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Executive Summary

The idea of banks too big to fail (TBTF) is not new. Neither is the challenge that such firms pose for policymakers, who have spent the past century at least enacting legislation and creating agencies to oversee banking systems.

It has been three decades since the Federal Deposit Insurance Corporation (FDIC) made its first TBTF bailout, in 1980, after concluding that a shuttered First Pennsylvania Bank, the nation's 23rd-largest bank at the time, would have serious and widespread financial repercussions. Since the 1980s, of course, big banks have grown much bigger. Citicorp, for example, the largest U.S. bank holding company (BHC) in 1983, has seen its assets grow 1,387 percent, to $1,874 billion (as of Q4 2011) and financial systems have become increasingly complex, both in the United States and elsewhere.

As a result, the definition of TBTF has undergone some refinement of its own through the years. While regulators initially considered asset size only, more recent definitions take into account additional factors, such as complexity and systemic interconnectedness.

Yet during those same three decades and despite the potential for big-bank failure, policymakers failed to implement any regulatory measures that would allow deeply troubled big banks to fail. There was always the fear that unless such banks were bailed out, there would be further bank runs, potential disruptions in the payments system, a tightening of credit, and shockwaves across the broader economy.

During the financial crisis of 2007–2009, U.S. policymakers (and their counterparts worldwide) again took extraordinary measures to prevent the collapse of large financial institutions. When Congress authorized the Troubled Asset Relief Program (TARP) in October 2008, authorizing up to $700 billion to purchase distressed assets, it was generally expected that those purchases would consist of mortgage-backed securities. But TARP was used instead mostly to make capital injections into banks/large bank holding companies, and other firms; in fact, 89 percent of TARP's capital purchase program funds went to 32 big banks, while the other 11 percent went to the 675 smaller institutions, drawing substantial attention from an angry public on the TBTF issue.

The Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank), which became law in July 2010, was the government's effort at long last to resolve the TBTF problem for banks. The law contained a provision to allow big banks or bank holding companies with $50 billion or more in assets to fail without leading to severe negative spillovers among other firms. Moreover, under the law, large financial institutions face new regulatory burdens, additional capital charges, and stringent requirements for capital and liquidity that raise the cost of being big. And this is on top of the recent move by the FDIC to charge insurance premiums on banks' non-deposit liabilities other than capital.

More recently, on a global level, the G-20 members and the Financial Stability Board in November 2011 identified an initial group of 29 banks as systemically important financial institutions, to be subjected to more stringent prudential standards. At the same time, the Basel Committee on Banking Supervision set forth an additional capital requirement for global systemically important banks. Some of the regulatory reforms remain works in progress, including the actual implementation of Dodd–Frank and the Basel III standards. Still more measures, such as efforts toward international coordination of the bankruptcy of multinational banks, also remain to be implemented.

The future of TBTF remains unclear, but it is likely that it will be different from the past. These changes promise to redefine the playing field for the large, interconnected financial companies. They will bring both costs and benefits. Higher capital and liquidity requirements, for example, will affect lending activity and thus the overall economy, but the quantitative impacts are much debated and remain to be seen. The new resolution authority under Dodd-Frank is likely to have an impact on creditor behavior and thus on funding costs, but it remains unclear how great this effect will be, and how and whether the law can be implemented with respect to banks that operate globally.

To get an idea of just how big the big banks are, two measures are used: asset size and asset size as a percentage of U.S. GDP; then on the global level, asset size and asset size per world GDP. In the U.S. analysis, the top five bank holding companies account for slightly over half of all U.S. bank holding company assets, while the 50 largest BHCs account for 89 percent of total assets. The biggest BHC, JPMorgan Chase, has $2.3 trillion in assets; by comparison, the world's largest publicly traded bank is Deutsche Bank, with $3 trillion of assets. As one adds the assets of more BHCs, the cumulative total relative to GDP reaches 98 percent for the 50 biggest U.S. companies. The assets of just the 10 biggest companies equal 75 percent of GDP. It could only take trouble at a few large financial companies to sharply curtail available credit and disrupt real economic activity. A catastrophic scenario would be one in which difficulty at key banks disrupts the payments system that constitutes the central nervous system of the U.S. economy.

