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The Fall and Rise of Banking Safety Net Subsidies

Joe Peek
Gatton Chair in International Banking and Financial Economics
437C Gatton Business & Economics Bldg.
Gatton College of Business & Economics
University of Kentucky
Lexington, KY 40506-0034

Tel: (859) 257-7342
Fax: (859) 257-9688
Email: jpeek0@pop.uky.edu

and

James A. Wilcox
Kruttschnitt Professor of Financial Institutions
Finance and Economic Analysis and Policy
Haas School of Business
545 Student Services, #1900
University of California, Berkeley
Berkeley, CA 94720-1900

Tel: (510) 642-2455
Fax: (510) 642-4700
Email: jwilcox@haas.berkeley.edu
http://www.haas.berkeley.edu/finance/wilcox.html

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Joe Peek and James A. Wilcox

Abstract

Financial safety nets are intended to reduce the likelihood and severity of financial crises that have macroeconomic externalities. While safety nets are intended to confer benefits on the macroeconomy, their design and implementation may confer disproportionate benefits on identifiable sectors, such as banks and depositors. In this study, we distinguish between safety net benefits and subsidies. Regardless of whether privately or publicly provided, risk-sharing financial services routinely provide benefits without subsidies. Subsidies arise here when the government misprices the financial services that it provides. We show how these government subsidies are typically shared by banks and their customers and typically lead to resource misallocation. We also discuss how existing estimates correspond to the benefits and subsidies associated with safety nets.

Analysts have long pointed to the 'traditional triad" (deposit insurance, the discount window, and the electronic payments system) as the major sources of safety net subsidies to banking. We argue that the value of safety net subsidies to banking has shifted by notable amounts and in different directions over the past two decades. Significant financial sector reforms since the 1980s, such as FIRREA and FDICIA, were designed to reduce safety net subsidies by introducing risk-based deposit insurance premiums, restricting discount window borrowing to solvent institutions, and instituting fees for Fedwire daylight overdrafts.

We further argue that safety net subsidies to banking rose in the latter 1990s and seem poised to rise further early in the first decade after 2000. We provide four examples of developments that have already raised the subsidy in recent years and five examples of developments that may well raise it further in the near future.

I. INTRODUCTION

Several longstanding federal government programs and policies are intended to operate as financial safety nets. Financial safety nets reduce the likelihoods and severities of financial crises that have macroeconomic externalities. Safety nets also improve shorter-term and longer-term macroeconomic performance by reducing the expected effects of disruptions in financial intermediation or the payments system. Historically, safety net policies generally directly pertained to commercial banking. The most frequently recognized and analyzed safety nets have been the "traditional triad" of FDIC deposit insurance, the Fed's discount window, and the Fed's electronic payments system (Fedwire).

While safety nets are intended to confer benefits on the macroeconomy, their designs and implementation also are likely to confer benefits disproportionately on identifiable segments of the macroeconomy, such as banking and bank depositors. We distinguish between safety net benefits and subsidies. A standard definition is that a subsidy in some way transfers resources from one group to another. A subsidy often drives a wedge between the (lower) price paid by consumers and the (higher) social cost of production. Subsidies are often conferred on banking by the mispricing of the financial services associated with safety nets.[1]

Safety nets may confer benefits without conferring subsidies. While benefits likely flow from the presence of safety nets, subsidies stem from their mispricing. Ely (1999) and Jones and Kolatch (1999) point out that fairly priced deposit insurance confers no subsidies. By contrast, the reduction in interest rates that banks pay to depositors on insured deposits would considerably overstate the subsidy associated with deposit insurance. The reduction typically consists not only of any subsidy, but also of the benefit attributable to a government having a cost advantage over the private sector in supplying deposit insurance to the very large banking

industry. Inefficient design and implementation of safety nets may hamper their long-term efficacy, subsidize banks and their deposit and loan customers, and generally misallocate resources.

We first illustrate how safety nets can provide benefits and subsidies to banking. We delineate (1) the difference between benefits and subsidies and (2) the difference between (a) the cost to government, (b) the value to banks and their customers, and (c) the misallocation of resources associated with subsidies. Next, we discuss how existing estimates correspond to those benefits and subsidies. We also discuss the difficulties involved in aggregating different subsidies and ascribing and measuring costs that would reduce the net subsidy associated with some or all the components of safety nets.

Then, we make the case that banking safety net subsidies declined after the late 1980s, rose starting in the middle of the 1990s, and may well rise further in the early part of the 2000s. Reforms that reduced banking safety net subsidies include the introduction of risk-based deposit insurance premiums, restricting discount window borrowing to solvent institutions, and instituting fees for Fedwire daylight overdrafts. Since the middle of the 1990s, however, other significant developments have almost certainly raised banking safety net subsidies.[2] For example, the recent growth of the size and activities of the Federal Home Loan Banks (FHLBs) is very likely to have raised the size of the safety net subsidy already and will do so further in the coming years.[3]

II. SAFETY NET BENEFITS VS. SUBSIDIES

In this section, we distinguish the benefits from the subsidies attributable to banking safety nets. Section A considers the case of government provision of financial services to banks. The U.S. Treasury's supply of a line of credit to the FDIC, the discount window, the Fed's

supply of intraday credit on its Fedwire electronic payments system, and the implicit government credit guarantee on the debt of the FHLBs are examples of government supplies. Government provision of financial services at prices that fully cover its costs of supplying them is likely to provide banks with benefits without aggregate or cross-subsidies, avoid resource transfers across groups, and be efficient, in that it would not misallocate resources. In contrast, government provision at prices below its costs typically generates aggregate and cross-subsidies and misallocates resources.

Section B analyzes the benefits and the subsidies specifically associated with the government provision of deposit insurance. Deposit insurance affects banks' demands for deposits and households' (and others') supply of deposits to banks. We model deposit insurance premiums that banks pay as a fixed share of deposits. As is the case for many government subsidies, the government subsidies attributable to the underpricing of deposit insurance are likely to be shared with depositors (and bank customers more generally). In response to the subsidy, banks raise the deposit interest rates that they pay.[4] In doing so, banks transfer some of the government subsidy to depositors.[5]

A. Subsidies in Markets with Government Supply of Financial Services

There are many privately provided financial services that provide banks (and other financial institutions) with safety nets. In essence, all risk-sharing financial services may be conceived as safety nets. Any bank may purchase lines of credit or derivative products to reduce risk of failure. That these financial services may not completely protect banks from financial distress does not mean that they do not serve as safety nets. At the same time, government safety nets may be designed to reduce the risks to the macroeconomy, but typically would not be expected to completely insulate individual financial institutions or their customers from risks.

Figure 1 shows demand for and supply of a financial service that provides a safety net (e.g., a line of credit). The downward sloping demand curve reflects that banks (as consumers of safety net services) value the first units of protection highly, but are less willing to pay for protection against more remote risks. The private supply of this financial service may be expected to be upward sloping. Agents willing to supply risk reduction will expect more compensation as they take on additional amounts of risk. Absent government, a private equilibrium occurs at point (P) with associated price (P_P) and quantity (Q_P). Point P shows that some financial services that entail safety nets may be privately provided. The existence of this service yields a consumer surplus (aPP_P) that is retained by banks and that may be associated with the benefits they receive from the existence of this service. For instance, the knowledge that a line of credit will be available in times of distress may permit banks to hold fewer liquid assets, to receive better terms from other creditors, or to engage in some higher-yielding riskier activities.

