

Deposit Insurance Design: Review of Theory and Evidence

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บทความวิชาการชิ้นนี้ประมวลทฤษฎีและหลักฐานเชิงประจักษ์ ที่เกี่ยวข้องกับรูปแบบของระบบคุ้มครองเงินฝากในประเทศต่างๆ ทั่วโลก รวมทั้งประเทศไทย ซึ่งงานวิจัยที่ผ่านมาโดยส่วนใหญ่ชี้ให้เห็นว่า ประโยชน์ที่ได้รับจากการระบบคุ้มครองเงินฝากจะถูกบั่นทอน ถ้าไม่มีการวางรูปแบบระบบคุ้มครองเงินฝากที่เหมาะสมควบคู่ไปกับการกำกับดูแลที่ดีโดยสถาบันคุ้มครองเงินฝาก เพื่อลดผลกระทบด้านลบที่เกิดขึ้นจากระบบคุ้มครองเงินฝาก

จากการศึกษาระบบคุ้มครองเงินฝากของไทย ตาม พ.ร.บ. สถาบันคุ้มครองเงินฝาก ปี พ.ศ. 2551 พบว่าระบบคุ้มครองเงินฝากของไทยมีจำนวนเงินคุ้มครอง (coverage limit) อยู่ในเกณฑ์ที่สูงเมื่อเทียบกับนานาประเทศ โดยเฉพาะกลุ่มประเทศที่มีรายได้สูงและรายได้ระดับกลางค่อนข้างสูง นอกจากนี้ผู้ฝากสามารถเพิ่มจำนวนความคุ้มครองได้อีกหลายเท่าตัวโดยการฝากเงินไว้กับธนาคารหลายๆ แห่ง ซึ่งการคุ้มครองเงินฝากในระดับสูงจะก่อให้เกิดผลเสียต่อระบบธนาคารมากกว่า

ประโยชน์ที่จะได้รับ ดังนั้นในระยะยาว ผู้วางนโยบายควรลดจำนวนเงินคุ้มครองให้อยู่ในระดับที่เหมาะสม และควรเปลี่ยนระบบการจัดเก็บเงินส่งเข้ากองทุนให้แปรผันตามความเสี่ยงของสถาบันการเงิน (risk-adjusted premium system) และเพิ่มระบบการประกันร่วม (co-insurance system) เข้ามาด้วย เพื่อควบคุมผลเสียที่จะเกิดขึ้นจากการมีระบบคุ้มครองเงินฝาก

ส่วนผลกระทบของระบบคุ้มครองเงินฝากที่อาจมีต่อระบบธนาคารพาณิชย์และตลาดการเงิน ในระยะสั้น คาดว่ามีผลกระทบค่อนข้างน้อย แต่ในระยะยาวคาดว่าระบบคุ้มครองเงินฝากจะมีผลกระทบโดยตรงต่อต้นทุนของธนาคารและความสามารถในการแข่งขันของธนาคาร ซึ่งธนาคารที่มีการบริหารความเสี่ยงที่ดี จะมีความสามารถในการแข่งขันที่สูงกว่าและมีต้นทุนที่เกี่ยวข้องที่ต่ำกว่า ซึ่งจะเป็นแรงผลักดันให้ธนาคารพาณิชย์พยายามที่จะบริหารความเสี่ยงของตนให้มีประสิทธิภาพยิ่งขึ้น

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Abstract

This article reveals various design features of deposit insurance schemes across countries and discusses how these design features can help to curb adverse effects on banking stability and development created by introducing deposit insurance schemes. Evidence suggests that the benefits of deposit insurance will be undermined if insurance schemes are not properly designed and accommodated by strong institutional environment, tough regulation and enforcement.

For the new deposit insurance scheme in Thailand, under the Institute of Deposit Protection Act 2008 that is postponed to be enforced in August 2011, overall the scheme offers considerably higher coverage limits relative to high and upper-middle income countries. Moreover, the actual coverage amounts can be even much larger since this coverage limit will be applied on the basis of per institution per account. Therefore, in the long term it is crucial for policy makers and banking regulators to lower the coverage limit and alter the extent of coverage. Other recent design features such as risk premium and co-insurance systems are also needed to be considered since they seem to be an effective means for controlling adverse effects arising from the deposit insurance by limiting risk-taking behaviors of banks and increasing incentives for market to discipline banks.

The immediate impact of the new deposit insurance scheme on the banking system in Thailand is likely to be minimal. However, in the long term, this deposit insurance scheme could potentially increase operating costs and lower competitiveness for banks with high risk, relative to low-risk banks. Therefore, to maintain or increase the competitiveness, banks will be actively forced to improve their risk profile.



1. Introduction

Deposit insurance can be explicit or implicit. **Explicit deposit insurance scheme (EDIS)** is a system established to protect depositors for a certain amount against the loss of their deposits invested in banks or depository financial institutions, which subsequently fail. Some studies (e.g., Demirgüç-Kunt and Kane (2002); Demirgüç-Kunt, Karacaovali, Laeven (2005); McCoy (2006)) points out that for countries where EDISs do not exist, then they have what is so called **implicit deposit insurance**. It is the presumption by depositors that the government will eventually step in to rescue banks from failures or bailout the depositors of failed banks, particularly during banking crises. This presumption usually is assumed from the government actions in the past. It sends a message that the government will provide similar rescue schemes in the future.

The adoption of EDIS around the world has been increasing rapidly over the last three decades. Based on the World Bank, only 12 countries had EDIS in 1974, but this number has been surged to 104 countries in 2010. Nowadays, the deposit insurance has been seen as one of the pillars of a modern financial safety net. The IMF and the

World Bank have been actively supporting and recommending EDIS as a way of either containing economic and financial crises or winding down crisis-generated **blanket guarantees**¹ (i.e. an EDIS that guarantees the full amount of deposits). European Union's adoption of EDIS in its 1994 Directive on Deposit Insurance helped fuel the surge of the EDIS by transition countries of Eastern Europe seeking to comply with the regulations of European Union.

EDIS has become an increasingly used tool by governments in an effort to provide stability to the banking system. In particular, the deposit insurance will minimize the likelihood of a **bank run**² due to the large loss of bank deposits from investors' rapid withdrawals. Furthermore, a bank run can lead to a panic since depositors at other banks may also fear for the safety of their own deposits. In which case, the run can spread into a generalized contagion and potentially trigger a full-fledged financial crisis. The deposit guarantee will ease the panic and help to keep public confidence in the banking system.

Many studies and reports have shown that banking crises are extremely costly and disruptive. Honohan and Klingebiel (2003) estimate the average

¹ See Folkerts-Landau and Lindgren (1998); Garcia (1999); Demirgüç-Kunt, Kane, Laeven (2008a).

