Preliminary version

A Deposit Insurer's Handling a Systemic Crisis

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Abstract

The 2007/2008 global financial crisis is said to be the severest after the Great Depression in the 1930's. It was shown how the crisis spread rapidly from originating countries like the U.S. and the U.K. to the rest of the world by way of interconnectedness among financial institutions in the various analyses. One of the lessons learned is that a well-established financial safety net is essential to crisis prevention and management and that deposit insurers should be given broader powers and authorities to ensure financial stability.

Based on survey results conducted on 50 deposit insurers in 49 jurisdictions regarding systemic crisis handling, this paper provides an overview of crisis prevention, management and resolution mechanisms and funding. In the concluding chapter, the paper will shed light on the recent call for more powers and mandates of deposit insurers, regardless of normal or crisis times. Not only for depositor protection but also for the public policy objective of ensuring financial stability must there be an effective deposit insurance system as an important part of the financial safety net.

Keywords: deposit insurance, systemic crisis, and financial safety net

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1. Introduction

Financial instability can range on a large spectrum at one end of which there is a temporary minor disruption that does not affect the financial market or the financial industry, and at the other end of which there is a systemic crisis which negatively shocks not only the financial system but the overall real economy.[1] Since the recent global financial crisis is viewed as a systemic one given its scale, there has been lively discussion of the causes and impacts of systemic crises and how to handle them. A variety of measures have been developed both at national and international levels. Furthermore, international organizations including the International Monetary Fund (IMF), Basel Committee on Banking Supervision (BCBS) and the International Association of Deposit Insurers (IADI), led by the G20 Summit leaders and Financial Stability Board (FSB), are now actively engaged in international efforts aimed at the prevention and resolution of systemic crises.

In particular, the IADI has developed the Core Principles for Effective Deposit Insurance Systems Methodology in December 2010, jointly with the BCBS, in a bid to provide effective guidelines for deposit insurers regarding how to respond to and resolve a crisis which can be used during a systemic crisis as well as during normal times. The Principles were reported to the FSB and adopted as one of FSB's 12 Key Standards for sound financial systems in April 2011. Deposit insurers around the world will be recommended to formally adopt the Principles.

This paper takes a look at the crisis responses taken by deposit insurers around the world to deal with systemic risks and systemic crises during the 2007/08 global financial crisis. It also explores ways to effectively prevent and overcome future crises. In particular, advanced countries where the crisis originated like the U.S. and the U.K. have taken various and wide-ranging measures to deal with systemic risks. On the other hand, other economies in Asia, South America and Africa had the good fortune of escaping systemic crises. Yet, the global financial crisis still had a significant impact on them, causing a serious financial disruption. As a result, those countries have taken policy measures to ensure financial stability. Thus, there needs to be research and policy making to use the lessons learned and develop a comprehensive framework for systemic crisis prevention and management.

There are largely two types of responses to handle a systemic crisis: ex ante measures to prevent a systemic crisis and ex post measures to effectively contain a crisis. Financial crises, be they systemic crises or less serious ones, are bound to repeat, with only the degree of severity varying. Therefore, the most important consideration in devising ex ante measures is to establish the most effective prevention system that would make the crisis less painful. In other words, the focus of the ex ante financial safety net should be to minimize the negative effects of a repeat of a crisis by monitoring systemic risks,

[1] The definition of systemic crisis will be discussed in detail in the next chapter.

strengthening micro-prudential supervision, managing macro-economic fundamentals in a sound manner and effectively operating the deposit insurance system.

Should a crisis occur despite best efforts for crisis prevention, financial safety net (FSN) participants should focus on a speedy recovery by keeping the crisis from escalating any further and resolving insolvent financial institutions or impaired assets promptly. For this to happen, a crisis response mechanism should be specified in advance, and a speedy resolution of failed financial institutions should be carried out under the mechanism. Also, for viable financial institutions, financial support should be provided to prevent any contagion. Another important issue is how to pay for the costs of handling a systemic crisis. In principle, the costs of recovery should be first borne by the responsible parties, i.e., shareholders, creditors and depositors of failed financial institutions. However, as shown in past cases of systemic crises, all the recovery costs cannot be paid by the responsible parties alone. More often than not, the government injects funds raised with taxpayers' money to stabilize the financial system. As a result, there are now discussions about whether an ex ante or an ex post fund (including the deposit insurance fund) is needed to pay for the costs of systemic crisis containment and, if so, how to raise such a fund.[2] If taxpayers' money is to be used to resolve a systemic crisis, there should be a pre-established legal framework that would allow for a timely injection of public fund. In addition, financial assistance should be followed by accountability investigations aimed at recovering the taxpayers' money in order to prevent moral hazard and ensure market discipline.

This paper is organized as follows: Chapter 2 provides deposit insurers' responses to the recent global financial crisis; Chapter 3 discusses what an effective financial safety net and funding mechanisms should look like to prevent and respond to a systemic crisis, with a focus on the deposit insurance system; and Chapter 4 concludes.

2. Deposit Insurers' Responses to the Recent Global Financial Crisis

As was clearly shown in the recent global financial crisis as well as past crises, any one of the financial safety net participants, be it the government, central bank, financial supervisory authority or the deposit insurer, cannot resolve a crisis by itself. In particular, if the crisis is much more than a temporary financial instability and threatens to become a systemic one, all members of the financial safety net will need to mount an all-round response since the negative impact will not only affect the financial industry but the real economy as well.

[2] During the recent financial crisis, the fund for systemic crisis management has been discussed in various names such as the resolution fund and bank levy, especially in discussion of the G20.

During systemic crises, deposit insurers took a variety of measures ranging from the use of the deposit insurance fund for depositor reimbursement or failure resolution, to the adoption of blanket guarantees, to expansion of coverage limit or scope, and to the implementation of a temporary debt or liquidity guarantee program. This paper reviews the crisis response measures that deposit insurers took during the recent crisis.

First of all, the general view is that it was only the U.S., U.K., and some EU members including Iceland that went through systemic crises during the latest round of global turbulence. Other countries managed to avoid systemic risks.[3] In the survey, only 18 jurisdictions, out of a total of 49 respondents, said they used the deposit insurance fund to resolve insured financial institutions that became insolvent during 2007 and the first half of 2010, though it is hard to determine at this stage that any of them had faced a systemic crisis. During the same period, the number of insured financial institutions that were wound down was the highest in the U.S. at 254, followed by 76 in Russia, 74 in Indonesia, 43 in Montenegro and 12 in Zimbabwe. The comparative figures for Korea, Taiwan, the U.K., Macedonia, Vietnam, Finland and Norway were 8, 8, 7, 4, 4, 2 and 2, respectively. Argentina, Guatemala, Hungary, Kazakhstan, Nicaragua and Portugal each resolved one financial institution during that period.

The responses made by deposit insurers during the recent crisis include expansion of coverage limit or scope, faster deposit payouts and liquidity support. First, the most decisive action taken by deposit insurers during the recent global financial crisis was to strengthen depositor protection by adopting blanket guarantees or expanding coverage limit. Data from a survey conducted by the IADI and IMF (2010) showed that 48 jurisdictions raised coverage limit during the recent global financial crisis. As shown in Table 1, the survey found that 19 jurisdictions including Austria and Germany adopted blanket protection on a temporary basis,[4] 22 raised the insurance limit permanently while 7 others issued a temporary increase in insurance coverage.