Worldwide, based on asset size, the five biggest banks accounted for 14 percent of total bank assets in Q4 2011. The 50 biggest banks or BHCs accounted for nearly 70 percent of total bank assets. The banks are headquartered in 16 countries that account for 71 percent of world GDP. The assets of these 50 big banks were nearly equal to world GDP in the Q4 2011. Furthermore, seven of these banks have assets that exceed 100 percent of the GDP of their home countries. These are indeed big banks. But will the reforms being undertaken help or hinder the TBTF problem?

Broadly speaking, the measures taken since 2008—including the Basel III regulatory reforms, domestic regulations like Dodd-Frank, and the designation of global systemically important

banks—fit into three categories, which have distinct purposes but also complement one another, to the extent that they are successful:

1. requiring increased capital and liquidity, with the goal of making firms more resilient to financial market disruptions, and making crises less likely.

2. restricting financial institutions' activities and size, with the hope that this will reduce the risks they take and pose to the financial system.

3. devising a framework in which to deal with failures, including through corporate "living wills," expanded resolution authority, and perhaps eventually international coordination of bankruptcies for multinational financial firms.

With respect to the first category, the capital charges under Frank–Dodd should result in a deadweight loss in the form of reduced lending and economic activity. The quantitative importance of this impact remains a subject of considerable debate. Research from regulators points to modest impacts, while banks and their associations point to greater ones. Given the considerable changes in the financial industry and its regulation, the ongoing impacts of higher capital standards will be understood only over time.

Limits on firms' activities and scale, and banking-sector concentration, could affect future merger activity, critics warn. Provisions like the Volcker Rule, which seeks to limit proprietary trading at banks, and the so-called Lincoln Amendment, which requires certain derivative trading activities to be pushed out of banks into separately capitalized entities—would certainly limit activities. But it is difficult to evaluate the cost-benefit ratio, largely because there is little evidence on either side. In a sense, it is not even easy to pinpoint the problem to which the Volcker Rule is the solution.

There are also likely to be costs in terms of reduced liquidity and increased transactions costs, which in turn translate into less investment, economic growth, and job creation. Indeed, this concern is implicit in the exemption to the Volcker Rule in terms of trading in Treasury securities. It is also implicit in the entreaties of domestic state and local borrowers, and of foreign governments, for similar treatment.

And while there may be benefits from separating certain derivatives activities from bank holding companies that encompass insured depository institutions, in terms of a simpler and more readily regulated financial system, there is no evidence either way. Indeed, so far regulators have found it difficult to implement these provisions of Dodd–Frank, raising further concerns about the balance between benefits and costs. In fact, the failures of firms in the crisis are not well correlated with the end of the Glass–Steagall restrictions. Bear Stearns and Lehman

Brothers both failed, for example, but they were investment banks, while JPMorgan Chase combined investment banking and commercial banking, but weathered the crisis relatively well.

With respect to policy changes to the framework for dealing with the collapse of large or systemically important financial institutions, the requirement for institutions to devise their own "living wills" to prepare for their demise may be a partly symbolic step. Even the most thoughtful plan could well be discarded in the event of an actual crisis, especially if the genesis of the crisis was not well anticipated.

In addition, the new orderly liquidation authority under Title II of Dodd–Frank could have profound impacts on the cost of funding for large, complex financial institutions. The FDIC might arrange a debt-for-equity swap that recapitalizes the failing firm, with the former bondholders as the new owners, who would bear losses to the government from such financing. The possibility of having such a swap imposed on them should affect the terms under which potential creditors, such as bond buyers, are willing to provide funding to financial institutions that might be taken into resolution. A potentially worrisome implication of the new resolution authority is that it could give providers of funding to banks an incentive to flee at early signs of trouble.

