

# Deposit Insurance Creates a Need for Bank Regulation

by Mark J. Flannery\*

Many bank managers and owners have long complained that they are overregulated by a plethora of government agencies. The thrust of their complaint is that they could do a better job—that is, become more profitable or increase their bank's market value—if left unencumbered by regulations limiting portfolio choice, capital adequacy, holding company formations, deposit rates, and so forth. They are doubtless correct. Yet banking in the U.S. possesses institutional characteristics that require at least some of the regulations currently in place. In particular, Federal deposit insurance gives insured bankers

an artificial incentive to undertake more risk than they would in an unregulated and uninsured free market. Bankers insured by the Federal Deposit Insurance Corporation (FDIC) can benefit *privately* by undertaking risks that the *society* as a whole considers excessive.

Restrictive bank regulations can thus be viewed as an effort to undo (or at least to limit) the distortive impact of deposit insurance on bank decisions. This view of bank regulation is certainly not all-encompassing, since numerous regulations pre-date FDIC and others are not directly related to bank risk taking. Nonetheless, considering the impact of FDIC insurance on bank behavior can often provide a useful framework for evaluating bank regulations and regulatory reform.

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### THE FEDERAL DEPOSIT INSURANCE SYSTEM

Congress introduced nationwide bank deposit insurance by creating the FDIC in the Banking Act of 1933.<sup>1</sup> By yearend 1980, 98.2 percent of all commercial banks in the U.S. were insured by FDIC. If an insured bank fails, FDIC promises to repay its depositors' losses, up to a maximum of \$100,000 per account. Today, coverage extends to 79.9 percent of all bank deposit balances in the U.S. In return for this insurance coverage, each insured bank pays FDIC an annual premium set by statute at .083 percent of total deposit balances.<sup>2</sup> FDIC uses this income to pay its expenses (including any insurance claims from failed banks' depositors) and to maintain an adequate insurance reserve fund. After providing for operating expenses, losses, and necessary additions to its reserve fund, FDIC is required to refund 60 percent of its remaining premium income to insured banks. In recent years, such refunds have lowered the net cost of FDIC deposit insurance to .03 percent or .04 percent of a bank's total deposits—less than half the statutory rate.

As with any insurance operation, FDIC's reserve fund is its first line of defense in the event of bank failures. At yearend 1980, this fund amounted to \$11 billion, or 1.16 percent of total insured deposits. Unlike private insurers, FDIC also possesses a unique second line of defense behind its reserve fund—a \$3-billion credit line from the U.S. Treasury. Although the government's formal

commitment to support FDIC ends here, many economists and regulators believe that the Federal Reserve and the Treasury would continue to provide almost limitless support to FDIC in the event of serious bank failures. This gives the taxpaying public a substantial indirect interest in the FDIC insurance fund's viability.<sup>3</sup>

Despite the fact that FDIC closely resembles private insurance companies in many regards, FDIC's fixed-rate premium structure is unusual, and this constitutes the *raison d'être* for other banking regulations. Private insurers use a variety of methods to calculate the level of premia they charge, but all have the same goal: providing adequate funds to cover future losses. Setting adequate premium levels requires an accurate assessment of the likely losses associated with each contract.

Insurance companies that cover automobiles, homes, and personal property generally charge a premium that varies with the perceived risk of the activity being underwritten. A seventeen-year-old urban male driver with three recorded accidents pays more for auto insurance than the elderly couple who live in a rural area and drive only on Sundays. Why? Because the insurance company anticipates that the teenager is more likely to have an accident and file an insurance claim. Greater perceived risk requires higher auto insurance premia if the company is to stay in business.

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<sup>3</sup>An example of this connection between FDIC and the general public occurred in 1974. During that spring and summer, Franklin National Bank was in serious danger of failing. Rather than close the bank and pay off its insured depositors, FDIC wanted to find another bank to acquire Franklin National. To keep the troubled bank afloat while FDIC sought a suitable merger partner, the Federal Reserve Bank of New York extended sizable loans at a below-market interest rate. This action cost the Federal Reserve Bank an estimated \$25 million. Since Federal Reserve operating surpluses are returned to the Treasury, U.S. taxpayers ultimately paid this cost. See Joseph F. Sinkey, "The Collapse of Franklin National Bank of New York," *Journal of Bank Research* (Summer 1976), pp. 113-122.

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<sup>1</sup>Although this article explicitly discusses only commercial banks, the same arguments apply to savings and loan associations, mutual savings banks, and credit unions.

<sup>2</sup>Note that banks with some accounts in excess of \$100,000 are paying for insurance coverage their depositors won't receive. Since larger banks more often have large customers, the effective cost of their deposit insurance (per insured deposit dollar) appears higher than it is for small banks.

