



6 May 2009

# **Funding of Deposit Insurance Systems**

## **Guidance Paper**

**Prepared by the Research and Guidance Committee  
International Association of Deposit Insurers**

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# I. Executive Summary

The International Association of Deposit Insurers ("IADI") was established in 2002 with a mission to "contribute to the enhancement of deposit insurance effectiveness by promoting guidance and international cooperation." As part of its work, IADI undertakes research to suggest guidance on deposit insurance issues.

Sound funding arrangements are critical to the effectiveness of a deposit insurance system and to the maintenance of public confidence in it as well as in the banking system. Inadequate funding can lead to costly delays in resolving failed banks and to the loss of credibility of the deposit insurance system. The purpose of this paper is firstly to examine various approaches to funding used by deposit insurers and secondly to provide suggested guidance on the design of funding mechanisms and closely related features of deposit insurance systems.

## A. Definitions and Key Concepts

Key terms and associated definitions used in the paper are as follows.

- The **assessment base** is defined as the base of deposits on which premiums are assessed. It may include only insured deposits, but can include all types of deposits that are potentially insurable or all deposits.
- **Backup funding** is funding that may be required should the insurer not have sufficient funds in place to cover deposit insurance claims.
- An **ex ante** funding system involves the advance accumulation and maintenance of a fund to cover deposit insurance claims. The fund consists of primarily premiums collected from the members of the deposit insurance system.
- In **ex post** funding system, funds to cover claims are only collected from members when a member institution fails and there is a need to cover deposit insurance claims develops.
- A **hybrid** funding system combines elements of ex ante and ex post funding.
- **Moral hazard** is the incentive for increased risk-taking due to the presence of insurance.
- A deposit insurance **premium** is the amount a member institution pays for deposit insurance for a given time period such as a year. A differential (risk-adjusted) premium system is when the premium

assessed for a member institution is related in some way to the risk that it poses to the system.

- A **target reserve ratio** of a deposit insurer is the ratio of fund reserves to total deposits or insured deposits.

## **B. Suggested IADI Guidance**

The following guidance points summarise the main conclusions of this paper and set out proposed IADI Core Principles and Supporting Guidance for the funding of deposit insurance systems. The guidance is reflective of, and adaptable to, a broad range of settings, circumstances and structures.

### **Core Principle: Funding**

Sound funding arrangements are critical to the effectiveness of a deposit insurance system. A deposit insurance system should have available all funding mechanisms necessary to ensure the prompt reimbursement of depositors' claims. Ex-ante funding requires the accumulation and maintenance of a fund to cover deposit insurance claims and related expenses prior to a member bank failure. In an ex-post system funds are obtained only once a bank has failed; banks are assessed and contribute at this time. Member banks should pay the cost of deposit insurance since they and their clients directly benefit from having an effective deposit insurance system. Recent IADI research indicates that ex-ante funding has many more advantages than disadvantages particularly with respect to ensuring prompt reimbursement to insured depositors, the maintenance of public confidence and as a means to avoid the pro-cyclical effects of deposit insurance assessments<sup>1</sup>.

### **Supporting Guidance Points**

1. Policymakers can choose among ex-ante, ex-post and combined (i.e. hybrid) approaches to funding, but ex ante and hybrid approaches are recommended in most circumstances and in particular for newly established systems.
2. In assessing premiums, the assessment base and the assessment

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<sup>1</sup> See IADI Core Principles for Effective Deposit Insurance Systems, Principle #11, International Association of Deposit Insurers, Basel 2008: [www.iadi.org](http://www.iadi.org)

criteria must be clear to all participants.

**3.** When considering adopting a differential (risk-adjusted) premium system, measures should be taken to ensure that the necessary sources of information are available to fully support the operations of the system.

**4.** A deposit insurance reserve fund can be built-up and maintained in at least two ways. One approach is to employ a steady premium rate over a long period. Alternatively, the premium system can be designed to maintain a target reserve ratio or range. In cases where a target reserve ratio is used, it is an effective practice to ensure that the target reserve ratio is sufficient to cover the potential losses of the insurer under normal circumstances and reduce the probability of the fund's insolvency to an acceptable minimum.

**5.** A wide range of factors need to be taken into account for the target reserve ratio approach. These include: characteristics of the banking sector such as the number and size of banks, the liabilities of member banks and the insurer's risk exposure to them, the likelihood of failures and the characteristics of losses typically experienced by the insurer. Deposit insurers can find themselves exposed to unexpected developments that can have a bearing on funding adequacy.

**6.** In cases where funds are accumulated in excess of targeted reserve requirements, the deposit insurer should consider developing a disbursement mechanism for surplus funds. Such a mechanism should take into account factors such as the assessment base of each bank, past contributions to the fund and the risk profiles of member institutions.

**7.** Should there be more than one type of financial institution that accepts deposits, it is an effective practice to consider having either one overall fund for all institutions or a separate fund for each category of institution. In the latter case it is necessary to ensure that the system does not introduce competitive distortions.

**8.** A deposit insurer should ensure that its funds are well managed and readily available to cover losses as they arise. This can be accomplished by implementing appropriate investment policies and procedures, and by instituting sound internal controls, risk mitigating practices, disclosure and reporting systems.

**9.** A deposit insurance system should have a means of obtaining supplementary backup funding.

## II. Introduction and Purpose

The purpose of this paper is to provide practical advice on the design of funding arrangements for deposit insurance systems. It draws on the experience of IADI members<sup>2</sup>, associates and observers, as well as information from the existing literature on the subject.

The principal public policy objectives of a deposit insurance system are to contribute to financial stability by protecting the financial system against bank runs and to ensure the safety and liquidity of the deposits of small depositors. Some deposit insurers have a broader mandate which may include a responsibility for resolving failed financial institutions in a timely and cost effective manner.<sup>3</sup>

In order to fulfil its mandate effectively, it is necessary that the deposit insurer either has adequate financial resources on hand or a funding mechanism whereby the required funds can be readily obtained. Financial resources are needed: to cover the reimbursement of insured depositors should an institution fail, to cover operating expenses related to the reimbursement of depositors, and for the resolving of a failed institution should the insurer have responsibility for this<sup>4</sup>. Inadequate funding arrangements can make the financial system vulnerable to bank runs, delays in resolving failed banks, and lead to significant increases in social costs (FSF Working Group, 2001). It must also be recognised that a deposit insurance system cannot safeguard the banking system alone. Other components such as a strong bank supervision program and a lender of last resort are also necessary.

The type of funding used has an important bearing on the overall design of a deposit insurance system. Whether funds are raised *ex ante*, (beforehand), *ex post* (as needed) or via a combination of *ex ante* and *ex post* mechanisms will determine many of the features of a deposit insurance system. The source of funding, whether from the insured institutions or the

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<sup>2</sup> The members of the IADI Subcommittee on Developing Guidance for Funding Deposit Insurance Systems are: Korea (Chairperson), Canada, Mexico, Taiwan, Russia, the Philippines and Turkey.

<sup>3</sup> A bank run occurs when many depositors, doubting a bank's ability to honor their deposit liabilities, precipitously try to withdraw their money. To meet depositors' demands, the bank has to sell assets quickly and possibly suffer fire-sale losses with the risk of failure. Liquidity insolvency can result where a bank does not have sufficient funds to pay depositors. Deposit insurance can help avoid bank runs by providing assurance to depositors that their deposits are protected, and in providing this assurance, deposit insurance can also mitigate the risk of contagion (i.e. whereby a bank run becomes more generalized and threatens otherwise healthy financial institutions).

