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Deposit Insurance in a Deregulated Environment

TIM S. CAMPBELL and DAVID GLENN*

I. Introduction

THE UNITED STATES has had a federal deposit insurance system for half a century. This system has been an unparalleled success in the sense that it has virtually eliminated "runs" on financial intermediaries. However, the deregulation legislation of 1980 and 1982, as well as the market forces which spawned this legislation, have raised serious questions about the viability of the deposit insurance system as it is currently structured.¹ There are two basic questions currently at issue. The first is whether the existing system of federal deposit insurance provides an appropriate incentive for risk taking on the part of insured institutions. The second question is whether the current system extends the government's credit guarantee to an inappropriate extent.

A number of reforms have recently been proposed to deal with the perceived problems of the current deposit insurance system.² Most of these reforms, such as risk-adjusted pricing of insurance, represent changes which would tend to compel the federal system to operate as if it were a private insurance market. Indeed, one of the suggested reforms is to replace or supplement the current system with one that is entirely private.³ Most serious observers of the deposit insurance system have taken it for granted that it is necessary to have the government involved in the system, at least as a residual guarantor, in order to provide the credibility necessary to avert runs. In this paper we also take it for granted that some form of government participation in the insurance system is essential.⁴ The purpose of this paper is to provide some insight into how a deposit

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¹ The principal relevant legislation includes the Monetary Control and Depository Institutions Deregulation Act of 1980 and The Garn-St. Germain Depository Institutions Act of 1982.

² Two of the most important recent sets of reform proposals are the reports prepared for Congress under Section 712 of the Garn-St. Germain Depository Institutions Act of 1982 by the Federal Deposit Insurance Corporation and the Federal Home Loan Bank Board.

³ See, for example, pages 6 and 7 of *Agenda for Reform*.

⁴ The only available alternative, it would appear, is to limit the volume of conventional deposits which are insured. One way to accomplish this is to eliminate the government insurance system entirely. The result might be a restructuring of the intermediation industry so that most institutions would operate as mutual funds without guarantees of interest or principal. Such a world would be closer to the ones imagined by Fama [3] and Black [1] than the one which exists today. However

insurance system with substantially enhanced private participation might function.

The paper focuses on the determinants of an optimal price for insurance and policy for closing insured institutions. The point of view taken in this paper is that the deposit insurance system may be viewed as an alternative legal mechanism for determining when insolvency has occurred. When insurance is competitively priced, the cost of issuing insured liabilities will reflect the cost of the legal mechanism for determining insolvency which is a part of the insurance system. As a result, insured liabilities will be more attractive than uninsured liabilities if the insolvency system used by the insurers is less expensive than the one which accompanies other forms of borrowing. Hence, the appropriate price and closure policy depend upon the underlying costs of the mechanism for determining insolvency implicit in deposit insurance. These costs are essentially the costs of measuring the real economic value of insured firms.

II. Optimal Closure and Pricing Policies

A. Deposit Insurance as an Alternative Insolvency System

In principle any firm, including a depository institution, is insolvent when the market value of its assets falls below the present value of its contractual liabilities (discounted at the risk-free rate)—when its real net worth falls below zero. In practice it is difficult to precisely measure when real net worth actually reaches zero, even for a firm with publicly traded equity shares. This is because the market does not generally value the firm's assets directly. Instead, it values contingent claims on the firm where the contingency hinges on the legal, as well as the economic definition of insolvency. In practice, therefore, it is necessary to have some legal procedure for determining when insolvency actually occurs which does not rely on contingent claim prices, as those prices are themselves determined by the insolvency mechanism.

For most firms other than insured depository institutions, the legal definition has centered on the firm's ability to meet contractual cash-flow obligations. Presumably, this is one of the reasons for the widespread use among firms which are not government-insured, of debt instruments requiring periodic cash payments, such as coupon as opposed to discount bonds or covenants with acceleration clauses. It is also, presumably, one reason for the relatively limited use by nonfinancial firms of short-term debt instruments with features like deposits, i.e., where the debt is "instantaneously puttable" to the firm. The greater the volume of this debt which is issued by any firm with a given stock of equity, the greater the loss of control over the legal status of solvency. It would seem that this control is valuable and, therefore, that it should be a part of the cost of borrowing with different types of debt instruments.

