



The effects of public capital infusions on banks' risk-shifting to the deposit insurance system in Japan



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ABSTRACT

Using option pricing based models, we compute the actuarially fair deposit insurance premium and the market value of assets and asset volatility for Japanese banks as implied by their stock prices. The findings based on these variables suggest that banks shift risks to the deposit insurer who charges them risk insensitive premiums. Well-designed regulatory policies in response to the crisis, however, effectively restrain banks' risk-shifting. Not only did the introduction of the prompt corrective action discipline insured banks, but large-scale public capital infusions successfully deleveraged banks whose assets are risky. This effectively mitigated banks' risk-shifting.

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1. Introduction

In Japan, amid the financial crisis of the late 1990s, the deposit insurance coverage cap at 10 million yen per depositor per institution was abandoned in June 1996, transforming the deposit insurance system from a limited to an unlimited insurance until March 2002 when the cap was reinstated.

As the financial crisis became more evident, the Japanese government decided to inject public capital into the banks, first in March 1998 and again in March 1999. Under 1998 and 1999 programs, which targeted primarily systematically important major banks, the amounts infused into the banking system totaled 1.8 trillion yen and 7.5 trillion yen, respectively.

A more rigorous regulatory action framework known as the Prompt Corrective Action (PCA) that mandates regulatory interventions into a poorly capitalized bank became effective in March 1998. The application of the PCA to domestic banks that are barred from international businesses was deferred for one year until March 1999.

The more generous insurance protection offered during a crisis is aimed at calming the fears of depositors who might otherwise panic and start a run on their viable banks to withdraw their

deposits.² There is, however, a broad consensus that the negative side effect of the publicly run deposit insurance system is the problem of moral hazard, that is, the propensity for insured banks to take excessive risks because the deposit insurance insulates insured banks from the risk of losing deposits when they lose their bets and become distressed.^{3,4}

The design of the modern day deposit insurance is characterized as a “flat” premium design. The risk profile of the premium per unit of insured deposits that the public insurer charges banks is flatter than that of the actuarially fair premium that the private insurer would charge in the absence of a public insurer. Consequently, insured banks are willing to take greater risks to pursue higher returns as their greater risk taking does not cost them a larger insurance premium. This is a classic example of moral hazard.⁵

Some authors argue that an insured bank’s moral hazard incentive is restrained by a strict regulator (a tougher enforcer of regulations) who successfully disciplines the banks (Grossman, 1992; Duan et al., 1992; Hovakimian et al., 2003; Hovakimian and Kane, 2000). Although public capital infusions and the expansion of the deposit insurance protection are the widely employed prudential policy package to contain a financial crisis, the impact of public capital infusions on the moral hazard of banks, which is likely fueled by a more generous deposit insurance protection, is overlooked in the literature.⁶

Using Japanese bank data, we examine whether the (generous) deposit insurance induced (accelerated) banks’ moral hazard and whether the tougher PCA regulatory framework restrained banks from excessive risk-taking. Our unique contribution to the literature, however, is to examine the impacts of public capital infusions on the risk-taking of insured banks. Public capital reduces a recipient bank’s leverage, thereby making a bank less susceptible to insolvency. Consequently, the deposit insurance becomes less valu-

² See Diamond and Dybvig (1983) for the classical discussion on the problem of an inefficient bank run and the role played by the publicly run deposit insurance system as a measure to prevent depositors’ panic. The recent global financial crisis, however, gives us a different picture. As Ivashina and Scharfstein (2009) find, banks that were in trouble and reduced credit were those that were heavily dependent on short-term debts raised from capital markets as short-term debtors left banks when the crisis erupted. According to Hyun Song (2009), even as for the case of Northern Rock that is often publicized as a rare event of a bank run in the recent crisis, the root cause of the bank’s demise was its heavy reliance on short-term debts. Based on such empirical evidence, the increased insurance protection may not be the most desirable response to the crisis.

³ For the review of the theoretical literature on the relationship between the deposit insurance system and insured banks’ risk taking, see Gropp and Vesala (2004). An excellent read on this subject is Freixas and Rochet (2008).

⁴ “Core Principle for Effective Deposit Insurance Systems” published in June, 2009 by the BCBS states, “Moral hazard should be mitigated by ensuring that the deposit insurance system contains appropriate design features and through other elements of the financial system safety net” (Principle 2).