² A bank run takes place due to the nature of a bank balance sheet. A commercial bank is mainly funded by short-term deposits, but it uses up those borrowed funds in acquiring longer-maturity assets (e.g., making loans). Therefore, if there is a large and rapid deposit withdrawal, which is more than the vault cash or liquid assets that the bank has, the bank might not be able to liquidate its longer-term assets fast enough to satisfy depositors' demands.

fiscal cost of banking crisis resolution at 13% of GDP. The World Bank reveals the total fiscal cost incurred in the 1997 Thai and Korean banking crises exceeded 30% of GDP, and 50% of GDP in Indonesia.³ Furthermore, there would be much more economic and social costs incurred from the crises beyond these direct fiscal costs.

Explicit guarantees also have immense political appeal, because it provides a sort of guarantee to depositors. Furthermore, for countries with implicit guarantee, bank failures are commonly bailed out by the government with the taxpayers' money. Thus, having explicit guarantee will shift financial responsibility away from governments to banks and other institutions which are compelled to fund the EDIS.

This aim of this article can be divided into four main sections.

1. This article reviews various design features of deposit insurance schemes around the world. For this purpose, the data employed is mainly obtained from the World Bank database⁴, the most complete and up-to-date database containing recent data and information on deposit insurance around the world. Furthermore, I have also updated and incorporated more recent data and

information obtained from the Deposit Insurance Surveys in 2008 by International Association of Deposit Insurers (IADI) into this dataset.

2. Theories and empirical evidence relating to problems of deposit insurance are discussed. For instance, these problems include moral hazard, adverse selection, information asymmetry and market discipline. Thereafter, I discuss how the different design features of deposit insurance could help to address the problems.
3. This article also reveals the role of deposit insurance in managing financial and banking crises. It also covers the latest global financial crisis arising in the U.S. in 2008.
4. Finally, the article discusses and analyses the new deposit insurance scheme in Thailand based on the Institute of Deposit Protection Act 2008, which will be enforced in August 2011. I also discuss the effects of this deposit insurance on the Thai's banking industry, and also provide recommendation for further development of this deposit insurance in the future.

³ See Demirgüç-Kunt and Kane (2002).

⁴ <http://go.worldbank.org/KXEZESCGJ0>.

The rest of the article proceeds as follows. Section 1 reviews theories and empirical evidence and primary problems associated with deposit insurance. Section 2 presents design features of deposit insurance scheme around the world and their applications. Section 3 discusses how the design features can curb the problems associated with deposit insurance. Section 4 presents the role of deposit insurance in managing recent financial crises. Section 5 discusses and analyses the deposit insurance scheme in Thailand based on the Institute of Deposit Protection Act 2008. The final section offers conclusion.

2. Review of Theory

2.1 The Moral Hazard and Adverse Selection

Although policy makers believe that deposit insurance makes bank runs less likely, it gives rise to **moral hazard**. Since bank failures are insured by the deposit insurance scheme, this naturally gives insured banks incentives to take greater risks to pursue higher profits. To boost up profits, banks can raise their risk by either increasing the risk of their asset portfolios, such as making high-risk loans or investing in riskier assets, or increasing their leverage. Prior studies have shown that deposit insurance could encourage risk taking by banks⁵. Hooks and Robinson (2002) show that deposit insurance contributed to the likelihood of bank failures in Texas during 1920s. Demirgüç-Kunt

and Detragiache (2002) employs a cross-country analysis and confirm the evidence of adverse effect of deposit insurance on bank stability. In particular, the adverse effect tends to be significantly stronger in the countries where the institutional environment is weak, that have greater coverage limit offered to depositors, and where the scheme is run by the government rather than by the private sector. Maysami and Sakellariou (2008) reveal that deposit insurance will be successful in alleviating the moral hazard and increase the stability of the financial system only if a sufficient degree of financial liberalization exists.

Apart from the moral hazard, some empirical evidence suggests that deposit insurance system also suffers from **adverse selection**. Wheelock and Kumbhakar (1995) study the adverse selection hypothesis in the Kansas's volunteer deposit insurance system in the early 1900s. They find that risk-prone banks appear to have had a greater demand for deposit insurance and were the first to join the system. Gunther, Hooks, and Robinson (2000) investigate the adverse selection hypothesis in the Texas depositions insurance system in the early 1900s. At the time, Texas banks were offered a choice of whether to obtain a privately issued guarantee of indemnity or joint a float-rate insurance plan. They found that banks that chose to insure their deposits by obtaining the privately issued guarantee of indemnity tended to be less risky than the ones that chose the flat-rate plan.

⁵ See, for example, Merton (1977); Kareken and Wallace (1978); Gennotte and Pyle (1991); Boot and Greenbaum (1993); Matutes and Vives (1996, 2000); Onder and Ozyildirim (2007).

2.2 Market Discipline

There are two ways that depositors can discipline banks that engage in excessive risk taking. Firstly, depositors will demand higher interest rates for their deposits to compensate for the higher risk level of the bank's activities. In other words, riskier banks need to pay higher interest rates to attract depositors⁶. Secondly, depositors may respond to the increase of risk taking behavior by withdrawing their deposits. There is large empirical evidence showing that the size of deposits at a bank is negatively related to the riskiness of the bank⁷. Hence, deposit insurance schemes diminish incentives by depositors and shareholders to monitor their banks, due to the insurance protection provided by the scheme. Even worse, the deposit insurance schemes could encourage depositors to choose higher-risk banks in order to gain higher interest rates. Thus, insurance schemes shift responsibility for controlling bank risk from the important stakeholders to the regulatory system. Recent empirical evidence confirms this conclusion⁸. It shows that deposit insurance reduces market participation of depositors. As a result, it increases the likelihood of bank crises.

Thiratanapong (2007) examines the effect of the 1997 banking crisis in Thailand on deposit market discipline. First, she finds that depositors discipline banks by withdrawing their deposits from high-risk banks in both pre-and-post crises. However, deposit rates were no longer significantly responsive to bank risk after the crisis because depositors were more concerned with the safety of their deposits and place their deposits with lower-risk banks during the post-crisis period when bank failures became evident.

2.3 Risk-Sensitive Deposit Insurance and Private Information

The other way to look at moral hazard inherited in deposit insurance is based on the arbitrage pricing method, originally developed by Merton (1977). He shows that deposit insurance can be priced as a put option on the value of the bank's assets with a strike price equal to the value of the bank's debt. If the insurance premium is not related to the bank risk, the deposit insurance will be underpriced, and the bank can exploit the mispricing deposit insurance by increasing the risk of its assets and/or decreasing its capital-to-asset ratio.

⁶ See, for example, Baer and Brewer (1986); Hanan and Hanweck (1988); Ellis and Flannery (1992); Brewer and Mondschean (1994); Flannery and Sorescu (1996); Flannery (1998).

⁷ See, for example, Kane (1987); Gorton and Pennacchi (1990); Park (1995); Park and Peristiani (1998); Calomiris and Wilson (1998).

⁸ See, for example, Barth, Caprio, and Levine (2004); Demirgüç-Kunt and Detragiache (2002); Demirgüç-Kunt and Huininga (2004).