The insolvency mechanism applicable to government insured institutions is quite different from the one which applies to most other firms. In fact, the

attractive the theory behind such an argument may be, this paper takes it for granted that guaranteed deposits will continue to be the common form of claim on financial intermediaries and that some government participation in the insurance system is essential.

creation of the government deposit insurance system in 1933 may be viewed as a substitution of a new legal procedure for determining insolvency for the one then prevailing. The purpose of this change was to eliminate the instability inherent in a system where a critical group of institutions, which were highly levered with "instantaneously putable" debt, were subject to an insolvency rule much like the one which applied to other firms. The relevant distinction in the prevailing insolvency rules was that depository institutions could, and did, suspend convertability of deposits into cash or gold.

Under the current system of federal deposit insurance, the definition of insolvency is determined by statutes which grant broad powers to the depository insurance agencies and to the regulators with which they share responsibility. Under present statutes, insolvency is determined essentially on the basis of measures of the book value of net worth of insured institutions. Moreover, substantial latitude regarding the appropriate measurement of net worth is granted the regulatory authorities. This creates a critical distinction between the insolvency mechanism in the deposit insurance system and the traditional insolvency mechanism used by other firms. With the traditional mechanism, insolvency occurs when it is impossible to persuade *any* lender to advance sufficient cash to meet contractual liabilities with creditors. Hence, to prevent bankruptcy only one lender with access to sufficient resources must believe that the firm, as currently structured, is economically viable. On the other hand, under the deposit insurance system there is a prior commitment between a particular lender or insurer and the insured institution to provide cash when a certain contingency is met. Because the traditional insolvency system does not distinguish such a contingency for insured firms, either that contingency must be defined by some exogenous rule or discretionary control over the determination of when the contingency has occurred must be delegated to a responsible third party.

The advantage of the traditional insolvency system appears to be that a firm is not insolvent until even the most optimistic potential creditor is unwilling to provide sufficient cash to maintain solvency. In spite of this advantage, the traditional system may still be a very costly system for any firm which is highly levered with instantaneously putable debt. The attractiveness of the insolvency mechanism under a regime of insurance appears to hinge either on the ability to devise a measurement system which can produce an accurate and unbiased estimate of economic net worth, or on the ability to structure a contract with the party given the responsibility for defining when insolvency has occurred which will induce him to behave in an unbiased manner.

B. The Role of Measurement Costs in Closure and Pricing Policy

Suppose the insurance agency were able to perfectly and costlessly measure the real net worth of an insured institution on a continuous basis. The insurer could then declare an institution to be bankrupt precisely when the real net worth reached zero. This insurance system would be costless as the insurer would experience no losses when insured institutions were closed. As a result, assuming away any administrative cost of the system, there would be no need for insurance premiums. If it were possible, yet costly, to accurately measure economic net

worth, then the same policy for closing institutions could be utilized. However, premiums would have to be large enough to cover the cost of measuring net worth. But again, if net worth were still measured perfectly, though at some cost, premiums would not be related to underwriting losses because losses would still be zero.

In practice, the accuracy of any measurement system is a function of its cost. Hence, it would be optimal to sacrifice some precision in the measurement system in order to minimize the cost of the system. The sacrifice in precision would lead to a cross-sectional variation in losses across institutions which are declared insolvent. Based strictly on economic criteria, the best measurement system would be the one which minimized the total cost imposed on all insured institutions arising from the cost of the measurement system itself and the losses generated by errors in measurement. There is a natural tradeoff between the cost of improving the accuracy of the measurement system and the losses imposed on institutions which result from inaccuracies in that system. Notice that even in an inaccurate measurement system, there may be a level of measured net worth for closing institutions such that the expected real net worth for all institutions which are closed is equal to zero. However, *ex post*, some will be closed too early, in that they will turn out to have positive net worth, and some will be closed too late, in that they will turn out to have negative net worth. Those that are closed too early lose as a result and this is a distinct cost of the imperfect measurement system.

Suppose that the closure rule adopted under an imperfect and costly measurement system does generate a positive expected loss. This means that, on average, institutions which are declared insolvent turn out to have negative real net worth. The expected loss can be reduced or eliminated by altering the closure rule, that is by raising the level of measured net worth at which institutions are closed. As a result, more institutions will be declared insolvent too early; that is, more institutions will turn out to have positive net worth after they are closed. This concentrates the cost of imperfect measurement on those which are closed too early. As this critical level of measured net worth is lowered it will increase expected losses and this will mean that premiums will have to be raised. This spreads the cost of imperfect measurement across all insured institutions.

