196	1.18	0
Finland	1969	25,000	26,877	0.93	Risk based: 0.05 to 0.3
France	1980	70,000	25,585	2.74	On demand but limited
Germany	1966	20,000	25,555	0.78	Official is 0.03 but can be doubled
Greece	1993	20,000	13,276	1.51	Decreasing from 0.125 to 0.0025 by size
Ireland	1989	20,000	33,280	0.6	0.2
Italy	1987	103,291	21,726	4.75	Risk adj.,ex post 0.4 to 0.8 of protected funds
Luxembourg	1989	20,000	50,373	0.4	Ex post
Netherlands	1979	20,000	27,506	0.73	Ex post
Portugal	1992	25,000	12,879	1.94	Risk-based between 0.1 and 0.2
Spain	1977	20,000	16,851	1.19	Maximum of 0.2
Sweden	1996	27,322	28,657	0.95	Risk-based, 0.5
United Kingdom	1982	53,846	27,271	1.97	On demand
Average		33,656	26,396	1.41	

Panel B. Accession countries

Country		Coverage limit in euros	GDP per capita in euros	Coverage divided by per capita GDP	
Cyprus	2000	35,088	14,132	2.48	
Czech Republic	1994	25,023	7,058	3.55	Banks 0.1, building societies 0.05
Estonia	1998	2,556	5,083	0.5	0.5 (maximum)
Hungary	1993	4,232	7,069	0.6	Risk-based to 0.3
Latvia	1998	4,918	3,647	1.35	0.3
Lithuania	1996	13,043	4,226	3.09	Banks and foreign branches 0.45, credit unions 0.2
Malta	2003				
Poland	1995	18,026	10,064	3.63	0.4
Slovak Republic	1996	13,242	4,783	2.77	0.1 to 0.3
Slovenia	2001	18,248	11,507	1.59	Ex post
Average		14,931	7,508	2.17	

Notes. Coverage data are for 2002. Averages are unweighed and in Panel B exclude Malta.

Coverage information is from DKL. Annual premium are mostly for 1999 and are from Demirgüç-Kunt and Sobaci (2000).

Premium data for the Check Republic, Denmark, Finland, Greece, Lithuania, Poland, Portugal and Slovenia are from the international deposit insurance survey conducted by the Canada Deposit Insurance Corporation conducted in 2002.

Table 2. External deposits of banks in the EU-15 in 2003

	Total external deposits		External deposits owned by non-bank	
	Billions of euros	As percent of GDP	Billions of euros	As percent of total
Austria	75	33	14	19
Belgium	340	126	111	33
Denmark	87	46	11	13
Finland	22	16	2	9
France	620	40	70	11
Germany	897	42	307	34
Greece	28	18	10	34
Ireland	246	182	50	20
Italy	311	24	22	7
Luxembourg	354	1,479	129	36
Netherlands	391	86	90	23
Portugal	116	89	14	12
Spain	314	42	128	41
Sweden	88	33	8	10
UK	2,268	143	615	27
Average fo				
5	6,157	66	1,579	26
Japan	413	11	44	11
US	1,375	14	321	23

Note: External deposits are deposits owned by non-residents. Averages for the EU-15 are unweighted. Sources: BIS (2005, Tables 3A and 3B) and Eurostat.

Table 3. Foreign banking in the EU-15 in 2002

	Foreign share	Of which: EEA		Non-EEA	
	FS	Branches	Subs	Branches	Assets/ GDP
Austria	21	1	20	0	2.56
Belgium	24	3	18	1	2.97
Denmark					
Finland	8	8	0	0	1.18
France	18	3	7	0	2.55
German	6	1	4	1	3.02
Greece	21	6	12	3	1.43
Ireland	50	13	25	0	3.7
Italy	4	4	0	1	1.61
Luxembourg	100	16	78	1	30.18
Netherlands	10	2	7	0	3.05
Portugal	25	5	20	0	2.72
Spain	10	5	4	1	1.94
Sweden					
UK					
Average	23	6	19	1	4.74

Note: Foreign share is the percentage of assets of foreign banks. Averages are unweighted.
Source: ECB (2003, Tables 5, 18, 20, 22 and 24).