Life insurance companies assess premia in a slightly more complicated fashion. Take the case of term insurance, which pays off only if the insured dies during the policy's term. Term insurance premia increase with an individual's age because, according to the annuity tables, older people are more likely to die during the contract period, exposing the insurance company to a loss. Like the automobile insurer, life insurance companies charge their higher risk customers more. At the same time, however, most insurance companies try to avoid the highest risk applicants in each age group by requiring applicants to undergo a physical examination. People in relatively poor health are denied coverage.

These examinations protect the insurance company against a phenomenon known as adverse selection. A person in poor health knows he is more likely to die than the average person his age in the general population. If all people the same age could purchase insurance for the same premium, those in worse health would be more likely to buy a policy. The average policy holder would therefore be more likely to die than the average person in the population, and the life insurance company would find itself paying for greater death benefits than it had expected from its annuity tables.<sup>4</sup>

FDIC's premium structure is like the life insurance company's in one way: each bank must initially demonstrate an acceptable level of financial health in order to qualify for FDIC coverage. But FDIC also requires frequent checkups (bank examinations) as a condition of continued coverage. This need constantly to reexamine insured banks arises because the provision of deposit insurance

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<sup>4</sup>Some insurance companies write policies for people without requiring a physical. This insurance is more expensive (has a higher premium) because the company knows it will suffer adverse selection. Healthy people are more likely to purchase lower cost policies that require a physical.

itself encourages the bank to become riskier than it was before becoming insured.

#### **DISTORTIONS CAUSED BY FDIC INSURANCE**

Consider first a bank with no deposit insurance. If it goes bankrupt, the shareholders will lose their entire investment and depositors will be less than fully repaid. Knowing this, each potential depositor should assess the riskiness of a bank's operations.<sup>5</sup> While a riskier loan portfolio is likely to mean higher returns for the bank, it also raises the prospects for bankruptcy. Depositors and stockholders will require compensation for bearing that risk in the form of a higher return on their funds. Thus the willingness of bank managers to make risky loans is held in check by the concern of depositors and stockholders for the safety of their funds. Indeed, free market advocates contend that the ability of people to shift funds from one bank to another ensures that banks will undertake a socially correct amount of risk.

Now consider the impact of fixed-premium deposit insurance on the bank's risk-taking decision. It is easiest to begin with an assumption that 100 percent of all bank deposits are covered and banks have no stockholders.<sup>6</sup> If the bank fails, FDIC stands ready to repay depositors in full, so depositors no longer care how risky the bank's asset portfolio

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<sup>5</sup>Whether depositors do or can evaluate bank risk is an entirely different issue, related to the initial reasons for Federal government provision of deposit insurance. See Ian McCarthy, "Deposit Insurance: Theory and Practice," *IMF Staff Papers* (September 1980), pp.578-600.

<sup>6</sup>A large school of thought contends that FDIC in fact has extended insurance coverage to all bank liability holders by its decisions to arrange mergers (technically called a "purchase and assumption") rather than closing failed institutions outright. See David B. Humphrey, "100% Deposit Insurance: What Would It Cost?" *Journal of Bank Research* (Autumn 1976), pp. 192-198 or Gary Leff, "Should Federal Deposit Insurance Be 100 Percent?" *Bankers Magazine* (Summer 1976), pp. 23-30.

really is. So long as people retain faith in FDIC's ability to make payments, the bank's borrowing (deposit) costs are the same no matter how risky its asset portfolio. One natural check on bank risk taking has thus been eliminated. Since riskier assets offer higher expected returns and since deposit costs don't vary with the bank's perceived risk, the bank maximizes expected profits by purchasing the riskiest available assets. This decision becomes perfectly rational from the bank's private perspective once deposit insurance has been procured. In other words, *banks have a clear incentive to become more risky when FDIC begins promising to absorb their default losses* (see Appendix).

This example overstates the argument by ignoring two important considerations. First, the bank's deposits and other liabilities are not fully (100-percent) insured by FDIC. Some depositors will therefore demand higher interest rates when the bank's underlying portfolio risk rises, making the banker's ability to profit by undertaking socially excessive risks smaller than it would be with 100-percent insurance coverage. Second, banks do have stockholders, and these owners are concerned about their risk exposure. Their aversion to risk will provide some limit to the manager's willingness to make ever riskier loans. FDIC insurance will still distort the private incentive to bear risk, however, by reducing the increase in deposit costs that would normally accompany greater bank portfolio risk.

Economists refer to distortions such as those resulting from FDIC deposit insurance as externalities, since one individual's actions affect the well-being of other people. An externality can be either good or bad. Picking up litter in a public park, for example, constitutes a good externality: the clean view is enjoyed by people *other than* the do-gooder. A factory whose chimney dumps soot onto nearby residents' drying laundry is a bad externality. The factory could burn cleaner fuel or install stack scrubbers, but

these actions would mean lower profits.<sup>7</sup> The outcome—air pollution—illustrates how government regulation—pollution control—can improve overall social welfare even though it imposes a real burden on private parties such as factory owners.