[3] Laeven and Valencia (2010) analyze that 13 countries experienced a systemic banking crisis during 2007-09. Among them, with the exception of the U.S. and Mongolia, all are in the European region.

[4] Though not in Table 1, the UK government offered full guarantees to depositors of Northern Rock when the bank's failure in September 2007 caused a bank run.

Table 1. **Actions Taken to Increase Deposit Insurance**

Full Depositor Guarantees	Deposit Insurance Coverage Increase	
	Permanent	**Temporary**
Austria	Albania	Australia
Denmark	Belgium	Brazil
Germany 1/	Bulgaria	Netherlands
Greece 1/	Croatia	New Zealand
Hong Kong, SAR	Cyprus	Switzerland
Hungary 1/	Czech Republic	Ukraine
Iceland 1/	Estonia	United States 4/
Ireland 2/	Finland	
Jordan	Indonesia	
Kuwait	Kazakhstan	
Malaysia	Latvia	
Montenegro 5/	Lithuania	
Mongolia	Luxembourg	
Portugal 1/	Malta	
Singapore 1/	Philippines	
Slovak Republic	Poland	
Slovenia	Romania	
Thailand 3/	Russia	
United Arab Emirates	Serbia 5/	
	Spain	
	Sweden	
	United Kingdom	
19	22	7

Notes: Full depositor guarantee consists of guarantees covering all deposits or the majority of all deposits in the banking system. In the case of Italy, no actual coverage increase has occurred; however, Law N.190 passed in December 2008 as a result of the international crisis, gives the minister for economy and finance power to introduce a state guarantee for depositors for a period of 36 months. In the case of Saudi Arabia, a full guarantee in effect prior to the crisis was reaffirmed in October 2008 in response to the crisis.

1/ Political commitments by government.
2/ Full guarantee for seven specific banks representing 80 percent of the banking system.
3/ Existing full guarantee in effect since 1997, originally set to expire in 2008. During the 2008 crisis, full guarantee was extended by two years.
4/ Does not take into consideration program providing for temporary unlimited guarantee for non-interest-bearing transaction accounts.
5/ Not included in 2009 Unwinding report.
Source : IADI and IMF(2010)

Our survey also found that 32 of the 50 respondents said that they had increased the coverage limit. For EU members, pursuant to the EU Directive 2009/14/EC, the minimum coverage level should be increased from €20,000 to €50,000 by 30 October 2008 and be set at €100,000 by 31 December 2010. Outside the EU, the US FDIC increased its coverage limit from US$100,000 to US$250,000, while the UK also increased their coverage limit from £35,000 to £50,000. In the case of Indonesia, the new increased limit is 20 times that before the crisis at IDR 2 billion. Hong Kong raised the limit five times from HK$100,000 to HK$500,000 and Taiwan doubled the insurance limit to NT$ 3 million after providing temporary blanket guarantees in 2010.[5]

Second, another important measure taken by deposit insurers during the recent crisis was the expansion of the scope of deposit insurance. Survey results showed that ten jurisdictions – Australia, Bulgaria, Croatia, Estonia, Hong Kong, Italy, South Korea, Malaysia, Serbia and Taiwan – expanded the scope of deposit insurance during the crisis. Among them, Korea and Malaysia expanded coverage to include foreign currency deposits.

Third, efforts were made to shorten the payout time. Any delay in payouts, which can halt economic activities and cause a financial disorder through contagion effects, can hamper the public's trust in the deposit insurance system. In EU, before the crisis, the EU Directive 1994/19/EC allowed deposit insurers to take from three up to nine months before they reimbursed depositors. However, in a revised Directive announced in 2010, the timeline was significantly reduced to 20 business days. Moreover, the EC recommended in 2010 that the timeline be further reduced to one week.[6] On the other hand, the FDIC can begin payouts within one business day of the bank failure since it has authorities for supervision and resolution of failed member institutions.

Fourth, in some cases, the deposit insurer provided liquidity support to keep money shortages at failing financial institutions from spreading to the whole financial market in addition to reimbursing the depositors of an insolvent financial institution. The number of survey respondents that said their deposit insurers had provided such liquidity support was seven - Brazil, Kazakhstan, Norway, Portugal, Russia, Taiwan and the U.S. The case in point

[5] The IADI and BCBS(2010) present that increases in coverage limit during the recent crisis in the countries surveyed ranged from 75 to 400%.

[6] Hoelscher (2011) argues that rapid payout will require reforms in deposit insurance systems: single customer view on deposit level; rapid data collection capacity; and close coordination between deposit insurer and insolvency agency.

is the US FDIC's Temporary Liquidity Guarantee Program (TLGP). With the TLGP which is divided into two separate programs, the FDIC offered guarantees on senior unsecured debts issued by member institutions or bank holding companies (Debt Guarantee Program, DGP) and provided full deposit insurance coverage for certain transaction accounts including those for salary payment (Transaction Account Guarantee Program, TAGP).[7]

3. Systemic Crisis and Regulatory Framework for Financial Stability

This chapter is devoted to the description of laws and regulations related to systemic crisis management and the framework for crisis prevention and resolution. An overview of systemic crisis management framework that defines which of the FSN participants will be responsible for the declaration and resolution of a systemic crisis is provided. Then, the mechanisms for systemic crisis management and resolution are set out. Lastly, the importance of funding to cover the costs of resolving a systemic crisis is discussed.

Table 2. Preventive and Managing Measures for a Systemic Crisis

Systemic Crisis	Measures
Prevention	1) establishment of effective regulation and supervision that monitors and acts on economy-wide systemic risk; 2) a sound macroeconomic management framework (for monetary, fiscal, and exchange rate policies) that can counteract the buildup of systemic vulnerabilities such as asset price bubbles; and 3) creation of a strong international financial architecture that can send pointed early warnings and induce effective international policy coordination to reduce systemic risk internationally.
Management	1) provision of timely and adequate liquidity; 2) rigorous examination of financial institutions' balance sheets, including through stress tests; 3) support of viable but ailing financial institutions through guarantees, nonperforming loan removal, and recapitalization; and 4) adoption of appropriate macroeconomic policies to mitigate the adverse feedback loop between the financial sector and the real economy, reflecting the specific conditions and reality of the economy.
Resolution	1) use of mechanisms for restructuring financial institutions' impaired assets and, hence, corporate and household debt; 2) use of well-functioning domestic insolvency procedures for nonviable financial institutions; and 3) use of international mechanisms for resolving nonviable internationally active financial institutions, including clear burden sharing mechanisms.

Source: Kawai and Pomerleano(2010)

[7] At their peak, the DGP and the TAGP guaranteed US$350 billion and US$834 billion, respectively.

3.1 Financial Safety Net Framework

In general, preventing systemic risks can be approached from the following three aspects: The first is the strengthening of micro-prudential regulation and supervision. This will require stronger capital adequacy requirements, liquidity requirements, leverage regulation, employee compensation standards and derivatives market control. The second is more robust macro-prudential regulation and supervision to deal with increased risk of systemic crisis, rapid spread of failures among financial companies or markets as a result of greater interconnectedness, and reduced procyclicity, all of which are driven by changes in the macro environment. The third is more broad-based improvements of the macro-prudential policy framework. This is a framework for coordination of roles and responsibilities among FSN players including the lender of last resort function of the central bank, deposit insurance and resolution of failed financial institutions as well as macro-prudential supervisory functions. In particular, the most essential element for systemic crisis prevention is financial regulation and supervision to keep the financial system healthy.