Public provision of this financial service is possible at costs that are lower than available through private provision. This is plausible, since agents holding larger volumes of assets and liabilities that are more diversified may be expected to absorb individual risks with a much smaller increase in overall portfolio risk. Thus, individuals may choose to self-insure for smaller risks (such as a refrigerator breakdown) and not purchase maintenance plans. In turn, individuals typically do not self-insure for larger, more long-term risks (such as death) and purchase life insurance policies. A small private insurance company may provide life insurance to individuals profitably by pooling their risks, since the incidence of deaths in a population can be predicted easily for even small populations and is unlikely to suddenly increase by large amounts.

Other types of claims are less predictable (such as casualty insurance for houses against tornadoes) and require larger insurance companies with more geographically diversified assets, and eventually even re-insurance companies that diversify their risks internationally. Along these lines, the government (of a large and stable country) might be viewed as an agent with assets that are more diversified and more capable of bearing risks and temporary losses for longer than any other domestic company, in part because of its larger wealth that includes the valuable assets of being able to command resources by printing money and imposing taxes. Thus, it appears likely that governments may be able to provide safety net financial services at a lower cost and in larger amounts than the private sector. In a sense, the government has "better technology," and thus there can be a benefit from the government entering the market.

Figure 1 includes a supply of government financial services that is sold fairly priced (i.e., at marginal cost). The intersection of fairly priced government supply and the demand curve yields a "fairly priced" equilibrium point (F) with an associated price (P_F) and quantity (Q_F). The supply curve of government fairly priced financial services included in Figure 1 is represented as a horizontal line, with average cost equal to marginal cost. It is likely, in practice, that this supply curve would not be perfectly horizontal, since larger volumes of insured deposits would increase the risk imposed on the government. However, the slope is likely to be close enough to zero that a horizontal supply curve closely approximates reality.

To the extent that this supply curve does represent a fairly priced financial service (i.e., demanders pay fees that cover the government's cost of production), there are no subsidies involved. There is, however, a measurable (net) benefit from the provision of this financial service. The triangle aFP_F represents the benefits to banks attributable to the introduction of government-supplied, fairly priced financial service. (The extra benefit of having the government

rather than the private sector supply fairly priced financial service is measured by the difference between this larger triangle (aFP_F) and the smaller triangle (aPP_P)). As in the case of private provision of safety net related financial services, the increased quantity of lower-priced lines of credit, for example, may tilt bank portfolios toward less-liquid assets and better borrowing terms from other creditors.

However, government provision of financial services can indeed lead to subsidies, transfers across groups, and the misallocation of resources. Consider the case of the government providing a safety-net related financial service below its fair price. In Figure 1, this is shown as a supply curve at the subsidized price of P_S (lower than P_P).[6] At this lower price, the subsidized equilibrium point (S) is associated with increased use of this financial service by banks (from Q_F to Q_S). At lower prices, banks indeed receive an additional gain that we may call a subsidy and that would be represented by the trapezoid P_FFSP_S. Along with this subsidy, banks could be expected to again reduce their holdings of liquid securities, to receive (perhaps) even better terms from other creditors, and to engage in further riskier activities. However, this additional risk taking is likely to impose costs in the form of bank failures or defaults on obligations that will have to be borne by the issuer of the credit lines (i.e., the government). By construction, the rectangle P_FbSP_S represents the extent of the underpricing of the financial service, and thus the costs imposed by it. Since the costs (P_FbSP_S) that providing this subsidy impose on government (and thus on taxpayers) exceed the subsidy received by banks (P_FFSP_S), the mispricing of this financial service leads to the misallocation of resources and to social waste in the amount of triangle Fbs.

B. Subsidies in Markets with Government Programs: The Case of Deposit Insurance

In this section, we show that fairly priced deposit insurance premiums provide benefits to banks and depositors alike, and, if government subsidies are provided to banks through the underpricing of deposit insurance, those subsidies may be shared with depositors. However, mispriced premiums generate subsidies, redirect resources across groups, and misallocate resources.

Let Figure 2 represent the market for deposits. In this market, households supply deposits as a positive function of interest rates with the intercept determined, for instance, by the risk of losing their deposits in a bank failure (as well as by the rates of return and risks on other investments). Banks demand deposits (to be lent out) as a negative function of interest rates with a vertical intercept determined, for instance, by the noninterest costs of deposits (and the rates required by other creditors). In the absence of a deposit insurance system, the equilibrium would occur at point A, with a level of deposits D_A and an interest rate (i_A) that would incorporate the default-risk premium demanded by depositors and would not incorporate the (noninterest) costs of participating in the deposit insurance system. Even in the absence of a credible deposit insurance system, the willing participation of private banks and depositors implies that there are benefits from the existence of a banking system. In particular, the benefit to banks may be represented by their consumer surplus (fAi_A) and the benefit to depositors by their producer surplus (i_AAh).

1. Fairly Priced Deposit Insurance

Credible deposit insurance involves shifting the risk of bank defaults from depositors to an outside party. Since this risk was a determinant of the supply of deposits, the introduction of deposit insurance shifts the supply of deposits downward. Since deposit premiums are a constant

share of deposits, the supply shifts parallel. At the original level of deposits D_A, the vertical distance AC (= i_A - i_C) is the difference between the interest rates that depositors would demand with and without insurance, and thus represents the default-risk premium.

A fair deposit insurance premium charged by a risk neutral government would equal the sum of expected deposit losses plus any administrative costs. If this fair premium per unit of deposits were imposed on banks, the demand for deposits would shift down to incorporate this noninterest cost. At the original level of deposits D_A, the vertical distance AB (= i_A - i_B) represents the difference between the interest rates that banks would pay if they bore the full costs of deposit insurance compared to bearing none of the costs.

We assume that the per-unit cost of providing deposit insurance does not vary across different banks, across aggregate amounts of deposits, or across time. Below we discuss the possibility that different banks have different risks of default. To allow for increasing aggregate amounts of deposits increasing risk to the deposit insurer, we could have the supply curve in Figure 1 slope upward. If insuring more deposits imposed more risks, and thus costs per unit of deposits, the distance between the two demand curves (i.e., the fairly priced premium) would increase as deposits rose.[7] We also assume that the distribution of expected losses due to bank failures is stable enough for the deposit insurer to calculate fairly priced, ex ante deposit insurance premiums.

In Figure 2, the downward shift in the supply curve combined with a downward shift in the demand curve leads to a new equilibrium point (D). This equilibrium will be associated with unambiguously lower interest rates to be received by depositors (falling from i_A to i_D). This is not surprising, since depositors would no longer demand a default-risk premium (AC) and banks have new noninterest costs (AB = nD). The level of deposits (D_D) associated with the new

equilibrium could theoretically be higher or lower than D_A. Figure 2 represents the case in which the cost of providing deposit insurance (AB) falls short of the default-risk premium (AC), and thus a case in which deposits increased. The increase in deposits seems the most probable case, since individual depositors are likely to be more risk averse than the deposit insurer.

