The Competitive Implications of Safety Net-Related Subsidies

Gary Whalen
Office of the Comptroller of the Currency
Economics Working Paper 97-9
May 1997

Abstract: Some favor maintaining constraints on bank powers and organizational form because they believe banks receive a significant net subsidy from access to the federal safety net. They argue that this net subsidy will be successfully transferred to subsidiaries or affiliates engaged in non-traditional activities, giving these units a significant competitive advantage vis a vis rivals not affiliated with insured depository institutions. A variant of this view is the belief that a holding company structure is more likely to impede the transmission of the subsidy than is a bank subsidiary structure.

While it is difficult to draw firm general conclusions about the size of the subsidy from available studies, the weight of the evidence suggests that most banks have not enjoyed a large gross subsidy in the past. Typically, researchers find small gross subsidy values for the vast majority of the banks in their samples. In fact, the estimated "fair" insurance values of most sample banks are below their respective explicit insurance premiums. Most studies do not estimate net subsidies because reliable measures of the regulatory costs born by banks are not available. The rough cost estimates that do exist, however, are substantial. This implies that the size of any net deposit insurance-related subsidy enjoyed by most banks must be smaller than the low gross subsidy estimates reported in previous empirical work. Further, a number of supervisory actions taken in the late 80s and early 90s are likely to have reduced the size of any subsidy. These actions include higher minimum capital requirements, risk-based capital requirements, prompt corrective action, and a system of risk-based deposit insurance premiums. Recent (June 1996) estimates suggest that the gross subsidies enjoyed by the largest banking companies in the United States are presently small and net subsidies are likely to be negative.

Even if these numbers are under-estimates, there is evidence that mechanisms like Section 23A and 23B restrictions on inter-company transactions and corporate separateness requirements can effectively impede the transmission of any safety net-related subsidy to noninsured subsidiaries or affiliates. Since the same two sets of insulating devices are used in both sorts of structures, there is no a priori reason or hard evidence to believe that transmission of the subsidy is more likely in one case or the other. There is some market evidence that subsidies are not substantial. When banks have an option, they do not uniformly locate activities within the bank or direct bank subsidiary where it is allegedly easier to take advantage any safety net-related subsidy. Banking organizations also do not systematically dominate activities (e.g., bank-eligible securities) where they can conduct the operations within the bank.

The opinions expressed in this paper are those of the author and do not necessarily represent those of the Office of the Comptroller of the Currency, the Department of the Treasury, or their staffs. The author thanks Frank Dwyer for editorial assistance.

Please address any comments to the author who is the Deputy Director, Bank Research Division, Office of the Comptroller of the Currency, Washington, DC 20219. Phone: (202) 874-5250.

Additional copies of this paper or other Economics working papers can be obtained from the Public Information Room, Office of the Comptroller of the Currency, 250 E Street, S.W., Washington, DC 20219. Telephone: (202) 874-5043. E-mail: kevin.satterfield@occ.treas.gov.

I. Introduction

One of the main arguments that has been used to justify constraints on the expansion of bank powers, even when exercised through separately incorporated subsidiaries or holding company affiliates, is that banks have access to an under-priced federal safety net – deposit insurance and the ability to borrow at the Federal Reserve's discount window.[1] This access allegedly creates a net subsidy for commercial banks, which, in turn, they successfully transfer to subsidiaries or affiliates engaged in nontraditional activities, giving these units a competitive advantage vis a vis rivals that are not affiliated with insured depository institutions. One variant of this argument asserts that a holding company structure is more likely to prevent the transfer of any safety net-related subsidy to nonbank affiliates than a bank subsidiary structure and so the former is the preferable organizational model for banking firms with expanded powers.

This paper provides evidence on the competitive implications of safety net-related subsidies. The existing evidence on the determinants and size of a potential subsidy stemming from possibly mis-priced deposit insurance will be discussed. Next, potential supervisory tools that might mitigate any subsidy or prevent its transfer to direct bank subsidiaries or holding company affiliates are outlined. A set of recent subsidy estimates for the 50 largest domestic bank holding companies are presented and discussed. The final

---

[1]The focus here will be on deposit insurance. Banks could also enjoy a subsidy stemming from the terms at which they can borrow at the discount window or use the payment system. Because these privileges are difficult to value, and could be minimized through pricing or other means, they are not discussed in this paper.

section contains some market evidence that provides insight on the existence and size of any subsidy.

The available evidence suggests that the typical bank does not enjoy a significant safety net-related subsidy at the present time. Further, it is likely to be difficult for banks to transfer any subsidy to a direct subsidiary or affiliate. Differences in subsidiary structures (i.e., between a bank holding company affiliate and a bank subsidiary), per se, are not likely to have markedly different effects on the likelihood that any net subsidy is transferred to nonbank affiliates. Finally, there is market evidence consistent with the view that banks do not have a meaningful safety net-related competitive advantage.