Therefore, the deposit insurance needs to be fairly priced to eliminate the risk-shifting incentive it gives banks. To tackle this mis-pricing issue, many believe that the prevailing risk-insensitive premium structure should be replaced by a **risk-sensitive deposit insurance scheme** where the insurance premium paid by banks needs to be priced in accordance with the level of risk exposed by the bank risk⁹.

However, risk-sensitive based insurance may not be feasible or desirable to be implemented due to **information asymmetry** and **adverse selection**. Banks have an incentive to misrepresent their asset risk in order to obtain favorable insurance premiums due to **private information** regarding the risk of its assets, and it is costly to eliminate **information asymmetry** by the regulator. Chan, Greenbaum and Thakor (1992) show that risk-sensitive deposit insurance schemes are incompatible with free competition in the banking sector in the case where banks have private information about their investment portfolio. They show that the subsidization of high-risk banks by the low-risk ones is required in a competitive environment. Without the subsidization, banks will be indifferent in capital structure, and the fairly priced deposit insurance will increase risk, thus high risk banks will choose to mimic the low-risk ones. Freixas and Rochet (1998) further study fairly priced deposit insurance in a general framework and find that a fairly priced

deposit insurance is feasible, but not desirable from the welfare point of view, since it will create inefficiency in the banking system.

3. Design Features of Deposit Insurance

The distinctiveness of design features of deposit insurance schemes across countries can be grouped into two main areas, the coverage of the deposit insurance scheme and how the scheme is funded. The coverage of the deposit insurance reveals types of deposits covered, coverage limit, extent of the coverage, and co-insurance system. The funding system will discuss sources of funding a deposit insurance scheme, the required insurance premiums to be contributed from member institutions, and how the insurance scheme is administrated.

3.1 Coverage

3.1.1 Coverage Type

Types of deposit coverage depend on a country's circumstances. For instance, in countries where foreign currency deposits are considerable, it is important for the EDIS system to extensively cover foreign currency deposits to promote financial stability. Based on Demirgüç-Kunt, Karacaovali, Laeven (2005) using the World Bank database, 76 percent of all the countries surveyed have coverage to foreign currency deposits.

⁹ See Black, Miller, and Posner (1978), Chan and Mak (1985), Cummins (1988), Edwards and Scott (1979), Kane (1982), Maisel (1981), Marcus and Shaked (1984), McCulloch (1985), Merton (1977, 1978), Pennachi (1984), Ronn and Verma (1986), and Taggart and Greenbaum (1978).

On the other hands, a small number of countries, approximately, 18 percent of all the countries, have extended the coverage to inter-bank deposits. Some say extending coverage to interbank deposit could reduce the incentive to supervise other banks and thus undermine market discipline.

3.1.2 Coverage Limits

Coverage limits cap the maximum dollar amount of deposits that the deposit insurance scheme guarantees. **Coverage ratio** is the coverage limit in local currency divided by the country's GDP per capita. As shown in Table 1, coverage limits and ratios vary across countries. Selected high and upper middle income countries tend to have a considerably low coverage ratio compared to selected low and lower middle income countries. Based on the IADI discussion paper 2007, Europe has the lowest insurance coverage on average, while the Middle East has the highest.

The insurance coverage can be set high or low, depending on the public policy objectives. If the objective is to ensure banking stability, high or relatively generous coverage limits are an attractive option. If the objective is to protect small depositors and reduce the moral hazard associated with insurance, low or less generous coverage limits are preferred.

Some studies¹⁰ show that politics affect how countries adopt and design deposit insurance scheme. Hence, it is not a surprise to find that less advanced economies may provide more generous insurance scheme, since this decision could be motivated by political purposes. Furthermore, less advanced economies tend to have less developed financial markets and financial risk management mechanisms. Therefore, this requires a greater need for their governments to provide shelters for low-risk deposits. However, the main problem with the generous approach is that the greater the amount of coverage increases the moral hazard and adverse selection associated with insurance and will reduce the incentives of depositors and shareholders to monitor bank risk. As a result, there is a greater likelihood of bank crises for countries with a higher coverage ratio¹¹. Demirgüç-Kunt, and Kane (2002) finds that countries with coverage ratios of four or five are more likely to suffer bank crises than countries with coverage ratio less than one.

Therefore, lower coverage limits would be one of the ways to restrict moral hazard created by the deposit insurance scheme. Garcia (1999) finds that a smaller coverage ratio implies the less moral hazard and the higher the incentive for the depositors to discipline the bank. Imai (2006) also reaches the similar conclusion, the market discipline in Japan

¹⁰ See, for example, Kroszner and Strahan (2001); Laven (2004).

¹¹ See Demirgüç-Kunt and Detragiache (2002); Barth, Caprio and Levine (2004); Cull, Senbet and Sorge (2005).

Table 1: Coverage Limits, Coverage Type and Payment Coverage Type for Selected Countries (Updated to October 2008)

Countries	Coverage limit in US\$	Coverage ratio	Foreign currencies	Inter-bank deposits	Payment coverage
High and Upper Middle Income Countries					
Brazil	32,182	2.33	No	No	Per depositor
Canada	91,429	2.39	No	Yes	Per account
France	47,789	2.70	Yes	No	Per depositor
Germany	25,260	0.78	Yes	No	Per depositor
Hong Kong	12,857	0.31	Yes	No	Per account
Japan	91,429	2.70	No	No	Per depositor
Malaysia	17,143	1.19	No	No	Per depositor
Russia	4,115	1.08	Yes	No	Per depositor
Singapore	14,286	0.29	No	No	Per depositor
South Korea	48,571	1.97	No	No	Per depositor
Taiwan	51,429	1.73	No	No	Per depositor
UK	19,611	1.89	Yes	No	Per depositor
US	100,000	2.17	Yes	Yes	Per account
Low and Lower Middle Income Countries					
India	2,308	3.87	Yes	No	Per depositor
Indonesia	12,857	3.78	Yes	Yes	Per account
Philippines	5,714	1.73	Yes	Yes	Per depositor
Thailand ²⁰	28,571	3.57	Yes	Yes	Per account
Vietnam	3,021	4.03	No	No	n.a.

Source: Fiscal policy office of Thailand (สำนักงานเศรษฐกิจการคลัง), World Bank

improved after the government lifted a blanket guarantee of all deposits and began limiting the coverage of time deposits. The IMF suggests coverage ratios of one or two as a rough rule of thumb for appropriately limiting coverage¹².

3.1.3 Extent of Coverage

Table 1 provides information regarding the extent of coverage for selected countries. In most countries surveyed by the World Bank, the coverage limit is applied to each depositor, no matter how many accounts the depositor hold. The sum of deposits for a person is protected up to the applicable limit. However, some countries provide protection per depositor per account. Hence, the actual amount of coverage can be much higher for investors with multiple accounts. Therefore, the insurance scheme with insurance coverage applied per account would effectively increase the amount of insurance

protection resulting in aggravating moral hazard and adverse selection. To ease these problems, insurance coverage per depositor would be highly preferable.

