

7. Deposit Insurance and Moral Hazard, Risk, and Incentives

Entries in this section deal with the moral-hazard problem caused by the provision of deposit insurance, methods of mitigating the problem, the effect of deposit insurance on bank risk-taking behavior and on the incentives of bank management, and the principal–agent problem in bank regulation.

Acharya, Sankarshan. 1991. Efficient Resolution of Moral Hazard via Capital Market: Monitoring Banks. Finance and Economics Discussion Series, no. 178. Board of Governors of the Federal Reserve System.

This paper shows that capital market competition can efficiently resolve moral hazard in a firm whose shareholders (the agent) control the standard deviation of the rate of return to assets (volatility), and whose debt holders, unable to observe the volatility, can appoint a not-for-profit principal (regulator) to insure their debt and monitor the firm for a price. In equilibrium, shareholders of such a firm (e.g., a bank) receive an expected rate of return (compensation) consistent with their risk of investment; and the asset volatility and debt (deposit) insurance premium are determined as increasing functions of capital. Further, thresholds of capital below which such a firm is closed is positive. An algorithm is presented to compute equilibrium results. (©1999 EconLit)

Acharya, Sankarshan. 1995. Efficient Resolution of Moral Hazard under No Arbitrage: Risk Premium, Volatility, and Leverage. Finance and Economics Discussion Series, no. 95-15. Board of Governors of the Federal Reserve System.

The shareholder–debtholder conflict is efficiently resolved when the capital market acts as a super monitor to preclude arbitrage and when debtholders monitor the firm. The market value of a firm in a world where monitoring is necessary is equal to the market value in a world where monitoring is not necessary; what adjusts in equilibrium is the state-pricing-density. In a no-arbitrage equilibrium, the asset risk premium and the volatility of a levered firm are negatively related, the asset volatility and risk premium are increasing in the asset/debt ratio, and the threshold asset/debt ratio below which the firm is closed because of bankruptcy or liquidation is an increasing function of the asset risk premium.

Baker, Tom. 1996. On the Genealogy of Moral Hazard. *Texas Law Review* 75, no. 2:237–93.

The author focuses on the legal and political question of the extent to which those who suffer are responsible for their condition. In the legal academy, the question is debated within the framework of law and economic analysis. Within that framework, the concept of “moral hazard” is one of the most important yet least well understood. The author explains how the concept of moral hazard, applied to banking regulation, bankruptcy law, business law, and the like, has changed the way U.S. laws treat citizens.

Benston, George J. 1995. Safety Nets and Moral Hazard in Banking. In *Financial Stability in a Changing Environment*, edited by Kuniho Sawamoto, Zenta Nakajima, and Hiroo Taguchi, 329-377. Bank of Japan. [Followed by comments by Pierre Duguay and Kazuhito Ikeo.]

In the absence of other constraints, bank owners and managers have incentives to take greater risks than they would have taken without the federal safety net. The essential questions considered in this paper are how costly the problem is and what can and should be done about the situation. Author describes the ways nongovernment providers of insurance deal with this problem. He also considers moral hazard in financial markets. He concludes that the optimal combination of the benefits from safety nets, the cost of moral hazard, and the cost of dealing with moral hazard is complex and best left to the parties affected; in general, government should not intervene.

Brewer, Elijah III, William E. Jackson, and James T. Moser. 1996. Alligators in the Swamp: The Impact of Derivatives on the Financial Performance of Depository Institutions. *Journal of Money, Credit, and Banking* 28, no. 3 (part 2): 482-97.

It has been argued that underpriced federal deposit insurance provides incentive for insured institutions to increase the value of shareholder equity by expanding into activities that shift risk onto the deposit insurer. Derivative instruments have been used by firms to change their risk exposure. Permitting firms with substantial moral hazard incentives to utilize interest-rate derivative instruments could lead to higher rather than lower exposure to risk. This article, using a sample of savings and loan associations (S&Ls), examines the proposition that involvement with interest-rate derivatives instruments increases depository institutions' risk. The authors find that there is a negative correlation between risk and derivatives usage. In addition, S&Ls that used derivatives experienced relatively greater growth in their fixed-rate mortgage portfolios. (©1999 EconLit)

Brewer, Elijah III, and Thomas H. Mondschean. 1992. Ex Ante Risk and Ex Post Collapse of S&Ls in the 1980s. Federal Reserve Bank of Chicago *Economic Perspectives* (July/August): 2-12.

This research examines the risk premiums on S&Ls' large certificates of deposit and the returns on, and volatility of, S&L common stock. These studies report evidence that supports that moral hazard—the incentive for managers and shareholders to take advantage of underpriced deposit insurance by taking additional risks—significantly increased the cost of the S&L bailout.

Brewer, Elijah III, and Thomas H. Mondschean. 1994. An Empirical Test of the Incentive Effects of Deposit Insurance: The Case of Junk Bonds at Savings and Loan Associations. *Journal of Money, Credit, and Banking* 26, no. 1:146-64.