II. Measurement of the Safety Net-Related Subsidy

Most of the empirical work that has attempted to measure the size of a safety net-related subsidy has focussed on the issue of mis-priced deposit insurance. From 1935, when federal deposit insurance was first offered, until the 90s, all banks paid the same, relatively low, explicit rate for federal deposit insurance.[2] This explicit premium was not related to any indicator of the risk that a bank posed to the insurance fund. For much of this same period, bank capital levels (which can be viewed as the deductible associated with deposit insurance) tended to decline.[3] Flat rate pricing and decreasing capital ratios created the possibility of

---

[2]The maximum rate paid was 8.3 cents per $100 of insured deposits from 1935 to 1989. For 30 years over this period, the effective rate was less than half of the stated rate because of rebates.

[3]The decline for larger banks is documented in Keeley (1988).

exploitable subsidies for higher risk institutions, encouraged risk taking, and contributed to the financial problems of insured institutions and the federal deposit insurance funds in the 80s and early 90s.

During the past decade or so, these problems have stimulated a great deal of research that has attempted to measure the value of deposit insurance to an institution, given the risk it posed to the insurance fund. Comparing "fair value" of deposit insurance estimates with explicit deposit insurance premia provides a measure of the gross subsidy conferred on banks by the insurance portion of the safety net that might be transferred to direct subsidiaries or affiliates engaged in nontraditional activities.

Most of this work generates estimates of the fair value of deposit insurance from option pricing models. In general, all of these models produce fair value deposit insurance estimates that depend upon the assumed level of a bank's insured liabilities (positively), a bank's market value capital ratio (negatively), the risk of a bank's asset portfolio (positively), the amount of any forebearance granted by regulators (positively), and the time until the next exam or the length of the insurance contract (positively).[4] The fair value estimate is compared with the deposit insurance premium in effect at that time to yield the gross subsidy.[5] The fair value and gross subsidy estimates of these models are quite sensitive to the values of these key variables. Some of the values of the variables used in these studies reflect assumptions

---

[4]The word "positively" in parentheses following one of the listed factors means that the value of deposit insurance for a particular bank is higher, the higher the level of that factor, everything else remaining unchanged. The word "negatively" indicates the opposite.

[5]For examples of these studies, see Marcus and Shaked (1984), Ronn and Verma (1986), Kuester and O'Brien, and Levonian (1991).

made by the researchers.[6] The magnitude of deposit insurance values also vary with the time period investigated because stock price data from such periods (typically quite short) are used to estimate model parameters.[7]

It is difficult and somewhat hazardous to draw general conclusions about the size of the gross subsidy from these studies. Estimated deposit insurance values are inherently sensitive, and the general option pricing approach and each of the individual studies can be criticized on a number of grounds.[8] With these caveats in mind, the weight of the evidence suggests that the preponderance of banks have not enjoyed a large gross subsidy in the past two decades. Most researchers find the distribution of estimated fair values highly skewed, with large values for only a very small percentage of their sample banks (typically in weaker financial condition) and small values for the others. Notably, for most of the banks in their samples, the estimated value of deposit insurance falls below the current explicit insurance premium for the bank at that time.

For example in the relatively recent study by Kuester and O'Brien (1990), the authors calculate deposit insurance values for a sample of 230 large banks at three different dates (December 1986, June 1987, and December 1987). They find that mean deposit insurance values are considerably smaller than the premiums paid by banks. Over this time period, the premium rate charged by the FDIC was 8.3 cents per $100. They report a mean deposit

---

[6]For example, the time until the next exam is generally assumed to be one year. Some researchers assume a specific degree of regulatory forbearance.

[7]Most of the studies use data drawn from the 1980s.

[8]See, for example, the conclusions in Flood (1990), p.34.

insurance value of roughly 0.4 cents per $100 as of December 1986 and 2.3 cents per $100 one year later. But they note that roughly 85 percent of their sample banks have deposit insurance values below the mean in each of the three time periods.[9] Moreover, the deposit insurance values in the December 1987 period could be biased upward because the time period reflects the stock market volatility in October of that year, and the sample includes the large Texas banks that were to fail in 1988 and 1989.

This study also highlights the volatility of the fair value estimates for each bank even over a relatively short period. The authors look at the degree to which each bank's deposit insurance value is stable over time by correlating deposit insurance values for their sample of banks at year-end 1986 and year-end 1987. The correlation is a relatively low 0.32. The implication of this finding is that the estimates of deposit insurance values, from this or other studies that indicate substantially different values, should be interpreted cautiously.