At normal times, prudential supervision is enough to ensure financial stability. However, once failures of financial institutions throw the market into chaos and cause a crisis, the other FSN players are called to play a larger part in maintaining the stability of the market. Experience from past financial crises shows that, to successfully prevent and handle a financial crisis, there must be a framework that clearly defines each FSN player's roles and responsibilities and ensures close coordination among them. However, at times of crisis, there is precious little time to design and build such a framework. Therefore, it is desirable that such a framework for crisis prevention, management and resolution be formally specified through legislation or regulation in advance.

In particular, experience during the recent crisis led to calls for deposit insurance agencies to play a more prominent role in maintaining financial stability, rather than just making deposit payouts for failed member institutions (Hoelscher, 2011; Gerhardt and Lannoo, 2011). Indeed, several deposit insurers including the FDIC are given authorities to provide liquidity to cash-strapped member institutions or resolve failed financial institutions. There is even an argument that some of financial supervisory functions may be attributed to the deposit insurer

as supervisory authorities have incentives for regulatory forbearance, which slows the failure resolution process and increases the costs (Gerhardt and Lannoo, 2011).[8]

This section outlines the FSN frameworks for financial crisis management, especially for detecting and handling systemic crises, found in the responses to the survey. First of all, 18 jurisdictions responded that they have provisions in their laws or regulations prescribing how to handle a systemic crisis.[9] The U.S. (the FDI Act), Indonesia (the IDIC Law), Nicaragua (the Law on Deposit Insurance System) and Taiwan (the DI Act) have such provisions in the deposit insurance law while other jurisdictions have included such provisions in the central bank law (Malaysia, the Central Bank of Malaysia Act; Thailand, the Bank of Thailand Act) or finance-related legislation (Bulgaria, the Currency Board Arrangements; Peru, the General Law of the Financial and Insurance Systems and Organic Law of the Superintendency of Banking and Insurance). Still others have established systemic crisis handling arrangements in the form of a FSN players' committee or an MOU (Romania, Portugal, Serbia and Turkey).

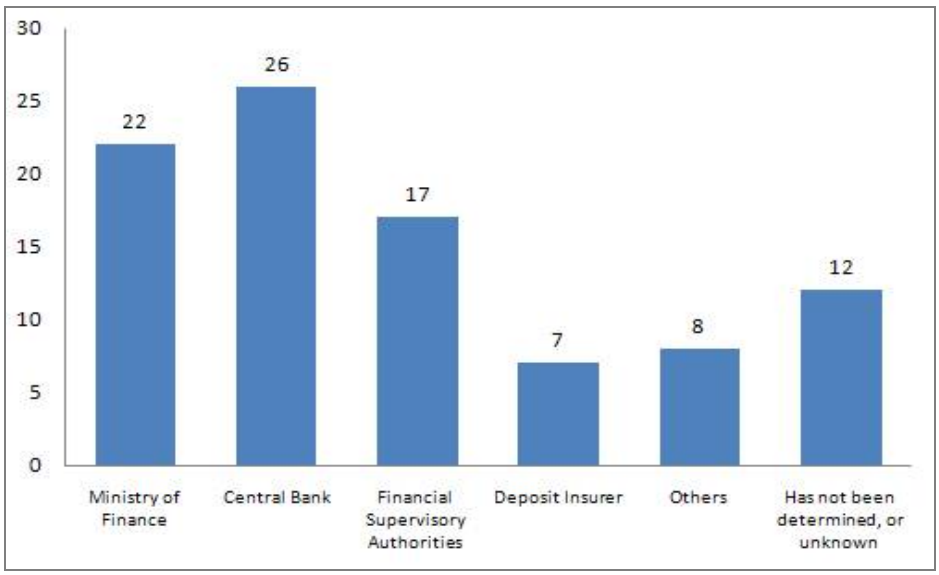
On the other hand, only a small number of countries, seven to be specific, answered yet to the question that asked if the country's law provides a definition and/or the declaring procedures for systemic crisis. They were the U.S., the Czech Republic, Indonesia, Macedonia, Nicaragua, Slovenia and Turkey. In Turkey, the Banking Law stipulates that the Savings Deposit Insurance Fund, the Undersecretariat of Treasury, the Central Bank and the Banking Regulation and Supervision Agency should jointly make a declaration of systemic crisis and that the cabinet should determine the necessary measures which will be carried out by relevant agencies. In the case of the Czech Republic, it is provided that the Czech National Bank should take necessary steps when a bank or the financial system faces a risk. As for the U.S., the Treasury Secretary used to make the declaration of systemic crisis after consultation with the President at the recommendations from the Federal Deposit Insurance Corporation and the Federal Reserve Board. However, since the Dodd-Frank Act (The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010) took effect on July 21, 2010, the

[8] Beck and Laeven (2006) argues that the deposit insurer with powers for both supervision and failure resolution has more positive implications for financial stability compared to those without such powers.
[9] Bulgaria, Canada-Quebec, Czech Republic, Estonia, Greece, Hungary, Indonesia, Kazakhstan, Malaysia, Nicaragua, Peru, Portugal, Romania, Serbia, Taiwan, Thailand, Turkey, and the U.S.

Financial Stability Oversight Council has been charged with responsibilities of managing systemic crises.[10]

It was shown that while less than half of the respondents to the survey had legal basis for defining and declaring a systemic crisis, others still had arrangements for dealing with a systemic crisis, should one occur, under the leadership of the government and the central bank. Next is how survey respondents answered questions regarding which of the FSN players makes the decision to declare a systemic. The largest number of respondents cited "the central bank" as the leading agency, followed by the government (Ministry of Finance) and regulatory and supervisory authorities.

Figure 1. Decision making agency on declaration of a systemic crisis



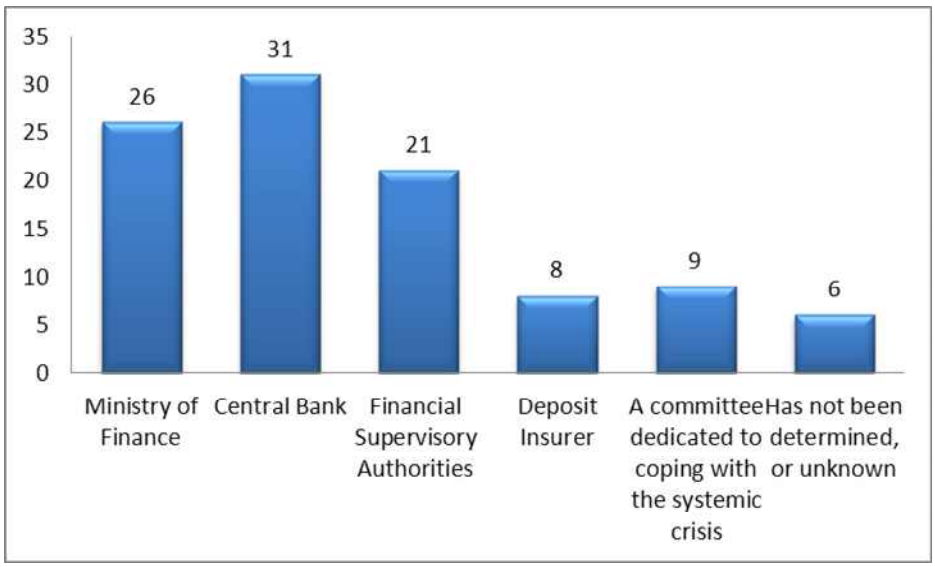
To take a closer look, 26 chose the central bank, 22 the Ministry of Finance and 17 regulatory and supervisory authorities. In the meantime, seven jurisdictions (Barbados, Canada-Quebec, Jamaica, Nicaragua, Serbia, Taiwan and the U.S.) chose the deposit insurer while eight countries answered that other agencies like a joint committee are responsible for