This paper analyzes how financial markets reacted to S&L diversification into junk bonds. The authors report that junk bond holdings are positively correlated with both the volatility of S&L equity returns and the interest rates paid on large CDs. Next, they examine the impact of junk bonds on equity returns. For poorly

capitalized S&Ls, greater risk-taking increases the value of deposit insurance and should lead to higher stock returns. However, a well-capitalized institution that increases junk bond holdings should not experience stock price gains. The authors find that this is the case for the sample of S&Ls they studied. (©1999 EconLit)

Brewer, Elijah III, Thomas H. Mondschean, and Philip E. Strahan. 1997. The Role of Monitoring in Reducing the Moral Hazard Problem Associated with Government Guarantees: Evidence from the Life Insurance Industry. *Journal of Risk and Insurance* 64, no. 2:301–22.

State guaranty funds provide partial protection to life insurance liability holders in the event of an insolvency, thus creating a potential moral hazard problem akin to the one associated with deposit insurance in the banking industry. Consistent with this theory, we find that risk-taking by life insurers is higher in states with guaranty funds that are underwritten by taxpayers. In states where taxpayers pay for the costs of resolving insolvencies, life insurers hold portfolios with higher overall stock market risk and higher levels of risky assets. By contrast, in states where the guaranty funds are underwritten by the industry, overall risk is no higher than in states without these funds. (©1999 EconLit)

Calomiris, Charles W., Charles M. Kahn, and Stefan Krasa. 1991. Optimal Contingent Bank Liquidation under Moral Hazard. Issues in Financial Regulation Working Papers Series, no. 1991-13. Federal Reserve Bank of Chicago.

This paper uses models of asymmetric information and incentive compatibility to explain two distinctive features of the arrangements by which banks obtain financing-demandable debt and the sequential service constraint. The option of early withdrawal and contingent liquidation of the bank serves as a disciplinary device to keep the banker's portfolio choice in line with depositors' preferences. The possibility of default and the first-come, first-served rule give depositors the incentive to monitor the banker.

Crawford, Anthony J., John R. Ezzell, and James A. Miles. 1995. Bank CEO Pay-Performance Relations and the Effects of Deregulation. *Journal of Business* 68, no. 2:231–56.

The authors test a deregulation hypothesis that posits that bank CEO compensation became more sensitive to performance as bank management became less regulated. They observe a significant increase in pay-performance sensitivities from their 1976–81 regulation subsample to their 1982–88 deregulation subsample. These increases in pay sensitivities after deregulation are observed for salary and bonus, stock options, and common stock holdings. The authors observe increases in the pay-performance relation associated with high-capitalization-ratio banks, consistent with providing incentives for wealth creation. Even larger increases in pay-performance sensitivity for lower capitalization-ratio banks suggest a Federal Deposit Insurance Corporation moral hazard problem. (©1999 EconLit)

Davies, Sally M., and Douglas A. McManus. 1991. *The Effects of Closure Policies on Bank Risk-Taking*. Finance and Economics Discussion Series, no. 158. Board of Governors of the Federal Reserve System.

This paper models bank closure policy for a risk averse bank that enjoys flat-rate deposit insurance. The authors find that increasing the level of net worth at which banks are closed can increase or decrease induced risk aversion, as well as increase the likelihood that marginally healthy banks would be subject to extreme moral hazard. In addition, they find that changes in closure policy can increase or decrease desired leverage and that this effect depends on the degree of correlation among asset returns. (©1999 EconLit)

Demsetz, Rebecca S., Marc R. Saldenberg, and Philip E. Strahan. 1997. *Agency Problems and Risk-Taking at Banks*. Staff Reports, no. 29. Federal Reserve Bank of New York.

The moral-hazard problem associated with deposit insurance generates the potential for excessive risk-taking on the part of bank owners. The banking literature identifies franchise value—a firm's profit-generating potential—as one force mitigating that risk-taking. The authors argue that in the presence of owner/manager agency problems, managerial risk aversion may also offset the excessive risk-taking that stems from moral hazard. Empirical models of bank risk tend to focus either on the disciplinary role of franchise value or on owner/manager agency problems. The paper estimates a unified model and finds that both franchise value and ownership structure affect risk at banks. More important, it identifies an interesting interaction effect: the relationship between ownership structure and risk is significant only at low-franchise-value banks—those where moral-hazard problems are most severe and where conflicts between owner and manager risk preferences are therefore strongest. Risk is lower at banks with no insider holdings, a finding that suggests that the owner/manager agency problem affects the choice of risk for only a small number of banks—those with low franchise value and no insider holdings.

Duan, Jin-Chuan, Arthur F. Moreau, and C. W. Sealey. 1992. *Fixed-Rate Deposit Insurance and Risk-Shifting Behavior at Commercial Banks*. *Journal of Banking and Finance* 16, no. 4:715–42.