Just as factories would ignore their polluting effects in the absence of regulation, banks will ignore the extra risk they impose on society as a result of not having to be concerned about the safety of depositors' funds. In response, bank regulators have taken steps to limit the risk that insured bankers are allowed to undertake. Effective regulations will reduce bank profits relative to what they would be without regulations (though with deposit insurance), but society should be made better off because of the diminished amount of bank risk taking.

#### **BANK REGULATIONS AS A RESPONSE TO DEPOSIT INSURANCE**

Many types of banking regulations can be interpreted as efforts to counteract the distortive effects of fixed-premium deposit insurance. With the introduction of one distortion (the insurance), others are required to prevent too great a departure from the socially ideal result that an unregulated market mechanism would yield. (The fact that FDIC received extensive regulatory powers in conjunction with its insurance

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<sup>7</sup>From the factory owner's own (selfish) perspective, spewing soot is the optimal decision. It maximizes her profits. Suppose, however, it would cost \$10 per year to eliminate the soot, which would make the neighbors feel \$15 better off. The *socially* optimal decision would be to eliminate the soot. Pollution control laws are intended to bring about the desired result. Since the factory owner finds it privately more profitable to pollute, her profits will decline as a result of enforcing these regulations. (If profits do not decline, either the regulations are ineffective or the factory owner was operating inefficiently to begin with.) Despite the factory owner's loss, the society as a whole—factory plus neighbors—will be made better off under a proper set of pollution restrictions.

responsibilities is consistent with this view.) Not all regulations and portfolio restrictions arise because of deposit insurance, but it often provides a useful framework for evaluating new or existing regulations.

**Asset Limitations.** Banks are subject to a large number of restrictions on the type or quality of assets they may hold in their portfolios. Banks may not own stocks or significant amounts of real estate; unsecured loans may not exceed 10 percent of a national bank's net worth (the lending limit); equipment leases must be conservatively valued; the quality of bank loans is evaluated carefully by bank examiners (see BANK EXAMINATIONS overleaf). Recently, the Federal regulators promulgated far-reaching restrictions on bank activities in the financial futures markets that many industry observers contend limit banks' ability to profit in these markets.<sup>8</sup> In each instance, the regulations limit bank expansion into areas that are presumed to be relatively risky. Would bankers be better off (more profitable) without such restrictions? Almost certainly the answer is Yes. Eliminating regulations won't make banks worse off, because they could choose the same portfolios if they wanted.

If banks choose new portfolios, it must be because expected profits are higher. Risk may also be increased, though, and the intent of these asset restrictions is to prevent insured banks from undertaking too much risk from society's point of view.

**Capital Adequacy.** A bank whose acquisition of risky assets is blocked by regulations could increase its shareholders' expected returns by lowering its equity cushion. Earnings from the same volume of assets would then accrue to a smaller number of shareholders, raising the expected return to each one. Since bank equity serves as a buffer to absorb losses, lowering the equity

cushion also exposes the FDIC to greater risk. A smaller proportional loss on assets would more readily bring on bankruptcy, raising the probability of an FDIC payout. Bank regulations try to prevent this by imposing minimum capital (net worth) ratios that all banks must meet to be considered sound.

The issue of adequate bank capitalization has been hotly debated and is the subject of often bitter dispute between bankers and regulators.<sup>9</sup> It should be. If capital regulations did not constrain bankers (that is, lower their expected return on equity), they wouldn't complain, but neither would the regulation be successfully counteracting the distortive effects of FDIC insurance.

**Bank Holding Company Permissible Activities.** In some other countries, banks are closely affiliated with a myriad of financial and nonfinancial firms via holding companies or overlapping ownership and management. In the U.S., Congress has limited bank holding companies to activities "so closely related to banking as to be a proper incident thereto" (Bank Holding Company Act, 1970 Amendments). While there may be other reasons for these limitations, bank safety is a prime concern. To allow banks to become closely affiliated with firms in nonbanking lines of commerce, the regulators fear, would expose the banking subsidiary to unacceptable risks of at least two sorts. First, the public might confuse a troubled holding company or nonbank subsidiary firm with the bank itself and then withdraw deposits and cause a liquidity crisis. Second, the bank may extend unsound loans to other holding company subsidiary firms in an effort to forestall disaster in the

<sup>8</sup>Not surprisingly, some of the futures exchanges are most critical of these regulations.

<sup>9</sup>For more on this subject, see Ronald Watson, "Insuring Some Progress in the Bank Capital Hassle," *Business Review*, Federal Reserve Bank of Philadelphia (July 1974), pp. 3-17, or Robert Taggart, "Regulatory Influences on Bank Capital," *New England Economic Review* (September 1977), pp. 37-46.

