The Journal of Private Enterprise 31(2), 2016, 1–13

The Implicit Costs of Government Deposit Insurance*

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Abstract
Most people believe that the benefits of deposit insurance provided by the Federal Deposit Insurance Corporation (FDIC) clearly exceed the costs. However, a growing literature suggests that the benefits of FDIC insurance are overstated while the costs are understated. We add to this literature by considering the implicit costs of government-provided deposit insurance. Specifically, we consider the costs arising from (1) an implicit taxpayer backstop and (2) suboptimal pricing. The implicit costs of government-provided deposit insurance are real economic costs borne by taxpayers, borrowers, lenders, and counterparties. Since such costs are routinely omitted from traditional cost-benefit analysis, most studies of the FDIC tend to be biased in favor of government-provided deposit insurance.

JEL Codes: E44, G28, G21
Keywords: actuarially fair, bank failures, comparative institutional analysis, deposit insurance, Diamond-Dybvig model, FDIC

I. Introduction

Few Americans give government-provided deposit insurance a second thought—and virtually no one calls for the abolition of the Federal Deposit Insurance Corporation (FDIC). To the extent that the FDIC is considered at all, it is politically popular. It is often credited with preventing bank runs like those of the Great Depression, and Congress has increased the maximum account balance covered by the FDIC seven times since its founding in 1933. With annual administrative and operating expenses averaging just a few cents per $100 insured, most people believe the benefits of government-provided deposit insurance exceed the costs.

* The authors thank the Cato Institute and the Mercatus Center at George Mason University for generously supporting this research.

A growing literature, however, suggests that the benefits are often overstated while the costs are understated. In particular, historical studies such as Calomiris and White (1994), Curry and Shibut (2000), and Krosner and Melick (2008) question the value created by the FDIC. Hogan and Luther (2013) consider the explicit costs of the FDIC and conclude that they are significantly larger than those assumed in the standard benchmark model. We add to this literature by considering the implicit costs of FDIC insurance. Since such costs are routinely omitted, traditional cost-benefit analyses of the FDIC tend to be biased in favor of government-provided deposit insurance.

At least two potentially significant costs are omitted in the standard benchmark model of deposit insurance. When governments provide deposit insurance, taxpayers bear an implicit cost. In times of crisis, they may be called upon to cover depositor claims in excess of the FDIC's Deposit Insurance Fund (DIF). Such a taxpayer backstop is costly. Although taxpayers are not called upon every year (and, under some systems, might never be called upon), taxpayers effectively hold a contingent claims contract. A reasonable measure of total annual expenses for FDIC insurance should include the implied cost of this contract.

Costs also arise from the suboptimal pricing of deposit insurance. The assessment rates set by the FDIC can be described as suboptimal when the actual rate is either higher or lower than the rate predicted by actuarially fair models of deposit insurance. Since a higher-than-optimal rate decreases intermediation and a lower-than-optimal rate encourages excessive risk-taking and increases financial fragility, borrowers, lenders, and their counterparties incur costs from suboptimal pricing. A reasonable measure of total annual expenses should include the implied costs that arise from suboptimal pricing.

We argue that a proper cost-benefit analysis of government-provided deposit insurance must include the costs of implicit taxpayer guarantees and suboptimal pricing. The implicit costs of government-provided deposit insurance are real economic costs borne by taxpayers, borrowers, lenders, and counterparties. These implicit costs should be added to those traditionally recognized when engaging in cost-benefit analysis. Ignoring these costs biases the analysis in favor of government-provided deposit insurance. In what follows, we discuss Diamond and Dybvig (1983), which serves as a theoretical justification for government deposit insurance. Then, we consider the empirical evidence of the implicit costs described above but omitted from the model. We find sufficient evidence to conclude that these costs are nontrivial.[1]

II. Theory of Deposit Insurance

The Diamond-Dybvig (DD) model can be summarized as follows: Suppose N people each deposit 1 unit of goods into a bank. The bank invests its funds at some rate $R > 1$. Agents can either withdraw their funds after 1 period or 2. Those withdrawals in period 1 receive a stated rate of r_1 where $1 < r_1 < R$. In period 2, the bank is liquidated, and its remaining funds are divided evenly among all remaining depositors who each receive r_2. Assume that some portion $0 < f \leq 1$ of depositors withdraw in period 1. Then r_2 is dependent on r_1 and f such that $r_2 = R\ (1 - f \times r_1)\ /\ (N - f)$. When the portion of withdrawers f is low, we know that $r_2 > r_1$, but when f is high, $r_2 < r_1$. Thus, there must be some tipping point f^* where $r_2 = r_1$.

