

# A TRANSACTION COST ANALYSIS OF BANKING ACTIVITY AND DEPOSIT INSURANCE

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## Introduction

In neoclassical price theory the firm is a black box and there are no banks. Into the box go labor and capital and out come products; the apparatus is driven by wealth maximization and governed by the laws of returns. At the individual firm level, activities are guided by market prices. If prices direct the patterns of specialization and exchange, what does the black box contain? What does "the firm" do? What does the banking firm do?

The suggestion of Ronald Coase (1937) that firms were alternatives to markets and served to reduce and control transactions costs remained sterile until further suggestions came forth as to the nature of these transactions costs. What can make markets so expensive that spot exchanges are abandoned and replaced by restraining agreements organized in institutions called firms? Two possibilities have yielded fruit—the costs associated with ascertaining quality and with negotiating price. Explicit consideration of these costs has enriched the theory of the firm and given us insight into the forces that determine what assets the firm owns, how ownership is structured, how firms are financed, the assignment of liability, and other aspects of corporate organization as well.

The early explorers of transactions costs set out on two very different expeditions. The first expedition went armed with the notions of moral hazard and adverse selection; it headed off in the direction of insurance and risk and ventured successfully into generalized

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principal/agent conflicts. The implications of informational asymmetries for behavior and market viability explained various aspects of insurance markets, the presence of teamwork, some firm financing decisions, and organizational features of the firm addressing conflicts of interest between owners and managers, inside owners and outside owners, and liability assignment.

The second expedition headed off from industrial organization to hunt for explanations as to why firms vertically integrated, and it found a powerful answer: the presence of quasi-rents among mutually dependent assets can result in high costs of negotiating the division of those quasi-rents. These potential costs can not only explain common ownership of assets and various aspects of the organization of ownership but also the motivation for other types of implicit and explicit long-term contracts, some of which are constraints on the operation of markets.

This second idea is referred to as "holdup." The concept (but not the term) was introduced by Alfred Marshall (1936) when he described the problems faced by a steel mill that located near a public power company, counting on the delivery of power at a given price. Once the mill's capital costs were sunk, the power company could raise prices, confident the mill would continue to produce and could not move. Marshall called the return to the mill's fixed costs a "composite quasi-rent," because it depended on the continued association of the mill and the power plant. Marshall did not develop the concept as a force determining features of firms and contracts, however, but said the conflicts would be resolved by appeal to gentlemanly behavior and to doing what was right.<sup>1</sup> Later Oliver Williamson (1985) and others would recognize that the power company could hold up the mill and emphasize the role of contracts in averting holdup.

Banks are firms, and this paper sets out to discuss the organizational features of banks in terms of the costs of determining quality and price as Alchian and Woodward (1986) did for firms generally. Because banks mediate the payments system, they are special and consequently merit special attention.

### Sources of Firm-Specificity in Bank Assets

Some of the resources firms use are owned by the firm directly, and some are owned by other parties who rent the services of these assets to the firm, as employees rent labor to the firm, for example. The firm will either own or have long-term contracts with those

<sup>1</sup>On the concept of the "holdup," see Marshall (1936, pp. 453–54, 626–27).

resources that are relatively more mutually dependent, that is, susceptible to either morally hazardous exploitation or to holdup. It is this kind of mutual dependence that makes assets "firm-specific." Firm-specific assets are those assets that are worth more to the firm than to any other party. By contrast, assets that are general and easily replaced at the same price are not firm-specific, and neither long-term contracts nor ownership integration is necessary for their most efficient use. There are two properties assets can possess that will cause them to be mutually dependent and thus firm-specific: vulnerability to moral hazard and vulnerability to holdup.

