

**DESIGN, STRUCTURE AND IMPLEMENTATION
OF A MODERN DEPOSIT INSURANCE SCHEME**

by
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SUERF – The European Money and Finance Forum
Vienna 2009

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INSURANCE SCHEME**

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Vienna: SUERF (SUERF Studies: 2009/5)

ISBN-13: 978-3-902109-50-7

Keywords: deposit insurance, risk-based premium, risk-adjusted pricing, premium calculator, system risk, fund size, funding, guarantee promises, depositor categories, eligible deposits, covered deposits, membership, expected loss, pan-european deposit insurance system, moral hazard, resolution regime, payout

JEL Classification Numbers: G1, G18, G21, G22, G28, G30, G32, G33

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Abstract

One of the important consequences to be drawn from the course of the financial crisis up to now is the insight that more attention must be paid in the future to the factors of liquidity, liquidity management and liquidity protection. That holds true for the protection of the stability of an individual bank as it does for that of a whole national or even international financial system. The liquidity problems of a bank can certainly have a variety of causes. However, as an examination of the history of bank insolvencies and financial crises shows,

an accelerated withdrawal of bank deposits by unsecured customers nearly always leads in the end to the collapse of an institution and, as an ultimate consequence, to a national or even international banking crisis.

This insight has also brought the deposit insurance institutions in many countries around the world to the attention of political, regulatory and banking management discussions. The rapid, politically necessary, factually often not well founded, guarantee promises made by many governments have shown those responsible that in Europe the need for a fundamental revision of the present deposit insurance schemes must be urgently addressed. In most industrialized countries of the OECD, as well as in a range of other states, working groups are studying the necessary revisions and adjustments of the relevant institutions to meet the new economic and political conditions. Even if solutions of this sort continue to be arranged differently from one country to another on the basis of differing regulatory, historical and structural circumstances, a consensus is emerging over the important basic questions of deposit insurance system design and architecture.

As a result of the worldwide financial crisis most European countries massively increased their coverage limits for their national deposit insurance schemes in the fall of 2008. Where no deposit insurance existed, it was introduced. Existing systems were critically scrutinized. In most countries the maximum insurance coverage was raised and the eligible deposit base was extended. Some individual states have even promised an unlimited deposit protection (in some cases with a time restriction). Under the pressure of an increasing number of bank failures these promises were made without revising the existing deposit insurance schemes themselves. In the course of 2009, both the individual European states and the EU itself then set about scrutinizing their existing protection schemes and mechanisms and revising the existing national deposit insurance schemes¹.

It is accepted throughout the world that well designed deposit insurance is an important element in a national safety net for maintaining and extending the stability of the financial system. The design and structure, but also the implementation, of a deposit insurance scheme (DIS) of this sort throws up numerous institutional, procedural and instrumental questions. Such operative and strategic issues must be answered against the background of the overall national circumstances and in line with the country specific realities of the respective financial intermediate system. However, there is a series of topics

¹ For an overview of the current structure of European Deposit Insurance Systems see JRC (2008a,b) and/or Schich (2009).

that can be assessed and solved independently of such individual circumstances. This is even more the case since the worldwide revision of the deposit insurance schemes offers the opportunity to create the conditions for a future harmonization of national deposit insurance schemes at least within Europe. An assimilation of this sort is, in turn, the basis for future EU-wide or perhaps even European depositor protection, which, like any broadly based guarantee, would certainly be more efficient than a multitude of national solutions.

This publication intends to make a contribution to the ongoing discussion of the complex questions connected with the further development of European deposit insurance schemes. Both complementing and extending the broad range of theoretical literature available, it focuses on some key design questions of modern deposit insurance schemes, on the discussion of their basic structural elements and on the appropriate consequences for the stakeholders in deposit insurance. We focus on:

- the derivation of the most important requirements of a modern European deposit insurance, and the
- discussion of specific organizational aspects and fundamental institutional requirements as well as of solutions for selected system building blocks.

The first chapter analyzes the institutional framework of deposit insurance schemes and its various aspects of cost/benefit considerations. The second chapter discusses the fundamentals of modern deposit insurance. The third chapter examines selected strategic and instrumental questions concerning the organization and implementation of deposit insurance schemes. The fourth chapter focuses on some questions related to the international harmonization and coordination of the design of deposit insurance schemes. In all sections we address some lessons learned from the recent financial turmoil. The fifth chapter finally addresses some conclusions and sketches some policy implications for designing and implementing a modern deposit insurance scheme.

1 Economics of Deposit Insurance

1.1 *Some cost-benefit considerations*

The starting point for all considerations about the design of a deposit insurance scheme is the question as to why such a system is needed in the first place, or how its economic, social and political value can be assessed.

Banks and other financial institutions accept short-term deposits from their customers, which they bundle together and in turn make them available to the economy in the form of long-term credit. In doing so, they assume a certain average quota of deposit withdrawals within a given time. For this capital requirement they allocate liquidity in the context of legal and voluntary cash management. Short-term excess liquidity or liquidity demand is invested or covered on the interbank market. Through this transformation function, however, they expose the depositors to the risk of not being able to withdraw their money at short notice if need be, as they were promised. Since, if a large number of depositors unexpectedly want to get their deposits back at the same time (often called a ‘bank run’), the bank, although by no means insolvent, does not have sufficient liquidity at that particular moment to meet their needs. In a situation like this, repayments of credit received in interbank trading or conversely the extension of short-term loans made to other banks is put at risk. In this way, contagion and spill-over effects can spread very quickly. In an extreme case they affect the whole of a financial market and lead to a financial system crisis².

A deposit insurance scheme (DIS) therefore always has two crucial aims to fulfill:

- the first priority is to prevent a run on an illiquid but not yet insolvent financial institution since in this way the spread of a crisis in one individual institution to the other network partners via the interbank market can be prevented;
- and as a second priority it should make good the losses incurred by depositors caused by an illiquid or insolvent financial institution up to a certain amount, since it is assumed that the majority of smaller depositors

² A keyword often used in this context is ‘domino effect’.

of the bank were hardly themselves able to monitor the risk that they had taken by, for example, opening a deposit account.

The first of these aims is directed towards protecting the stability of the system, the second towards consumer protection. These two positive effects of deposit insurance are, however, balanced by negative aspects of such an insurance system. An effect that is called ‘moral hazard’ stands at the centre of a heated discussion that has been going on for decades. The starting point is the consideration that the managers and shareholders of a bank are principally prepared to take larger risks to achieve a bigger profit³. The depositors, by contrast, primarily look for a stable and secure banking partner, since they do not share the bigger profit, but just receive the interest agreed, even though they could lose their assets in the case of a collapse. They are therefore motivated to monitor the risk behavior of the managers and, if necessary, to sanction it by an early withdrawal of deposits at risk. If the deposits⁴ are protected, however, the necessity and thus also the motivation to take disciplinary action against the managers’ high-risk behavior reduces. According to the theory, the managers then systematically take higher risks, to provide themselves and their shareholders with higher short-term profits. This might further boost the instability and thus also the likelihood of a collapse of the bank. Therefore a highly-developed deposit insurance scheme can even reduce the stability of a deposit insurance system.

This risk-taking behavior is accentuated if, every time there is a financial crisis, the state extends the deposit insurance scheme further, as has happened in nearly every larger crisis of recent decades. This gives rise to the supposition among market participants that the state will always jump in as ‘lender of last resort’ and existing explicit protection is overlaid with the assumption of more extensive implicit protection guarantees.

There is a multitude of empirical studies that support this set of arguments. Deposit insurance safety nets strengthen the tendency of agents to take risks

³ The Financial Stability Forum (FSF) defines moral hazard as “... the incentive for excessive risk taking by banks or those receiving the benefit of (deposit insurance) protection” (FSF (2001)).

⁴ Throughout the paper the following definitions are used:

- *Deposits*: Any deposit as defined in Article 1(1) of Directive 94/19/EC, excluding those deposits left out from any repayment by virtue of Article 22.
- *Eligible deposits* (or protected or insured): Deposits repayable by the guarantee scheme under your national law, before the level of coverage is applied.
- *Covered deposits* (or guaranteed or reimbursable or repayable): Deposits obtained from eligible deposits when applying the level of coverage provided for in your national legislation.
- *Level of coverage*: Level of protection granted in the event of deposits being unavailable under your national law, not applying coinsurance.

See also http://ec.europa.eu/internal_market/bank/docs/guarantee/deposit/an6_en.pdf.

and thus increase the vulnerability of the financial system⁵. Another critical study includes an empirical analysis of 61 countries, which shows how and under what circumstances deposit insurance can have an explicitly counter-productive effect on the stability of the financial system⁶. And a more recent study⁷ shows that the concession of protection guarantees over longer periods of time can substantially damage the market discipline of fundamentally insolvent banks.

Moral-hazard behavior can also come about on the part of the depositors when, for example, they entrust their deposits to institutions that entice them with the promise of interests above average rates, without thinking too much about the fact that higher returns must bring with them greater risks - relying instead on the deposit insurance promised.

It is widely accepted that an incorrectly conceived deposit insurance scheme leads to problems of moral hazard. Theory and practice are therefore largely in agreement that a strengthening of deposit insurance must go along with an improvement in the prudential and supervisory framework⁸, which seeks to reduce precisely this sort of moral hazard behavior. The sensible way for this to happen is primarily by attempting to counteract the adverse incentives (for managers and owners of banks to increase their risks⁹) that are inherent in any deposit insurance scheme. If it is possible to reinforce deposit insurance with appropriate accompanying measures in the prudential regulation, it can achieve its aim of improving the stability of the system and ultimately even lead to a positive effect on economic growth¹⁰.

The key question for the design and implementation of a modern deposit insurance scheme is therefore: How can a system of this sort be organized, so that the above mentioned positive benefits are achieved while minimizing the risk of moral hazard behavior on the part of its stakeholders?

⁵ Chai/Johnston (2000).

⁶ Demirgüç-Kunt/Detragiache (2001).

⁷ Demirgüç-Kunt/Serven (2009).

⁸ E.g. Prescott (2002), Demirgüç-Kunt/Kane (2002), Garcia (2000a), Blair et al. (2006) and Principle 2 "Mitigating moral hazard" of the revised Core Principles (BCBS/IADI (2009)).

⁹ Bhuyan/Yan (2007).

¹⁰ Cull et al. (2001).

1.2 European history of deposit insurance

The idea of providing special protection for investors is not new. It always comes up following larger financial crises, in the course of which a large number of depositors have lost their savings - usually accompanied by more or less acute economic, social and political crises. The first national deposit insurance scheme emerged as early as the 1920s in what was then Czechoslovakia¹¹. In the 70s deposit insurance schemes were created in Belgium and in Germany, for example, but also in Italy, each with very different characteristics¹².

The recommendation on insurance protection in the member states of what was then the European Community, issued by the European Commission in 1986¹³, can be seen as a milestone. It tried to impose somewhat more consistent basic conditions for insurance schemes that were already in existence. Additionally, it encouraged states that did not yet have appropriate deposit insurance to implement a suitable scheme.

Since the recommendations were phrased in a very general way, quite different national deposit insurance schemes emerged as a result, whose design and structure reflected national economic and political influences. Only in 1994, in the form of the Directive 94/19/EC on Deposit Guarantee Schemes, did the creation of the first framework come about that aimed to harmonize the deposit insurance schemes in the EU member states. But, here too, crucial elements, such as the determination and size of the level of coverage, the membership or the modes of financing, were left to the individual countries as a self regulatory issue. In the context of the periodic review of the guidelines in 2006 a commission stipulated the necessity for a modernization and wider-reaching harmonization of the national deposit insurance schemes of the member states¹⁴. The financial crisis that broke out in summer 2007 and, in particular, reached its high point in fall 2008, exposed fundamental weaknesses in the deposit insurance schemes operating at the time. In nearly all states, work subsequently began to carry out a fundamental renewal of the existing deposit insurance schemes - also as a consequence of the state guarantees and rescue measures that became necessary. As early as

¹¹ Garcia (2000b).

¹² Further details on the history of deposit guarantee schemes in the EU can be found in Cariboni et al. (2008).

¹³ Refer to European Commission (1987).

¹⁴ Commission of the European Community (2006).

March 2009, the EU presented a comprehensive proposal for the adjustment and extension of the Directive 94/19/EU¹⁵.

The financial crisis also caused a range of other supranational institutions to concern themselves again and more intensively with questions relating to the structure and implementation of national deposit insurance schemes. A report by the Financial Stability Forum (FSF)¹⁶ from early 2008 stressed the necessity of internationally recognized basic principles and conditions for the structure of deposit insurance schemes. In summer 2008, the Basel Committee on Banking Supervision (BCBS) together with the International Association of Deposit Insurers (IADI) started with the revised version of the so-called 'Core Principles for Effective Deposit Insurance Systems'. The results of this work - a set of 18 principles in total, which together define the target function of a modern deposit insurance scheme - were presented to the international community in summer 2009¹⁷. Outside Europe, for a number of years the IMF and the World Bank have been posing questions concerning the adjustment of deposit insurance schemes to the rapidly changing national and international conditions of the financial markets.

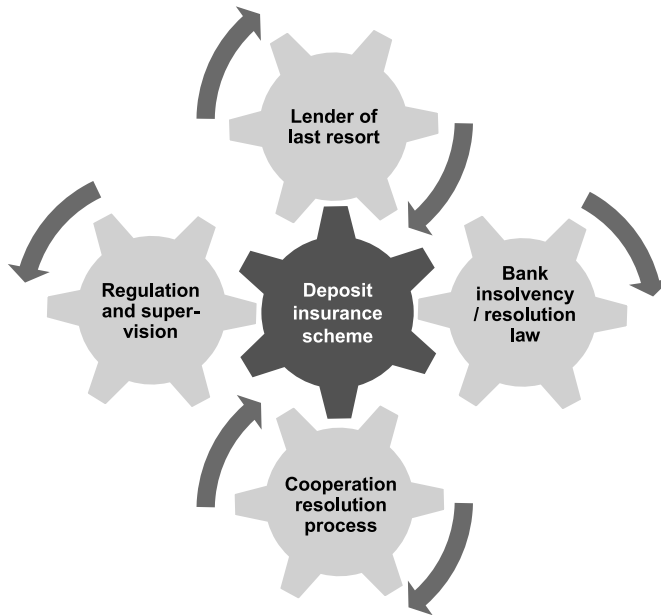
1.3 Deposit insurance as an element in the financial safety net

Deposit insurance is always part of a comprehensive system for enhancing and ensuring the financial stability of a country. Irrespective of the national peculiarities of the financial intermediation systems, such an extensive financial system safety net consists of five elements that complement and strengthen each other:

¹⁵ Refer to Directive 2009/14/EC. For an entire overview on newly adopted coverage limits refer to Schich (2008a, 2009).

¹⁶ FSF (2008).

¹⁷ BCBS/IADI (2009).

Figure 1: Elements of the financial system safety net

- *Regulation and supervision*: The basis for securing the stability of the financial system is an efficient regulation and supervision of financial intermediaries, which, on the one hand, should prevent the onset of a crisis and, on the other, should reduce the effects of the crisis if it does happen. Findings from the latest financial crisis show that here in particular the significance of bank-specific liquidity regulations and the maximum level of deposit insurance coverage must be reconsidered.
- *Lender of last resort*: A further finding is that every national financial intermediation system needs and possesses an explicit or implicit lender of last resort in case of a broader financial system crisis. This can be the state, the central bank or both of them together.
- *Bank insolvency/resolution law*: As a part of the regulation specific to the financial industry these legal provisions regulate the specific conditions for the handling of bank failures and insolvencies.
- *Deposit insurance scheme*: The actual deposit insurance schemes secure clearly defined accounts of specific categories of depositor¹⁸, thereby reducing the risk of a bank-run and, as a result, preventing a liquidity crisis in the financial system as a result of it.

¹⁸ Refer to Directive 94/19/EC and to the appropriate list of exclusions in Annex I. An overview on exclusions applied in the EU Member States can be found in Cariboni et al. (2008).