Consider the extreme example of a banking system in which banks holding two percent of total deposits failed each year and in which the deposit insurer raised only half the value of those deposits from selling the remaining assets of the failed banks. This implies that the deposit insurer could operate by charging banks a yearly fee of (roughly) one percent of deposits. In Figure 2, this would be represented by a cost (and a premium) per unit of deposits of gi_D (=AB) and total costs of $gnDi_D$ when the level of deposits is D_D. In contrast, it is highly likely that depositors would demand significantly more than a one percent default-risk premium for accepting a two percent chance of losing half of their deposits (or for a one percent chance of losing all their deposits). Thus, if the compensation that depositors demand against losses exceeds the cost of covering those losses, one would expect that the development of a risk-sharing mechanism would benefit the involved parties.

Figure 2 confirms the a priori notion that risk-sharing mechanisms benefit both banks and depositors. Banks benefit because their per-unit cost of funds (including both interest and premiums) fall from i_A to g (= $i_D + gi_D$), while deposits increased from D_A to D_D. Thus, the benefit to banks from the existence of a fairly priced deposit insurance system is represented by the increase in banks' consumer surplus (i_AAng). Again, since banks would be covering the costs of the deposit insurer, there would not be a subsidy, but simply a benefit equivalent (in kind if not in volume) to that provided by a private provider of any safety net-related financial service.

Next, we consider how depositors would be affected. The triangle i_AAh would represent the amount of producer surplus retained by depositors prior to the introduction of deposit insurance. In turn, the parallelogram ACmh would represent the compensation received by depositors for default risk. Alternatively, compensation for default risk could be represented by the rectangle i_AACi_C and producer surplus could be represented (relative to a supply curve that is free from default-risk) by the triangle i_CCm. Thus, the introduction of fairly priced deposit insurance would benefit depositors, since the (default-risk free) interest rate that they receive would increase from i_C to i_D, while deposits increased from D_A to D_D. The size of this benefit would be represented by the associated increase in depositors' producer surplus (i_DDCi_C).[8]

2. Underpriced Deposit Insurance

Suppose, instead, that the government levies no deposit insurance premiums. Shifting the entire cost of deposit insurance from banks to the government implies that banks can acquire insured deposits below their cost of production (by the amount of the fair premium). At the initial deposit level D_D, the total size of the subsidy received by banks would equal the size of the government outlays (gnDi_D) and imply a subsidy to banks of gi_D per dollar of deposits. When the cost of deposits falls short of the price that banks are willing to pay, banks will add deposits. To attract more deposits, as shown by the upward-sloped supply curve, banks will have to offer higher deposit interest rates. To attract deposits banks are likely to increase interest and noninterest costs, such as marketing, operational expenses, and so on. The downward-sloped demand for deposits reflects the declining marginal profitability of banks' lending opportunities. As deposits increase, the gap between the price that banks are willing to pay and the total costs for each additional deposit head toward zero. At equilibrium point E, the higher level of deposits

is associated with a higher deposit interest rate (i_E) than with fairly priced deposit insurance (i_D), but lower than without deposit insurance (i_A).

At point E, some of the deposit insurance subsidy does accrue to depositors and some resources are wasted. As deposits increase from D_D to D_E, the expected costs of the deposit insurance system, which are being entirely borne by the government, would increase by nqsD from $gnDi_D$ to $gqsi_D$. The subsidy that banks retain equals the (consumer surplus) trapezoid $gnEi_E$. The subsidy that depositors retain equals the (producer surplus) trapezoid of EDi_Di_E.

Benefits are the gains to trade when the prices paid for financial services (whether privately or publicly provided) cover total production costs. Subsidies arise when prices paid do not cover total production costs, with the difference picked up by the government. In Figure 2, the trapezoids i_AAng and DCi_Ci_D measure the benefits from deposit insurance. The cost to government of the subsidies is represented by the rectangle $gqsi_D$.

Figure 2 also shows how the cost to government of subsidies exceeds the sum of the subsidies that accrue to banks and their customers. When the government charges no deposit insurance premium, it incurs costs equal to $gqsi_D$. Banks gained $gnEi_E$ and depositors gained EDi_Di_E. The triangles nqE and EsD measure waste, in that they are the costs incurred by the government that do not benefit banks or their customers.

III. EXAMPLES AND ESTIMATES OF BANKING SAFETY NET SUBSIDIES

The previous section analyzed safety net benefits and subsidies qualitatively. In this section, we discuss how policies and implementation of four categories of federal government programs generate safety net subsidies for banking: deposit insurance, the discount window, the payments system, and the FHLBs.[9] Conventional wisdom holds that underpricing of the services of the first three of these programs, the "traditional triad", has long provided subsidies to

banking.[10] Because of the recent growth of their size and activities, we also analyze how FHLBs increasingly contribute to banking safety net subsidies.

A. Deposit Insurance[11]

Historically, neither individual banks nor banks in the aggregate paid fully risk-based deposit insurance premiums. Until the early 1990s, the FDIC levied flat-rate insurance premiums on banks as a function of deposits, but not banks' risks. From 1935 to 1988, banks paid flat rate insurance premiums that never exceeded 8.3 basis points.[12] As a result of the depletion of the FDIC reserves due to the thrift and banking crises, premiums were then raised to as high as 31 basis points. The enactment of FDICIA in 1991 required that the FDIC introduce risk-based premiums. To date, however, the range of the premiums remains much narrower than the range of risk exposures of the FDIC to individual bank failures. Under the terms of the Deposit Insurance Funding Act of 1996, when the FDIC reserve fund exceeds 1.25 percent of deposits, the safest of banks pay no deposit insurance premium. Recently, that meant that more than 90 percent of banks, which held well over 90 percent of total bank assets, paid no premiums.

Figure 2 assumed that the cost of providing deposit insurance per dollar of deposits was constant across individual banks and across time. As the FDIC's expected losses vary across banks and across time, fair deposit insurance premiums should vary, too. If they do not vary sufficiently or if they reflect factors other than ex-ante risks, then both aggregate and cross-subsidies are almost inevitable.

Often, governments underwrite the expenses of deposit insurance programs. Typically, they do not make explicit the expected costs that they incur by doing so. So long as a banking crisis does not occur, the expected costs are largely hidden in the form of contingent costs. To the extent that banks will not be required to cover all the actual costs of the deposit insurer, a

government's commitment to make depositors whole during future crises means that the government incurs that implicit liability. In the United States, the government's provision of this "catastrophe insurance" as well as a no-fee line of credit, to the FDIC confers benefits and subsidies on banking. Thus, to a first approximation, deposit insurance premiums are underpriced to the extent that the government underprices the services that it provides to the FDIC.

The fair price for deposit insurance can be estimated in different ways. Option-pricing models have often been used to obtain estimates of fair deposit insurance premiums. When a bank becomes insolvent, insured depositors effectively have the option to sell (or "put") their deposits to the FDIC at par. The value of this put option is a measure of the fair premium for the deposit insurance. Calculating the option value of deposit insurance is not trivial. First, the most commonly used models for pricing options assume a finite time horizon. Thus, calculating the option value for any fixed short horizon will understate the fair value of the insurance, since the deposit insurance provided by the FDIC is ongoing. Second, the current health of a bank is a key determinant of the option's value. Third, bank regulations are important, such as minimum capital requirements, limitations on the types and amounts of assets that can be held or activities that can be undertaken, and the frequency of exams. Fourth, the value of the option is affected by supervisory practices, that is, the enforcement of the regulations.