## BANK EXAMINATIONS AND CAPITAL ADEQUACY

On-site FDIC bank examinations play an important part in identifying bank behavior that is considered overly risky. An examination evaluates many dimensions of bank operations, including liquidity, earnings, and the quality of management. In addition, asset quality and capital adequacy receive considerable attention:

"One of the most important aspects of the examination process is the evaluation of loans, for, in large measure, it is the quality of a bank's loans which determines the risk to depositors." (*FDIC Manual of Examination Policy*, Section H, p. 1.)

"Some qualifications are necessary, but in general the degree of protection afforded depositors is closely related to the strength of a bank's capital position. For this reason many important phases of the bank examination procedure have as their purpose the determination and analysis of a bank's capital." (*FDIC Manual of Examination Policy*, Section D, p. 1.)

Examiners' loan quality evaluations can heavily influence the level of capital considered adequate for a particular bank.

Loan losses are a routine, if unpleasant, aspect of any bank's operations. In recognition of this, bankers carry a Loan Loss Reserve in the capital account. This Reserve represents the banker's best guess of the loans on her books that will not be repaid. If this evaluation is accurate, the bank's balance sheet fairly reflects the value of its assets. (In particular, bank capital—the residual difference between assets and liabilities—is correctly recorded on the balance sheet.) If the Loan Loss Reserve understates likely future losses, however, the bank's books tend to overvalue loan assets and hence overstate the true capital position.

The loan examination process constitutes an effort to verify the adequacy of the Loan Loss Reserve account. The loan examiner generally selects a subset of the bank's loan population for scrutiny, emphasizing relatively large loans and those with recent payment problems. Some examined loans will (usually) be criticized by the examiner, reflecting her opinion that the loan is somewhat unlikely to be repaid in full. In other words, the examiner does not consider the asset to be of bankable quality. The examiners take the bank's reported (book) capital position and *subtract out* a portion of the loans that have been criticized. If the bank's Loan Loss Reserve was at least sufficient to cover the examiner's estimated likely loan losses, there is no change in the bank's reported capital position. Otherwise, the bank's balance sheet overstated the true degree of protection afforded the depositors (and the FDIC). Examiners may require that some loans be written off, or that the Loan Loss Reserve account be increased through retained earnings. In any case, the regulator's determination of bank capital adequacy will be based on the reported book capital *adjusted* for the examiner's estimate of likely loan and security losses.

This connection between loan evaluation and capital adequacy can sometimes make the bank examination process acrimonious. Examiners have the primary power to criticize a bank's activities as too risky, and this criticism affects the bank's need for additional capital. Since more capital reduces the expected rate of return to equity holders, bank management views this process as intrusive. It is. Banks and FDIC hold differing views on the issue of bank risk taking. On-site examinations constitute a prime tool by which FDIC monitors and controls its insured banks' activities.

nonbanking firms.

**Interest Rate Ceilings.** Bank competition for selected types of deposit funds has also been limited by regulation over the years. Congress prohibited the payment of interest on demand deposit (checking) accounts in 1933, and it empowered the Federal Reserve to set maximum permissible rates payable on time and savings deposits (Regulation Q). The initial intent of both these rules was to limit bank risk taking. Banks were viewed as bidding against one another for deposit funds, then being forced to invest in risky assets in order to earn enough to cover their deposit costs.

Over the past ten or fifteen years, financial markets have developed an impressive array of devices aimed at circumventing Regulation Q. Faced with this new, unregulated competition, banks often become unable to acquire deposits in sufficient quantity at the

regulated rates. While deposit rate regulation was introduced as a means of limiting bank risk exposure, it has instead become a threat to bank stability. This development was recognized by Congress when it voted in March, 1980 to eliminate Regulation Q ceilings by 1986. (This process has already begun, under the control of the Federal Depository Institution Deregulation Committee.)

It is impossible to identify precisely how much these various regulations reduce the additional risks banks take in response to their deposit insurance. The key point, however, is that insurance and regulation are *linked* activities. If one side is subjected to reforms—take deregulation as an example—then unless something is done with the present insurance scheme society will be left to bear more risk (see REFORMING DEPOSIT INSURANCE).

### REFORMING DEPOSIT INSURANCE

If the existing deposit insurance system requires such a myriad of restrictive bank regulations, why not change the system and remove the regulatory burden? Either of two significant reforms would eliminate some of the current system's distortions, but each would be difficult to implement in practice.

