

Review

Regulatory Restrictions on US Bank Funding Sources: A Review of the Treatment of Brokered Deposits

James R. Barth ^{1,*} , Wenling Lu ²  and Yanfei Sun ³

¹ Department of Finance, Auburn University, Auburn, AL 36849, USA

² Department of Finance and Commercial Law, Western Michigan University, Kalamazoo, MI 49008, USA; wenling.lu@wmich.edu

³ Department of Finance, Ryerson University, Toronto, ON M5B 2K3, Canada; yanfei.sun@ryerson.ca

* Correspondence: barthjr@auburn.edu; Tel.: +1-334-844-2469

Received: 12 May 2020; Accepted: 12 June 2020; Published: 18 June 2020



Abstract: This paper is the first paper to provide a comprehensive review of the US regulatory treatment of a relatively recent and controversial source of funds, namely brokered deposits. To do this, we consider the extent to which banks rely on brokered deposits, as well as the impact of these funds on bank performance, bank failures, and bank failure costs. We also consider the changes taking place in technologies and how they continue to affect the way banks obtain funds and provide services to their customers. Our conclusion is that, without sufficient evidence to the contrary, such deposits should be treated no differently from all other deposits and other purchased funds.

Keywords: US bank regulation; bank performance; bank funding sources; brokered deposits

1. Introduction

Banks have always played an essential role in American growth and prosperity. For more than 200 years, they have functioned by offering financial products and services in the marketplace and then channeled the funds they raise to individuals and businesses through loans and investments for various productive purposes. It is not surprising that, over the course of US banking history, the range of financial products and services has evolved to meet growing customer demand and facilitate economic growth and development.

The broadened scope in marketplace offerings has involved both bank assets and liabilities, and off-balance sheet activities. More recently, innovations in financial technology have enabled banks to offer new products and services, and extend their reach to both national and international customers. Today, they have more opportunities than ever to contribute to economic activities that benefit local communities and society at large.

Banks, of course, have not been free to operate any way they see fit. Laws and regulations have been put in place over the years with the goal to ensure safe and sound banking; and it is generally agreed that some requirements on activities are indeed appropriate for the maintenance of a well-functioning and stable banking system. Over time, regulations have restricted the scope of a bank's permissible activities, as well as the geographical range in which it may offer those activities. These limits in scope and range apply to both the asset and liability side of bank balance sheets, and more specifically to the types, quantities, and prices of the products and services banks may offer. Regulatory authorities have also had some discretion over the restrictions placed on the sources of funds—be they equity capital, non-brokered and brokered deposits, or other liabilities—used to make various types of loans and to support different types of investment projects.

At times, banks and their regulators disagree over whether the benefits of a restriction exceed the costs. Those disagreements, coupled with data on actual impacts, have sometimes led to the loosening or eliminating of restrictions; at other times, they have resulted in stricter regulations.

This is the first paper to provide a comprehensive review of the regulatory treatment of a relatively recent and controversial source of funds, namely brokered deposits. Regulators treat brokered deposits differently from other deposits, whereas banks consider such treatment inappropriate. Even though there have been studies of the impact of brokered deposits on bank performance, we are the first to provide not only a comprehensive review of the studies but also extent to which they support the regulatory treatment of such deposits, or not. To do this, we consider the extent to which banks rely on brokered deposits, as well as the impact of these funds on bank performance, bank failures, and bank failure costs. We also consider the changes taking place in technologies and how they continue to affect the way banks obtain funds and provide services to their customers.¹ We generally conclude on the basis of our review that brokered deposits should be treated no differently from core deposits, and some progress has been made in this regard by treating well-capitalized banks more favorably than other banks.² Technology has been rapidly expanding, and, given the effect of COVID-19, many customers are now doing more banking online so that banks are finding many branches no longer necessary, especially when additional funds in the form of brokered deposits can be obtained when needed.

The remainder of the paper proceeds as follows. Section 2 provides an overview of brokered deposits, their origins as well as growing concerns among bank regulatory authorities as their use has become more widespread.³ Section 3 addresses legal restrictions that have been imposed on the use of brokered deposits by banks. Section 4 contains information on regulatory definitions of brokered deposits and the different types of brokered deposits used by banks. Section 5 presents aggregate and individual bank data on the banking industry's use of brokered deposits. Section 6 examines the impact of brokered deposits on bank performance, bank failures, and bank failure costs. Section 7 discusses the role of brokered deposits in a marketplace that is increasingly reliant on financial technologies. Section 8 contains concluding remarks.

2. Origin and Concern over Brokered Deposits

Brokered deposits first appeared in the early 1960s with the development of electronic funds transfers (EFTs) that made it possible for financial institutions to exchange funds across great distances at high speed and at almost no cost. With the innovation of brokered certificates of deposit (CDs), in particular, banks could raise large sums from savers and investors well beyond their local service markets; and by the 1980s, the same technologies made it possible for banks to turn home mortgages into mortgage-backed securities—in theory not unlike CDs—for resale in the capital markets (Brady 1989, p. 4). This brought greater liquidity to banks and contributed immensely to growth in the housing market. In short, technological innovations gave banks access to a broader range of funding sources and the sale and creation of mortgages-backed-securities enabled them to make money by originating and servicing the mortgages without having to hold all of them as assets on their balance sheets.

¹ We focus on US banks since we could find no academic research on brokered deposits in other countries. In addition, no data on brokered deposits for banks in other countries are available in BankFocus. Furthermore, as regards regulatory treatment, there is no clear guidance in Basel III.

² On 10 February 2020, the Federal Deposit Insurance Corporation invited comments on a proposal relating to the brokered deposits restrictions that apply to less than well capitalized banks. The proposal would create a new framework for analyzing certain provisions of the “deposit broker” definition, including “facilitating” and “primary purpose”, as well as establish an application and reporting process for the primary purpose exception (see <https://www.fdic.gov/news/board/2019/2019-12-12-notice-dis-b-fr.pdf>, accessed on 11 June 2020). No final rule has been issued as of the writing of this paper.

³ Throughout this paper, we use the term “bank” to refer to a federally insured depository institution, excluding credit unions, unless otherwise noted.

The biggest banks were the first to acquire brokered CDs (Harless 1984, p. 18). They commissioned brokers to secure large-sum CDs from institutional investors across the country.⁴ Regional banks followed suit in the mid-1970s, although small- and mid-size banks rarely turned to CD funding sources until the late-1970s. At the time, the CDs were uninsured, but the failure of Penn Square Bank of Oklahoma in July 1982, and the huge losses to its holders of jumbo CDs, proved to be the impetus for growth in the insured brokered CD market. When Penn Square failed after selling nearly \$1 billion in “loan participation” deposit certificates to major banks across the country, the Federal Deposit Insurance Corporation (FDIC) determined it was less costly to pay off only the insured depositors (with insured deposits capped at \$100,000) than to arrange a merger with another bank, as had been typically the case in prior failures. The banks holding Penn Square’s CDs took heavy losses, some in the hundreds of millions of dollars, leading to a crisis nationwide.⁵ Thus, Penn Square acquired the sorry distinction of being the largest bank failure in the FDIC’s history in which uninsured depositors suffered losses. The agency’s refusal to protect uninsured depositors brought about another workaround: it provided brokers with a strong incentive to break up their large deposits into \$100,000 denominations for distribution among different banks to ensure that investors had full FDIC coverage (Goodman and Shaffer 1984, p. 157).

Of particular concern to bank regulators was Penn Square’s phenomenal growth in assets over just five years, from \$62 million to \$520 million from 1977 to mid-1982 (FDIC 1998, p. 527). That growth correlated with the use of brokered deposits, from under \$20 million to \$282 million (FDIC 1997, p. 119). Its failure, as well those of other banks and thrifts at the time, focused attention on the extent to which institutions were using brokered deposits to fuel rapid, irresponsible, high-risk asset growth that could expose the federal insurance funds to losses.⁶ Penn Square showed the classic behavior of a troubled institution—it needed to raise money fast to make excessively risky loans that promised high returns but that could go south in a heartbeat (and did when the price of oil fell worldwide). “The growth of brokered deposits outstanding has recently been phenomenal,” wrote Caroline Harless, at the time a bank examiner in the Department of Supervision and Regulation of the Federal Reserve Bank of Atlanta. “According to the Federal Home Loan Bank Board (FHLBB), brokers ‘had brought in \$26 billion to thrifts as of October 1983, up from \$4.6 billion in June 1982.’” She added, “According to unedited call report data, as of 30 September 1983, 536 commercial banks ... indicated the use of brokered deposits ... [and] ... these deposits amounted to \$19.2 billion” (Harless 1984, pp. 16–17).

In view of this situation, “... FDIC and the Federal Home Loan Bank Board (FHLBB) studied the issue of brokered deposits ...” and “... expressed their concern that the practice of deposit brokering ‘enable[d] virtually all institutions to attract large volumes of funds from outside their normal market area irrespective of the institutions’ managerial and financial characteristics’” (FDIC 1998, p. 541). More specifically, the regulators were concerned “... about deposit brokers ... [not] necessarily conducting any credit analysis to ascertain the conditions of the offering institutions” (FDIC 1997, p. 119). In addition, there was the concern that “... [the] use of brokered CDs, therefore, may actually increase the cost to the FDIC of disposing of a troubled institution, because the institution will have had access to more insured deposits than it otherwise would” (as cited by Goodman and Shaffer 1984, p. 157).

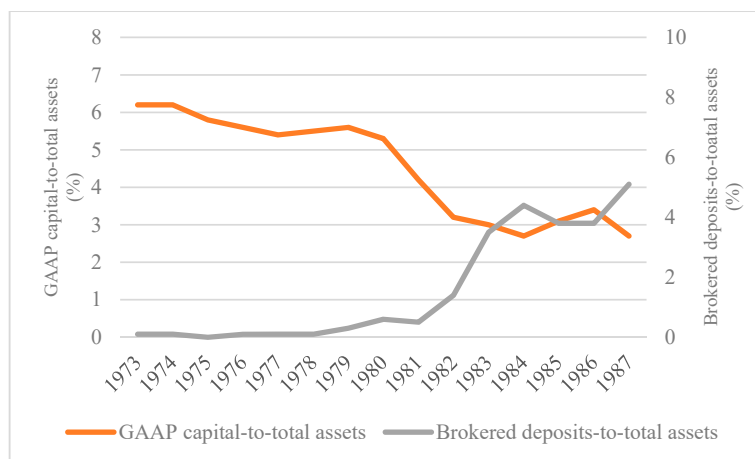
Although it appears that data on the use of brokered deposits by insured depository institutions are not available electronically from the regulatory authorities before 1992, some hard-copy data are

⁴ Investors liked the large uninsured CDs because the rates offered on them were not subject to regulatory interest rate restrictions in effect at the time (Harless 1984, p. 19).

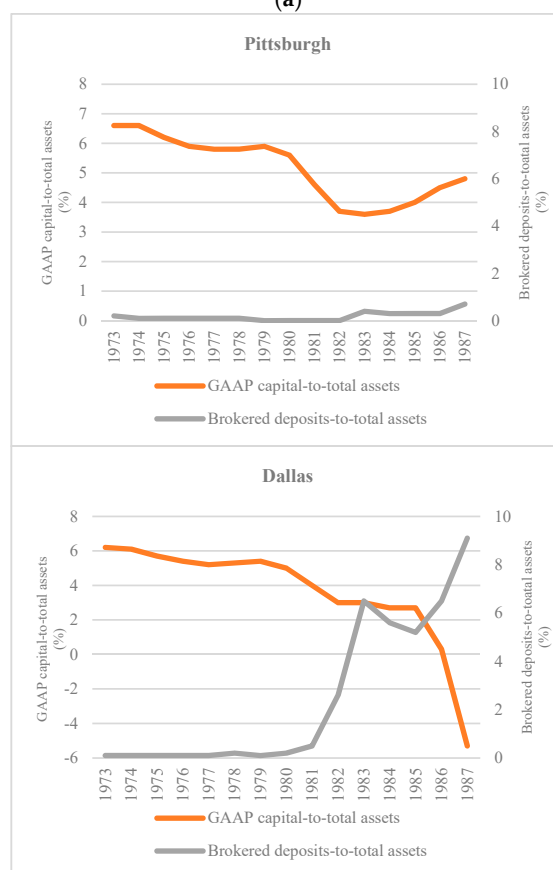
⁵ The insurance limit at the time was \$100,000, having been increased from \$40,000 to \$100,000 in March 1980. In October 2008, the insurance limit was temporarily increased to \$250,000 and then made permanent by the Dodd–Frank Wall Street Reform and Consumer Protection Act of July 2010.