For simplicity, Diamond and Dybvig (1983) assume most agents are indifferent between consumption in periods 1 and 2. However, in period 1, some portion t of the agents becomes impatient and prefers to consume in that period. As long as $t < f^*$, the return on deposits is higher in period 2 than in period 1, and only impatient agents will withdraw in period 1. All other agents will wait and withdraw in period 2 since they are indifferent between periods, and the payoff $r_2 > r_1$. However, if the number of impatient agents exceeds the tipping point (i.e., when $t > f^*$), the payoff r_1 in period 1 becomes greater than the payoff r_2 in period 2. In this case, even the patient agents have an incentive to withdraw their funds in period 1. Since all agents—both patient and impatient—attempt to withdraw their funds in period 1, a bank run occurs.

When a run occurs, the bank does not have sufficient capital to cover all withdrawals. All agents attempt to withdraw their funds simultaneously, and each agent withdraws $r_1 > 1$, making a total of $N \times r_1$ in withdrawals. However, because the bank holds only $N \times 1$ in deposits, there is not enough capital in the bank to pay r_1 to all agents. Some agents will be paid their return of r_1 while others will get nothing. Diamond and Dybvig (1983) assume a "sequential service constraint" such that agents arrive at the bank in random order and are paid according to their place in line until the bank is devoid of

[1] Our results seem especially relevant when one considers the large set of alternatives to government-provided deposit insurance (Hogan and Johnson 2016).

funds. Thus, the first 1 / r_1 agents receive a payment of r_1 while the remaining 1 – (1 / r_1) agents receive a payment of 0.

In the DD model, the ability or inability to prevent bank runs depends on what information is publicly available. If a bank has the ability to verify a customer's type as patient or impatient, then the bank can prevent runs by promising to pay only impatient agents in period 1. Similarly, if the bank knows the portion t of impatient agents in the population, then the bank can promise to pay out a maximum of $t \times r_1$ in period 1. In this case, patient agents are guaranteed to receive $r_2 > r_1$ in period 2 and have no incentive to redeem their deposits in period 1, so no bank run occurs. Assured their deposits will be safe until period 2, patient depositors will never need to withdraw in period 1. The signal alone is enough to prevent runs at no cost to the bank.

Problems arise when customer preferences are not publically observable. Banks do not have full information about their depositors nor about how many agents will withdraw in any given period. Since agent type is not verifiable, and t is unknown, banks cannot credibly commit to preventing runs. Common knowledge of this lack of information and the *potential* for a bank run to occur further complicate matters: patient agents have an incentive to withdraw their funds in period 1 if they *expect* others to run. As a result, any signal indicating that a bank run might occur could, itself, produce a bank run. Diamond and Dybvig (1983, p. 410) suggest that the signal may be any "commonly observable random variable in the economy . . . even sunspots . . . [and] need not be anything fundamental about the bank's condition."

Diamond and Dybvig (1983) propose that "sunspot" runs can be prevented with government deposit insurance. While banks do not have sufficient information to prevent runs, the government, the authors conjecture, has information not available to the public and is able to verify each agent's type ex post. Additionally, the government can levy taxes after all withdrawals are made in period 1.[2] The authors propose a system in which all deposits are taxed according to the expected value of t. If, at the end of period 1, there has been no run, then the taxes are repaid such that each agent receives the expected value of their deposits r_1 or r_2. If a run does occur, then each impatient depositor receives their original deposit of 1 while patient

2 Some works question the appropriateness of the implicit technological or epistemic asymmetry between government agents and bankers (e.g., Wallace 1988, McCulloch and Yu 1998, White 1999).

depositors receive *R*. Of course, in such a system, no patient depositor has an incentive to withdraw in period 1, and the signal alone is enough to prevent bank runs.

Under these strict assumptions, runs are inherent to deposit banking. By assuming that the government is not subject to the same time and informational constraints as regular banks, runs can be eliminated in the DD model. Unfortunately, this model abstracts away many factors that historically have affected bank runs. Studies such Dowd (1988), Chari (1989), and Selgin (1993) address aspects of banking and bank runs that are missing from the DD model. This study, on the other hand, considers aspects of deposit insurance that may be absent from simple analyses such as the DD model. The next section discusses the implicit cost borne by taxpayers of FDIC insurance. Section four discusses the losses created by the suboptimal pricing of deposit insurance.