C. Determinants of the Equilibrium Value of Insurance

The preceding section sketches the basic relationship between measurement costs and closure and pricing policy. Next it is important to evaluate what determines an optimal insurance scheme for an individual firm or what the value of insurance to an individual firm may be. At the outset it is necessary to distinguish between the break-even or competitive price for deposit insurance and the value of deposit insurance to firms which may use it. The break-even price is determined by three factors: the cost of the system used to measure net worth and administer the insurance program, the measured value of net worth at which insured institutions are declared insolvent and closed, and the risk premium demanded by those who place their capital at risk in the insurance fund. Insured firms will have preferences about the optimal combination of value

of measured net worth which defines insolvency and the optimal measurement cost, but their choice will be constrained by the fact that in a competitive market the premium for insurance will also be determined by these factors.

While a private market can be expected to set competitive premiums, the value of insurance to those who purchase it is determined by the impact of insurance on their cost of issuing debt. From the vantage point of the lender, insurance functions as a substitute for additional equity or subordinated debt. Like equity, additional insurance reduces the cost of debt. And if insurance is competitively priced, its attractiveness will depend on the relative efficiencies of the alternative insolvency mechanisms which are available. Competition will drive down the price of deposit insurance until any comparative advantage of the insolvency mechanism implicit in it accrues to the insured firms which utilize it.

The relevance of the cost of the bankruptcy system in determining the attractiveness of insurance is illustrated in Figure 1. The figure shows the cost of uninsured debt, represented by the curve R_A , for a hypothetical firm of constant scale as the firm's leverage (defined as the face value of the debt divided by the value of the firm's assets) increase from zero to one. The cost of debt includes the risk-free interest rate plus a risk-premium demanded by the lender and a premium sufficient to cover the expected cost of the relevant insolvency mechanism.

If the insolvency mechanism applicable to a firm were unaffected by the acquisition of insurance on its debt instruments, then that insurance should have a value equal to the sum of the risk premium and the premium for insolvency

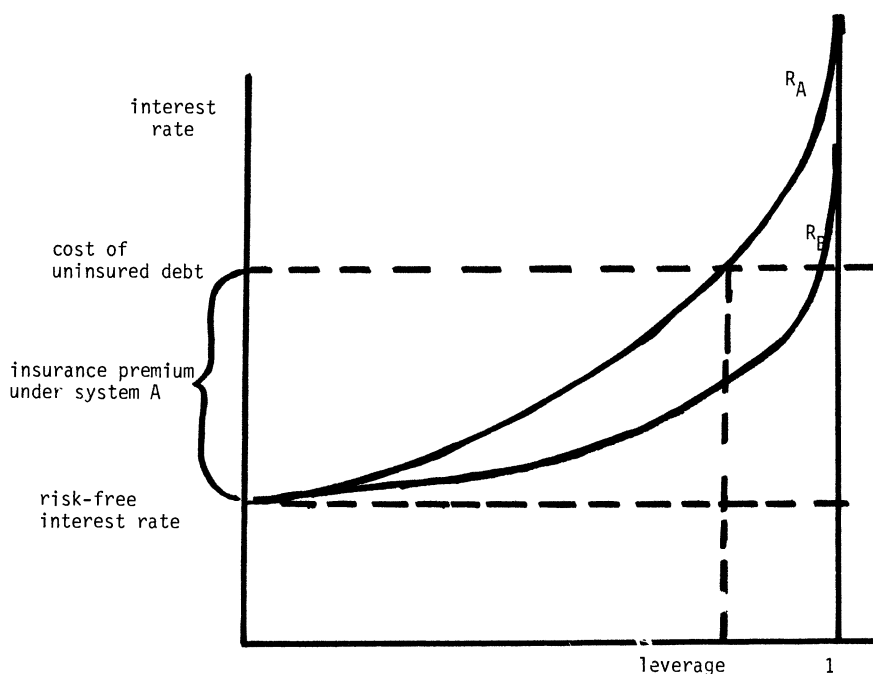


Figure 1.

expense. Such insurance would normally incorporate a stop-loss or liability limit for the guarantor. As a result, the price of a dollar of insurance coverage, measured in terms of the magnitude of the stop loss, should be equal to the cost of debt for a firm with comparable leverage, less the risk-free rate, as shown in Figure 1 by the difference between curve R_A and the horizontal dashed line through the risk-free interest rate.