⁶ The term “thrifts” refers to savings and loan associations. At the time, banks were insured by the FDIC, while thrifts were insured by the Federal Savings and Loan Insurance Corporation (FSLIC). The FSLIC was governed by the Federal Home Loan Bank Board. Approximately 90% of thrift institutions reported losses in the early 1980s and hundreds of institutions failed, and the FHLBB and FSLIC attributed many such failures to the use of brokered deposits.

available for thrift institutions in earlier years. It is useful to examine these data to better understand the relationship between the growth in brokered deposits and the growth in assets by thrifts. In particular, Figure 1a shows brokered deposits as a percentage of total assets for all thrift institutions over the period 1973–1987. The Generally Accepted Accounting Principles (GAAP) capital-to-total assets ratio is also shown.



(a)



(b)

Figure 1. (a) All thrift institutions: Capital and brokered deposits ratios. (b) Thrifts in two Federal Home Loan Bank districts: Capital and brokered deposits ratios. Source: Federal Home Loan Bank Board.

As shown in Figure 1a, the use of brokered deposits by thrifts increased significantly only after their capital ratios began to decline fairly rapidly in the early 1980s. This is consistent with the view that troubled institutions may turn to the brokered deposit market and other funding sources to overcome

their financial difficulties through more rapid asset growth. However, here it is important to note two important points. First, the brokered deposits per se were not the problem. The problem lay in the assets that these and other funds acquired. William Seidman, a former chairman of the FDIC, made this important point in 1989:

“A dollar deposited in an insured institution is the same whether obtained directly from a local depositor or through the intermediation of a deposit broker. There may be differences in the cost and stability of that dollar deposit depending on its source. However, losses in banks do not occur, generally speaking, by virtue of the source of their deposit liabilities. Instead, the losses arise from the quality of and return on loans and investments made with those funds. Consequently, the focus of attention should be on the employment of brokered deposits rather than their source”.

(Clark 2012, p. 137)

Second, the rise in the use of brokered deposits, among other funding sources, correlated with a decline in capital relative to assets. This was a classic symptom of a troubled institution, and means that regulators should focus on curtailing the rapid growth in assets when it occurs in such institutions.

It is also useful to look a bit deeper and examine how thrifts in two different Federal Home Loan Bank districts used brokered deposits. Figure 1b shows the brokered deposit ratios for thrifts in the Pittsburgh and Dallas districts, and it is clear that each used brokered deposits quite differently. The Pittsburgh thrifts show no sharp increase in the use of brokered deposits over the entire period 1973–1987 because, even though their collective capital ratio declined, the decline was relatively modest and occurred for only a short period before increasing in the latter part of the period. However, in the Dallas district, we see a sharp increase in thrifts’ use of brokered deposits in the second half of the period, when the capital ratio was sharply declining without ever reversing. Stated another way, in the case of Pittsburgh thrifts, there was no correlation between the ratio of brokered deposits-to-total assets, and the ratio of capital-to-assets, whereas, for Dallas thrifts, there was a significantly negative correlation between the two ratios. The explanation? The Dallas thrifts were far more deeply troubled and using brokered deposits to try to grow their way out of their problems.

More generally, hard-copy data indicate that the Dallas district thrifts had rapidly increased their purchased funds-to-total asset ratio at the same time (brokered deposits were only one component of these), from 1% in 1973 to 17.1% in 1987. This means that all purchased funds helped fuel asset growth, not just brokered deposits.⁷ The data in these figures are consistent with statements made by Nicholas Brady, then Secretary of the Department of the Treasury, who stated that “[s]upervisory and regulatory laxity in oversight ... contributed to the ... [thrift] problem. Inadequate capital requirements allowed thrifts to grow quickly with almost no ‘at-risk’ capital. Low equity, in turn, encouraged greater risk taking” (Brady 1989, p. 5).

Of note as well, the FHLBB issued a research paper on the costs of resolving failed thrift institutions from December 1981 to October 1985. Based on an econometric analysis, Barth et al. (1986) found that brokered deposits did not have significant or positive relationships to the costs of such failures. Instead, it was the use to which the funds of thrifts were put and the delay in resolving troubled institutions that increased the costs. Specifically, acquisition-and-development land loans and direct investments did have significant and positive relationships to the resolution costs, as did the length of time between insolvency and closing by the regulatory authorities (Barth et al. 1990; Barth and Dan Brumbaugh 1994). In short, the paper supports the view that the thrift problem in the early 1980s was not caused by brokered deposits per se, but because deeply troubled institutions were allowed to remain open and

⁷ It should be noted that the ratio of core deposits for Dallas thrifts declined to a low of 57.6% in 1984, while for Pittsburgh thrifts the ratio was 82.2% in the same year.

obtain additional funds, from various sources, to make excessive risky acquisition-and-development land loans and direct investments.

3. Legal Restrictions on Brokered Deposits

In view of the problems in the thrift industry in the early 1980s, Edwin Gray, then chairman of the FHLBB, stated that “[f]rom a safety and soundness point of view, the Board is very concerned about the heavy focus on rapid deposit and asset growth by too many savings institutions today” (Gray 1984, p. 9). Both the FHLBB and the FDIC were now concerned about the use of brokered deposits to bring about irresponsible asset growth, and they jointly proposed in October 1983 to limit the insurance coverage afforded to deposits placed by or through a broker with an insured bank or thrift. The proposal was to take effect in October 1984. Then, in March 1984, both agencies voted to limit insurance to \$100,000 per broker per institution for accounts.⁸ At the same time and as an interim measure, the FHLBB voted to prohibit thrifts whose current regulatory net worth was below 3% of liabilities from accepting more than 5% of their deposits by or through a broker. In June 1984, and then again in January 1985, the courts ruled that the FHLBB did not have the authority to limit federal insurance coverage for brokered deposits⁹. However, the FHLBB in February 1985 made permanent its own interim measure, while providing temporary exemptions for certain thrifts suffering from a shortage of liquidity or substantial dissipation of assets (FHLBB 1985, p. 18).

It is important to note the difference between the FHLBB action and the FDIC. The FHLBB turned its focus to asset growth and ensuring that there was adequate capital underlying that growth. Thus, in 1985, thrifts had to increase their capital as their growth rates rose. In addition, institutions with more than \$100 million in assets had to seek permission from the FHLBB to grow more quickly than 25% a year. More capital also was required for thrifts with direct investments. Finally, the five-year averaging used to calculate net worth was gradually eliminated (Barth and Regalia 1988, pp. 138–39). Clearly, the emphasis was to ensure that asset growth was supported by adequate capital, irrespective of the extent to which kinds of deposits were a source of funds.

However, court rulings and a redirected focus by the FHLBB toward adequate capital ratios did not bring an end to restrictions on the use of brokered deposits. They continued to be targeted by bank regulatory authorities. Moreover, the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 prohibited any troubled institution from obtaining deposits by or through deposit brokers without a waiver from the FDIC. The law defined a “troubled institution” as any insured depository institution that failed to meet its minimum capital requirements (US Congress 1989). In 1991, the Federal Deposit Insurance Corporation Improvement Act (FDICIA) altered the earlier law so that restrictions applied to any insured depository institutions that were not “well capitalized” (i.e., those not ranked in the highest of the FDIC’s five capital-ratio categories). Institutions rated “adequately capitalized” (the second-highest category) could accept brokered deposits only upon obtaining a waiver from FDIC. Those “undercapitalized institutions” in the lowest three categories were prohibited from accepting brokered deposits.¹⁰

The 1991 law, moreover, prohibited any institution that was not rated “well capitalized” from paying a rate of interest on its brokered deposits that significantly exceeded the rate paid on deposits of similar maturity in its normal market area—or, for deposits accepted outside the institution’s normal market area, the “national rate” on deposits of comparable maturity, as established by the FDIC (US Congress 1991). In 1992, in the case of retail deposits, the FDIC stated that the national rate would

⁸ The Office of the Comptroller of the Currency opposed the proposal arguing for “a supervisory approach that would allow an institution to accept up to twice its capital in brokered deposits as long as brokered deposits did not exceed 15 percent of total deposits.” See (FDIC 1997, p. 120).

⁹ See <https://www.federalregister.gov/documents/2019/02/06/2018-28273/unsafe-and-unsound-banking-practices-brokered-deposits-and-interest-rate-restrictions#footnote-15-p2367>, accessed on 11 June 2020.

¹⁰ Of 5838 banks, as of Q1 2017, 5794 were well capitalized, 23 were adequately capitalized, and 21 were undercapitalized.

be 120% of the current yield on similar maturity Treasury securities, while in the case of institutional (wholesale) deposits, the national rate would be 130% of the current yield on similar maturity Treasury securities (Federal Register 1992). Much more recently, in 2009, the FDIC specified that insured depository institutions that were not well capitalized would be permitted to offer a new “national rate” plus 75 basis points. The new national rate is defined as a simple average of rates paid by all insured depository institutions and branches for which data are available (Federal Register 2009).¹¹

As of July 2017, the following restrictions were in effect on brokered deposits: (1) well-capitalized banks may accept brokered deposits at any time and pay any rate on those deposits; (2) adequately capitalized banks may accept brokered deposits if they obtain a waiver from the FDIC and pay a rate on the deposits that does not exceed the “national rate” plus 75 basis points; and (3) undercapitalized banks may not accept brokered deposits. In addition, as of December 2016, select insured depository institutions are subject to deposit insurance assessment rate adjustments for brokered deposits.¹² The FDIC stated that all established (i.e., those insured five or more years) small institutions would no longer be subject to brokered deposit adjustments.

However, the FDIC’s methodology for determining the insurance assessment rate includes a core deposit ratio (core deposits/total assets) component, which operates, in effect, as a brokered deposit adjustment. For example, if a highly rated, well-capitalized bank with a 10% brokered deposit ratio should increase the ratio to 50%, the deposit insurance assessment would increase a huge 550 basis points. Newly established small institutions in the FDIC Risk Categories II, III, and IV, and all large and highly complex institutions, were subject to assessment rates for brokered deposits. The brokered deposit adjustment was limited to those institutions for which the ratio of brokered deposits to domestic deposits was greater than 10% and ranged from 0 to 10 basis points (FDIC 2016a).¹³ In addition, the brokered deposits of banks with more than \$50 billion in assets were subject to stricter restrictions with respect to the liquidity coverage ratio and the net stable funding ratio.

4. Definition and Types of Brokered Deposits

There has always been debate as to what exactly constitutes brokered deposits and what types of brokered deposits should be restricted—and it does not seem to have gotten easier over time. The first official attempt to define the different types of these deposits appears in November 1983, when the FHLBB and the FDIC described three forms of deposit brokering: (1) simple brokering, in which a money broker solicits deposits from customers for placement by the broker or by the customer at banks; (2) CD participations, in which a broker-dealer purchases a bank-issued CD and sells interests in the CD to customers; and (3) deposit-listing services, in which a bank advertises interest rates and maturities through a third party who arranges for the sale of the bank’s deposits to the public (Federal Register 1983).

In January 1984, the FHLBB and the FDIC defined a “deposit broker” as any person or entity, other than an insured institution or its employee, engaged in the business of placing or listing for placement the deposits of insured institutions (Federal Register 1984).

Five years later, in 1989, FIRREA defined a brokered deposit as any deposit obtained, directly or indirectly, from or through the mediation or assistance of a deposit broker, where the term “deposit broker” meant: (1) any person engaged in the business of placing deposits, or facilitating the placement of deposits, of third parties with insured depository institutions; or engaged in the business of placing deposits with insured depository institutions for the purpose of selling interests in those deposits to third parties; and (2) an agent or trustee who establishes a deposit account to facilitate a business

¹¹ The FDIC makes the national rate available weekly on its website at: www.fdic.gov/regulations/resources/rates/previous.html.

¹² Reciprocal deposits are excluded from brokered deposits for making this calculation, but sweeps, referrals from affiliates, and all other brokered deposits are included (FDIC 2011, p. 34).