<sup>4</sup> Expenses for resolving a failed institution may include costs incurred to liquidate impaired assets, to transfer assets and liabilities, or fund assets placed in a receivership.

public sector, is also relevant for system design. At the same time, various elements such as: mandates, the assessment system, investment policies and loss-sharing may have implications for funding arrangements.

### **III. Deposit Insurance Funding Methods**

#### **A. Ex Ante Funding**

Ex ante funding requires the accumulation and maintenance of a fund to cover deposit insurance claims and related expenses prior to a failure actually occurring. It is funded by its members through contributions, insurance premiums and other means. An ex ante system is more rule-based and offers greater certainty than other systems – the funds are intended to be in place before they are needed. The knowledge that funds have been raised in advance and that the fund is well-managed can reassure depositors that their insured deposits are safe. This helps minimise the risk of sudden withdrawals and the escalation of withdrawals to a bank run.

Furthermore, an ex ante system also has the advantage of being more equitable than an ex post system. This is because all member institutions, including those that fail, will have helped to support the system financially through payments into the fund. Ex ante funding helps avoid situations whereby prudently managed financial institutions subsidise less well managed ones, through the deposit insurance system. By way of contrast, in the event of a failure the deposit insurer would need to raise premiums of, and impose levies on, the surviving institutions in a pure ex post system.

An ex ante funding system spreads the cost of insurance losses over time, since insurance premiums are collected taking into account expected losses over the long run. In addition, it contains an anti-cyclical feature and buffer for the industry; the fund continues to accumulate premiums during stronger economic conditions, when losses may be low, as a hedge against future needs when economic circumstances may be less favourable and losses higher. It thus avoids further weakening of the overall banking industry at the time of a failure.

From the perspective of a member institution, compared to an ex post system, an ex ante system may at first sight appear more expensive, since it involves an explicit up-front business expense as opposed to an uncertain one and the ex ante payments required from the institution may reduce the resources it has available to absorb losses on its own. Additionally there is an opportunity cost to the premium paying bank and the overall economy, if one takes into account how the resources represented by the insurance premiums might otherwise have been employed.

Others maintain that a drawback of an ex ante system is that it can

exacerbate the moral hazard already inherent in a deposit insurance system.<sup>5</sup> This is based on the argument that the mere presence of an ex-ante fund may reduce the incentive for institutions to monitor and sanction peer risk-taking.

## **B. Ex Post Funding**

In an ex post system funds are obtained only once an institution has failed; member institutions are assessed and contribute at this time; there are no advance contributions. Ex post systems often do not have explicit responsibilities regarding the sharing of costs for reimbursing depositors. In this sense, ex post systems are less equitable for remaining institutions because a failed institution will not have contributed to the cost of reimbursing its depositors; this cost is borne by the surviving institutions.

On the plus side, an ex post system is less onerous during periods when there are no or few failures because premiums are not being collected continually. Supporters of ex post funding argue that this approach is less expensive than ex ante funding over the long run, since it avoids the administrative costs associated with the ongoing collection of premiums and portfolio management of a fund.

These systems require effective bank supervision and operate best in a relatively stable financial environment with few failures. A number of European countries that did not experience banking crises in the 1980s and 1990s, such as Austria, the Netherlands, Switzerland and the United Kingdom use ex post systems and do not maintain a fund to compensate for bank failures.<sup>6</sup>

While the advance costs to the members of an ex post system are lower than an ex ante system, the overall costs to the economy may be higher. As the experiences of several countries have demonstrated, inadequate funding can lead to delays in resolving failed institutions and to significant increases in overall costs in terms of disruption of the financial system.<sup>7</sup>

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<sup>5</sup> The term moral hazard refers to a situation where an insured entity intentionally assumes additional risk as a result of being insured. In the case of deposit insurance, an insured entity may shift risk from the private sector to the government. Insurance can create a divergence between the private and public cost of risk taking, and inadvertently creates an incentive for additional risk-taking.

<sup>6</sup> The "Study of deposit guarantee systems in credit institutions in Europe", prepared for the European Commission in 2002, identified 9 European countries with having an ex ante system, three with an ex post system and six with a mixed system. The study examined the 15 EU countries plus Liechtenstein, Iceland and Norway.

<sup>7</sup> The experience of the United States in resolving the savings and loan crisis during the 1980s and early 1990s provides such an example (Financial Stability Forum, 2001).

Without an insurance fund, the risk level of member institutions is increased since they may be called upon to make relatively big contributions within a short period of time to reimburse the depositors of a failed institution. If failures occur during an economic downturn, the surviving members may have to make large contributions at an inopportune time when their own financial situation is under pressure. This pro-cyclical feature of ex post systems can increase financial market volatility and make systemic risk higher than it need be.

Ex post systems carry greater financial risk for the government. When a failure occurs, the government can come under pressure from a variety of quarters, including from the surviving banks, to provide financial assistance. This pressure could be more intense at a time of economic weakness when government finances are lacking. The surviving banks could argue that they did not cause the failure and that making large payouts under the circumstances could unduly jeopardize their own position as well as the financial system as a whole. Covering the banks deposit insurance obligations could in turn lead to calls for a more general bailout.

Finally, prompt reimbursement of depositors may be difficult under an ex post system since the systems, procedures and qualified personnel may not be in place to collect and distribute the required funds. A commitment by the authorities to collect the funds from surviving banks following a failure may lack credibility – particularly during times of financial distress. Taking these considerations into account would suggest that, other things being equal, an ex ante system may be more effective in preventing bank runs.

### **C. Hybrid Funding**

Hybrid funding combines features of both ex ante and ex post funding. It incorporates an ex ante fund financed by premiums and contributions and includes a mechanism to obtain funds ex post from member institutions, through special premiums, levies or loans, should they be needed. Hybrid funding systems are relatively common. An ex ante deposit fund may be established and the insurer be empowered to levy ex post contributions to make up for any fund shortfall.<sup>8</sup> With ex ante funding, under very adverse circumstances, such as a large failure or a systemic crisis, losses may exceed the fund's reserves and a temporary increase in premiums or access to emergency (e.g. government) lines of credit may be appropriate. Thus, in practice, the real choice may not be between pure ex ante and ex post funding, but the relative extent to which the deposit insurance system relies on each.

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<sup>8</sup> Canada Deposit Insurance Corporation is an example of this approach.

## D. Trade-offs Associated with Funding Approaches

Ex ante funding has several advantages. Firstly, it ensures a readily available pool of funds enabling prompt disbursement to insured depositors. Secondly, it is more fair to collect premiums before a failure rather than after since all members, including failed institutions, would have helped cover the costs of the system. Thirdly, ex ante funding avoids the pro-cyclical effect of ex post funding. Finally, the existence of a fund that can reimburse depositors reinforces public confidence in the deposit insurance and banking systems. On balance ex ante funding seems to be a better mechanism for achieving the goals of a deposit insurance system.