- *Institutionalized decision-making/cooperation and resolution processes:* And last but not least the viability of a safety net in case of crisis also depends on efficient communication and cooperation between all network elements. This requires appropriately standardized and clearly regulated processes that at best are also internationally harmonized.

The deposit insurance scheme complements, supports and strengthens the protective functions of the other system elements, just as these complement and support the deposit insurance scheme in fulfilling its function. In concrete terms, the DIS should fulfill, in the context of this comprehensive system, five key functions:

- (1) *Confidence function:* Deposit insurance creates, through its existence and its credibly communicated mechanisms for dealing with a financial crisis, confidence among the depositors of the insured institutions in the stability of those institutions and of the whole financial system.
- (2) *Protection function:* It protects depositors in case of crisis against loss of their covered deposits in insured institutions. Indirectly it shelters the insured institutions against a run on them, and thus the affiliated institutions against instability.
- (3) *Security function:* Deposit insurance secures covered deposits from the grasp of other stakeholders in the bank. By virtue of its authority it asserts the entitlements of depositors on the basis of the insured deposits.
- (4) *Financing function:* It ensures that there is adequate financing of the capital base necessary to carry out the protection and security functions and for a risk-free administration of an increase in the accumulated fund size. It makes available sufficient liquidity to cover the insured deposits credibly in the case of a claim.
- (5) *Support function:* Finally, deposit insurance supports the other financial safety net institutions concerned with the task of securing and improving the stability of the financial system (for example financial market supervision or the central bank).

A safety net can only deliver its protective function if every node fulfills the function given to it. In the end, the net is only as strong as its weakest element. The explicit guarantees of numerous states that became necessary to protect eligible bank deposits show clearly that the present deposit insurance schemes were not able to meet the demands put upon them adequately.

2 Deposit insurance fundamentals

With a deposit insurance institution, as with every insurance, there is an underwriter who covers certain risks in respect of the insured party or provides certain benefits. In the case of deposit insurance, the insured risk consists in a financial institution being unable to pay out the covered deposits in certain accounts to its owners because of a lack of liquidity or as a result of insolvency. A deposit insurance scheme therefore contains the explicit guarantee of an institution (deposit insurance), usually limited as far as the sum is concerned, in respect of a precisely-defined category of depositors of specific financial institutions (mostly banks or other financial intermediaries with deposits from the public) in case of a shortfall in precisely-defined deposit classes.

2.1 Aims and requirements of a modern deposit insurance scheme

2.1.1 Aims of deposit insurance

The latest financial crisis has shown that the causality of aim and means of deposit insurance in the modern financial intermediation system has reversed. If, until now, aspects of depositor insurance were in the foreground, which should consequently lead to a strengthening of system stability, today it is precisely the reverse: The primary aim of a deposit insurance scheme is the strengthening of system stability, which is to be achieved by credible depositor protection, among other things¹⁹.

This difference is an important one, even if it might have faint echoes of the question about the chicken and the egg. Thereafter, the role profile for modern deposit insurance as well as the formulation of its targets shall go beyond the pure ‘pay box’ function of paying out covered deposits in the case of a claim. A corresponding definition of the aim can be guided by the following points:

¹⁹ The current formulations in the revision of the EU deposit insurance are similar, where the aims are formulated as follows: “1. strengthen depositor confidence, 2. enhance financial stability, 3. protect part of depositors’ wealth (...)”. European Commission (2009).

Deposit insurance:

- prevents the collapse of illiquid but fundamentally solvent financial institutions through appropriate bridging measures in coordination with the financial supervisory institutions and the central bank;
- ensures quick and full payout of covered deposits in the case of a claim and provides the financial market supervisory body with controlled liquidation or resolution of financial institutions that have become insolvent or are threatened with insolvency; and therefore
- increases the stability of the financial intermediation system by means of a credibly communicated guarantee of short-term customer deposits with banks and other system-relevant financial intermediaries.

In all cases, the central aim of deposit insurance is to make a contribution to strengthen the financial market stability. This can be achieved by increasing the confidence of the depositors, as an important category of creditors, in the security of the capital that they have entrusted to the financial intermediary, and thus reducing the risk of a bank run. The deposit insurance system thereby conceives of itself as an element in a comprehensive safety net of financial intermediation.

The discussions about the target function of a deposit insurance scheme are strongly shaped by national political and economic conditions. An examination of the contributions to discussions in the international, and in particular the European context shows that in the conception of a modern deposit insurance scheme other aims can certainly also be included:

- *Competition policy*: Strengthening of the competitiveness of smaller banks relative to larger participants in the market and securing access to the market for new competitors.
- *Consumer protection*: Protection in the first instance of uninformed depositors and investors with insufficient financial literacy.
- *Growth policy*: Support for the tendency to save and strengthening of the economic growth potential associated with it, as well as support for macro-economic stability.

- *Reduction of costs:* Through the funding of a deposit insurance fund (DIF) the follow-up costs for the tax payer from a financial crisis are reduced.

Numerous empirical studies²⁰ show that a well-conceived deposit insurance scheme not only supports the stability of the financial system, but can also contribute to achieving all of these aims. Accordingly, the scheme must be conceived of as part of a comprehensive safety net for the financial sector. Equally clear, however, is the recognition that if deposit insurance is inadequately structured it can even be counter-productive and can undermine the stability of the financial system.

2.1.2 Requirements of a deposit insurance scheme

In order to achieve the aims attributed to it, a deposit insurance scheme must fulfill a set of basic requirements. These include in particular:

- *Financial stability:* The deposit insurance scheme can only fulfill its role if it has the necessary financial capacity available to do so. The fund's capital base thereby also fulfills an important function in assessing the credibility of the insurance and thus the confidence in the security of the eligible deposits.
- *Fair competition:* Contributions made in support of a deposit insurance scheme must be organized to offer fair competition. Individual or groups of insured institutions must not be disadvantaged.
- *Originator orientation:* Contribution payments are to be organized according to the cost-by-cause principle i.e. according to the claim risk of the insured institution. Anyone who represents a bigger claim risk for the deposit insurance scheme shall pay a higher contribution to the fund. Premiums for the insured institutions that are not risk-based do not fulfill the requirement of fair competition mentioned above.
- *Incentive compatibility:* The trade-off between the security connected with high coverage sums and the reduced market discipline (moral hazard) must be prevented by the appropriate design of the deposit insurance scheme.

²⁰ E.g. Demirgüç-Kunt/Detrageache (2001), Demirgüç-Kunt/Kane (2002) and references herein.

- *Regulation of powers:* The deposit insurance scheme needs extensive power to ensure the payment of contributions, to stabilize endangered financial institutions and to ensure the rapid and complete payout of covered deposits.
- *Simplicity and transparency:* Credibility is based on convincing communication of the aims and mechanisms of the deposit insurance scheme. Simplicity and transparency of the structures and processes are the keys to this.
- *Cost efficiency:* Directly connected with the above is the concept of cost efficiency. The administration of the fund assets, the management of the fund and the handling process must be organized in a cost-efficient way.
- *Independency:* The deposit insurance scheme is to be organized on the one hand as an integral element of a national safety net, but on the other as independently of the external exertion of influence by stakeholders as possible²¹.
- *Responsibility:* Independence goes along with accountability for capital, returns and costs to parliament, the government and the public.
- *Reasonability:* Last but not least a deposit insurance scheme has indispensably to consider also country-specific conditions. It has to ensure that its specific design features are compatible with mainly economic circumstances ensuring that deposit insurance is not overpriced²² so that premiums are bearable.

Essential external conditions for efficient deposit insurance include effective regulatory conditions, close supervision of the financial institutions, an ongoing assessment of the current risk situation in the financial intermediation system and a comprehensive set of regulations for monitoring and dealing with illiquid banks or for handling the resolution of insured institutions.

²¹ See also Garcia (2000a), Kahn/Santos (2002).

²² Garcia (2000a), Laeven (2008), Demirgüç-Kunt et al. (2007).

2.2 *Guarantee promises*

2.2.1 Implicit and explicit guarantees

A guarantee promise for the protection of deposits can take place explicitly or implicitly²³. In the case of a formal deposit insurance scheme the guarantee promise is always explicit. The guarantee is secured by contract. There exists a legally secured and therefore enforceable claim for fulfillment of the guarantee promise.

Guarantee promises are often based on governmental declarations (explicit guarantee). But they can also only be based on the public assumption (implicit guarantee) that in the case of a bank failure the state will cover in whole or in part the losses of depositors. These assumptions may be founded on the statements of government representatives (for example, the ‘Merkel guarantee’ of fall 2008 in Germany) or on past experience of the state, for whatever reason, saving illiquid or insolvent financial institutions (so-called ‘bail out measures’). An examination of the history of financial crises in recent years shows that in the end the state (or the tax payers) has always intervened when larger financial institutions have got into difficulty. The latest financial crisis, too, has proved once again that no government can economically or politically afford to let larger financial institutions and a larger number of depositors suffer losses.

It is important to recognize that with explicit guarantee systems (for example, in the context of a state deposit insurance scheme) implicit guarantee promises are also always present. No deposit protection scheme will be in a position to defray all covered deposits in the case of a serious crisis in the financial system. A lesson from the latest financial crisis is that the public, and ultimately the financial institutions too, can work on the basis that in the worst case the state will limit the losses to depositors with suitable bail out measures. Only if such implicit guarantees are expressly accepted can they also be factored in to corresponding risk-based financing models of deposit insurance.

²³ To see the difference and an appropriate academic literature overview on explicit deposit insurance refer to Hoelscher et al. (2006) or Garcia (2000a).

2.2.2 Limiting guarantee promises

Guarantee promises in deposit insurance are basically always limited. The determination of the appropriate limit is one of the self regulatory issues of a national deposit insurance scheme.

In the course of the latest financial crisis a series of governments lifted these limits in fall 2008²⁴ and made unrestricted guarantee promises for certain deposits. Such promises in the middle of a dramatically unfolding crisis are certainly helpful in stopping an erosion of public confidence in the financial sector. They might be politically justifiable, but they are problematic in a number of respects. For one thing, the question arises as to if and how a state can actually honor the promise in the case of a claim. For another, a large number of negative incentives come from promises of this sort - the danger of shifting capital into deposits with unlimited protection or a weakening of market discipline can be cited as examples. In addition, the question arises as to how unlimited promises of this sort can be withdrawn again at a later date and what their effect on the public with regard to the behavior of the state in future crises will be.

Studies show that the size of the deposit insurance coverage correlates negatively with the effect on market discipline²⁵. The bigger the guarantee promise, the smaller will be the motivation of the investors to worry about their bank's exposure to risk. And the greater will also be the incentive for bank managers to use this decreasing market discipline to take on additional risks and thereby profiting of the additional associated short-term returns associated with them²⁶.

2.3 Depositor and deposit categories

Deposit insurance schemes also generally limit the categories of depositors who are eligible to benefit from the guarantee promises. Those exclusively protected depositors, be they private individuals, associations of people or small and

²⁴ An overview can be found in Schich (2008a). According to Directive 2009/14/EC the coverage shall be increased to 100,000 EUR per depositor until 31 December 2010 latest.

²⁵ Demirgüç-Kunt/Huizinga (2004) consider two cross-country samples of banks from 30 to 50 countries in 1990–1997. They find that explicit deposit insurance lowers banks' deposit interest rates and renders interest rates less sensitive to bank risks. Thus deposit insurance is found to reduce the market discipline required by depositors.

²⁶ This behavior, which is supported by numerous empirical studies, is the reason why a lot of economists reject an extension of deposit insurance. See here the description in Schich (2008b).

medium-sized business, hold investments in financial institutions in the form of savings deposits²⁷. Here, too, in fall 2008 a series of governments considerably extended the circle of depositors and deposit categories insured, in order to reduce the drain on liquidity in endangered banks. Even the state protection of interbank investments was discussed. Here, too, the question arises as to how the guarantee promises made could really be honored in the case of a claim²⁸.

Lessons from the financial crisis

- In the case of a crisis, explicit and implicit guarantee promises coexist in all states.
- Governments are rather expeditious to make assurances about extended guarantees. The quicker unlimited guarantee promises are made by the state in a crisis, the more heavily the stakeholders in the financial system will rely on corresponding bail out measures in the next crisis and orientate their behavior accordingly.
- Deposit insurance schemes that are introduced or revised under the pressure of a financial crisis often come along with a greater risk of relaxing market discipline than those that are developed and implemented in calmer times²⁹.

2.4 Political aspects of deposit insurance

Ultimately, the target function of a deposit insurance scheme derives from its legally determined mandate. This means, however, that the concrete organization of a national deposit insurance scheme is not only determined by objective criteria, but is also exposed to a multitude of political influences. In every country the legislative and the executive branches find themselves exposed to heavy pressure from the financial lobby when it comes to defining restrictions on the financial industry. This is also true for the conception and implementation of comprehensive and effective deposit insurance.

²⁷ Referred to as 'eligible or insured deposits'. For EU 27, an overview on types/classes of deposits excluded from guarantee regarding the list in Annex 1 to the Directive 94/19/EC can be found in JRC (2007).

²⁸ In 2008, for example, Ireland extended its guarantee promises to all deposits in the six biggest banks in the country, even though the financing of these investments in the case of a claim was an open question. Iceland even had to fall back on credit from the International Monetary Fund to fulfill its promises of deposit insurance.

²⁹ See here, for example, the studies of Demirgüç-Kunt et al. (2007), Demirgüç-Kunt et al. (2006B) and Hovakimian et al. (2003).

Discussions following the latest financial crises show that in practice there are four problem areas that need to be considered in this context:

- *Political influence on the aims*: Mostly, pressure is applied in the direction of a generous design of deposit insurance, with regard both to the type of deposit insured and to the level of the guarantee promise. Empirical studies confirm, however, that generous solutions encourage moral hazard behavior³⁰. In particular, weak financial institutions and those that have a large appetite for risk lobby for an extension of the benefits of the deposit insurance.
- *Political instrumentalization of the decision-making authorities and/or the decisions*: Here, it is mainly a question of influencing the decisions about paying out threatened deposits, or, where they are a part of the role of the deposit insurance scheme, the decisions to bail out banks threatened with insolvency. Influence can for example be exerted via the politically-motivated selection of committee members for deposit insurance organizations.
- *Regulatory capture*: Not only private, but also public deposit insurance schemes attempts to instrumentalize deposit insurance in favor of the insured financial industry can come about.
- *Conflicts between elements in the financial safety net*: Finally, politics regularly also plays a part in the cooperation and coordination of the individual elements of the financial safety network of a country. Although the ministry of finance, the central bank, regulatory institutions and deposit insurance have a common interest in securing and strengthening the stability of the financial system, they are partly pursuing other goals too.

Studies have demonstrated the fact that - and the means by which - interest groups and the political economy influence the structure and development of a whole financial intermediation system, but also its individual elements and in particular deposit insurance. The principal/agent problems that emerge from this can only be reduced through a clear formulation of the aim of deposit insurance within the framework of legal and regulatory provisions, the guarantee of the widest possible independence of the institution and its committees, a clear allocation of powers, a controlled and open exchange of information between all involved institutions in the financial safety net and procedures that are as standardized as possible for the 'normal case'

³⁰ Manz (2009), Demirgüç-Kunt et al. (2007), Demirgüç-Kunt et al. (2006a,b), Gropp/Vesala (2004).

of a financial crisis restricted to a few institutions or the ‘special case’ of a systemic financial crisis.