¹³ Prior to 1 April 2011, deposit insurance assessments were based on domestic deposits, while after that date they were based on total assets.

arrangement with an insured depository institution to use the proceeds of the account to fund a prearranged loan.

Most recently, in July 2016, the FDIC defined a brokered deposit to be “any deposit that is obtained, directly or indirectly, from or through the mediation or assistance of a deposit broker.” The FDIC noted as well that “the meaning of the term ‘brokered deposit’ depends upon the meaning of the term ‘deposit broker.’” One must remember that the definition of a “deposit broker” provided by FIRREA is sufficiently broad that a brokered deposit may be any deposit accepted by an insured depository institution from or through a third party, such as a person or company or organization other than the owner of the deposit (FDIC 2016b, p. 1).

When FIRREA became a law in 1989, banks did not use, or barely used, deposit listing and placement services, sweep programs, reciprocal brokered deposits, and general purpose prepaid cards. These are all innovations in financial technology in routine use, and it will be useful to describe them briefly—since some of them are considered brokered deposits.

A listing and placement service compiles and publishes information for potential depositors about the deposit accounts available from different banks. However, not every such service is considered a deposit broker. “Where the only function of a deposit listing service is to provide information on the availability and terms of accounts,” notes the FDIC, “we believe that the listing service is not facilitating the placement of deposits. Rather, it facilitates the decision of the would-be buyer whether (and from whom) to buy a certificate of deposit; it is not facilitating the *placement* of deposits *per se* [italics original]” (FDIC 2016b, p. 6). In this case, the listing service is not considered to be a deposit broker.

A brokerage firm may operate a sweep program in which its customers sweep, i.e., transfer, their excess cash balances into a bank deposit that provides a positive return and insurance coverage on those funds (FDIC 2011, p. 25). Paul Clark, who advised Merrill Lynch on the structuring of its sweep program in 2000, writes that it “offered a savings deposit linked to a transaction account, permitting Merrill Lynch customers full transaction capabilities through their [cash management account]” (Clark 2012, p. 103). Although the FDIC generally considers any securities firm or investment company that places deposits in a bank to be a deposit broker, it made an exception for a firm when the “primary purpose” of its program is to facilitate its clients’ purchase and sale of securities, not to provide them with a deposit-placement service.

In making this determination, the FDIC relies on three factors: (1) the funds are not swept into time deposit accounts; (2) the amount of swept funds does not exceed 10% of the total amount of program assets handled by the brokerage firm on a monthly basis; and (3) the program fees are “flat” (i.e., equal “per account” or “per customer” fees, representing payment for recordkeeping or administrative services, and not representing payment for placing deposits) (FDIC 2011, pp. 26–27). If these requirements are satisfied, the company is not a deposit broker under the “primary purpose” exception with respect to the “swept” funds.¹⁴ If the requirements are not satisfied, the company is a deposit broker.¹⁵

A reciprocal deposit is one that “an insured depository institution receives through a deposit placement network on a reciprocal basis, such that: (1) for any deposit received, the institution (as agent for depositors) places the same amount with other insured depository institutions through the network; and (2) each member of the network sets the interest rate to be paid on the entire amount of funds it places with other network members” (Government Publishing Office 2012). Reciprocal deposits

¹⁴ The FDIC issued an opinion on 3 February 2005, that generally funds in accounts that are “swept” into money market deposit accounts at affiliated banks are not brokered deposits (FDIC 2005).

¹⁵ According to Clark, brokerage firms with affiliated banks included Merrill Lynch, Lehman Brothers, Smith Barney, Charles Schwab, UBS, E*Trade, and Morgan Stanley (Clark 2012, p. 103).

are almost all insured since they exist only to increase a depositor's insurance coverage. The FDIC considers these deposits to be brokered deposits.¹⁶

A general purpose prepaid card is sold at retail stores or other public venues. After the funds are collected from the card purchaser, they may be deposited by the card company or other third party into a custodial account at an insured depository institution. The cardholder can then access the funds by using the card. The FDIC considers prepaid card companies or other third parties who sell these cards to be deposit brokers, and the deposits are classified as brokered deposits (FDIC 2011, pp. 31–32).

The bottom line is that the FDIC has substantial discretion to determine whether or not various deposits acquired by banks are brokered deposits. Once a type of deposit gets so labeled, it is generally subject to the same restrictions as all other brokered deposits, even though this one-rule-fits-all can significantly influence the ability of banks with different business models to compete on equal terms in the financial marketplace. Most important, when these deposits are treated differently from other deposits (e.g., core deposits), some banks may be placed at a competitive disadvantage, adversely affecting both the banks and their customers. The question is whether any “benefits” of treating different types of deposits differently exceed the costs of doing so—for the regulators, the banks, and its clients.

5. Usage of Brokered Deposits by Banks

In this section, we look at data, on the individual and aggregate level, to help understand the extent to which banks actually use brokered deposits. As shown in Figure 2, for the period 1992–2008, the number of banks using brokered deposits increased from 1185 to 3788; the number then declined to 2237 by 2018. (Of course, the total number of banks also declined from 2008 to 2018.) Figure 2 also shows that the percentage of banks using brokered deposits increased from 8% in 1992 to a high of 46% in 2008, and then declined somewhat, to 38%, in 2013, before rebounding to 41% in 2018. Clearly, a large percentage of banks considers brokered deposits to be a useful source of funds, and less costly than operating and expanding a branch network. Of course, the regulatory treatment, including a general disdain, of brokered deposits described Section 3 no doubt curtailed the use of brokered deposits by many banks.

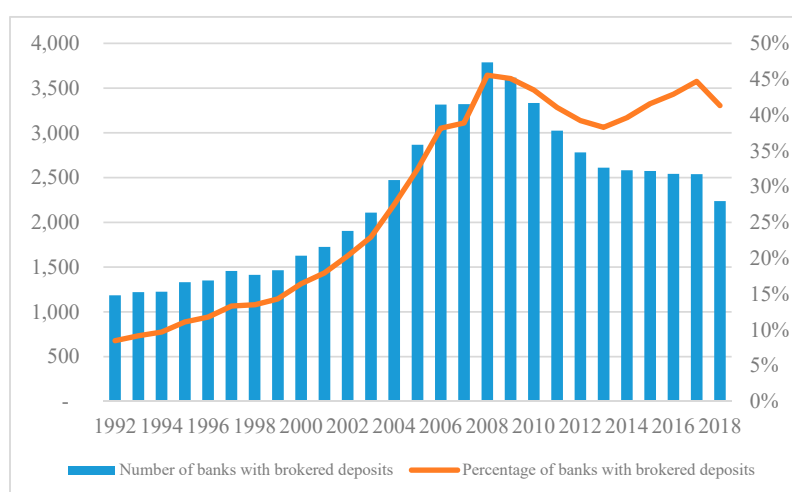


Figure 2. Number and percentage of banks with brokered deposits. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

¹⁶ However, “the assessment system excludes all reciprocal deposits from the adjusted brokered deposit ratio that applies to well-capitalized, well-managed small banks, and from the brokered deposit adjustment when applied to well-capitalized, well-managed large banks” (FDIC 2011, p. 54). Also, banks began reporting reciprocal deposits in 30 June 2009 (p. 117). As of the last quarter 2018, reciprocal deposits amounted to \$61.5 billion.

In terms of the amount of such funds, Figure 3 shows that brokered deposits increased from \$59 billion in 1992 to a high of \$1071 billion in 2018.

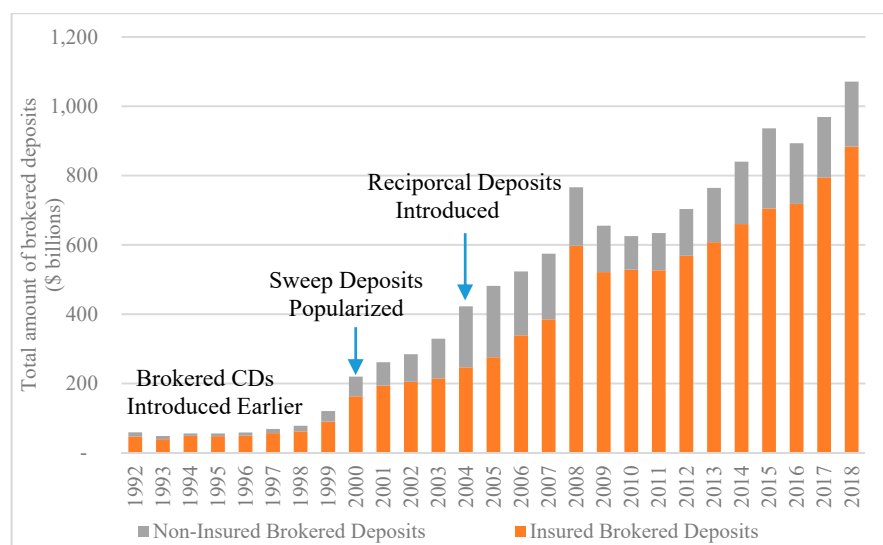


Figure 3. Total amount of brokered deposits, 1992–2018. Note: Roughly 30 insured deposit institutions had about \$725 billion in sweep deposits satisfying the “primary purpose” exemption at year-end 2018 (Federal Register 2019, p. 2369). As of 2018, approximately 44% of brokered deposits were in brokered CDs and 54% in sweep deposits (IDC Financial Publishing, Inc., 17 December 2018). Unfortunately, bank call reports do not provide information on the brokered CDs and sweep deposits (not subject to the primary purpose exemption) held by banks. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

One can also consider the importance of brokered deposits, in terms of both share of total deposits and share of total assets. Figure 4 shows these shares, first, for all banks and then for only those banks with brokered deposits. In both cases, the share of brokered deposits has been 10% or less over the entire period. The share increased after 1998 and then tended to level off for the latter part of the period.

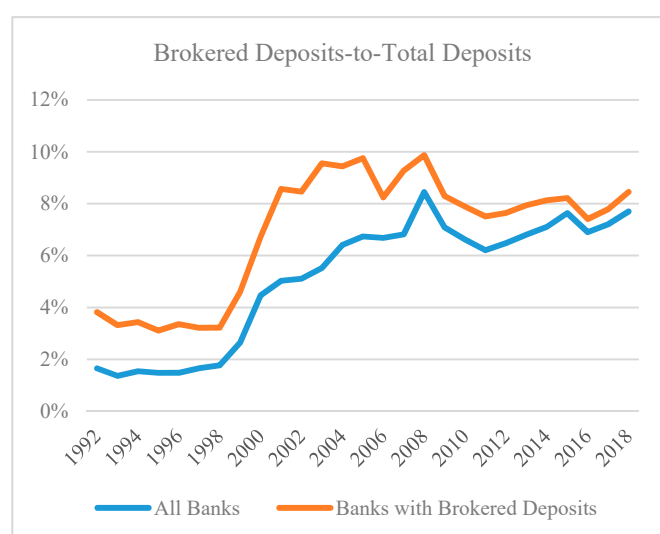


Figure 4. Cont.

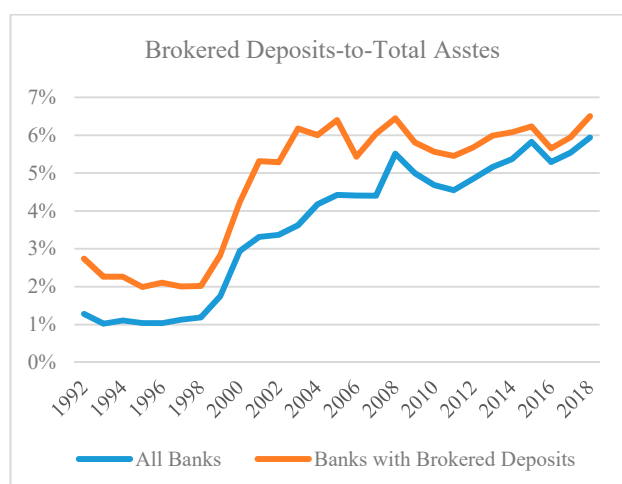


Figure 4. Brokered deposits-to-total deposits/brokered deposits-to-total assets. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

Figure 5 shows the concentration of brokered deposits within the banking industry. Specifically, it shows that when institutions are ranked by the amount of brokered deposits they hold, the top 100 banks hold 90% of all these deposits. Of course, as we count fewer banks, we see lower shares of total brokered deposits. However, even the top five banks still account for more than 40% of all such deposits. Of these five banks, Wells Fargo Bank leads the list, with \$126 billion, followed by TD Bank with \$99 billion; Bank of America with \$95 billion; Citibank with \$61 billion; and Goldman Sachs Bank with \$53 billion.