**Table 1: Relative Evaluation of Ex Ante Funding Versus Ex Post Assessments**

	Ex ante funding	Ex post assessments
<b>Effectiveness</b>		
Deposit insurer's liquidity	+	-
Deposit insurer's solvency	+	-
Transparency and information sharing	+	-
Conducive to supervision allowing for risk measurement and control	+	-
Cross sectional risk adjustment of premiums for fairness and correct incentives	+	-
Smoothing of premiums through time for improved stabilization	+	-
Potential for government back-up financing (as most funded systems are publicly run)	+	-
Confidence of depositors	+	-
<b>Efficiency</b>		
Operating costs	-	+
Issues related to funds management		
- Optimization of quantity-target level	-	+
- Optimization of quality-risk-return	-	+

+ : relative advantage, -: relative disadvantage

Source: Roy (2000).

While most countries with ex post systems in place have not been changing to ex ante systems, newly created systems have typically adopted ex ante funding. Indeed, over 80 per cent of deposit insurance systems worldwide involve ex ante funding. The recent emphasis on ex ante funding is an example of international convergence of best practices for financial safety nets. By 2003, only fourteen out of eighty-eight countries with deposit

insurance systems had an explicit unfunded (ex post) system.<sup>9</sup>

**Table 2: Recent Establishments of Deposit Insurance Systems**

<b>Year Adopted</b>	<b>Countries that established an explicit system</b>
2006	Hong Kong, Singapore
2005	Indonesia, Malaysia
2003	Malta, Paraguay, Russia, Zimbabwe
2002	Albania
2001	Nicaragua, Serbia and Montenegro, Slovenia
2000	Cyprus, Jordan, Vietnam
1999	Bahamas, Bulgaria, Ecuador, El Salvador, Guatemala, Honduras, Kazakhstan, Mexico (Cameroon, Central Africa Republic, Chad, Equatorial Guinea, Gabon, Republic of Congo: deposit insurance law ratified by two out of these six CEMAC countries)
1998	Bosnia-Herzegovina, Estonia, Gibraltar, Jamaica, Latvia, Ukraine
1997	Algeria, Croatia
1996	Korea, Lithuania, Macedonia, Romania, Slovak Republic, Sweden
1995	Belarus, Brazil, Oman, Poland

Source: Demirguc-Kunt, Kane and Laeven. (2006) and IADI (2006).

In determining the most appropriate funding mechanism for a given country its policymakers need to take into account a number of features of its economy and financial system in addition to the considerations already mentioned. Public policy objectives, the general state of the economy, the profile of depositors, various aspects of the financial industry and other factors influence the soundness of a deposit insurance system. The objectives of the various financial safety net players are relevant and differ among countries. For example, if the objective is to protect small depositors against a failure of an individual bank, rather than contribute to the stability of the financial system, ex post funding may be sufficient. If the financial system is strong and there is a long history of effective bank supervision an ex ante fund may not be as necessary as in other systems.

<sup>9</sup> Demirgüç-Kunt, Asli, Edward J. Kane and Luc Laeven. 2006. "Determinants of Deposit Insurance Adoption and Design", *Policy Research Paper No. 3849* (Washington DC: World Bank). Unfunded systems are mainly confined to Europe. Countries with unfunded systems include: Austria, Bahrain, Chile, Gibraltar, Isle of Man, Italy (In Italy banks pay annual contributions for operating expenses of the insurer), Liechtenstein, Luxembourg, the Netherlands, Slovenia, Switzerland and the United Kingdom.

## **IV. Sources of Funds for Deposit Insurance Systems**

The sources of funds for a deposit insurance system, especially for those covering depositor reimbursements, resolution costs and current expenses can come from the public sector, the private sector or both. Most countries operate a system that relies on private funding to a large extent.

### **A. Private Sources**

Member institutions should be the main source of funding. Institutions usually pay mandatory premiums as one of the conditions of membership. Premium amounts are typically determined relative to either the insured deposit base or the total deposit base. Policymakers in nations which use insured deposits as a basis for determining premiums are usually of the view that institutions with a higher percentage of insured deposits benefit more than others. On the other hand some claim that using total deposits has the advantage of ease of operation and can prevent speculative switches by banks between insured and uninsured deposits. To top up a fund following a failure, it may be necessary to introduce special premiums or levies.

### **B. Public Sources**

In addition to premiums collected from members, most deposit insurance systems have facilities in place that can access public sector funds if needed. These can take the form of initial contributions when the system is established, government or central bank loans to cover special circumstances and grants to cover losses.

A number of countries have relied on government funds for an initial capital injection to establish the system, for example, the United States, Russia, and Chile among others. Since the promotion of financial system stability and the operation of a financial safety net are important government objectives which benefit the country as a whole, it can be argued that it is appropriate for the public sector to give the system some financial support by providing some initial capital to establish a fund and/or by providing supplementary funding in crisis situations. The government can provide contingent financing even for systems which are financed ex ante. Some deposit insurers have a line of credit with central bank or with the government directly. In some cases the government may play an indirect role by guaranteeing private sector borrowing by the deposit insurer.

Generally speaking it is less expensive for the insurer to obtain funds from the public sector than from the private sector, since given its credit rating, the public sector can usually raise funds at lower cost. In addition, it may be difficult to raise funds directly in the private sector during crisis situations. Supplementary financing from the public sector or borrowings with

government guarantees should be repaid in full as the fund recovers. If needed, special levies on members can be introduced as the financial system strengthens.

Procedures for accessing public sources of funds, should these be required, need to be considered at the time the deposit insurance system is designed. The system should not be designed in such a way that the expected recourse to public support is frequent, since this can undermine public confidence in the system and encourage unnecessary risk-taking by member institutions.

**Table 3: Design Features of Explicit Deposit Insurance Systems**

Number of countries with each feature in a given category (as of 2003) by level of per capita income

	High income	Upper middle income	Lower middle income	Low income	Number in all countries
Foreign currency deposits	22	12	23	4	61
Inter-bank deposits covered	2	1	8	3	14
Co-insurance exists	8	7	6	0	21
Payment per depositor	23	15	21	7	66
Scheme is permanently funded	19	15	28	7	69
Premiums are risk-adjusted	6	3	11	0	20
Membership is compulsory	28	16	23	7	74
Source of funding					
Private	15	1	11	1	28
Joint	15	13	15	6	49
Public	0	1	0	0	1
Administration					
Official	14	10	19	6	49
Joint	9	5	7	1	22
Private	7	1	1	1	10

Sources: Demirgüç-Kunt, Karacaovali and Laeven (2005)

**Table 4: Design Features of Explicit Deposit Insurance Systems**

Proportion of countries with each feature in a given category (as of 2003, in percent) by level of per capita income

<i>Feature</i>	High income	Upper middle income	Lower middle income	Low income	Proportion (%) in all countries
Foreign currency	73	80	82	57	76
Inter-bank deposits	7	7	29	43	18
Co-insurance exists	27	44	21	0	25
Payment per depositor	77	94	72	78	79
Scheme is permanently funded	63	94	97	100	84
Premiums are risk-adjusted	20	19	39	0	25
Membership is compulsory	93	100	82	100	91
Source of funding					
Private	50	7	42	14	36
Joint	50	87	58	86	63
Public	0	7	0	0	1
Administration					
Official	47	63	70	75	60
Joint	30	31	26	13	27
Private	23	6	4	13	12

Sources: Demirgüç-Kunt, Karacaovali and Laeven (2005)

### **C. Options for Initial Funding of a Deposit Insurance System**

Some initial seed money is needed to operate a deposit insurance system. The source depends in part on who introduces the system and its objectives. Typically the government introduces deposit insurance with the public policy objectives of promoting financial sector stability (and by extension general economic stability) and protecting the assets of small depositors. Under these circumstances the deposit insurer is likely to be a public institution or agency and some initial funding will be provided by the government.