First, Federal deposit insurance could be eliminated entirely. Eliminating FDIC would strengthen the impact of market forces on bank risk-taking decisions, allowing at least some bank regulations to be removed. At the same time, however, depositors would find themselves exposed to more risk, and they would have to evaluate their investment decisions more carefully. Imposing this burden on small depositors seems to contradict the initial spirit of the Federal insurance program. A middle course here would reduce the extent of FDIC coverage, for example from \$100,000 back down to \$20,000 or \$10,000. Deposit costs would then reflect bankers' asset decisions more closely, while small savers, for whom investment and information evaluation costs are presumably most burdensome, would still benefit from insurance protection.

A second possible reform would be to make the insurance premium paid by banks vary according to the riskiness of their portfolios. (The Federal Savings and Loan Insurance Corporation has recently announced its intention to pursue a policy of this sort.) Just as automobile insurance companies charge more to insure unsafe drivers, riskier banks would pay a higher price for insurance than safe banks. With a perfectly accurate method of assessing the risk of a bank's portfolio, a variable premium system would mimic the private market. It would give bankers the socially correct incentives to undertake risks while extending the benefits of Federal deposit insurance to bank depositors. The problem here is that any practical system for measuring risk would be imperfect, overestimating the risk of some activities while underestimating others. (This is also true of other existing types of insurance.) If bankers and their customers felt a particular activity was really less risky than FDIC did, the bankers would find it unprofitable to undertake

these investments because the expected return would not cover deposit costs plus the variable insurance premium. Alternatively, an FDIC premium that bankers considered too low for some particular type of risk would generate too much risk taking of this sort.

Distortions to bank asset portfolios would not disappear under a variable rate system, but they probably would be smaller. Some existing bank regulations could be modified accordingly or eliminated. Offsetting these gains, however, would be the increased complexity of determining an appropriate FDIC premium rate for each bank. Accurately comparing the effects of a risk-related FDIC premium versus the current system is a formidable task but one that bears further study.

### CONCLUSION

Bankers benefit substantially from fixed-rate FDIC insurance, which allows them to procure a large supply of funds at a low (that is, riskless) interest rate regardless of their assets' riskiness. Severing the connection between portfolio risk and deposit costs leads banks to undertake risks they otherwise wouldn't, secure in the knowledge that they get all the benefits of a good outcome while suffering less than all of any losses that may occur. To counteract this distortion, regulators impose portfolio restrictions, capital standards, and so forth on insured banks as a means of limiting the risk FDIC is forced to insure against. These regulations limit bankers' freedom and may reduce bank profits. Yet neither of these observations

implies that the attendant regulations are socially bad, only that they are effective. If bankers felt no pain from regulators' actions, the regulations could not be affecting bank behavior!

Is there too much corrective regulation? This is a very difficult question to answer. It requires a careful comparison of society's losses (in terms of lower output) from the restrictions placed on bank decisionmaking versus the social benefits of a safer financial environment. To date, no one has made much of an attempt to grapple with this big issue. Until some answers are generated, it will be quite difficult to say how much regulation (or deregulation) is ideal from society's point of view.

## APPENDIX . . .

## A SIMPLE EXAMPLE OF HOW FDIC INSURANCE CAN DISTORT BANK RISK-BEARING INCENTIVES

This example is set in a highly simplified world. The bank finances its asset acquisitions by issuing a single type of deposit liability, and it has no net worth. Uncertainty is limited to the fact that either of two possible states of the world may occur in the future. Bank assets return their higher value in the good state, and their lower value in the bad state. At the time investments are made, each future state of the world is considered equally likely to occur. (That is, each has a probability equal to 1/2.)

### EXAMPLE 1: Determining the Deposit Rate and Equity Market Value.

This first example serves to illustrate the basic components of bank valuation. Assume the bank buys a one-period asset today for \$900. If state number 1 occurs, the bank's asset will be worth \$1,000, while in the second possible state the asset's value will be \$2,000. The bank finances itself by issuing a deposit liability of \$900, giving it an initial balance sheet:

Assets	Liabilities
900	900
	0 Net Worth

At the end of one time period the bank will collect on its assets, pay off the depositors, and go out of business. The riskless market rate of interest is 6 percent per year.

The value of the firm's equity can be calculated from the expected value of its future profits, assuming *risk neutrality* on the part of the owners and depositors.\* First consider the depositors. Even in the bad future state of the world the bank will be able to pay off depositors their principal plus interest at the riskless rate (\$954). The deposit rate will therefore be 6 percent. Risk-neutral owners will value the bank's equity at the net present value of expected future earnings after interest payments. Ignoring the discount rate:

$$\begin{aligned}
 \text{Value of equity} &= \frac{1}{2} (\text{profit in state 1}) + \frac{1}{2} (\text{profit in state 2}) \\
 &= \frac{1}{2} (1000 - 900 (1.06)) + \frac{1}{2} (2000 - 900 (1.06)) \\
 &= \$546.
 \end{aligned}$$

In other words, the right to receive this bank's (uncertain) end-of-period profits would be worth \$546.