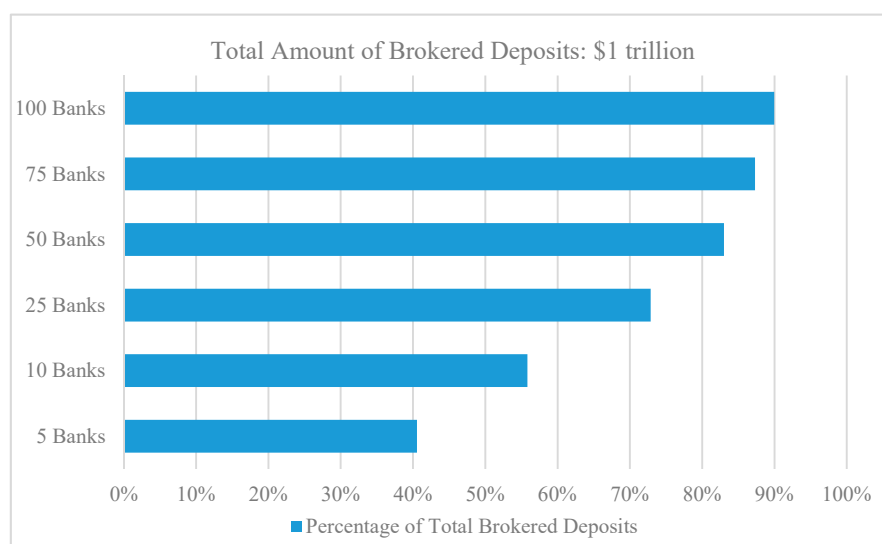


Figure 5. Concentration of brokered deposits among banks, 2018. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

The picture looks quite different when one ranks the banks by their ratio of brokered deposits-to-total deposits. Figure 6 shows the top ten banks, according to this ranking. The top four banks, Medallion Bank, TD Bank USA, E*TRADE Savings Bank, and LCA Bank Corporation have ratios over 99%. While even the bank ranked tenth, Comenity Capital Bank, has a relatively high ratio of 83%. Six of these banks are industrial loan companies (ILCs), with two of them being commercial

ILCs (BMW Bank of North America and Comenity Capital Bank) and the other four financial ILCs. One of these banks, TD Bank USA, also ranks among the top ten banks in terms of the actual amount of brokered deposits. It should be noted that brokered deposits reported on the bank call reports may in fact be mainly sweep deposits, although the latter are only covered by the primary purpose exception if swept to affiliate banks. Otherwise they are simply reported as brokered deposits.

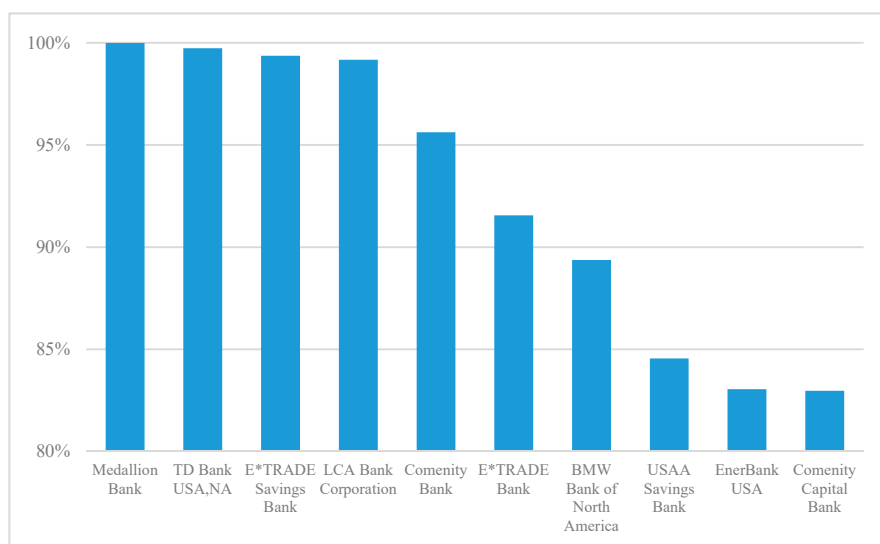


Figure 6. Top 10 banks by ratio of brokered deposits-to-total deposits. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

Things also look different when the banks are ranked in terms of the ratio of brokered deposits-to-total assets. As shown in Figure 7, four different banks make an appearance in this top-10 ranking. Moreover, the ratio of brokered deposits-to-total assets ranges from a high of 83% to a low of 66% in this figure. Here, four of the banks are ILCs (as compared to four in Figure 6), with one being a commercial ILC (EnerBank USA) and the other three financial ILCs.

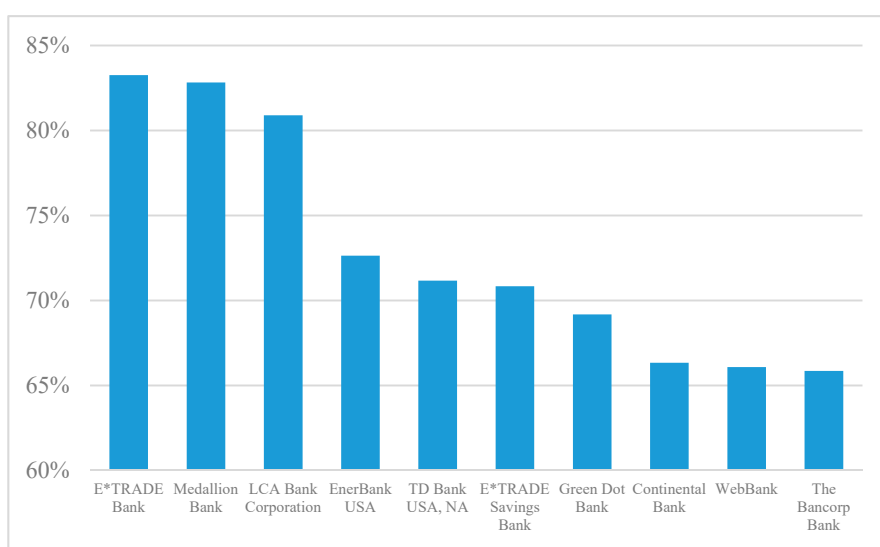


Figure 7. Top 10 banks by ratio of brokered deposits-to-total assets. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

It is also important that not all brokered deposits are fully insured. Figure 8 shows the ratio of fully insured brokered deposits to the total number of brokered deposits. The ratio is shown for all banks with brokered deposits, as well as for banks with brokered deposits and assets greater than \$50 billion. The former ratio declined from a high of 87% in 1994 to a low of 57% in 2005, before increasing to 84% in 2010. It stood at 82% in 2018. The ratios for the largest banks show the greatest declines in percentages, as well as the biggest rebounds.

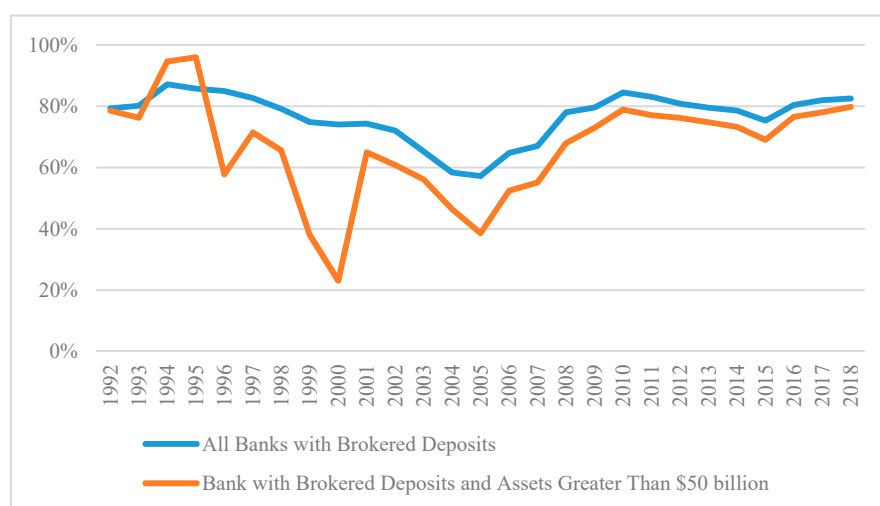


Figure 8. Ratio of fully insured brokered deposits-to-total brokered deposits. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

It is useful as well to look at some of the characteristics of banks relying fairly heavily on brokered deposits. Table 1 presents information on the top 100 banks, when ranked by the ratio of brokered deposits-to-total deposits. The ratios range from a high of 100% to a low of 26%. The table also provides information on the ratio of brokered deposits-to-total assets; the ratio of insured brokered deposits-to-total brokered deposits; the number of branches; the efficiency ratio (noninterest expense less amortization of intangible assets as a percentage of net interest income plus noninterest income)¹⁷; their capital-to-asset ratios; and those ILCs in the top 100 banks. The information is based on the averages and medians for the different categories of banks. As the table shows, the averages and medians indicate that the top 100 banks have significantly higher ratios of brokered deposits to both total deposits and total assets. The same group also has a slightly higher average ratio of insured brokered deposits-to-total deposits, relative to all banks with brokered deposits.

The top 100 banks generally have fewer branches than do all banks with brokered deposits, as well as all banks, especially if one does not consider TD Bank, which has 1251 branches. (As of 2018, there were 1042 banks without domestic branches.) The top 100 banks also have lower efficiency ratios and slightly higher capital ratios than all banks with brokered deposits, as well as all banks.

Sixteen ILCs (out of a total of 25 ILCs) are included in the top 100 banks.¹⁸ These banks rank higher on average (in terms of both arithmetic means and medians) than all the other categories of banks: they have higher ratios of brokered deposits-to-total deposits, brokered deposits-to-total assets, and insured brokered deposits-to-total brokered deposits. They also on average have fewer branches, lower efficiency ratios (indicating greater efficiency), and higher capital ratios than the other banks.¹⁹

¹⁷ This ratio measures the proportion of net operating revenues that are absorbed by overhead expenses, so that a lower value indicates greater efficiency.

¹⁸ As of the 2018, 21 ILCs account for 6% of all brokered deposits, while four had no brokered deposits.

¹⁹ For more detailed information on ILCs, see (Barth et al. 2011, 2012; Barth and Sun 2017).

Table 1. Information on Top 100 banks with the highest ratio of brokered deposits-to-total deposits.

	BD/TD (%)	BD/TA (%)	IBD/BD (%)	Number of Branches	Efficiency Ratio (%)	Capital Ratio (%)
Average of the top 100 banks	45.7	34.5	86.8	15	61.7	13.4
Median of the top 100 banks	37.7	29.0	100.0	1	60.2	11.4
Average of ILCs (16)	66.6	46.4	92.9	1	47.9	19.3
Median of ILCs (16)	73.8	46.9	100.0	0	45.1	16.5
Average of banks with brokered deposits (2228)	7.8	6.2	81.4	30	64.4	11.3
Median of banks with brokered deposits (2228)	4.8	3.9	100.0	4	64.7	10.8
Average of all banks (5415)	3.2	2.6	33.5	16	67.9	12.3
Median of all banks (5415)	0.0	0.0	0.0	3	67.0	11.0

Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

6. Impact of Brokered Deposits on Bank Performance, Failures and Failure Costs

6.1. Some General Observations

Given the concern of the bank regulatory authorities since the early 1980s with regard to brokered deposits, it is important to consider the impacts of such deposits on bank performance, failures, and failure costs. To begin, we use data for the top 100 banks (by ratio of brokered deposits-to-total deposits) from Table 1 to examine some fairly simple and suggestive relationships among variables. In particular, we examine the relationship between the ratio of brokered deposits-to-total deposits and: (1) the number of branches a bank operates; (2) a bank's efficiency ratio; and (3) its capital-to-asset ratio.