All of these studies compare their estimated fair deposit insurance values to the explicit premium charged by the deposit insurer to derive their measure of the extent to which deposit insurance is mis-priced. That is, they derive a gross subsidy value. However, to judge whether or not a possibly mis-priced safety net confers an exploitable competitive advantage on banks and related companies, one should measure the size of the deposit insurance subsidy net of supervisory costs (explicit plus implicit). Good estimates of these costs do not exist. One dated (1980) and very crude estimate of explicit costs is 2 to 3 basis

---

[9]The clustering of the deposit insurance values below the mean is reflected in the substantially smaller median deposit insurance values. For example, in December 1987 the median deposit insurance value was 0.07 cents per $100.

points per dollar of deposits.[10] This cost estimate, based on direct examination costs to the supervisor, is unlikely to reflect a variety of costs born by banks as a result of supervision. For example, it does not include the cost of reporting requirements or costs stemming from enforcement actions. It is also true that supervisory costs, like deposit insurance values, increase with bank risk and leverage and so tend to limit the size of any net subsidy for riskier banks.[11]

A somewhat more recent estimate of the regulatory burden on depository institutions is provided in the 1992 study by the Federal Financial Institutions Examination Council. Despite a number of caveats, this study indicates that regulatory costs are roughly 6 percent to 14 percent of the noninterest operating expenses of insured institutions.[12] If one assumes that the lower bound of this range is correct, aggregate regulatory costs on banks totaled roughly $9 billion in 1995. This figure amounts to 35 basis points when expressed as a percent of total deposits in insured banks, at a time when the FDIC estimated that the average effective premium for BIF-insured institutions was around 12.4 basis points.[13]

---

[10]These are direct exam costs to the FDIC reported in Pyle (1986), p.193. However, Pyle notes that this figure excludes some supervisory costs and assumes that total supervisory costs for banks range from 10 to 50 basis points in his calculations.

[11]This has traditionally been the case but various provisions of FDICIA (e.g., section 131 mandating prompt corrective action) formalized the connection between bank financial condition and the intensity and cost of supervision.

[12]See Federal Financial Institutions Examination Council (1992), p.3. This estimate excludes the opportunity cost of holding sterile reserves at the Federal Reserve.

[13]If one uses this same approach to calculate estimated regulatory costs in 1987, the year for which Kuester and O'Brien produce the deposit insurance values cited above, the figure is approximately $5.8 billion. This amounts to about 26 basis points at a time when the explicit deposit insurance premium was 8.3 basis points.

III. Supervisory Practices and Subsidies

The option pricing models described above reveal that the value of any deposit insurance subsidy increases if any of the following factors increase: the risk of a bank's asset portfolio, its market leverage ratio (market value of assets divided by market value of equity), the length of the examination interval, and the assumed amount of supervisory forbearance (the degree to which banks are permitted to operate with negative net worth). Past estimates of deposit insurance subsidies reflect actual or assumed supervisory practices prevailing at the time when the studies were done. But supervisors can alter deposit insurance values and the magnitude of any subsidy for banks by altering key rules and practices. For example, even if deposit insurance premia do not vary with bank risk, and expanding opportunities or deregulation permit banks to take on more risk, supervisors can increase the capital requirements for riskier banks, either through higher minimum standards or risk-based requirements, to limit the size of any safety net-related subsidy. Doing so is equivalent to increasing the deductible in an insurance policy.[14]

Supervisors attempted to raise capital requirements during the 80s, although evaluation of the success of their effort is complicated because regulatory capital standards are specified in book value, rather than the more relevant market value terms.[15] First, they phased in higher

---

[14]Another example is placing resident examiners in larger institutions which serves to decrease the length of the examination interval.

[15]The option pricing models use market value of assets and equity to value deposit insurance.

required minimum capital ratios for banks.[16] By year-end 1990, banks were expected to meet a minimum risk-based capital ratio, with a higher minimum standard effective on December 31, 1992.[17] There is some evidence that supervisors were able to induce banks, particularly weaker banks, to bring their capital levels more in line with their risk during the 80s and 90s.[18]

Further, the FDIC began to raise premium rates in 1989. The effective rate paid by banks increased in each year over the 1990 - 1992 interval, ultimately rising to 23 cents per $100 in 1992 from 8.3 cents per $100 in 1989.

Many provisions of FDICIA in 1991 mandated changes in supervision to reduce the likelihood that banks, particularly weaker banks, would realize subsidies stemming from their access to the safety net. These include provisions mandating a system of prompt corrective supervisory action (including closure) linked to bank capital levels, and adjustments in risk based capital requirements to incorporate non-credit risks. FDICIA also directed the FDIC to develop a system of risk-based deposit insurance premia for insured institutions, which the agency implemented in January 1993.[19] The system ultimately adopted tied the premiums paid by banks to their supervisory ratings and capital levels, with banks posing greater risk to the fund (those most likely to enjoy subsidies related to deposit insurance) paying more,

---

[16]The process was initiated in December 1981. By June 1985, all banks were required to maintain primary capital ratios of 5.5 percent.

[17]The minimum was 7.25 percent beginning 12/31/90 and 8.0 percent on 12/31/92.

[18]See for example, Keeley (1988), McManus and Rosen (1991) and Levonian (1991).