III. Taxpayer Backing

In times of financial crisis, the burden of insuring depositors has frequently fallen on taxpayers rather than on the FDIC alone. While taxpayers are affected in some years and not in others, they bear an implicit cost in every year because it is not known in advance when banks will default on their obligations or by how much. The probabilistic annual cost to taxpayers is functionally equivalent to the cost of a contingent claims contract, since taxpayers are committed in advance to financing any deficit of the DIF, should such funding become necessary.

The original DIF was created in 1934 with equity capital investments of $150 million from the US Treasury and $139 million from the Federal Reserve Banks (Bradley 2000, p. 8), amounting to more than $4.7 billion in today’s dollars. These stock holdings technically entitle the US government to any future profits of the DIF. However, since excess earnings are rebated to FDIC member banks rather than paid out as dividends, the original capital invested by the Treasury was, for all practical purposes, forced donations from taxpayers to banks.

In years when the cost of bank failures is so great that FDIC disbursements exceed the DIF’s value, taxpayers are forced to cover the difference. Curry and Shibut (2000) explain how the savings and loan crisis of the 1980s cost taxpayers $153 billion. The Federal Savings and Loan Insurance Corporation (FSLIC) managed the assistance and resolution of thrifts and savings banks at the time. By

1986, however, the large number of thrift failures had bankrupted the FSLIC. Congress created the Financing Corporation (FICO) in 1987 to fund the FSLIC for the short term. Then, in 1989, the FSLIC was replaced with the Resolution Trust Corporation (RTC). The RTC was originally funded with $50 billion in capital comprised of $30 billion in contributions from the US Treasury and the Federal Home Loan Banks and $20 billion from the issuance of debt securities. Congress later authorized further contributions of $30 billion, $6.7 billion, and $18.3 billion to increase the fund's capitalization (Curry and Shibut 2000, pp. 28–29).

The Savings Association Insurance Fund (SAIF), managed by the FDIC, was created by the Financial Institutions Reform, Recovery, and Enforcement Act in 1989. The goal of this fund was to insure thrifts and savings banks going forward and to completely replace the RTC as of December 31, 1995. Unlike the original DIF, the SAIF was funded by high assessment rates on SAIF member banks. SAIF banks continued to pay interest on FICO bonds, a burden later shared with Bank Insurance Fund (BIF) member banks (FDIC 1997, pp. 133–35). In 2006, the BIF and SAIF were merged into a single DIF fund (Pennacchi 2009, p. 6, n. 13). According to Curry and Shibut (2000, tables 1 and 4), the FSLIC made disbursements of $125 billion, and the RTC added $394 billion. Of these disbursements, a total of $153 billion was taxpayer funded. In today's dollars, this taxpayer expense equals roughly $230 billion.

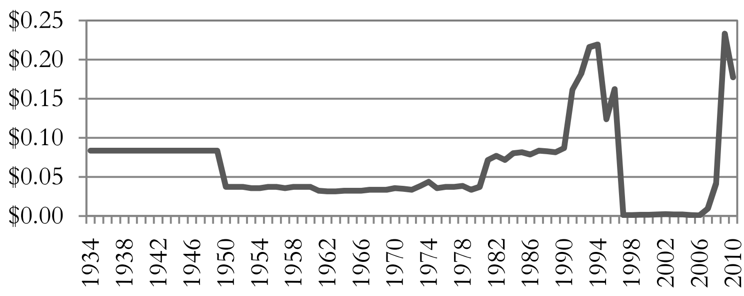
It is too soon to tell whether losses from the financial crisis of 2008 will be passed on to taxpayers. In 2009, FDIC president Sheila Bair said that "the deposit insurance fund could become insolvent this year," but that "banks, not taxpayers, are expected to fund the system" (Vekshin 2009). To replenish the DIF and prevent its insolvency, the FDIC issued a special, one-time assessment in September 2009. The DIF remained solvent through 2010, due partly to the special assessment but also because bank failures in that year, although still high, were lower than predicted (FDIC 2010, p. 10). The FDIC was also fortunate to share the burden of the financial crisis with the Federal Reserve and the US Treasury, each of which made trillions of dollars in loans to failing financial institutions. Had the costs of the Fed and Treasury loans been classified under the FDIC, DIF losses would have indeed been great. In either case, the American taxpayer—not the FDIC member banks—footed the bill.