Vulnerability to moral hazard is partly a question of monitoring costs and partly a question of a property called "plasticity" by Alchian and Woodward. The term "plastic" indicates that the set of choices for how an asset is used and maintained is wide, and that it is difficult for those outside the firm to *second guess the decisions* regarding their use made by those inside the firm. Examples of plastic assets are trucks and copying machines, which can be maintained either well or badly, somewhat undetectably. They are consequently vulnerable to moral hazard and are more likely to be owned than rented because ownership internalizes the costs, aligns the incentives, and is cheaper as a result. Lawyers can choose a low-risk strategy of routine contract law or can take a *personal injury case on contingency*, and consequently can have very plastic human capital. The assets of research and development firms, laboratories and teams of researchers, are very plastic, because the array of opportunities for their employment is very broad. Examples of implastic production are heavy manufacturing and oil pumping (but not exploration) because these assets offer little in the way of opportunities to (a) increase the variance of possible outcomes, (b) turn the assets into *personal consumption* (through undetected shirking or use for personal aggrandizement), or (c) be stolen.

Holdup vulnerability can result when assets are very implastic. Implastic assets such as those in heavy manufacturing often have few attractive alternative uses and are thus vulnerable to holdup. But any investment that is particular to a given team of assets will have the same kind of vulnerability. For example, a sign that heralds "Bob's Burgers" is useful only to Bob. It would never make sense for a party outside the firm to own the sign, because if Bob refused to pay the promised rent, the owner would have no alternative use for the sign. The value of the sign depends on the profitability of the hamburger stand, which is at least partly under Bob's control. Bob could claim he has fallen on hard times and could use the hard times as an excuse to cut the rent in half, and the sign owner would have no recourse

except litigation or strategic refusal to deal. Such costly negotiations are avoided if Bob owns the sign. Owners of such team-specific resources will seek protection from holdup, and although the usual solution will be common ownership, long-term contracts are an alternative.

Bank assets consist primarily of loans "produced" by the owning bank. The most important factor determining why a given loan is worth more to one bank than another, and consequently why the bank owns that loan, is that the originator of a loan has learned details about the loan that could only be learned by another party at some cost. The source of the idiosyncratic or "impacted" information is the borrower. Borrowers know more about themselves than banks know about them, and it is costly for the bank to become informed. The borrower has an incentive to represent himself as more creditworthy than he is, and he will expend resources signalling his creditworthiness, sometimes honestly and sometimes not. Banks expend resources evaluating the data they collect about borrowers. The cost of this evaluation is reflected in the terms of the loan.

The more idiosyncratic a loan is, the less likely it is that the bank will sell the loan to another institution, because the assessment the second institution would undertake before the sale is costly, just as was the origination. The second institution will not just accept the assessment of the first regarding the loan. The first institution can get a higher price for the loan by representing it as a better quality loan than it is. The second institution will protect itself from this incentive to misrepresent the loan by evaluating the loan itself. Thus, the originating bank creates the asset, and the value differential arising from information asymmetries makes the loan bank-specific. Others, especially Leland and Pyle (1977) and Campbell and Kracaw (1980) have also emphasized private information in theories of the banking firm.

Against the impacted information that makes loans bank-specific looms the bank's portfolio problem. Bank loans involve some risk that is diversifiable. There are several ways nonsystematic risk can be diversified. First, if a bank has publicly traded equity shares, the risk is borne in diversified portfolios via the stock market, as is the risk of other large firms. Second, banks could be organized with national branches. Since a large component of lending risk, especially in real estate and agriculture, is regional in nature, nationwide branching can go a long way toward creating a diversified loan portfolio. Third, banks can trade loans, either directly, or by selling them to intermediaries who resell them. If full diversification is feasible, interest rates on loans will be set so that they compensate the lender

for the time-value of money, for the nondiversifiable risk borne, and for gathering the desired information.

In U.S. banking institutions, various geographical restrictions on branch banking impede the first two solutions to the bank portfolio problem. Branch banking laws in some states constrain banks to be small and thus limit their access to the market for publicly traded equity. The branch banking laws also preclude diversification via national branching, and in some states even statewide branching restrictions admit little diversification. What remains is securitization, and surely one of the reasons Fannie Mae (the Federal National Mortgage Association) and Freddie Mac (the Federal Home Loan Mortgage Corporation), the two government-sponsored firms that comprise the lion's share of the secondary market in mortgages, thrive as institutions is that they are conduits for reallocating regional components of risk. As such, they are explicitly a means around the Glass-Steagall Act preventing banks from underwriting most securities and are implicitly a device to make the barriers to branch banking less costly.