Not surprisingly, options-based estimates of fairly priced deposit insurance premiums vary with the sample period, moving inversely with the overall health of the banking system. Jones and Kolatch (1999) reported that studies based on 1980s data estimated that premiums were underpriced only for the weakest banks, with most banks paying more than the fair premium. Both Jones and Kolatch (1999) and Whalen (1997) concluded that premiums were

more generally underpriced in more recent periods. Whalen (1997) provided evidence based on the application of the option-pricing methodology to June 1996 data for the 50 largest BHCs. Based on a range of assumptions, Whalen reported the median put option value to be four basis points, if when banks were closed when the market value of their assets declined to 90 percent of the market value of their liabilities.[13]

These estimates of the fair premiums exceed the costs of deposit insurance to the government by the amount of the expected, average contributions of banks to the FDIC. Further, the expected total costs of deposit insurance to the government exceed the subsidy received by banks. As shown in Figure 2, an amount equal to the total costs incurred by the government is split among banks, depositors, and waste associated with resource misallocation.

Greenspan (1997) proposed an alternative to the option-based approach. His alternative is based on the assumption that safety nets provide funding advantages to a lead bank but not to its parent holding company. He advocated using the yield spread between the bonds of a bank holding company and those of its lead bank to measure the effect of safety nets on the bank proper. By this measure, the subsidy was in the range of 10 to 15 basis points in 1990, but only about half that value after 1994.

It seems unlikely that the relative impact of the safety net on a bank and its parent BHC is the sole reason for the yield differential. Jones and Kolatch (1999) cite Moody's and Standard and Poor's credit rating manuals for evidence that the priority of bank debt over BHC debt is the primary reason for bank debt having a higher rating. Bank supervisors can limit or prohibit dividend payments from a bank to its parent when the bank's financial health weakens. In addition, a BHC may be required to provide resources to its subsidiary banks to prevent their insolvency. Further, safety nets may reduce funding costs for both the bank and its holding

company (which may consist of little more than a lead bank), implying that the yield spread underestimates the funding advantages conferred by safety nets.

Since its founding in 1934, the FDIC has collected premiums (and earned income on its accumulated reserves) that approximately equal its bank-failure and administration expenses. So far, the government has not ever explicitly injected funds into the FDIC. Nonetheless, the government has subsidized the FDIC by providing two valuable financial services at no cost to the FDIC and thereby to banks: a line of credit and catastrophe insurance.

The cost to the government of the FDIC's line of credit consists of any expected losses plus any interest rate subsidy. If credit were extended to the FDIC at interest rates below the (fully) risk-based level, the FDIC would receive a subsidy from government.[14] The underpricing of services to the FDIC enables it to levy lower premiums on banks.[15] Measuring the fair fee and interest rates for the FDIC's line of credit is problematic. Walter (1998) cites five basis points as the lower limit of the range of fees that private-sector, nonbank corporations pay to banks for their lines of credit. If an annual fee of five basis points were the fair fee for the FDIC's $30 billion line of credit, the FDIC has been paying $15 million less than the fair fee.

Although the FDIC has never received any explicit infusions of funds from the government, its backing by the full faith and credit of the U.S. Treasury introduces a subsidy in the form of a no-fee catastrophe insurance policy. There seems to be little doubt that, in practice, the full faith and credit of the United States stands behind the FDIC. Indeed, without objection from the Treasury, FDIC chairs have publicly stated that the full faith and credit of the United States does back up the FDIC (beyond the simple $30 billion line of credit). Regardless of whether that pledge is codified in the letter of the law, the government, the banking industry, and financial markets each do act as if such a pledge is in force.

In the event of bank failures, the insurance fund reserves presumably would be the first line of defense against FDIC losses. Next, the FDIC would turn to banks for premiums and special assessments to bolster the insurance fund and would next turn to the Treasury for liquidity by drawing upon its (repayable) line of credit.

FIRREA, FDICIA, and other legislative and regulatory changes may well have reduced the value of the backstop that the Treasury provides to the FDIC. In fact, some contend that the Treasury is no longer at risk from the FDIC because FDICIA, in effect, gives to the FDIC a call option on the aggregate stock of equity capital in banks to make good on the FDIC's deposit insurance obligations. They argue that that stock is much larger than any plausible loss that the FDIC could incur, and therefore that the Treasury bears no risk.[16]

At some point, the losses to the FDIC could indeed become so great that the interests of national welfare would argue for the Treasury to extend funds to the FDIC that would not be repaid by surviving banks. That point would presumably come long before the entire capital of the banking industry had been lost by banks or had been siphoned out of the remaining banks by the FDIC. If costs of bank failures are large (as in the savings and loans crisis or those implied by estimates of Japanese nonperforming loans), the fees to be imposed on banks could outweigh their capacity to generate revenues and to meet capital requirements. If FDIC fees sought to recoup the costs of bank losses quickly, they could exhaust the capital of surviving banks and lead to their closure. If FDIC fees were targeted such that capital requirements were met, extended periods of zero earnings could follow. Experience supports our contention that there is a catastrophe insurance policy in place. During the thrift crisis and its aftermath, some capital was indeed extracted from the remaining healthy banks, as well as thrifts, to help cover the obligations of the thrift deposit insurance program. But long before all of the capital of the

remaining, solvent thrifts had been called, the Treasury agreed to cover the remaining losses without reimbursement.

Thus, estimates of the banking safety net subsidies also need to allow for fairly priced premiums of such catastrophe insurance policies. If one were to regard a fee of one basis point on domestic deposits of about $3 trillion as a reasonable estimate of the annual fee for both financial services, the FDIC would pay to the Treasury about $300 million annually. As our discussion of Figure 2 noted, in general and these services are unlikely to be an exception, the total costs to the government of supplying underpriced services are likely to exceed their value to banks.

B. Discount Window

The Federal Reserve may provide collateralized loans to solvent banks (and to other solvent nonbank institutions) through its discount window. In this analysis, we regard the Fed's discount window as following the dictate that it make only fully collateralized loans. In that light, the window makes risk-free loans.[17] To the extent that the discount rate approximates the interest rate on risk-free borrowing, borrowing through the discount window would provide no or only very small subsidies. However, Ely (1999) notes that if the discount rate is slightly below the market risk-free rate, perennial borrowing from the discount window would subsidize the (small set of mostly small) banks that engage in this practice. The recent Fed decision to peg the discount rate slightly above the Fed funds rate beginning on January 9th (Lagomarsino 2002) would appear to further reduce, if not eliminate, this subsidy.

However, the discount window does provide banks with other benefits and subsidies. The discount window effectively offers the possibility that the Fed will extend credit to a bank that has a liquidity problem. To the extent that the window provides banks with access to loans when

the private sector would not, the benefit of the discount window is that liquidity can be obtained at all. In that sense, the window has features of a line of credit. Also, to the extent that access to this source of credit reduces the risk that banks' liquidity problems would be converted into solvency problems, the discount window reduces the default risk faced by the bank's deposit and non-deposit creditors, and thus reduces the bank's cost of funds. Since this service could be provided in a manner that imposed its full, expected costs on banks, the existence of this line of credit and the better terms that it entails for banks on their other borrowing may be considered benefits to banks, and not subsidies. However, banks currently pay no fee to the Fed for this line of credit feature. Thus, the underpricing of the discount window services confers a safety net subsidy on banks.