⁵ The studies that examine the impact of the deposit insurance on banks’ moral hazard include Keeley (1990), Duan et al. (1992), Grossman (1992), Brewer and Mondschean, (1994), Brewer (1995), Wheelock and Wilson (1995), Karels and McClatchey (1999), Hovakimian and Kane (2000), Demirgüç-Kunt and Detragiache (2002), Hooks and Robinson (2002), Hovakimian et al. (2003), Gropp and Vesala (2004), Wagster (2007, 2012), and Ioannidou and Penas (2010). Among them, only Keeley (1990), Grossman (1992) and Karels and McClatchey (1999) present evidence against insured banks’ moral hazard.

⁶ According to Laeven and Valencia (2012b), 17 out of 23 countries studied incurred the fiscal cost of bank recapitalization and other restructuring costs, whereas 21 of these countries expanded the deposit protection during the years 2007–2009. According to Laeven and Valencia (2012a), in 8 of 42 historical financial crises, banks were recapitalized and deposits were protected under the blanket guarantee. More recently, Demirgüç-Kunt et al. (2015) report the main findings from the IMF’s comprehensive cross country database covering 189 IMF countries and Liechtenstein. Based on the database, which is publicly accessible, among 112 countries where relevant information is collected, from 2008 through 2013, the deposit insurance system had been introduced in 14 countries and the statutory insurance coverage had been raised in 59 countries.

able to the bank. Thus, public capital potentially mitigates the moral hazard of a bank that is insured by flat-rate based deposit insurance.

Based on the model developed by Duan et al. (1992), we test how policy measures influence the banks’ risk-shifting, that is, an insured bank passes its risks on to the deposit insurer who is liable for the losses incurred by depositors if the bank fails. Using the daily stock prices and semiannual balance sheets of all listed Japanese banks, for each bank, we compute the semiannual “actuarially fair” insurance premium per dollar (IPP), which represents the value of the deposit insurance to an insured bank per unit of deposits. Our test is based on the relationship between a bank’s IPP and the volatility of the market value of a bank’s assets. When the actual premium is fixed, the bank is taking advantage of the flat rate based deposit insurance if a bank’s actuarially fair premium increases with its overall asset risk. This is because an increase in a bank’s asset risk increases the value of the deposit insurance to the bank but does not increase the premium that the bank pays to the publicly run insurer.

Our major findings are fourfold: First, banks that are insured by the flat-rate based deposit insurance are engaged in risk-shifting regardless of whether or not the insurance coverage is unlimited. Second, in aggregate, fully insured banks that were not subject to the PCA did not accelerate risk-shifting. Third, the PCA was effective in restraining insured banks’ risk-shifting incentives. Fourth and most importantly, the 1999 public capital infusion program was effective in restraining the banks’ risk-shifting through curbing leverage, whereas the 1998 public capital infusion program was ineffective. Under the 1999 program, the amount of public capital injected into each bank was linked to its capital adequacy. As a consequence, the more greatly a bank increased its asset risk, the more public capital the bank received and the less leveraged it became because an increase in asset risk was generally associated with a decrease in capital adequacy. On the other hand, under the 1998 program the amount of capital received by each bank was not linked to its capital adequacy. To the best of our knowledge, we are the first to identify the mechanism through which properly designed public recapitalization affects not only the quantity of a bank loans as discussed in the literature but also its overall risk-taking behavior (quality of assets held by the bank).⁷

The remainder of the paper is organized as follows: Section 2 discusses the related literature. Section 3 introduces the institutional background, Section 4 discusses the empirical methodology, Section 5 discusses the data and empirical results. Section 6 concludes.

2. The related literature

Two studies using our empirical framework find that introducing tougher regulatory reforms mitigates the banks’ moral hazard. Duan et al. (1992) find that banks in the United States became more restrained from risk-shifting after the introduction of numerical capital adequacy standards in 1981. Similarly, Hovakimian and Kane (2000) find that American banks became more restrained from risk-shifting after regulatory reforms in 1991, which introduced the deposit insurance premium linked to a bank’s capital adequacy and the PCA.

Moreover, using a sample of banks in Milwaukee and Chicago in the 1930s, Grossman (1992) finds that insured thrifts held fewer foreclosed loans than uninsured thrifts and that the risk reducing effect of the deposit insurance was less pronounced in Chicago where regulation was lenient than in Milwaukee where regulation

⁷ For the review of the literature about effects of public recapitalization on the banking behavior, please see Section 2.

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