3.1.4 Co-Insurance

Coinsurance mechanisms require depositors to bear part of the cost in case of a banking failure. The percentage of the deposit balance that a depositor would lose in the case of a bank failure is indicated by **coinsurance percentage**. Table 2 lists the countries that have an EDIS with co-insurance and also reports the coinsurance percentage for those countries. According to Demirgüç-Kunt, Karacaovali, Laeven (2005), 25 percent of all the countries surveyed have an EDIS with co-insurance. Mostly are high income and upper middle income countries and located particularly in Europe.

Table 2: Explicit Deposit Insurance Schemes with Co-Insurance by Income Level (Updated to 2008)

High income	Upper middle income	Lower middle income
Austria (10%)	Belarus (20%)	Albania (15%)
Belgium (10%)	Chile (10%)	Bolivia (50%)
Czech Republic (10%)	Colombia (25%)	
Cyprus (10%)	Lithuania (10%)	
Estonia (10%)	Poland (10%)	
Germany (10%)	Russia (50%)	
Ireland (10%)		
Isle of Man (25%)		
Luxembourg (10%)		
Oman (25%)		
Slovak Republic (10%)		
UK (10%)		

¹² See Garcia (1999).

Co-insurance is an additional measure to foster the market discipline by forcing depositor to make more prudent bank choices in their deposit decision and to monitor bank risk taking. Demirgüç-Kunt and Detragiache (2002) find evidence to support this point. They find that EDISs with no co-insurance suffer more banking system instability than EDISs with co-insurance. Furthermore, to make the co-insurance work, it is important that depositors have access to the necessary financial information that is sufficient to accurately assess risk.

3.2 Funding the Insurance Scheme

3.2.1 Sources of Funding, Administration and Membership

EDISs can be either funded or unfunded. In funded systems, usually the member institutions (e.g., banks and financial companies) privately make periodic contributions to the fund or the insurance agency that is usually set up by the government. However, public funding may also be an additional source of funding. In Thailand, based on the Institute of Deposit Protection Act 2008, the government commits to provide 1,000 million bahts as an initial capital amount for the deposit insurance scheme. In the U.S., the role of government in financially supporting its EDIS also includes absorbing the losses from the insurance agencies and may also

lending to the insurance agencies in the crisis. According to Demirgüç-Kunt, Karacaovali, Laeven (2005), the majority of EDISs around the world are jointly funded by the member institutions and their governments. In an unfunded system, which is operated in some countries¹³, the members have to contribute to the fund after the failure.

The EDIS of a country could be privately, officially (e.g. by central bank or other government agencies), or jointly administrated. EDISs typically are administrated by a government agency or by a public-private partnership. Only a few countries manage their schemes privately¹⁴. For membership, in most countries membership to the deposit insurance scheme is compulsory. Only about 10 percent of EDISs around the world have a voluntary system¹⁵.

3.2.2 Insurance Premium

Insurance premiums are the contribution required by the insurance agency administrating the insurance scheme from the member institutions. This fund will then be used as the main source of paying out depositors during bank failures. Table 3 shows annual premium, the annual contribution that the member institutions have to make in proportion to their assessment base. Premiums are generally based on deposits or insured deposits.

¹³ As of 2003, for example, these countries are Austria, Chile, France, Italy, the Netherlands, Switzerland, U.K.

¹⁴ See Demirgüç-Kunt, Karacaovali, Laeven (2005).

¹⁵ See Demirgüç-Kunt, Karacaovali, Laeven (2005).

Table 3: Premium Information for Selected Countries (Updated to October 2008)

Countries	Premium system	Annual Premium
High and Upper Middle Income Countries		
Brazil	Flat rate	0.15% of deposits
Canada	Flat rate	Maximum of 0.11% of insured deposits
France	-	On demand (unfunded system)
Germany	Flat rate	0.03% of insured deposits but can be double
Hong Kong	Risk-based	0.05%, 0.08%, 0.11%, 0.14% of deposits
Japan	Flat rate	0.108% for deposits for payment and settlement purposes, 0.08% for general deposits
Malaysia	Risk-adjusted	0.03%, 0.06%, 0.12%, 0.24% of insured deposits
Russia	Flat rate	0.13% of deposits with the maximum of 0.15%
Singapore	Risk-based	0.03%, 0.04%, 0.08% of insured deposits
South Korea	Flat rate	0.05% of deposits
Taiwan	Risk-based	Risk-based: three levels: 0.05%, 0.055%, 0.06% of insured deposits
UK	-	On demand (unfunded system)
US	Risk-adjusted	Risk-based from 0 to 0.27% of deposits
Low and Lower Middle Income Countries		
India	Flat rate	0.05% of deposits
Indonesia	Flat rate	0.1% of average of monthly balance of total deposits
Philippines	Flat rate	0.20% of deposits
Thailand*	Flat rate	0.40% of deposits with the maximum of 1%
Vietnam	Flat rate	0.15% of insured deposits

* This information is based on the Institute of Deposit Protection Act 2008 that will firstly be applied in August 2011.

Usually, the premium rate required is flat across member institutions. However, some EDISs determine the premium according to the riskiness of the assessment base of each member. Hence, premiums contributed vary across member institutions with different risk profile. This approach is so called **risk-adjusted premiums**. According to Demirgüç-Kunt, Karacaovali, Laeven (2005), there are 20 countries or about 25 percent of all countries

using such an approach. These countries primarily are high or upper-middle income countries in Europe and Latin America, for example, Argentina, Finland, Hungary, Italy, Portugal, Romania, Sweden, Turkey, Uruguay, and US. Several advanced economies in Asia including Hong Kong, Malaysia, Singapore, and Taiwan have also adopted the risk-adjusted premium system.

Risk-adjusted premium is a more recent technique to quelling moral hazard risk because the higher the riskiness of a bank, the greater the contributions required to fund the insurance scheme. In other words, risk-based contribution approach penalizes risk taking behavior of banks. It also reduces the cross-subsidizing between banks with high-and-low risk. Thus, it will force bank to monitor and reduce its own risk. There is also a number of empirical studies supporting this conclusion¹⁶.

4. Curbing Moral Hazard and Adverse Selection with Deposit Insurance Designs

Moral hazard and adverse selection decisions are the centre issues that undermine the benefit of deposit insurance. Thus, one of the main objectives in designing a deposit insurance scheme is to reduce such problems associated with deposit insurance. In generally, there are three main ways to curb the moral hazard.

1. All deposit insurance schemes need to incorporate features that will help to limit risk-taking behavior of banks. This can be achieved by setting a suitable insurance coverage limit and determining the extent of coverage. Lower coverage limit and extent of coverage will directly reduce incentives for banks to pursue risk-taking activities. Risk-adjusted premium is a new method that is especially designed for this

purpose. In comparison to a flat-premium scheme, a risk-premium scheme will directly increase insurance cost for banks with higher risk. In other words, the risk-adjusted premium will price deposit insurance more fairly. Thus, this limits opportunities for bank to economically exploit underpriced insurance by taking more risky.