There are few, if any, estimates of the value of access to the discount window. Along with Ely (1999), we regard the interest rate subsidy in discount window borrowing to be minor because, as noted above, such borrowing is collateralized and the discount rate typically is not very far from risk-free rates. However, a more sizeable subsidy emanates from the Fed's providing access to liquidity when banks are least likely to be able to obtain liquidity from the private sector. Walter (1998) notes that banks charge their nonbank customers annual fees in the range of five to 20 basis points of the dollar amount of the loan commitment. Lines of credit supplied by private-sector banks typically include clauses that allow banks to deny credit in the event of "material adverse conditions." By contrast, the discount window would be expected to be available to a bank so long as the bank is solvent at the time of borrowing, which would make the discount window more valuable than a private-sector bank line of credit. Another difficulty in estimating the value of this financial service, unlike a private line of credit, is that the ceiling of the line of credit is not explicitly specified. If the size of the line were taken to be as large, say,

as the volume of assets that the Fed would accept as collateral to be pledged for the discount window loan, then it might be regarded as being as large as a substantial fraction of a bank's total assets.

C. Fedwire

The Federal Reserve operates a real-time gross settlement electronic payments system, commonly referred to as Fedwire. Via Fedwire, banks are able to transfer funds to other institutions' reserve accounts at the Fed. The Fed processes payment instructions as they are received in real time, even if the sender does not have sufficient funds in its reserve account to cover the transfer at the time of the payment instruction. The Fed guarantees payment finality: Once the Fed notifies a bank that the Fed has credited the bank's reserve account at the Fed, the funds cannot be recalled, even if the bank that sent the payment instruction is unable later to deliver the funds.

Historically, the Fed has underpriced the credit that it extends during the course of the business day by guaranteeing payments made via Fedwire. Until April 1994, the fee was zero; since April 1995, the effective rate has been 27 basis points at an annual rate. Compared with even the risk-free rate, not to mention the risky rate that would be most relevant for this unsecured borrowing, the fees charged for daylight overdrafts on Fedwire have been and remain extremely low.

The benefit to banks arises because they are extended a line of credit that permits them to have daylight overdrafts (i.e., negative balances in its reserve account prior to the close of Fedwire that day) as a result of transfers to other banks. Essentially, the Fed makes an intraday loan to a bank so that its transactions can clear without having to wait until its reserve account has a sufficient balance. The Fed absorbs the credit risk, which stems from the possibility that the

sending bank will not be able to cover the daylight overdraft. The benefit to the bank includes the reduced need to hold reserves. The subsidy arises because banks are extended a line of credit for which they pay no fee and because the loan rate on daylight overdrafts is well below one percent annually, a rate charged on a risky daylight overdraft that is far below the average over time of the risk-free rate.

As with the subsidy associated with discount window access, there are few estimates of the value of the subsidy associated with below-market pricing of Fedwire daylight overdraft credit. Mengle, Humphrey, and Summers (1987) estimated that the market rate during the 1980s could have been in the neighborhood of 100-124 basis points. Increases in banks' capital ratios and various financial sector reforms may have reduced considerably the fair market interest rate for daylight overdrafts since the 1980s. We have no independent estimate of the current market rate for credit extended via daylight overdrafts. Suppose, however, that the midpoint of the estimated current range was one-half (56 basis points) of the midpoint (112 basis points) of the range cited above. Then, given average, aggregate, outstanding daylight overdrafts of about $30 billion, the current fee undercharges borrowers by over $40 million annually.[18]

D. Advances and MPF Programs at FHLBs

FHLBs are arguably part of the banking safety net because they share with the Federal Reserve a scaled-down version of the function of lender of last resort. FHLBs routinely extend credit in the form of advances to qualifying thrifts and commercial banks. In addition, FHLBs can be expected to continue to extend credit to banks and thrifts when other sources of funds dry up. In that manner, FHLBs provide banks and thrifts with implicit, and hence underpriced, lines of credit. Moreover, the rates that FHLBs charge on advances to thrifts and commercial banks are directly affected by the rates at which the FHLBs themselves can borrow. The rates at which

FHLBs borrow are reduced by the full faith and credit of the U.S. government that is presumed to undergird their debts. These reductions in borrowing costs are then passed along to thrifts and commercial banks either directly or indirectly. The direct route is through reduced rates charged for advances or through above-market compensation for services provided to the FHLBs. The indirect route is by passing along higher FHLB earnings via dividends to the thrifts and commercial banks that constitute the FHLBs' shareholders.

In addition, the Mortgage Partnership Finance Program (MPF) run by the FHLBs also passes along some of the reduced borrowing and capital costs available to FHLBs. Under MPF, thrifts and commercial banks essentially act as mortgage loan origination agents for the FHLBs. They originate mortgages on behalf of the FHLBs without actually taking these mortgages onto their balance sheets. Instead, the FHLBs use their funding advantage to fund these mortgages. The thrifts and commercial banks also typically retain servicing rights. Thrifts and commercial banks thus earn fee income for originating and servicing mortgages.

As with other services that government provides to banking, it is important to distinguish benefits from subsidies. FHLB lines of credit provide banks a benefit but not a subsidy if banks paid the FHLBs the full cost of operating that service. However, since they are, again, provided at no cost to banks, subsidies are therefore present. The lower interest rates that banks receive from participation in FHLB activities consist of both benefit and subsidy components. The gains to banks arise from FHLBs' reduced financing costs, which stem from their diversification and securitization of assets and from their funding being implicitly guaranteed by the government.

IV. GROSS VS. NET SUBSIDIES

Above, we showed examples and estimates of banking safety net subsidies. Participation in safety net programs may also impose costs on banks. Subsidies considered in absence of those

costs might be termed gross subsidies. Subtracting the associated (but not the unassociated) costs of safety nets from the gross subsidies generates measures of net subsidies. Section 1 discusses some of the costs associated with safety nets and some estimates of their sizes. In Section 2, we caution that the limitations associated with netting costs from gross subsidies are considerable.

A. Estimates of Costs to Banks of Safety Nets

While banking may benefit from some safety net subsidies, public policies also impose some safety net-specific costs that may partially offset subsidies. Indeed, some important aspects of bank supervision and regulation arose precisely to restrain banks from taking the excessive risks that the implementation of safety net-related policies may encourage. Other aspects of supervision and regulation have evolved for myriad other reasons. Whether they are reasonably netted from measures of safety net subsidies is open to question.

Among the supervisory and regulatory costs imposed on banking that have been attributed to safety nets are (1) examinations and reporting requirements, (2) activity restrictions, (3) balance sheet restrictions, and (4) the required reserve tax. Banks devote considerable time, material, and space resources to cooperate with bank examinations. For example, the largest national banks have bank supervisors on site continually. Banks are restricted from conducting certain financial activities from which they might profit. They are also constrained by bank supervision and regulations to either hold or not hold certain assets and liabilities on their balance sheets. For example, banks might prefer to have less equity capital and more debt on the liability side of their balance sheets; they might also prefer to hold assets that are more like equity and less like debt on the asset side of their balance sheets. Finally, banks are required to hold non-interest-bearing reserves against their transactions deposits. The opportunity cost

associated with the reserves that are held in excess of the amount that a bank would hold in the absence of reserve requirements constitutes a regulatory cost to banks.