[10] The determination of systemic risk by the Secretary of the Treasury, following consultation with the President, and supported by recommendations from the FDIC and the FRB, is required in order for the FDIC to deviate from statutory requirements for least-cost resolutions. The process is defined by Section 13(c)(4)(G)(i) of the Federal Deposit Insurance Act, Emergency Determination By Secretary of the Treasury. The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, effective July 21, 2010, specifically requires the determination of systemic risk for the orderly liquidation of systemically-important failing financial companies by the FDIC, which involves a consultative process similar to that described earlier. Refer to Title II – Orderly Liquidation Authority under the Dodd-Frank Act.

deciding whether there is a systemic crisis. However, it was also found that as many as 12 jurisdictions had not instituted any separate authority to make a systemic crisis declaration. In 23 jurisdictions including eight that chose the deposit insurer as the responsible agency for systemic crisis declaration, two or more FSN players jointly make a decision on whether a systemic crisis exists.

Concerning which agency leads the efforts to manage a systemic crisis, 31 respondents answered "the central bank," 26 "the Ministry of Finance", 21 "regulatory and supervisory authorities," nine "a special committee", eight "the deposit insurer," and two "other." Six jurisdictions had no particular agency to lead such efforts. It was shown that, in 30 jurisdictions, multiple agencies are given a leading role in systemic crisis handling. The countries where a special committee is the leading agency include Bulgaria (Financial Stability Advisory Council), Poland (Financial Stability Committee), Romania (National Committee for Financial Stability), Taiwan (Financial Supervisory Liaison Committee) and the U.S. (Financial Stability Oversight Council).

Figure 2. Leading agency to manage a systemic crisis



In a nutshell, most of the survey respondents have arrangements for systemic crisis declaration and management specified in legal provisions and have the central bank or the Ministry of Finance as the leading agency in crisis resolution. However, 12 jurisdictions do not have a particular agency responsible for systemic crisis declaration and six jurisdictions

answered that they did not assign the responsibility for systemic crisis handling to any specific agency. For effective prevention and resolution of systemic crises, it would be good to establish a legal framework of systemic risk regulators composed of FSN participants.[11] Even though it may be impossible to produce an internationally-agreed definition of systemic crisis, there is a need to develop some criteria to detect and manage a systemic crisis taking into account unique country circumstances. This will surely help to reduce the disruption arising from a crisis and subsequent costs.

3.2 Crisis Prevention

As Kawai and Pomerleano (2010) pointed out, there is little disagreement that prevention is better than management when it comes to systemic crises. As was discussed in the previous section, the presence of a legal framework for cooperation among FSN players in times of systemic crisis does itself help to prevent a crisis. Also, the IADI and BCBS (2010)'s *Core Principles for Effective Deposit Insurance Systems,* along with its accompanying set of preconditions, will play a positive role in ensuring that the public's knowledge of effective deposit insurance will have positive implications for the prevention of a systemic crisis.

This section takes a look at the information-sharing framework among FSN players, appropriate level of coverage, public awareness, early detection of risk and timely intervention as necessary tools for the deposit insurer to prevent a systemic crisis.

First, there must be a framework for information sharing among FSN players not only for systemic crisis prevention but for effective handling of bank failures.[12] The IADI and BCBS (2010) argues that quick exchange of information within the FSN is essential to ensure prompt payouts in the event of a bank failure and to detect early signs of failure and intervene.

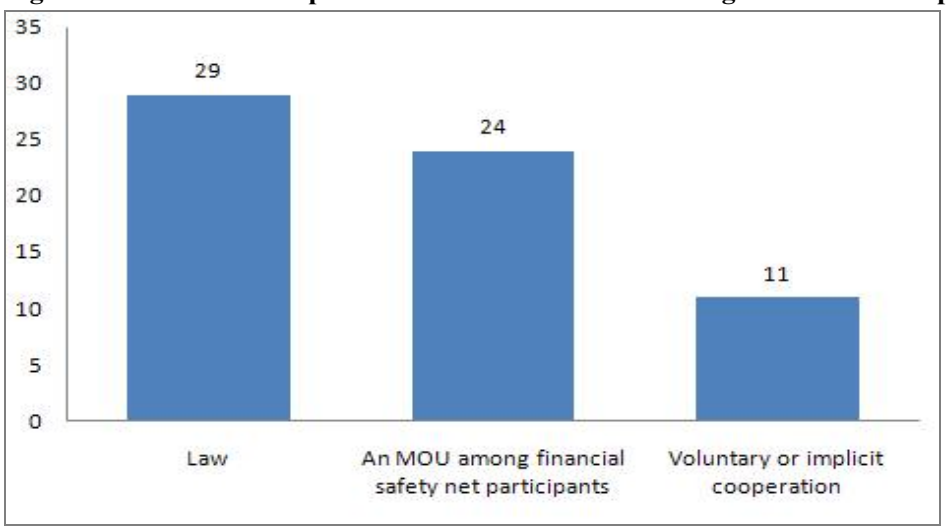
The survey results showed that 38 respondents had such an information-sharing framework. As for the basis for establishing that framework, 29 cited "law", 24 "an MOU", 11 "voluntary or implicit cooperation" and 19 said they had a combination of two of them or more. On the other hand, Malaysia (MDIC and Central Bank of Malaysia) and Poland (Central Bank and

[11] Aside from macro- and micro-supervisory authorities, the IMF(2010) suggested the need to establish systemic risk regulators whose responsibility is to detect systemic risks at an early stage and supervise them. Kawai and Pomerleano(2010) also emphasized that a systemic stability regulator with sufficient powers should be established at the national level that focuses on all three dimensions: crisis prevention, management, and resolution.

[12] Bernet and Walter (2009) provides a detailed explanation of the need for coordination and cooperation among the DI, financial supervisory authority, central bank and the government.

Financial Supervisor) answered that, though not an MOU, an inter-agency agreement is signed to facilitate information sharing.

Figure 3. Basis for the deposit insurer's information sharing with other FSN players



Meanwhile, the number of countries with an IT system for information sharing was 15. Deposit insurers in countries like Canada – The CDIC has access to the Bank of Canada's Financial Institutions Committee database. -, Taiwan, Thailand and Turkey have a shared database or direct access to the central bank's or financial authority's database. In Korea, each FSN player has its own IT system, but shares information with each other. The U.S. FDIC manages a database storing quarterly reports filed by all member institutions. For quick information sharing, the mere presence of databases is not enough. All FSN players must be given access to information. Therefore, there seems to be a need for the improvement of the IT infrastructure.

Six jurisdictions - El Salvador, Finland, Indonesia, Korea, the U.K. and the U.S.- said that there were changes in the information sharing system during the recent global crisis. El Salvador set up a Risk Committee. Finland established a consultation system with the supervisory authority (FSA). Indonesia's IDIC was given an authority to examine individual banks with problem under special surveillance of bank supervisor.[13] In Korea, in September 2009, a new MOU was signed to replace the old one among the central bank, supervisory

[13] IDIC can also examine bank in the event of the verification of premium payment.

