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ECONOMIC COMMENTARY

Equity, Efficiency, and Mispriced Deposit Guarantees

by James B. Thomson

Federal deposit insurance is supposed to protect savers and to help stabilize our banking system. However, if the deposit guarantees are mispriced, federal deposit insurance has unintended effects that are undesirable.

In this *Economic Commentary*, we examine the factors that determine the value of deposit insurance. We show how insured banks can increase the value of their insurance and discuss their incentives to do so.[1]

The economic consequences of mispriced deposit insurance includes a misallocation of resources, an inequitable transfer of wealth between society and the insured industry, and an inequitable transfer of wealth between institutions within the insured industry.[2]

Since its beginning in 1934, federal deposit insurance has provided safety for the savings and transactions balances of small savers. This role usually is justified on the basis of equity and efficiency. Providing deposit guarantees for small savers is considered equitable because the cost of obtaining information is thought to be greater for small depositors than for large depositors. If small depositors lack the sophistication and resources to monitor the health of their banks, then without deposit insurance they are at a disadvantage compared to large depositors. Large depositors, being better informed, usually manage to withdraw their money from a failing bank, typically leaving small savers holding the bag.

If small depositors lack information about their bank, then they will tend to overreact to whatever bad news they may hear, whether it is true or not. The rational response against a perceived threat is for small savers to attempt to protect themselves against loss by participating in a run against the bank.

By guaranteeing the deposits of small savers, federal deposit insurance removes the incentives for them to participate in bank runs. Providing deposit guarantees for small savers thus increases the efficiency of the banking system because it reduces the probability of destabilizing bank runs.

Moreover, a single federal deposit-insurance agency is likely to have lower information costs than the total cost of the combined efforts of a mass of small depositors. For this reason, provision of deposit guarantees for small depositors also increases the efficiency of deposit markets by lowering the costs of gathering information on the condition of banks.

By guaranteeing deposits, however, the federal deposit guarantor bears the risk of the deposits it is insuring, and there are costs associated with this. Whether or not a bank fails, for example, the federal deposit guarantor incurs the cost of gathering and evaluating information about the condition of a bank. If banks do fail, the guarantor then has the additional expense of paying claims of insured depositors.

If a system of deposit guarantees is to improve the equity and efficiency of deposit markets, the deposit-insurance agency must charge the insured institutions for the risk-bearing services provided by the deposit-insurance agency lest those services be overused.

Forcing individual institutions to bear the costs of the risks they place on the deposit-insurance fund makes sense because bankers will manage the risks in their portfolios more carefully if they know they will have to bear all the costs of making risky loans and investments. Such a reallocation of costs also is desirable because risk-based premiums allocate the costs of the deposit-insurance system among the insured institutions on the basis of the benefits they receive from the system.[3]

If insured institutions do not pay the full costs of the risk-bearing services they receive from the deposit-insurance agency, then the deposit-insurance system subsidizes the risk-taking behavior of the insured institutions. Since, at the margin, the subsidy reduces the

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1. The discussion here is limited to the deposit guarantees issued by the three federal deposit-insurance agencies: the Federal Deposit Insurance Corporation (FDIC), the Federal Savings and Loan Insurance Corporation (FSLIC) and the National Credit Union Share Insurance Fund (NCUSIF). However, the analysis can easily be extended to other types of government guarantees.

2. For a comprehensive discussion of this topic see Edward J. Kane. *The Gathering Crisis in Federal Deposit Insurance,* MIT Press, 1985.

3. If the social benefits of government deposit insurance exceed the private benefits, the deposit-insurance premium should be higher than that implied by the private benefits that accrue to the insured institution. However, if the external benefits of deposit insurance accrue to society in general, then it can be argued that society as a whole should pay for the benefits. A risk-neutral subsidy that reallocates wealth from the deposit-insurance system to the insured institutions is one way of accomplishing this. For a more complete discussion of this argument, see: Anthony Saunders and John J. Merrick Jr. "Bank Regulation and Monetary Policy." *Journal of Money,*

cost of risk to the insured institutions, the insured institutions will tend to increase the risk of their portfolio.

The subsidy inherent in such a deposit-insurance system can be independent of the risk of the institution or can increase with the risk of the institution. For example, Buser, Chen and Kane argue that the FDIC purposely underprices its guarantee to all banks to induce state-chartered banks that are not members of the Federal Reserve System to submit to federal regulation.[4] This subsidy is independent of the risk of the institution. The current flat-rate deposit-insurance premium that is assessed against all institutions, regardless of risk, creates a deposit-insurance subsidy whose value increases with risk. In either case, mispriced deposit insurance subsidizes risk-taking behavior by insured institutions and encourages insured institutions to increase the risk of their portfolios.