2. The deposit insurance schemes must incorporate incentives to encourage large depositors, shareholders and other creditors to monitor the banks. Co-insurance is a specific design feature that addresses this issue. Co-insurance directly increases depositor's cost of negligence bank risk. Hence, it will increase incentives for depositors to monitor bank risk and penalize banks with higher risk.
3. Strong institutional environments and regulations are needed to enforce these safeguards. Design features will not help to reduce moral hazard and improve financial stability unless it is implemented under a strong institutional environment with strict enforcement. Effective banking regulations together with tough resolution policies, and credible safety features in deposit insurance require consistent enforcement of laws, integrity, indepen-

¹⁶ Cordella and Levy Yeyati (1998); Matutes and Vives (2000); Demirgüç-Kunt and Detragiache (2002).

dence from political interference, and the ability to resist bribery and demonstrate government accountability to the public¹⁷. A number of studies have stressed the important of a strong institutional environment to accompany deposit insurance scheme. Eichengreen and Arteta (2000) and Laeven (2002) show that weak institutional environments undermine gains arising from deposit insurance schemes. Furthermore, weak institutional environment may destabilize the country's financial system rather than help it¹⁸. Demirgüç-Kunt, Kane, Laeven (2008b) suggest that in countries where the quality of legal institutions is poor, the potential for corruption and abuse is high. This is likely to generate opportunities for risk-shifting by insured banks. In countries with weak legal institutions, the public interest would be better served if deposit insurance schemes were adopted later and imposed stronger risk-shifting controls.

5. Roles of Deposit Insurance in Managing Crises

A blanket deposit guarantee has been commonly used for battling banking and financial crises. For instance, countries that have used this approach in the past include Sweden (1992), Japan

(1996), Thailand (1997), Korea (1997), Malaysia (1998), Indonesia (1998), Turkey (2000). With the recent global financial crisis, many countries either employed the blanket guarantee or substantially raised the coverage limit in order to strengthen public confidence in the banking system and so prevent capital flight from their countries. The brief detail of the changes is presented in table 4.

Honohan and Klingebiel (2003) covered 40 financial crisis around the world to examine the impact of blanket guarantees and other crisis management strategies on the full fiscal costs of resolving banking system distress. They found that these crisis management measures significantly increase the ultimate fiscal cost but do not necessary increase the speed of economic recovery. In other words, a larger bailout package does not lead to a quicker recovery. In addition, they also state that providing liquidity support for economically insolvent institutions appears to prolong a crisis.

6. Discussion and analysis of the Deposit Insurance Scheme in Thailand under the Institute of Deposit Protection Act 2008

6.1 Brief Historical Background

The Thai deposit insurance history began during 1997's Asian financial crisis. To calm down the panic and maintain public confidence in banking

¹⁷ See Vaez-Zadeh, Xie and Zoli (2002).

¹⁸ See Demirgüç-Kunt and Kane (2002).

Table 4: Changes of Coverage Limit of Deposit Insurance Resulted from the 2008's Global Financial Crisis

Country	Previous Coverage Limit	New Coverage Limit	Begin
Developed countries			
Australia	AUD 20,000	Full	12 Oct 08 – 12 Oct 11
Austria	€ 20,000	Full	6 Oct 08
Denmark	DKK 300,000	Full	5 Oct 08
Germany	€ 20,000	Full	7 Oct 08
Greek	€ 20,000	€ 100,000	13 Oct 08
Hong Kong	HKD 100,000	Full	14 Oct 08 - 31 Dec 10
New Zealand	Nil	NZD 1 million	13 Oct 08 - 13 Oct 10
Singapore	SGD 20,000	Full	16 Oct 08 - 31 Dec 10
Sweden	SEK 250,000	SEK 500,000	6 Oct 08
UK	£ 33,000	£ 50,000	7 Oct 08
US	\$ 100,000	\$ 250,000	3 Oct 08 - 31 Dec 09
Emerging market countries			
Czech Republic	€ 25,000	€ 50,000	14 Oct 08
Indonesia	IDR 100 million	IDR 2 billion	13 Oct 08
Hungary	6 million forints	13 million forints	13 Oct 08
Malaysia	MYR 60,000	Full	16 Oct 08 - 31 Dec 10
Philippines	PHP 250,000	PHP 500,000	13 Oct 08
Russia	RUB 200,000	RUB 700,000	13 Oct 08
Taiwan	TWD 1.5 million	TWD 3 million	7 Oct 08
Thailand	THB 1 million	Full	28 Oct 08 - 10 Aug 2011

Source: Fiscal policy office of Thailand (สำนักงานเศรษฐกิจการคลัง)

system, the Thai government of the time put forward a resolution to fully insure all bank deposits (i.e. a blanket guarantee) and bank creditors in August 1997 under the administration of The Financial Institution Development Fund (FIDF). The full coverage for creditors had been withdrawn in 2003. On 11 August 2008, the Deposit Protection Agency Law came into effect. The Deposit Protection Agency (DPA) has replaced the FIDF as the administrator for the deposit insurance scheme.

However, due to the recent global financial crisis, the Thai cabinet agreed to extend the full coverage deposit insurance scheme until August 2011.

6.2 Main Features of the New Deposit Insurance Scheme

Coverage: This insurance scheme will cover all deposits in domestic currency, foreign currencies and interbank deposits. The coverage limit will start with a full bank deposit in the first year before

falling to no more than 100 million baht, 50 million baht and 10 million baht per account per one financial institution in the second, third and fourth year respectively. Eventually, the coverage will be at no more than 1 million baht from the fifth year onwards. This one million baht coverage will cover approximately 98.7% of all deposit accounts in Thailand. The coverage limit applied under the new deposit insurance scheme is per depositor per account. Thus, each depositor could gain substantial larger deposit insurance coverage by having accounts with multiple institutions.

Funding the insurance scheme: This insurance scheme will be primarily funded by the compulsory contributions from member institutions, including 34 commercial banks and 8 other deposit-taking institutions. The flat-premium rate of 0.4% per annum will be charged to each member institution based on its deposits.

6.3 Analysis of the New Deposit Insurance Scheme

This deposit insurance scheme can be considered as the first proper step to a deposit insurance scheme in Thailand. The ad-hoc blanket guarantee introduced in 1997 was intentionally used to battle the 1997's Asian financial crisis by boosting public confidence in the Thai's banking system. Initially, this new insurance scheme will require monitoring and further modifications may be needed after its implementation in August 2011.

Advantages of the New Deposit Insurance Scheme

1. The new insurance scheme is simple but easy for public to understand. However, considering that this is a change from blanket guarantee to a deposit insurance system, it would be important for public to slowly adjust to the new insurance system rather a radical change.
2. The significantly high coverage ratio of 3.57 as reported in table 1 help to maintain public confidence and lower the chance of panic when this insurance scheme become effective. The insurance coverage will cover about 98.7% of all deposit accounts in Thailand. Furthermore, persons with multi-million deposits could increase coverage by having an account with multiple banks.
3. Maintaining the flat-rate premium of 0.4% helps to get support from the member institutions and make it easy for the member institutions to adapt to the new scheme.