Table 3. Changes in the Deposit Insurance Coverage Levels

	Coverage 1/		Ratio 2/	
	Old	**New**	**Old**	**New**
Europe			**1.4**	**4.8**
Albania	LEK700	2,500	2.0	6.9
Austria	€20	50	0.6	1.5
Belgium	€20	100	0.6	3.2
Bulgaria	LEV40	196	4.6	11.4
Croatia	HRK100	400	1.3	5.3
Cyprus	€20	100	0.9	4.7
Czech Republic	€25	50	1.8	3.8
Estonia	€20	50	1.7	4.9
Finland	€25	50	0.7	1.6
France	€70	100	2.0	2.9
Germany	€20	50	0.7	1.7
Greece	€20	100	0.9	4.7
Hungary	FT6,000	13,668	2.3	5.3
Ireland	€20	100	0.5	2.7
Latvia	€20	50	2.0	6.0
Lithuania	€22	100	2.3	12.5
Luxembourg	…	100	…	1.3
Malta	€20	100	1.4	7.3
Netherlands	€20	100	…	2.9
Poland	€23	50	2.4	6.2
Portugal	€25	100	1.6	6.5
Romania	…	50	…	9.2
Russia	RUB400	700	1.4	2.5
Spain	€20	100	0.8	4.4
Sweden	€25	50	0.7	1.6
Switzerland	SWF30	100	0.4	1.4
Ukraine	UAH50	150	2.4	7.6
United Kingdom	£ 35	50	1.5	2.2

Table 3. Changes in the Deposit Insurance Coverage Levels(Continued)

	Coverage 1/		Ratio 2/	
	Old	**New**	**Old**	**New**
Asia/Pacific region			**2.2**	**26.8**
Australia	…	AU$1,000	…	17.4
Indonesia	RP100,000	2,000,000	4.6	82.5
Kazakhstan	T700	5,000	0.7	4.8
New Zealand	…	NZ$1,000	…	23.3
Philippines	PHLP250	500	3.0	6.0
Western Hemisphere				
United States	$100	250	2.1	5.4

1/In thousands.
2/Ratio of coverage level to per capita GDP: Old(2008) and New(2009)

Note: For EU member jurisdictions, the level of coverage has been set at EUR 100,000 to be implemented by 31 December 2010 in view of the EU Directive requirements.
Source: Hoelscher(2011) reprinted from IADI and IMF(2010)

authority and the KDIC and to include the Ministry of Strategy and Finance and the Financial Services Commission as new members. In the U.K., in accordance with the EU Deposit Guarantee Schemes Directive, the FSCS was allowed to have access to information necessary for deposit payouts and stress tests on banks. The U.S. took steps to require substantial information sharing and collaboration among FSN participants with the establishment of the Financial Stability Oversight Council.

Second, having an appropriate coverage level can be part of the deposit insurer's ability to prevent a crisis as it discourages depositors from running on banks. During the recent financial crisis, many jurisdictions significantly raised their coverage limits, compared to pre-crisis levels.[14]

According to Hoelscher(2011) the EU announced a Directive to expand the coverage limit to 100,000, which is estimated to cover 98% of all depositors and 60% of the value of all deposits. In the U.S. where the coverage limit was raised from 100,000 dollars to 250,000 dollars, 99.8% of depositors and 78% of the value of deposits will be provided protection (Hoelscher, 2011).

[14] A survey conducted by the IADI and the BCBS (2010) revealed that, during the recent crisis, 19 jurisdictions adopted temporary blanket guarantees and 21 jurisdictions increased the coverage limit permanently. In the survey carried out for this paper, 31 jurisdictions answered that they adopted insurance coverage enhancement measures during the crisis.

Such increases in the coverage limit might lead to moral hazard of financial institutions and depositors. In other words, a high coverage limit might induce bank managers to invest in high-risk assets while reducing the incentives for depositors to monitor the health of their banks and encouraging them to move their money to higher-interest-paying banks. Therefore, it is important to find an appropriate level of coverage to maintain the public's confidence in the deposit insurance system and prevent a bank run without causing moral hazard. Also, additional considerations have to be made for potential premium increases or a build-up in the government's contingent liabilities due to funding requirements for the deposit insurance fund. The IADI and BCBS (2010) suggested that, on top of the overall FSN structure, more factors need to be taken into account when choosing the appropriate coverage level in consideration of the free flow of money around the world: the coverage levels in neighboring countries; any history of banking crises; and high coverage levels to support financial reform.

Third, establishing an FSN framework for early detection of failure risk, timely intervention and orderly resolution is another important crisis prevention measure. In particular, when the deposit insurer has the authority for bank failure resolution, early detection of risk and timely intervention become necessary preconditions for minimizing resolution costs and loss to the deposit insurance fund. Moreover, when the deposit insurer can assess the risk profile of individual financial institutions, it can effectively reduce insolvency risks by charging risk-based premiums, providing checks and balances against financial supervisory authorities to prevent regulatory forbearance, and strengthening financial institutions' risk management systems. In case of a pay-box deposit insurer, the role of failure resolution should be embedded into another FSN player.

It was found in the survey that the number of jurisdictions in which the deposit insurer has powers for risk assessment and intervention aimed at early detection of insolvency risk was 19. In most cases, risk assessments are conducted by financial regulatory authorities. Deposit insurers that are pure pay-box systems like the Hong Kong Deposit Insurance Board (HKDPB) and the Singapore Deposit Insurance Corporation (SDIC) do not have powers for ongoing risk assessment and early intervention. In Italy, though the deposit insurer does not have any supervisory authority, it is allowed to obtain financial data from the supervisory authorities to generate risk indicators and adjust insurance premiums accordingly. On the other hand, 19 deposit insurers like the Central Deposit Insurance Corporation (CDIC) in

Taiwan and the Federal Deposit Insurance Corporation (FDIC) in the U.S. are given various tools for risk assessment and early intervention, for example, examination of financial statements of insured financial institutions, on-site inspections and early warning systems.

During the recent financial crisis, Kazakhstan, Malaysia, Taiwan, the U.K., the U.S. and seven other jurisdictions enhanced their deposit insurers' powers for risk assessment and intervention. Among them, the Kazakhstan Deposit Insurance Fund (KDIF) was given the authority to conduct on-site inspections to assess the accuracy of depositor information held by failed banks and evaluate their accounting systems. In Serbia, the deposit insurer is now able to conduct on-site inspections, too, after the revision of the Deposit Insurance Law. Taiwan introduced prompt corrective action (PCA) measures on December 9, 2008 in the revised Banking Law, which allows the CDIC to have consultations with related agencies in accordance with the principles for early intervention for risk management.

3.3 Crisis Management and Resolution

Though prevention is better than cure, financial crises are bound to occur periodically with varying intensity and duration. Once a systemic crisis does occur, all FSN players become engaged in crisis management. This section provides an overview of crisis response measures taken by FSN participants during the recent crisis and their resolution mechanisms.[15]

One of the first crisis responses was to provide liquidity support and guarantees on bank liabilities. The recent financial crisis caused acute liquidity shortages along with capital losses when asset prices plunged and credit ratings took a nosedive. In order to stabilize the financial market and prevent bank failures, central banks promptly announced large-scale liquidity support measures. Unlike in past crises, the liquidity support was provided not only to banks but to non-bank institutions. To do this, on top of traditional support mechanisms used by central banks, new facilities were developed and used. For example, the Federal Reserve Board of the U.S. extended the discount window, which used to be reserved for banks, to primary broker-dealers as well. The European Central Bank introduced covered bonds. And currency swap facilities were signed among central banks of major countries.