Strategies for Increasing the Value of the Deposit Guarantee

We assume that bank managers want to maximize the value of the bank to its stockholders. If deposit insurance is properly priced, the value of a bank to its owners is neutral, it is the same with deposit guarantees as it is without them.[5] If the deposit guarantee is either underpriced or overpriced, however, deposit insurance either increases or decreases the total value of the bank by the amount of the deposit-insurance subsidy. With mispriced deposit insurance, the goal of the owners is to maximize the combined value of the bank (without deposit insurance) and the deposit-insurance subsidy. Bank managers thus will act to increase the value of the deposit-insurance subsidy so long as it increases the total value of the insured institution. They even will accept a reduction in the value of the bank, net of the deposit-insurance subsidy, as long as the increase in the value of the deposit-insurance subsidy more than offsets the decrease in the value of the bank.

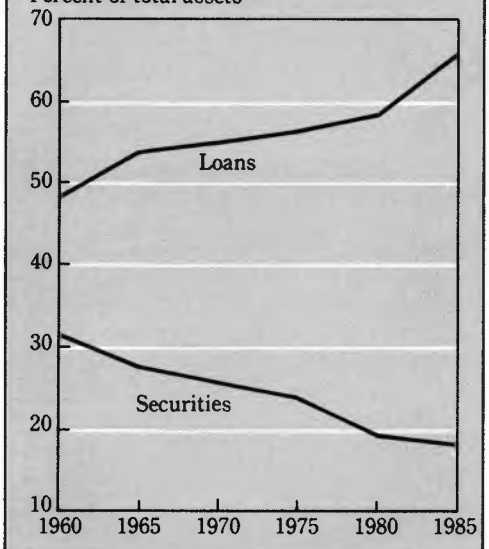
The value of the deposit guarantee is a function of the expected losses to the deposit-insurance agency if the bank becomes insolvent, and to the probability that the bank will become insolvent.[6] In other words, the value of the deposit-insurance subsidy arises because bank stockholders receive the returns from increased leverage and/or portfolio risk, while the deposit-insurance agency and the uninsured depositors bear the increased downside losses. The owners of the institution receive all the benefits from increased leverage and portfolio risk without having to pay the full costs associated with their actions.

Here are some ways banks can increase their risk. The leverage of the institution, can be increased by reducing the amount of capital the institution holds relative to its assets. One way of doing this is to increase the size of the institution and to finance its growth entirely with debt. Another way is to issue debt and to distribute the proceeds of the debt issue to the stockholders as dividends, instead of purchasing additional assets. The marked decline in bank capital ratios during the 1960's and 1970's suggests that the major banking institutions may have increased the value of the deposit-insurance subsidy by increasing their leverage during this period.

Without changing the leverage of its portfolio, an institution can also increase the value of its deposit insurance by increasing its total portfolio risk. There are several ways to do this. The portfolio risk can be increased, for example, by changing the composition of the institution's assets or by changing the composition of the liabilities used to fund the assets.

Chart 1 Loans and Securities

% of total commercial banking assets



SOURCE: Board of Governors of the Federal Reserve System.

Asset risk can be increased by changing the relative amounts of the portfolio's low-risk and high-risk assets. If the percentage of the bank's portfolio invested in high credit-risk assets (such as commercial loans) is increased at the expense of low credit-risk assets (such as treasury bills), the overall risk of the portfolio will increase. In fact, we have seen such a change in the composition of banks' portfolios in recent years. As seen in chart 1 loans (securities) as a percentage of assets have steadily increased (decreased) since the early 1960's.

The portfolio risk also can be raised by increasing the credit risk of the portfolio's high credit-risk assets. If the asset credit risk in the risky asset part of the bank's portfolio increases (as bank managers replace less-risky exist-

4. See Steven A. Buser, Andrew C. Chen, and Edward J. Kane. "Federal Deposit Insurance, Regulatory Policy, and Optimal Bank Capital." *Journal of Finance* vol. 36, no. 1, March 1981, pp. 51-60.

5. The social value of the properly priced deposit insurance may be positive if federal deposit insurance increases the efficiency and equity of the financial system.