\*A person is risk neutral if she will take a fair bet. For example, consider a game where the dealer flips a coin, promising to pay the player \$1.00 if heads come up, but nothing in the event of tails. A risk-neutral person would pay up to 50¢ to play this game—the expected (mean) value of the winnings. A *risk-averse* person would pay less than 50¢; a *risk-loving* person would pay (a maximum of) more than 50¢.

**EXAMPLE 2: Risk Bearing With Deposit Insurance.**

Now consider the situation where the firm has the opportunity to buy an additional asset for \$300. The firm will have to borrow \$300 to acquire the asset, resulting in the balance sheet,

Assets	Liabilities
900	900
+300	+300
	0 Net Worth

The new asset will be worth \$100 in state number 1 and \$500 in state number 2, giving it an expected return of 0 percent [ $\frac{1}{2}(100) + \frac{1}{2}(500) = 300$ , the asset's purchase price]. No one should wish to purchase such an asset when the riskless market rate is 6 percent. Nonetheless, it will be shown that a bank whose deposits are insured at a fixed premium would be willing to buy this asset.

At the end of the period, the firm's total assets will be worth \$1,100 (\$1,000 for the initial asset plus \$100 for the new one) in state number 1 and \$2,500 (the initial \$2,000 plus \$500) in state number 2. Bankruptcy will result if state number 1 occurs: depositors will not be paid interest (or even repaid all the principal). FDIC insurance is now valuable to the bank's owners. Suppose FDIC promises to repay the bank's depositors in full (including interest) in return for a \$1.00 premium (.083 percent of the \$1,200 deposits). Insured depositors will lend to the bank at the riskless rate of 6 percent, making the value of equity:

$$= \frac{1}{2}(1100 - 1200(1.06) - 1) + \frac{1}{2}(2500 - 1200(1.06) - 1)$$

$$= \frac{1}{2}(1100 - 1273) + \frac{1}{2}(2500 - 1273).$$

Since expenses in the first state of the world are greater than earnings, the owners expect to receive no return for this period and will default on their obligations—that is, the firm will be declared bankrupt. (Because of deposit insurance, however, all deposits will still be paid off.) Even though the firm is worth nothing if state number 1 occurs, owners will bid a positive price for the firm's equity because profits will be positive if state number 2 occurs:

$$\text{Value of equity} = \frac{1}{2}(0) + \frac{1}{2}(2500 - 1273)$$

$$= \$613.50.$$

With deposits insured by FDIC, the owners of the bank will undertake to buy the new asset because the value of their equity rises from \$546 (without the new asset) to \$613.50. Why does this occur? Because the owners receive *all the profits* in the good state of the world but have *only limited liability* in the bad state of the world.

**EXAMPLE 3: Risk Bearing Without Deposit Insurance.**

Now suppose the bank's deposits are not insured. If the bad state of the world occurs, the firm goes bankrupt and the depositors as a group receive only \$1,100 for their \$1,200 of deposits. To compensate for this possible loss, the depositors must be offered a rate of return (R) in the good state of the world high enough to make their *expected* return on deposits equal to or greater than the risk-free rate. That is, for deposits of \$1,200, depositors must be promised a rate R such that:

$$\frac{1}{2}(1100) + \frac{1}{2}(1200(1 + R)) \geq 1200(1 + .06)$$

$$R \geq 20.3 \text{ percent.}$$

Risk-neutral depositors would accept a promised return of 20.3 percent; risk averse depositors would demand more.

With this higher promised deposit rate, the value of the bank's equity after it purchases the \$300 asset will be:

$$= \frac{1}{2} (0) + \frac{1}{2} (2500 - 1200 (1 + .203))$$

$$= \$528.02.$$

Undertaking this new investment without deposit insurance therefore would make the firm's value drop below its initial value (\$546). The bank would not invest in the asset, which is the socially correct decision.