[15] Claessens et. al (2011) present the following three phases of crisis management: 1) containment to deal with acute liquidity stress and financial liabilities; 2) resolution and balance sheet restructuring to remove insolvent financial institutions from the system and recapitalize viable ones; and (3) operational restructuring to restore the financial soundness and profitability of financial institutions and asset management.

Also, unconventional liquidity measures through which central banks directly bought assets in specific markets with liquidity problems were adopted. The US Federal Reserve Board purchased mortgage-backed securities issued by non-bank, government-sponsored entities like Freddie Mac and Fannie Mae and commercial papers through the Commercial Paper Funding Facility (CPFF). Other examples include the Bank of England's Asset Purchase Facility and, in Ireland, a new agency was created to take ownership of poorly-performing real estate-related assets from Irish banks. Guarantees were also widely deployed as an effective way to support financial institutions that were having trouble in financing without incurring an immediate cash burden.

Other than central bank measures to supply liquidity, government authorities also took action by making direct injections of public funds into at-risk financial institutions. In return, the government received equity shares and the insolvent financial institution became nationalized. Chief examples include AIG in the U.S., Northern Rock and RBS in the United Kingdom, Fortis in Belgium, Hypo Real Estate in Germany and Kaupthing·Landsbanki·Glitnir in Iceland. The U.S. government implemented the Troubled Asset Relief Program (TARP) worth US$700 billion to purchase non-performing assets including AIG's preferred shares and provide liquidity support to the troubled automotive sector. The EU also spent US$196 billion to recapitalize financial institutions.

The recent crisis has brought about recognition of the importance of speedy and orderly resolution as well as effective crisis management. Due to the characteristics of financial institutions, in wide-spread bank failures, asset values plunge and a negative externality happens, which rapidly affects other institutions. Therefore, there needs to be a resolution scheme that enables a speedy and orderly resolution of failed banks. However, as was shown during the recent crisis, the general bankruptcy procedures under the bankruptcy law are not suited at times of systemic crises. Thus, deposit insurers need to adopt a special resolution scheme aimed at the speedy and orderly wind-down of failed financial institutions in crises, outside general bankruptcy procedures.[16] Different countries assign different resolution powers to their deposit insurers, but, to ensure a prompt response in a crisis situation, there

[16] Bernet and Walter (2009) present the three pillars of a Special Resolution Regime: (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.

must be a clear demarcation line of roles and responsibilities so that each FSN player can understand what is expected of it with regard to failure resolution.

When asked how many financial institutions they resolved during 2007 and June 2010, 12 of the survey respondents answered one or more. During the period, the U.S. spent US$74 billion to close 267 insolvent financial institutions. Russia resolved 97 financial institutions, which cost more than US$10 billion. In the UK, seven failed financial institutions received nearly US$37 billion in assistance, all of which was incurred in 2008. In the case of Korea, only eight small mutual savings banks were resolved during the period. As for resolution methods, the survey found that a variety of options were used including deposit payouts, purchase of assets and assumption of liabilities (P&A), bridge bank, open bank assistance (OBA) and mergers and acquisitions (M&A). In the U.S. where the largest number of resolutions occurred during 2007 and June 2010, 237, or 90% of the total, failed financial institutions were resolved through P&A transactions. And 77% of the total costs, or US$57 billion, was paid for with assistance from the government. Taiwan also wound down eight failed institutions through P&As. In Russia, 79 financial institutions were closed after deposit payouts. Finland, Hungary, Norway, Vietnam, the United Kingdom and the U.S. provided protection to depositors by making payouts as well.[17] In the case of Korea, all eight failed banks were resolved through bridge bank arrangements.

As shown in the Table 4 below, there are various methods to resolve a failed financial institution. Which one of them minimizes resolution costs and impacts the financial system in the least negative way can differ depending on country circumstances. It was found in the survey that the number of jurisdictions where the deposit insurer has the authority for determining failure resolution was 25, nearly half of all survey participants. Among them, 11 said that their deposit insurers had the responsibility to take a leading role in resolving failed insured financial institutions.[18] With regard to the determination of insolvency of an insured financial institution, the agencies that were most frequently mentioned were the financial supervisory authority (18) and the central bank (17). Only two jurisdictions – Australia and Canada[19] – chose the deposit insurer. In Italy and Norway, it is the Finance Ministry or the

[17] In Russia, the resolution costs were paid with government assistance (RUB200 billion) and borrowing from commercial banks.
[18] Australia, Canada(CDIC and Quebec), Indonesia, Malaysia, Nicaragua, Serbia, Slovenia, Taiwan, Turkey, Uruguay, and U.S.
[19] CDIC and Quebec

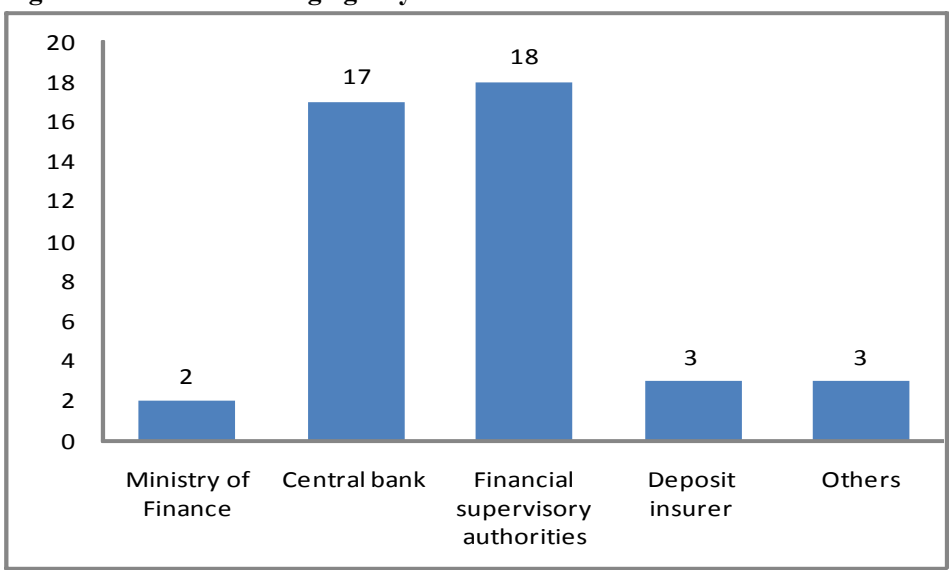
Treasury that has the insolvency determination authority while the court has such an authority in Austria, Azerbaijan and Vietnam.

Table 4. Resolution Actions Taken by Deposit Insurer

Country	Resolutions	Total
Argentina	1(Other)	1(9)
Finland	1(Payout), 1(Other)	2(20.7)
Hungary	1(Payout)	1(15)
Indonesia	1(OBA)	1(750)
Korea	8(Bridge Bank)	8(2,414)
Macedonia	3(Other)	3(29.7)
Norway	1(Payout)	1(-)
Russia	79(Payout), 3(P&A), 12(M&A), 3(Nationalization)	97(10,760)
Taiwan	8(P&A)	8(-)
UK	7(Payout)	7(37,476)
US	15(Payout), 237(P&A), 13(OBA) 2(Bridge Bank)	267(74,000)
Vietnam	4(Payout)	4(129)

Note: The unit is US$ million. The resolution costs have been converted into US dollars using the exchange rate for the concerned year.
Source: Survey responses

Figure 4. Decision making agency of the failure of an insured institution



Meanwhile, 20 jurisdictions said that the deposit insurer acts or may act as the liquidator of a failed financial institution and the court appoints the liquidator in 28 jurisdictions, except for Italy.[20] However, only the U.S. saw any change in the deposit insurer's authority as the liquidator during the recent crisis: Under the *Dodd-Frank Wall Street Reform and Consumer Protection Act* (Dodd-Frank Act), the FDIC was given broader authority to become the receiver of systemically important financial institutions including bank-holding companies and non-bank financial institutions.