Lessons from the financial crisis

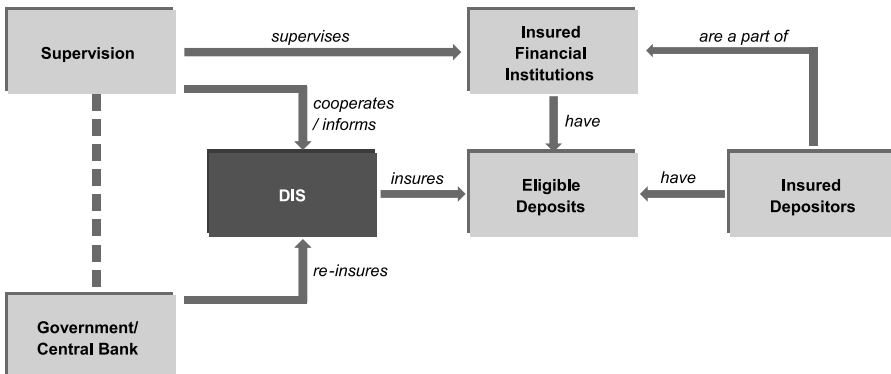
- The deposit insurance scheme must primarily be directed at the improvement in system stability. Depositor protection is a means to an end in this.
- A detailed agreement, settled in advance, on the roles and powers of the individual elements in the financial safety net is needed.
- The absence of a detailed manual for dealing with systemic crises can lead to conflicts and loss of efficiency between the elements of the financial safety net.

3 Deposit insurance architecture

3.1 Scheme structure

As already mentioned, deposit insurance is not just based on an institution created for the purpose, but on the efficient collaboration of all institutions entrusted with roles in securing the stability of the financial system. Like any system, the system of deposit insurance can be understood through its elements, the relationships between these elements and the characteristics of those elements and relationships. Figure 1 provides an overview of the typical system elements found in any DIS.

Figure 2: Basic elements of a national DIS



- *Insured financial institutions*: Refers to the circle of institutions included in the deposit insurance or, put negatively, the institutions whose deposits are explicitly not insured.
- *Insured depositors*: Legal classification of the depositors who are in possession of eligible deposits.
- *Eligible deposits*: Legal classification and factual and/or quantitative demarcation of the insured positions or, put negatively, the positions not covered by the deposit insurance.
- *Deposit insurance institution(s)*: Underwriters as the key element of the deposit insurance scheme.

- *Supervisory system*: Supervisory functions that are directly or indirectly connected with the deposit insurance.
- *Central bank*: Mostly takes on specific functions in connection with deposit insurance (for example, guarantee functions that act as a form of reinsurance).
- *Government*: In any deposit insurance scheme the state has an important role, be it as the agency of the deposit insurance institution or as an additional explicit or implicit guarantor. In the interests of completeness, the guarantee functions of individual state levels/elements present in addition to the deposit insurance institution in different countries must be included here (liabilities assumed by public bodies, guarantor's liability, to give just a few examples, as still in existence in some states, for example Switzerland). Legal and regulatory provisions define the overall conditions within which the participants in the system operate and fulfill their functions.

These stakeholders in a DIS all have different interests and aims. The design of a deposit insurance scheme is therefore always confronted with conflicts of aims. Common to all stakeholders is the need for the highest possible level of stability in the financial intermediation system. Financial system stability has become a public commodity that has a positive (albeit different) value for all stakeholders.

3.2 Principles of design

The concrete organization of a deposit insurance scheme will always depend on the legal, political, economic and cultural conditions of the country concerned. Independently of these national characteristics, however, some principles of design that are valid for all modern systems can be derived from the experiences of the recent past. As early as 2001, the Financial Stability Forum presented a 'manual' for the development and implementation of a deposit insurance scheme³¹. Numerous other practice-oriented publications complemented and extended these proposals in subsequent years. In early 2009 the IADI together with the Basel Committee on Banking Supervision presented the 'Core Principles for Effective Deposit Insurance Systems', which can serve as a guide for the development and extension of modern

³¹ FSF (2001).

deposit insurance schemes³². These not only summarize the main results of a broad theoretical and practical discussion over recent years, but also explicitly include experiences related to deposit insurance from the latest financial crisis.

Lessons from the financial crisis

- A too low level of coverage leads to the complete ineffectiveness of deposit insurance. A deposit insurance scheme is either credible without any reservations or it is completely ineffective.
- Independent of the design of a deposit insurance guarantee, any deposit insurance scheme requires additional explicit or implicit guarantee promises / implications from the state in case of crisis.
- To have its full effect, a deposit insurance scheme needs a clear aim that must be communicated to the public in a comprehensible and credible way.
- In the case of a crisis the deposit insurance institution must cooperate closely with the other institutional elements in the financial safety net, in particular with the bank supervisory authorities, the central bank and the government.

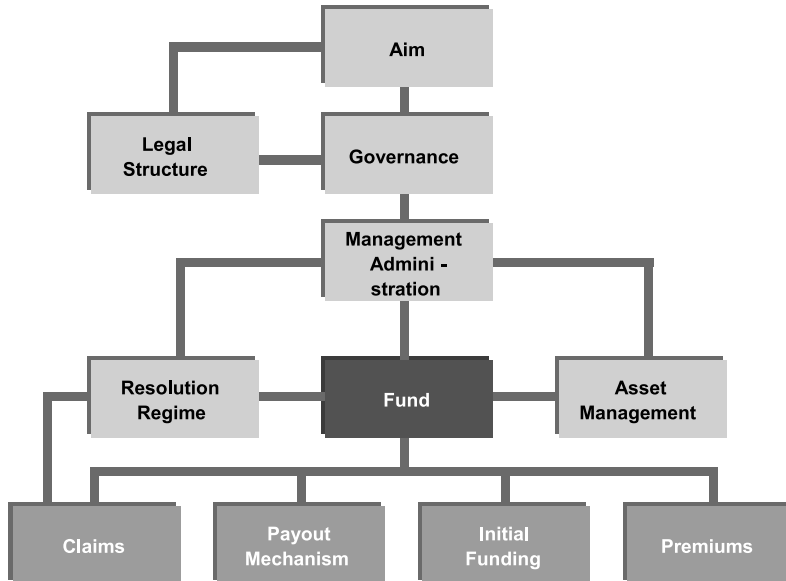
3.3 Building blocks of a deposit insurance scheme

Every deposit insurance scheme consists of a number of basic building blocks. While these building blocks are almost identical in all solutions, their specification naturally takes country specific circumstances into consideration. Thus it is possible to describe a modern deposit insurance scheme (in extending the building blocks in figure 2) by means of the following complementary building blocks:

³² BCBS/IADI (2009).

³³ For an example refer to the Northern Rock experience in 2008. See also Congdon et al. (2009).

Figure 3: Complementary building blocks of national deposit insurance schemes (DIS)

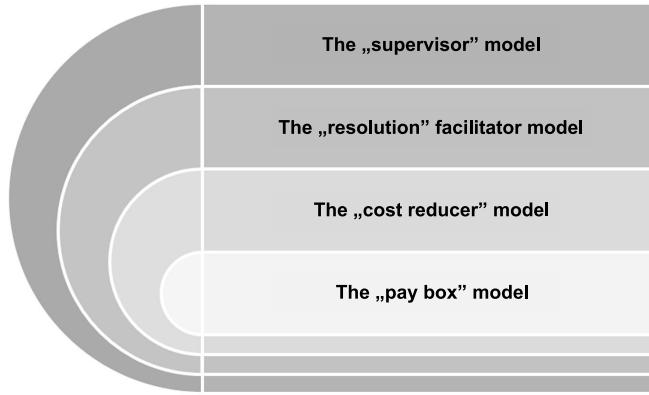


3.3.1 Aim and remit

The basic aim of a deposit insurance scheme is more or less identical in all solutions: Strengthening the stability of the financial system by preventing runs on banks (preventive effect) and securing deposits up to a specified amount (curative effect). On the basis of the fundamental functions attributed to the deposit insurance scheme, it is possible to differentiate four separate types of deposit insurance schemes, which differ with regard to their roles and powers, and also regarding their fundamental design³⁴, where the functions of the simpler model are always contained in those of the more complex model:

³⁴ LaBrosse/Walker (2006).

Figure 4: Types of deposit insurance schemes (DIS)



- (1) *The 'pay box' model*: In this model the role of the deposit insurance institution is limited to paying out on the covered deposits in favor of the eligible deposits. In the case of a claim, the deposit insurance fund receives a corresponding instruction (from the bank supervisors, for example) and ensures an orderly settlement of all claims.
- (2) *The 'cost reducer' model*: In addition to the settlement function, in this model the deposit insurance institution takes on the role of handling any occurrence of insolvency in an insured institution with the lowest possible costs and externalities for the financial intermediation system. In this case, the deposit insurance is granted powers in specific circumstances or events to intervene in the insured institution and to arrange preventive or corrective measures to protect the covered deposits.
- (3) *The 'resolution facilitator' model*: This model of the powers of deposit insurance goes a step further. It allows the deposit insurance institution to use its capital not only to settle deposit shortfalls that have occurred, but also proactively to support a bank that has got into difficulties (but is not yet illiquid or even insolvent). In this model, the deposit insurance institution will, for example, help to sell an insured institution to a suitable partner, split up individual business areas, or prepare recapitalization in order to protect covered deposits.
- (4) *The 'supervisor' model*: This model has the broadest portfolio of powers. Here the deposit insurance institution itself becomes part of the supervisory system. It exercises direct supervisory functions and has a corresponding influence over the financial institutions associated with it.

Lessons from the financial crisis

- Deposit insurance schemes should be an integrated part of recapitalization strategies for illiquid (but not insolvent) insured financial institutions.
- The mixture of supervisory and insurance functions leads to an increasing need for coordination with other public institutions, but not to an enhancement in the credibility of the deposit insurance.
- The ‘resolution facilitator’ model has proved to be a sensible one.

3.3.2 Legal form

The choice of legal form - which depends, in turn, on the national legal circumstances - is a function of the chosen aim and of the degree of independence desired for the deposit insurance institution. Literature and practice agree that a deposit insurance institution should enjoy an independence that is as great as possible both from the financial industry that is insured and from other public elements of the financial safety net (supervisory authorities, central bank and government)³⁵. To this end, it requires a legal form in which, although the management and governing body are selected by political committees, they can take decisions and act independently.

A further determining factor for the legal form (and the governance structure connected with it) is the choice of ownership for the deposit insurance fund. Essentially, the fund can be conceived of either as a public or private special asset³⁶. Especially in the latter case, a legal form will be chosen that allows more extensive rights of co-determination or even ownership rights of the insured institutions.

Lessons from the financial crisis

- Private deposit insurance organizations conceal the danger of ‘regulatory capture’.
- In case of crisis a non-governmental organization structure can have pro-cyclical effects if unsuitably constructed.

³⁵ Hoelscher et al. (2006), Garcia (2000a,b).

³⁶ (Dis)advantages can e.g. be found in Hoelscher et al. (2006) or Garcia (2000a) and references therein.

3.3.3 Membership

Three fundamental questions arise in connection with membership: What types of financial institutions should be included in the deposit insurance, should membership be voluntary or compulsory, and should large institutions, whose covered deposits in the case of a crisis cannot be defrayed by a fund, no matter how it is conceived, also be included? The experiences of the recent past can be helpful to answer these questions:

- *Insurance for all types of institutions with deposits and interbank relationships*: Fundamentally, all financial institutions that accept deposits from the public and/or might directly or indirectly represent a risk for the stability of the financial intermediation system should be included in the deposit insurance. A risk of this sort arises primarily through the complex financial interdependence of financial institutions through interbank business. Among these institutions, irrespective of their legal status, all of those financial intermediaries who both accept deposits and carry out interbank business are included. Conversely, institutions that do not fulfill at least the deposit criteria can be exempted from the obligation to make contributions and from the protection of the deposit insurance.
- *Obligatory membership*: Opinion is largely united today that membership for all financial intermediaries who meet the above criteria must be obligatory³⁷. Voluntary membership leads to adverse selection or increased moral hazard behavior³⁸. In addition, the credibility of the deposit insurance at the system level correlates positively to the level of coverage (i.e. fund size as well as the implicit or explicit guarantee) in a system of financial intermediation: The more complete the insurance cover, the more credible the system as a whole appears. This means that financial institutions that might have other forms of shortfall guarantees available to them are to be incorporated into the deposit insurance scheme. Their specific circumstances can be taken into consideration within their risk-based contributions to the financing. Arguments about the risk diversification of the fund play a subordinate role in this connection - here clear differences exist from other forms of insurance, which mean that default risks in the deposit insurance fund can hardly be diversified.

³⁷ See Directive 94/19/EC, art. 3, para. 1. Accordingly, academic and practical literature argues for further for obligatory membership.

³⁸ Blair et al. (2006), Garcia (2000b).

- *Inclusion of larger financial institutions:* There will be financial institutions in each country for which in every case the disbursement of all covered deposits would go beyond the deposit insurance scheme's ability to pay. As a consequence of the latest financial crisis it seems clear that in future crises, too, these institutions will have at their disposal an implicit government guarantee of their covered deposits and, if need be, of other financial items, indeed that they will even have at their disposal an (implicit) guarantee of survival. This insight might be undesirable from the point of view of regulation policy and be rejected in this form by several politicians, but for the coming years, if not decades, it will be regarded by all market participants as the basis of their decision-making and behavior³⁹.

The contributions of larger financial institutions to the deposit insurance fund reduce the potential costs to the tax payer and strengthen the basis of the fund to cover shortfalls of other insured institutions. They are to be regarded as pro-rata compensation for externalities of a comprehensive crisis in the financial system, usually triggered by these large institutions. As a consequence of this insight it follows that even large financial institutions should be obliged to be affiliated to national deposit insurance schemes and have to contribute to its financing in accordance with the risk they represent, even if it can be assumed that in the case of a crisis it is not the fund, but some other form of public support, that will come into effect.

Lessons from the financial crisis

- Membership of the deposit insurance system must be obligatory for all financial institutions with defined characteristics.
- This also holds true for large institutions that have additional explicit or implicit state guarantees available.

3.3.4 Insured depositors and eligible deposits

If the primary aim of deposit insurance consists in preventing a run on a bank or reducing the likelihood of one occurring or in minimizing its effects, then considerations motivated by social policy should not primarily be the basis for

³⁹ An examination of the financial crises of the recent past (for example, from the middle of the 1990s up to the latest crisis in 2008/2009) shows that, without exception, the state in all affected countries has saved or restructured system-relevant financial institutions with appropriate bail-out measures.

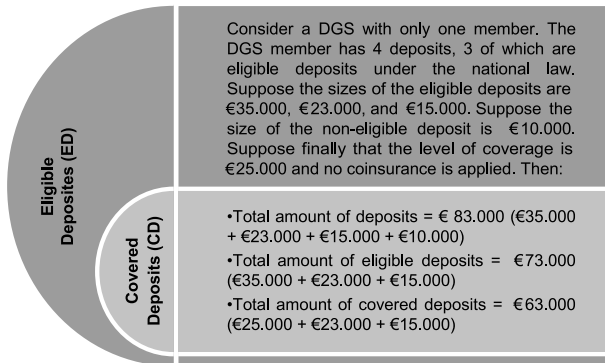
determining the form of the insurance. Rather, it is a matter of including all of those deposit classes in the deposit insurance that in the short term can lead directly to liquidity bottlenecks for the bank. On the other hand, all deposits that do not have a direct effect on liquidity and thus represent no direct threat to the stability of the insured institution and/or the financial system can be excluded.

Those deposits should be insured for which in the case of a crisis a rapid withdrawal, and through a risk to liquidity, must be expected. These include (in all currencies):

- all kind of saving accounts and short term deposits by private and business customers (excluding financial institutes);
- outstanding debts to customers with a short duration of a maximum of three months.

In the following we refer to the sum of the items described above as the eligible deposits (ED). The sum insured within these items up to a defined cap (for example 100,000 euro/customer) is referred to as covered deposits (CD). The covered deposits (CD) are therefore a subset of the eligible deposits (ED)⁴⁰.

Figure 5: Relationship between eligible deposits (ED) and covered deposits (CD)



Source: Based on definitions provided by JRC (2007)

Most national deposit insurance schemes only secure deposits in the ‘traditional’ form of savings and deposit accounts⁴¹. This solution, motivated

⁴⁰ For numerical examples refer to Annex IV of JRC (2007), available under http://ec.europa.eu/internal_market/bank/guarantee/index_en.htm.