Disadvantages of the New Deposit Insurance Scheme

1. In comparison to the high and upper medium income countries, the coverage ratio of 3.57 as reported in table 1 is substantially higher and much greater than the level recommended by the IMF. Furthermore, this coverage limit applies to each depositor's account rather than

to each depositor. Hence, the actual amount of coverage can be much higher for investors with multiple accounts. The generous coverage limit could directly cause moral hazard and other adverse effects that will affect the banking stability and development in the long term.

2. The use of a flat-rate premium of 0.4% rather than a risk-adjusted premium system will also increase moral hazard and adverse selection. Under the flat-rate premium system, banks with different risk profiles are required to contribute the same premium. Therefore, banks will have an incentive in order to increase their risk to exploit the under-priced deposit insurance.
3. The new deposit insurance scheme tends to undermine market discipline. Without the co-insurance system, depositors who are major stakeholders (creditors) of a bank have less incentive to monitor bank risk. Although there are only 25 percent of all the countries surveyed that have their deposit insurance scheme using co-insurance¹⁹, the trend to having this is increasing, and it is expected to be widely used in the future.

6.4 Impacts of Introducing the Deposit Insurance Scheme on the Commercial Bank Industry and Financial Markets in Thailand

1. Changing operating cost and competitiveness of commercial banks with different risk profiles.
 - a. In the short term, the immediate effect of Thailand's new deposit insurance scheme on commercial banking is likely to be minimal. The new insurance scheme requires commercial banks to contribute a flat-rate of 0.4% premium to fund the insurance scheme. However, this premium has continued to be charged to commercial banks since the FIDF was set up in 1997. Therefore, the new insurance scheme will not increase operating costs for banks. Furthermore, the new insurance scheme will not be fully effectively until 5 years after its introduction. This will prolong immediate impacts of the scheme on commercial banks.
 - b. In the long term, there will be a growing tendency to adopt risk-adjusted premiums in Thailand's deposit insurance schemes since deposit insurance systems around the world have been moving more toward this approach. Several countries in Asia

¹⁹ See Demirgüç-Kunt, Karacaovali, Laeven (2005)

have also adopted this system. Under the risk-adjusted premium system, high-risk banks will be charged a higher rate of insurance premium compared to low-risk banks. This will directly increase the operating cost and damage the competitiveness of the high-risk banks. Furthermore, banks with higher risk in Thailand tend to be small banks. Large banks in Thailand seem to be well equipped with capital and have a better risk controls. Therefore, the risk-adjusted premium system may provide further competitiveness to these large Thai banks over their medium and small banks.

2. Boosting public interest and awareness of bank risk will potentially stimulate deposit flights and force banks to improve their risk profile.

a. The new insurance scheme eventually lowers the insurance protection from the full guarantee to the limited coverage of one million baht per account. Deposits in banks with different risk profiles are no longer covered by the same full guarantee. Therefore, the potential cost of ignoring or failure to monitor and assess bank risk properly could be substantial, particularly for wealthy depositors and institutional investors such as provident funds. Therefore, this potentially induces

deposit flights from high-risk banks to low-risk banks if the deposit rates offered by the high-risk banks are not relatively large enough.

b. In this environment the public is likely to grade banks into different risk categories similar to how bonds are graded using credit rating. Bank with lower risk will be able to offer relatively lower deposit rates whereas banks with higher risk will be forced to offer higher deposit rates to compensate depositors for risk increased. In other words, the bank's deposit rates will become more sensitive to the bank risk. Deposit rates between banks with different risk profile are likely to be widened. This will give a direct incentive for banks to manage their own risk.

c. Low-risk banks will not only gain competitiveness from lower cost of borrowing, but will gain from a perceived quality and thereby brand image enhancement. This is similar to when we refer to a bond with "AAA" rating as a quality bond. This will further enhance competitiveness of low-risk banks and increase incentive for banks to improve their public images by lowering their risk.

3. Creating advantages to specialize financial institutions involved in deposit-taking and lending activities.

These institutions include the government saving banks, the bank for agriculture and agricultural co-operatives, the government housing bank, and the Islamic bank of Thailand. These institutions were set up by the government for some specific purposes other than profit maximizing. Under the Institute of Deposit Protection Act 2008, these institutions are excluded from the insurance scheme since the deposits at these institutions are guaranteed by the government. The government guarantee may produce deposit flight from high-risk and low-risk banks to these institution whose deposits are backed up by the government. Furthermore, this allows these institutions to offer lower deposit rates, due to lower default risk. As a result, the cost of borrowing rates for these institutions would be cheaper than for other deposit-taking institutions.

4. Aiding the development of bond market and mutual fund industry.

As a result of introducing the new insurance scheme, bank deposits are no longer seen as risk-free or low-risk. This will potential generate a substantial demand for other types of low-risk investments such as investment graded-bonds or bond mutual funds.

5. Improving information disclosure in the banking industry.

Banks will be forced by the public and the banking regulators to disclose more information regarding bank risk in order to help depositors assess the banks risk. Information regarding a bank's financial position and operation will become increasingly available to the public.

6.5 Recommendations to the New Deposit Insurance Scheme

In my opinion, in long term the new deposit insurance scheme will continue to cause a moral hazard and an adverse selection problem, and also reduce market discipline. These problems undermine the benefits of having the deposit insurance and negatively impact banking stability and development. I propose that the new deposit insurance scheme looks appropriate in the short term due to its simplicity and its ability to maintain public confidence in the banking system during the termination of the blanket guarantee. Furthermore, it will take 5 year after its introduction in August 2011 for the coverage limit to be fully applied. Therefore, the public and the banking system have ample time to adjust to the new scheme. However, in the medium and long term, this deposit insurance scheme will need further development such a.

1. The coverage limit needs to be cut although there is no exact benchmark for the optimal coverage limit. However, based on the recommendation by the IMF, a coverage ratio which is closed to 2 is desirable in the medium term.

2. The extent of the coverage should be changed from the basis of “per institution per account” since this directly undermines the coverage limit itself. Depositors can easily multiple their deposit protection by having accounts with multiple banks. Therefore, to limit adverse effects created by the deposit insurance, this probably is the most urgency issue that need to be addressed.
3. In the medium term, the Thai’s DPA should consider incorporating features such as risk-premium and co-insurance system into the Thai deposit insurance scheme. The risk-premium might be easier to be adopted since it will mainly affect banks who are the contributors of the scheme and not the general public. However, to adopt the risk-premium system, the DPA needs to consult and provide a time-line since this system will affect competitiveness of banks.
4. The co-insurance system is another way to control undesirable side-effects from deposit insurance by increasing incentives for depositors to monitor the banks in which they have invested. However, it is not easy for Thailand to adopt the co-insurance system even in the medium term. This system requires a public awareness and understanding of bank risk, which is lacking due to the prolonged and generous deposit protection.
5. Strong institutional environments and regulations are also required to be in place. Several

studies have pointed out that the schemes will not be effective without a strong institutional environment.