It was also found that there was little difference in the resolution of ordinary banks and systemically important ones during the crisis. However, in the U.K., when Royal Bank of Scotland (RBS) and Lloyds Group face failure, the government provided assistance from the recapitalization fund and bought their shares since their failures would have posed systemic risks to the financial system. The U.S. also provided assistance to Citigroup and Bank of America in an OBA arrangement.[21] Other special arrangements available for the resolution of large financial institutions include: nationalization in Colombia; exception from the least-cost test in Korea; and exchange of covered bonds with government securities in Norway. Russia answered in the survey that the deposit insurer is now allowed to make capital injections into systemically important financial institutions, provide assistance to acquirers of failing banks and arrange P&A transactions from October 2008 to the end of 2011.

During the recent crisis, 26 jurisdictions adopted a special resolution regime for failed financial institutions. Among them, Canada, Finland, Kazakhstan, Norway, Russia and Serbia introduced a whole new type of resolution scheme. Especially, the CDIC in Canada was given the power to establish a bridge bank, and the deposit insurer in Kazakhstan was allowed to nationalize and restructure failed banks by purchasing their shares.

Aside from countries that implemented a special resolution regime, 13 others implemented changes in the resolution authority and roles of the deposit insurer. Among them, Malaysia revised the MDIC Act to give the deposit insurer an authority to establish a bridge bank and lend to uninsured financial institutions. In Poland, the deposit insurer now has new powers for capital injection. And the Serbian deposit insurer was enabled to manage banks' business,

[20] It is the Finance Ministry in Italy that appoints the liquidator. It is reported that the supervisor also appoints a banking liquidator in France.

[21] The FDIC should resolve failed financial institutions at the least cost under the FDI Act, but in the face of systemic risk, exceptions can be made. When considering an open bank assistance plan, the FDIC should make judgements about whether there are systemic risks.

create a bridge bank, arrange P&A transactions and support bank acquisitions in accordance with the new Law on Deposit Insurance Agency enacted in 2010.

3.4 Funding

A deposit insurance system should have sound funding arrangements to make prompt deposit payouts in the event of failure of an insured financial institution and maintain public confidence in deposit insurance. The IMF (2000) recommends that sufficient funds should be maintained to enhance the reliability of the deposit insurance system to ensure the reimbursement of insured deposits and resolution of failed banks.[22] Whether funds are raised ex ante, ex post or via a hybrid combination of ex ante and ex post mechanisms and how to provide back-up financing (in case of tight money) should be determined by law or regulations.

Table 5. Advantages and Disadvantages of the Two Funding Mechanisms

	Advantages	Disadvantages
Ex-post	• **Market discipline**: Induces banks to monitor each other's activities.	• **Potential payout-delays**: The funds are not collected beforehand. • **Pro-cyclical 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	• **Public confidence**: Prompt reimbursement of depositors possible. • **Smoothened premium payments** : Reduced pro-cyclical effects. • **Reduces moral hazard**: Ex-ante funding could incorporate risk-adjusted premiums. • **Equitable and fair**: All member institutions (including prospective failed institutions) contribute.	• **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.

Source: Bernet and Walter(2009)

[22] A sufficient level of funding means guaranteeing protection for depositors of two small-to-mid-sized banks or one large bank at normal times.

All countries with deposit insurance have raised a fund, whether ex ante, ex post or hybrid, to be used for deposit payouts or assistance to failing financial institutions. In general, an ex ante financing model is considered to be more beneficial in terms of depositor confidence or system efficiency although an ex post model does help to enhance market discipline by encouraging market participants to monitor each other (IADI, 2009; Bernet and Walter, 2009; Gerhardt and Lannoo, 2011).

The survey revealed that, as of the end of 2009, there were only two nations with a deficit in the deposit insurance fund: the U.K. with a deficit of 4.3 billion pounds and the U.S. with a 21 billion dollar deficit. In the U.K. where an ex post funding mechanism is used, the deposit insurance fund has run up a deficit because it had to reimburse claims of depositors of seven failed banks including Northern Rock that experienced a bank run in 2007.[23] Even in the U.S. where the fund is raised ex ante, more than 250 bank failures since 2007 have pushed the fund into the red. In the case of Taiwan, there are two deposit insurance funds: the Banking Financial Deposit Insurance Fund and the Agricultural Financial Deposit Insurance Fund. The former has been running a deficit for four years due to bank failure resolution costs. Korea's deposit insurance fund which has six accounts for different financial sectors (e.g. banking, insurance) has recorded a deficit in the savings bank account as well.

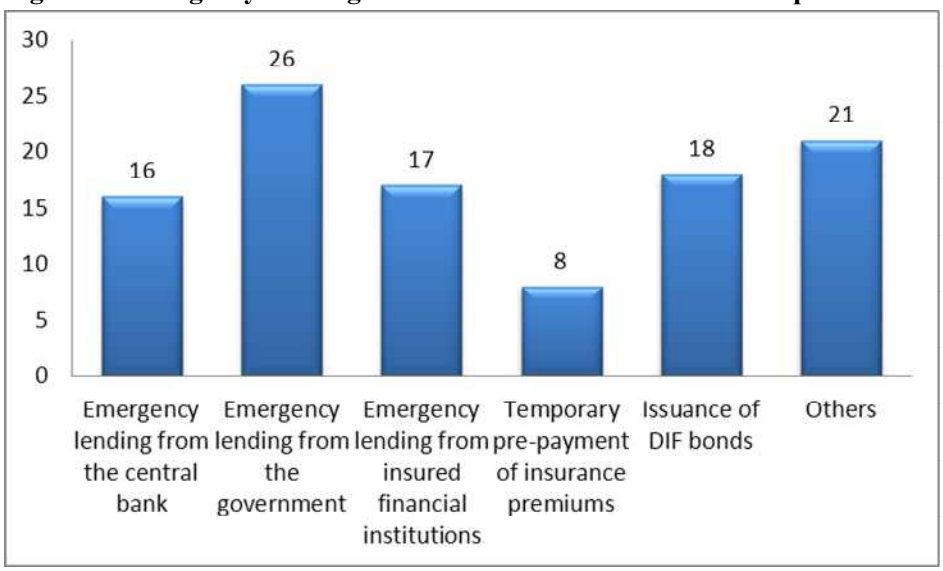
However, there may be cases where it is impossible for the deposit insurer to cover all the costs of depositor reimbursement or bank failure resolution, should a financial turbulence occur. To prepare for such instances, governments should establish a backup financing mechanism in advance. During past systemic crises, the funding for crisis recovery could not be met by the deposit insurance fund alone, but also had to rely on liquidity injections by the central bank or provision of public funds by the government.