The initial funds to establish a deposit insurance system are commonly provided by the government or a public agency but other sources like a banking association may be used. In the case of the Federal Deposit Insurance Corporation and the Canada Deposit Insurance Corporation the initial funding was repaid over time as the insurer got into a position to do so. The FDIC has no capital stock as the entire amount was repaid. As for

CDIC, it had fully repaid the government's initial funding within ten years of its establishment in 1967. In some countries the initial funds were obtained from international organisations, such as the IMF or World Bank.<sup>10</sup>

## **D. Access to Backup Financing**

A deposit insurance system, by itself, will not be able to contend with a large scale financial crisis. Even in a non-systemic crisis the deposit insurance system may find itself without adequate funds in reserve to meet its commitments. A gap between resources and financial obligations can be covered by giving the insurer access to additional or backup financing either from the government or the market. The backup funding would allow the prompt reimbursement of insured deposits and could be repaid through special assessments of the surviving institutions and/or proceeds from the liquidation. If a backup funding mechanism is in place, it is important that there be clearly defined rules on its use so that public funds will not be excessively relied on or otherwise used inappropriately.

Backup financing can be either improvised at the time or pre-arranged. Having a mechanism in place, rather than relying on improvised funding is highly advantageous. The terms and conditions of the financing can be more carefully considered. Access to funds can be gained quicker and the existence of a financial recourse mechanism may increase confidence in the system. It may facilitate the timelier closure and resolution of failed banks and help contain the costs associated with a failure. In the case of a new system that has not accumulated sufficient resources, a backup system can be particularly important.

There are a number of potential sources from which to obtain contingency funding. These include the private sector (loans or bonds, with or without a government guarantee), the government treasury, the central bank or another government agency. The treasury or central banks are the most common sources. International organisations such as the IMF and the World Bank may be approached for help in some cases. If the government is unable to mobilise financial resources quickly enough, because of legal or other constraints, the deposit insurer may need to borrow from the central bank or an international organisation, although in these cases a government guarantee would be appropriate. Borrowing from the central bank may later be replaced by borrowing from the government or by the issuance of government guaranteed bonds.

In rare cases the deposit insurer could consider private sources such as obtaining one or several lines of credit with sound banks. The issuance of bonds or buying put options to place bonds or debentures if needed are other

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<sup>10</sup> The number of countries offering explicit deposit guarantees surged from 20 in 1980 to 96 by September 2007. See the IADI web site: [www.iadi.org](http://www.iadi.org).

possibilities. Although the deposit insurer is typically a government agency, a government guarantee may nevertheless lower the cost of borrowing from the private sector since it can enhance the credit rating of the financial instrument used. In some cases the lack of a government guarantee may even prevent access to private sector credit.

Backup funding facilities can also be provided by the private sector, with Germany being a case in point. Prior to the introduction of an EU directive in 1994, requiring members states to have a compulsory deposit guarantee system, Germany had a voluntary, industry-based system which did not involve government supervision or access to government backup funding.

In non-crisis situations, the deposit insurer may have access to backup financing from financial markets. Some investors may be willing to lend money to the deposit insurer or buy bonds issued by it. In more serious situations, large international banks may be willing to provide funds if the arrangements are guaranteed by a major international financial organisation.

## **V. Deposit Insurance Assessments**

The most common method for a deposit insurer to raise funds is to levy premiums, whether *ex ante* or *ex post*, on member institutions. The mechanism for the assessment and collection of premiums should be clearly defined. The premiums are determined by applying the premium rate to the assessment base. The premium rate is determined taking into account the funding needs of the insurer and the ability of the members to fund the system. Policymakers must determine both the assessment base and the pricing method. Premiums can be either flat rated or adjusted for risk (i.e. institutions with a higher risk profile would pay higher premiums).

### **A. Defining an Assessment Base**

The premium assessment base is the foundation used to determine the contributions made to the fund by member institutions. The extent of the assessment base is determined by taking into account the maximum exposure of the deposit insurance system and can vary among systems. The most common assessment bases are insured and total deposits; however, some systems may have a broader base and include domestic liabilities or all liabilities and obligations or take into account considerations such as non-performing loans.

Insurable deposits are defined as all deposits in all categories that are insured, including amounts in excess of the limit on insurance claims. For example if the insured limit for a demand deposit is \$50,000, a \$90,000 deposit would be fully counted in insurable deposits, but only \$50,000 would be included in insured deposits. Insured deposits are the amount of deposits that are protected within the limit of insurance claims. Calculating premiums

on the basis of insurable deposits means that premiums would be charged on deposits which are not covered. Total deposits would accentuate this issue, since some categories of deposits may not be covered at all. Charging premiums on insured deposits would seem more equitable, but can be more complex to administer.

As noted previously the premiums paid by member institutions can be assessed and collected regularly (ex ante system) or only when a failure occurs (ex post system).

## **B. Premium Systems: Flat Rate and Differential (Risk-adjusted)**

Under a flat-rate premium approach, all member institutions are assessed at the same rate given the assessment base and it is relatively straightforward to implement. The major shortcomings, however, is that it is inequitable since more prudently managed low-risk institutions subsidize higher-risk institutions and the exposure to moral hazard is higher than under a risk-adjusted system.<sup>11</sup>

Flat-rate deposit premiums, in the absence of any corrective action by the supervisory or regulatory authorities, does not contain any disincentive for an insured financial institution to engage in unsound and risky activities and penalizes more prudently managed ones. Additionally, with ex post funding, a flat rate premium involves an inequitable distribution of insurance losses among the surviving financial institutions. Unless capital positions and risk-taking behaviour of insured financial institutions are controlled by the supervisory authorities, a flat rate system can have some undesirable long-term effects and increase the exposure of the financial system to failures.

An alternative is the risk-adjusted or differentiated premium system, whereby the risk posed to the deposit insurer by a member institution is incorporated into the premium structure. This attenuates the moral hazard issue by providing member institutions with an incentive to take a more prudent approach in risk management. Differential premiums are more equitable, since cross-subsidization among institutions is reduced. An important advantage of risk-adjusted systems is that it can lead to pressure by the member institutions' board of directors for management to address risk-related issues when premiums are raised.

A drawback of differential premium systems is that they are more complex to develop and administer. Developing a reasonably accurate and acceptable procedure to gauge risk profiles can be complex and to align them with differences in premiums is a difficult task requiring special expertise. A

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<sup>11</sup> For a detailed discussion of differential premium systems and guidance please see [http://www.iadi.org/docs/IADI\\_Diff\\_prem\\_paper\\_Feb2005.pdf](http://www.iadi.org/docs/IADI_Diff_prem_paper_Feb2005.pdf)

differential premium system requires more resources and is more expensive to administer. Developing a system to obtain relevant and reliable information requires the sharing of information among safety net players, the development of a method to assess risk profiles and ensuring that reliable information is disclosed in a timely manner. When a deposit insurance system is in its early phase of development, it is difficult to put necessary infrastructure in place. The introduction of a differential premium system is usually deferred until the deposit insurance system is well established. In 1995, for example, the United States was the only country employing risk-based premiums. Since then, the number of countries using differential premiums has increased significantly.<sup>12</sup>

### **C. Collection and enforcement issues**

Premiums can be collected using either an invoice system or an automatic debit of a financial institution's account at the central bank or another institution. Automatic debits help ensure the timely collection of premiums.