Fixed-rate deposit insurance is thought to provide banks with an incentive to shift risk to the FDIC, thereby expropriating wealth. Banks can achieve these wealth transfers by increasing their overall risk and thus increasing the actuarial value of the deposit insurance. The authors test the risk-shifting hypothesis on a sample of U.S. banks. They use an option-based methodology to price each bank's actuarial liability to the FDIC. They then conduct statistical tests to determine if banks have been successful in manipulating risk in such a way as to increase these liabilities. The results suggest that, with notable exceptions, risk shifting is not widespread.

Finch, Howard James. 1992. Thrift Insolvency and Go-for-Broke Management Behavior. Ph.D. diss., University of Alabama.

This dissertation seeks to test for excessive risk-taking, or “go-for-broke” behavior, on the part of thrifts that experience declining net worth. First, the author fits a regression equation to account for changes in each variable due to macroeconomic influences. Then, using statistical quality-control techniques, he tracks the residuals from the regressions, representing unexplained changes. The conclusion is that thrifts experiencing declining net worth did not engage in “go-for-broke” investment behavior. The analysis indicated that the risk subsidies that deposit insurance forbearance provides managers did not result in excessive risk-taking by thrifts facing financial distress.

Goldberg, Lawrence G., and T. Harikumar. 1991. Risk-Taking Incentives of Banks and Risk-Adjusted Deposit Insurance. *Journal of Financial Research* 14, no. 3:233–39.

The manager of a depository institution is shown to exhibit risk-taking behavior under the current insurance arrangement. Perfect monitoring or risk-based deposit insurance would eliminate this incentive if information were symmetric between bank managers and the insuring agency. Absent symmetric information, it is shown that a recently suggested scheme, where insurers collect insurance premiums based on projected and actual risk levels, does not control the risk-taking incentive. The only way to control this incentive through insurance rates is to levy a relatively high premium, which is not actuarially fair. (©1999 EconLit)

Gorton, Gary, and Richard Rosen. 1995. Corporate Control, Portfolio Choice, and the Decline of Banking. *Journal of Finance* 50, no. 5:1377–420.

In the 1980s, U.S. banks became systematically less profitable and riskier as nonbank competition eroded the profitability of banks’ traditional activities. Bank failures rose exponentially during this decade. The leading explanation for the persistence of these trends centers on fixed-rate deposit insurance: the insurance gives bank equityholders an incentive to take on risk when the value of bank charters falls. The authors propose and test an alternative explanation based on corporate control considerations. They show that managerial entrenchment played a more important role than did the moral hazard associated with deposit insurance in explaining the recent behavior of the banking industry. (©1999 EconLit)

Grossman, Richard S. 1992. Deposit Insurance, Regulation, and Moral Hazard in the Thrift Industry: Evidence from the 1930s. *American Economic Review* 82, no. 4:800–821.

This paper compares risk-taking of insured and uninsured thrifts operating under strict and less-strict regulatory regimes during the 1930’s. Analysis of balance-sheet data indicates that while newly insured thrifts undertook less risk than their uninsured counterparts, possibly because of screening by deposit-insurance authorities, moral hazard emerged gradually. Insured institutions operating under relatively permissive regulatory regimes were more prone to undertake risky

lending activities than their more tightly regulated counterparts. Possibly because of screening by deposit-insurance authorities, moral hazard emerged gradually. Insured institutions operating under relatively permissive regulatory regimes were more prone to undertake risky lending activities than their more tightly regulated counterparts. Given the current system of deposit insurance, the results suggest that effective regulation and supervision will play a key role in maintaining thrift stability in the 1990s. (©1999 EconLit)

Gunther, Jeffrey W., and Kenneth J. Robinson. 1990a. Empirically Assessing the Role of Moral Hazard in Increasing the Risk Exposure of Texas Banks. Financial Industry Studies Working Paper no. 90-4. Federal Reserve Bank of Dallas.

The authors investigate the possibility that a deterioration in financial performance, coupled with federal deposit insurance, prompted Texas banks in 1983–1984 to take on the large amounts of asset risk that ultimately contributed to their high rate of failure. To assess the role of moral hazard in banking difficulties, the authors test whether changes in asset risk occurring from 1983 to 1984 were related to the prior rate of growth in book-value capital among a sample of insured commercial banks operating in the Dallas and Houston metropolitan areas. They do this by developing an econometric model to investigate the factors that contribute to a bank's risk exposure.

Gunther, Jeffrey W., and Kenneth J. Robinson. 1990b. Moral Hazard and Texas Banking in the 1980s: Was There a Connection? Financial Industry Studies Working Paper no. 90-6. Federal Reserve Bank of Dallas.

The authors analyze the potential role of the risk-taking incentives arising from moral hazard as a causal factor in the financial difficulties of Texas banks in the 1980s. The ability of insured depository institutions to place at risk funds that are guaranteed by the government may encourage institutions to participate in risky ventures they otherwise might avoid. Given the incentives to engage in activities with greater risk, a key linkage between moral hazard and federal deposit insurance is a bank's capital position. Moral hazard, combined with deregulation and increased competition created the financial sector distress of the 1980s. The existence of moral hazard may lie behind the transition from the well-balanced bank portfolios characteristic of stable banking periods to the higher-risk portfolios that tend to characterize banks when their capital levels drop below regulatory standards.