Figure 9 shows a significantly negative relationship between the number of branches and the ratio of brokered deposits-to-total deposits. Banks, of course, can secure deposits through branches or brokers, or some combination of the two sources of funds; and they will incur either the costs of operating their branches or the fees of acquiring brokered deposits, or both costs if they are securing funds from both sources. It is important to acknowledge that the business models of some banks make it less costly to rely on brokers than to operate a network of branches. This may help explain the finding that the higher a bank's brokered deposits ratio, the fewer branches it operates.

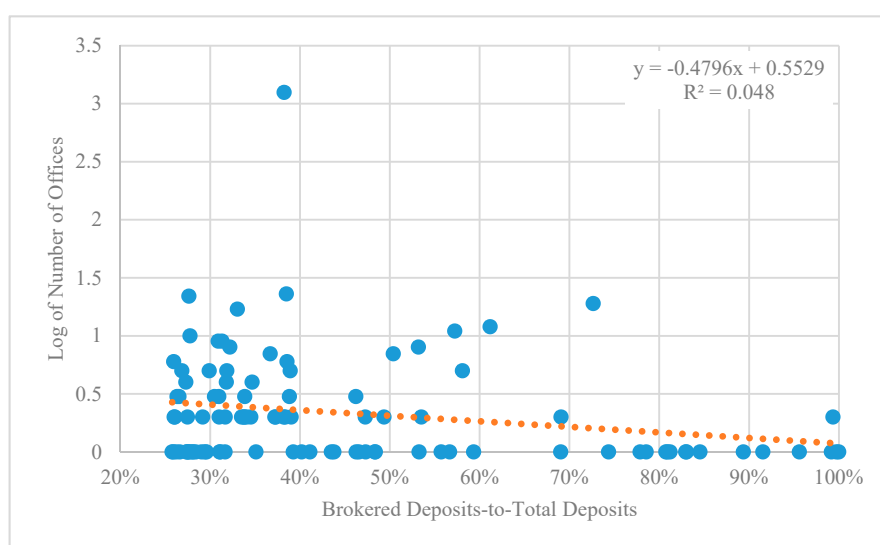


Figure 9. Number of branches vs. ratio of brokered deposits-to-total deposits. Note. The relationship is statistically significant at the 1% level. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

Figure 10 looks at the relationship between a bank's efficiency ratio and its ratio of brokered deposits-to-total deposits, and shows a significantly negative relationship between the two, consistent with a view that banks with higher brokered deposit ratios operate more efficiently than those with lower ratios. This finding is consistent with the previous finding insofar as banks with fewer branches are most likely to incur lower non-interest expenses.

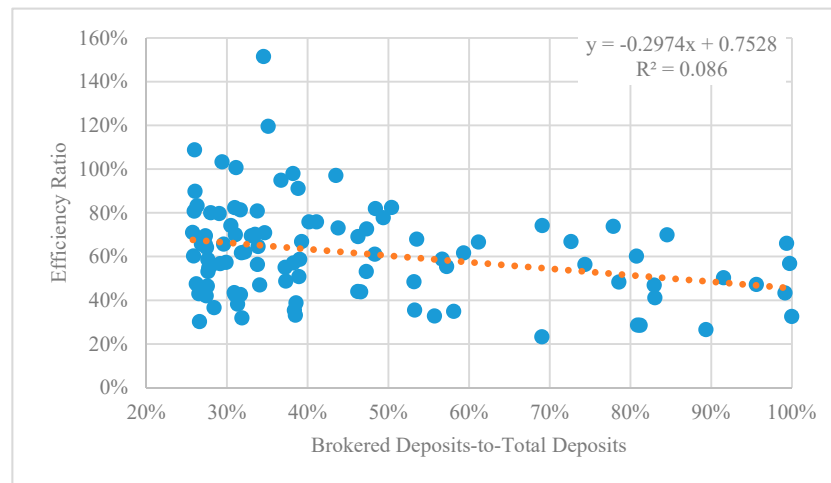


Figure 10. Efficiency ratio vs. ratio of brokered deposits-to-total deposits. Note. The relationship is statistically significant at the 1% level. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

Figure 11 examines the relationship between a bank's capital-to-asset ratio and its ratio of brokered deposits-to-total deposits. It shows a significantly positive relationship, indicating that the higher is the brokered deposits ratio, the higher is the capital asset ratio. This finding, coupled with the previous two findings, suggests that on average that greater use of brokered deposits is associated with higher capital ratios and better efficiency ratios for the top 100 banks.

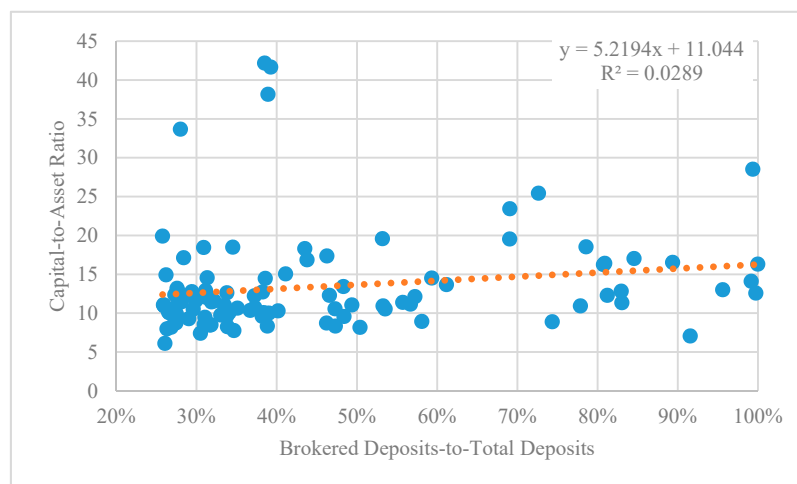


Figure 11. Capital-to-asset ratio vs. ratio of brokered deposits-to-total deposits. Note. The relationship is statistically significant at the 5% level. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

These findings also indicate that brokered deposits may be an important source of funds for some banks, depending on their business models, and do not pose the types of problems of concern to regulators. Indeed, brokered deposits may enable some banks to operate more safely and soundly.

However, it is important to consider more rigorous studies of the impacts of brokered deposits on bank performance, bank failures, and bank failure costs, which we do next.

Before we examine the impacts of brokered deposits on bank performance, bank failures, and bank failure costs, it is important to clarify that banks hold two types of deposits: brokered deposits and core deposits. Through 2010 (when the definition underwent a change; we address this shortly), the Federal Financial Institutions Examination Council (FFIEC) included as “core accounts” all demand and savings deposits, including money market deposits, NOW, and ATS accounts, other savings deposits, and time deposits in amounts under \$100,000 (FDIC 2011, p. 115).²⁰

Regulatory authorities do not, of course, treat core deposits and brokered deposits equally; they have historically perceived, and categorized, core deposits as stable, less costly funds obtained from local customers who maintain relationships with the institution. Meanwhile, they perceive brokered deposits to be volatile because they draw customers more broadly, mainly in search of yield.

However, this view is not necessarily supported if one looks at the characteristics of both types of deposits. Core deposits typically have few or no restrictions on early withdrawals—which makes the banks more vulnerable to “runs” during periods of uncertainty. Brokered deposits, on the other hand, do not permit early withdrawals unless the depositor dies or is declared incompetent by a court of law, making it impossible for these depositors to flee. However, even considering these factors, the volatility of any deposits should depend ultimately on whether the bank itself is well capitalized and whether the rates it offers on its various deposits are competitive in the marketplace.

Despite these historical perceptions of stability versus volatility, the FDIC nonetheless stated in 2011 that “examiners do not necessarily view the presence of any certain source of funding as inherently bad,” and adds that “there should be no particular stigma attached to the acceptance of brokered deposits per se and the proper use of such deposits should not be discouraged” (FDIC 2011, p. 32). However, brokered deposits are certainly not treated as core deposits. Worse, this treatment is not justified by any consensus based upon a thorough quantitative analysis.

Figure 12 looks at core and brokered deposits in terms of their relative roles in funding, respectively, total deposits and bank assets. Looking first at core deposits, we see that they constitute a significantly larger portion of total deposits than they do of total assets. Over the period 1992–2018, core deposits ranged from 67% to 83% of total deposits. The percentage declined over the first half of the period to its lowest value of 67% in 2006, and then increased during the second half to end at 78% in 2018. The pattern is similar when we examine the role of core deposits in funding total assets, but they are on average 22% lower. This means that all non-core sources of funds, and not just brokered deposits, are quite important in supporting the assets of banks.

Turning to brokered deposits, Figure 12 shows that their percentage of both total deposits and total assets generally increased over the period, beginning in 1992 with values of 2% and 1%, respectively, and ending in 2018 with values of 8% and 6%. Of note, the core deposit ratio generally decreased leading up to and during the financial crisis, while the brokered deposit ratio generally increased over the same period, as many banks turned to not only brokered deposits but non-deposit liabilities as sources of funds. However, toward the end of the period, the brokered deposit ratios were tending to level off, even as the core deposit ratios were still increasing.

Since non-core sources of funds constitute a relatively significant portion of total assets, a comparison of these funds with brokered deposits is helpful. Figure 13 shows the percentage of total assets funded by core deposits, insured brokered deposits, non-insured brokered deposits, and equity capital and other liabilities. The figure shows that brokered deposits, including both insured and non-insured deposits, fund a relatively small portion of total assets, as noted in Figure 12.

²⁰ It should also be noted that core deposits are not defined by any particular law, but are instead defined in the user guide for the Uniform Bank Performance Report (“UBPR”). See: <https://cdr.ffiec.gov/Public/DownloadUBPRUserGuide.aspx>.

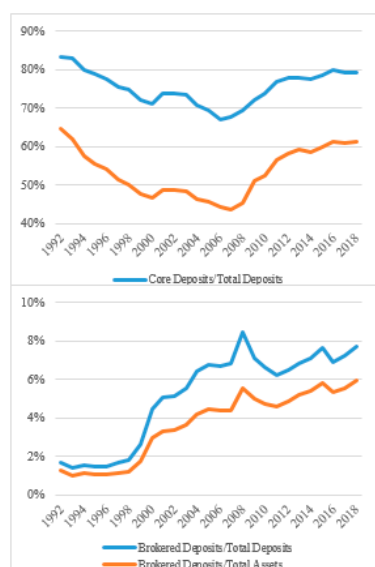


Figure 12. Core deposits and brokered deposits: Ratios to total assets and total deposits. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

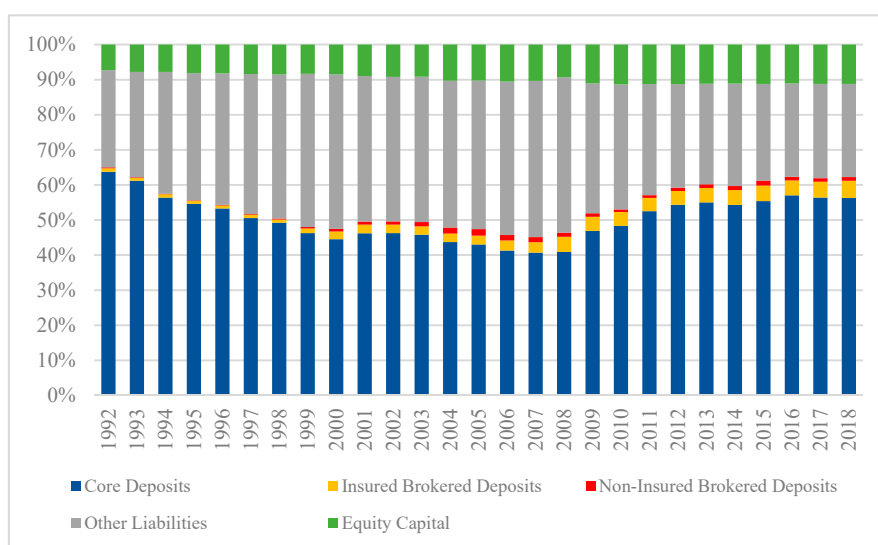


Figure 13. Composition of funding sources for total assets of all banks. Note: Through 2010, core deposits include insured brokered deposits, which means deposits under \$100,000. In 2011 and thereafter, core deposits exclude brokered deposits under \$250,000. Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

Of interest here, insured brokered deposits were included in core deposits through 2010. However, on 31 March 2011, a new definition of core deposits included time deposits up to \$250,000, but excluded brokered deposits under \$250,000. At the time, those insured brokered deposits accounted for 81% of total brokered deposits. The FDIC study behind the decision cites a number of research papers on core and brokered deposits, but it did not rely on comparable data or variables, making the reason for the change, and the evidence supporting it, unclear (FDIC 2011). In the study, some of the research papers cited that find core deposits to be beneficial include insured brokered deposits in core deposits. Other cited papers do not distinguish between insured and non-insured brokered deposits. In addition, the study states that one deposit characteristic that can contribute to potential problems is being uninsured. Furthermore, it does not appear from the empirical work that insured and non-insured

brokered deposits are included as separate variables, or that the regressions separately control for all non-core deposit variables.