6. After the new deposit insurance scheme is effective, the policy makers and banking regulators need to play an important role in promoting public awareness and educating the public about the bank risk and its measures, since the further development in the deposit insurance scheme such as lowering the insurance coverage, risk-premium system and co-insurance system would not be possible without general public understanding and support.

7. Bank risk is crucial for depositors when choosing banks and has a direct impact on banks’ competitiveness. As a result, there will be a need for all commercial banks to obtain a credit rating. This rating will be the main tool for the public to indentify and measure default risk for their deposits.

7. CONCLUSION

Explicit deposit insurance schemes have been seen as one of the pillars of modern financial safety. It has become one of the main tools to provide stability to the banking system and a safeguard to prevent banking crises. However, if insurance schemes are not carefully designed, instituted and enforced, deposit insurance could give rise to moral hazard, induce adverse selection, and also reduce incentive for market to discipline banks. These problems will undermine the benefit of deposit insurance and could produce substantial adverse

effects on banking stability and development. Deposit insurance design features such as risk-adjusted premium and co-insurance are now widely used to address the unwanted effect created by the deposit insurance since it helps to reduce incentives for risk-taking behavior of banks and increase incentives for depositors to monitor bank risk.

For the new deposit insurance scheme in Thailand that was postpone to begin in August 2011, this deposit insurance scheme is likely to cause more moral hazard and adverse selection, and reduce market discipline of banks in the long run due to substantially high coverage limit together with the large extent of coverage and lack of design features such as risk-based insurance premium and co-insurance system. For the short-term, in order to make the transition from the blanket guarantee to the limited coverage system smoothly and to maintain public confidence in the banking system, these design features might be appropriate for the moment. However, in the longer term, the policy makers and banking regulators will need to seriously consider lowering the coverage limit and alter the extent of the coverage from per institution per

account to be per depositor. Moreover, risk premium and co-insurance systems are also needed to be considered for adoption in the long-term for controlling the adverse effects.

Immediate impacts of introducing this deposit insurance scheme on the Thai banking system will be minimal. However, in the long run the scheme could significantly affect the banking system by providing competitive edge to low-risk banks. The spread between deposit rates between banks with different risk profile is expected to be widened. Therefore, to maintain competitiveness, high-risk banks will need to adjust and improve their risk profile. Under such environment, the banking regulators should consider applying the credit rating system or other risk assessment to all commercial banks in order to help the public identify and assess default risk of their deposits. Bond markets and mutual fund industry will reap the benefit of the new insurance scheme since the bank deposits can no longer be seen as risk-free or near risk-free investments. This will create substantial demand for other types of low-risk investments such as bonds and mutual funds.

References

- ทวีศักดิ์ มานะกุล, พีรกานต์ บูรณากาญจน์, กาญจนา ตั้งปกรณ, จรัสวิทย์ สายธารทอง, 2551, ทำไม 1 ล้านบาท, สำนักงานเศรษฐกิจการคลัง
- ทวีศักดิ์ มานะกุล, พีรกานต์ บูรณากาญจน์, จรัสวิทย์ สายธารทอง, ปุริม คัมภักซ์, 2551, ระบบคุ้มครองเงินฝากทำให้ระบบสถาบันการเงินเข้มแข็งและระบบการเงินมีเสถียรภาพจริงหรือ?, สำนักงานเศรษฐกิจการคลัง
- รานี อภิญาวัตร์, พีรกานต์ บูรณากาญจน์, กาญจนา ตั้งปกรณ, จรัสวิทย์ สายธารทอง, 2551, วิฤตการณ์เงินกับระบบประกันเงินฝาก, สำนักงานเศรษฐกิจการคลัง
- Baer, H. and E. Brewer, 1986, Uninsured Deposits as a Source of Market Discipline: Some New Evidence, **Federal Bank of Chicago, Economic Perspectives**, Sep., pp. 23-31.
- Barth, J.R., G. Caprio, and R. Levine, 2004, Bank Regulation and Supervision: What Works Best?, **Journal of Financial Intermediation** 13, 205-248.
- Black, F., M.H. Miller, and R.A. Posner, 1978, An Approach to the Regulation of Bank Holding Companies, **Journal of Business** 51, pp. 379-412.
- Boot, A. and S. Greenbaum, 1993, Bank Regulation, Reputation, and Rents: Theory and Policy Implications, in **Capital Market and Financial Intermediation**, ed. by C. Mayer and X. Vives, Cambridge University Press, pp. 262-285.
- Brewer, E. III and T.H. Mondschean, 1994, An Empirical Test of the Incentive Effects of Deposit Insurance, **Journal of Money, Credit, and Banking** 26, 1, pp. 146-64.
- Calomiris, C. and B. Wilson, 1998, Bank Capital and Portfolio Management: The 1930's 'Capital Crunch' and Scramble to Shed Risk, NBER Working Paper No. 6649.
- Chan, Y-S., S. Greenbaum, and A. Thakor. 1992, Is Fair Priced Deposit Insurance Possible? **Journal of Finance** 47, 1, pp. 227-245.
- Chan, Y-S. and K.T. Mak, 1985, Depositor's Welfare, Deposit Insurance, and Deregulation, **Journal of Finance** 39, pp. 959-974.
- Cummins, J.D., 1988, Risk-Based Premiums for Insurance Guaranty Funds, **Journal of Finance** 43, pp. 823-839.
- Cordella, T. and E.L. Yeyati, 1999, Financial Opening, Deposit Insurance, and Risk in a Model of Banking Competition, IMF Working Paper no. 98/97, International Monetary Fund, Washington, D.C.

- Cull, R., L.W. Senbet, and M. Sorge, 2005, Deposit Insurance and Financial Development, **Journal of Money, Credit, and Banking** 37, 1, pp. 44-80.
- Demirgüç-Kunt, A. and H. Huizinga, 2004, Market Discipline and Deposit Insurance, **Journal of Monetary Economics** 51, pp. 375-399.
- Demirgüç-Kunt, A., B. Karacaovali, and L. Laeven, 2005, Deposit Insurance around the World: A Comprehensive Database, The World Bank, Washington, D.C.
- Demirgüç-Kunt, A. and E. Detragiache, 2002, Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation, **Journal of Monetary Economics** 49, pp. 1373-1406.
- Demirgüç-Kunt, A. and E.J. Kane, 2002, Deposit Insurance around the Globe: Where Does it Works, **Journal of Economic Perspectives** 16, pp. 175-195.
- Demirgüç-Kunt, A., E.J. Kane, and L. Laeven, 2008a, **Deposit Insurance around the World: Issues of Design and Implementation**, MIT Press
- Demirgüç-Kunt, A., E.J. Kane, and L. Laeven, 2008b, Determinants of Deposit-Insurance Adoption and Design, **Journal of Financial Intermediation** 17, pp. 407-438.
- Edwards, F.R. and J. Scott, 1979, Regulating the Solvency of Depository Institutions: A Perspective for Deregulation, in Franklin R. Edwards, ed.: **Issues in Financial Regulation** (McGraw-Hill, New York, NY).
- Eichengreen, B. and C. Arteta, 2000, Banking Crises in Emerging Markets Presumptions and Evidence, **Mimeo**, University of California, Berkley.
- Ellis, D.M. and M.J. Flanneiy, 1992, Does the Debt Market Assess Large Bank's Risk?, **Journal of Monetary Economics** 30, 3, pp. 481-502.
- Freixas, X. and J-C. Rochet, 1998, Fair Pricing of Deposit Insurance. Is It Possible? Yes. Is it desirable? No., **Research in Economics** 52, pp. 217-232.
- Flannery, M.J., 1998, Using Market Information in Prudential Bank Supervision: A Review of the U.S. Empirical Evidence, **Journal of Money, Credit, and Banking** 30, 3, pp. 273-305.
- Flannery, M.J. and S.M. Sorescu, 1996, Evidence of Bank Market Discipline in Subordinated Debenture Yields: 1983-1991, **Journal of Finance** 51, 4, pp. 1347-377.
- Folkerts-Landau, D. and C-J. Lindgren, 1998, Toward a Framework for Financial Stability, International Monetary Fund, Washington, D.C.
- Garcia, G.G.H., 1999, Deposit Insurance: A Survey of Actual and Best Practices, IMF Working Paper no. 99/54, International Monetary Fund, Washington, D.C.

