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Esa Jokivuolle and George Pennacchi
Designing a Multinational Deposit Insurance System: Implications for the European Deposit Insurance Scheme

INTRODUCTION

There are two main benefits to a credible deposit insurance system, whether the system is national or multinational. One is that deposit insurance protects the savings of financially unsophisticated individuals and small businesses. These “retail” bank customers often lack the ability to judge a bank’s credit risk or find it very costly to do so. Credible deposit insurance removes their need to concern themselves with a bank’s default risk and provides them with what might be their only safe savings vehicle.

The other major benefit relates to the short-term, demandable nature of deposits that makes them convenient for settling transactions. Liquidating deposits at short notice allows for immediate settlement of payments, but can also lead to a “bank run,” where depositors may seek to withdraw their savings en masse if they believe that their bank’s failure may be imminent. Large-scale withdrawals may force a bank to quickly liquidate securities and loans at “fire-sale” prices that exacerbate the bank’s losses. In a system with inter-bank lending, one bank’s default may lead to failures at others, resulting in widespread distress that cuts off bank lending, one bank’s default may lead to failures among nations. Deposit insurance losses, whether absorbed by a nation’s surviving banks or its government, will tend to have lower variance under a multinational system than single nation systems.

The next section considers the basic nature of deposit insurance and, in particular, a deposit insurer’s cost of providing it, where by “cost” we mean its fair market value. The reason for this discussion is to understand why various moral hazard-related distortions arise if banks are not charged an insurance premium equal to this fair cost. As will be argued, most deposit insurance schemes, including those with risk-based premiums, tend to set banks’ contributions below the insurance’s market cost. These subsidized rates not only lead to moral hazard but may cause conflicts among member nations in a multinational deposit insurance scheme.

Figure 1
Annual Number of US Bank Failures
1934–2018


As far as we are aware, Grubel (1979) makes the first proposal for a multinational deposit insurance corporation. He argues that an international deposit insurer could resolve the failure of a multinational bank more efficiently.

The bank fail. But confidence may be fragile if a bank’s deposits are denominated in a currency that its nation’s central bank cannot freely supply, and the banking system is large relative to its government’s payment capacity. Such conditions may arise in the Eurozone, where monetary policy is delegated to the European Central Bank and member nations differ in terms of the size of their banking systems (and domestic deposits) relative to payment capacity. A purely national deposit insurance scheme could be exposed to the “sover-eign-bank doom loop,” where a decline in the creditworthiness of a nation’s banking system increases the cost of resolving bank failures impairs the government’s creditworthiness. In turn, this decline in government creditworthiness causes a loss of confidence in deposit insurance that leads to bank runs and further bank losses. A multinational deposit insurance system can break this loop by sharing the losses from insuring deposits among nations. Deposit insurance losses, whatever absorbed by a nation’s surviving banks or its government, will tend to have lower variance under a multinational system than single nation systems.

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THE COST OF DEPOSIT INSURANCE

A large academic literature on deriving the cost of deposit insurance began in the 1970s.6 Deposit insurance differs from many other types of insurance in that the risks of insuring banks’ deposits cannot be easily diversified. Unlike, say, insuring automobiles, where the risk of a claim on a particular policy is highly idiosyncratic, the risk of a deposit insurance claim from a bank failure is highly systematic. As an example, Figure 1 shows the number of bank failures in the United States each year since federal deposit insurance was implemented in 1934. Clearly, in contrast the number of bank failures was very low, but a large proportion of failures clustered in three periods: the Great Depression of the 1930s; the Savings and Loan Crisis of the 1980s and early 1990s; and the Great Recession of 2008–2012.