One may produce an estimate of the reserve tax associated with the requirement that banks hold reserves. Required reserves are based on a bank's transactions accounts and pay no interest. This calculation requires making an assumption about the opportunity cost of those reserves. Using an opportunity cost of five percent, Jones and Kolatch (1999) calculate a marginal cost of 15 to 50 basis points, depending on the size of the bank's transactions deposit balances. However, such an estimate seems too high. The opportunity cost should be calculated only on the binding portion of required reserves. That is, only on the amount by which required reserves exceed the amount of reserves a bank would hold in the absence of the reserve requirement.

The costs of supervisory and regulatory burdens are much more difficult to estimate. Both Jones and Kolatch (1999) and Whalen (1997) rely on estimates by the Federal Financial Institutions Examination Council (1992), though Jones and Kolatch (1999) observe, "good estimates…do not exist…". The FFIEC study calculated banks' costs imposed by regulation and supervision of 6 to 14 percent of a bank's noninterest operating expenses, not including the opportunity cost of non-interest-bearing reserves. Using the lower bound of 6 percent, this amounts to about 35 basis points as a share of total deposits in 1995 (Whalen 1997) and 29 basis points in 1996 (Jones and Kolatch 1999). Since the FFIEC estimate is for the period prior to FDICIA, the costs do not incorporate any increased supervisory and regulatory costs associated with regulatory changes in the 1990s. Nor do they include higher regulatory costs associated with revisions to the Community Reinvestment Act or stricter enforcement of fair lending regulations.

B. Limitations in Netting Costs from Subsidies

We have pointed out some of the challenges involved in estimating the sizes of various safety net subsidies. The magnitudes of many subsidies vary with expected conditions in the macroeconomy and in the banking industry. They sometimes depend on the sizes of lines of credit, whose limits are unknown. Even when gross safety net subsidies and costs can be measured, if they apply to different margins, it may be misleading to merely subtract costs and interpret the result as the net subsidy. For example, the effects of a gross subsidy of $1 billion that was linked linearly to deposits would likely not be completely offset by a regulatory cost to banks of $1 billion linked to bank supervision or activity restrictions. While the direct effects on bank net worth might largely cancel, prices and quantities would still differ from their non-subsidized levels.

In addition, the myriad regulatory burdens cannot simply be assumed to be attributable to the existence of banking safety nets. Bank supervision and regulation predates both the existence of federal deposit insurance and even of the Fed by over half a century. Although some costs are imposed on banks as byproducts of attempts to limit the costs to government of providing banking safety nets, some are not. That view is supported to the extent that the elimination of all safety nets or safety net subsidies would be accompanied by the dismantling of banking regulation and supervision. For instance, neither the Community Reinvestment Act nor fair lending laws are linked to the provision of bank safety nets or subsidies.

V. THE FALL AND RECENT RISE OF SAFETY NET SUBSIDIES

Over time, both safety net subsidies and the offsetting costs associated with safety nets have changed by large amounts, both relative to the size of the banking industry and relative to each other. They have changed as a result of changes in public policies, of changes in the

conditions of banks that arise from managerial choices and the economy more broadly, and of changes in financial technologies. The safety net subsidies and offsetting costs may well continue to change by considerable amounts in the future.

A. The Fall

Conventional wisdom holds that safety net subsidies began to decline in the late 1980s as a result of the following public policy changes: higher minimum required bank capital, more rigorous bank supervision, introduction of prompt corrective action (PCA), introduction of least-cost resolution of failed banks, higher deposit insurance premiums, introduction of national depositor preference, discount window reforms, and introduction of caps and fees on Fedwire daylight overdrafts. (See Walter (1998), Ely (1999), and Kaufman (2001).) This list of public policy changes consist of some lowering of safety net subsidies and some raising of the costs attributable to the safety net, both of which reduce the net safety net subsidy. Jones and Kolatch (1999) conclude that any resulting net marginal safety net subsidy is "very small".

Examples of higher costs in the 1990s that reduce safety net subsidies are the increases in fees for Fedwire daylight overdrafts. Average overdrafts rose to about $70 billion in the early 1990s and peaked at over $150 million. The Federal Reserve began charging fees for daylight overdrafts in 1994. The initial fee of 10 basis points (at an annual rate) rose to 15 basis points in 1995 and 27 basis points in 2000. In parallel, average overdrafts have fallen to about $40 billion.[19]

Some changes in banking regulations have also reduced banks' regulatory costs. The accumulation of regulations over the years, as well as rapid technological changes had no doubt rendered some regulations suboptimal. As a result, by the early 1990s the scale and scope for reducing banking regulations so that banks could reduce their explicit costs and foregone

opportunities seemed quite large. Regulatory reforms like these would raise the net safety net subsidy to banking. A wide-ranging review in the early 1990s of banking regulations by a federal government interagency task force led to a concerted attempt to identify inefficient regulations that could be removed or reduced.

Overall, from the late 1980s through the middle of the 1990s, changes in public policies probably did reduce the safety net subsidy. The improvement in the overall health of the banking system is also likely to have reduced it. Public policies toward deposit insurance, the discount window, and Fedwire meant that the stronger the banking sector was, and therefore the less likely it was to fall into the safety net, the lower the magnitude and value of the subsidy.

B. The Recent Rise

What has been much less recognized has been the recent rebound in the value of safety net subsidies. Since about the middle of the 1990s, the subsidies to banks may well have risen significantly. Here we list several factors that have tended to raise, and perhaps raise substantially, safety net subsidies in recent years.

First, the required reserve tax has fallen sharply. Starting in the middle of the 1980s, required reserves rose from about $40 billion to about $60 billion. Required reserves then hovered around $60 billion until the middle of the 1990s. From the middle of the 1990s through the end of 2000, required reserves fell dramatically--to about $40 billion, their lowest level since the 1970s. (By the middle of 2002, required reserves were $37 billion.) Reductions in required reserve ratios and the increasing "sweeping" of households' reservable accounts at banks contributed importantly to the $20 billion decline in required reserves. As a result, banks could hold $20 billion more of interest-bearing assets instead of zero-interest required reserves. For the sake of example, suppose that banks earn a risk-free rate of five percent on the $20 billion of

redeployed assets. That redeployment would reduce the costs to banks of the safety net subsidy and raise annual, before-tax income by $1 billion. Thus, the change in offsetting costs would have raised the net subsidy by over $1 billion annually.

Second, the Deposit Insurance Funding Act (DIFA) of 1996 prevents the FDIC from charging fully risk-based premiums. In effect, DIFA requires that nearly all banks now pay no explicit deposit insurance premium whatsoever. Making deposit insurance premiums lower and less risk-sensitive (again) probably reinforces some of the subsidy that stemmed from deposit insurance. Also, to the extent that insured deposits grow faster than the FDIC reserve fund (which currently grows roughly at the rate of return of its invested assets), the reserve fund would underfund potentially larger claims due to failed banks. Thus, the value of the two unpriced services provided by the Treasury to the FDIC would also increase. In essence, by lowering the premiums and reducing their risk sensitivity, DIFA has raised safety net subsidies.

Third, bank regulators noted that in the late 1990s banking had become noticeably riskier. Bank risks are likely to have risen then for several reasons. Lending practices had become more liberal. Continuing "capital arbitrage" effectively removed safer bank assets from bank balance sheets and thereby raised the average riskiness of retained assets relative to bank capital. Surveys also indicated that banks' commercial lending standards eased after the middle of the 1990s. The aggregate U.S. Tier 1 and total capital ratios drifted down after the middle of the 1990s. Thus, equity and options price-based calculations of bank risk would have indicated that banks generally had higher insolvency probabilities at the end of the decade than they did in the middle of the 1990s. Expected losses in the event of failure might have also increased. Taken together, these developments are likely to have increased the safety net subsidy that accrued to banks via the deposit insurance system.