Holguin, Angela H. 1997. Controlling Moral Hazard of Federal Deposit Insurance through the Risk-Related Premium System. Ph.D. diss., University of Delaware.

The author explains how the federal deposit insurance system has demonstrated its ability to stave off banking panics and depositor runs in the face of industry and economic hardships. However, she argues, the ability of the premium system to discourage moral hazard must be improved if the banking industry is to remain competitive and the insurance funds are to be maintained at sufficient levels to absorb losses from insured institutions. For these goals to be accomplished, the system's risk mechanisms for identifying and pricing should be refined so that

they promote greater financial incentives to control risks and so that they distribute the costs of deposit insurance more equitably.

Hovakimian, Armen, and Edward J. Kane. 1996. Risk-Shifting by Federally Insured Commercial Banks. Working Paper no. W5711. National Bureau of Economic Research.

When deposit insurance is mispriced and misadministered, it imparts risk-shifting incentives to U.S. banks. Regulators are expected to monitor and discipline increases in bank risk exposure that would transfer wealth from the FDIC to bank stockholders. This paper assesses the success regulators had in controlling risk-shifting by U.S. banks during the period 1985–1994. In contrast to single-equation estimates developed from the option model by others, the simultaneous-equation approach used here yields evidence that indicates regulators failed to prevent large U.S. banks from shifting risk to the FDIC. Moreover, at the margin, banks that are undercapitalized shifted risk more effectively than other sample banks.

Iwamura, Mitsuru. 1993. Deposit Insurance and Moral Hazard. *Bank of Japan Monetary and Economic Studies* 11, no. 1:63–85.

It is well known that deposit insurance creates a moral-hazard problem. However, no precise answers have been given as to what characterizes the risk-incentive mechanism of commercial banks under deposit insurance systems and whether a system of variable deposit insurance premiums, which is often regarded as a more consistent framework, can resolve the moral-hazard problem. This article seeks to estimate the risk premiums of deposit insurance systems, using numerical integration under certain simplified assumptions; it also seeks to offer some answers to the two questions above. The functions of most deposit insurance systems extend beyond simple insurance payoffs and include rescue operations and merger assistance. The former function guarantees only the principal of bank deposits, while the latter covers both principal and interest. This article examines why these functional differences create some difficulties in resolving the moral-hazard problem.

Kane, Edward J. 1990. Principal–Agent Problems in S&L Salvage. *Journal of Finance* 45, no. 3:755–64.

FDIC legislation and traditional insolvency-resolution procedures intensified the principal–agent problems most responsible for the Federal Savings and Loan Insurance Corporation (FSLIC) crisis. These same principal–agent problems placed counterproductive constraints on the governance and operating policies on the Resolution Trust Corporation—the agency responsible for rescuing and salvaging assets in insolvent thrifts. Such constraints slowed insolvency resolution, increased interim financing costs, and undermined RTC recovery of asset value. In an attempt to preserve evanescent and economically misconceived “franchise values,” the RTC allowed insolvents to seek financing on an unconsolidated basis, initiated bidding for institutions one at a time, held back seriously troubled assets, and recruited an overly narrow range of bidders.

Kane, Edward J. 1993. How Incentive-Incompatible Deposit Insurance Funds Fail. In *Research in Financial Services: Private and Public Policy: 1992*, vol. 4, edited by George G. Kaufman, 51-91. JAI Press.

An incentive-incompatible deposit insurance fund (IIDIF) is a scheme for guaranteeing deposits at client institutions that deploys defective systems of information collection, client monitoring, and risk management. These defective systems encourage voluntary risk-taking by clients and by managers and politicians responsible for administering the fund. The paper focuses on how principal-agent conflicts and asymmetries in the distribution of information lead to myopic behavior by IIDIF managers and by politicians who appoint and constrain them. (©1999 EconLit)

Karels, Gordon V., and Christine A. McClatchey. 1999. Deposit Insurance and Risk-Taking Behavior in the Credit Union Industry. *Journal of Banking and Finance* 23, no. 1:105-34.

This paper examines the relationship between deposit insurance and risk-taking behavior within the credit union industry. Time series tests employing industry average financial ratios for federal and state credit unions did not support the increased risk-taking hypothesis. Although federal credit union capital declined immediately following the adoption of deposit insurance, this was most likely the result of reduced capital requirements, not deposit insurance. Liquidity and loan delinquency ratios had a negative time trend coefficient, implying a decline in risk-taking behavior during the post-insurance period. Cross-sectional test results employing Iowa state-chartered credit union data indicated that insured credit unions were better capitalized and more liquid than their uninsured counterparts. Overall there was no evidence that the adoption of deposit insurance increased the risk-taking behavior of credit unions. (©1999 EconLit)

Keeley, Michael C. 1990. Deposit Insurance, Risk, and Market Power in Banking. *American Economic Review* 80, no. 5:1183-200.