We can estimate the annual implicit cost to taxpayers by dividing the historical taxpayer contributions to the FDIC by its current lifetime. Using only historical costs, we find that the FDIC cost taxpayers roughly $235 billion in today's dollars from 1933 to 2010, an annual cost of $2.9 billion per year. This calculation potentially understates the true implicit cost of government-provided deposit insurance since some FDIC banks have been rescued by contributions from the Fed or the US Treasury. Although these funds were not allocated from the DIF, the FDIC committed to insuring these institutions and would have been responsible for their deposits had those banks failed. In either case, the taxpayer ultimately bears the cost.

IV. Assessment Rates

The actual costs of FDIC insurance differ markedly from those predicted by most models of deposit insurance. In order to cover expenses, the FDIC assesses member banks an annual fee. Although the amount each bank pays is based on the quantity of insurable deposits it holds, annual fees are not premiums for fair insurance. The DIF is managed as a rainy-day fund; annual assessments rates depend crucially on the current balance. The FDIC accumulates funds over time in the DIF in order to repay the losses to depositors of any failed bank. When losses are incurred, assessment rates are raised to replenish the fund. These losses are the main concern in setting assessment rates for the fund in practice. Unlike fair insurance, the FDIC's assessment rates are based on actual historical costs rather than expected future losses.

Figure 1. Annual Assessment Rates per $100 of Deposits, 1934–2010



Source: FDIC (2010).

Deposit insurance fees assessed to banks have changed significantly over the FDIC's history. Figure 1 shows annual assessment rates per $100 of insured deposits from 1934 through

2010. Assessments were initially set at a fixed rate of one-twelfth of 1 percent—about $0.083 per $100 of insured deposits. By 1950, funding for the DIF had been repaid and fully replenished. Accordingly, the FDIC began to rebate some portion of its annual assessments. These rebates reduced the effective assessment rate by more than half. From 1950 through 1980, the average effective assessment rate was less than $0.04 per $100 of insured deposits. Then, as the rise in bank failures during the savings and loan crisis of the 1980s forced significant payouts from the DIF, the FDIC began to reduce its annual rebates. The effective assessment rate jumped from $0.037 in 1980 to $0.071 in 1981 and increased steadily to $0.082 in 1989. Despite increases in the effective assessment rate, the DIF had been fully depleted by 1990, so the FDIC used over $150 billion in taxpayer funds to pay the insured depositors of failed member banks (Curry and Shibut 2000). Replenishing the fund required a significant increase in assessment rates. From 1990 to 1996, effective assessment rates averaged $0.177 per $100 of insured deposits.

The FDIC adopted two policies to help prevent the DIF from going broke again. First, the FDIC resolved to adjust assessment rates in a manner that maintained the DIF at 1.25 percent of total insured deposits. Second, it implemented a tiered rate-setting system in order to assess higher rates to banks holding riskier assets, thereby discouraging excessive risk taking. Whereas the former policy aimed at keeping the DIF sufficiently funded to cover losses in the event of a crisis, the latter intended to reduce the frequency and size of crises.

With the fund fully replenished, annual assessment rates per $100 of insured deposits fell to $0.001 in 1997 and averaged $0.002 from 1997 through 2007. Then, as a wave of bank failures again depleted the DIF, assessment rates were increased to replenish the fund. Annual assessment rates increased from $0.009 in 2007 to $0.042 in 2008. Annual assessment rates totaled $0.233 and $0.177 in 2009 and 2010, respectively.

Ideally, rates assessed for deposit insurance would be actuarially fair, reflecting the actual risk of bank failure when the premium is paid. If the price of insurance is higher than the actuarially fair rate, banks overpay for insurance. Resources that could have been marshaled to fund useful banking services will instead be devoted to providing insurance, making depositors worse off. If, on the other hand, the price of insurance is lower than the actuarially fair rate, banks have an incentive to take excessive risk. For example, an actuarially fair rate would have been high in 2006, with risk building up in the banking system, but the actual assessment rate was only \$0.0005, the lowest rate in FDIC history! Excessive risk taking increases the costs of deposit insurance by increasing the likelihood of bank failures and, thus, the amount needed to cover insurance losses.[3]