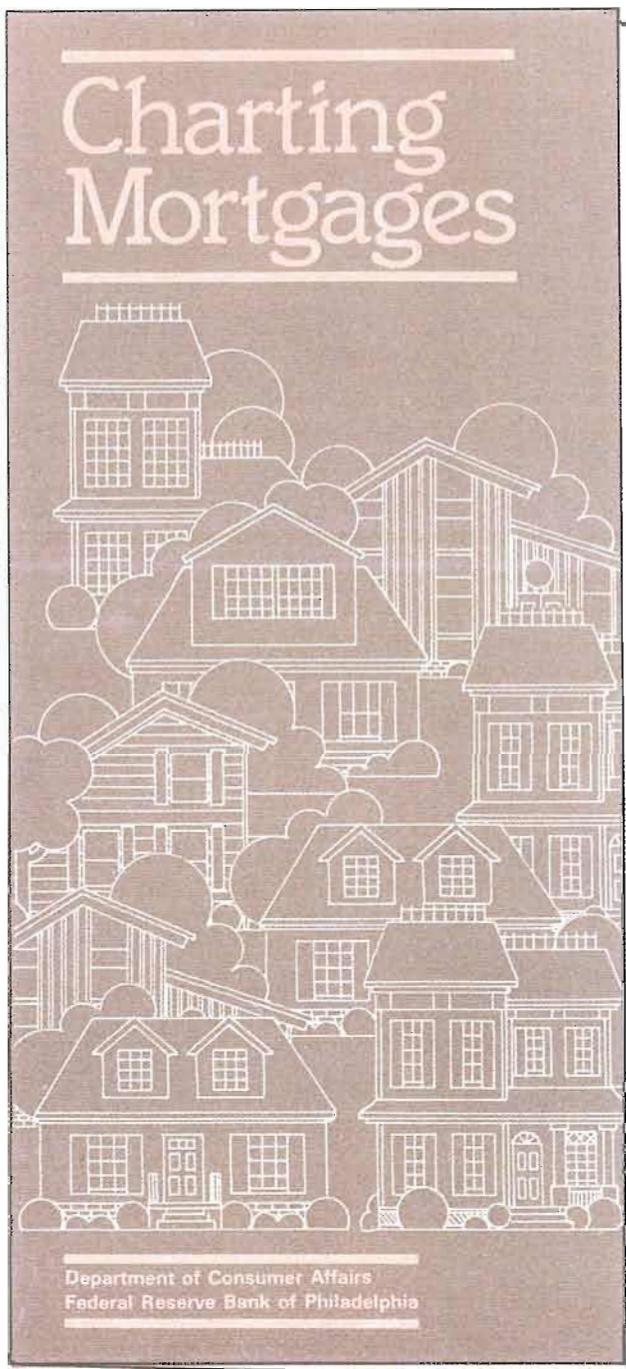
These examples could be made considerably more realistic by increasing the number of possible future states, introducing positive net worth and several classes of depositors, allowing risk-averse depositors or bank owners, and so forth. None of these changes would alter the basic conclusions. The important implication of this example is that *a bank will undertake risky projects with a fixed-premium insurance program that it would not normally undertake*. The bank has an incentive to take on greater risks because it does not pay FDIC a premium that fully reflects the *social* cost of the bank's risk taking.

### SUGGESTED READINGS

The notion that FDIC insurance distorts bank risk-taking decisions has been developed by John H. Kareken and Neil Wallace, "Deposit Insurance and Bank Regulation: A Partial-Equilibrium Exposition," *Journal of Business* (July 1978), pp. 413-438; Robert C. Merton, "On the Cost of Deposit Insurance When There Are Surveillance Costs," *Journal of Business* (July 1978), pp. 439-452; and William F. Sharpe, "Bank Capital Adequacy, Deposit Insurance and Security Values," *Journal of Financial and Quantitative Analysis* (November 1978), pp. 701-718.

Reasons for Federal provision of deposit insurance and alternative ways of setting premia for that insurance are discussed in Kenneth E. Scott and Thomas Mayer, "Risk and Regulation in Banking: Some Proposals for Federal Deposit Insurance Reform," *Stanford Law Review* (May 1971), pp. 857-902.

## FROM THE PHILADELPHIA FED . . .



This new pamphlet compares creative mortgage financing methods with the conventional mortgages. Copies are available without charge from the Department of Public Services, Federal Reserve Bank of Philadelphia, 100 North Sixth Street, Philadelphia, Pennsylvania 19106.

## Did the Tax Cut Really Cut Taxes? A Further Note

Stephen A. Meyer and Robert J. Rossana

The previous issue of this *Review* contained our analysis of the three-year personal income tax cut adopted in 1981.<sup>1</sup> We concluded that the phased-in twenty-five percent cut in personal income tax rates will have little effect on people's behavior, because few taxpayers will face lower tax rates in 1983 than they did in 1980, or in 1978. Bracket creep caused by continuing inflation, plus rising social security payroll taxes, mean that families in most tax brackets will face the same or higher marginal tax rates on a given real income in 1983 than in 1980 or 1978. Thus it is unlikely that the personal income tax cuts adopted in 1981 will improve incentives to work or save.

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<sup>1</sup>Stephen A. Meyer and Robert J. Rossana, "Did the Tax Cut Really Cut Taxes?" *Business Review*, Federal Reserve Bank of Philadelphia, November/December 1981, pp. 3-12.

Mechanical errors in converting total income into taxable income led to errors in the tax rate tables in our earlier article. In particular the marginal tax rates for families who take the standard deduction were incorrect; the correct marginal tax rates are lower, across the board, than those we reported originally. Similarly, the original article overstated, slightly, the marginal tax rates that will apply in 1983 to families who itemize deductions and understated them for 1981. In this note we provide the *correct* marginal tax rates. Tables 3 and 4 presented here *replace* Tables 3 and 4 in the earlier issue of this *Review*.