For many types of insurance, such as life insurance or automobile insurance, the risk of individual policyholder claims can be diversified by underwriting a large number of policies whose risks are largely independent. As a result, an insurer’s loss rate is relatively predictable from one year to the next. This makes the market value cost of each policy close to the “actuarially-fair” value, defined as the insurer’s expected loss on each individual policy. But this is not the case for deposit insurance, where the insured’s losses tend to be low during macroeconomic expansions and high during macroeconomic contractions. The insurer faces losses that are unsystematic or “systematic.” Consequently, the market cost of deposit insurance will exceed the actuarially-fair expected loss due to the addition of a systematic risk premium needed to compensate the insurer for bearing unsystematic risk.6

Specifically, if we define EDF as a bank’s annual expected default frequency and LGD as the deposit insurer’s loss given default, then EDF*LGD is the insurer’s annual expected losses from insuring a bank, which also equals the unsystematically-fair cost of deposit insurance premiums. We call the “fair market” cost of providing deposit insurance, equal to the insurer’s expected losses for each policy, the “fair market” cost of deposit insurance premia.

In summary, fair insurance premiums incorporate a sizable systematic risk premium that tends to increase with a bank’s expected losses. Unfortunately, few, if any, national deposit guarantee schemes set premiums in this manner. At best, premiums may be calibrated to equal only actuarially-fair expected losses (EDF*LGD) and not systematic risk premiums (SRP), resulting in a premium that is subsidized relative to its fair-market cost. The consequence is several market failures. First, relative to uninsured bank debt and deposits whose credit spreads incorporate systematic risk premiums, banks will have an incentive to prefer insured deposits. Second, banks will have an incentive to invest in insured securities (especially structured financial securities) and loans with excessive systematic risk premiums, both of which tend to increase the riskiness of taking on this type of risk (Penna & Coval et al. 2009). Empirical evidence supports this incentive for systematic risk-taking (Lando & Ellingsen 2015). The danger is that banks’ risk-incentives will systematically invest in instruments that are highly likely to suffer losses during economic downturns, increasing the likelihood of systemic failures.

THE EUROPEAN DEPOSIT INSURANCE SCHEME

We now consider the implications of the prior section’s arguments for the proposed European Deposit Insur-

### Notes

1. See, for example, Duffie and Singleton (1999). 
2. Credit spreads are average option adjusted bond spreads by rating taken from Moody’s Analytics and estimates of EDF by Moody’s Analytics and estimates of LGD from Markit, where the systematic risk premium equals the CDS residual after expected losses. 
3. The figure shows a similar pattern to that of bond credit spreads. For each credit rating, the average systematic risk premium always exceed the average expected default loss, and the overall ratio of the systematic risk premium to expected losses is i.2.9. Empirical studies that estimate the seven fair cost of deposit insurance premia from bank stock market and financial statement data find similar ratios of systematic risk to expected losses on the order of 1.5 to 3.9.

4. The logic can be seen from the basic Capital Asset Pricing Model (CAPM). The basic proposition is that the fair premia for covering this cost, is: 
   
   EDF*LGD + SRP 

5. The value of default-risk debt = Value of Default-Free Debt - Value of Default Insurance (2) 
6. Since the value of default-free debt is less than the value of default-free debt that promises the same future payments, its lower price is reflected in a higher promised yield to maturity compared to the yield on equivalent default free debt. The difference in these yields is referred to as the default-risky debt’s “credit spread.” Importantly, the value of this credit spread is analogous to a fair-market annual deposit insurance premium: both represent deferring risk. Consequently, theory implies that a default-risky debt’s credit spread should also equal EDF*LGD + SRP. 
7. Even more closely related to deposit insurance is another financial contract that directly insures against default losses: a credit default swap (CDS) contract. The CDS spread on a firm’s debt equals the annual insurance premium that the insured (protection buyer) pays to the insurer (protection seller) to cover losses if the debt defaults. Thus, as with the debt’s credit spread, theory predicts that the fair CDS spread equals the debt’s expected default losses plus a systematic risk premium, EDF*LGD + SRP. 
8. Empirical evidence strongly supports this theoretical prediction. Moreover, the size of the systematic risk premium because where the insured’s losses tend to exceed the actuarially-fair expected loss due to the addition of a systematic risk premium needed to compensate the insurer for bearing unsystematic risk. 
9. See, for example, Duffie and Singleton (1999). 
10. Credit spreads are average option adjusted bond spreads by rating taken from Moody’s Analytics and estimates of EDF by Moody’s Analytics and estimates of LGD from Markit, where the systematic risk premium equals the CDS residual after expected losses. 
11. Their sample covers more than 500 firms over the 2002–2015 period.