Another concern is that the resolution authority will be incomplete and perhaps unworkable until there is more progress on the international coordination of bankruptcy regimes. In the case of Lehman's failure, for example, the U.K. bankruptcy regime disrupted the operations of many U.S.-based firms when it froze their overseas assets. While 85 percent or more of some large institutions' assets are domestic—those of Bank of America, Mitsubishi UFJ, or especially the large Chinese banks—others, such as Barclays, have more than half of their assets outside their home countries. International coordination of both regulatory regimes for both normal times and during resolution or bankruptcy procedures will be crucial for the continued evolution of the global financial system.

It will be necessary for policymakers to monitor such impacts over time and to adjust the regime as needed to ensure that the benefits of improved stability are commensurate with the costs involved.

Introduction

During the financial crisis of 2007–2009, governments worldwide took extraordinary measures to prevent the failure of large financial institutions. Policymakers clearly considered some of them too big to fail (TBTF). At different times and across various countries and economic conditions, they protected both insured and uninsured depositors, guaranteed bank debt, insured risky assets, provided liquidity for exceptionally long periods and against collateral of depressed value, and injected public capital to the benefit of shareholders of banks that would otherwise have failed.

To be sure, many shareholders suffered large losses despite that support (and in some cases, because of it). But governmental intervention made losses infrequent among the bondholders and other creditors at systemically important financial institutions. If anything, the market disruptions that followed bondholder losses at Lehman Brothers and Washington Mutual (WaMu) made governments even more reluctant to allow similar failures during the crisis.[1] Meanwhile, hundreds of smaller banks were allowed to fail, with their shareholders wiped out and creditors and uninsured depositors taking losses, in some cases through the normal resolution process.

The resolution authority of the Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank), which became law in July 2010, formalizes the idea that the largest banks will be regulated differently from smaller ones, to eliminate any special or deferential treatment. The new law includes not only a different regulatory regime for normal times but also a new resolution authority to be invoked in case of a serious problem and which allows regulatory authorities to support a large financial institution that faces insolvency while imposing losses on its creditors and shareholders. Thus, it could allow big banks to fail without leading to severe negative spillovers among other firms—though the key word is “could,” since the authority is yet untested.

Even so, Dodd–Frank constitutes a potential sea change for large financial institutions. Creditors now understand that it is possible, even more likely, that they will take losses if the firm fails. This in turn should increase financing costs for large financial institutions even in normal times, removing one source of their funding advantage over smaller banks: the presumption that being TBTF meant that regulators would make good on the debts of the largest banks; thus, bondholders were willing to fund them at a lower cost than they would smaller institutions. This is no longer as obvious going forward.

1. It turns out that WaMu bondholders as of March 2012 were likely to recover all or nearly all of their value in the end, as a result of litigation. This suggests that some of the market turmoil that ensued from the resolution of WaMu might have been avoidable.

Moreover, large financial institutions face new regulatory burdens and other more stringent requirements for capital and liquidity that raise the cost of being big. And this is on top of the recent move by the Federal Deposit Insurance Corporation (FDIC) to charge insurance premiums on banks' non-deposit liabilities other than capital. Thus, large banks that rely on borrowing rather than deposits would have to pay deposit insurance premiums, even on uninsured liabilities.

These changes promise to redefine the playing field for large, interconnected financial companies (LIFCs), which Dodd–Frank identifies as banks/bank holding companies with $50 billion or more in assets. On a global level, the G-20 member countries and the Financial Stability Board (FSB) in November 2011 identified an initial group of 29 banks as systemically important financial institutions (G-SIFIs), to be subjected to more stringent prudential standards. At the same time, the Basel Committee on Banking Supervision (BCBS) set forth an additional capital requirement for global systemically important banks (G-SIBs).[2] Other regulatory reforms remain works in progress, including implementation of Dodd–Frank and the Basel III standards. Still more measures, such as efforts toward international coordination of the bankruptcy of multinational banks, also remain to be implemented. The future of too big to fail remains unclear, but it is likely that it will be different from the past.