6. Merton shows that deposit insurance can be modeled as a put option. Thomson uses put options to show how subsidies arise from mispriced deposit insurance. For a discussion of the use of put options to value deposit insurance, see: Robert C. Merton, "An Analytic Derivation of the Cost of the Deposit Insurance and Loan Guarantees: An Application of Modern Option Pricing Theory." *Journal of Banking and Finance* vol. 1, no. 1 June 1977, pp. 3-11; Robert C. Merton. "On the Cost of Deposit Insurance When There are Surveillance Costs." *Journal of Business* vol. 51, no. 2, July 1978, pp. 439-452; and James B. Thomson. "The Use of Market Information in Pricing Deposit Insurance." Working Paper, Federal Reserve Bank of Cleveland, August 1986. (Forthcoming.)

ing loans with riskier loans), the risk of the portfolio and, hence, the value of the deposit guarantee increases. An indication that this is happening can be inferred from the fact that banking and thrift industry regulators routinely express concern regarding the declining asset quality at many banks and thrifts.

The third way bank managers can restructure assets to increase portfolio risk is by decreasing the diversification of the portfolio. The risk level of the portfolio increases as its sensitivity to any single firm, industry, country, or macroeconomic shock increases. The difficulties faced by banks with major investments in the depressed energy sector, and in the farm sector, underscores the risks inherent in overconcentrating assets in any one sector of the economy.

The risk on the liability side of the portfolio can be raised by increasing the institution's reliance on purchased funds, which tend to be a less stable source of funds than deposits.[7] An increase in the instability of the liabilities used to fund the asset side of the portfolio raises the probability of near-term illiquidity, leading inexorably to insolvency for the institution. An excessive reliance on purchased funds, for example, is thought to be one of the major causes of the near failure of Continental Illinois National Bank and Trust Company of Chicago in 1984.

The total portfolio risk of an institution can also be increased by mismatching the maturity and/or the interest sensitivity of assets and liabilities.[8] An increase in the mismatch between the maturity of the assets and the liabilities that fund them increases the probability that large and unexpected deposit outflows will force the institution to liquidate part of the asset side of the portfolio at a large loss. This forced liquidation increases the probability that the institution will fail, therefore increasing the total risk of the institution.

An increase in the interest-sensitivity mismatch between assets and liabilities also increases overall portfolio risk. If the assets are more (less) interest sensitive than the liabilities, an increase in interest rates causes an increase (a reduction) in the value of the portfolio. A decrease in interest rates has the opposite effect. Therefore, an increase in the portfolio's asset-liability interest-sensitivity mismatch, increases uncertainty about earnings and, hence, the total risk of the portfolio.

The risks inherent in interest-sensitivity mismatches between assets and liabilities are illustrated by the current problems in the thrift industry. The inflationary climate of the late 1970's and early 1980's increased the cost of funds for thrifts and decreased the value of their assets (primarily fixed-rate mortgages). The losses in the thrifts' portfolios eroded the capital of these institutions, leaving one-third of them at or near the brink of insolvency on a market-value basis.

The Economic Effects of the Deposit-Insurance Subsidy

Deposit-insurance subsidies arise when the insurance premium paid by banks is less than the fair value of the deposit guarantee. It is important to remember that there is a tradeoff between risk and expected return. Bearing risk is a service provided by private sector market participants for which they must be paid. As the risk of a project increases, the amount of risk-bearing services provided by market participants also increases. Therefore, the amount they are paid should increase as the services they provide increases. If insured institutions are able to increase the expected return to their shareholders without paying for the additional value of their deposit insurance, then the value of the deposit-insurance subsidy increases.

An institution receiving deposit insurance has real incentives to increase the value of the subsidy by increasing either its leverage, its portfolio risk, or a combination of both. Increasing the value of the deposit-insurance subsidy increases the bank's value to its stockholders at the expense of the deposit-insurance agency.[9] However, there are real economic costs other than the money transferred from the deposit-insurance agency to the bank's stockholders. Deposit insurance that is equal for all insured institutions, regardless of risk, or that increases with the risk of the institution, with no corresponding increase in premium, has two basic effects. First, the subsidy gives insured institutions a competitive advantage over uninsured institutions in raising funds and buying assets. In essence, the insured institution can offer part of its insurance subsidy to depositors in order to attract deposits. Holding risk constant, the insured institution can pay higher rates on its liabilities than the uninsured institution can offer on equivalent debt. When competing for assets, the insured institution can give better terms on loans and pay higher prices for securities than the uninsured institution because it can offset the higher cost of assets with its deposit-insurance subsidy.