A fixed-rate deposit insurance system in the absence of regulation might provide a moral hazard for excessive risk-taking. Although the U.S. deposit insurance system appears to have worked remarkably well over most of its 50-year history, major problems began to appear in the early 1980s. This article tests the hypothesis that increases in competition caused bank charter values to decline, which in turn caused banks to increase default risk through increases in asset risk and reductions in capital. The results suggest that banks with more market power hold more capital relative to assets and have a lower default risk, as reflected in lower risk premiums on large, uninsured CDs.

Khorassani, Jacqueline. 1997. Real Deposit Insurance Limits, the Moral Hazard Problem, and Bank Failure. Ph.D. diss., West Virginia University.

This dissertation investigates an explanation for the high failure rate among depository institutions during the 1980s and early 1990s. The moral-hazard hypothesis contends that, in the presence of deposit insurance, banks have an

incentive to acquire riskier assets than they should, because insured depositors—secure in the knowledge that their funds are safe in any event—will not penalize the institution by withdrawing their funds or requiring that a risk premium be added to the rates paid on their deposits. Thus, the moral-hazard hypothesis relies on the behavior of two groups of agents, depositors and banks, and on the linkage between them. The author uses 44 quarterly cross-sectional data sets to test 60–95 percent of all insured commercial banks in the United States over the period 1984–1994. The results suggest that as real deposit insurance decreased, depositors’ sensitivity to bank risk increased. However, as predicted by the moral-hazard hypothesis, banks did not react to depositors’ increased risk sensitivity by lowering the level of their controllable risk.

Kroszner, Randall S. and Philip E. Strahan. 1995. Regulatory Incentives and the Thrift Crisis: Dividends, Mutual to Stock Conversions, and Financial Distress. Working Paper no. 119. Center for the Study of the Economy and the State, University of Chicago.

This paper explores the incentive problems arising from the insolvency of both individual thrifts and the thrift deposit insurance fund during the 1980’s. Consistent with their theory, the authors find insolvent and poorly-capitalized mutual thrifts were much more likely to convert during the period of the deposit insurer’s cash shortage than either before or after. Second, insolvent institutions had a higher propensity to pay dividends during the period of cash shortage. Third, using a model of regulatory and thrift behavior relating dividend payments to conversions, capital, and earnings, they find that initially insolvent mutual-to-stock converters were more likely to pay dividends out of earnings and were less constrained by low capital than other stock thrifts. The authors conclude by discussing how private debt covenants prevent this type of behavior in non-financial firms and how recent legislative changes can be interpreted as requiring regulators to impose similar types of covenants on depository institutions. (©1999 EconLit)

Kuester, Kathleen A., and James O’Brien. 1989. Bank Equity Values, Bank Risk, and the Implied Market Values of Banks’ Assets and Liabilities. Finance and Economics Discussion Series, no. 67. Board of Governors of the Federal Reserve System.

The paper examines the importance of several sources of risk in valuing banks’ market equity and deposit insurance. The analysis indicates that both bank-specific loan credit risk and the market’s discount for bank default risk are important determinants of banks’ market equity values. The results suggest that the market risk discount may be influenced by factors that are important in determining the general level of stock prices. Finally, the value of deposit insurance net of explicit and implicit regulatory costs is found to differ across banks, depending in part on bank-specific risk. (©1999 EconLit)

Levonian, Mark E., and Fred Furlong. 1995. Reduced Deposit Insurance Risk. Federal Reserve Bank of San Francisco *Weekly Letter*, no. 95-08 (February 24).

This issue of the *Letter* analyzes trends in bank risk and the implications for the deposit insurance system. The analysis suggests that, although the risk associated with bank assets and activities has increased, bank capital positions have soared, pushing down estimates of the federal deposit insurance liability to relatively moderate levels. In the public-policy debate, the improved health of banks and the deposit system should tip the balance more toward the gains in efficiency that may result if the barriers separating banks from other financial institutions are removed.

Macey, Jonathan R., and Geoffrey P. Miller. 1995. Deposit Insurance, the Implicit Regulatory Contract, and the Mismatch in the Term Structure of Banks' Assets and Liabilities. *Yale Journal on Regulation* 12, no. 1:1-24. Also 1995. Deposit Insurance, the Implicit Regulatory Contract, and the Mismatch in the Term Structure of Banks' Assets and Liabilities. In *Banking Law Anthology*, edited by Allison P. Zabriskie, 329-352. International Law Library Publishers.

Authors explore the relationship between deposit insurance and the mismatch in the term structure of commercial banks' assets and liabilities. After critiquing the traditional regulatory hypothesis, which posits that banks have incentives to fund long-term assets with short-term liabilities because government-sponsored deposit insurance enhances bank credit and subsidizes short-term liabilities, they use public choice theory to argue that a modified version of the regulatory hypothesis is the best explanation for the mismatch in the term structure of banks' assets and liabilities. Finally, they argue that embracing the regulatory hypothesis does not imply acceptance of the government-sponsored deposit insurance scheme as it exists in the U.S. (©1999 EconLit)

Matutes, Carmen, and Xavier Vives. 1995. Imperfect Competition, Risk-Taking, and Regulation in Banking. Discussion Paper 1177. Centre for Economic Policy Research.