This paper puts the issue of too big to fail in historical and quantitative perspective, and assesses the potential impacts of recent regulatory changes. Both an understanding of how the TBTF problem has evolved and a consideration of quantitative measures for bank size are useful for considering the potential impacts of Dodd–Frank and other regulatory and financial system changes. Accordingly, the next section reviews historical developments in the United States. The third section continues those developments relating to TBTF in the context of the U.S. financial crisis of 2007–2009.[3] The fourth section provides quantitative measures for U.S. banks that one might consider too big to fail, as well as banks identified by regulatory authorities as no longer TBTF.

The fifth section reviews developments relating to the TBTF problem based on a global perspective, as well as quantitative measures one might use to assess whether a bank is too big to fail. The paper then uses those measures for the list of banks identified as TBTF by international authorities. The final section discusses whether indeed bank "bigness" is a serious problem and, if so, how to address it in the context of recent market and policy developments.

2. The G-SIBs will be grouped into different categories of systemic importance to determine the minimum additional loss absorbency (common equity as a percentage of risk-weighted assets), with the recommended additional capital ranging from a low of 1 percentage point to a high of 3.5 percentage points (for additional information, see *http://www.bis.org/publ/bcbs207.htm*).

3. For a discussion of the TBTF problem in the context of responses to the global financial crisis by several European countries during this period, see Mullineux (2012).

This problem of too big to fail is not new. The term itself dates back to 1984, when the FDIC took over the Continental Illinois National Bank and Trust Company (Continental Illinois), then the seventh-largest U.S. bank (Feldman and Rolnick, 1998). Continental Illinois shareholders were wiped out, but uninsured depositors and creditors were made whole, or shielded from losses, making the government action a bailout of these parties. Then, as now, the true bailout in most financial-sector interventions was for the creditors, not the equity holders.

C.T. Conover, Comptroller of the Currency at the time, explained the government bailout by noting that "had Continental failed and been treated in a way in which depositors and creditors were not made whole, we could very well have seen a national, if not an international, financial crisis the dimensions of which were difficult to imagine" (Conover, 1984, p. 288). When asked by Banking Committee Chairman Fernand St. Germain at a congressional hearing, "Do we allow, ever, a large bank to fail?" he replied, "I think it is important that we find a way to do that" (1984, p. 300).

In the three decades between the rescue of Continental Illinois and the widespread rescues of 2008 and 2009, big banks grew bigger and the financial system became more complicated, both in the United States and around the world. Yet despite these developments, no regulatory measures were implemented that would allow deeply troubled big banks to fail.

I. The Origins of TBTF in the United States

Banks play a central role in the economy by providing credit to individuals and businesses; offering services, such as deposits; and by facilitating payments for goods and services. If depositors withdraw their funds believing that the bank is on the verge of insolvency, it could be forced to sell off its assets at "fire sale" prices, thereby turning an illiquidity problem into a solvency problem. Such a run could trigger similar runs on other institutions and drive them all into insolvency. This state of affairs could lead to a disruption in the payments system and a tightening of available credit, with an adverse macroeconomic impact.

To address issues of systemic risk in the banking system, Congress established the Federal Reserve in December 1913. A major purpose of the Federal Reserve was to act as a lender of last resort by providing funds to solvent banks experiencing liquidity problems. These loans were to be made against good collateral, defined by the Federal Reserve Act as secured "to the satisfaction of the Federal Reserve." Twenty years later, in June 1933, Congress created the FDIC, its purpose being to guarantee deposits, up to a limit, to lessen the incentive of depositors to make panicked withdrawals and thereby to reduce the likelihood of bank runs.

Prior to the establishment of these two federal institutions, U.S. banks suffered through several periods of runs, with dire financial consequences. Although the Federal Reserve had already

been in existence for nearly two decades, the worst such period was during the Great Depression, demonstrating that the Fed by itself could not prevent bank runs[4] and paving the way for creation of the FDIC.