When the acquisition of credit insurance alters the insolvency mechanism, then the cost of debt is altered by the difference in the expected insolvency costs between the two systems. Hence, the curve representing the cost of debt shifts down, as illustrated by the difference between line R_A and line R_B in Figure 1. Under the alternative bankruptcy mechanism, the competitive price for additional units of insurance coverage will still equal the price of debt less the risk-free interest rate, so that the cost advantages of the alternative bankruptcy mechanism will accrue to firms which utilize insurance.

If all relevant markets were unregulated, both types of insolvency systems might exist simultaneously for distinct types of firms. Some firms might find it profitable, *ex ante*, to enter an intermediation industry which is highly levered with instantaneous debt. These firms may find that the cost of the insolvency mechanism implicit in an insurance system is lower than the traditional alternative. At the same time, firms in other industries, which do not choose to use instantaneously puttable debt, may view the traditional insolvency system as the least-cost alternative.

It is important to note that if insurance is required rather than optional for firms which offer deposits, then the insolvency mechanism incorporated in insurance may be more rather than less expensive than the traditional system. These costs could be offset by subsidizing the insurance system or by other benefits of the regulatory system which accompanied insurance. Without such subsidies or benefits, profit-seeking firms would cease to operate as insured and regulated institutions.

III. The Merits of Private Versus Government Deposit Insurance

There appear to be three central issues regarding the operation of a private versus a public deposit insurance system. The first issue is whether a private market would be subject to market failure due to adverse selection or other problems. The second issue is how control over the closure rule should be allocated under the two alternative systems. The analysis in the previous section directly applies to this issue. The third issue pertains to the nature of the underlying risk in the system. The question is which type of system is preferable when the underlying risk is not well diversified and which type of system can most effectively encourage diversification of risk. Once again, as pointed out in the introduction, it is taken for granted that some government participation is essential to maintain confidence in the insurance system. However, the operational question is whether this participation can be effectively limited to that of a residual guarantor with the responsibility for management of the system, including choosing and enforcing a closure rule, granted to private guarantors.

A. Adverse Selection

A private market for deposit insurance is likely to face adverse selection problems similar to those facing any private insurance market. The high risks will be inclined to over-insure and the low risks under-insure. Adverse selection problems in most insurance markets are generally thought to be generated by cross-sectional differences in risks (see Rothschild and Stiglitz [6] for a treatment of insurance contracting problems which derive from these types of differences). However, a market for deposit insurance is also likely to be confronted with an intertemporal adverse selection problem.

To see the nature of this problem it is useful to briefly examine the operation of the existing market which most closely resembles deposit insurance, the financial guarantee market. There are at least four major types of financial guarantees currently in existence in the United States: letters of credit, surety bonds, mortgage insurance and insurance on marketable bonds, particularly municipal bonds. The financial guarantee which is probably most similar to deposit insurance is mortgage insurance, i.e., insurance against default on mortgage debt obligations. Indeed, private mortgage insurance constitutes a partial privatization of deposit insurance for savings and loans.

The key to the post-war success of the mortgage insurance industry (note that a distinct pre-war mortgage insurance industry became insolvent during the Depression) appears to be the long-term nature of the insurance contract (in addition to relatively low default incidence, see Campbell and Dietrich [2]). Mortgage insurers do not maintain the right to cancel an insurance contract: rather, the contract is renewable at the choice of the insured, subject to the regulatory requirement that mortgages which constitute more than 80 percent of the value of the property must be insured. The premium structure includes both an initial and a renewal premium.

This kind of insurance contract is distinctly different from a traditional type of contract as used in, say, casualty insurance. In a casualty insurance market, those who do not file a claim during a given year pay premiums that are used to cover the losses incurred by those who do file a claim during that year. If losses increase from one year to the next, premiums are raised to cover increased expected losses. There is no long-term contract and therefore no intertemporal transfer of premium income. In mortgage insurance, premiums are collected during years when aggregate losses are very low for use in years when mortgage default rates increase. This is due to the fact that the underlying risk is not stable over time.