The authors develop a model of banking competition which disentangles the roles that limited liability, deposit insurance (both with flat and risk-based premia), and rivalry for deposits play in determining risk-taking incentives both in the asset and the liability side of the balance sheet. They find that in all market configurations (uninsured or insured) banking rivalry yields excessive deposit rates when social failure costs are high or when competition is intense. Maximal risk-taking incentives (on the liability and asset sides) exist with flat-premium deposit insurance and minimal with risk-based insurance. In an uninsured market, risk-taking on the asset side is implied by limited liability and the presence of moral hazard (asset risk not observable). With flat-premium deposit insurance maximum risk-taking incentives exist even if there is no moral hazard. Finally, the authors extricate the role of rate and asset regulation both in the case of insured and uninsured deposits. (©1999 EconLit)

Mazumdar, Sumon C. 1997. Regulatory Monitoring, Closure Costs, and Bank Moral Hazard Behavior. *Journal of Regulatory Economics* 12, no. 3:267–89.

This article theoretically analyzes the efficacy of close regulatory monitoring and early bank closure policies, introduced by the 1991 Federal Deposit Insurance Corporation Improvement Act (FDICIA), in reducing the FDIC's losses and curbing bank moral hazard behavior induced by mispriced deposit insurance. Contrary to conventional wisdom the author demonstrates that continuous bank monitoring and early closure may in fact exacerbate the moral hazard problem if bank shareholders face a penalty upon closure. Moreover, if reputational disincentives and monitoring costs prevent the regulator from implementing timely closure then the bank's moral hazard incentives are significantly altered. These results suggest several new policy implications. (©1999 EconLit)

McKenzie, Joseph A., Rebel A. Cole, and Richard A. Brown. 1992. Moral Hazard, Portfolio Allocation, and Asset Returns for Thrift Institutions. *Journal of Financial Services Research* 5, no. 4:315–39.

This article examines the earnings performance of nontraditional assets allowed to thrifts since the early 1980s. It uses the statistical cost accounting methodology developed by D. Hester and J. Zoellner to estimate average returns on thrift portfolio investments for the years ending June 30, 1987 and June 30, 1988. Results show that average returns on land loans, service corporation investment, real estate investment, and commercial loans were significantly lower than returns on more traditional assets. The results are far more pronounced at capital deficient institutions, lending support to the hypothesis that they used nontraditional investments as a means of exploiting the deposit insurance system. Returns on nontraditional assets are significantly affected by geographic factors, even for well capitalized institutions. The article concludes with an evaluation of the reimposition of portfolio restrictions on thrifts by the Financial Institutions Reform, Recovery, and Enforcement Act of 1989. (©1999 EconLit)

Mei, Jianping, and Anthony Saunders. 1991. Bank Risk and Real Estate: An Asset Pricing Perspective. Working Paper S-91-50. Salomon Center, New York University.

While a number of papers have investigated the ex post variables driving the return-generating process of bank stock returns, no study has comprehensively studied: (i) the ex ante risk premiums on bank stocks and (ii) the time varying nature of such premiums. In this study, the authors investigate how the changing nature of bank risk-taking (especially in the real estate market) along with the presence of a federal safety net (like deposit insurance) has affected the ex ante pricing of risk in the market for bank stocks. The major finding is that a premium for real estate risk is increasingly apparent in the market for bank stocks, presumably reflecting these banks' growing exposures in this area; however, factor risks for the biggest money center banks are underpriced. This underpricing is consistent with the presence of "too-big-to-fail" safety-net subsidies for the nation's largest banks. (©1999 EconLit)

Nagarajan, S., and C. W. Sealey. 1997. Market Discipline, Moral Hazard, and Bank Regulation. In *Technology://www.policy.implications.for.the.future.of.financial.services/com*, Proceedings of the 33d Annual Conference on Bank Structure and Competition, 226-40. Federal Reserve Bank of Chicago.

This paper seeks to develop a model of bank regulation under conditions of moral hazard and to examine the feasibility of delegating the regulatory function to market forces. The authors designed the model to investigate the incentives of different claimholders to exert market discipline on banks' risk-taking decisions. The authors show that the various private-sector claimholders of a bank will choose optimal levels of information production and monitoring that are less than that of the regulator.

Pecchenino, Rowena A. 1992. Risk-Based Deposit Insurance: An Incentive Compatible Plan. *Journal of Money, Credit, and Banking* 24, no. 4:499-510.

This paper develops a model of a risk-based deposit insurance regulatory regime in which the insurer induces banks to reveal truthfully the riskiness of their portfolios and to protect adequately their creditors from loss. This scheme reduces the limits on stockholder liability, responds to changes in market conditions, and provides depositors with timely information on bank risk. (©1999 EconLit)

Peek, Joe, and Eric S. Rosengren. 1997. Derivatives Activity at Troubled Banks. *Journal of Financial Services Research* 12, no. 2-3:287-302.