6.2. Some Research Studies

Over the years, of course, many studies have focused on the causes of bank failures, the costs of resolving bank failures, and bank instability. Here, we examine and review a number of these studies to see if there is any consensus in the role brokered deposits play in bank performance, bank failures, and bank failure costs, and why. It seems appropriate to focus first on two studies undertaken by bank regulatory authorities themselves. The first, by the FDIC in 2011, is titled “Study on Core Deposits and Brokered Deposits” (FDIC 2011), while the second was released the same year by the Office of Inspector General (OIG) of the Board of Governors of the Federal Reserve System and titled “Summary Analysis of Failed Bank Reviews” (Office of Inspector General 2011).

The FDIC study identifies three of the most important potential problems deposits can pose. The first, referred to as “rapid, risky growth,” occurs if a bank acquires deposits too easily and thus has more funds than it can prudently invest (e.g., if a bank pays a higher rate on its deposits than it earns on its loans, it will ultimately fail). The second, “deposit volatility,” is the greater likelihood that a depositor will withdraw funds for higher rates elsewhere when the bank is under stress, resulting in the greater risk that the bank will encounter liquidity problems. It should be noted that the FDIC stated that “[t]he net effect of brokered deposits on liquidity is, therefore, uncertain and variable for different types of institutions and in different regions” (see US Department of the Treasury 1991, pp. IV–8). The third problem, “lower franchise value,” occurs when potential buyers of failed banks find that some kinds of deposits—those with low relative costs, those that offer a continuing customer relationship, and those likely to remain at the bank after acquisition—more attractive than others and demand discounts on the “more volatile” brokered deposits.

The FDIC relies on five factors to determine whether brokered deposits create any or all of these three potential problems: (1) deposit accounts that pay high interest rates (which are likely to exhibit all three of the problems)²¹; (2) many forms of brokered deposits (which can be acquired quickly and in bulk); (3) deposits that are not based on a customer relationship (which again are likely to present all three problems)²²; (4) uninsured deposits (which can exacerbate liquidity problems at a weakened bank); and (5) the duration of a deposit (which can present or mitigate the problem of a deposit leaving a bank for higher rates or when the bank is under stress).²³

Based on these five characteristics, the FDIC concludes that reciprocal deposits should be considered brokered deposits. Sweep deposits from affiliates fall within the purview of the primary purpose exception and therefore should not be considered as brokered deposits, although sweep deposits from non-affiliates should be considered as brokered deposits. Referrals of deposits from affiliates and their agents should be considered as brokered deposits. Listing service deposits have not yet been identified as a potential problem on account of insufficient data.

However, all high-rate deposits pose a problem. Furthermore, the FDIC recommends that Congress not amend or repeal the brokered deposit statute, since “increasing levels of brokered deposits are correlated with a higher probability of failure and higher losses to the FDIC in the event of failure ... [and] ... increasing levels of brokered deposits are associated with lower core deposit ratios,

²¹ The FDIC admits that “defining a ‘high rate,’ however, is not simple and is hampered by a lack of data.” In addition, the FDIC states that it “is exploring the possibility of gathering additional data with which to conduct a statistical analysis to determine the best definition of a high rate deposit.” We are unaware of whether this has been done as of the date of this paper.

²² Defining a “relationship,” according to the FDIC, is also not simple, and its study does not attempt to define it. In addition, the FDIC states that “... additional analysis is needed to determine the proper definition of a relationship”. We are unaware of whether this has been done as of the date of this paper.

²³ It should be noted once again that brokered CDs only terminate early upon on death or incapacity of the depositor.

more rapid growth, and riskier underwriting standards, each of which is correlated with a higher probability of failure” (FDIC 2011, p. 59).

Furthermore, the FDIC provided an analysis that included banks and thrifts that failed between 1 January 1988, and 8 April 2011. It found a strong, statistically significant link between the use of brokered deposits and asset growth rates, as well as with higher future rates of noncurrent and nonperforming loans. It also found that bank average growth rates are higher the larger the share of bank assets funded with brokered deposits, but it acknowledged that the relationship is likely to be the result of a complex series of choices made by bank management that drive both a bank’s growth rate and its use of brokered deposits. This means that “[t]he underlying structural choice models are undoubtedly much more complex than the models estimated in this analysis” (FDIC 2011, p. 82). It should be noted that the asset growth rate is not included in all the regression models, nor is it interacted with brokered deposits, and in some cases the statistical significances of brokered deposits are mixed.

Of significance, the FDIC study lacks consistency in its findings. In some cases, there is a statistically positive relationship, showing that brokered deposits increase the probability of a bank failure; in others there is no statistically positive relationship. The results are therefore mixed, and their use to support a differential regulatory treatment of brokered deposits is questionable.

Perhaps even more important, while the study provides some information about correlations, it provides no information about causation as it relates to the impact of brokered deposits on bank performance, bank failures, and bank failure costs. This is a major weakness and must be addressed because causation may in fact not derive from brokered deposits, but from the opposite direction—in that troubled institutions can turn to these deposits late in the game and as a last-ditch effort to grow out of their problems by investing the funds in excessively risky assets. When they then fail, it might seem reasonable on the surface to point to brokered deposits as the cause, but that would be an error. The real underlying cause would be that these troubled institutions were allowed to take in more funds and invest them in the risky assets, whether the sources of those funds were brokered deposits or some other sources, including high-rate non-brokered deposits. The FDIC study leaves this question unanswered.

Another flaw of the study is that it provides no direct information about the relationship between brokered deposits and the terrible trio of problems: “rapid, risky growth,” “deposit volatility,” and “lower franchise value.” Even more confusing, a few years after the study was released, the FDIC stated that “[b]rokered deposits can be a suitable funding source when properly managed as part of an overall, prudent funding strategy. However, some banks have used brokered deposits to fund unsound or rapid expansion of loan and investment portfolios, which has contributed to weakened financial and liquidity positions over successive economic cycles. The overuse of brokered deposits and the improper management of brokered deposits by problem institutions have contributed to bank failures and losses to the Deposit Insurance Fund” (FDIC 2016b).

In other words, the problem again is not brokered deposits *per se*, but troubled institutions and their attempts to fund unsound or rapid expansion of loans and investments, as well as their overuse of brokered deposits. It would seem to follow naturally that regulations (regulators) should, therefore, be directed (focused) on these factors, rather than on brokered deposits. After all, other sources of funding can contribute to unsound or rapid expansion of excessively risky loans and investments.

The 2011 OIG study examines selected failed state member banks for the period December 2008–February 2011. It cites four common elements in the failures of the 20 institutions that displayed “unusual circumstances,” namely: (1) management making poor decisions as they pursued aggressive growth objectives and made strategic choices; (2) rapid loan portfolio growth that exceeded the bank’s risk management capabilities and/or internal controls; (3) asset concentrations that were tied to commercial real estate (CRE) or construction, land, and land development (CLD) loans, thus increasing the bank’s vulnerability to changes in the marketplace and compounding the risks inherent in

individual loans; and (4) management failure to raise sufficient capital to cushion mounting losses (Office of Inspector General 2011, p. 8).

The OIG also stated that “[i]n . . . supplemental research and analysis comparing failed banks to those that withstood the financial crisis, we found that lower commercial real estate and CLD concentration levels, strong capital positions, and minimal dependence on non-core funding were key differentiating characteristics. Our research also revealed a correlation between high CLD concentration levels and the likelihood of failure during the recent financial crisis” (Office of Inspector General 2011, p. 2).

This seems to suggest that the OIG did not consider brokered deposits to be an important factor in the bank failures. Indeed, even when mentioning non-core funding as a factor, the OIG wrote that “[f]unding . . . can be very sensitive to changes in interest rates, . . . [which includes] brokered deposits, certificates of deposit greater than \$100,000, federal funds purchased, and borrowed money” (Office of Inspector General 2011, p. 52). In short, brokered deposits, which accounted for only 10% of non-core funding during the period of bank failures studied by the OIG, played a minor role, if any. The obvious question again is: Why treat brokered deposits differently than other non-core funding?

Several other studies have also considered the role of brokered deposits in bank failures, failure costs, and banking instability. Rather than discuss each in detail, we summarize the more important findings of empirical studies in Table 2. Of the studies, nineteen focus on the relationship between brokered deposits and the likelihood of bank failure, while the other four studies focus on whether brokered deposits increase bank failure costs.

Table 2. Summary of studies of bank failures and failure costs.

Do Brokered Deposits Increase the Likelihood of Bank Failure? (19)		
Yes—8	Mixed—6	No—5
1. Bologna (2011)	1. Berger et al. (2016)	1. Barth and Dan Brumbaugh (1994)
2. Bouvatier et al. (2014)	2. Cole and White (2012)	2. Barth et al. (1990)
3. Fissel et al. (2017)	3. FDIC (2011)	3. Barth et al. (1986)
4. Gallemore (2019)	4. Li and Shaffer (2015)	4. Rossi (2010)
5. Goenner (2019)	5. Lu and Whidbee (2013)	5. Wu (2018)
6. Hong and Wu (2013)	6. Sun et al. (2018)	
7. Ozdemir and Altinoz (2018)		
8. Wang and Cox (2013)		
Do Brokered Deposits Increase Bank Failure Costs? (4)		
Yes—0	Mixed—2	No—2
N/A	1. Schaeck (2008)	1. Barth et al. (1990) (BDs decrease failure cost)
	2. FDIC (2011)	2. Barth et al. (1986)

Of the nineteen studies that examine the relationship between brokered deposits and the likelihood of a bank failure, eight find a significantly positive relationship between brokered deposits and bank failures, five find no such relationship, and six find mixed results. In the case of the remaining four empirical studies that examine the relationship between brokered deposits and bank failure costs, two find no relationship between these two variables, while one study actually finds that an increase in brokered deposits is associated with a decrease in bank failure costs. Two find mixed results in that some relationships were significantly positive, while others were not significant.

Interestingly, a study finds in one case that core deposits were statistically and positively related to the cost of resolving failed banks, while in another case that such deposits were not significantly related to the failure costs of banks (FDIC 2011, p. 104). This is a study by the FDIC.

The bottom line here is that most of the empirical studies, those focusing on either bank failures or bank failure costs, do not provide justification for the current regulatory treatment of brokered deposits. In this regard, the Department of the Treasury in its report titled “Modernizing the Financial System: Recommendations for Safer, More Competitive Banks,” stated that “studies of depository

institution failures have not found a consistent, statistically significant relationship between brokered deposits and either the probability or cost of failure” (US Department of the Treasury 1991, pp. IV–4).

Most important, the studies do not consider different types of brokered deposits or control for all non-core sources of funding used by banks in the empirical work. They also do not generally take into account the underwriting standards used when loans are made or the extent of fraud involved in bank failures, among other limitations.

Moreover, none of the studies provide direct evidence that brokered deposits are a causal factor with respect to bank failures, failure costs, or banking instability. For example, the FDIC study states that “[b]rokered deposits are correlated with behaviors that increase the risk of failure” (FDIC 2011, p. 47). However, the correlations that do emerge are totally consistent with the view of Rossi (2010, p. 22), who states that “a picture emerges supporting the view that brokered deposits do not drive asset growth, risk-taking or insolvency. . . . Instead, it was shown that greater risk-taking could promote increased usage of brokered deposits when faced with a constraint on retail deposits.”

The bottom line, more generally, may be best found in statements made by the FDIC in an older but timely study titled “Deposit Insurance for the Nineties: Meeting the Challenge.”