Table 4. Foreign ownership in Eastern Europe in 1996-2000

	No of banks	Foreign ownership
Czech R	24	81
Estonia	3	100
Hungary	30	86
Latvia	20	34
Lithuania	8	76
Poland	33	64
Slovenia	18	29
Slovakia	17	71
Average	19	68

Note: Foreign ownership is percentage of observations with majority foreign ownership. Average is unweighted. Source: Bonin, Hasan and Wachtel (2003, Table 29).

Table 5. Heckman two-step selection model for the coverage ratio

Second-stage:	Coverage ratio	
	(1)	(2)
Inflation	- 0.015***	-0.014***
	(0.004)	(0.004)
GDP growth	-0.0003	-0.033
	(0.052)	(0.040)
GDP per capita	0.160***	0.141***
	(0.027)	(0.018)
External pressure	3.724***	2.823***
	(0.607)	(0.428)
Executive constraints	1.166***	0.905***
	(0.122)	(0.092)
Crisis dummy	4.357***	3.702***
	(0.712)	(0.549)
Post-crisis adoption	3.201***	2.772***
	(0.647)	(0.481)
Heckman Lambda	8.123***	6.498***
	(0.307)	(0.197)

First-stage:	Deposit insurance	
	(1)	(2)
Inflation	-0.001**	-0.001**
	(0.000)	(0.000)
GDP growth	0.006	0.002
	(0.006)	(0.006)
GDP per capita	0.023***	0.029***
	(0.003)	(0.003)
External pressure	0.591***	0.560***
	(0.070)	(0.064)
Executive constraints	0.163***	0.162***
	(0.014)	(0.013)
Crisis dummy	0.510***	0.534***
	(0.085)	(0.082)
Post-crisis dummy	0.419***	0.471***
	(0.078)	(0.072)
Observations	3798	4336
Censored observations	3281	3564

Note: The endogenous variable in the first stage is the explicit deposit insurance indicator, while the endogenous variable in the in second stage is the coverage ratio. Regressions are based on those in column 1 in Panel A of Table 12 of DKL. However, regressions 1 exclude observations for all EU member states, while regressions 2 exclude observations for the accession countries. Sample period is 1961-2002. Inflation is based on GDP deflator and in percent. GDP growth is the real GDP growth rate in percent. GDP per capita is in constant 1995 thousands of US dollars. External pressure is a dummy variable that takes on a value of one for the years 1999 and onwards. Crisis dummy equals 1 if the country experiences a systematic crisis in that year and 0 otherwise from 1976. Post-crisis adoption equals 1 if a deposit insurance system was adopted between 0 and 3 years following a crisis and 0 otherwise. Executive constraints is an index measuring the extent of institutionalized constraints on decision-making powers of chief executives. The index ranges from 1 to 7, where 1 represents unlimited authority and 7 executive parity or subordination. Estimates are efficient or maximum likelihood (ML) estimates. Data has been made available by DKL. See DKL for data sources. *, **, *** indicate significance at the 10%, 5% and 1% level, respectively.

Table 6. Deposit insurance adoption probabilities and expected coverage limits

Panel A. EU-15

Country	Predicted values			Is predicted coverage less then 20,000 euros ?	Is in addition the actual equal to 20,000 euros?
	Probability of adoption	Coverage ratio	Coverage limit in euros		
Austria	0.64	4.42	117,712	No	No
Belgium	0.62	4.21	106,430	No	No
Denmark	0.69	4.99	170,581	No	No
Finland	0.64	4.33	116,443	No	No
France	0.55	3.51	89,853	No	No
Germany	0.63	4.35	111,270	No	No
Greece	0.47	2.78	36,856	No	No
Ireland	0.62	4.05	134,934	No	No
Italy	0.53	3.33	72,286	No	No
Luxembourg					
Netherlands	0.62	4.18	115,061	No	No
Portugal	0.45	2.7	34,790	No	No
Spain	0.66	4.84	81,498	No	No
Sweden	0.63	4.29	122,883	No	No
United Kingdom	0.55	3.47	94,613	No	No
Average	0.59	3.96	100,372		