[19]The FDIC estimates the average effective rate produced by the risk-based schedule at 24.4 cents per $100 in 1993, 23.6 cents per $100 in 1994, and 12.4 cents per $100 in 1995.

reducing any discrepancy between the value of deposit insurance and the premia charged.[20,21] These adjustments suggest that deposit insurance values in the present environment should be smaller than in the past.

IV. Recent Net Subsidy Estimates

Virtually all of the available subsidy estimates reflect fair premia based on data from the 1980s and so reflect bank financials, economic conditions, and the supervisory and regulatory environment prevailing at that time. Banks face a different set of circumstances in the mid-90s, and so fair premia and subsidy estimates are likely to differ as well. To determine the extent to which this is the case, a standard option pricing model was used to generate current fair premium estimates for a sample of the 50 largest domestically owned bank holding companies in the United States for June 1996. The approach used is detailed in the appendix.

As noted above, one of the key factors influencing the size of estimates produced by

---

[20]Kendall and Levonian (1991) show that a relatively simple system of risk-based deposit insurance pricing keyed to bank capital can eliminate a great deal of the mis-pricing associated with deposit insurance.

[21]The beneficial effects of the switch to risk-based pricing have been attenuated recently because the explicit premia the FDIC may charge have been limited by the full recapitalization of the BIF.

this type of model is the assumed supervisory closure threshold.[22] This is reflected in the ρ (rho) value that appears in equations 1 and 2 in the appendix and is a measure of the assumed ratio of a bank's market value of assets divided by market value of liabilities at which supervisors close problem institutions. Some studies assume that supervisors close troubled banking organizations roughly when the institutions are market value insolvent – when the market value of assets and liabilities are equal to one another (a ρ value of 1.0).[23] Others assume that closure generally occurs when a institution's market value of assets is below the market value of its liabilities by some percentage (a ρ value less than 1.0). For example, several studies assume that banks are closed when the market value of their assets are 97 percent of the value of their liabilities (ρ = .97).[24] Others have argued that in the 80s, closure typically occurred when the market value of a bank's assets was roughly 90 percent of its liabilities (ρ=.90).[25] This assumption is important because relaxing the closure threshold can significantly increase the estimated fair insurance value and gross deposit insurance subsidy for any bank.

Because of the sensitivity of the subsidy estimates to the assumed closure threshold and the lack of consensus about the most appropriate value for this parameter, four different sets of fair premium estimates were produced for the sample of banking companies. Each set

---

[22]Empirical evidence on this sensitivity is presented in Office of Economic Analysis (1991).

[23]This is the assumption used in Kuester and O'Brien (1990) and Furlong (1988), for example.

[24]This is the assumption in Ronn and Verma (1986) and Kendall and Levonian (1991).

[25]This argument is made in Office of Economic Analysis (1991), pp. 26-28.

assumes a different closure threshold. The four rho values used are 1.0, 0.97, 0.95, and 0.90. Mean and median values for the four sets of premium estimates appear in table 1.

The mean values of the estimated premia are very small for rho values greater than 0.90. For example, the mean is only 1 basis point (1 cent per $100) when rho is assumed to be 0.95. The premium estimates get larger as the closure threshold is relaxed further. The mean premium value when rho is assumed to take on a value of 0.90 is roughly .0030 or 30 basis points (30 cents per $100). But, as has been found in all of the previous studies of this issue, the calculated premia are highly skewed. For all of the rho values, the estimated premia for most of the sample banking companies are below the mean value reported in the table. This is reflected in median premium values considerably below the corresponding mean value for each rho category. For example, when rho is assumed to be 0.90, the median deposit insurance value is roughly .0004 or 4 basis points while the mean is 30 basis points. At this same rho value, 80 percent of the sample companies have estimated fair premia below the mean value. Given this sort of distribution, the median rather than the mean value is a better indicator of the premium for the "typical" bank.

These estimates are well below those reported in studies of previous time periods. A primary reason is that in June 1996, the market capitalization ratios of the large banking companies making up the sample were considerably higher than they had been when the earlier studies were done. For example, Kuester and O'Brien (1990) report mean and median market capital - asset ratios of approximately 7 percent as of December 1987. In June 1996, the values for the sample holding companies were roughly 13 percent. Higher market capital ratios imply lower fair deposit insurance premium estimates, everything else being equal.

Because the explicit deposit insurance premiums for most banks were basically zero in June 1996, these fair premium estimates can be viewed as current estimates of the gross deposit insurance subsidy.[26] To derive the more relevant net subsidy measures, these premia must be compared with contemporaneous estimates of regulatory costs expressed on a similar per dollar of insured liability basis.

Two sets of cost estimates are calculated for each of the sample companies. One is formed by dividing the lower bound estimate of regulatory costs reported in the FFIEC study – 6 percent of noninterest expenses – by a company's volume of total domestic deposits. The sample mean and median values of this ratio are .0052 (52 basis points) and .0032 (32 basis points), respectively. An even more conservative cost estimate is also calculated for each company, using 3 percent of its noninterest expenses, rather than 6 percent in the numerator and the same denominator. The mean and median values of this ratio are .0026 (26 basis points) and .0016 (16 basis points), respectively.