Fourth, public policy responses to potential and actual financial crises during the 1990s (e.g., those in Mexico, Korea, Thailand, Indonesia and Russia) may have raised financial markets' estimates of how far the financial safety nets provided by the U.S. government and international institutions extend. The Fed's involvement in the LTCM affair also may have raised the expected value of the safety net to banks proper and even more so to the parts of bank and financial holding companies beyond commercial banks.

Fifth, public policy recently further increased access of banks to the FHLB system at the same time that FHLBs increased their offerings of services to their member thrifts and banks. FIRREA in 1989 and GLBA in 1999 had already eased the access of commercial banks to FHLB advances. Increased access by commercial banks to FHLB advances and increased offerings of other services such as those associated with the MPS programs have contributed to the very rapid growth of FHLBs. From 1992 through 1999, the number of member institutions more than doubled to over 7000, with more than 500 commercial banks that had more than $500 million in assets counted as members. By 1993, less than $6 billion in FHLB advances were outstanding to commercial banks. By 2000, nearly $150 billion were outstanding to commercial banks, comprising more than one-third of all FHLB advances. Thus, the safety net subsidy to banking that flows through the FHLB System may have grown substantially in recent years.

The Shadow Financial Regulatory Committee noted, "in the long run, the new powers granted to the FHLBs may be among the most significant elements of the (GLBA) legislation." GLBA permitted advances backed by agricultural and small business loans, thereby making additional FHLB subsidies available to small banks, and perhaps ultimately to large segments of the agricultural and small business lending market. The Shadow Committee concluded that

GLBA allows for a major expansion of FHLB activities. Given their GSE status, that expansion offers the possibility of a major increase in this avenue for safety net subsidies to banking.

C. The Future

Will the net subsidy continue to rise? Here are some reasons that it might. First, the Federal Reserve has proposed that it be allowed to pay a market-related interest rate, rather than the long-standing rate of zero, on reserves held at its banks. Raising the rate paid on reserves would reduce offsetting costs and increase the net safety net subsidy. If five percent interest were paid on $7 billion held in reserve accounts at the Federal Reserve Banks, $350 million would be added to banks' pre-tax income.

Second, rules for sweep accounts may also be liberalized. Liberalization, for example to include all business and government accounts, would enable banks to reduce further their required reserves. At a five percent interest rate, reducing required reserves by another $20 billion, for example, would generate for banks another $1 billion in pre-tax income.

Third, potential Basel capital reform may enable many banks to hold less capital per unit of risk. Absent the prospect for aggregate reductions in capital per unit of risk, banks' support for reforms may be tepid and reforms unlikely. If the likely outcomes for reform are either none with continuing success at capital arbitrage or for lower aggregate capital requirements, the expected direction of "reformed" bank capital rules is a tilt toward liberalization.

Fourth, FHLBs' activities may continue to expand. Their activities have been growing very rapidly in recent years. FHLBs are unlikely to have completely penetrated the markets that have opened to them. As their activities grow, so will the subsidies that they confer on banks.

Fifth, the effective repeal of Glass-Steagall and provisions of GLBA may lead banks to extend their current reach into more activities. So far, relatively little has changed as a result of

GLBA. If banks and their holding companies were to avail themselves of the opportunities opened up by GLBA, the safety net subsidy might increase noticeably.

Thus, perhaps the two most striking aspects of the current situation are how much the safety net subsidies to banking have risen and how they may rise in the future.

VI. SUMMARY AND IMPLICATIONS

We have sought to distinguish the benefits from the subsidies attributable to financial safety nets. We highlighted that benefits arise when prices cover the full cost of (publicly or privately) producing financial services. Subsidies arise when prices do not completely cover the costs associated with producing financial services. Absent positive externalities, underpricing safety net-related financial services misallocates resources.

We applied our framework to the actual structure of deposit insurance in the United States. We argued that the provision of financial services to the FDIC, and thereby to banks, by the government at a cost of zero leads to a web of cross-subsidies among banks and to aggregate subsidies from government to banks. Safety net subsidies were likely reduced by improvements in the conditions of banks and changes in public policies after the 1980s. On the other hand, safety net subsidies appear now to have risen noticeably since the middle of the 1990s. Conditions and public policies may also be paving the way for banking safety net subsidies to rise further in the first decade of the new millennium.

We draw two implications from our research on these issues. First, the framework introduced here is likely to provide a useful guide for estimating banking safety net subsidies. By more concretely delineating the full costs of production and the subsidies. Second, the framework directs attention toward reforms of banking safety nets system that would improve

allocational efficiency. For instance, more fully adjusting deposit insurance premiums for ex ante risks will likely reduce aggregate and cross-subsidies in banking.

By more concretely delineating the full costs of production incurred by government in its provision of banking safety nets and the division of those expenses into the subsidies to banks, the subsidies to their customers, and to waste, a foundation has been laid for constructing estimates of their magnitudes.