Because of the impacted information in many loans, trading loans may be inferior to interstate branching as a means of diversification. Potential buyers would want to learn whatever the originator of the loan learned in order to make the loan in the first place. This learning process is appropriately regarded as one of the costs of the operation of markets. If either national branching or publicly traded equity is feasible, these routes will dominate when information transfer costs are large. When there are other avenues for risk spreading, costs absorbed in trading loans are, from a social point of view, pure loss. Economies are realized when a single institution originates, administers, and concludes a loan contract. For those loans with substantial idiosyncrasies and for which information costs are large, secondary markets will not arise spontaneously, and it is efficient that they should not.

Costly information also plays a role in determining which loans a given bank will originate, more particularly why a bank is more likely to make loans to its own depositors than is another bank. The information gathered in managing a customer's demand deposit is valuable in determining the terms on which to lend to that customer. The bank could, of course, sell the information to another bank. But if the information transfer process is costly, that is, if it is cheaper for the depositor's own bank to evaluate his loan application than for another bank to do so, a pattern will emerge in which demand depositors choose a bank (to manage demand deposits) mostly on the basis of

convenience, and bank loan portfolios consist primarily of loans to depositors.

Apart from loans, there are few other assets used by banks that are at all firm-specific. Banks rarely have long-term contracts with employees, frequently rent office space, and seldom hold assets other than loans and securities. The major forces driving firm-specificity of bank assets are the information asymmetries present once loans are made and, to a lesser degree, the information complementarities between deposits and loans and between past loans and future loans.

### The Bank as a Corporation

When firm-specific assets are large in total value, the limited wealth and risk aversion of investors call for organizing the firm so that assets are owned in common by many shareholders in a corporation. Corporations often have managers who are not owners, owners who play no role in management, and some debt financing. As a result, conflicts of interest can arise among the shareholders, between shareholders and managers, between shareholders and depositors (and bondholders), and when a clearinghouse or deposit insurer is present, between this agent and shareholders.

#### *Conflicts among Shareholders*

Although only a few of the thousands of banks in the United States have publicly traded shares, a substantial fraction of all bank assets are in such banks. Transferable shares lower the cost of administering a pool of resources because the personal decisions and beliefs of individual shareholders are accommodated through trading of the shares and need not affect the production decisions of the firm. Banks are no exception.

Corporations limit their liability to creditors to accommodate transferable shares. Without limited liability, the creditworthiness of the firm would depend not just upon the assets of the firm but on the personal assets of the shareholders as well. By limiting the liability of the firm to the assets of the firm itself, all concern regarding the identity and wealth of individual shareholders is eliminated, and it is eliminated for both shareholders and creditors. For the firm with less than fully transferable shares, limited liability can be a desirable device for laying off equity holders' risk. But small, closely held firms extend liability to shareholders as well as limit it. Indeed, extended liability is observed today only among firms that do not have traded equity. Apparently, the moral hazard costs of limiting liability frequently outweigh the risk-spreading opportunities it offers for many firms whose organization precludes publicly traded shares.

Banks were among the last firms to limit liability. Prior to the introduction of deposit insurance, the willingness of bank owners to assume personal liability for their bank's soundness doubtless increased depositor confidence and reduced incentives for bank risk-taking. Depositors expressed interest in the size and composition of the wealth of the owners of their bank, and they doubtless were comforted by evidence that their bankers were rich and conservative. Even into the 1950s, the liability of many bank shareholders extended to double the par value of the stock, and amounts due as a result of their extended liability were collected from many bank shareholders during and after the Great Depression.