Second, mispriced deposit insurance subsidizes the institution's risk-taking and thereby allows it to hold a riskier portfolio than it would if the subsidy were zero and if the insurance were fairly priced. By mispricing its guarantee, the deposit-insurance agency reduces the cost to the bank's shareholders and managers of increasing the risk of the bank's portfolio. Thus, an insurance subsidy that does not vary with the amount of risk-taking by insured institutions causes resources in the economy to be misallocated.

7. Purchased funds are liabilites that the bank or thrift attracts from national capital markets. They include negotiable certificates of deposit, brokered deposits, federal funds and Eurodollar borrowings. Deposit liabilities include the traditional demand deposits, NOW accounts, money market deposit accounts, and small time and savings deposits.

8. McCulloch claims that maturity mismatching in a bank's portfolio is a consequence of deposit insurance and not a natural function of financial intermediation by these institutions. See J. Huston McCulloch. "Misintermediation and Macroeconomic Fluctuations." *Journal of Monetary Economics* vol. 8, no. 1, July 1981, pp. 103-115.

9. The recent moves by firms such as Merrill Lynch, and Sears, to set up or purchase institutions that offer insured deposits is an indication that the value of the deposit-insurance subsidy is economically significant. The brokered-deposit market, where brokers are paid a fee to gather insured deposits for institutions, is another example of the value of the deposit-insurance subsidy.

If the deposit-insurance subsidy increases as the institution takes greater risks, the perverse effects of the subsidy are magnified. As insured banks take on more risk, their deposit-insurance subsidy increases and their ability to pay a higher return (offer a lower interest rate) on their liabilities (assets) than uninsured institutions increases. A subsidy that increases with risk encourages an insured institution to adopt an even riskier portfolio than a subsidy that does not increase with risk. Allowing deposit-insurance subsidies to increase with bank risk magnifies the resource misallocations associated with mispriced deposit insurance.

In addition, a risk-related subsidy that automatically increases with the level of risk has the additional effect of giving high-risk insured institutions a competitive advantage over low-risk insured institutions. As with the uninsured institution, the low-risk institution's smaller deposit-insurance subsidy does not allow it to pay as much for its assets or to offer as high a return on its deposits as a high-risk insured institution with a larger subsidy. This causes society as a whole to invest too heavily in risky projects and increases the probability of a system-wide failure of the federally insured banking and thrift industries.

Conclusion

The goals of federal deposit insurance are to protect uninsured depositors and to increase the stability of the banking system. Few would argue that the system has failed in its goal of protecting small savers. No small saver has lost a penny of insured money since federal deposit insurance was established.[10]

However, it is not clear that the current system of federal deposit insurance has achieved its second goal. The absence of bank runs on federally insured institutions is an indication that federal deposit insurance has helped stabilize the financial system.[11] On the other hand, mispricing the deposit guarantee encourages insured institutions to adopt riskier portfolios. This effect serves ultimately to destabilize the financial system.

Whether the ultimate net effect of federal deposit insurance on the stability of the financial system is positive or negative is beyond the scope of this article. While few economists would dispute the claim that federal deposit insurance has tended to stabilize the banking system, it is clear that removal of the subsidy inherent in the current deposit-insurance system would increase the equity, efficiency, and stability of our banking and thrift industries.[12]

10. See The Federal Deposit Insurance Corporation. *Federal Deposit Insurance Corporation: The First Fifty Years,* 1984, Washington, D.C.

11. The collapse of the privately operated Ohio Deposit Guarantee Fund (ODGF) led to runs on ODGF-insured savings and loan institutions. See the Federal Reserve Bank of Cleveland 1985 Annual Report.

12. See for example, Edward J. Kane. "A Six-Point Program for Deposit Insurance-Reform." *Housing Finance Review,* July 1983, pp. 269-278; George G. Kaufman, and Gerald O. Beirwag. "A Proposal for Federal Deposit Insurance with Risk Sensitive Premiums." *Occasional Papers of the Federal Reserve Bank of Chicago,* 83-3, March 16, 1983; Pyle, David H. "Pricing Deposit Insurance: The Effects of Mismeasurement." Federal Reserve Bank of San Francisco, Working Paper 83-05, October 1983; The Working Group of the Cabinet Council on Economic Affairs, *Recommendations for Change in the Federal Deposit Insurance System,* United States Treasury Department, January 1985.

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