6 The paper in this literature is by Nobel Laureate Robert C. Merton. 
7 The logic can be seen from the basic Capital Asset Pricing Model (CAPM). The basic proposition is that the fair premia for covering this cost, is: 

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9 The European Commission’s proposal of November 24, 2015 is available at http://ec.europa.eu/finance/docs/law/171011-communicati

10 The FDIC now has a long-run target for its DIF of 1.30 percent of insured deposits.
creating an incentive to grow faster (slower) and exacer-
buting the credit cycle.

The proposed EDIS plans to set risk-based premi-
ums, where banks that are estimated to be riskier will pay relatively higher premiums compared to banks deemed to be safer. At any point in the financial cycle, however, premiums are unlikely to be risk-based in an absolute sense of fairly reflecting the cost of insurance because the need to target DIF failures forces the average insurance premium to be countercyclical. Now it may be that, through the financial cycle, average premiums will approximately equal average losses to the DIF. But as argued earlier, this implies that the average insurance premi-
num will be subsidized because it fails to include a system-
atic risk premium. Indeed, if banks’ insurance premi-
ums were set fairly in a market value sense, the ratio of DIF funds to covered deposits should be expected to grow without bound due to the presence of the systematic risk premium that makes the average premium exceed the DIF’s average loss. 14

One might argue that appropriate risk-based premi-
ums can, at least, prevent cross-subsidization whereby riskier banks will not be subsidized by safer ones. For example, if each bank’s average premium through the financial cycle equaled its expected loss to the DIF through the cycle, no cross-subsidization of riskier banks by safer banks would result (Carmassi et al. 2014). However, such risk-based premiums would still represent cross-subsidization on a market value basis. Since systematic risk tends to rise with a bank’s expected loss, safer banks will be transferring market value losses to riskier ones. In other words, on a market value basis, the difference between riskier banks’ premiums versus safer banks’ premiums should be substantially greater than the difference in their expected losses (Fig-
ure 1). This market value cross-subsidization at the bank level may be a source of conflict in establishing the EDIS. EU member nations operating a national DGS should be concerned with safer banks cross-subsidiz-
ing riskier banks when these banks are their own. How-
ever, participation in the EDIS may result in relatively safer national banking systems providing net market value subsidies to relatively riskier national banking systems. Consequently, there has been some resist-
ance to the EDIS or proposals that would retain national DGSs with the EDIS mainly providing a backstop to national DGSs (e.g., Bénassy-Quéré et al. 2018).

MEASURES TO REDUCE DISTORTIONS AND CONFLICTS

This section considers several design features that would reduce the previous distortions that arise from cross-subsidy banks and that can lead to conflicts between national banking systems.

Require substantial bail-inable equity and debt: If banks have a substantial amount of liabilities that are moved into bail-inable positions, the EDIS and the SRF, the EDIS would absorb much of the expected losses but also a systematic risk premium, the EDIS would absorb much of the expected losses but also a systematic risk premium, the EDIS would absorb much of the expected losses but also a systematic risk premium. Consequently, there is economic justification for setting banks’ insurance premiums that cover both expected losses and these losses’ systematic risk premiums.