The non-payment of premiums may be addressed by levying fines, publishing non-compliance information or revoking the institution's banking license. Passing legislations that amounts due the deposit insurer have priority over other creditors or that they have the same status as amounts owed the government are other ways of dealing with the problems of overdue premiums.

## **VI. Determining the Optimal Size of a Deposit Insurance Reserve**

There are two basic approaches to creating an insurance fund or reserve. A steady premium can be levied over an extended period; alternatively, a premium system can be designed to achieve and maintain a target reserve level or range.

In the case of a target reserve it is necessary to establish how large a reserve is appropriate. The target level should be adequate to at least cover the potential losses of the insurer under normal circumstances. A large number of factors need to be taken into account including: the composition of member banks (number, size, lines of business), the liabilities of members and the exposure of the insurer to them, the probability of failures and the characteristics of losses that the insurer can expect.<sup>13</sup> Deposit insurers and

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<sup>12</sup> These include: Argentina, Belarus, Bolivia, Canada, El Salvador, Finland, Hungary, Italy, Micronesia, Peru, Portugal, Romania, Sweden, Taiwan, Turkey, the United States and Uruguay.

<sup>13</sup> For instance, in countries with highly concentrated banking sectors, a small number of banks may account for a large portion of insured deposits and premium revenues. Although it can be argued that if large banks are well diversified, they may pose less of a risk to the

the member institutions can be exposed to a wide range of factors that are difficult to identify in advance. Potential losses can also be affected by the activities of the insuring agency itself and other members of the financial safety net, such as the supervisory authorities. For example, an effective supervisory regime can reduce the probability of bank failures and, by extension, the risk exposure of the deposit insurer.

Policymakers need to balance the requirements of the insurer to cover potential losses with the ability of the industry to fund the system. It should be borne in mind that an excessive reserve ratio could have a negative impact on profitability and hamper the development of the financial system. On the other hand a very small fund, designed to minimize the burden on contributing members, would probably be too limited to absorb significant losses and would likely require large ex post contributions by members at potentially awkward times.<sup>14</sup>

## **A. Methodologies for Determining a Target Reserve**

There are a number of methods available to calculate the appropriate size for a targeted reserve. A common element of all of them is the need to determine the potential losses of the deposit insurance fund. The most common approach is to consider the country's historical experience with bank failures and associated losses. The majority of countries that have a target reserve ratio use this approach.<sup>15</sup>

The advantages of this approach are relatively straightforward and easily understandable and it relies on existing information. A shortcoming, of course, is that the past may not be a good guide to the future. It does not take into account the current risk profile of member institutions and other information which may be useful in assessing potential losses to the deposit insurer. The credit portfolio approach is a more analytical method to determine a suitable reserve ratio and is used, for example, in Hong Kong, Singapore, the United States and Canada. Under those systems the deposit reserve is viewed as being subject to a portfolio of credit risks similar to a

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deposit insurance system, the cost of resolving one of these banks would likely be substantial and could have a major impact on the deposit insurance fund. See FSF Working Group on Deposit Insurance (2001).

<sup>14</sup> As there is a conflict of interest between a deposit insurer and a bank in terms of setting an appropriate level of deposit insurance funds, some observers argue it may be more effective for a third party institution with both points of view to set a target reserve.

<sup>15</sup> See, Canada Deposit Insurance Corporation. 2003. International Deposit Insurance Survey (Ottawa: CDIC), World Bank (2005), Demirguc-Kunt, Asli and Baybars Karacaovali, Luc Laeven "Deposit Insurance around the World: A Comprehensive Database." (Washington D.C., World Bank Working Paper), and Garcia, G. 1999. "Deposit Insurance: A Survey of Actual and Best Practices." (Washington D.C., IMF Working Paper).

bank loan portfolio. The portfolio consists of individual exposures to insured banks, each of which has the potential (some greater than others) of causing a loss to the fund. In most cases there will be a relatively high probability of small losses and a much lower probability of very large losses. The probable large losses would tend to be associated with the presence of large banks.

**Table 5: Targeted Reserve Ratios of Selected Countries**  
(as a per cent of total or insured deposits)

(As of DEC. 31, 2007)

Country	Target Ratio	Country	Target Ratio
Venezuela	10.11%	Argentina	0.50%
Colombia	5.00%	Canada	0.40-0.50%
Jordan	3.00%	Taiwan	0.30% of insured deposits *
Tanzania	2.70%	Singapore	0.30%
Indonesia	2.50%	Bahamas	0.20%
Jamaica	2.00-2.25%	Honduras	0.10%
Brazil <sup>16</sup>	2.00%	India	0.05%
USA <sup>17</sup>	1.25%		
Average (ex. Venezuela)		1.45%	

Sources: CDIC International Deposit Insurance Survey (2003), World Bank and Garcia (1999).

\* Since January 2007, a target ratio of 2% of insured deposits has been stipulated by the Deposit Insurance Act (CDIC Taiwan).

Table 5 shows that there is considerable variation in targeted reserve ratios; however, the appropriateness of a reserve ratio will be affected by such characteristics as the assessment base as well as the effectiveness of regulatory oversight.

Adopting the credit portfolio approach to reserve targeting requires an insurer to consider: (1) developing a specific provision for each member bank taking into account the risk of loss and the range of losses that could occur over a specified period of time; and (2) setting aside additional funds (or

<sup>16</sup> The targeted reserve ratio is 2% of the total balance of the accounts guaranteed. About the premium, the Board of Directors of the FGC is authorized to fix at 0.0125% monthly also on the total balance of the accounts corresponding to the obligations of the guarantee.

<sup>17</sup> The FDIC calculates the reserve ratio as the ratio of estimated insured deposits to deposit insurance fund balance – not the assessment base. The target ratio for the FDIC fund(s) was 1.25 percent until the Federal Deposit Insurance Reform Act of 1995 was enacted. Under the new law, *the FDIC must set a target for the reserve ratio* within the range of 1.15 percent to 1.50 percent. The FDIC Board of Directors set the target reserve ratio at 1.25 percent of estimated insured deposits.

surpluses) to cover situations where actual losses, as a result of unexpected factors, may exceed reserves. Another explanation is that a deposit insurance fund is exposed to both expected and unexpected losses and these need to be taken into account in determining the target size of the fund.<sup>18</sup> A more detailed review of this approach is contained in Annex I.

## **B. Disbursements and Rebates**

What options should a deposit insurer consider when its targeted reserve is reached? Should premium collection be suspended? Should excess funds be rebated or refunded to members? To a large extent, the answer depends on how policymakers view the respective roles of depository institutions and the government. If deposit insurance assessments paid by members are viewed as payments for the credit enhancement provided by government or as user fees — that is, the government bears the risks associated with depository institution failures — then it is difficult to claim that the depository institutions should have a claim against the deposit insurance fund.<sup>19</sup>

On the other hand, if government is viewed as providing a back-stop for catastrophic losses only, then members may be viewed as having a claim on excess deposit insurance assessments paid to the fund. Various funding arrangements are consistent with this approach. For example, suspending premium collections once a target size has been reached is a relatively straightforward approach and has been used in Russia, the United States and Finland. However, this has the consequence of new banks not contributing to the reserve, even though they pose a risk to the system. Therefore the probability exists that a new bank could fail, resulting in losses to the fund and it will not have contributed anything to its resolution costs, which would be unfair to the other members.