The intertemporal transfer of premium income appears to be an essential feature of this market.⁵ The reason for this feature of mortgage insurance is an intertemporal adverse selection problem. If mortgage insurance contracts were not long-term commitments, lending institutions and borrowers would want to be insured only in times when they expected high default incidence. By combining

⁵ Fischer Black has strongly argued in comments to us that the adverse selection problem described here is a result of the regulatory system which fixes prices of mortgage insurers and requires certain loans to be insured, rather than the other way around.

regulatory restrictions that require mortgage insurance on loans that are sufficiently levered and long-term commitments by the mortgage insurers, the adverse selection problem has been largely overcome.

It appears likely that the important type of adverse selection problem which faces the deposit insurance industry is intertemporal (as long as risk-sensitive premiums are utilized). Hence, any deposit insurance system would probably not be able to operate effectively if insurers could or would cancel insurance coverage. Yet the right to cancel under certain circumstances is often used to control risk in insurance contracts, and it is not clear that private insurers could insure deposits without such a cancellation feature. Similarly, there probably would have to be some mechanism for binding those who purchase deposit insurance to a long-term contract without termination rights. Whether this is feasible is an open question.

B. Responsibility for the Closure Rule

An ideal closure rule is one which involves no discretion and one which cannot effectively be abused. For example, such a rule might be that an institution is closed when the market value of its equity (assuming that it is publicly traded) reaches some predetermined percentage of its total outstanding deposits. However, such a rule is inherently arbitrary, just as is a rule based on the institution's book value. The shortcoming of such a rule is that it may involve a suboptimal commitment of resources to a measurement system, and therefore, may be excessively costly. That cost may be reflected either in high premium levels or in the closure of many institutions which have positive real net worth.

On the other hand, a closure rule which incorporates a substantial measurement system would presumably incorporate increased opportunity for abuse by agents pursuing their own private interests. One of the simplest abuses would be to close firms early in order to minimize expected losses. It seems reasonable to expect that firms closed under such a system would have recourse in the courts so that ultimate discretion in enforcement of the closure rule would lie with the judiciary.

Problems surrounding ultimate control over the closure rule are present in either a public or a private insurance system. The principal difference is that private guarantors, presumably, would act to maximize their own wealth whereas political and social considerations may motivate a public guarantor. Hence, private guarantors could be expected to close institutions early if it were profitable to do so. Moreover, they could be expected to cancel insurance, assuming that were an option, if the expected losses from continuing the guarantee exceeded the expected premiums. Presumably, these contingencies would occur only if one insured institution could be identified as more risky than others and if the increased risk could not be compensated for by changing the premium charged to that institution. As long as the failure of modest numbers of institutions are involved, so that there is no threat of a sizeable social cost for the society as whole, then there appears to be no viable reason why a government guarantor should behave differently from one which is private.

C. Problems Arising from a Lack of Diversification

Possibly the most difficult problem facing either a private or a public deposit insurance system develops when the underlying risk is not well-diversified. In this circumstance large numbers of institutions would have to be closed simultaneously. This situation would be more difficult if there were a discontinuity in valuation of many institutions over time, such that institutions abruptly changed from being healthy to having significant negative net worth. Under these conditions both a private and government insurer might have a strong incentive to seek to protect a (finite) insurance fund and fail to close institutions which are determined to have negative net worth.

In addition, in an economic environment where there are many failing institutions, the regulators presumably take into account the perceived social cost of closing institutions on a large scale. It is this ability to use discretion about the magnitude of this social cost that is a critical element of the federal deposit insurance system. However, such discretion would probably not be feasible in a private insurance system. If the private insurers themselves had the discretionary authority to determine when a failure occurred, they would be cognizant only of their private cost and not the social cost of failure. If discretionary authority were left with the regulators, the private insurers would presume that their interests would be sacrificed first and would be compelled to price their private insurance accordingly. Hence, no joint public-private system based on discretion appears to be feasible. Yet it also seems infeasible to write a contract intended to define when an institution has failed which can take social cost into account.

One possible way to deal with this problem is for insurers to maintain the right to cancel insurance when a measure of the net worth of the institution reaches some designated level subject to a predetermined penalty to be paid by the private to the public insurer. The federal insurers would then have the option to declare the institution insolvent and the private insurer would be obligated to honor its contractual claims. However, the federal insurer could choose to accept the economic penalty and allow the institution to continue to operate, assuming total responsibility for all subsequent insurance claims. The private insurer would then no longer have a financial obligation to depositors in the institution. This type of system would involve a clear contractual definition of insolvency, and it would also preserve the public policy discretion of the insurers and regulators.