⁴¹ For details refer to the country specific (self)regulatory authorities’ web pages.

primarily by social policy, fails to recognize that for endangered financial institutions substantial liquidity risks can also come from other short-term passive deposits. In addition, experience shows that in situations of uncertainty a shift from non-protected forms of investment to protected investments must be anticipated.

Lessons from the financial crisis

- The definition of covered deposits should start from the liquidity exposure of eligible deposits on the balance sheet, and not be guided by socio-political motives.
- Not only private but also business customers can be subject to ‘bank-runs’.

3.3.5 Governance and responsibilities

The latest financial crisis has once again made clear that only the state is in the position to rebuild and maintain confidence in the stability of the financial system. Deposit insurance is primarily directed at supporting the financial system stability. For this reason, the deposit insurance institution must use the ‘confidence capital’ of the state, but at the same time ensure its independence as one of the prerequisites for the credibility of deposit insurance. For the governance of the deposit insurance scheme this means:

- *Freedom to take decisions and to act independently*: Board and management of the deposit insurance institution should be given the greatest possible freedom to take decisions and to act within the legal framework.
- *Triggers and procedures*: Clear trigger events that set off appropriate decisions and actions by the committees must be laid down. In doing so, however, the freedom to take decisions must not be limited unnecessarily. In addition, the processes for selected events should be defined and documented in advance (for example, in the case of an isolated illiquidity, the case of an expanding crisis, or of an actual system crisis).
- *Governing body*: Fundamental decisions are reserved for the board, even if they are of an operational nature, such as the decision to make payments in the case of a claim or to release funds to continue financing banking

services in the context of a ‘bridge finance’ solution. The governing body is also responsible for defining investment policy and for monitoring the exposure to risk of the deposit insurance fund. Similarly, setting the premiums to be paid by the individual insured institutions, the choice of the appropriate calculation method and the procedure for determining these premiums fall within the remit of the governing body. It is further responsible for the financial accounting and statement of accountability for the deposit insurance fund.

- *Management*: The management is the executive for the decisions taken by the governing body. It supervises the implementation of measures decided upon, coordinates their effects with the other partners in the financial network, in particular with the financial market supervisory body, the central bank and the branches of government involved, and ensures the operational implementation of the administration and the management of the deposit insurance fund’s capital.
- *Transparency and accountability*: Transparency regarding the fund’s assets, its financing mechanism and its returns is one of the central principles in the governance of the deposit insurance institution. To this end, it will make available to the public at least once a year a detailed report that the layman can also understand. Over a long period of time, very large amounts of capital will be accumulated in the deposit insurance fund. In addition to the information relating to the financial accounts, the deposit insurance institution must also provide regular information about its aims regarding investment policy, its decisions about and measures for the implementation of investment policy, and its exposure to risk or its assessment of the current and future risk.

The requirement of independence does not mean that members of the governing body cannot be appointed by the government, parliament or other state-run authorities. From the point of view of independence, however, it would not make much sense to appoint to key positions representatives of other institutions involved in the supervision of the financial market (for example, from the central bank or the bank supervisory authority) or industry associations. Members of the governing body should also be selected for a longer period of time (ideally four to six years) to reduce undue political influence, for example in the case of a change of government. Ideally the chair of the board will be someone with financial experience who is independent from both the financial industry and the government.

3.3.6 Administration

One of the aims of the management of the deposit insurance institution is cost efficiency. Administration costs reduce the returns on the fund. These assets must be covered from contributions by the insured institutions. The administration of the fund and the safeguarding and execution of its functions should therefore be carried out with the lowest possible operational costs.

One important question in connection with the governance of deposit insurance concerns the organizational independence of the institution. Should deposit insurance be put under the control of one of the other institutions entrusted with protecting the stability of the system, and if so, which? Or should it be organized as an independent element in the system of deposit insurance, which, although taking decisions and acting in close cooperation with other members of the system, is ultimately free to make and implement its own decisions?

- *The deposit insurance institution is ultimately an executive body, despite having aims that are mostly conceived of more broadly:* In the case of a crisis it ensures an efficient payout of the covered deposits and makes available the funds for bridging measures. It could therefore easily be allocated to, or put under the control of one of the institutions that regulate the financial market. Reasons to support this idea include cross-functional communication, simplified implementation of decisions taken by the financial market supervisors, better financial interfaces with the government or the central bank, and easier deployment of the accumulated funds within the federal finances.
- *The deposit insurance institution is, however, also a 'signal body':* It signals to the depositor by its very existence and structure the safety of his or her deposits. The primary commodity of deposit insurance is its credibility. This is supported by its organizationally documented independence from all direct and indirect political influences. Organizational subordination to other financial market institutions can put this credibility at risk and lead to conflicts of interest.

3.3.7 Funding and pricing

The most important structural element in a deposit insurance scheme is its financing model whereas the focus is mainly on two questions:

- (1) Should a fund be set up so that it can be drawn upon to secure payments for deposit insurance, or should the means required for payments only be mobilized in the case of a claim?
- (2) How should the premiums that are to be paid by the insured financial institutions be set?

3.3.7.1 *Ex-ante vs. ex-post funding*

Deposit insurance schemes can fundamentally either allow for financing in advance of future payments, or allow for a financial model which, after a claim or payout occurs, sets out a distribution of the amount of the claim over the institutions insured. The former case is referred to as *ex-ante* financing of the deposit insurance scheme, the latter as *ex-post* financing. At the end of 2009 the majority of European deposit insurance schemes were based on *ex-ante* financing of the deposit insurance scheme⁴².

In the literature there is a broad discussion relating to the advantages and disadvantages of the two basic financing models⁴³. The most important points are summarized in figure 6. The discussion related to the consequences of the latest financial crisis shows that a modern deposit insurance scheme should be based on *ex-ante* financing. It can be assumed that, in the course of the ongoing reforms, most countries whose deposit insurance is currently still based on *ex-post* schemes will move over to *ex-ante* solutions too.

⁴² Own updates based on JRC (2008a,b) and data provided by IMF as of summer 2009.

⁴³ FSF (2008), e.g. Hoelscher et al. (2006), IADI (2009).

Figure 6: Advantages and disadvantages of the two funding mechanisms

	Advantages	Disadvantages
Ex-post	<ul style="list-style-type: none"> • Market discipline: Induces banks to monitor each other's activities. 	<ul style="list-style-type: none"> • Potential payout-delays: The funds are not collected beforehand. • Procyclical effects: Commitments in poor economic situations may lead to a domino effect of bank failures, a renegotiation of conditions and/or a collapse of the DIS.
Ex-ante	<ul style="list-style-type: none"> • Public confidence: Prompt reimbursement of depositors possible. • Smoothed premium payments: Reduced procyclical effects. • Reduced moral hazard: Ex-ante funding could incorporate risk-adjusted premiums. • Equitable and fair: All member institutions (including prospective failed institutions) contribute. 	<ul style="list-style-type: none"> • Adequate fund-size: Difficult to establish a fund of sufficient size. • Adequate premium calculation: Difficulties in defining a 'fair' calculation method. • Administrative complexity: Organizational and strategic intricacy.

The design of an ex-ante financing system is based on the following three basic building blocks:

- (1) Creation of a deposit insurance fund, which is funded by initial payments and periodic premium payments. It serves as a covering substrate for future payments in favor of the insured banks and/or depositors.
- (2) Determination of an investment policy for the fund capital which ensures that the risk-free invested capital is always disposable on short notice.
- (3) Creation of a fund administration, the costs of which must be covered from the returns on the fund and/or the contributions from those insured. Usually, the fund administration is part of the management remit of the deposit insurance institution.

3.3.7.2 Pricing and premiums

One of the central factors connected with the implementation of a modern deposit insurance scheme is the question as to the premiums that should be paid by the insured institutions to the deposit insurance fund. Theory

and practice agree that ‘fair’ premiums are one of the basic prerequisites of a credible national deposit insurance scheme. But what does fairness mean in this context? And how are such ‘fair’ premiums arrived at? What effect do design features of the deposit insurance scheme have on pricing? What role do regulatory circumstances play with regard to determining fair insurance premiums for deposit insurance? How should systemic risks be incorporated in the calculation of premiums and who ultimately pays for these risks?

These are examples of questions that are shaping the current discussion about the structure of premium models and the practical setting of insurance contributions for members of deposit insurance institutions; they will be discussed in the following sections.

3.3.7.2.1 Requirements of a pricing model

The conclusions of a large number of contributions to the discussion on the subject of deposit insurance pricing can be summarized as follows: The contribution made by any insured institution should stand in functional relationship to the risk that the institution’s membership causes to the deposit insurance fund⁴⁴. This risk consists primarily in the fact that the deposit insurance fund must satisfy the depositors’ requirements of an insolvent bank whose business activities have to be ‘bridged’. A second risk is represented by infection or spill-over effects, which go from one illiquid or insolvent financial institution to another member of the system and which can get the latter into difficulties too (with corresponding consequences for the deposit insurance fund).

Put simply, the contribution that an insured institution makes to the deposit insurance institution must cover the individual risk of default on covered deposits as well as the systemic risk for the insured deposits that emanates from the institution. A premium of this sort is ‘fair’ if it covers these two risk factors as precisely as possible and is translated into an annual contribution to be made by the bank.

⁴⁴ According to article 12 of the Directive 2009/14/EC, the Commission shall submit possible models for introducing risk-based contributions as of 31 December 2009 which points up the importance of fair, member specific premium models as “ (...) a desirable enhancement to the existing framework (...)”. Several international commissions have tackled the theme, but the Joint Research Forum came up with concrete overview and suggestion on potential solutions. See JRC (2009, 2008a).

Therefore a pricing model must meet a series of requirements⁴⁵:

- it must cover both the individual risk of default and the systemic risk of the insured institution as exactly as possible;
- it must be comprehensible, understandable and justifiable for all stakeholders in the deposit insurance scheme;
- despite the complexity of covering the adequate risk, it must be easy and cost-efficient to implement;
- it must be sufficiently flexible to be able to represent changing institution-specific, political and economic circumstances; and finally
- the model should be able to be used in different European countries despite different circumstances.

Thus we get a simple risk function that derives the premium to be paid by an insured institution from the two risk parameters ‘specific risk’ (r_{im}) and ‘systemic risk’ (r_s) and from the ‘institution-specific insurance basis’ (ED_m):

$$P_m = f(r_s, r_{im}, ED_m) \left\{ \begin{array}{l} P_m: \text{Premium of insured institution 'm'} \\ r_s: \text{Systemic risk factor} \\ r_{im}: \text{Specific risk factor of institution 'm'} \\ ED_m: \text{Eligible deposits of institution 'm'} \end{array} \right.$$

A model of this sort, that satisfies both the theoretical requirement for fairness and the practical requirements of simplicity and comprehensibility, has unfortunately not been available up to now. But the discussion in the respective academic literature about risk-based premiums to compensate for deposit insurance benefits (that has already been going on for several years) has become more intensive in recent years. As early as September 2001, the Financial Stability Forum in its ‘recommendations’ pointed explicitly to the importance of a risk-based calculation of premiums⁴⁶. The European Forum of Deposit Insurers (EFDI) established a working group in 2002 that concerns itself with the integration of risk-based factors into the pricing of deposit insurance benefits and the monitoring of corresponding developments in European deposit insurance schemes. The International Association of Deposit

⁴⁵ An overview/a summary of the general tone can be found in JRC (2009).

⁴⁶ FSF (2001).

Insurers (IADI) recommended even in the basic version of its Core Principles published in 2002 the adoption of risk-based price models. In the revised version of 2009 this recommendation was repeated and strengthened⁴⁷.

A multitude of other international financial institutions, including the International Monetary Fund (IMF) and the World Bank, have also made recommendations in recent years regarding the introduction of risk-based premium models. The results of the broad theoretical and practical discussion of this subject up to now can be summarized as follows:

- Risk-based premium models meet the requirements mentioned above better than flat-rate models. They are also perceived as fairer by the insured institutions, since they include the individual risk exposure of those insured in the calculation of the premium level.
- Risk-based models actually require a fund with ex-ante financing. They can, however, also be used in systems with ex-post financing (for example Italy). But the corresponding calculations are much more complex here and throw up numerous unanswered questions.
- There is widespread agreement that both the specific and the systemic risks should be incorporated into the calculation of premiums⁴⁸. Little agreement exists regarding the appropriate parameters and models.
- A scientifically-based and objective calculation of risk seems almost impossible. The approaches and models discussed in the literature point to more or less serious practical shortcomings in their application of calculating deposit insurance risks⁴⁹. The most likely method of calculating premiums in a fair way seems to be the expected loss model familiar from the credit sector⁵⁰. The numerous approaches based on option pricing models have proved not to be very suitable⁵¹.

⁴⁷ BCBS/IADI (2009).

⁴⁸ This general tone of academic (and practical) literature is mirrored on European level mainly through work composed by the European Commission, Joint Research Centre. Refer to JRC (2009, 2008a).

⁴⁹ An overview on potential methods can be found in Laeven (2008).

⁵⁰ E.g. Bennett (2001), Kuritzkes et al. (2003), Oliver, Wyman & Company (2002).

⁵¹ One base property of Merton (1977) and the appropriate second generation models is that it relies on bank's asset value as well as on the appropriate volatility parameter which both are unobservable variables and thereafter prevented the model to be applied in practice. Several papers dealt with potential proxies, which is practically complicated because of a lack of data.

- Empirical studies show that the premiums calculated for the insured institutions are mostly too low⁵². But the anomaly seems to be larger with flat-rate models than with risk-based premium models.
- In most risk-based models the systemic risk is either not incorporated at all or in an unsatisfactory way.
- Risk-based premiums are a central factor in the reduction of moral hazard risk that can arise on the part of insured institutions when a deposit insurance scheme is implemented.

a. Calculation of the specific risk factor (r_{im})

The risk exposure of a bank or a stockbroker is determined by a series of factors. For the issues surrounding the risk specific to the deposit insurance we can restrict ourselves to two factors: the specific risk of an insured financial institution depends on the one hand on its business activities and on the other on the structure of the balance sheet of the institution at the time.

- *Business activity:* The risk-oriented assessment of the business activities can be centered on the type and risk exposure of the assets as well as on the off-balance-sheet investments of an insured institution. It is mainly expressed in the business model of the financial institution. A further risk indicator is the level of maturity transformation with which a financial institution operates: Banks transform short-term deposits into long-term assets in the form of loans and investments. Through term transformation, deposits that mature in the short term are ‘immobilized’. A liquidity risk therefore arises for the bank. In addition, assets with a longer maturity also carry a greater risk regarding the danger of shortfall.
- *Balance sheet structure:* Liquidity risks based on balance sheet structure are a function of the available first and second degree liquidity, of the liquidity requirement from irrevocable limits, the current possibility of liquidating assets and the re-financing capacity of a financial institution. Indirectly, the equity base of the financial institution also plays an important role in this connection. Among other things, it influences the re-financing capacity and the re-financing costs of the institution.

⁵² See e.g. Laeven (2008) and references herein.

For the calculation of the institutions specific risk exposure the risk of liquidity demand is of primary interest. This refers to the risk that depositors might become convinced that a bank can no longer or no longer completely meet its payment obligations, and therefore begin to withdraw their deposits in a quantity that threatens the existence of the bank. Business activity (or the business model) and the structure of the balance sheet stand in a functional relationship. Focusing on specific areas of business requires a specific balance sheet structure with corresponding typical liquidity risks. It therefore seems sensible to assess the risk exposure related to liquidity of an insured institution by means of both of these factors.