Another option may be to link rebates to past contributions and the current risk profile of the bank in question. This approach can also be applied to deposit insurance systems which use differential or “risk-adjusted” premiums. Just as premium rates applied to banks can be differentiated or risk-adjusted, so too can rebates.

## **C. Separate Deposit Insurance Funds**

Most deposit insurance systems which utilize elements of ex-ante funding maintain only one deposit insurance reserve or fund for all their member institutions. However, a case can be made for establishing separate deposit insurance funds for different types of member institutions. For instance, in

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<sup>18</sup> Some observers argue that a deposit insurer with liquidity support does not need a cushion to deal with unexpected losses.

<sup>19</sup> See Final Report of the FSF Working Group on Deposit Insurance (2001).

situations where there are major differences between the risk profile of different types of institutions it could be beneficial to have separate funds. Separate funds can help separate out institutions with significantly different risk profiles and reduce the scope of cross subsidies between the sectors. While common costs can be shared, sector specific costs can be isolated and premiums can vary among sectors.

An example of a deposit insurance system with separate funds is the Malaysia Deposit Insurance Corporation. One fund was established for conventional deposits and another for Islamic deposits. The inherent characteristics of these types of deposits are quite different and religious considerations require their separation. Although separate, both funds are administered by the deposit insurer.<sup>20</sup>

Nevertheless, the separate fund approach does have some disadvantages. Having more than one fund can result in risks being overly concentrated (particularly if there are a small number of institutions in each fund). Sometimes the original justification for separate funds is overridden by changing circumstances. In the United States, the FDIC's Bank Insurance Fund (BIF) and the Savings and Loan Insurance Fund (SAIF) were originally separate and premiums were paid under different assessment systems. However, with changes to legislation over the years the differences in powers and activities between banks and savings and loan institutions have been virtually eliminated (they now offer identical products). With less and less distinction between the members of the two systems it was decided to merge the associated funds into one.

The advantages and disadvantages of separate funds must be weighed carefully when deciding to establish how best to proceed. If a separate funds approach is adopted it is important to ensure that the integrity of the funds are maintained and that distinctions among the institutions and their funds are real and do not contribute to competitive distortions.

## **VII. Management of Deposit Insurance Funds**

When a deposit insurance system is primarily funded on an *ex-ante* basis, policymakers need to consider what investment or portfolio management policy to pursue. There is a trade-off between liquidity and return. A fund must have an adequate level of liquid assets on hand to enable it to readily compensate insured depositors should an institution fail. Depending on the mandate of the insurer, funds may also be required to support other forms of failure resolution. Funds will also be necessary to support day-to-day

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<sup>20</sup> Although there are numerous definitions of what constitutes "Islamic deposits" these can be viewed as investment vehicles that generate returns based on profit and loss sharing ventures rather than through the generation of interest.

operations and to attract staff and the operational resources necessary for the functioning of an insurer.<sup>21</sup>

In many systems funds are held in low-risk, highly liquid assets – typically short-term government securities. This approach is used in countries such as Brazil, Canada and Finland and is by far the most common one.<sup>22</sup> In other cases, policymakers may pursue an investment strategy that places more emphasis on achieving higher rates of return. Both of these methods have their advantages and disadvantages. If a conservative approach is adopted, the opportunity cost is the foregone return to the deposit insurance fund. The pursuit of a higher-return policy may result in funds not being available for insurance purposes when they are needed and/or the loss of principal, if securities have to be sold at an inopportune time. This, in turn, could cause an erosion of public confidence in the deposit insurance system. A more balanced approach would be an investment strategy that balances higher rates of return against the certainty that funds will be available when needed and which guards against loss of principal.<sup>23</sup>

Other considerations include whether a deposit insurer should invest in its own members. The advantage of this approach is that, effectively it places the capital withdrawn from the banking system by the deposit insurer back into the industry. However, a drawback is that the insurer runs the risk of investing in members which could subsequently fail and therefore lose its principal. This risk can be mitigated to some extent by only placing funds with low-risk members. A problem with this approach is that it can place the insurer in an awkward position should an institution in which it has placed funds begin to experience difficulties; withdrawing its funds could worsen the institution's situation, but not to do so is unfair to the other members and inconsistent with the rationale for the fund.<sup>24</sup> At a minimum the insurer should refrain from placing funds with high risk or troubled institutions. It is also advisable to invest funds in financial assets denominated in the currency in which potential claims are most likely to occur.<sup>25</sup>

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<sup>21</sup> It should be mentioned that there is a great deal of literature available on investment fund management and how it applies to financial and non-financial corporations. However, much less has been written on this subject from the perspective of deposit insurance systems.

<sup>22</sup> See CDIC (2003) and Pawlikowski, A. 2005. The Polish Deposit Insurance Scheme Compared to Arrangements Adopted in Other Countries. (Warsaw: National Bank of Poland).

<sup>23</sup> In Russia's deposit insurance system, the fund may invest in government securities as well as top rated corporate bonds and other securities; however, it may not acquire securities issued by member banks.

<sup>24</sup> Withdrawing funds could transmit the insurer's concerns to the public.

<sup>25</sup> In some small country cases which experience extreme currency volatility there may be merit to investing in high quality basket of foreign securities. For example, Colombia pursues strategic investment approach in low risk, high quality foreign denominated assets in response to the Colombian market characterized by low liquidity and a scarce depth. Many studies

Regardless of the specifics of fund management, it is critically important that the governing body of the deposit insurer have clear oversight over the funding process and investment policy. Such a policy would set out the goals and objectives of funding management and include policies to dictate management of the fund. This can include policies on the types of investments and maturities permitted; the setting of borrowing limits and authority for transactions vis-à-vis senior management; counterparty selection and limiting credit, liquidity, market and interest rate risk.<sup>26</sup> The policy should also include provisions for ensuring that there is an internal audit process for monitoring and auditing the observance of investment policies. Investment policies should be publicized in annual reports or other materials.

## **VIII. Transparency and Disclosure Applied to Funding**

Transparency refers to the process by which information on the deposit insurance system's actions is made available to and understood by the public. Ensuring that the deposit insurance system is transparent and disclosing information (such as on funding) in a timely, consistent and accurate manner can enhance the accountability and integrity of the system.

Nevertheless, certain forms of disclosure can have negative consequences such as the disclosure of member-specific information to the public. In cases where an institution is encountering serious problems such disclosure could exacerbate difficulties and erode confidence in the institution and the financial system in general. Accordingly confidentiality is an important issue.

The extent and frequency of information disclosed by deposit insurers varies considerably among systems. Some approaches involve regular disclosure of detailed reports on an insurer's activities, financial position, performance, funding positions and even information on the costs associated with individual failures and problem institutions. Other approaches provide for only a limited amount of information to the public, citing concerns that too much disclosure (particularly on the costs associated with failures and anything related to the financial position of individual member institutions) could impact negatively on confidence and financial system stability. Designers of deposit insurance systems need to determine the appropriate balance between the desire to promote accountability and sound

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suggest that the current Colombian market conditions reinforce the motivation to move towards high quality US denominated assets.

<sup>26</sup> Balance sheet stress testing is a useful technique to assess interest rate risk and see how the ability of the deposit insurer to repay its debts is affected under a variety of scenarios.

management through disclosure and transparency and the need to ensure confidence and financial system stability.