A further complication is that solvency depends to a significant extent on the ability and willingness of the regulators to provide insured institutions with liquidity. Indeed, it is often argued that an important reason for the banking crisis of the early 1930's was unwillingness of the Federal Reserve to provide liquidity to commercial banks when the government did not directly bear any of the cost of their failure. If deposit insurance were completely private, prudence would dictate that private insurers presume that liquidity would not be forthcoming to the same extent it would be if the regulators were also responsible for insuring against failure. These kind of disputes have even taken place under the present system of distinct regulatory and insurance agencies for commercial banks. The potential for such disputes would be reflected in the prices that

private insurers would charge. The prices at which private insurers could expect to break even could easily be too large to make complete private insurance feasible.

The problems mentioned in this section may be the most important real obstacles facing private deposit insurance. Moreover, they focus attention on the issue of the social costs of failure. It is apparent that the social cost resulting from a complete failure of the financial system due to widespread withdrawals is intolerably large. However, it is not apparent that the failure of modest or even large numbers of institutions generates a large social cost if those institutions are closed when economic net worth is zero and depositors are left unharmed in the process. More extensive coverage or more liberal rules for determining closure result in de facto insurance protection for equity owners or for entrenched management in mutual organizations. In effect, this means insurance for the existing market and ownership structure of the depository institutions industry. If this view is correct, then the social cost involved in deposit insurance is the cost of avoiding large-scale concentration of firms in the financial institutions industry.

It is extraordinarily difficult to determine whether these social costs should be included in the premiums for insurance which are assessed on participating institutions. If these social costs are actually a cost imposed on society in general, resulting from a widespread collapse of financial intermediaries as occurred in the 1930's, then it would seem inappropriate to include such social costs in premiums. Instead, society should be taxed to cover these costs. If, however, these costs result from a desire to protect and maintain an existing market structure, then it seems entirely appropriate that these costs should be included in insurance premiums. In practice it is extremely difficult to separate these two types of costs.

Finally, it is important to note that the way the system enforces a closure rule in a circumstance where a large number of institutions are experiencing financial difficulty is likely to have an effect on the way those institutions evaluate risk. If managers of institutions perceive that their risk of being closed by the guarantor is minimal as long as they all are experiencing the same risk, then there will be an incentive to collectively take on large risks and underprice those risks. This may offer an explanation of apparently low risk premiums incorporated in fixed rate mortgage loans and in many loans to developing countries made by large commercial banks in the United States.

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DISCUSSION

PAUL M. HORVITZ*: This is an important paper. Its focus is on the feasibility of private deposit insurance, but it discusses issues that arise in the context of deposit insurance that have broader implications for finance theory. It is unfortunate that space limitations prevent that authors from discussing these implications in more detail, and I hope they will carry on from where this paper leaves off.

The paper begins with what the authors claim are the "two basic questions currently at issue" with respect to deposit insurance. The answers to those questions are easy: "no," the existing system of federal deposit insurance does not provide appropriate incentives with respect to risk-taking by insured institutions; and "yes," the current system extends the government's guarantee to an inappropriate extent. Fortunately, the paper does not stop with answers to these questions, but goes on to deal with the resulting, tougher question: what can be done about this problem?

The academic literature has long proposed risk-related insurance premiums as the efficient solution. I do not believe that a move toward risk-related deposit insurance premiums (such as that now being planned by the FDIC) is the right solution, and recent work by Pyle, and Costa and Greenbaum suggests that that position may be gaining respectability.

Apart from the risk-related premiums approach, the solution to the deposit insurance problem most frequently referred to in the economic literature is that of private deposit insurance as a substitute or supplement to federal insurance. The discussion of private insurance in the literature has been rather casual, usually consisting of nothing more than assertion that if the federal government can do it, than the private sector can also, or the argument by analogy that if the private sector can provide insurance against earthquakes or mortgage loan defaults, than it can also provide deposit insurance.

Some of the operational aspects of the feasibility of private deposit insurance are discussed in a paper by Glenn and Campbell for the FSLIC report on deposit insurance mandated by the Garn-St. Germain Act. That report (and the corresponding report by FDIC) consider such issues as the limited capital of the casualty insurance industry, and the need for a governmental guarantee of private insurance.

This paper, however, represents the first analysis of the essential elements of

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