This institution-specific risk factor (r_{im}) must be easy to calculate and yet expresses the liquidity-related risk exposure of the institution as selectively as possible. It can be calculated as an aggregated risk indicator and should include the following risks that are characteristic of the institutions' liquidity risk exposure:

- *Extent of the maturity transformation*: Calculation of the duration gap between selected active and passive investments;
- *Re-financing capacity*: Ability of the institution to generate additional liquidity. To this end, various proxy investments can, in turn, be drawn on;
- *Relative liquidity strength*: Available liquidity in relation to liquidity required;
- *General risk exposure of the institution*: Capital resource base (for example by means of tier I capital ratio) and/or risk-weighted assets relative to all assets;
- *Earning capacity*: Cost/income ratio, structure of returns, volatility of returns, etc.

So, risk indicators should, on the one hand, represent the business activity or the business model, and on the other hand evaluate the capital structure. They should be easy to collect or have already been collected in any case by the bank (in other connections). The proxy variables needed to calculate the risk indicators should also:

- be significant indicators in the context of the permanent monitoring of the insured institution by supervisory authorities, and
- be selected in such a way that data that are already available or need to be collected in other connections can be used. In this way, the additional cost to the insured institution can be minimized.

Possible starting points are an assessment of the *solvency*, of the *liquidity* and of the *profitability* of the insured institution. The institute-specific risk (r_{im}) can then be expressed based on the following simple formula:

$$r_{im} = a(r_s) + b(r_L) +/- c(r_p) \left\{ \begin{array}{l} r_{im}: \text{ Aggregated specific risk indicator} \\ \text{of institu-tion 'm'} \\ r_s: \text{ Solvency indicator} \\ r_L: \text{ Liquidity indicator} \\ r_p: \text{ Performance indicator} \\ a, b, c: \text{ Weighting coefficient} \end{array} \right.$$

Alternatively, a very straightforward, although also less subtle approach can be chosen: In the extreme case only one single factor⁵³ is chosen to determine the risk exposure of the insured institution, such as a form of the equity coverage ratio (for example, on the basis of Basel 2 indicators) or a simple liquidity ratio. This factor then expresses the institute-specific risk.

b. Calculation of the systemic risk factor (r_s)

The term ‘systemic risk’ refers to contagion and spill-over effects that can lead directly or indirectly to claims in a deposit insurance scheme. In connection with this systemic risk, three questions usually arise: The question of quantifying the risk, the question about the insurance carrier and the question of risk compensation.

- *Quantifying the systemic risk*: On the one hand, the systemic risk is a function of the stability of a financial intermediation system at the time and the national economy concerned, on the other of the market structure of the national banking and financial system. An oligopolistic competition structure, in which just a few big banks hold large shares of the market, exposes the financial system to a higher systemic risk in a crisis than

⁵³ JRC (2009).

a financial system with an atomistic competition structure⁵⁴. Additionally, the systemic risk is influenced by the stability of the financial system at any given time and the current financial strength of the participants in the system. Ultimately the existence of so-called ‘system-relevant’ financial institutions is the decisive fact defining the level of systemic risk. A scientifically-based quantification of the systemic risk does not, however, seem possible: For the calculation of the consequences of infection effects, which go from one illiquid or insolvent institution to other insured financial institutions, neither the theoretical models nor the data required to test the models and to derive forecast values from them, are available at the moment. The quantification of the corresponding risk thus becomes a primarily political decision.

- *Compensation for systemic risk*: System-relevant financial institutions pay, in addition to the premium for their individual default risk, a premium as compensation for the systemic risk incurred by them for the deposit insurance. To this end, the first step is to identify these system-relevant banks. The sensible way for this to be done is by the supervisory authority, the central bank or another government body. The identification of system relevance can also be delegated to the deposit insurance institution.
- *Insurance carrier for systemic risks*: The compensation for the systemic risk will flow to the carrier for this risk type. That is, on the one hand, the deposit insurance fund, which sees itself exposed to a greater payout risk because of contagion and spill-over effects. Since the deposit insurance fund will hardly ever be able to cover the entire default risk for the deposits of all system-relevant banks, a credible deposit insurance scheme always needs additional re-insurance from the state. It is sensible that this re-insurance is also made in the form of an explicit guarantee promise. As a result, part of the premium for compensation of the systemic risk belongs to the state.

The systemic risk factor expresses the basic risk of the financial system and/or of a specified group of institutions. The factor derives from base 1: If the systemic risk as a whole is estimated as being higher for one type of bank or one group of banks, the factor is raised (for example to 1.2); conversely, a reduced systemic risk can be weighted with a factor below 1. By including such a premium factor for systemic risk as a multiplier in the risk function an

⁵⁴ To measure the concentration, a countries’ Herfindahl index can be calculated (as the sum of the squares of all the institutions’ market shares in terms of total assets). For data refer to European Central Bank (2008).

institution specific differentiation in the premium can be arrived in an easy way.

As far as method is concerned, two possibilities can be discussed here:

- *Standardized rate for all insured institutions:* A uniform rate (r_s) is set for all insured institutions. The factor expresses the respective assessment of the systemic risk. If the system stability reduces, the factor can be raised, and vice versa. The same can be done (with the reverse sign) in case of crisis to relieve the banks and to prevent counter-productive effects.
- *Differentiated rate for different types of institution:* The systemic risk factor is organized as a function of the risk for specific institution profiles.

For the reasons cited above, a calculation of the institution-specific systemic risk contribution of each individual insured institution seems impractical or simply impossible.

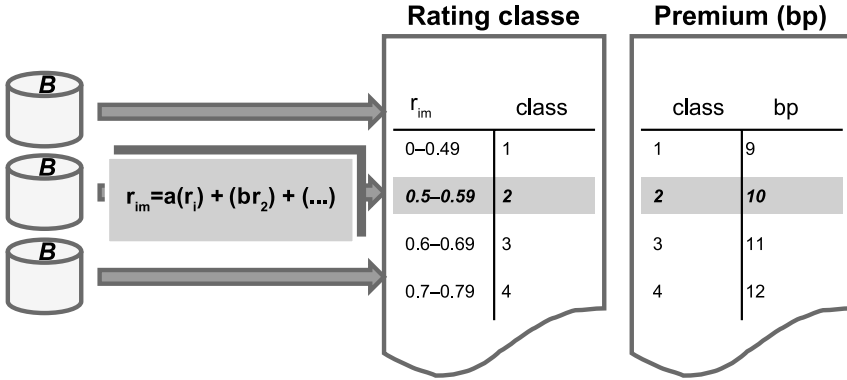
3.3.7.2.2 Methodology of premium calculation

By using an aggregated risk indicator (r_{im}) the second step is to allocate different risk classes to the institutions. Each risk class corresponds to a premium factor. For the premium factor a specific bandwidth can be set.

- *Risk classes:* The number of risk categories determines the degree of differentiation in the premium system. Here, too, simplicity should be the first commandment. At the same time, however, in choosing the number of risk classes and bands, incentives to improve the risk behavior of the insured institutions should be given.
- *Systemic risk factor:* The systemic risk factor is a multiplier. It can move in a range (for example between 0.8 and 1.2) and is periodically determined by government.
- *Bandwidth:* The bandwidth expresses the range between the individual risk classes. The wider the band selected, the harder it will be for an insured institution to migrate from one risk class to another (and thus to get a different premium factor).

The following figure illustrates the procedure by means of a simple example:

Figure 7: An example of premium calculation



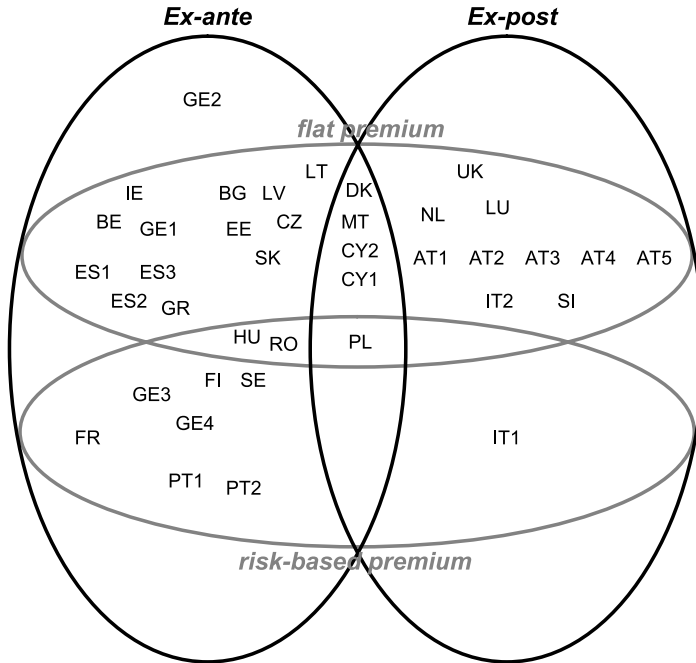
The premium arrived at in this way (for example 10 bp) is subsequently multiplied by the premium factor for the systemic risk (for example by 1.2, which gives a premium to be paid to the deposit insurance fund of 12 bp times eligible deposits (ED)).

3.3.7.2.3 An examination of practice in the EU

An analysis at the end of 2008⁵⁵ of the deposit insurance fund present in the 27 EU member states shows that up to now a risk-based premium system has only been introduced in 11 countries. Of these, only seven have a structure based on an ex-ante supply of the fund. The following figure shows the current position regarding financing and premium models.

⁵⁵ JRC (2008a), Annex III and data provided by IMF as of summer 2008.

Figure 8: Funding mechanism in EU 27



Source: Based on information of IMF, European Commission and own updates

The fact that so few deposit insurance systems in practice introduce risk-based premium models, even though the positive assessment of them is today largely uncontested, can be traced back to the fact that the Directive 94/19/EC on Deposit-Guarantee Schemes had left the organization of the pricing models to the individual countries. The revised version in 2009 at least recommends the introduction of risk-based premium models, without, however, addressing specific aspects of the model to be applied.

Lessons from the financial crisis

- The existence of a substantial fund capital strengthens the credibility of the deposit insurance institution and thereby reduces the likelihood that the fund will have to be called upon. Ex-ante financing of the fund is therefore preferable to the ex-post financing model.
- Only risk-based premium models can take account of the different risk exposure that a specific bank represents for the deposit insurance institution. They reduce the moral hazard behavior of the insured institution and correspond most closely to the requirement of fairness.
- Along with the institution-specific risk, the systemic risk has to be incorporated into the premium calculation. Only in this way can compensation be made for explicit (and implicit) guarantees, at least in a rudimentary way, and influence be exercised over the moral hazard behavior of the system-relevant institutions.

3.3.7.3 Fund size

Establishing the optimal target capital volume for a fund is undoubtedly a key issue for designing a deposit protection system. The optimal fund size is directly derived from the target set by the deposit insurance fund and described by the terms ‘confidence function’ and ‘protection function’. The more credible the protection, the higher the confidence in this protection and the lower the probability of the necessity to access the fund. Conversely, the target capital also generates moral hazard effects. The higher the protection, the higher the risk of a lack of risk-adequate behavior on part of the banks and their depositors⁵⁶.

On the one hand, the fund size volume should be determined in such a way that objective and credible protection for the deposits is ensured. On the other hand, the fund volume should neither negatively affect the insured bank’s risk-readiness nor the investors risk conduct:

- *Objective protection*: Established funds offer sufficient protection if they ensure effective losses to be covered in the long term, i.e., payments from bank insolvencies and financing bypassing measures. The period addressed here refers to several decades.

⁵⁶ For a bank, morally hazardous conduct may be displayed as readiness to assume higher business risks. For investors, too high protection may lead to negligence of monitoring duties (for instance, by transferring investments to banks with exaggerated profit promises).

- *Credible protection*: Promised protection is credible not only if it is underpinned by objective formula comprehensible to experts, but also if it comprehensively signals to depositors inexperienced with financial matters that the deposits are secure.
- *Prevention of moral hazard*: Morally hazardous effects are not so much influenced by the vast fund volume but rather by the outstanding eligible and/or covered deposits and methods of contribution selected.

The fund capital volume ultimately depends on the risk to which the deposit insurance fund considers itself exposed: The risk being that payments must be made within a certain time period (for example one year). This risk is determined by the following five factors:

- (1) The probability of an insured institution having to call a claim within a certain time period;
- (2) The volume of covered deposits in insolvent or illiquid institutions at the time of calling the deposit insurance fund;
- (3) The effective amounts to be covered by the deposit insurance fund in the event of a loss, taking into account all payout reducing recovery transactions (for example liquidation of bank assets, coverage management etc.);
- (4) The deposit insurance fund's diversification potential;
- (5) The contagion and spill-over effects in the financial and economic system.

3.3.7.3.1 Probability of calling a claim (probability of default (PD))

Assessing the failure probability of a bank is presumably the most difficult task in determining the target fund capital. In theory, there are many methods and procedures for calculating the failure probability. They can be divided into three categories:

- *Indicator-based procedure*: Determination of the failure risk based on qualitative and quantitative indicators, subsumed into a risk score and assigned to a failure probability⁵⁷.
- *Market-based procedure*: Various procedures based on option prices belong here, but also the consideration of spreads on the CDS market⁵⁸, the inter-banking business, or other interest-based instruments.
- *Rating-based procedure*: Basically a type of indicator-based procedures leading to rating classifications. Ideally, ratings of independent agencies or recognized private ratings are being considered.

All these approaches have a common weakness: On the one hand, statistical fundamentals from the past are missing, and on the other hand, causality is insufficient if past events are projected into the future. Furthermore, statistical calculations are made difficult by the presupposed skewed distribution function of losses (long periods of low losses contrast with short periods of high losses) and missing independence of loss events (presumably high correlation between bank insolvencies in the event of crisis resulting from mutual dependencies).

For this reason, there is no ‘correct’ method from a theoretical point of view. Therefore, we should primarily aim at the criterion of practicability in determining failure probability: What is already available or, respectively, what is yet to be determined or calculated in the course of other supervisory functions.

3.3.7.3.2 The amount of covered deposits in the event of loss

The second variable refers to covered deposits actually at the bank’s disposal in the event of loss⁵⁹. This amount can be elicited with a certain reliability for each bank by periodically:

- assessing the number of depositors, as well as the appropriate covered deposits;

⁵⁷ This approach is currently adopted in practice and mainly based on fundamental data JRC (2008a).

⁵⁸ E.g. Pennacchi (2009) and references herein.

⁵⁹ Exposure at default (EAD).

- using the average values of the past three years as a basis;
- correcting this amount with a factor ‘ Δ ’ (whereby $\Delta < 1$, since it must be assumed that a bank will be dispossessed of those covered deposits below the maximally ensured sum at the first signs of a crisis, despite credible depositor protection).

This correction factor is a psychological factor - the more credible the depositor protection, the higher the factor (i.e. the lower the prophylactic reduction of liquidity).

3.3.7.3.3 Effective payout demand in the event of loss

The effective failure covered by the DIF⁶⁰ is usually much lower than the sum of secured deposits (i.e. EAD) because:

- the bank in jeopardy is able to recover⁶¹ a part of the receivables with its own assets;
- in some countries a liquidity pool is created by (over-) defraying covered deposits with domestic assets, capable of satisfying most receivables (for example with general commitments, pledging, repo-transactions or ad hoc emission of bonds etc.);
- the existence of a credible depositor insurance slows down and reduces the amounts of depositors’ withdrawals, hence allowing the bank and the supervising authorities additional time for restructuring or organized liquidation.

3.3.7.3.4 Diversification potential

The deposit insurance fund’s portfolio is comprised of insured institutions with different risk exposure. Similar to a stock portfolio, the risk for a group of insured parties is lower than the combined individual risks for each insured party. A risk-reducing diversification effect may therefore occur in the deposit insurance fund. The requirements for this to happen are as follows:

⁶⁰ Loss given default (LGD).

⁶¹ As already mentioned earlier LGD can be expressed through 1- Recovery rate (rr).

- incomplete or as low as possible equity profit correlation of the insured institutes;
- an as broad as possible basis of insured institutes;
- an as low as possible spread of covered deposits of individual banks around the average value.