## **IX. Other Types of Funding Arrangements Available to Deposit Insurers**

In addition to the approaches to funding surveyed in this paper, research is ongoing on a number of alternative funding options which may have the potential for improving the situation of depositors and the deposit insurance agency through transferring risk to third parties. These include: reinsurance through catastrophe bonds, credit derivatives, cross-guarantees among member banks and the setting up of multi-jurisdictional funds for insurers. While further investigation is needed to develop these options more fully, Annex II provides an overview of these approaches.

## **X. Conclusion**

A well-designed deposit insurance system can make an important contribution to the integrity of a country's financial system, thereby promoting financial and economic stability. In order to meet its objectives of protecting small depositors and maintaining public confidence in the ability of the deposit insurance system to meet its commitments adequate funding arrangements must be in place.

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## Annex I

### Credit Portfolio Approach to Determining a Reserve Target

Adopting a credit portfolio approach for targeting an appropriate reserve requires an insurer to consider a number of issues such as: developing a specific provision for each member bank covering the risk of loss and the range of expected losses that might occur over a specified period of time; and setting aside additional funds to cover situations where actual losses may exceed reserves due to unexpected factors. The following section provides some examples and the issues which need to be considered when evaluating this approach.

#### Provisioning for Expected Losses

In order for a deposit insurer to determine an appropriate reserve using this approach, factors which must be addressed include:

1. the exposure an insurer would face in a failure;
2. the losses which could likely be experienced in a failure (e.g. loss given default);
3. the probability of any given member bank failing (e.g. expected default probability); and
4. consideration of default correlation or the probability that several banks fail at the same time.<sup>27</sup>

Exposure is typically a measure of the proportion of insured deposits in banks. In most cases this is relatively straightforward to determine from information provided to the deposit insurer or supervisor on the assessment base. For the loss given default calculations, one must estimate the losses typically incurred in the event of failure. This can be expressed as an average loss rate on resolutions on a net present value basis.<sup>28</sup> It is common practice to use historical loss rates for this calculation because projecting loss rates into the future can be very difficult. This is because the

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<sup>27</sup> Default correlation measures the probability of two or more banks failing simultaneously. This is important to include in calculations because the failure of a bank is rarely an isolated event and multiple failures can occur.

<sup>28</sup> Loss given default results are influenced by a wide variety of factors such as security rankings, creditor preference, asset volatility, recovery rates and the discount factors used when determining the NPV loss rates.

nature of bank failures can change over time and it is difficult to estimate the cost effectiveness of recoveries on future failures.

Probably the most challenging aspect of reserve targeting is determining the expected default probability of a bank. There are numerous approaches to dealing with this question but we have focused in this paper on four commonly used approaches: (1) fundamental analysis; (2) market analysis; (3) rating methods; or (4) some combination thereof.<sup>29</sup> Fundamental analysis is typically based on broad quantitative and qualitative indicators such as CAMEL(S) or risk-based supervisory rating or score to estimate the probability of failure. Market analysis tends to be based on market information available on banks such as interest rates, spreads and yields on uninsured bank debt such as subordinated debt or debentures. Included in this approach are the various models based on option pricing theory.<sup>30</sup>

Rating analysis uses rating agency information such as Moody's and Standard and Poor's, to determine the probability of a given bank defaulting. These agencies can provide information on historical default probabilities associated with individual bank ratings (i.e. typically on corporate bonds).<sup>31</sup>

It is difficult to find a single approach appropriate for all deposit insurance systems. Thus, many insurers have opted to use a combination of methods to arrive at expected default frequencies. For instance, the Canada Deposit Insurance Corporation (CDIC-Canada) uses a combination of ratings, market analysis and fundamental analysis to generate estimated default probabilities. This includes historical indicators measuring the average of Moody's and Standard and Poor's default statistics and a forward-looking component provided by Moody's KMV, a well-known provider of market-based quantitative credit risk products for financial institutions and credit risk

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<sup>29</sup> See Leuven, L. 2003. Pricing of Deposit Insurance (Washington DC: World Bank).

<sup>30</sup> Option pricing models such as those developed by Merton (1978) and Ronn, E. and A. Verma, "Pricing Risk-adjusted Deposit Insurance: An Option-based Model", *Journal of Finance*, No. 41, 1986 model deposit insurance as a "put" option on the value of a bank's assets. These models are very appealing from a theoretical viewpoint since they utilize the market's assessment of the value of the bank's equity and assets rather than accounting values. However, they have practical limitations since some critical inputs, such as asset valuations and volatility may be unknown.

<sup>31</sup> For example, actuarial predictive models use historical quantitative information on bank failures to predict the likelihood of banks failing. Credit scoring models use balance sheet and income data to gauge the probability of default and are especially useful for unlisted firms. Altman's Z score models are an example of this approach, Edward Altman, "Financial Ratios, Discrimination Analysis and the Prediction of Corporate Bankruptcy," *Journal of Finance*, 23, September, 1968,

investors.<sup>32</sup> Both the historical and forward looking components are then weighted to arrive at an expected default frequency for each bank.<sup>33</sup>

CDIC-Canada also creates a separate provision for watch-list members (i.e. high risk or acute institutions). For non-watch list (low risk) members, the methodology uses a similar formula but with different estimated default frequencies. The watch-list provision default frequencies are determined internally by the historic migration of members on the watch list and represents the likelihood of failure within five years. To reflect the increasing risk of failure each year a member is on the watch list the provision is phased in over a three year period.

CDIC-Canada's provision for expected losses is also adjusted using a qualitative assessment. The qualitative assessment is used as a mechanism for the insurer to introduce its own judgment based on its knowledge of industry and company specific issues to corroborate or adjust the calculated results. This is designed to capture risk characteristics that are not already incorporated in the calculations.

### **Determining a Reserve for Unexpected Losses**

Assigning a portion of a reserve to cover unexpected losses is even more challenging than dealing with estimating a provision for expected losses. The major difference from modelling expected losses is that one must utilize a different technique for modelling default probabilities. An increasingly common approach to do this is with Monte Carlo estimation techniques (e.g. Singapore and Canada). This is a modelling approach or technique that draws on some characteristics of membership, as well statistics on defaults and losses to estimate failure probabilities and resulting losses. Analysis is based on the premise that financial resources of \$X are expected to cover losses in all but (1- Y)% of the time (where Y is the confidence interval).

Monte Carlo simulations essentially model a year in the life of a deposit insurer many times over to build a picture of the various probabilities of loss and a loss distribution facing a deposit insurer without making assumptions about individual institutions. By running literally millions of trials the analysis estimates a loss distribution from which reserve levels can be determined for different confidence intervals.

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<sup>32</sup> Using market based indicators like credit spreads between banks may not work well in many countries where markets are inefficient and even illiquid. In the case of Russia, many of these indicators are unavailable so bank specific financial data is relied on to model expected default rates. See Smirnov et al. (2005).

<sup>33</sup> CDIC uses a five-year time horizon in order to match the underlying maturity of the deposit insurance coverage provided on insured products.

## **Annex II**

### **Research into Other Types of Funding Arrangements for Deposit Insurance**

#### **A. Reinsurance through Catastrophe Bonds**

Risks transfers are routinely performed in the property and casualty insurance business through reinsurance contracts obtained from reinsurance companies. The insurance industry has thus been naturally attracted to financial markets to solve its capital needs and a trend has developed towards securitisation of insurance risks. More specifically, in the case of catastrophic risks new instruments such as catastrophe bonds and catastrophe options have been created. A catastrophe bond is similar to a standard bond, except that if a specified catastrophic event occurs the bond is not redeemed. In this way, the bondholder acts as an insurer with respect to the catastrophe. Also, the bond mechanism eliminates the credit risk from the point of view of the insured party.