Panel B. Accession countries based on model 1 in Table 5

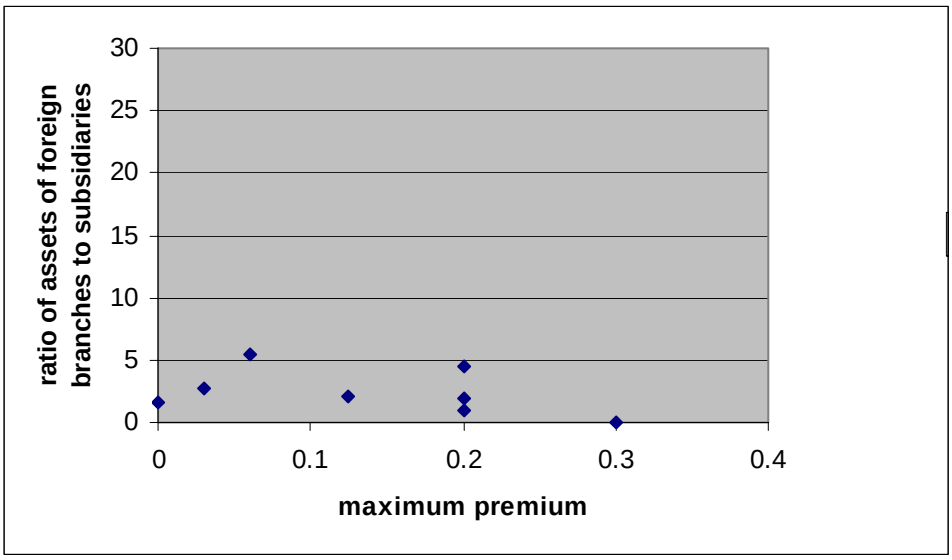
Country	Predicted values			Is predicted coverage less then 20,000 euros ?	Is in addition the actual equal to 20,000 euros or less?
	Probability of adoption	Coverage ratio	Coverage limit in euros		
Cyprus					
Czech Republic	0.39	2	15,657	Yes	No
Estonia	0.39	2.16	11,001	Yes	Yes
Hungary	0.56	3.64	25,747	No	No
Latvia	0.54	3.49	12,732	Yes	Yes
Lithuania	0.54	3.47	14,657	Yes	Yes
Malta					
Poland	0.54	3.55	17,643	Yes	Yes
Slovak Republic	0.39	2.14	10,248	Yes	Yes
Slovenia	0.45	2.62	30,139	No	No
Average	0.48	2.95	15,383		

Panel C. Accession countries based on model 2 in Table 5

Country	Predicted values Probability of insurance	Coverage divided by GDP	Coverage limit in euros	Is predicted coverage less then 20,000 euros ?	Is in addition the actual equal to 20,000 euros or less?
Cyprus					
Czech Republic	0.41		13,532	Yes	No
Estonia	0.4	1.92	9,237	Yes	Yes
Hungary	0.59	1.82	22,570	No	No
Latvia	0.57	3.19	10967	Yes	Yes
Lithuan	0.57	3.01	12,574	Yes	Yes
Malta		2.98			
Poland	0.57	3.15	15,663	Yes	Yes
Slovak Republic	0.4	1.81	8,680	Yes	Yes
Slovenia	0.48	2.27	26,155	No	No
Average	0.50	2.52	14,922		

Note: Averages are unweighted.

Figure 1. The ratio of assets of foreign subsidiaries to foreign branches from EEA-countries in EU-15 and the maximum premium



Note. Data available for 8 countries among the EU-15. The maximum premium is the maximum number mentioned in the last column of Table 1, Panel A. Source for assets of foreign branches and subsidiaries of EEA countries is ECB (2003, Tables 18 and 20) for 2002.