It has been suggested that banks return to extended liability for their shareholders in order to discourage their undertaking large risks under the umbrella of deposit insurance.<sup>2</sup> But today, such a policy is a bad idea. Publicly traded shares and extended liability are not compatible, so precluding limited liability would be a serious impediment to large banks' attempts to raise equity capital from a large number of shareholders. To inhibit risk-taking by small banks, it makes more sense to employ risk-adjusted deposit insurance premiums based on the extent of equity capital or to increase capital requirements directly. Increasing equity capital requirements explicitly extends the amount for which shareholders are liable. In contrast, the additional protection gained by the deposit insurer via extended liability would depend on the wealth of bank owners, and could conceivably motivate personal "capital requirements" for bank owners in addition to capital requirements for the banks themselves.

#### *Conflict between Managers and Shareholders*

The conflicts of interest between managers and stockholders of banks are evidently not of paramount importance. As evidence of this, we observe first, that among large banks, ownership of equity is very diffuse. Second, branches are managed by individuals with no equity interest. Many bank practices are designed precisely to provide the information necessary to make bank activities easy to monitor, both for the bank equity holders and for bank regulators. Even the practice of requiring monthly payments on loans serves to provide a monthly signal of the status of a loan. Despite the fact that

<sup>2</sup>Such proposals call for "unlimited" liability, a term I avoid because, if nothing else, shareholders' wealth limits liability. For a more extended discussion of limited liability, see Woodward (1985).

bank assets, many of which are fungible,<sup>3</sup> are by implication very plastic, the costs of monitoring them are low because the transactions are easily recorded and the excuses for failing to record them are few.

*Conflict between Shareholders and Creditors (Depositors)*

Prior to the introduction of government-supported deposit insurance, stockholders of a bank stood in relation to depositors just as the stockholders of nonfinancial firms stand to their creditors. In the United States today, deposits are insured by the FDIC or FSLIC, and depositors are no longer concerned about how much equity capital their bank has. Prior to the introduction of deposit insurance, depositors would look to the capital of the bank for security, and as a result, banks had much larger amounts of equity—roughly 25 percent of assets as opposed to today's regulated bank with 5–6 percent equity.

While the corporate finance literature has summarily rejected tastes (for example, risk aversion) as a feature explaining debt/equity ratios for nonfinancial corporations, it seems difficult to imagine that the nature of demand deposits is not primarily driven by the desire of depositors to have an easily valued asset to use for payments. Even very wealthy individuals do not, and do not want to, write checks on an ordinary stock mutual fund. And in the allegorical histories we use to teach banking, the primary motivation for the existence of banks is deposits. We start with a warehouse that takes deposits and issues receipts, that then discovers it can also make loans, rather than the reverse.

Ben Bernanke (1983) has argued that banks were originally organized with deposits and equity rather than as mutual funds because lending was too morally hazardous to organize with what would be almost completely (financially) disinterested managers (as would be the case with a mutual fund) and that the equity served as a signal to depositors that someone, the equity holders, had a stake in assuring that the bank was well managed. I reject this argument for two reasons. First, if lending were indeed so morally hazardous and difficult to monitor, the monitoring costs would preclude banks with diffuse outside uninvolved equity holders as well. In fact, the large publicly traded banks are very widely held and are usually managed by persons who have little financial interest in the bank. Second, if the

<sup>3</sup>A fungible asset is one that can be replaced at low cost with another that is virtually identical. Treasury Bills and grain are fungible assets. Bank loans are thus not fungible, because they are not identical and are costly to trade.



driving concern were the principal/agent problem and not the uncertainty of the value in the account, then ordinary mutual funds would compete as successfully with conventional demand deposits for transaction balances as do money market mutual funds. But there is little interest in ordinary mutual funds as checking accounts.

The operation of mutual banks, the vestiges of which remain today, also sheds light on why banks are not organized as mutual funds. Mutual firms are distinguished from ordinary firms in that the customers of the firm own it. Identifying exactly who is a customer of a bank is somewhat more subtle than identifying the customers of a shoe store, however, as both depositors and borrowers are in some sense customers. Mutual banks are organized with depositors as equity holders. One cannot be an owner without making a deposit, and one cannot withdraw the deposit without ceasing to be an owner. In the absence of deposit insurance (the condition under which the deposit mutual evolved), the combined accounts of the depositor (the deposit plus the share account) made the depositor a shareholder in a 100 percent equity loan company, essentially a mutual fund. The risk/return outcomes to the depositor/equity holders were exactly the same as they would be to shareholders in a mutual fund that held the same loan portfolio as does the mutual bank. So why the separate accounts?