A deposit insurance system runs a catastrophic risk inasmuch as it is faced with fairly low probabilities of potentially large losses. The risk transfer technique used in property and casualty insurance could be transposed to the deposit insurance context and a deposit insurer could transfer part of its risks by issuing financial catastrophe bonds. Those bonds would not be redeemed if losses of the deposit insurance agency exceed some fixed amount during a specified period of time.

For deposit insurance system which do not have access to government back-up funding, catastrophe type bonds could provide them with supplementary capital and improve their solvency, and possibly also their liquidity. For those systems that have access to government back-up funding, these instruments would not normally affect significantly either their liquidity or solvency. Rather the potential benefits would come from the creation of an active market for these securities, assuming that one could emerge. Such a market for deposit insurance risks would stimulate production of information by investors and could improve the pricing of these risks. This could assist the deposit insurance agency in various ways. It could help it adjust the overall level of premiums. It could also send it signals with regard to the perceived effectiveness of its supervisory and risk control program. In a financial crisis, the capital obtained from investors would stand ready to absorb losses, but the losses borne by some of these investors could seriously weaken them and have other negative effects.

Despite the theoretical attractiveness of these bonds, there are drawbacks. First, there are substantial costs to issue securities such as catastrophe bonds. Moreover, additional costs are generated by the need to manage and invest the capital obtained. Second, investors could fear being

at a disadvantage in terms of information relative to the deposit insurance agency and would thus require some risk premium to protect themselves. Third, there could be a moral hazard problem. Specifically, the decision to declare a bank insolvent is usually within the control of the supervisory authority and/or deposit insurer. If such a decision allows the insurer or other authority to obtain third party capital, they may have an incentive to do so. Accordingly the mechanism used to deal with problem institutions would have to be explicit and transparent to ensure that all bank failures are treated similarly, thus limiting to some extent the flexibility of the deposit insurance agency. Finally, to be effective these securities would need to be traded in a sufficiently liquid market, which may be difficult to achieve in countries with relatively small financial markets.

## **B. Risk Transfer through Credit Derivatives**

Following instruments used to trade interest-rate risk and exchange-rate risk, derivative securities have recently been introduced to trade credit risk. Swaps of different varieties have become the preferred method to trade credit risks: the three main types are the total return swap, the credit default swap and the credit default exchange swap. Under the first two types, one party to the transaction buys protection for credit losses from another party and thus the reduction of risk involves a cash outflow. Under the third type, two parties exchange credit exposures and if the two exposures are similar, the contract may be entered into without any cash outlay. This latter type of contract, which would involve a swap between two insurers seems the most interesting for deposit insurance agencies.<sup>34</sup>

As discussed in Annex I, a deposit insurer may be viewed as holding and managing a portfolio of credit risks. Indeed, when a bank becomes insolvent a credit default occurs relative to its depositors and the shortfall is assumed by the deposit insurer. However, contrary to many portfolio management situations, deposit insurance agencies have very limited abilities to select the composition of their portfolio. A deposit insurance agency may intervene when a bank licence is requested and may close down a failed bank, but otherwise it is in a fairly passive situation relative to the structure of its portfolio of liabilities.<sup>35</sup> As a consequence, deposit insurance agencies in countries that have a concentrated banking system have de facto a concentrated portfolio of credit risks. Credit derivative securities offer the possibility of modifying the structure of their portfolio of credit risks. In particular, concentration and total risk can be reduced through better diversification.

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<sup>34</sup> See Roy (2000).

<sup>35</sup> It can have some impact via risk-based premiums and through coordination with the financial institution supervisory authorities.

Although such transactions may be theoretically justified and appealing, it must be acknowledged that they also raise several concerns. First, even though the swap contract would not involve payments for the protection itself, it is clear that operating expenses would be incurred to set up and negotiate it. Second, a deposit insurance agency would then bear credit risk for which it has no monitoring power. Third, it would also be put in a situation of asymmetric information. Fourth, the contract would involve assuming some credit risk relative to the counterparty; that is a deposit insurance agency could default on its obligation. Also, there would be a potential problem of moral hazard as again the closing down of a bank would allow obtaining compensation, and would thus have a greater incentive to do so. These remarks point out that the two deposit insurance agencies should be themselves of similar solvency and have similar information access and closure powers. Some agreement would also be needed as to how to respond to a systemic crisis that avoids one country's action disadvantaging the other. In general, the two countries must be able to rely on each other.

### **C. Cross-guarantees among Member Banks**

The use of cross-guarantees has been proposed as an alternative to conventional ex-ante funding for deposit insurance systems. Such schemes generally involve a system of member banks which guarantee each others insured deposits. Cross-guarantee deposit insurance systems were used in the United States during the 19<sup>th</sup> century and are present in private deposit insurance systems in Germany and Austria. In these systems, each member bank is responsible for meeting the obligations of any one of the other banks in the system should it fail. In order for such a system to work effectively, each of the member banks would need to monitor the other members to minimize its own risk exposure. This would require some sort of peer monitoring or regulatory arrangement whereby the member banks would have the power to influence the others and each liable, either directly or indirectly via required insurance premiums, for the activities of other banks in the system.<sup>36</sup>

While this model has a number of advantages, it has numerous drawbacks. These include a reduction in competition and less financial innovation. Such systems have often proved incapable dealing with a wave of failures or systemic shocks – often requiring government support in times of financial stress. In addition, these systems tend to work best in certain types of institutional environments such as those characterized by strong bankruptcy laws, strict corporate governance requirements and stringent regulatory requirements imposed by the peer monitoring organization.

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<sup>36</sup> See Roy (2000), op. cit.

#### **D. Alternatives to Conventional Emergency Liquidity Support**

There are many deposit insurance systems in the world which have limited financial resources for funding their own systems. Moreover, resources available from their respective public authorities for liquidity purposes (e.g. in an emergency) are also quite limited. Thus, the issue of accessing outside financial resources or pooling their resources in some way is of great interest.

An example of an alternative method of providing liquidity support is currently being developed in Romania. The European Bank for Reconstruction and Development (EBRD) is in the process of working with Romania to develop a special multi-jurisdictional fund for use by that country (and possibly others) in the event that the Romanian Deposit Insurance Agency experiences the need to borrow externally.

## Annex III

### Definitions of Key IADI Guidance Terms

IADI's objects state that the Association will: "...set out guidance to enhance the effectiveness of deposit insurance systems [and] such guidance shall take into account different circumstances, settings and structures."

<sup>37</sup>For the purposes of this paper, we have set out the following definitions for the guidance IADI provides:

- **Core Principles** which are defined to be: *fundamental statements applied to a broad policy area*. Although principles focus on what is fundamental, they can also be applied broadly and provide a high degree of flexibility in implementation to suit individual country circumstances.
- **Supporting Guidance Points:** which help to clarify the principle(s) and can add additional information to help practitioners apply the core principles.

*When developing guidance it is important to ensure that it assists countries in developing and enhancing their deposit insurance systems and, as much as possible, that this guidance should be adaptable to the overall culture, history, political, economic, legal and institutional environment.*

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<sup>37</sup> See Statutes of the International Association of Deposit Insurers, Article 2(b), Basel, October 2004.