A set of net subsidy estimates are derived for each of the sample companies by subtracting each of the two cost measures from the four fair premium or gross subsidy estimates calculated using the assumed alternative supervisory closure thresholds. The mean and median values of the net subsidy estimates are contained in table 2 (assuming regulatory costs are 6 percent of noninterest expenses) and table 3 (assuming the lower 3 percent cost level).

The data in table 2 indicate that the estimated net subsidies for the sample companies

---

[26]In June 1996, most banks were in the top zone of the FDIC's risk-based premium schedule. Such banks were charged only a minimum annual fee for deposit insurance of $2,000; their risk-based premium was 0 basis points.

are negative when the 6 percent cost estimates are used, even when the closure threshold is the most relaxed (i.e., when rho is assumed to equal .90). In this case, the mean and median net subsidy values take on their highest values of minus .00218 (negative 21.8 basis points) and minus .00257 (negative 25.7 basis points), respectively. In addition, the net subsidy estimates are negative for all of the sample banks for all but the rho=0.90 closure threshold. When rho is assumed to be .90, the net subsidy estimates of 43 companies, or 86 percent of the sample, are negative.

The data in table 3 show that even if a more conservative cost estimate is used, the net subsidy values for the sample companies also tend to be negative. For all of the closure thresholds or rho values above rho=0.90, the mean and median values remain negative. Even in the case of the most relaxed closure threshold (rho=.90), the median net subsidy value remains negative and the mean value is a modest .00042 or 4.2 basis points. The net subsidy estimates for 37 of the 50 sample companies, or almost three-quarters of them, are negative.

It might be argued that expressing regulatory costs as a percentage of total domestic deposits is inappropriate (for example, because the insurance guarantee extends, or is perceived to extend, to broader liability categories de facto) and that either total deposits or total liabilities is a preferable cost denominator. Since these magnitudes are larger than the domestic deposit totals for the holding companies in the sample, in some cases by a considerable amount, using total deposits or total liabilities in the denominator of the cost measures will produce smaller cost ratios and so higher net subsidy estimates. To determine the sensitivity of the net subsidy estimates to these factors, the numbers reported in tables 2 and 3 were recalculated using first total deposits, and then total liabilities, in the denominator

of the cost measures.

Table 4 contains mean and median net subsidy estimates for each of the four closure thresholds generated under the assumption that the regulatory cost ratio is 6 percent of noninterest expenses divided by total deposits. Table 5 contains similar figures calculated under the assumption that the regulatory cost ratio is 3 percent of noninterest expenses relative to total deposits. With one exception, the mean and median net subsidy estimates are again negative. The exception is for the rho=0.90 closure threshold, where the mean net subsidy estimate is .00141 (14.1 basis points). Even in this case, the median value is minus .00108 (negative 10.8 basis points) and the net subsidy estimates of 72 percent of the sample companies are negative.

Tables 6 and 7 contain the same sort of data as that reported in tables 4 and 5, but the regulatory cost estimates reflect total liabilities rather than total deposits in the denominator. Not surprisingly, the mean and median net subsidy estimates are a bit higher than in the previous sets of tables. But even with the reduction in the cost ratios stemming from the change in the deflator, the mean and median net subsidy estimates remain negative for all of the rho values except rho=0.90. With a cost assumption of 6 percent and a closure threshold of rho=0.90, the mean net subsidy value is a positive but modest .00071 (7.1 basis points). In this case, the median value is still minus .00183 (negative 18.3 basis points) and the net subsidy estimates of 78 percent of the sample companies are negative. With a cost assumption of 3 percent and a closure threshold of rho=0.90, the mean net subsidy value is .00186 (18.6 basis points). But even in this case, the median value is minus .00073 (negative 7.3 basis points) and the net subsidy values of 68 percent of the sample companies are

negative.

So using a standard option pricing approach, a reasonable set of assumptions, and current data (including a value of zero for the explicit deposit insurance premium), the evidence indicates that the net subsidy associated with deposit insurance is minimal or negative at present for the set of banking companies most likely to engage in broader powers to any significant degree.

V. Structural Restrictions Between Banks and Nonbank Subsidiaries and Affiliates and Subsidies

Even if one believes that the evidence above understates the true size of the net subsidy enjoyed by the typical bank, uninsured affiliates engaged in nontraditional activities only benefit if any subsidy can be successfully transmitted to them. Supervisors can impede the transmission of a subsidy by imposing limits on financial transactions between banks and related nonbank companies, and by requiring that banks house nontraditional activities in legally separate, fully capitalized subsidiaries or affiliates.[27]

There are several ways in which nonbank affiliates might benefit from a safety net-related subsidy enjoyed by an affiliated bank. One is through credit extensions to or asset purchases from nonbank affiliates on terms that favor them at the expense of the related bank providing the credit. Restrictions on inter-company funds flows, such as those incorporated in sections 23A and 23B of the Federal Reserve Act, limit the ability of holding company

---

[27]For a more detailed discussion and evaluation of firewalls and corporate separateness see Whalen (1997).

banks to behave in this fashion.[28] If a large deposit insurance subsidy existed in the past, and 23A- and 23B- type restrictions have not been effective, one should observe high levels of such inter-company activity and possibly superior relative performance by the nonbank affiliates of bank holding companies.