According to the study, proposals regarding limits on brokered deposits “ignore FDIC examination experience, which suggests that supervision can, in general, effectively discriminate between sound and unsound use of brokered funds. . . . Moreover, recently proposed changes in reporting requirements should enhance examiners’ ability to detect brokered-deposit abuses early. Supervisors will get clear signals that closer scrutiny is warranted. These signals take the form of increases in offering rates and the growth of brokered-funds purchased. Once in the bank, supervisors can evaluate the quality of lending in the usual manner. This indicates that brokerage of funds is not a special problem, but part of the more general incentive problem in deposit insurance” (FDIC 1989, pp. 95–96).

7. Perspectives on Brokered Deposits in a More Technologically-Oriented Financial Marketplace

As stated above, brokered deposits came into use as a natural consequence of a more technologically oriented financial marketplace. In this regard, it is worth quoting extensively from an article by Caroline Harless, published in the Federal Reserve Bank of Atlanta’s Economic Review. The article was published in March 1984, but most of it seems as relevant today as it did then. According to her, CD brokers act as conduits among financial institutions, by playing and continuing to play an important role in our economy. Their services have benefited not only the banking system but the individual consumer as well. Brokered deposits: (1) provide national sources of funding, an alternative for many sound and stable small, medium-sized, and regional banks; (2) facilitate the transfer of excess savings from savings-rich areas to areas short of funds to meet credit needs of individuals and businesses; (3) provide banks greater flexibility in managing funds by allowing them to match more closely the maturities of assets with those of liabilities; (4) provide a quicker, more efficient, and often cheaper source of funding for banks than they can obtain within the local market; and (5) increase the investment alternatives available for the institutional investor and for the small investor. This certainly seems as appropriate an assessment today as when it was made, with respect to the positive role brokered deposits can play in a modern financial marketplace.

The FDIC has also identified some potential benefits of brokered deposits. First, they may reduce the cost of inter-regional flows of funds, thereby reducing regional interest rate differentials and allocating funds to areas where they can be more profitably invested. Second, they may provide an important source of funding at lower costs than uninsured alternatives. Third, a bank may find it less expensive to pay higher interest rates on a specific set of funds raised through a brokered deposit program, while maintaining stable rates on other types of deposits, than to try to attract funds by increasing the rates on a broad range of accounts. Fourth, if brokered deposits can substitute for more expensive, uninsured funds, this could reduce operating losses in periods prior to closure, thus reducing the magnitude of insolvency when a failure was resolved. Fifth, brokered deposits can enhance liquidity when other sources of funds are not available, and may reduce interest rate risk

when brokered deposits are a source of longer-term funds than would be available in local market (US Department of the Treasury 1991, pp. IV-6–IV-8).

Given that some of these benefits are couched in terms of interest rates, it is useful to compare the actual rates paid on alternative sources of funds available to banks. Table 3 provides information on rates paid on selected bank deposit accounts and FHLB advances as of 28 April 2019. As shown, the rates offered on CDs vary by term to maturity and are higher over longer terms. The rates offered on brokered CDs are always higher than the national average CD rate, but sometimes lower than the best rates offered by some banks. The rates offered on brokered CDs are generally fairly similar to those on FHLB advances.

Table 3. Rates on Selected Bank Deposit Accounts and FHLB Advances, April 28, 2019.

CD Term	National Rate Cap (%)	Rate on Brokered CDs (%) (Fidelity)	Rate on FHLB Advances (%) (Boston)	National Average CD Rate (%)	Best Bank CD Rate (%)	Bank Offering Best Rate
3 months	0.97	2.35	2.73	0.50	2.35	MINT National Bank
6 months	1.16	2.40	2.74	0.89	2.75	CD Bank (Online)
9 months	N.A.	2.35	2.60	N.A.	3.00	SpiritBank
1 year	1.40	2.40	2.61	1.38	3.00	CD Bank (Online)
2 years	1.59	2.45	2.64	1.67	3.20	CD Bank (Online)
3 years	1.73	2.55	2.63	1.86	3.33	Peoples Bank (LA)
5 years	2.00	2.75	2.70	2.25	4.00	Bank of Utica
Product Name	National Average Rate (%)		Best Rate (%)		Bank Offering Best Rate	
Money market	0.40		2.75		Heartland Bank (Ohio)	
Personal savings	0.28		2.50		Customers Bank (Pennsylvania)	
Standard checking	0.20		3.01		Hawthorn Bank (Missouri)	
Reward checking	1.75		5.01		Hometown Community Banks (Illinois)	

Sources: DepositAccounts, www.depositaccounts.com/cd/3-month-cd-rates.html; Fidelity, www.fidelity.com/fixed-income-bonds/cds; Federal Home Loan Bank of Boston, <http://www.fhlbboston.com/rates/historicalrates/index.jsp>, accessed on 28 April 2019; Note: CD Bank is the online division of TBK Bank, SSB, who has a brokered deposit to total asset ratio of 7.7%. SpiritBank has a brokered deposit to total asset ratio of 32%; Customers Bank, 14%; Peoples Bank (LA), 25%; MINT National Bank, 4.4%, Hawthorn Bank, 3%; and the remaining banks, all less than 1%.

Table 3 also shows that the rates offered on brokered CD are higher than the national average rates on core deposits, but that they are not always the best rates available. Once again, note that brokered deposits enable banks to avoid the costs associated with branch networks, as well as the costs of service centers associated with Internet banks. Brokered deposits can, therefore, offer higher rates due to these kinds of cost savings. Furthermore, brokered deposit CDs have evolved since the 1980s, when they had the whiff of “hot money.” They are now a relatively rational funding source, with rates that are typically no more than 50 basis points higher than the rates offered on US Treasury securities, depending on the term to maturity.²⁴

Despite these benefits, the FDIC still expresses concern over the use of brokered deposits by banks, and by ILCs in particular, stating that “for ... industrial loan companies ... brokered deposits made up virtually all of their domestic deposits” (FDIC 2011, pp. 116–17). There is an important reason for this, of course—ILCs are not permitted to offer either checking or savings accounts, i.e., the most

²⁴ See Harless (1984, p. 21) for a citation to “The Hot Money”. Harless (1984, p. 16) also points out that at the time CD money brokers charged a fee, “which generally ranges from 25 to 100 basis points (annualized) per CD.”

common types of core deposits. In addition to the concern over brokered deposits, the OIG has stated (as noted previously) that one of the common elements of the failure of 20 institutions it analyzed was “asset concentrations tied to commercial real estate (CRE) or construction, land, and land development (CLD) loans.”

In view of these statements, a closer look at the 25 ILCs operating in 2018 is in order, in terms of their use of brokered deposits and involvement in CRE and CLD loans. Table 4 provides this information for each ILC, showing its ratio of brokered deposits-to-total assets, then to total deposits, and finally its ratios of CRE and CLD loans to total assets. As seen in the table, the ratio of brokered deposits-to-total deposits ranges from a low of 0% up to 100%, while the range of brokered deposits-to-total assets ranges from 0% to 83%.

Table 4. Importance of branches, brokered deposits, CRE and CLD loans at ILCs, 2018.

Name	Type of ILC	Number of Branches	BD/TD (%)	BD/TA (%)	CRE/TA (%)	CLD/TA (%)
Medallion Bank	Financial	0	99.99	82.83	0.18	0.00
LCA Bank Corporation	Financial	0	99.17	80.90	0.00	0.00
BMW Bank of North America	Commercial	0	89.37	53.86	0.00	0.00
USAA Savings Bank	Financial	0	84.55	15.78	0.00	0.00
EnerBank USA	Commercial	0	83.05	72.64	0.00	0.00
Comenity Capital Bank	Financial	0	82.97	59.53	0.00	0.00
WebBank	Financial	0	80.90	66.08	0.07	0.00
Celtic Bank	Financial	0	78.57	62.18	31.07	4.47
Merrick Bank	Financial	0	69.05	54.79	0.00	0.00
WEX Bank	Financial	0	56.68	39.98	0.00	0.00
Sallie Mae Bank	Financial	0	53.27	38.72	0.00	0.00
Toyota Financial Savings Bank	Commercial	0	43.80	36.11	2.27	0.00
Rancho Santa Fe Thrift & Loan Association	Financial	0	39.27	22.63	0.00	0.00
American Express National Bank	Financial	1	39.03	24.72	0.00	0.00
Beal Bank USA	Financial	22	38.51	17.35	13.61	4.00
First Electronic Bank	Commercial	0	28.00	14.48	0.00	0.00
UBS Bank USA	Financial	0	12.08	10.63	0.06	0.00
Balboa Thrift and Loan Association	Financial	3	7.14	6.19	15.39	0.05
Minnesota First Credit and Savings, Incorporated	Financial	3	7.09	5.63	0.00	0.19
The Morris Plan Company of Terre Haute, Inc.	Financial	0	2.43	1.61	0.30	0.00
Optum Bank, Inc.	Financial	0	0.16	0.13	4.76	0.00
Community Commerce Bank	Financial	3	0.00	0.00	46.56	0.01
Eaglemark Savings Bank	Commercial	0	0.00	0.00	0.00	0.00
Finance Factors, Ltd.	Financial	12	0.00	0.00	9.04	5.81
The Pitney Bowes Bank, Inc.	Commercial	0	0.00	0.00	0.00	0.00

Source: Federal Deposit Insurance Corporation, Statistics on Depository institutions, https://www7.fdic.gov/sdi/download_large_list_outside.asp.

For two of the ILCs, the ratio of brokered deposits to total deposits is greater than 90%, while, for six of them, brokered deposits account for 4% or less of total deposits. For ratios of brokered deposits-to-total assets, the ratio is under 90% in all cases; it exceeds 50% in just eight of the ILCs. For six of them, the ratios of brokered deposits-to-total assets are 3% or less.

Turning to CRE loans, in the case of eighteen of the twenty-five ILCs, the ratio to total assets is less than 1%. For the other seven ILCs, the ratios range from a low of 2.27% to a high of 46.56%. For CLD loans, twenty-one of the ILCs have almost no such loans. The ratios for the other four range from a low of 0.19% to a high of 5.81%. Furthermore, of the twelve institutions that hold any CRE or CLD loans, five either have no brokered deposits or have ratios of brokered deposits to both total deposits and total assets of 4% or less.

In summary, Table 4 shows that not all ILCs have brokered deposits, and, of those that do, the concentrations of assets in CRE and CLD loans are generally not high. The table indicates that

misperceptions likely exist about both the extent to which ILCs use brokered deposits to fund assets and to fund “risky” CRE and CLD loans.²⁵

Finally, it is worth noting that nineteen of the twenty-five ILCs have no branches. Of the six remaining, one has a single branch, three have three branches, one has twelve, and the last one has twenty-two. In addition, some ILCs with no branches also have few or no brokered deposits. None of the commercial ILCs have branches.

The important point here is that ILCs operate under a variety of business models; it may be less costly for some to use brokered deposits than to operate a branch network. It would seem that they should not be subject to regulatory penalties when they base their decisions on rational assessments of alternative business models and the associated costs of funding them.

8. Conclusions

Banks have used brokered deposits for more than fifty years. From a relatively modest beginning, they have become an important source of funding, especially with the development of electronic transfer technologies now in use by nearly half the banking industry today. Despite these advancements, brokered deposits play a minuscule role relative to other bank funding sources in the aggregate. However, bank regulatory authorities remain concerned over their use, and have imposed tighter and costly restrictions on these deposits than all other bank deposits and, in fact, other purchased funds.

The justification for this is unclear when one looks at the empirical evidence and at numerous statements put out by the regulatory authorities themselves. However, the fact is, the restrictions put banks that rely on brokered deposits at a competitive disadvantage in the financial marketplace. Costly restrictions are also proving to put such banks at a disadvantage to a growing number of financial firms that operate in the so-called shadow banking sector.

It should be clear, based on the evidence presented throughout this report, that these restrictions are unwarranted. The various research studies offer no consensus that brokered deposits either increase the likelihood of bank failures or the costs of resolving them. In fact, even some of the regulatory authorities cite examples of their benefits, without providing any direct evidence that the costs they mention exceed those benefits.

More fundamentally, the overwhelming information indicates that brokered deposits per se are not the problem. The problem is the use of any funds obtained by troubled banks to acquire too risky assets in an attempt to grow their way out of their troubles. In other words, the regulatory focus is misplaced. The problem is not in the funding source itself, but in the troubled bank using its funding sources irresponsibly.