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Figure 1

The Market for Government Provided Financial Services

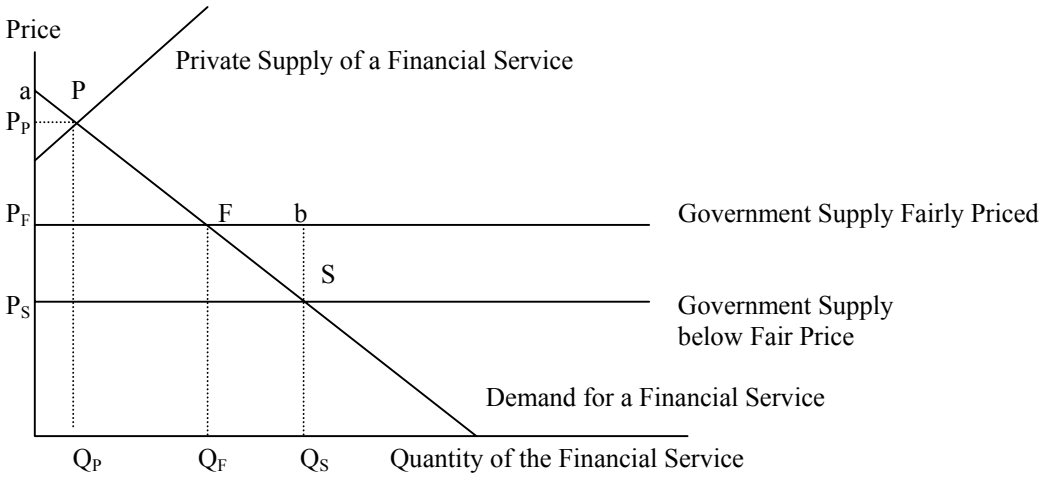
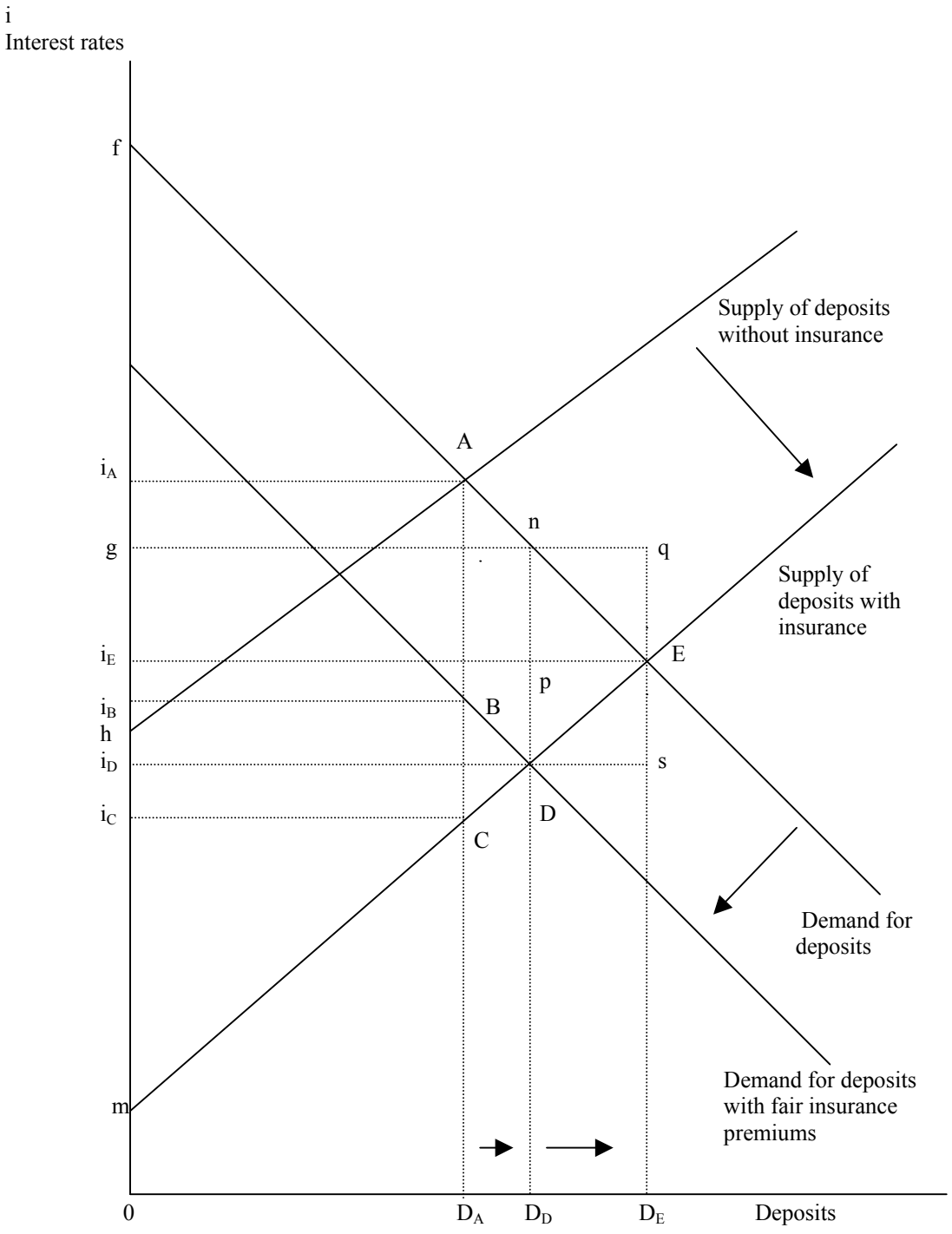


Figure 2

Deposit Insurance and the Supply of and Demand for Deposits



[1] For simplicity, we refer to any safety net subsidy that accrues to banks or any part of their holding companies as a safety net subsidy to banks or banking. We also ignore the distinctions associated with thrifts and their insurance fund. Much of this analysis would apply to them in the same way that it applies to banks.

[2] The breadth of the coverage of safety nets in practice and the dollar value of the aggregate safety net subsidy to banking were debated fiercely during the legislative attempts at financial modernization that culminated in November 1999 in the passage of the Gramm-Leach-Bliley Act. Barth, Brumbaugh, and Wilcox (2000) discuss the impetus to the Gramm-Leach-Bliley Act and some of its implementation issues and important implications.

[3] See Stojanovic, et. al. (2000) for discussion of the expanded roles of the FHLBs.

[4] See Passmore (1992) and Ely (1999).

[5] In terms of the distribution of taxes and subsidies among producers and consumers, economic analysis generally holds that whether the legal recipient of the tax or subsidy is the producer or the consumer is largely irrelevant. Thus, whereas FDIC insurance is technically targeted at depositors and not banks, the analysis below shows both banks and depositors to receive subsidies from mispriced deposit insurance premiums.

[6] When financial services are provided at a price of zero, the equilibrium quantity occurs where the demand curve intersects the horizontal axis.

[7] The assumption of constant costs for government deposit insurance (across banks and across aggregate volumes of deposits) also implies that, if government costs are lower than private costs, there would be no private provision of deposit insurance. Lifting these assumptions would permit the coexistence of public and, as is the case, some (admittedly small amount of) private

provision. Also, justification of caps on insured deposits may rest on such increasing costs of insurance.

[8] For the case in which the cost of the deposit insurance system (AB) exceeds the default-risk premium (AC), the introduction of a fairly priced system would not benefit the average bank or depositor. Rather, the system would involve transfers from both surviving banks and depositors at surviving banks to the depositors of failed institutions.

[9] In addition, Lehnert and Passmore (1999) broadened the conceptual range of the sources of the safety net with their theoretical framework in which the conduct of monetary policy can produce a safety net for banking.

[10] See Carnell (1999). Among others, Jones and Kolatch (1999), Ely (1999), Kwast and Passmore (1999), and Walter (1998) have also pointed to these areas as the sources of subsidies.

[11] For a complete discussion of the public subsidy that flows through deposit insurance and for a specific proposal that addresses it, see Wilcox (2001).

[12] See Jones and Kolatch (1999).

[13] The average ratio of market values of assets to liabilities at failed institutions during the thrift crisis was considerably below 0.90, and perhaps well under 0.70. After that period, FDICIA imposed prompt corrective action on regulators. To the extent that PCA is enforced, the average ratio might be in the neighborhood of 0.90.

[14] That subsidization may arise through this mechanism is clear. For instance, subsidization would take place if the Treasury lent at 1% and had a cost of funds of 3%. Also, if the government were assumed to be a risk neutral borrower, non-subsidized government lending would have to charge interest rates that are high enough to cover the government's costs of funding, the administrative costs of a lending program, and expected defaults. In this light,

government lending programs that charged an interest rate equivalent to only the government cost of funds would involve a subsidy if administrative costs and defaults were nonzero.

[15] Of course, if the FDIC administration involved internal mismanagement and waste such that its lower costs were not passed on to banks as lower premiums, there would not be a subsidy passed to banks, but simply social waste equal to the total size of the cost of the subsidy.

[16] See, for example, Kaufman (2001) and Ely (1999)).

[17] When a bank fails that has discount window loans outstanding, their collateralization pits the interests of two safety nets at loggerheads. If the Fed claims the collateral, it effectively subtracts it from the assets left for the FDIC, thereby imposing more costs on either on other banks or on taxpayers, or both.

[18]This calculation omits charging a market-like premium for the consistent availability of such credit that the private sector is unlikely to provide.

[19] Hancock and Wilcox (1996) estimated the price elasticity of banks' demand for Fedwire daylight overdrafts implied by those fee increases and the concomitant declines in overdrafts.