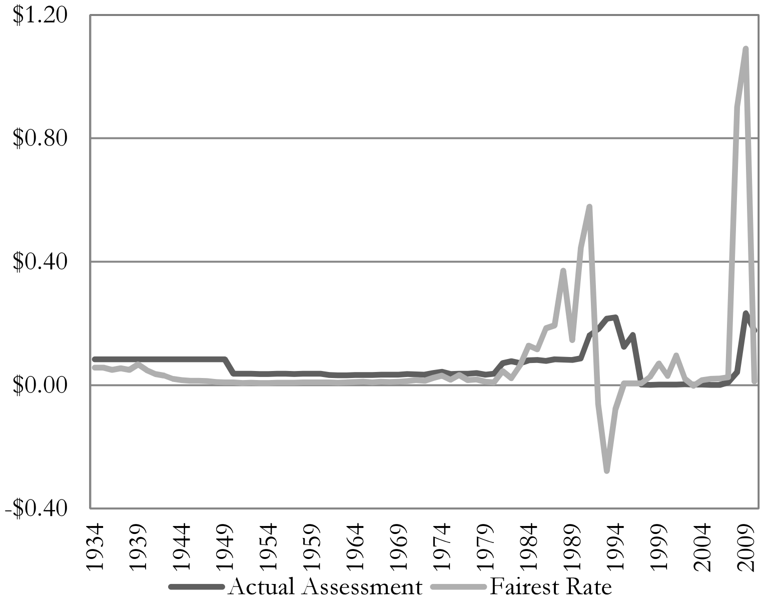
Many authors have estimated optimal premiums on deposit insurance in order to compare them to the actual rates assessed by the FDIC. Duffie et al. (2003) show rates could be set more accurately using a model of security default risk. Acharya, Santos, and Yorulmaze (2010) demonstrate that deposit insurance assessment rates do not account for the potential of joint bank failure. Chan, Greenbaum, and Thakor (1992) go so far as to claim that actuarially fair assessment rates are impossible even in theory. Others employ options theory to compare theoretically optimal premiums on deposit insurance to the actual rates assessed by the FDIC (Merton 1977; Marcus and Shaked 1984; Ronn and Verma 1986). Practical barriers inhibit the FDIC from offering truly actuarially fair premiums on deposit insurance. Recall that, for optimally priced deposit insurance, annual premiums would equal the average losses to the DIF for that year. The FDIC cannot charge this rate since it must also cover its annual operating expenses. Nonetheless, we can compare its actual rate with the "fairest" rate it could charge in practice by adding the FDIC's annual operating expenses as a percentage of insured deposits to the optimal rate.

Figure 2 compares the actual rate assessed by the FDIC to our estimate of the fairest rate in each year from 1934 through 2010. Our estimate of the fairest rate in each year equals the average losses to the DIF for that year plus the FDIC's annual operating expenses as a percentage of insured deposits to the optimal rate.

The actual rate exceeded the fairest rate in every year from 1934 through 1983. Expenses resulting from the savings and loan crises pushed the fairest rate from 0.06 percent in 1983 to 0.13 percent in 1984. With actual rates averaging only 0.09 percent, they remained below the fairest rate from 1984 to 1991. Actual rates exceeded fairest rates again from 1992 to 1996, as actual rates were increased

3 One might wonder whether the size of the fund is relevant in the case of FDIC. It is possible, for example, that the risk of deposits could increase at a time when the fund is sufficiently large to cover potential losses. In such a case, it might not be necessary to increase the fee to provide for a sufficiently large fund. However, it would still be required to increase the fee to provide an optimally-priced insurance.

Figure 2. Actual Annual Assessment and Fairest Rates, 1934–2010



Source: FDIC (2010).

markedly in order to replenish the DIF. Actual rates averaged 0.18 percent over the period. From 1997 through 2007, FDIC assessments were less than the fairest rate in every year except 2003. Whereas the fairest rate averaged 0.03 percent, actual assessments averaged a mere 0.0022 percent. Actual rates increased to 0.04 percent in 2008 and 0.23 percent in 2009, while fairest rates equaled 0.90 and 1.09, respectively. In 2010, fairest rates fell to 0.01 percent; held at 0.18 percent to replenish the DIF, actual rates exceeded fairest rates for the first time since 2003.