- Gennotte, G. and D. Pyle, 1991, Capital Controls and Bank Risk, **Journal of Banking and Finance** 15, pp. 805-824.
- Gorton, G. and G. Pennacchi, 1990, Financial Intermediaries and Liquidity Creation, **Journal of Finance** 45, 1, pp. 49-71.
- Gunther, J.W., L.M. Hooks, and K.J. Robinson, 2000, Adverse Selection and Competing Deposit Insurance Systems in Pre-Depression Texas, **Journal of Financial Services Research** 17, 3, pp. 237-258.
- Hannan, T.H. and G.A. Hanweck, 1988, Bank Insolvency Risk and the Market for Large Certificates of Deposit, **Journal of Money, Credit, and Banking** 20, 2, pp. 203-11.
- Honahan, P. and D. Klingebiel, 2003, The Fiscal Cost Implications of an Accommodating Approach to Banking Crises, **Journal of Banking and Finance** 27, pp. 1539-1560.
- Hooks, L.M. and K.J. Robinson, 2002, Deposit Insurance and Moral Hazard: Evidence from Texas Banking in the 1920s, **Journal of Economic History** 62, 3, pp. 833-853.
- Kane, E. J., 1982, S & Ls and Interest Rate Regulation: The FSLIC as In-Place Bailout Program, **Housing Finance Review** 1, pp. 219-243.
- Kane, E.J., 1987, Who Should Learn What from the Failure and Delayed Bailout of the ODGF?, **Federal Reserve Bank of Chicago, Proceedings from a Conference on Bank Structure and Competition**, pp. 306-326.
- Karenen, J. and N. Wallace, 1978, Deposit Insurance and Bank Regulation: A Partial Equilibrium Exposition, **Journal of Business** 51, pp. 413-438.
- Kroszner, R.S. and P. Strahan. 2001. Obstacles to Optimal Policy: The Interplay of Politics and Economics in Shaping Bank Supervision and Regulation Reforms. In: F.S.
- Laeven, L., 2002, International Evidence on the Value of Deposit Insurance, **Quarterly Review of Economics and Finance**, 42, 4, pp. 721-732.
- Laeven, L., 2004, The Political Economy of Deposit Insurance, **Journal of Financial Services Research** 26, 3, pp. 201-224.
- Maisel, S.J., 1981, The Theory and Measurement of Risk and Capital Adequacy, in Scott J. Maisel, ed.: **Risk and Capital Adequacy in Commercial Banks** (NBER) (University of Chicago Press).
- Marcus, A.J. and I. Shaked, 1984, The Valuation of FDIC Deposit Insurance: Empirical Estimates Using the Options Pricing Framework. **Journal of Money, Credit and Banking** 16, pp. 446-460.

- Matutes, C. and X. Vives, 1996, Competition for Deposits, Fragility, and Insurance, **Journal of Financial Intermediation** 5, pp. 184-216.
- Matutes, C. and X. Vives, 2000, Imperfect Competition, Risk Taking, and Regulation in Banking, **European Economic Review** 44, pp. 1-34.
- Maysami, R.C. and C. Sakellariou, 2008, Financial Liberalization, Deposit Insurance and Bank Stability, **Applied Economics Letters** 15, pp. 743-747.
- McCoy, P.A., 2006, The Moral Hazard Implications of Deposit Insurance: Theory and Evidence, **Seminar on Current Developments in Monetary and Financial Law**, Washington, D.C., October 23-27, 2006.
- McCulloch, J.H., 1985, Interest-Risk Sensitive Deposit Insurance Premia: Stable ACH Estimates, **Journal of Banking and Finance** 9, pp. 137-156.
- Merton, R.C., 1977, An Analytical Derivation of the Cost of Deposit Insurance and Loan Guarantees, **Journal of Banking and Finance** 1, pp. 3-11.
- Merton, R.C., 1978, On the Cost of Deposit Insurance When There Are Surveillance Costs, **Journal of Business** 51, pp. 439-452.
- Mishkin, ed., **Prudential Supervision: What Works and What Doesn't**. Chicago: University of Chicago Press, pp. 233-273.
- Önder, Z. and S. Özyildirim, 2008, Market Reaction to Risky Banks: Did Generous Deposit Guarantee Change It?, **World Development** 36, pp. 1415-1435.
- Park, S., 1995, "Market Discipline by Depositors: Evidence from Reduced-Form Equations, **Quarterly Review of Economics and Finance** 35, pp. 497-514.
- Park, S. and S. Peristiani, 1998, Market Discipline by Thrift Depositors, **Journal of Money, Credit, and Banking** 30, 3, pp. 347-364.
- Pennachi, G.G., 1984, Valuing Alternative Forms of Deposit Insurance for Intermediaries Subject to Interest Rate Risk, Working paper, Wharton School, University of Pennsylvania.
- Ronn, E. and A.K. Verma, 1986, Pricing Risk-Adjusted Deposit Insurance: An Option Based Model, **Journal of Finance** 41, pp. 871-895.
- Thiratanapong, N., 2007, Market Discipline in Banking: Evidence from Thailand during the 1997 Crisis, **Applied Economics Letters** 14, pp. 559-563.

Vaez-Zadeh, R., D. Xie, and E. Zoli, 2002, MODIS: A Market-Oriented Deposit Insurance Scheme, IMF Working Paper no. 02/207, International Monetary Fund, Washington, D.C.

Wheelock, D.C. and P.W. Wilson, 1995, Explaining Bank Failures: Deposit Insurance, Regulation, and Efficiency, **Review of Economics and Statistics** 77, pp. 689-700.

Taggart, R.A. and S.I. Greenbaum, 1978, Bank Capital and Public Regulation, **Journal of Money, Credit and Banking** 10, pp. 158-169.