The diversification of non-systemic risks for the DIF tends to reduce the premium rate for the insured parties. In other words; insuring the deposits of an entire financial system is more favorable than insuring the deposits of individual banks⁶². However, contagion and spillover effects strongly limit these diversification effects, as the following section will show.

3.3.7.3.5 Contagion and spillover effects

Deposit insurance basically resembles a normal insurance. However, there are important differences that should be considered when calculating the fund's target capital and insurance rates.

In contrast to life and indemnity insurances for instance, the diversification potential of depositor protection insurance is strongly limited as losses in a national as well as in the international financial system correlate with each other. The reason for this correlation is not only the strong interdependence of banks, but also functional dependencies between the financial system and the rest of the national economy. Payouts (and risks) of depositor insurance directly correlate with the stability of the financial system. This correlation of the failures relevant for deposit insurance goes back to contagion and spillover effects:

- *Contagion effects*: Banks infect each other with liquidity problems. Due to the close connection between financial institutes in the inter-banking business, liquidity problems can quickly spread from one bank to the next, as clearly obvious in the current financial crisis⁶³. Experience shows that

⁶² There weren't many empirical studies so far covering this aspect. An example can be found in Laeven (2008).

⁶³ "Financial innovation and global market developments have transformed the nature of liquidity risk in recent years. The funding of some banks has shifted towards a greater reliance on the capital markets, which are potentially a more volatile source of funding than traditional retail deposits" (BCBS (2008)).

customers tend to transfer their deposits from threatened to seemingly secure banks, whereby the latter may gain additional resilience⁶⁴.

- *Spillover effects*: Recent history of financial crises, beginning with the Asian crisis at the end of the 90s until the current crisis shows, that a financial system crisis may lead to an economic crisis in other markets outside of the financial system, and even to a recession or a general economic crisis in extreme cases.

In conclusion, this means that the deposit insurance fund does not only have to cover the sum of ‘expected’ losses, as calculated based on the risk exposition of individual insured institutions, but that it should also maintain additional risk coverage for so-called ‘unexpected’ losses. These unexpected (or ‘systemic’) losses have to enter into the calculation of insurance rates.

Both, diversification and spillover effects affect the insurance rates but with different algebraic signs. To date, there is no empirical examination of these effects. We assume however, that (cost-increasing) contagion and spillover effects of systemic risks by far exceed the (cost-reducing) diversification effect of non-systemic risks.

3.3.7.3.6 Fund credibility

Regardless of objective requirements, the fund size has to be determined carefully to convince the insured depositors and the public of the fact that covered deposits are truly protected in the event of loss. As mentioned before: While a too low coverage for the eligible deposits undermines the credibility of the fund, a too high coverage increases the risk of morally hazardous conduct on part of the insured stakeholders. However, the target capital should be adjusted to the ‘normal case’ of expected losses over a long time period (for example a decade), as extraordinary losses will have to be covered by additional state warranties in the case of a grave system crisis. No deposit protection system, regardless of its design, could actually cover insured investments to the full extent.

⁶⁴ See also Kroszner/Melick (2008).

3.3.7.4 *Investment policy*

The DIF collects one of the largest capital sums of a national economy. First, this capital has to be invested securely to conserve and increase value, and second, it has to be at the disposal of the national economy, directly or indirectly. To this end, the deposit insurance fund requires an adequate investment policy and strategy. It shall define permissible investment categories, acceptable risk exposure, profit goals derived on this basis, and determine the conditions related to terms and liquidity.

In particular, fundamentals of such an investment policy are:

- Investments have to be risk-free or exposed to minimal risks only. This refers to both market and operational risks as well as counter-party risks. Calculations of the capital stock growth should therefore be based on the risk-free interest rate.
- There is no connection between the investments and the insured institutions and items allowed. Fund assets must not be placed in the financial sector directly or indirectly.
- Quick liquidation of large items without direct influence on financial markets. The DIF has to be able to liquidate its assets quickly and without stock price losses in the event of crisis. At the same time, liquidation must not trigger or strengthen negative stock price effects on the financial markets.
- It should be possible to invest assets directly in the national economy or in support of the monetary purposes of the Central Bank. For this reason, they are either transacted through the state (which leads to a relief for the capital market) or deposited at the Central Bank.

Publicly presenting and explaining the investment policy of the deposit insurance fund is part of the transparency requirement.

3.3.7.5 *Initial financing*

Establishing new or restructuring existing deposit insurance systems raises the question of how to ensure that the fund is functional from the outset or within a fairly short period after its establishment. The deposit insurance

system should fulfill its main function from the start to inspire confidence in the depositors of insured institutes.

All known systems augment the usually very large target capital by collecting regular insurance premiums from insured institutions. But the target capital is usually not achieved for several decades. Therefore, a deposit insurance fund requires initial financing that quickly puts target capital (or at least a substantial part of it) at its disposal and thus endows it with credibility required for its functionality.

This can only be achieved if the DIF can demonstrate quickly and credibly that it is capable of satisfying potential claims. To this end, large start-up capital is required (hereafter referred to as DIF_{\min}). Several possibilities for obtaining this start-up capital are under consideration:

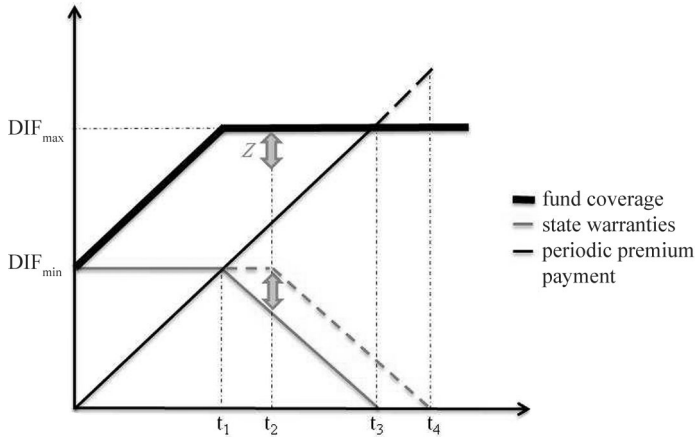
- a) State warranty;
- b) Contribution of capital by insured institutes;
- c) Security-based financing;
- d) Combination of ex-ante with ex-post financing.

3.3.7.5.1 State warranties

The state and/or the Central Bank guarantee(s) the predefined starting amount without actually providing the financial means. Simultaneously, capital stock accumulates from the yearly premium payments of the insured parties. This accrual continues until the warranty and the capital stock reach the defined maximal level. Then the state warranty is annually reduced by the amount of newly paid premiums or financial means from profits realized through asset management. Should payouts occur, resulting in a fund decrease under the defined maximal level, a federal warranty automatically takes effect for the emerging difference.

The following figure shows the main characteristics of this solution:

Figure 9: The impact of state warranties



- The DIF disposes over DIF_{min} coverage capacity from the start;
- The periodic payments of the insured parties continuously increase the coverage capacity;
- After the defined maximal coverage capacity DIF_{max} is reached at t_1 , the state warranty will be reduced gradually;
- In the event of loss (here at t_2) with a payout 'Z', the state warranty automatically increases by 'Z', so that the fund shows the defined coverage sum at all times;
- If no losses occur, the liquid means of the DIF reach the defined coverage sum at t_3 ;
- In the event of loss, the payment obligation of the insured parties is extended (from t_3 to t_4 in the example). The extension is reduced by profits from capital stock that has not been taken into account for the figure for reasons of simplification.

Advantages	Disadvantages
<ul style="list-style-type: none"> • High <i>credibility</i> of the declared warranty • Simple <i>implementation</i> • High <i>acceptance</i> in the financial sector • <i>Conformity</i> with traditional forms of state warranty • <i>No self-energizing</i> effects 	<ul style="list-style-type: none"> • <i>Political</i> discussion (state influence) • <i>Risk costs</i> of the warranty must be borne by the state • In contradiction to the '<i>responsible party pays</i>' principle

3.3.7.5.2 Contribution of capital by insured institution

With advance payments made by the insured parties it is possible to reach coverage up to the DIF_{\min} level. This basic mechanism is identical with the previously mentioned warranty solution. The main characteristics of this solution are:

- The amount to be effected is calculated in the same way as the risk-based premiums, i.e., an insured party with a higher risk makes higher contributions;
- The contributions are entered into the books of the insured institutions as an asset (i.e. as subordinate debt in the books of the deposit insurance fund);
- Interest is annually added to the financial contributions at a risk-free interest rate (interest rate is determined by the Central Bank for instance). The interest is credited to the insured party but not paid out;
- If a loss occurs at t_2 , then the outstanding payments Z are covered by the special reserves made up of the interest payments. Not before $R < Z$, the remaining difference will be demanded from the insured institutes as an additional obligatory contribution;
- From t_1 onwards, outstanding premiums are applied against the depletion of the initial financing amounts.

Advantages	Disadvantages
<ul style="list-style-type: none"> • <i>Causar-based</i> financing • Simple <i>implementation</i> 	<ul style="list-style-type: none"> • Blocked <i>liquidity</i> • Probably <i>low acceptance</i> in the industry

3.3.7.5.3 Security-based financing

Security-based financing is generally functionally identical with the above mentioned financing solutions. The main difference is that advance financing of DIF_{\min} is ensured by emitting bonds (notes) through the DIF. The main characteristics of this solution are:

- The DIF emits the notes in the total amount of DIF_{min} ;
- The notes feature progressive maturity (for example yearly tranches);
- They are paid back between t_1 and t_3 , in coordination with the capital stock growth comprised of premium payments of the insured parties;
- The notes are booked at the insured institutes through obligatory signing (following the same key as in the solution above). In a second step they may be placed on the secondary market;
- Banks may count the notes against their legal liquidity requirements and use them as coverage for repo-transactions;
- Thereby a guaranteed coverage similar to suggestion a) would be reached, with the difference of the coverage capital DIF_{min} actually being at disposal (which means increased credibility of the fund).

Advantages	Disadvantages
<ul style="list-style-type: none"> • High <i>flexibility</i> through various options for emission • Opportunity to <i>trade</i> notes: Tapping into a broad capital basis • <i>Broad basis</i> for financing • High <i>credibility</i> • High <i>acceptance</i> in the financial sector • Useful <i>Central Bank instrument</i> 	<ul style="list-style-type: none"> • Higher <i>complexity</i>/higher expenses • <i>Competition</i> with other financing instruments of the state

3.3.7.5.4 Combination of ex-post and ex-ante financing

Combinations of ex-ante and ex-post solutions (i.e. with obligatory additional contribution) are, of course, conceivable. There are two major options:

- *Coverage of DIF_{max} through limited call for additional cover in case of a loss*

The insured institutes make their regular annual premium payments (ex-ante) up to the defined coverage level DIF_{max} and are obliged to make additional payments (ex-post) in the case of claims. Once the defined

coverage level DIF_{max} is reached, , the call for additional cover may be abolished.

- *Coverage of DIF_{max} through permanent call for additional cover in case of a loss*

The same combination of ex-ante and ex-post financing is as described above. In contrast, the insured parties are permanently obliged to make additional payments in the case of claims. The call for additional cover increases in the event of loss and would be reduced based on capital stock profits respectively.

Advantages	Disadvantages
<ul style="list-style-type: none"> • <i>Simplicity</i> • High <i>acceptance</i> in the sector 	<ul style="list-style-type: none"> • Lower <i>confidence</i> • No solution for <i>general weaknesses</i> attached to <i>ex-post systems</i>

3.3.8 Resolution regime

3.3.8.1 Why a special Resolution Regime?

In the case of a system-relevant bank the specific intermediation function of banks in the national economy may result in liquidity problems or even in threatening insolvency of a financial institute, which may have a major immediate impact on other financial institutes and the national economy as a whole. The bankruptcy law applicable for general types of companies is generally not suited for balancing or preventing these negative external effects in case of a bank insolvency. Hence, most countries have enforced a bankruptcy law or insolvency regime aimed specifically at banks and financial institutions.

The goal of such legal framework is to make it possible to transact an imminent or occurring insolvency of a financial institution under guidance of the responsible authority. So, claims of depositors can be maximally satisfied and the negative externals arising from the insolvency for the financial system and the national economy can be minimized. The appropriate regulations will

be called ‘Special Resolution Regime’ (SRR) in the following⁶⁵. Empirical studies conclude that there is a positive connection between the design of a national SRR and the resilience of the financial intermediation system⁶⁶.

3.3.8.2 *The three pillars of a Special Resolution Regime*

The concrete design of bank insolvency regulations is always exposed to strong political influences. There is a wide range of SRR solutions in Europe: Every country selects a different approach in dealing with threatened financial institutions⁶⁷. The vast theoretical and empirical literature on this topic⁶⁸ agrees that an efficient SRR is built on three pillars:

- (1) timely recognition of a looming illiquidity or insolvency;
- (2) timely initiation of preventive measures to secure existing assets and liquidity; and
- (3) timely shutdown or recapitalization of insolvent financial institutions.

For all three points the word ‘timely’ is of great importance. When problems are recognized too late, their solution is not only much more difficult, but also significantly more expensive⁶⁹. In all three points the deposit insurance system plays an important role, whereby its implementation undoubtedly focuses on steps two and three. The effect of a crisis is mainly a matter of how quickly jeopardized financial institutions are declared ‘illiquid’ or ‘insolvent’ and how quickly they are restructured by means of appropriate measures⁷⁰.

3.3.8.2.1 *Timely recognition of crises*

The symptoms of a financial system crisis are easily recognizable. Bank-runs, massive transfer of depositor items between financial institutions, cumulative liquidity problems and insolvencies of financial institutions are the main characteristics of such a crisis. Timely recognition of a crisis (or potential problems leading to a crisis) for initiating prophylactic measures through the elements of the financial security system has to begin earlier - before the

⁶⁵ Other designations for the same are, for instance, “Bank Insolvency Resolution Program”.

⁶⁶ Beck/Laeven (2008).

⁶⁷ Cihák/Decressin (2007).

⁶⁸ Eisenbeis/Kaufman (2007), Su (2006), Poghosyan/Cihák (2009).

⁶⁹ Poghosyan/Cihák (2009).

⁷⁰ Kaufmann (2006).

system crisis as such occurs. But it is not that easy to know whether a financial institution is approaching a critical situation or already on the verge of a crisis. The triggers signaling an imminent crisis prompt supervising authorities or other elements of the financial security network to take appropriate action. The restructuring methods differ vastly from country to country⁷¹.

Empirical studies show that most European countries use a combination of risk assessment, based on financial reporting data and crisis indicators, rating models and statistical analyses for an early warning system of this kind⁷²:

- *Crisis indicators*: The use of CAMEL⁷³ variables is widely spread: They combine indicators for equity or capital ratios, asset quality, management, earnings/profit situation, and liquidity. The definitions, quantification and combinations of individual variables as crisis indicators, as well as the determination of threshold values that may signal an imminent crisis, differ from country to country. Apart from the classical CAMEL variables, risk key data specific to banks or indicators for the financial and economic environment often enter into the risk analysis of supervising authorities.
- *Rating models*: The crisis indicator results are mostly combined into a rating model which ideally results in an appropriate rating. The rating classification represents either the ‘proximity’ of the financial situation to a predefined crisis threshold value or the probability of receiving a better/worse rating within a certain period (and hence approaching or diverging a critical situation)⁷⁴.
- *Statistical analyses*: Statistical analyses aiming to assess the failure probability of a financial institution (or the probability of its surviving) based on data relating to the past or estimations of future profits and losses belong to the most complex early warning systems⁷⁵.

⁷¹ See also Cihák/Decressin (2007).

⁷² Poghosyan/Cihák (2009) provide a good overview of this topic; we shall rely on their consideration here.

⁷³ Capital adequacy, Asset quality, Management, Earning/Profitability, Liquidity.

⁷⁴ The SEER-model used by the U.S. Federal Reserve may be taken as an example (SEER: System for Estimate Examination Ratings).