There is likewise no convincing empirical evidence to show that brokered deposits increase the cost to the FDIC when resolving bank failures. In fact, the stigma now associated with these deposits, rather than the deposits themselves, may increase resolution costs. Because bank regulatory authorities want to treat these deposits differently, they impose additional costs and scrutiny on the banks that use them, and on the agencies themselves. The regulatory authorities may in fact be responsible for lowering the franchise value of those banks because of the stigma they have attached to these deposits; potential acquirers of failed banks may demand that discounts be applied to brokered deposits.

It is time to break with the past and re-examine brokered deposits in light of empirical analysis and against the backdrop of rapidly evolving technologies. Indeed, based on our comprehensive review of the treatment of brokered deposits and the studies examining the impact of such deposits on bank performance, brokered deposits should be treated no differently from all other deposits and other purchased funds. This will provide banks greater flexibility in choosing the most appropriate and cost-effective source of funds with which to acquire various assets.

²⁵ For more information on the performance of the ILC industry, see (Barth and Sun 2017).

Funding: This research was funded by the Utah Center for Financial Services, University of Utah.

Acknowledgments: The authors are extremely grateful for the financial support provided by the Center for Innovation in Banking and Financial Services, University of Utah, and to helpful comments provided by George Sutton, Andrew Bauman, Kirk Weiler, Ron Ostler, Frank Pignanelli, Aimee McConkie, Paul Clark, and Allison Gladstone. Thanks are also due to Bijie Jia, Nguyen Nguyen, Jiayi Xu, and Wenjuan Guo for helpful assistance.

Conflicts of Interest: The authors declare no conflict of interest.

References

- Barth, James R., and R. Dan Brumbaugh Jr. 1994. Risk-Based Capital Requirements: Informational and Political Implications. In *Global Risk Based Capital Regulations: Capital Adequacy*. Edited by Charles A. Stone and Anne Zissu. New York: Irwin Professional Publishing, vol. 1, pp. 363–99.
- Barth, James R., R. Dan Brumbaugh, and Daniel Sauerhaft. 1986. *Failure Costs of Government-Regulated Financial Firms: The Case of Thrift Institutions*. Washington, DC: Federal Home Loan Bank Board, Office of Policy and Economic Research.
- Barth, James R., Philip F. Bartholomew, and Carol J. Labich. 1990. Moral Hazard and the Thrift Crisis: An Analysis of 1988 Resolution. Available online: <https://fraser.stlouisfed.org/files/docs/meltzer/barmor89.pdf> (accessed on 17 June 2020).
- Barth, James R., Tong Li, Apanard Angkinand, Yuan-Hsin Chiang, and Li Li. 2011. *Industrial Loan Companies: Supporting America's Financial System*. Santa Monica: Milken Institute, Available online: <https://assets1b.milkeninstitute.org/assets/Publication/ResearchReport/PDF/ILC.pdf> (accessed on 17 June 2020).
- Barth, James R., Tong Li, Apanard Angkinand, Yuan-Hsin Chiang, and Li Li. 2012. Industrial Loan Companies: Where Banking and Commerce Meet. *Financial Markets, Institutions & Instruments* 21: 1–69.
- Berger, Allen N., Björn Imbierowicz, and Christian Rauch. 2016. The Roles of Corporate Governance in Bank Failures during the Recent Financial Crisis. *Journal of Money, Credit and Banking* 48: 729–70. [CrossRef]
- Barth, James R., and Martin A. Regalia. 1988. The Evolving Role of Regulation in the Savings and Loan Industry. In *The Financial Services Revolution: Policy Directions for the Future*. Edited by Catherine England and Thomas Huertas. Boston: Kluwer Academic Publisher and Cato Institute, pp. 113–61.
- Barth, James R., and Yanfei Sun. 2017. *A New Look at the Contribution and Performance of Industrial Loan Companies to the US Banking System*. Salt Lake City: The Utah Center for Financial Services, University of Utah.
- Bologna, Pierluigi. 2011. *Is There a Role for Funding in Explaining Recent US Banks' Failures*. Washington, DC: International Monetary Fund.
- Bouvatier, Vincent, Michael Brei, and Xi Yang. 2014. *Bank Failures and the Source of Strength Doctrine*. Economix Working Paper. Nanterre: University of Paris Nanterre.
- Brady, Nicholas. 1989. Testimony before the Committee on Banking, Finance, and Urban Affairs. *Treasury News*. February 23. Available online: www.c-span.org/video/?26981-1/savings-loans-crisis (accessed on 17 June 2020).
- Clark, Paul T. 2012. Just Passing Through: A History and Critical Analysis of FDIC Insurance of Deposits Held by Brokers and Other Custodians. *Review of Banking & Financial Law* 32: 99–178.
- Cole, Rebel A., and Lawrence J. White. 2012. Déjà Vu All Over Again: The Causes of US Commercial Bank Failures This Time Around. *Journal of Financial Services Research* 42: 5–29. [CrossRef]
- Federal Deposit Insurance Corporation (FDIC). 1989. Deposit Insurance for the Nineties: Meeting the Challenge. Available online: <https://babel.hathitrust.org/cgi/pt?id=coo.31924072709946;view=1up;seq=7> (accessed on 17 June 2020).
- Federal Deposit Insurance Corporation (FDIC). 1997. History of the Eighties: Lessons for the Future. Vol. I. An Examination of the Banking Crises of the 1980s and Early 1990s. Available online: https://www.fdic.gov/bank/historical/history/87_136.pdf (accessed on 17 June 2020).
- Federal Deposit Insurance Corporation (FDIC). 1998. Managing the Crisis: The FDIC and RTC Experience 1980–1994. Available online: <https://babel.hathitrust.org/cgi/pt?id=mdp.39015043145542;view=1up;seq=541> (accessed on 17 June 2020).
- Federal Deposit Insurance Corporation (FDIC). 2005. Are Funds Held in 'Cash Management Accounts' Viewed as Brokered Deposits by the FDIC? FDIC Advisory Opinions. Available online: www.fdic.gov/regulations/laws/rules/4000-10350.html (accessed on 17 June 2020).

- Federal Deposit Insurance Corporation (FDIC). 2011. Study on Core Deposits and Brokered Deposits. Submitted to Congress pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act. Available online: www.fdic.gov/regulations/reform/coredeposit-study.pdf (accessed on 17 June 2020).
- Federal Deposit Insurance Corporation (FDIC). 2016a. FDIC Assessment Rates. Available online: www.fdic.gov/deposit/insurance/assessments/proposed.html (accessed on 17 June 2020).
- Federal Deposit Insurance Corporation (FDIC). 2016b. Guidance on Identifying, Accepting, and Reporting Brokered Deposits Frequently Asked Questions. Available online: www.fdic.gov/news/news/financial/2016/fil16042b.pdf (accessed on 17 June 2020).
- Federal Register. 1983. Brokered Deposits: Advance Notice of Proposed Rulemaking. Vol. 48. No. 212. Available online: <https://cdn.loc.gov/service/ll/fedreg/fr048/fr048212/fr048212.pdf> (accessed on 17 June 2020).
- Federal Register. 1984. Brokered Deposits; Limitations on Deposit Insurance. Vol. 49. No. 64. Available online: <https://cdn.loc.gov/service/ll/fedreg/fr049/fr049064/fr049064.pdf> (accessed on 17 June 2020).
- Federal Register. 1992. Unsafe and Unsound Banking Practices. Vol. 57. No. 109. Available online: <http://cdn.loc.gov/service/ll/fedreg/fr057/fr057109/fr057109.pdf> (accessed on 17 June 2020).
- Federal Register. 2009. Federal Register. 2009. Interest Rate Restrictions on Insured Depository Institutions That Are Not Well Capitalized. Vol. 74. No. 111. Available online: www.fdic.gov/regulations/laws/federal/2009/correction.pdf (accessed on 17 June 2020).
- Federal Register. 2019. Unsafe and Unsound Banking Practices: Brokered Deposits and Interest Rate Restrictions. Vol. 84. No. 25. Available online: <https://www.govinfo.gov/content/pkg/FR-2019-02-06/pdf/2018-28273.pdf> (accessed on 17 June 2020).
- Federal Home Loan Bank Board (FHLBB). 1985. *Key Issues in 1985*. Annual Report. Washington, DC: FHLB System Publication Corp.
- Fissel, Gary S., Gerald A. Hanweck, and Anthony B. Sanders. 2017. Residential House Prices, Commercial Real Estate and Bank Failures. Available online: <https://ssrn.com/abstract=2995113> (accessed on 17 June 2020).
- Gallemore, John. 2019. Bank Financial Reporting Opacity and Regulatory Intervention. Available online: <https://ssrn.com/abstract=2838541> (accessed on 17 June 2020).
- Goenner, Cullen F. 2019. Uncertain Times and Early Predictions of Bank Failure. *Financial Review*. [CrossRef]
- Goodman, Laurie S., and Sherrill Shaffer. 1984. The Economics of Deposit Insurance: A Critical Evaluation of Proposed Reforms. *Yale Journal on Regulation* 2: 145–62.
- Government Publishing Office. 2012. *Code of Federal Regulations*; 12 CFR Ch. III (1-1-12 Edition). Available online: www.gpo.gov/fdsys/pkg/CFR-2012-title12-vol5/pdf/CFR-2012-title12-vol5-sec327-8.pdf (accessed on 17 June 2020).
- Gray, Edwin J. 1984. *Revitalizing America's Savings Institutions*. Washington, DC: A Report of the Federal Home Loan Bank Board.
- Harless, Caroline T. 1984. Brokered Deposits: Issues and Alternatives. In *Economic Review*. Atlanta: Federal Reserve Bank of Atlanta, pp. 4–25. Available online: https://fraser.stlouisfed.org/files/docs/publications/frbatreview/pages/66677_1980-1984.pdf (accessed on 17 June 2020).
- Hong, Han, and Deming Wu. 2013. Systemic Funding Liquidity Risk and Bank Failures. Available online: <https://ssrn.com/abstract=2328421> (accessed on 17 June 2020).
- Li, Guo, and Sherrill Shaffer. 2015. Reciprocal brokered deposits, bank risk, and recent deposit insurance policy. *The North American Journal of Economics and Finance* 33: 366–84. [CrossRef]
- Lu, Wenling, and David A. Whidbee. 2013. Bank Structure and Failure during the Financial Crisis. *Journal of Financial Economic Policy* 5: 281–99. [CrossRef]
- Office of Inspector General. 2011. *Summary Analysis of Failed Bank Reviews*; Washington, DC: Board of Governors of the Federal Reserve System. Available online: https://oig.federalreserve.gov/reports/Cross_Cutting_Final_Report_9-30-11.pdf (accessed on 17 June 2020).
- Ozdemir, Nilufer, and Cuneyt Altinoz. 2018. Do internal markets influence bank failures? *Applied Economics Letters* 25: 567–70. [CrossRef]
- Rossi, Clifford V. 2010. Decomposing the Impact of Brokered Deposits on Bank Failure: Theory and Practice. Available online: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.478.7459&rep=rep1&type=pdf> (accessed on 17 June 2020).
- Schaeck, Klaus. 2008. Bank Liability Structure, FDIC Loss, and Time to Failure: A Quantile Regression Approach. *Journal of Financial Services Research* 33: 163–79. [CrossRef]

- Sun, Junjie, Deming Wu, and Xinlei Zhao. 2018. Systematic risk factors and bank failures. *Journal of Economics and Business* 98: 1–18. [CrossRef]
- US Congress. 1989. H.R. 1278. Financial Institutions Reform, Recovery, and Enforcement Act of 1989. Available online: www.congress.gov/bill/101st-congress/house-bill/1278/text (accessed on 17 June 2020).
- US Congress. 1991. S.543. Federal Deposit Insurance Corporation Improvement Act of 1991. Congress.gov. Available online: www.congress.gov/bill/102nd-congress/senate-bill/543/text (accessed on 17 June 2020).
- US Department of the Treasury. 1991. *Modernizing the Financial System: Recommendations for Safer, More Competitive Banks*. Washington, DC: U.S. Government Printing Office.
- Wang, Grace W. Y., and Raymond A. K. Cox. 2013. Risk Taking by US Banks Led to Their Failures. *International Journal of Financial Services Management* 6: 39–59. [CrossRef]
- Wu, Deming. 2018. Systemic Risk and Bank Failure. Available online: <https://ssrn.com/abstract=2492883> (accessed on 17 June 2020).



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).