Table 3 reports what marginal tax rates would have been for families who take the standard deduction, if Congress had not adopted the 1981 tax package. The rise in marginal tax rates for families who itemize would have been virtually the same. As we

**TABLE 3**  
**MARGINAL TAX RATES**  
**WITHOUT TAX CUT**

AGI (1981\$)	1978		1979		1980		1981		1982		1983	
	Fed.	Tot.										
13000	.19	.25	.18	.24	.18	.24	.21	.28	.21	.28	.21	.28
15000	.22	.28	.21	.27	.21	.27	.21	.28	.24	.31	.24	.31
17000	.22	.28	.21	.27	.24	.30	.24	.31	.24	.31	.28	.35
19000	.25	.25	.24	.30	.24	.30	.28	.35	.28	.35	.32	.39
22500	.28	.28	.28	.28	.28	.28	.32	.39	.32	.39	.37	.44
27500	.32	.32	.32	.32	.32	.32	.37	.37	.37	.37	.43	.43
40000	.42	.42	.43	.43	.43	.43	.49	.49	.49	.49	.49	.49

N.B. Fed. = Marginal rate from Federal tax code.

Tot. = Sum of Federal marginal rate and social security rate.

Data apply to joint return of four person household using standard deduction. Tax rates are rounded to the nearest percent.

reported in our earlier article, marginal tax rates would have risen, across the board, had the 1981 tax bill not been passed. Table 4 provides the correct marginal tax rates, contained in the 1981 tax act, that will apply from 1981 to 1983. We present tax rates for families who use the standard deduction and for those who itemize deductions. These corrections do not change the conclusions in the original paper to any significant extent. The corrected tax rates, as well as those reported in the original paper, show that few families will face lower marginal tax rates in 1983 than they did in 1980 or in 1978.

Among families who take the standard deduction, those in the lowest income groups that we studied (\$13,000 to \$17,000 in 1978 dollars) will face the same total marginal tax rates in 1983 as they did in 1980. Families in the middle income groups (\$19,000 to \$27,500 in 1978 dollars) will face higher total marginal tax rates in 1983 than they did in 1980.

The few families in the \$40,000 (in 1978 dollars) income group who take the standard deduction will face a slightly lower marginal tax rate in 1983 than they did in 1980, in contrast to the original table.

For families who itemize deductions, those in the lowest income group will see a slight drop in their total marginal tax rate from 1980 to 1983, while those in the \$15,000 and \$17,000 (in 1978 dollars) groups will face constant marginal tax rates. Families in the middle income groups (\$19,000 and \$22,500 in 1978 dollars) will face higher tax rates. Higher income families (those in the \$27,500 to \$40,000 range, in 1978 dollars) will actually see a slight decline in their marginal tax rates from 1980 to 1983, contrary to our original results. But even these families will face higher marginal tax rates in 1983 than they did in 1978.

The overall conclusions of the original article largely remain. Although the 1981 tax

**TABLE 4**  
**MARGINAL TAX RATES AFTER REAGAN TAX CUT**

Household Of Four Filing Jointly  
(Using Standard Deduction)

AGI (1978\$)	1980		1981		1982		1983	
	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.
13000	.18	.24	.21	.27	.19	.26	.17	.24
15000	.21	.27	.21	.27	.22	.29	.20	.27
17000	.24	.30	.24	.30	.22	.29	.23	.30
19000	.24	.30	.28	.34	.25	.32	.25	.32
22500	.28	.28	.32	.38	.28	.35	.30	.37
27500	.32	.32	.37	.37	.33	.33	.35	.35
40000	.43	.43	.48	.48	.44	.44	.40	.40

Household Of Four Filing Jointly  
(Itemizing Deductions)

AGI (1978\$)	1980		1981		1982		1983	
	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.	Fed.	Tot.
13000	.18	.24	.18	.24	.16	.23	.15	.22
15000	.18	.24	.21	.27	.19	.26	.17	.24
17000	.21	.27	.21	.27	.22	.29	.20	.27
19000	.21	.27	.24	.30	.22	.29	.23	.30
22500	.24	.24	.28	.34	.25	.32	.25	.32
27500	.32	.32	.32	.32	.33	.33	.30	.30
40000	.43	.43	.42	.42	.39	.39	.40	.40

N.B. Tax rates are rounded to the nearest percent.

cut ensures that tax rates in 1983 will be lower than they would otherwise have been, tax rates in 1983 will be the same as or higher than they were in 1980, with few exceptions.

Bracket creep and higher social security taxes will offset the 25-percent reduction in personal income tax rates for families in a majority of brackets.

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