Because of moral hazard associated with deposit insurance, troubled banks that have a relatively thin capital cushion to absorb losses have an incentive to take speculative positions. Thus, the prevalence of problem banks among those actively engaged in derivatives markets should be of concern to bank supervisors. However, the authors find no evidence that bank supervisors take into account, either favorably or unfavorably, the derivatives activities of troubled banks in their decisions to downgrade bank ratings or impose regulatory actions. The derivatives activity of troubled banks should raise the same concerns expressed about banks' on-balance-sheet positions, namely, that they may not be fully exploiting hedging opportunities or may be placing their remaining capital at risk, intentionally or unintentionally. (©1999 EconLit)

Scott, Kenneth E. 1989. Deposit Insurance and Bank Regulation: The Policy Choices. *Business Lawyer* 44, no. 3:907-33.

Technological advances in the computer and communications industries, rising inflation and interest rates, the collapse of energy prices, and a world recession all exerted pressure on the old system of deposit insurance and legal regulation of banking. The author discusses three possible explanations for the stress: (1) the national and world economies have undergone random shocks; (2) events have shown a need for better supervision of banking; and (3) the uniform premium structure of the deposit insurance system creates an incentive for a bank to accept higher risks than it would otherwise. Controlling institutional risk, matching the

insurance premium to the risk, closing the bank before insolvency, and transforming insured deposits into riskless claims are all policy choices for dealing with the risk-incentive problem.

Shiers, Alden F. 1994. Deposit Insurance and Banking System Risk: Some Empirical Evidence. *Quarterly Review of Economics and Finance* 34, no. 4:347–61.

This paper examines the effect of federal deposit insurance on the riskiness of the commercial banking system. It is generally acknowledged that a system of fixed rate deposit insurance creates incentives for banks to increase their risk-taking activities. Yet very little empirical evidence exists confirming or refuting this supposition. The coefficient of variation of bank profits and the standard deviation of profits are used as measures of bank risk. How these measures of bank risk are affected by deposit insurance coverage, and other variables thought to affect bank risk, is examined. Deposit insurance is found to have a statistically significant positive effect on bank risk. This result provides empirical support for the FDIC Improvement Act requirement of risk related deposit insurance premiums starting January 1994. (©1999 EconLit)

Shoven, John B., Scott B. Smart, and Joel Waldfogel. 1991. Real Interest Rates and the Savings and Loan Crisis: The Moral Hazard Premium. Working Paper no. 3754. National Bureau of Economic Research.

Real interest rates rose to historically high levels in 1980 and remained high throughout the decade. Macroeconomists attribute this phenomenon to a combination of tight monetary policy, fiscal deficits, and variable inflation rates. This paper presents preliminary evidence for an additional explanation of high real rates that is related to the decade-long crisis in the savings and loan industry. Deposit insurance moral hazard, and regulatory forbearance provide the incentives and the means for insolvent thrifts to issue liabilities that compete with Treasury securities in the market for funds. Thus, as the magnitude of the thrift crisis grew during the 1990's, so did pressure on Treasury yields. Even if the effect of the S&L crisis on interest rates is small, the increased cost of financing the public debt adds significantly to the total costs associated with the savings and loan fiasco. (©1999 EconLit)

Sivasangaram, Murugesu. 1991. Deposit Insurance and Banks' Risk-Taking Incentives with Forbearance and Uncertain Insolvency Resolution. Ph.D. diss., Queen's University at Kingston.

This dissertation extends Marcus's (1984) work to analyze the implication of forbearance and uncertain insolvency resolution for depository institutions' risk-taking behavior. The author's prime objective is to investigate whether forbearance and uncertain insolvency resolution have contributed to past banking crises. The models show that forbearance and uncertain insolvency resolution distort banks' risk incentives. However, the distortions do not seem to create a financial crisis. The general wisdom, which holds that the insurers' practices are responsible for the crisis, does not have much validity. The dissertation also

shows that with forbearance and uncertain insolvency resolution, the equilibrium deposit rate of return becomes sensitive to the behavior of the insurer and the market as well as to the interactions between them.

Spiegel, Mark M. 1999. Moral Hazard under the Japanese “Convoy” Banking System. Federal Reserve Bank of San Francisco *Economic Review*, no. 3:3–13.

The author examines whether the prevailing regulatory regimes in Japan’s banking sector through most of the 1990s may have played a role in the sector’s slow movement towards recovery. For example, the article examines the Japanese “convoy” system, under which the burden of maintaining the deposit safety net was to some extent placed on the banking industry as a whole. The author reviews the history of bank failures in Japan and demonstrates that banks were called upon to assist with failures, particularly systemic failures and those that occurred after the funds of the Japanese Deposit Insurance Corporation were effectively exhausted in the mid-1990s. The theoretical model demonstrates that the relative level of moral hazard in bank lending among the various regimes depended on bank charter values and that the level of moral hazard was greater under the convoy banking regime than under a fixed-premium deposit insurance scheme.