The rather sketchy, somewhat dated available evidence is that banks do not provide a great deal of funding to nonbank affiliates.[29] The existence of restrictions on bank lending to affiliates is cited as the likely reason for this finding. In this study, the authors find that net credit typically flows from nonbank affiliates (including the holding company parent) to bank affiliates, mostly through credit extensions over the 1976-1980 period. Studies that have examined the performance of nonbank holding company subsidiaries relative to unaffiliated competitors have found that the former have not out-performed the latter.[30]

Another possibility is that any subsidy could be transferred to nonbank units through direct or indirect capital injections by related banks.[31] The available sketchy evidence suggests that this does not occur to any significant extent at present.[32] Constraints on dividend payments made by banks to the parent company and on equity investment by banks

---

[28]Applying loan-to-one-borrower restrictions to transactions between a bank and a direct subsidiary represent another.

[29]See Rose and Talley (1984).

[30]The results of several studies of the relative performance of nonbank affiliates of holding companies are summarized in Curry (1978).

[31]An example of a direct capital injection would be an equity investment by a bank in a direct subsidiary. An example of an indirect capital injection is parent equity investment in a nonbank affiliate funded by bank dividends paid to the parent.

[32]See Greenspan (1997), p. 2.

in direct subsidiaries could mitigate this potential problem.

A net subsidy could also be transferred from banks to direct subsidiaries or holding company affiliates if the market views the nonbank units as integral parts of the insured entity, and treats the liabilities of the nonbank units as if they are de facto insured. A variety of "corporate separateness" requirements have been imposed on banking companies in the United States by supervisors to ensure that market participants can distinguish insured liabilities from uninsured ones and can identify which corporate entities within the banking organization has issued those liabilities. The same sorts of constraints are applicable for both direct bank subsidiaries and nonbank holding company affiliates.[33] The potential insulating power of the constraints should be the same in both cases.[34]

The actions and pronouncements of supervisors, however, are a key determinant of the extent to which the potential benefits of corporate separateness requirements are realized. If bank supervisors state that the entire banking group is an integrated entity, or act as if it is, or consciously ignore corporate separateness (e.g., by encouraging or pressuring banking companies to provide aid to troubled affiliates or unrelated companies in excess of their obligations), the rational response of the market is to view the group in this fashion, increasing the likelihood that any subsidy leaks through to uninsured subs or affiliates.

---

[33]There is a great deal of overlap between the set of constraints required by the FDIC for bona fide bank subs and the Federal Reserve Board for nonbank subsidiaries of a holding company.

[34]Thompson (1991) reviews legal cases in which the corporate veil has been pierced (i.e., where courts have ignored corporate separateness). He indicates that it is more likely in the case of corporate siblings than it is in the case of a parent and a direct subsidiary. See footnote 111 on page 1057.

Alternative courses of supervisory action can reduce this likelihood. In the past, supervisory behavior in this regard has been somewhat inconsistent, and so the available evidence on market perceptions of corporate separateness reflects this inconsistency to some extent.

But there is evidence that the market is cognizant of corporate separateness. For example, if the deposit insurance subsidy were substantial and created a large competitive advantage, and this subsidy leaked to affiliates, the debt ratings of banks and their affiliates, including their parent company should tend to be the same, and the parent should be able to borrow funds at better rates than companies of similar size and credit ratings. But the ratings of BHC parent companies tend to be below those of their bank subsidiaries, and the rates parent companies pay on their commercial paper are generally the same as those paid by corporations of similar size and credit. The typically lower rating of the parent company can be interpreted as reflecting asymmetric and binding constraints on funds flows between banks and their parents in a bank holding company. Specifically, there are no legal constraints on the amount of funding that can come from affiliates to the bank when the bank is in distress. In fact, the Federal Reserve Board encourages the parent to serve as a "source of strength." The opposite type of funds flows are constrained. On several occasions, one or more bank subsidiaries of bank holding companies have failed while others did not.[35]

VI. Market Evidence and Subsidies

If the deposit insurance subsidy were substantial and created a large competitive

---

[35]Two such cases are Hawkeye Bancorporation and MCORP in the late 80s.

advantage, banks would tend to locate activities inside the bank when they have an organizational choice. But when banks have flexibility regarding organizational form, no clear pattern emerges. For example, banks can locate their mortgage banking operations in a bank, in a bank subsidiary, or in a subsidiary of the holding company. If the ability to transfer a subsidy from a bank to an affiliate were uniquely associated with the bank subsidiary form, we would not expect to see mortgage companies as holding company subsidiaries. In fact, of the top 20 bank holding companies, six conduct mortgage banking operations in a holding company affiliate, nine conduct mortgage banking activities in the bank or in bank subsidiaries, and five conduct mortgage lending through a combination of the bank and holding company. Table 8 shows that other activities are structured as both holding company affiliates and bank subsidiaries. This sort of pattern suggests either that any net subsidy is minimal, which is consistent with the quantitative evidence presented above, or that it is the same for both sorts of organizational arrangements.