Deposit mutuals and mutual funds have one important common feature: assets are owned and controlled by depositors. Thus, assets will be managed in their interest. Given that both total returns and control are identical, there are two reasons why the interest might be segregated into deposit and equity accounts. First, if the assets are risky, dividing the interest into a less risky and a more risky portion leaves the less risky portion a more convenient account on which to write checks, and thus lowers personal transaction costs. Note that the "checkable" mutual funds (which have only a single account) hold only very low risk securities, another way of accommodating check writing. Second, if the assets are nonfungible (as are the loans of most ordinary banks and mutual banks), separating the accounts into a fungible part, on which checks can be written, and a nonfungible part, against which residual losses and gains can be booked as they are realized, accommodates both check writing and the bearing of the risk. An important feature that distinguishes the equity interest in mutual banks from ordinary, noncheckable mutual funds is that the equity is nonfungible. The equity cannot be sold except back to the bank itself, and one cannot cease to be an equity holder without withdrawing one's deposit.

Mutuals may have solved some principal/agent conflicts in banking (again, in the absence of deposit insurance) but they created two problems that do not arise with banks organized as joint stock companies (ordinary corporations). First, tying the deposit and equity together inhibits efficient risk allocation because it takes away a degree of freedom in structuring portfolios. (Of course, the introduction of deposit insurance transforms the conflicts between depositors and equity holders into conflicts between the deposit insurer and the equity holders, to be discussed later.) Second, because the equity is nonfungible and tied to the deposit, depositors pessimistic with respect to the bank's prospects will remove equity and deposit together and go to another bank. This problem remains even with deposit insurance.

*Conflicts between Shareholders and Customers (Borrowers)*

Banking activity can be organized in a mutual firm not only with respect to the liability side with depositors as owners but also with respect to the asset side with borrowers as owners. The largest such organization in the U.S. economy, the Farm Credit System, does not take deposits, but funds its lending activities entirely through securities issues. Loan mutuals are potentially even more troublesome as a risk-spreading vehicle than are deposit mutuals, however, since most of the risk faced by a lending institution is generated by its loans, not its deposits. The more correlated are the fortunes of the borrowers, the worse is a mutual loan company in terms of diversifying risk because the borrower's return on his investment in his borrower mutual is highly correlated with the rest of his wealth.

One factor that may motivate loan mutuals is the desire for trust between borrower and lender. The borrower knows himself to be an honorable fellow and knows that he will not take his loan and bet it in the options markets instead of, for example, buying seed (the pretense for the loan), even when it is in his interest to do so. But the borrower fears that if his lender does not know him personally, the lender will assume that greater moral hazard is present in the loan than would be suspected if he knew the borrower well. The borrower thus sees a potential to be "held up" if his personal fortunes decline temporarily. When the borrower falls on hard times, other lenders less familiar with him will lend to him only on very unfavorable terms. Knowing this to be true, even the long-time lender could charge more than is necessary to cover the risk he knows is present, which is less than an unfamiliar lender would expect. Anticipating this holdup, borrowers could be motivated to organize a mutual to protect themselves.

This desire for familiarity and acknowledged commonality of moral values (keeping one's word to buy seed instead of speculating in cocoa futures contracts) may also help explain the support in the agricultural states for locally run banks. Farmers perceive (somewhat correctly) that much of the risk they bear is not under their control and that an inability to keep up their loan payments is often not a reflection of incompetence or sloth but of bad weather or unfavorable government policy. These borrowers want to ensure that those who lend to them do not suspect their intentions, and if the farmers are well known to their lenders, their intentions will not be suspect. One way to achieve this is to ensure that their banks are locally owned and operated.