⁷⁵ The SAABA-model of the French Commission of Banks (“... for banking analysis”), or the model of the Italian Central Bank, both of which are based on estimating future losses of the financial institutions see exemplify such models (see f.e. Poghosyan/Cihák (2009)). Statistical models use many other supervising institutions such as the German Federal Bank.

Market information tends to be incorporated in early warning systems more frequently, even though not on a very systematic basis. Changes of stock prices and spreads in the financing sector, especially in the interbanking business, are the focal point here. As a consequence of the financial crisis, interest rates offered in the investment business will most likely draw more attention in the future⁷⁶.

The development and use of such early warning systems is useful in many respects. On the one hand, they may provide the financial security network institutions with clues about a developing crisis. But they also increase the awareness of all stakeholders in the system for the determinants of such a crisis. Thirdly, if made public, the results of the early warning systems increase market discipline by informing market participants in a timely manner of a change in risk exposure of a financial institution and by applying pressure to management as a consequence.

3.3.8.2.2 Timely initiation of preventive measures

The recognition of imminent crises forms the basis for timely initiation of preventative measures on part of the authorities and it is an indispensable requisite for containing or overcoming a crisis. A look back at the history of past financial crises around the world shows that such measures were unfortunately not taken early enough, which resulted in its reduced effects and higher costs for overcoming the crisis.

Such preventive measures, mostly enacted and implemented under tight cooperation between the supervising authorities, deposit insurance organization(s) and the Central Bank at best, can be assigned to one of the following categories.

- *Assistance management*: The mildest form of a preventive measure places the financial institution under the management (or co-management at best) of an administrator appointed by the supervising authorities or deposit insurance organization. From the perspective of deposit insurance, his main task is to prevent a worsening of the situation with regards to liquidity and thus threats to the deposits and an increased risk for the deposit insurance fund respectively;

⁷⁶ The example of the Icelandic Kaupthing bank shows that a higher interest rate offer for deposits goes hand-in-hand with increased risk exposure for the bank.

- *Bridge bank*: Establishing a ‘bridge bank’ may be the solution if a financial institution with a positive market value is in jeopardy to become illiquid or insolvent before a purchase and assumption transaction (see the next point) succeeds. The supervising authority and/or the deposit insurance organization establish(es) a bridge bank which takes over the assets and liabilities of the jeopardized or insolvent bank in part to ensure that basic functions continue (mostly account and payment transactions as well as credit operation). Usually, management of the insolvent bank is replaced by external administrators appointed by the supervising authority or the deposit insurance institution. Their task is to continue the bank’s business on a reduced basis over a limited period of time (mostly between half a year and a year), in order to protect existing assets and reduce risks for the depositors. Establishment of a bridge bank is useful if immediate shutdown or liquidation of a financial institution is not a consideration due to system resilience, or if several financial institutions simultaneously run into difficulties in a massive crisis. Bridge bank measures are primarily a matter of gaining time for essential recapitalization and restructuring measures⁷⁷.
- *Purchase & Assumption (P&A)*: In this widely spread solution it is a matter of finding a purchaser for the assets and liabilities of the jeopardized financial institution in part or as a whole⁷⁸. Supervising authorities ensure a limited transitional financing for the bank or arrange for reduced continuation of business. In some countries financial means of the deposit insurance fund are accessible to this end. Such supporting measures are taken only if there are justified prospects for realizing an appropriate P&A solution for the short term.

These preventive measures are also known as ‘Open Bank Assistance’ (OBA) since the endangered bank is basically kept ‘open’, but its business activities are restricted⁷⁹. OBA measures are mostly implemented under close cooperation and with the financial support of the deposit insurance organization. The use of financial means from a deposit insurance fund is always justified if the cost is less, in comparison to shutting down the financial institution and paying out covered deposits (although it is of course difficult to calculate this in advance). The involvement of deposit insurance

⁷⁷ See also Ho (2008), Su (2006).

⁷⁸ For further information refer to <http://www.fdic.gov/bank/historical/reshandbook/ch3pas.pdf>.

⁷⁹ “There are two types of possible resolution transactions: open-bank assistance (OBA) and closed-bank resolution (CBR). In an OBA transaction, which is used in rare situations, the FDIC provides financial assistance to the bank while it remains open for specific reasons”. (JRC (2008b)).

funds has to be in the best interest of the protected investor⁸⁰ independently of other goals of the financial market supervision or other financial network partners.

3.3.8.2.3 Timely shutdown or recapitalization

If bridging measures are no longer an option, then the insolvent financial institution has to be shut down as quickly as possible. If this does not take place in a timely manner, the risk for the deposit insurance fund increases substantially. Experience shows that state authorities often hesitate to make the necessary decision to shut down an institution. Such decisions are almost always exposed to political pressures, especially in the case of larger banks and financial institutions. Additionally, practical examples clearly show that only timely and tough measures can reduce risks and costs for the deposit protection fund. Adequate conclusions can only be drawn and implemented if the deposit insurance organization is able to draw the right conclusions and act independent of political influence. Shutdown decisions should be made based on predefined criteria in the course of a standardized decision process and implemented following a predefined procedure. Following Su (2006) and under consideration of the experience in 2008 and 2009, it is possible to define a number of principles for designing measures for overcoming a crisis from the perspective of deposit insurance. In particular, the following might be taken into consideration:

- (1) The legal and regulatory conditions should determine the function of the deposit insurance system in the course of open-bank assistance (OBA) or closed-bank resolution (CBR) as clearly as possible. Mandate, responsibilities, and competencies of the deposit insurance organization should be carefully adjusted to each other.
- (2) At the same time, the coordination and cooperation between the involved network partners should be (pre)defined and ensured. In particular, this includes securing timely and comprehensive exchange of information between the financial market supervising authority, the deposit insurance institution, the Central Bank and other institutions involved.

⁸⁰ Su (2006).

- (3) Triggers for certain measures must be determined. The network partners shall agree to a common early warning system and determine which measures should be taken and how upon reaching the limit values.
- (4) To this end, decision and implementation processes in the event of crisis have to be formulated in advance and defined obligingly. Thereby, the ‘normal case’ (for example an isolated crisis at a smaller bank) should be distinguished from an acute or threatening system crisis (for example in a ‘too-big-to-fail’ case, or a number of financial institutions with critical symptoms and the danger of contagion over the entire financial intermediation system).

Lessons from the financial crisis

- The swiftness of state intervention is crucial for containment of the negative externals of a financial system crisis. Hesitant intervention reduces the effect of the measures and results in higher costs for overcoming the crisis.
- Crisis-indicating triggers, as well as decision and implementation processes derived thereof, must be defined and specified ex-ante in the course of OBA or CBR measures in order to prevent discussions between the involved network partners and political influence in the event of crisis.
- Predefined measures must not result in an increased morally hazardous conduct on part of the insured financial institution’s management. To this end it is helpful for the supervising authority and deposit insurance institution to clearly communicate their intention of imposing OBA measures quickly on threatened institutions or to shut them down in order to replace management, as well as to hold the responsible individuals of the insured institutions legally accountable.

3.3.9 Payout mechanism

Pursuant to legal provisions, the deposit insurance fund arranges for a quick and efficient payout of covered deposits in the event of loss. The attributes ‘quickly’ and ‘efficiently’ are the characteristics of this design element.

- *Time aspect:* The period in which a deposit insurance institution is able to make covered deposits available to investors is an essential element of ensuring the credibility of the protection system. Therefore, this time period should be as brief as possible. The American FDIC undoubtedly sets

the benchmark aiming for a period of one or two business days⁸¹. The new EU Directive 2009/14/EC assumes 20 days⁸². Other European countries use time periods of more than a week as a target.

- *Efficiency aspect*: A payout mechanism is considered efficient if it supports the goal of system resilience while involving the lowest costs possible for transacting the payout. Generally, there are two payout models for discussion: Direct payout through the deposit insurance fund or making the liquidity required to payout covered deposits available to the illiquid bank and transacting the payout through this bank (for example in the course of bridge bank transactions). Experience shows, that the latter is preferred as it is more cost-efficient while simultaneously reducing the risk of depositors effectively transacting withdrawals (i.e., by extending the period in which such withdrawals occur).

3.3.10 Claims and recovery

Directly connected to the payout mechanism the question arises of whether and to what extent the deposit insurance fund obtains receivables from the insolvent bank as a consequence of bridged payments to depositors. Here, two alternative solutions are for discussion: Pure insurance approach and succession approach:

- *Insurance*: The deposit insurance fund is conceptualized as an insurance only. Similar to an indemnity insurance it accrues reserves used for covering incurred losses. The right of recourse against the insolvent bank is excluded. In this model, the LGD turns out to be significantly higher⁸³ of course, since the deposit insurance does not receive any financial means from the insolvent financial institution in the course of the mostly tedious liquidation process. The expected loss and the required coverage premium are proportionately higher.

⁸¹ Refer to Annual Performance Plan 2009, Insurance Program available at <http://www.fdic.gov/about/strategic/performance/2009/insurance.html>.

⁸² The payout delay of three months currently provided for shall be reduced to a period of 20 working days. By March 2011, the Commission should submit to the European Parliament and to the Council a report on the effectiveness and delays of the payout procedures assessing whether a further reduction of the delay to 10 working days would be appropriate.

⁸³ I.e. the recovery rate (τ) is lower which leads to a higher LGD since the latter is defined as $(1-\tau)$.

- *Succession*: In this model the deposit insurance institution assumes the depositor's position to the extent of the payouts. This way it only provides an anticipatory credit for the payout of covered deposits and aims to add the transacted payments from the liquidation proceeds to the fund in part or as a whole. It is obvious that the premiums to be paid by the insured institutions turn out significantly lower in this model than in the insurance model.

Combinations of the two models are, of course, conceivable. Each model has its advantages and disadvantages. The insurance model strengthens the position of other creditor claims not covered by deposit insurance (in particular the protected but not covered amount of deposits⁸⁴). This reduces the risk of untimely liquidity outflows. On the other hand, deposit protection designed in this way requires a high volume of target capital and credible reinsurance from the state or the Central Bank. The succession model requires low target capital volume and lower premiums, but it weakens the non-secured depositor claims in case of bankruptcy and it entails cash maintenance costs for the insured institution because of mostly strict provision regarding liquidity and account balancing structure.

3.3.11 Reinsurance and additional warranties

Design and architecture of the deposit insurance systems aim at the 'normal case', i.e., coverage of failures at small institutes or a few medium size failure within mostly long time periods. If a failure of a big banking house or several thereof occurs, or if cumulative insolvencies of smaller and mid-size banks take place, then the capacity of even a generously designed insurance fund will be exhausted or overwhelmed very quickly. Even if the deposit insurance fund is just sufficient at best, thereafter, it is hardly capable of operating and appearing credible for years as a consequence.

Therefore, every deposit insurance system requires additional state warranties in terms of reinsurance. Such warranties should be of explicit nature. This is the only way they can reach the desired effect of increasing the credibility of deposit insurance and account for the warranties in terms of premiums at the expense of the warranty recipient. It is indisputable that dangerous morally

⁸⁴ I.e. the depositors are separately compensated and do not have to be disbursed by 'liquidated assets' of the financial institute.

hazardous effects emanate from unrestricted reinsurance commitments of the state. In addition, the question arises as to whether the state would be able to fulfill adequate warranty commitments in the event of crisis. Since such commitments have to be associated with a strict and efficient regime of insolvency and resolution, the path towards nationalization always remains an option, which will also prevent a bank-run in most cases (at least in the European states)⁸⁵.

The following aspects are of particular importance in connection with such reinsurance commitments of the state:

- (1) *Guarantor*: Only the state itself or its Central Bank represents a credible guarantor. Solutions with private insurance or reinsurance companies, as discussed in the literature as well, have hardly proven to be realistic⁸⁶. At best, a market solution would be conceivable in terms of securitizing failure risks which in turn would be afflicted by other problems⁸⁷.
- (2) *Terms of warranty*: State reinsurance may include an unrestricted or restricted commitment. It can be claimed either when the deposit insurance fund has been exhausted or in case of certain events. It may be formulated as an anticipatory credit or refundable warranty payment.
- (3) *Warranty-triggering events*: The claim to reinsurance has to be associated with clearly predefined situations or events. Such events could be foreseeable insolvency of the fund or achievement of the minimal threshold value of fund assets. But it is also possible to determine the failure of certain financial institutions as the triggering factor ex-ante, for example by transacting deposit payouts in case of certain financial institutions relevant for the system (in general or starting with a certain threshold value) directly through the reinsurance of the state instead of the deposit insurance. In that case, reinsurance ensures continuous functionality and credibility of the deposit insurance fund, which can be of importance when a system crisis is looming. The deposit insurance

⁸⁵ It is a completely different matter in countries where the state itself has low credibility regarding its ability and intention to fulfill warranty commitments.

⁸⁶ E.g. the FDIC engaged Marsh & McLennan to evaluate the feasibility of private sector reinsurance arrangements. The study found that reinsurers had only limited interest in engaging in reinsurance agreements with the FDIC on terms acceptable to the Corporation. Further extracts can be found in FDIC (2007).

⁸⁷ This would be, for instance, a question of volume for securitization, capital management, related interest charges etc.

institution should be the triggering entity for claiming the reinsurance commitment for each case.

- (4) *Restricted or unrestricted warranty*: The restriction of state reinsurance commitments reduces the state's risk without excluding that unrestricted commitments must be made in the event of a system crisis. Since in the latest financial crises a great number of states have entered into unrestricted warranty commitments, market participants will presume the same in case of future crises of similar extent. It is therefore recommended to make unrestricted warranty commitments under conditions specified in detail from the outset. In particular, a clearly specified Failure Resolution Regime including clearly specified OBA and CBR should be part of this framework, respectively measures, explicit intention and the legal competence to nationalize financial institutions threatened by failure and relevant for the system, as well as the explicit commitment to hold decision-making staff at the problematic institutes legally accountable.
- (5) *Anticipatory credit or warranty payment*: In case of anticipatory credit of payments out of the reinsurance, it is assumed that the state payments will be restored in the course of the deposit insurance system. The required capital to this end usually arises from the liquidation proceeds from the insolvency process. In case of warranty payments, the guarantor shall waive the refund in part or completely since the insolvent institute will likely always be nationalized in case of claiming a warranty.
- (6) *Payout mechanism*: Payouts from the reinsurance commitment will always be transacted by the deposit insurance institution (just as outstanding refunds in favor of the guarantor).
- (7) *Compensation*: Explicit reinsurance commitments have to be compensated risk-adequately, in favor of the guarantor. Appropriate premiums can either be included in the total premium of an institute relevant to the system or charged separately. In each case, the collection of the premium should be transacted together with the normal deposit insurance premium. Whether the state deposit insurance fund reimburses the state for the collected reinsurance premium or retains it to strengthen the capital basis and itemizes it as a guarantor's claim on the balance sheet depends on the concrete design of the reinsurance mechanism.

Lessons from the financial crisis

- Every deposit insurance institution disposes of explicit or implicit reinsurance commitment of the state. In many cases the implicit warranty commitment has been transformed to an explicit commitment in the course of the crisis' accentuation.
- In order to reduce morally hazardous commitments, warranties should be made explicit in advance and compensated risk-adequately.
- Reinsurance commitments of the state should be accompanied by clearly defined Failure Resolutions Regimes and OBA or CBR measures.
- Reinsurance commitments by the state should be accompanied by the clearly communicated intention to nationalize a bank relevant to the system quickly. The agency should be held responsible for the insolvency and decision-makers legally accountable.

3.3.12 Cooperation and coordination

The importance of close cooperation between the institutions responsible for the resilience of the financial system for efficient deposit insurance has already been addressed several times. The experience of the recent financial crisis confirms that financial market supervision, deposit insurance and the Central Bank can inspire confidence in the market participants necessary for containing a crisis only by cooperating and making well founded joint decisions.

Cooperation and coordination with the other elements of the financial safety network of a financial intermediation system are important for effective deposit insurance. The financial crisis has shown that there are other interfacing areas aside from supervision and regulation, e.g. the government or the state. In addition, there is always a cross-border demand for cooperation and adjustment as a consequence of internationalization and globalization of the financial sector.