CONCLUSION

Enhancing the credibility of deposit insurance to avoid a “sovereign-bank doom loop” is a clear benefit of a multinationa
deposit insurance system such as the proposed EDIS. Yet some member nations may object if they risk becoming a systemic risk premium. By providing a backstop in the form of a credit line to the DIF (and also the SRF), the EDIS would absorb much of this systemic risk premium. Consequently, the EDIS’ function of compensating for the EDIS in the form of systematic risk premiums paid by banks. For example, if a bank’s risk-
based premium is, on average, equal to the expected loss imposed by the EDIS, a systematic risk premium can be calculated that is on the order of 1 to 2 times the expected losses, a level that is consistent with empiri-
cal evidence. However, banks’ systematic risk premi-
iums would be paid directly to the EDIS, not the DIF. Requiring that banks pay this charge would reduce EDIS moral hazard incentives and cross-subsidies among banks. Not only would conflicts among member nations be mitigated but there may be increased consensus for the EDIS to serve as a backstop.

Allow nonbanks to share the risk of DIF targeting: There is little or no room for requiring EDIS member banks to benefit from reduced (increased) deposit insurance premiums when the DIF is above (below) its expected losses. The EDIS would reduce the previous distortions that arise from cross-subsidies banks and that can lead to conflicts between national banking systems. For example, a bank’s average premium would be subsidized because it fails to include a systematic risk premium. Indeed, if banks’ insurance premi-
munums were set fairly in a market value sense, the ratio of DIF funds to covered deposits should be expected to grow without bound due to the presence of the systematic risk premium that makes the average premium exceed the DIF’s average loss. 14

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Pennacchi, G. (2005), “Risk-based capital standards, deposit insurance, and moral hazard incentives sold to third-party investors be used to manage the DIF. One contract could take the form of a swap whereby in return for the DIF making a fixed payment, the swap counterparty would make or receive a varia-
table payment equal to the amount of the DIF that is below or above its target. 16

Since private investors would require compensa-
tion from the DIF that covers not only their expected losses but also a systematic risk premium, the EDIS would have an economically observable justification for setting banks’ insurance premiums that cover both expected losses and these losses’ systematic risk premiums.

11 During the US Savings and Loan (S&L) Crisis, such arguments were used to justify the need for the FDIC to cover uninsured savings to avoid the S&Ls’ defaulted DIF. Such arguments also reapplied in 2009, when proposals – many with strong parallels to the FDIC in mind – for example, use “basically insured” (BIS) “New Assessment Labeled in Context” in the American Becker, March 3, 2009.

12 Contracts could be specified as a “second loss” piece or tranche of a traditional insurance policy. For example, see Pennacchi (1999) for a discussion of the role of reinsurance in the insurance derivatives market.

13 See Pennacchi (2000) for proof. This result holds as long as the average expected losses are set in a market value sense, the ratio of DIF funds to covered deposits should be expected to grow without bound due to the presence of the systematic risk premium that makes the average premium exceed the DIF’s average loss. 14

14 As an example, the US FDIC implemented risk-based premiums in 1993, basing premiums on risk measures of banks’ capital adequacy. Since then, banks with a substantial amount of liabilities that are moved into bail-inable positions, the EDIS and the SRF, the EDIS would absorb much of the expected losses but also a systematic risk premium, the EDIS would absorb much of the expected losses but also a systematic risk premium. Consequently, there is economic justification for setting banks’ insurance premiums that cover both expected losses and these losses’ systematic risk premiums.

15 As a result, moral hazard distortions and deposit insurance subsidies will be minimized.

16 As an example, the US FDIC implemented risk-based premiums in 1993, basing premiums on risk measures of banks’ capital adequacy. Since then, banks with a substantial amount of liabilities that are moved into bail-inable positions, the EDIS and the SRF, the EDIS would absorb much of the expected losses but also a systematic risk premium, the EDIS would absorb much of the expected losses but also a systematic risk premium. Consequently, there is economic justification for setting banks’ insurance premiums that cover both expected losses and these losses’ systematic risk premiums.