*Conflict between Shareholders and Deposit Insurers—The Microeconomic Level*

Deposit insurance transfers the risk of losses on the bank's portfolio (in excess of the bank's equity) from the depositors to the deposit insurer. Because low risk is one of the features depositors seek in a bank account, it seems plausible that deposit insurance could emerge privately as a device to accommodate deposit accounts that are easy to value.

Insurance markets, especially for commercial insurance, are very old, dating from at least the 13th century, when "sea loans" were insured.<sup>4</sup> Indeed, this insurance was designed to make loans to different ships' owners closer substitutes, more fungible, more marketable, and easier to trade in a secondary market, just as many forms of mortgage insurance and other "credit enhancements" serve to make certain instruments more liquid today. But the institution closest to deposit insurance that emerged without government support was the clearinghouse, which was more like a central bank in that its focus was on ensuring the liquidity of the banking system rather than on shifting risk from depositors to insurers.

On the microeconomic level, the last decade has amply demonstrated the problems of insuring the deposits of banks. Deposit insurance is, as is all other insurance, subject to moral hazard. The greater the coverage (with respect to banks, the greater the fraction of assets funded by insured deposits as opposed to equity or noninsured debt), the greater the potential moral hazard costs. Macroeconomic policies of the 1970s resulted in historically high nominal interest rates and a nearly universal deep insolvency of thrift institutions (on a market value basis) by 1981. The fall in interest rates since that time has

<sup>4</sup>See de Roover (1945) for detailed descriptions of these early institutions.

recouped much of the loss, but even now many thrifts and commercial banks are operating with seriously eroded equity, and a significant fraction of the thrifts is operating with negative or zero equity. From this experience the problems associated with insuring the deposits of bankrupt or nearly bankrupt institutions have been amply demonstrated, and as a result, they are well understood and widely appreciated as empirically significant.<sup>5</sup>

Deposit insurers attempt to control the moral hazard through an elaborate regulatory framework. The regulations include limitations on the amounts and nature of assets that banks and thrifts can hold, various balance sheets constraints, capital (minimum equity) requirements, and restrictions on other forms of business that banks can do.

But the regulations, like most contracts, are written in terms of accounting data, and banks must heed only the letter, not the intent, of the regulations that accompany deposit insurance. Any exploitation of the rules (such as accounting conventions that do not reflect the true value of assets) is regarded as fair game. Any hole in the regulations (such as the failure of the deposit insurer to require explicit recognition of standby letters of credit as liabilities) is exploited with alacrity. Given the moral hazard costs of deposit insurance, the costs it has recently imposed on the FDIC and FSLIC, and the suspicion that because deposit insurance is government supported it is more exploited than private insurance would be, two difficult questions arise: First, are there alternative ways of organizing deposit insurance (such as less than full coverage of deposits, or privately provided deposit insurance) that would be less costly? Second, are there any reasons why government-supported deposit insurance might be efficient despite the moral hazard that accompanies it?

### Deposit Insurance as an Alternative Market Organization—The Macroeconomic Level

The macroeconomic problem that deposit insurance addresses is the illiquidity of bank assets. Traditionally, bank liabilities have consisted primarily of demand deposits,<sup>6</sup> which banks guarantee to be fully liquid. But their assets consist of loans that are not callable and that are too small, idiosyncratic, and “information impacted” to be marketed at low cost. If bank assets, like money market mutual fund assets, consisted of marketable fungible securities, then banks

<sup>5</sup>See Barth et al. (1985) for a discussion of the recent FSLIC crisis.

<sup>6</sup>According to the *Federal Reserve Bulletin* of November 1987, the total assets of the U.S. commercial banking system were \$2.7 trillion, of which \$1.9 trillion was funded with insured deposits, although only \$573 billion of these were transaction deposits.

could, as do the mutual funds, buy and sell securities to accommodate fluctuations in the level of deposits. The essential difference is that the loans held by banks can only be sold after an evaluation process; this process is costly, and its cost will be reflected in the price the bank gets for the loan. From the originating bank's point of view, paying another institution to evaluate the loan is a losing proposition because the originating bank already performed this function and absorbed the cost of doing so.