Funding patterns of bank holding companies and banks also are not consistent with a large subsidy. If the subsidy was large, one would expect to see banking organizations issue debt exclusively at the bank level. But at a number of holding companies, debt is issued at both the parent company and the bank level.

Further, if banking companies had the option to organize activities as either direct subsidiaries or holding company subsidiaries and the market viewed the leakage of any subsidy to be more likely in the former, direct subsidiaries should be more risky than the holding company affiliates. Only one study examines this issue, and the authors found that the risk of direct mortgage banking subsidiaries of banks was less than that of affiliates of

bank holding companies.[36]

If the deposit insurance subsidy were substantial and created a large competitive advantage, banks would tend to dominate activities they can conduct within the bank. In the markets for bank-eligible securities, for example, this does not appear to be the case.[37] There is also some evidence that banks have steadily lost market share in a number of areas to other types of intermediaries over the last several decades.[38]

VII. Summary

This paper attempts to provide evidence on the competitive implications of safety net-related subsidies. The findings from studies done in the 80s and early 90s, as well as the more recent evidence presented in this paper, suggest that the net insurance-related subsidy enjoyed by the typical bank is minimal, possibly negative at the present time. Further, it is likely to be difficult for banks to transfer any subsidy to a direct subsidiary or affiliate. Differences in affiliate structures (i.e. bank holding company affiliates vs. bank subsidiaries), per se, are not likely to affect whether any net subsidy is transferred to nonbank affiliates, because the mechanisms employed to minimize this likelihood (firewalls and corporate separateness) are the same in both cases. Finally, there is market evidence to support the view

---

[36]See Rose and Rutz (1981).

[37]See Board of Governors (1987), p. 500, footnote 94.

[38]See, for example, Boyd and Gertler (1994) and Kaufman and Mote (1994). It should be noted that pronounced market share declines are evident for some (generally those based on measures of on-balance sheet assets) but not all possible measures of bank output.

that banks do not have a meaningful safety net-related competitive advantage.

REFERENCES

Board of Governors of the Federal Reserve System. Order Approving Applications of Citicorp, J.P. Morgan and Bankers Trust to Engage in Limited Underwriting and Dealing in Certain Securities, Legal Developments, Federal Reserve Bulletin (June 1987), 473- 508.

Boyd, J. and M. Gertler. "Are Banks Dead? Or Are the Reports Greatly Exaggerated?" Proceedings From a Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago (May 1994), 85-117.

Curry, T. "The Performance of Bank Holding Companies." in The Bank Holding Company Movement to 1978: A Compendium, Board of Governors of the Federal Reserve System (September 1978), 95-120.

Federal Financial Institutions Examination Council. "Study on Regulatory Burden." December 17, 1992.

Flood, M. "On the Use of Option Pricing Models to Analyze Deposit Insurance." Economic Review, Federal Reserve Bank of St. Louis (January/February 1990), 19-35.

Furlong, F. and M. Keeley. "Bank Capital Regulation and Asset Risk." Economic Review, Federal Reserve Bank of San Francisco (Spring 1987), 20-40.

Furlong, F. "Changes in Bank Risk-taking." Economic Review, Federal Reserve Bank of San Francisco (Spring 1988), 45-56.

Giammarino, R., E. Schwartz, and J. Zechner. "Market Valuation of Bank Assets and Deposit Insurance in Canada." Canadian Journal of Economics XXII No 1 (February 1989), 109-127.

Greenspan, A. Testimony before the Subcommittee on Financial Institutions and Consumer Credit of the Committee on Banking and Financial Services, U.S. House of Representatives (February 13, 1997).

Kaufman, G. and L. Mote. "Is Banking a Declining Industry? A Historical Perspective." Economic Perspectives, Federal Reserve Bank of Chicago (May/June 1994), 2-21.

Keeley, M. "Bank Capital Regulation in the 1980s: Effective of Ineffective?" Economic Review, Federal Reserve Bank of San Francisco (Winter 1988), 3-20.

Kendall, S and M. Levonian. "A Simple Approach to Better Deposit Insurance Pricing." Journal of Banking and Finance 15 (1991), 999-1018.

Kuester, K. and J. O'Brien. "Market-Based Deposit Insurance Premiums." Proceedings From a Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago (May 1990), 62-95.