Stern, Gary H. 1999. Managing Moral Hazard with Market Signals: How Regulation Should Change with Banking. Federal Reserve Bank of Minneapolis *Region* 13, no. 3: 28–31, 60–62.

Banking consolidation and the increasing complexity of bank operations have made past reforms seem less able to address the moral-hazard problem that is inherent in a financial safety net. Regulators and policymakers agree that additional reform is needed. The author of this article is the president of the Federal Reserve Bank of Minneapolis and believes that proposals relying exclusively on unfettered markets to eliminate moral hazard are not credible, and proposals relying exclusively on supervision and regulation are unlikely to address the moral-hazard problem effectively. Rather, promising reform proposals that use market signals to enhance discipline can be combined with the best aspects of current regulation to help mitigate the moral-hazard problem—a problem that is most acute with the largest banks. The reforms discussed in this paper would apply only to the largest banks, especially those considered too big to fail.

Sundaresan, Natarajan. 1996. Essays in Banking. Ph.D. diss., University of Massachusetts.

This dissertation consists of two essays analyzing the effect of policy measures used to control the risk-taking behavior of banks. The first essay explores the effect of increasing the required minimum capital-to-asset ratios on the riskiness of banks’ assets. The empirical results indicate that banks’ preference for risk is likely to be increased. The second essay deals with the development of a risk-based deposit insurance model in consonance with the bailout policy of the FDIC. The author derives a theoretical model for estimating the bank insuring agency’s

liability and therefore the risk-adjusted deposit insurance premium of a bank. The model used here is an application of the flexible writer extendible put option but, in contrast to models used in previous studies, this one explicitly incorporates the FDIC's bailout policy (characterized by the lack of inclination on the part of the FDIC to close low- or negative-net-worth depository institutions). This distinction is significant, as regulator forbearance was originally a significant contributor to deposit insurance fund losses.

Thadden, Ernst-Ludwig von. 1997. The Term-Structure of Investment and the Banks' Insurance Function. *European Economic Review* 41, no. 7:1355–74.

The author examines the proposition, first formulated rigorously by Bryant (1980) and Diamond and Dybvig (1983), that in a production economy with stochastic liquidity shocks to the household sector, banks serve to provide optimal intertemporal insurance to consumers. The author argues that to understand the moral-hazard problem inherent in this insurance problem, one cannot consider solely the role of banks as providers of liquidity. He develops a model with several investment opportunities in which banks have the additional function of asset diversification. This pooling of intermediation functions is shown to reduce the moral-hazard problem, thereby enhancing the stability of depository contracts and increasing the scope of the banks' insurance function.

Weber, Marsha. 1997. Changes in Bank Risk from Deposit Insurance Premium Increases. Ph.D. diss., University of Nebraska at Lincoln.

Increases in the number of bank failures during the 1980s put a strain on the deposit insurance fund that caused much concern about the role of regulators in the banking industry and the ability of the banking insurance system to withstand credit crises. The FDIC raised deposit insurance premiums during this period to keep the Bank Insurance Fund (BIF) solvent and, in 1994, adopted a risk-based fee structure. This dissertation seeks to analyze and empirically test the effects of these changes in deposit insurance premiums on the risk-taking behavior of commercial banks. Specifically, the author seeks to analyze the effects of these premium changes on bank total asset risk. Evidence suggests that banks attempting to maximize the value of deposit insurance will increase asset risk when deposit insurance premiums increase. The empirical evidence, however, does not consistently support this relationship.

Weinstein, Harris. 1992. Moral Hazard, Deposit Insurance, and Banking Regulation. *Cornell Law Review* 77, no. 5:1099–104.

Deposit insurance has succeeded in capping destructive panics and bank runs despite the large numbers of bank and thrift failures that are highly related to fraud and wrongdoing. Depositors have confidence in the federal guarantee and continue to seek the best return, regardless of the risk of failure. The savings and loan crisis provides an instructive example of the consequence of separating risk from reward in the financial marketplace. The lesson to be learned about deposit insurance is not that one must choose between “regulation” and “market” but that

the better option is regulation within the market, including regulation that seeks to reinforce market-based incentives and limits.

Wheelock, David C., and Subal C. Kumbhakar. 1995. Which Banks Choose Deposit Insurance? Evidence of Adverse Selection and Moral Hazard in a Voluntary Insurance System. *Journal of Money, Credit, and Banking* 27, no. 1:186–201.

This article investigates adverse selection and moral hazard in the voluntary deposit insurance system of Kansas, which operated from 1909 to 1929. Regulations were imposed to limit risk-taking and membership was made voluntary to assuage objections that insurance forces conservative banks to protect depositors of high-risk institutions. The authors find, however, that risk-prone banks were the most likely to join the system at its inception. Using a simultaneous equations model, they also detect both adverse selection and moral hazard behavior throughout the system's first ten years. (©1999 EconLit)