Origination or reevaluation costs make many loans "bank-specific." Given the nonfungibility or bank-specificity of most bank assets, it can be argued that a method of organizing bank activity that would avoid, under some circumstances, the necessity of placing bank assets "in the market" could be potentially less costly than market alternatives. That is, it is possible that market solutions to the bankruptcies, both real and imagined, that are caused by occasional macroeconomic disturbances are simply more costly than government-supported deposit insurance. Let us consider two extreme cases.

#### *Case #1: The "Irrational" Run*

A banking system suffering from an irrational run is one in which the banks are not truly insolvent (that is, bank assets are worth more than bank liabilities), but some event has alarmed the depositors and propelled them to attempt to withdraw their funds. Apparently information is costly and depositors do not know that their banks are not insolvent. Consider the difference in the costs of this disruption with and without deposit insurance or a lender of last resort.

If there is no deposit insurance, banks must attempt to sell their loans in order to deliver on promises to liquidate demand deposits. This sale of loans is costly. Indeed, these costs could make the difference between the bank having or not having enough assets to cover all deposits. The problem is exacerbated by the "me-first" rule with respect to withdrawals. Because the deposits are withdrawn on demand, and the amount withdrawable depends only on the amount deposited (plus, perhaps, some accrued interest) and not on the value of the bank's assets (since no easy assessment of their value is available), the depositors at the head of the line are more likely to get all of their money than are depositors at the end of the line. Thus, the depositors run to withdraw and create pressure to sell assets even more quickly and at even larger discounts.

An even greater risk is the possibility that the disruption of the payments system that attends a systemic run and the massive effort to revalue bank assets may result in a decline in real economic activity (depression). Transactions come to a halt because the institutions

that have a comparative advantage in executing them must turn their attention to liquidating and revaluing their loan portfolios, and the run reinforces expectations that borrowers will not be able to repay.

If there is an institution ready to lend to the banks to accommodate depositors' desires to withdraw their funds, the costs of selling the loans, as well as a collapse of the payments system, can be avoided. This accommodation could be provided by either a deposit insurer or a central bank so long as either is empowered to print money (or to advance unlimited reserves, which is functionally equivalent). An institution with the power to print money will be able to meet a run of any size. An institution without this power, such as a private insurance company, faces the possibility that it too will be made insolvent by the run if its reserves are finite and less than the amount insured. This possibility reveals that deposit "insurance" is not insurance in the same sense as, for example, *life insurance*. Its success does not depend so much on the law of large numbers (insuring occasional, isolated bank failures) as on the power to head off or accommodate a systemic run, possibly requiring the power to print money.

Once the depositors calm down, they redeposit their cash balances at the banks, the banks repay their loans to the central bank, and business continues with no necessity of selling the loan portfolio. Clearly, if this is an isolated transaction, the social costs are lower if the central bank advances the system the cash and the collapse is averted. These benefits must be traded off against the increased probability of true insolvencies that result from the moral hazard costs of deposit insurance and banks' exploitation of it.

#### *Case #2: A Systemic Insolvency*

When a run is motivated by a true insolvency rather than a scare, the central bank must not merely accommodate the run in order to maintain the liquidity of the banking system, it must also absorb the losses to the degree that they invade deposits. If any losses were to be forced on depositors, the "me-first" rule would induce the depositors to run.

There are at least two ways these losses could be absorbed by the central bank. First, it could print the money to make the deposits good, and society would bear the loss in the form of inflation. Second, taxes could be collected to provide the funds. In both cases, the losses that exceed bank equity are borne by society at large rather than by individual depositors, as would be the case without deposit insurance. With either arrangement, there is no associated col-

lapse of the payments system with government-supported deposit guarantees.