Levonian, M. "What Happens if Banks are Closed Early?" Proceedings From a Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago (May 1990), 273-295

Levonian, M.. "Have Large Banks Become Riskier? Recent Evidence From Options Markets." Economic Review, Federal Reserve Bank of San Francisco (Fall 1991), 3-17.

Marcus, A. and I. Shaked. "The Valuation of FDIC Deposit Insurance Using Option-pricing Estimates." Journal of Money, Credit and Banking, 16 No. 4 (November 1984, Part 1), 446-460.

McManus, D. And R. Rosen. "Risk and Capitalization in Banking." Proceedings From a Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago (May 1991), 296-321.

Merton, R. "An Analytical Derivation of the Cost of Deposit Insurance and Loan Guarantees: An Application of Modern Option Pricing Theory." Journal of Banking and Finance 1 (June 1977), 3-11.

Office of Economic Analysis. "Estimating the Value of Federal Deposit Insurance." Mimeo, Securities and Exchange Commission (March 29, 1991).

Pennacchi, G. "A Reexamination of the Over- (or Under-) Pricing of Deposit Insurance." Journal of Money, Credit and Banking 19 No. 3 (August 1987), 340-360.

Pyle, D. "Capital Regulation and Deposit Insurance." Journal of Banking and Finance 10 (1986), 189-201.

Ronn, E. and A. Verma. "Pricing Risk-Adjusted Deposit Insurance: An Option-Based Model." Journal of Finance XLI No. 4 (September 1986), 871-895.

Rose, J. and R. Rutz. "Organizational Form and Risk in Bank-Affiliated Mortgage Companies." Journal of Money, Credit and Banking 13(3) (August 1981), 375-380.

Rose, J. and S. Talley, "Financial Transactions Within Bank Holding Companies." Journal of Financial Research (Fall 1984), 209-217.

Thompson, R. "Piercing the Corporate Veil: An Empirical Study." Cornell Law Review 76 (July 1991), 1036-1074.

Thomson, J. “The Use of Market Information in Pricing Deposit Insurance.” Journal of Money, Credit and Banking 19 No. 4 (November 1987), 528-537.

Whalen, G. “Bank Organizational Form and the Risks of Expanded Activities.” Working Paper 97-1, Office of the Comptroller of the Currency (January 1997).

APPENDIX

The standard option pricing approach used in Ronn and Verma (1986) and Kendall and Levonian (1991) and a number of other studies is employed to derive the estimates of the fair deposit insurance premia in this study. Basically, given information about an institution's market value of equity, the instantaneous standard deviation of the rate of return on equity, the market value of its liabilities, and assumptions about the length of the monitoring interval and the closure threshold, equations 1 and 2 below are solved for the two unknown variables in them: the market value of an institution's assets and the instantaneous standard deviation of the rate of return on assets. These variables are then substituted into equation 3, along with information on the institution's dividends per dollar of assets and some of the same variables and parameters used in equations 1 and 2 to produce the fair deposit insurance premium estimates. Symbolically, the equations are as follows:

$$E = AN(x) - \rho BN(x - \sigma_A\sqrt{T}) \qquad (1)$$

$$\sigma_A = \sigma_E E/AN(x) \qquad (2)$$

$$d = N(y + \sigma_A\sqrt{T}) - (1-\delta)(A/B)N(y) \qquad (3)$$

where:

E = the market value of equity,
B = the market value of total liabilities,
A = the market value of assets excluding insurance,
T = the monitoring interval,
ρ = the closure threshold,
$N(\cdot)$ = the standard normal cumulative density function,
δ = dividends per dollar of assets,
σ_A = the instantaneous standard deviation of the rate of return on assets,
σ_E = the instantaneous standard deviation of the rate of return on equity,
d = the fair deposit insurance premium,

$$x = \frac{\text{Log}(A/\rho B) + .5\sigma_A^2 T}{\sigma_A\sqrt{T}}$$

$$y = \frac{\text{Log}(B/A(1-\delta)) - .5\sigma_A^2 T}{\sigma_A\sqrt{T}}$$

All of the institution-specific financial information used in the study is for the consolidated bank holding company. With the exception of certain stock price data, the financial information is drawn from the Y-9C report filed by each company with the Federal Reserve Board for June 30, 1996. The book value of liabilities on that date is assumed to approximate market value and is set equal to B. The market value of equity is the product of the closing price for the holding company's common shares and the number of those shares outstanding at the end of the second quarter of 1996. The instantaneous standard deviation of the rate of return on equity is approximated by the standard deviation of the daily returns on each holding company's common stock over the second quarter of 1996. The numerator of the dividend rate measure is dividends paid over the second quarter of 1996 and the three previous quarters. The monitoring interval is assumed to be one year. As discussed in the text, the closure threshold is assumed to take on four different values: 1.0, 0.97, 0.95 and 0.90.