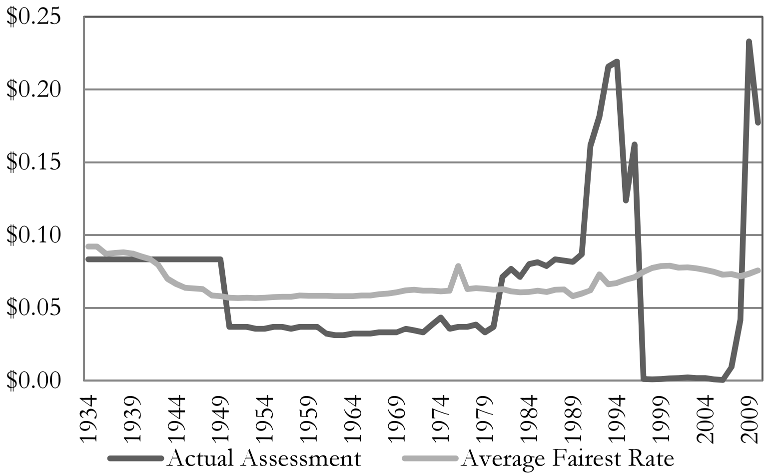
If depositors expect deposit insurance to pay out over time rather than in any particular year, it might be more appropriate to compare the actual assessment rate with the average fairest rate rather than with the fairest rate in a particular year.[4] We calculate the average fairest rate by adding annual administrative and operating expenses to the average annual rate of DIF losses. Over the history of the program, the average annual rate of DIF losses is roughly 0.05

[4] For example, an expected probability of failure of 1 in 100 might indicate that depositors expect 1 of every 100 banks to fail this year; alternatively, it might indicate they expect a particular bank to fail 1 time in every 100 years.

percent. After including annual expenses, the average fairest rate ranges from 0.06 to 0.09 percent per year.

Figure 3 presents the average fairest rate alongside the actual assessment rate in each year from 1934 through 2010. Actual rates were less than the average fairest rate from 1934 through 1941, 1950 through 1980, and again from 1997 through 2008. Over these periods, the measure indicates that banks were encouraged to take on excessive risks. From 1942 through 1949, 1981 through 1996, and again from 2009 through 2010, actual rates exceeded the average fairest rate. As such, the measure indicates that banks overpaid for deposit insurance over these periods.

Figure 3. Actual Annual Assessment vs. Average Fairest Rates, 1934–2010



Source: FDIC (2010).

Comparing actual assessments with fairest and average fairest rates yields mixed results. Both measures imply that assessment rates frequently deviate from the ideal, sometimes markedly. Furthermore, both suggest that the gap between actual and ideal might be increasing over time. However, the two measures do not always agree on the sign of the gap—that is, whether actual assessments are too high or too low. Nonetheless, the exercise serves as a useful reminder that the costs of government-provided deposit insurance as conventionally calculated likely understate the true costs involved.

V. Conclusion

Most Americans—and most economists—believe government-provided deposit insurance is a pretty good deal. However, traditional cost-benefit analysis tends to overstate the benefits and understate the costs. In an earlier work, Hogan and Luther (2013) consider the explicit costs of deposit insurance provided by the FDIC. Here, we consider the implicit costs arising from the taxpayer backstop and suboptimal pricing. We find that these costs are not trivial.

In the case of the implicit taxpayer backstop, we estimate the cost at $2.9 billion per year. It is nearly twice the FDIC's 2010 budget of $1.6 billion for administrative and operating expenses. Moreover, since some FDIC banks have been rescued by the Fed or the US Treasury, our estimate probably errs on the conservative side. If such initiatives were characterized as government-provided deposit insurance claims, the true implicit cost to taxpayers would be even larger.

Although it is more difficult to estimate the costs arising from suboptimal pricing, we show that FDIC insurance is clearly suboptimally priced. Assessment rates deviated from the fairest rates calculated here by an annual average of $0.05 per $100 insured, a difference that is more than 80 percent of the annual average over the program's history. Since a higher-than-optimal rate decreases intermediation and a lower-than-optimal rate encourages excessive risk-taking and increases financial fragility, the observed departures likely result in significant costs for the financial system.

It is admittedly difficult to assess the costs and benefits of government-provided deposit insurance. Improving our estimates requires careful reflection on the traditional approach. In our opinion, the traditional view errs in omitting the implicit costs of deposit insurance. These costs are not borne by the Federal Deposit Insurance Fund; they are borne by taxpayers and other members of the financial system. Future efforts to consider the costs and benefits of government-provided deposit insurance would do well to include these costs in their analysis.

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