- *Interface to the financial market authority:* The most important interface for deposit insurance institutions is undoubtedly with the financial market authority. Unlike the American FDIC for instance, no supervision functions (or only minimal functions) have been transferred to the European deposit insurance institutions. Determining the risk exposure of a financial institutions or the financial system as a whole and timely intervening is the task of the financial market authority and this should not be transferred to the deposit insurance institution. The financial

market authority also decides about implementing support and redevelopment measures and demands financial means from the deposit insurance fund for financing OBA measures. Usually, the decision to release indemnity payments to the insured depositors is made by the authority as well.

- *Interface with the Central Bank:* There is usually a direct point of intersection with the Central Bank if this reinsurance function or the financing function for the deposit protection fund has been transferred. The Central Bank will mostly be involved in OBA or CBR measures (and certainly in solving problems of banks relevant to the system) along with the deposit insurance institution in most cases.
- *Interface with the government:* Experience of the recent financial crisis shows that the state very quickly gets involved in the event of a spreading financial system crisis. Careful adjustment of state warranty commitments to the deposit insurance system is a requirement for preventing morally hazardous conduct of the market participants in the future. This particularly includes early discussion and decision on future measures of suspending or gradually reducing state warranty commitments. If state commitments are extended in case of crisis, regulation and supervision should be enhanced at the same time⁸⁸.

As said before, coordination and cooperation require a careful definition of the decision and action process, not only within individual elements of the financial security network but also across the network as a whole. It is equally important to establish an institutionalized, formalized and quick exchange of information between the network elements.

Lessons from the financial crisis

- In the event of crisis there is intense communication and cooperation between the deposit insurance institution and the financial market authority as well as the Central Bank.
- This close cooperation and coordination between the main elements of the financial safety network in terms of taking action and decision-making is a requirement for the efficiency of the deposit insurance system.
- In this regard, information exchange as well as decision and action processes must be defined and formalized for the entire network in advance.
- Additional state warranty commitments have to be accompanied by increased regulation in order to prevent morally hazardous conduct of market participants.

⁸⁸ See also Schich (2009).

4 International harmonization and coordination

4.1 Legal initial position

The decision to design and implement a deposit insurance system has primarily been a national issue for a long time. Pursuant to the Investment Services Directive adopted in 1993⁸⁹, which refers to the harmonization of many areas of financial market supervision, the Directive 94/19/EU on deposit insurance for the first time defines general conditions for adjusting deposit insurance systems in the EU member states. Thereby all member states were indeed obliged to implement deposit insurance systems, their appropriate design however was left to individual countries.

The events of the financial crisis in 2007 and particularly in the fall of 2008 revealed weak spots in many European deposit insurance systems. It particularly became apparent that their most important goal of ensuring resilience of the banks and the financial system by inspiring confidence of the depositors in the protection of their insured deposits was not achieved at all or only in part. As a consequence, Directive 94/19/EU was revised and adopted by the European Parliament in March 2009 as Directive 2009/14/EU. The minimal coverage sum, the decision-making period about a crisis of an insured institution, the payment period for covered deposits as well as prohibition of damage shares for investors (co-insurance) still prescribed by many deposit insurance systems have been adjusted or changed. The 2009 Directive concretely defines general conditions for important design elements of deposit insurance systems obligatorily applicable in 27 EU-member states.

These changes can be seen as a consequence of reactions from different member states governments to the events in the fall 2008. The Commission also recognized that further international harmonization of deposit insurance systems will be required as a consequence of the experiences made in the financial crisis. Hence, in the spring of 2009, the EU Commission submitted

⁸⁹ Directive 93/22/EEC. The ISD established the conditions in which authorized investment firms and banks could provide specified services in other EU on the basis of home state authorization and supervision and also contained the right of direct or remote access of any authorized ISD firm to participate in trading on exchanges or regulated markets in other member states. The ISD has now been revised by the Markets in financial instruments directive (MiFID).

a consultative document in which it asked the member states for their opinion on a total of forty key questions⁹⁰. Based on their opinions the Directive 94/19/EU should probably be fundamentally revised even more in the medium term.

4.2 The importance of international harmonization

Differing standards and regulations of national deposit insurance systems may lead to a regulatory arbitrage of the depositor. Informed investors transfer deposits to countries with better deposit insurance (for example by using foreign branches of their domestic banks) or financial institutions use another country's better protection for acquiring deposits and then transfer them across the border within the international corporation⁹¹. Depositors less well informed or internationally less flexible can be placed at a disadvantage. Governments may be tempted to give their domestic banks and financial intermediaries a cutting edge by enforcing looser general conditions (for example for financing deposit insurance).

Therefore, internationally harmonizing the architecture of national deposit insurance systems definitely makes sense. This does not, by any means, exclude that the characteristics of individual building blocks consider country-specific circumstances and general conditions.

4.3 Cross-border cooperation

The growing internationalism of retail banking forces the national deposit insurance institutions to cooperate more closely across borders. Two problem areas take center stage: Cooperation in the course of topping-up arrangements and insolvencies of internationally operating financial institutions.

- *Topping-up arrangements*: Generally, the deposit insurance system of the country in which a financial institution has its headquarters is responsible for the investors' indemnity in the event of loss even if it placed its deposits

⁹⁰ European Commission (2009). The answer of EFDI as of July 2009 can be found under <http://www.efdi.net/scarica.asp?id=107> &Types=NEWS.

⁹¹ Thus Icelandic banks booked more than 300 million Euro in deposits at German branches in 2008 alone, although the entire Icelandic investment protection systems guaranteed a coverage of only approx. 105 million Euro. Similarly high volumes of investments were accepted in Dutch and British branches.

with a foreign branch of the parent company. However, if it is a legally independent subsidiary company of the insolvent institute, then the deposit insurance system of the country where the subsidiary company has its headquarters is obliged to cover the required payments. If the coverage sum for the appropriate deposits is higher in the host country of the subsidiary than in the home country, then the deposit insurance system of the host country has to cover the difference between the (lower) coverage sum of the home country and the (higher) coverage sum of the host country. In other words, topping-up arrangements consist in supplementing ('topping-up') a lower home country guarantee up to the wider cover offered in the host country. Such a differentiated deposit insurance coverage between individual countries is problematic in many respects. It makes it more difficult to calculate risk-adjusted amounts for the insured institutions. It results in unfair competition and thus interferes with smooth operation of the financial services market across borders. It complicates quick and efficient deposit payout and confuses investors who suddenly have to struggle with several different deposit insurance systems in different countries. Not to mention, it impedes with efficient redevelopment and liquidation of an illiquid or insolvent financial institution with an international structure of organization because of the mostly differing regulatory conditions in the countries in question⁹².

- *Insolvency of international financial institutions*: The liquidation of the international branches or subsidiaries of the Icelandic Kaupthing bank for example shows that missing harmonization of deposit insurance and insolvency regulations may lead to high costs in the affected countries. Rescue operations of banks with an international organizational structure are facilitated by harmonizing and standardizing deposit insurance regulations. The appropriate processes and structures have to be defined and adjusted before a crisis - we have learnt from experience that there is no time left once the crisis has arrived. In connection to this, the suggestion that only a single deposit insurance system, for example that in the investor's country of residence, shall take responsibility for all demands including deposit insurance systems in other countries, makes sense.

⁹² For further discussion on topping-up as well as on possible options for the future refer to Cariboni et al. (2008).

4.3.1 Creation of a pan-European deposit insurance system?

If international harmonization, coordination and cooperation are requirements for an efficient national deposit insurance system, then the question arises as to whether a unique or pan-European deposit insurance system for all EU member states would be the right solution.

The experience of the recent financial crisis shows that internationally operating banks have to be influenced by internationally coordinated or even independent international regulation and supervision in their business conduct. Following through on this thought we arrive at the conclusion that only a central supervising authority can decide whether an internationally operating financial institution is approaching illiquidity or insolvency, or whether it has reached this state already.

The catalogue of questions submitted for consultation by the EU Commission correctly declares that there are hardly any incentives for national supervising authorities in the currently fragmented national deposit insurance system to give thought to the question as to how to arrive at an optimal solution for all affected depositors in many different countries if an internationally operating bank runs into difficulties⁹³. Every country will try to optimize its own advantage.

The creation of a pan-European deposit insurance system comes not only with a series of fundamental advantages but also disadvantages that should be carefully evaluated. The following advantages can be adduced:

- *Improved credibility*: A deposit insurance system at the level of the European Union with only one contact partner inspires credibility even in those investors who transferred their deposit at foreign branches of their financial institution.
- *International solidarity*: The creation of a unique deposit insurance system results in increased international solidarity in the event of crisis and stays abreast the cross-border integration of financial institutions in the interbanking sector, for instance.

⁹³ “Since banking supervisors are involved in the decision whether a bank should be saved or the DGS be triggered, the fragmentation of DGS does not provide incentives for supervisors to reach a solution that is in the interest of all depositors and takes into account the potential impact on the financial stability of all Member States concerned”. See European Commission (2009).

- *Simplified failure resolution*: The greatest advantage of all is certainly that it becomes possible to conduct cross-border procedures of insolvency and resolution, including OBA and CBR measures, more efficiently and cost-effectively.
- *Simplified payouts*: It is possible to simplify and accelerate payouts by financial institutions with a network of international branches and subsidiaries in the course of insolvency proceedings.
- *Broader fund-base*: The more insured institutions, the broader the fund-base. A fund-size in pan-European dimension might be in the position to flatten abrupt liquidity fluctuations while avoiding payout problems.
- *Simplified premium payments*: A supranational deposit insurance fund may not eliminate but significantly reduce problems of calculating risk-adequate premiums for internally operating financial organizations.
- *Reduction of adverse selection/moral hazard*: After all, a pan-European deposit insurance system may avoid regulatory arbitrage related to different national deposit insurance systems.

In sum all these positive aspects imply that a supranational deposit insurance system can inspire confidence in international investors who operate across borders and hence reduce the risks of a bank run affecting several countries. Thus, the deposit insurance system promotes resilience. However, these advantages contrast with important disadvantages:

- *International supervising authorities as a requirement*: A requirement for a pan-European deposit insurance system is the creation of appropriate supranational regulation and supervision of the financial institutions associated with this deposit insurance. The creation of a cross-border deposit insurance scheme is inconceivable before such an international supervising institution, as well as supranational conditions of regulation have been implemented.
- *Political obstacles*: The suggestion of a pan-European deposit insurance system may include a number of strong points and it may certainly solve some of the problems in connection with deposit insurance of internationally operating financial institutions still unresolved today. However, the political country specific problems related to this are massive. For this

reason the chances of success for this project are probably not too high in the foreseeable future.

- *Fund management/investment policy*: Fundamental problems also exist in connection with managing a large pan-European deposit insurance fund. The investment of the fund capital would present the authorities responsible for this with a great challenge.
- *Administrative and operative complexity*: The more insured institutions have to be subsumed under one fund organization the higher the administrative cost (i.e. IT, premium calculation, control mechanism). An immense steering and implementation intricacy might further challenge cost-benefit considerations.

The evaluation of advantages and disadvantages of such a cross-border solution shows that this goal has to be pursued despite foreseeable difficulties. That seems to be also the declared intention of the European Union⁹⁴.

4.3.2 Architectural options

Following the considerations of the EU Commission⁹⁵, at least three different options for designing a pan-European deposit insurance system in the future should be discussed:

- (1) *Centralization of the national deposit insurance systems into a pan-European system*: This solution dissolves the individual national deposit insurance systems or rather integrates them into a supranational deposit insurance organization. The pan-European deposit insurance system assumes the previous functions of the national protection systems.
- (2) *Supplementary pan-European deposit protection*: The national deposit insurance systems remain but they are supplemented by an additional supranational one⁹⁶.

⁹⁴ <http://www.efdi.net/scarica.asp?id=107&Types=NEWS>.

⁹⁵ See footnote above.

⁹⁶ The EC mentions in this context a so called '28th regime' complementary to the existing solution in the 27 member countries. See European Commission (2009).

- (3) *Establishment of a deposit insurance network*: Finally, a pan-European solution can be achieved by establishing a network of national deposit insurance institutions, which creates solidarity based on appropriate formal coordination, unique architecture and specifications of fundamental design elements, as well as extensive cooperation agreements.

4.3.3 Memberships

An important question of conceptualizing supranational deposit insurance is that of membership. Should all banks become members of this organization? Or only those who operate internationally? Or only those financial institutions that operate internationally on the one hand but are relevant to the national or international system on the other hand? The answer to this question also depends on the selected system architecture. It is different for the two options mentioned in the previous section. Of course all financial institutions with eligible deposits will have to become member in creating a unique pan-European deposit insurance scheme replacing the current national solutions. If an additional supranational institution is established, then it can be designed as a reinsurance for the national systems, which would imply a membership of the these that pay appropriate premiums into the international deposit insurance fund. A direct membership of system-relevant financial institutions in individual countries is also conceivable for this solution since it must be assumed that the excessive demand on the national systems (and hence a claim on the supranational system) has been triggered by these insured institutions in all probability.

Lessons from the financial crisis

- National deposit insurance systems will be overstressed in many European countries in the case of a system crisis.
- The more international the financial services sector becomes, the sooner an insolvency of a financial institution will affect the deposit insurance system of several countries.
- The growing internationalism of the deposit insurance business demands cross-border structures as well as cross-border solidarity.

5 Some Policy implications

The analysis of the current theoretical and empirical results of research on the various effects of a deposit insurance system, as well as the experiences from the recent financial crisis, arrives at the following key conclusions, which could be helpful to political institutions dealing with adjustment, authorization, and implementation of modern deposit insurance:

- (1) Deposit insurance primarily aims at improving and ensuring the ***resilience of the financial system***. Considerations of costs and benefits should be made under these aspects.
- (2) The aforesaid unrestricted warranties of many states in 2008 have strongly influenced depositors' expectations for future financial crises. The danger of morally hazardous conduct is significantly higher than before the crisis. Appropriate ***tightening of the regulatory conditions*** has to act as a counterbalance to the enhanced state protection commitment.
- (3) The deposit insurance institution is not simply a 'pay box' for paying out jeopardized deposits, but rather an ***integrated part of a comprehensive safety network*** for stabilizing the financial system. Its role and competencies in case of a financial crisis should be defined clearly in advance and delimited from the functions of other security network elements.
- (4) Governance of a deposit insurance system should be organized not only by including the insured sector but also ***by minimizing the risks of 'regulatory capture'*** and exerting ***political influence***.
- (5) The ***eligible deposit base*** shall include short-term deposits (i.e. outstanding debts to customers with a short duration of a maximum of three months) which potentially lead to grave liquidity problem in case of immediate withdrawal.
- (6) ***Insured depositors*** shall not only be private but also business customers which also can be subject to 'bank-runs'.

- (7) An adequate and aim-matching deposit insurance scheme is financed on an *ex-ante basis* with *obligatory membership* on national or pan-European level.
- (8) The deposit insurance organization has to ensure that the fund's assets are *invested on a risk-free basis* and can be *rapidly liquidated*.
- (9) The fund needs to be equipped with a *minimal coverage capital* from the start which can either be directly at disposal or guaranteed.
- (10) In case of payout decision, *covered deposits* shall be *disbursed within few working days*.
- (11) The appropriate *premium calculation models* have to be *simplified* and designed *risk-based* while including *institution-specific* as well as *systemic* risk components.
- (12) System-relevant banks always have an implicit state warranty. It is better to *transform implicit into explicit warranty*.
- (13) Design and architecture of deposit insurance systems should support *cross-border harmonization and cooperation*.

These conclusions are in line with the recommendations that the Basel Committee on Banking Supervision submitted together with IADI in the spring of 2009⁹⁷. They also support and supplement considerations made in the course of revising the EU Directive 94/19/EU as well as its preliminary amendment in the spring of 2009.

⁹⁷ BCBS/IADI (2009).

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