To say that depositors are not the best candidates to provide the market discipline to the banking system is not to say that no such discipline is desirable. On the contrary, the most important reason to ensure that there is equity in the banking system is to impose market discipline. In a true insolvency, the services of the market will be needed to revalue bank assets and to recapitalize the banks. Giving time to the banks so that they get more for their assets is, of course, beneficial to the banks, but for society as a whole it is not clear how much forbearance is worth it. The experience from 1983 to 1986 with the FSLIC suggests that delay in closing bankrupt institutions can increase the costs of closure considerably. A tradeoff must be made between giving the banks enough time to avert a collapse of the payments system but not so much that they can double their bets, as is in their interest, while still insolvent.

Is the institution described here truly deposit insurance, or is it a lender of last resort? It is both, and functionally the two institutions are the same. Deposit insurance is not true insurance. It does not so much diversify away risk as change the way in which risk is borne. The alteration does not eliminate the necessity for society to absorb losses by individual banks or by the banking system, but it does allocate the risks in such a way as to avert a collapse of the payments system when depositors suspect banks may be insolvent. Explicit government guarantee of deposits reassures depositors that if the bank cannot deliver on its deposits, the government will. Lenders of last resort reassure depositors that if there is a run, the lender of last resort will provide the banks with funds to make deposits good. The point of both systems is to avert runs and the attending collapse of the payments system.

When making the decision about the best design of public institutions, it is necessary to weigh the following costs: Without deposit insurance, occasional irrational runs will result in costs associated with liquidating loan portfolios under pressed conditions. With both irrational runs and true insolvencies, there may also be a decline in real economic activity due to a collapse of the payments system. With deposit insurance, moral hazard costs must be borne by the deposit insurer. Which regime is less costly is an empirical question. The essential point to keep in mind is that banks fixed the price of deposits in the first place because it was so costly to value the loans. Having once established that the high cost of market mechanisms precluded demand deposits with flexible prices (such as those of money market

mutual funds), it seems doubtful that allowing runs to force immediate market valuation of all bank assets is very often a fruitful exercise.

### *Deposit Insurance Forever?*

The primary problem addressed by deposit insurance is the illiquidity of bank loans, that is, the high transaction costs often associated with selling loans to other institutions. Because they hold instruments that are cheaply marketed, money market mutual funds face no such problem. They can offer depositors liquidity with no vulnerability to runs because their assets are liquid and always carried at their market value. The rapid rise and fulsome success of the money market mutual funds demonstrate that it is possible to have checkable deposits backed with marketable assets. Once there are sufficient liquid, low-risk, low-transaction cost instruments in the economy to fund the payments system, there is no reason not to move to a set of institutions that use this market mechanism (which is cheap) rather than deposit insurance (which was adopted because the market mechanisms formerly available were costly). Debt that is cheaply marketed could be used to fund transaction accounts (demand deposits) and "information impacted" loans would be held by loan companies and financed with ordinary debt.

The success of this transition depends, however, on correctly pricing deposit insurance, that is, on ending any subsidies associated with it. While some observers argue that deposit insurance is not merely mispriced (due to not being risk-adjusted) but also underpriced, it is still the case that insured deposits now fund a smaller fraction of nonfinancial debt (the sum of government, household, and business debt, netting out institutions) than they used to. In 1960, net insured deposits (insured deposits less bank holdings of government debt, government-guaranteed loans, cash, and reserves) were 10.6 percent of nonfinancial debt. By 1975 this figure had risen to 27 percent, but by 1985, fallen back to just under 20 percent<sup>7</sup>.

## Conclusion

This paper starts with the premise that banks are in the transaction business and that banking institutions are designed to minimize transaction costs. Banks find their comparative advantage in collecting and assessing information and writing loan contracts. But because informational asymmetries prevail, the banking institutions of capitalism do not consist of "free markets" but rather of markets that are

<sup>7</sup>*Economic Report of the President*, 1986, p. 190.



free to impose restrictions upon themselves when they regard it as appropriate, that is, when those restrictions are cost minimizing. "Free"—that is, unconstrained—markets are not always the least expensive way to organize transactions, as Coase's view of the nature of the firm has argued. In particular, I have offered some suggestions as to why deposit insurance might be an efficient institution despite the moral hazard costs that it entails, and I have discussed the implications of the nature of the various transaction costs in banking for the future of deposit insurance.

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