In an answer to a question regarding the backup funding that may be needed should the insurer not have sufficient funds in place to cover deposit insurance claims, many of the survey respondents said that they get the emergency funding by borrowing funds from the government, central bank or financial institutions: 16 respondents checked the box for borrowing from the central bank; 26 lending from the government; and 17 lending from other insured financial institutions. In the meantime, 18 jurisdictions chose issuance of deposit

[23] In the Banking Act 2009, it is specified that the FSCS may request a loan from the National Loan Fund, charge 1.84 billion pounds per annum to all insured financial institutions in ex post levies, and access a credit facility of 75 million pounds and an overdraft facility of two million pounds from the private sector.

insurance fund bonds as their source of emergency funding and 8 chose temporary pre-payments of insurance premium. 30 out of 50 respondents said they used two or more methods to finance any shortfall in the deposit insurance fund. When asked how they plan to repay the emergency loans, 15 respondents answered that they would raise deposit insurance premiums; 14 said they would levy special assessments or contributions; two (Nicaragua and Serbia) said they would use money from its own treasury; 10 indicated that they would resort to other methods; and as many as 12 said they would not take any measures.

Figure 5. Emergency funding measures for the shortfall in the deposit insurance fund



Regarding the changes, if any, in the premium assessment criteria during the recent crisis, 13 respondents chose increasing insurance premiums; 4 (Brazil, Greece, Kazakhstan and the U.S.) adopting a differential premium system; 2 (Hong Kong and the U.S.) changing premium assessment criteria; 2 (Taiwan and the U.S.) levying special assessments; and 7 others. Hong Kong plans to cut insurance premiums by 65% to prevent banks from passing the costs onto depositors. In Russia, quarterly premium rates were reduced from 0.13% to 0.1% in October 2008. The U.S. FDIC raised annual premiums by 0.03% permanently on September 29, 2009, to be effective on January 1, 2011, imposed one-time special assessments of 5 basis points on September 30, 2009 and required insured financial institutions to prepay three years of estimated insurance assessments on November 12, 2009.

4. Conclusion

In the midst of the 2007/08 financial crisis which is said to the most serious since the Great Depression in the 1930's, countries world over engaged in crisis response efforts to promptly stabilize the financial market and resolve failed financial institutions by providing liquidity, purchasing assets, offering guarantees and recapitalizing banks. Moreover, they increased the deposit insurance coverage and shortened the payout period to protect depositors and enhance public confidence in the financial system. It seems that the recent crisis heightened awareness about how important the deposit insurance system is as a part of the financial safety net.

This paper, which draws on a survey conducted on IADI and EFDI members and a review of literature on systemic crisis, has reviewed the roles and responsibilities of a deposit insurer regarding how to handle a systemic crisis. From analyzing responses from 50 deposit insurers of 49 jurisdictions, the study has yielded the following implications for the deposit insurance agency's effective handling of a systemic crisis.

First, it is clear that any one of the FSN players cannot prevent or manage a systemic crisis by itself. Therefore, to ensure effective crisis prevention and containment, a framework should be established in advance by law or regulation that prescribes the roles and responsibilities of each FSN player. It would also be desirable to have a regular meeting of FSN players so that they can review the state of the financial system on a regular basis and take appropriate measures accordingly. The U.S. Financial Stability Oversight Council is a good example.

Second, monitoring the financial market and detecting signs of failure early is critical to preventing a systemic crisis. To make that happen, the FSN players should be enabled to share information quickly and easily and make timely interventions at the earliest sign of trouble. The deposit insurance system should have sufficient coverage levels to prevent a bank run, and maintain public confidence in the system through strong public awareness programs at normal times. One good idea would be to review and improve the deposit insurance system to make it more closely aligned with the *Core Principles for Effective Deposit Insurance Systems*, developed by the IADI and the BCBS in consideration of each jurisdiction's economic and financial circumstances.

Third, providing full guarantees or a significant increase in coverage to depositors of failed banks helps to contain a systemic crisis. Also, there should be a special resolution regime for financial institutions outside the general bankruptcy procedures. In particular, an international framework for cooperation in dealing with failures of systemically important financial institutions and large financial institutions that engage in cross-border operations should be developed. This issue has drawn considerable attention since the onset of the recent crisis.

Fourth, there is little disagreement about the importance of funding to pay for the costs of systemic crisis management. A deposit insurance fund should have sufficient reserves to ensure prompt reimbursement of deposits. An ex ante financing model is seen to be more efficient than an ex post one to maintain public confidence in the deposit insurance system and to reduce moral hazard. In addition, a plan to acquire emergency financing to make up for any shortage of funds needs to be developed in advance. Moreover, given the nature of a systemic crisis, there is a need to set up a separate fund that can be used to provide liquidity or purchase impaired assets.

References

BCBS and IADI, Core Principles for Effective Deposit Insurance Systems, Basel, June 2009.

Bernet, Beat and Susanna Walter, Design, Structure and Implementation of a Modern Deposit Insurance Scheme, SUERF Studies: 2009/5, Vienna, 2009.

Campbell, Andrew, Deposit Insurance and Bank Insolvency Law Reforms: The UK Experience, Paper presented at 2011 IADI Research Conference, Basel, June 2011.

Claessens, S., C. Pazarbasioglu, L. Laeven, M. Dobler, F. Valencia, O. Nedelescu, and K. Seal, Crisis Management and Resolution: Early Lessons from the Financial Crisis, IMF Staff Discussion Note, Washington D.C., March 2011.

Gerhardt, Maria and Karel Lannoo, Options for Reforming Deposit Protection Schemes in the EU, Economic Policy Brief No.4, European Credit Research Institute, March 2011.

Group of Ten, Consolidation in the Financial Sector, 2001.

Hendricks, Darryll, John Kambhu, and Patricia Mosser, Systemic Risk and the Financial System Background Paper, Paper presented at NAS-FRBNY Conference on New Directions in Understanding Systemic Risk, May 2006.

Hoelscher, David S., Deposit Insurance Policies and the Financial Crisis, Paper presented at 2011 IADI Research Conference, Basel, June 2011.

IADI, Discussion Paper on Cross Border Deposit Insurance Issues Raised by the Global Financial Crisis, Basel, July 2010.

IADI, Funding of Deposit Insurance Systems, Guidance Paper, Basel, 2009.

IADI, General Guidance for an Effective Deposit Insurance Mandate, Basel, 2007.

IADI, General Guidance to Promote Effective Interrelationships among Financial Safety Net Participants, Basel, January 2006.

IADI and IMF, Update on Unwinding Temporary Deposit Insurance Arrangements, Basel, June 2010.

IMF, Systemic Risk and the Redesign of Financial Regulation, Global Financial Stability Report, Chapter 2, Washington D.C., April 2010.

Kaufman, George G. and Kenneth E. Scott, What Is Systemic Risk, and Do Bank Regulators Retard or Contribute to It?, The Independent Review, VII-3, Winter 2003.

Kawai, Masahiro and Michael Pomerleano, Regulating Systemic Risk, ADBI Working Paper Series, No. 189, January 2010.

Laeven, Luc and Fabian Valencia, Resolution of Banking Crises: The Good, the Bad, and the Ugly, IMF Working Paper WP/10/146, Washington D.C., 2010.

Laeven, Luc and Fabian Valencia, Systemic Banking Crises: A New Database, IMF Working Paper WP/08/224, Washington D.C., 2008.

Murton, Arthur J., Bank Failures and the Decline in the Deposit Insurance Fund, Paper presented at 2011 IADI Research Conference, Basel, June 2011.

Pennacchi, George, Deposit Insurance, Bank Regulation, and Financial System Risks, Journal of Monetary Economics 53:1~30, 2006.

Schich, Sebastian, Financial Turbulence: Some Lessons Regarding Deposit Insurance, Financial Market trends, OECD, 2008.