But even before the FDIC was up and running, the government had been forced to address widespread problems that existed in the banking industry during 1929–1933.[5] Thus, in January 1932, Congress created and chartered the Reconstruction Finance Corporation (RFC)[6] to "make loans to banks and financial institutions which cannot otherwise secure credit where such advances will protect the credit structure and stimulate employment" (Todd, 1992).

The Emergency Banking Act of March 1933 further authorized the RFC to purchase preferred stock issued by banks in need of capital for organization or reorganization (*Federal Reserve Bulletin*, 1933, and *Final Report on the Reconstruction Finance Corporation*, Secretary of the Treasury, 1959).[7]

Some of the RFC's actions, especially those with respect to the purchase of preferred stock, represented the first government bailouts of banks to address broader credit and economic problems arising from the financial sector.[8] Beginning in March 1933 and continuing until 1945, the RFC purchased the preferred stock of 4,202 banks (*Final Report*, 1959). To put these numbers in perspective, it should be noted that roughly 9,000 of about 25,000 banks failed during the 1930s, with nearly half of the failures occurring in 1933 alone.

Did big banks, perhaps considered too big to fail, receive special treatment with respect to the bailouts? According to Todd (1992, p. 26), "[a]lmost all large banks ... funded themselves through the RFC." This suggests that most of the banks that failed or were allowed to fail during and for several years after 1933 were small banks.[9]

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4. Todd (1992, p. 24) points out that "[p]rior to 1932, the Federal Reserve Banks were not authorized to make advances against assets other than 'real bills' or government securities, and they could lend for no longer than 15 days on the government securities owned by member banks."
5. It is interesting to note that, according to Kaufman (2002, p. 425), "Before the introduction of deposit insurance in 1934, very big banks did not often become insolvent and fail, even in periods of widespread bank failures and macroeconomic difficulties, such as 1893, 1907, and the early 1930s."
6. The Treasury Department provided the RFC with $500 million in capital. It was also allowed to borrow funds, but the outstanding amount was not to exceed three times its capital (*Final Report on the Reconstruction Finance Corporation*, 1959).
7. This authority expired in June 1947, when the applicable provision of the Emergency Bank Act was repealed (*Final Report on the Reconstruction Finance Corporation*, 1959).
8. Of course, not all of the funds were used by the RFC to bail out banks. Funds were also made to conservators, receivers, or liquidating agents to aid in the liquidation of closed banks (*Final Report on the Reconstruction Finance Corporation*, 1959).
9. Kaufman (2002) also provides evidence to support this point. At least one large bank—Bank of United States—failed before the establishment of the FDIC; indeed, the 1930 failure of this institution is often seen as contributing to the broader panic that took hold at the end of 1932 and into 1933.

Once the FDIC was in operation, it assumed responsibility for dealing with failed and failing banks. Until 1950, it had only two options available under the Federal Deposit Insurance Act (FDIA): (1) to liquidate a bank and pay off insured depositors or (2) to arrange for the bank's acquisition by a healthy bank. The FDIC was required to choose the less costly of the two.

In 1950, however, Congress authorized the FDIC to infuse funds into a bank to keep it open. The FDIC had sought this authority out of "concern that the Federal Reserve would not be a dependable lender to banks faced with temporary funding problems" (FDIC, 1984, p. 94). But such "open bank assistance" was only permitted "when in the opinion of the [FDIC's] Board of Directors the continued operation of such a bank is essential to provide adequate banking service in the community" (FDIC, 1984, p. 94). When this "essentiality" condition was invoked, the FDIC could ignore the requirement to choose the less costly resolution method.[10]

Before the rescue of Continental Illinois in 1984, essentiality was used just five times,[11] and in only one of these cases was the FDIC's determination of essentiality based mainly on the size of the bank. This case, in 1980, involved First Pennsylvania, which was the nation's 23rd-largest bank at the time.[12] The FDIC concluded that closing such a large bank would have serious repercussions in both the local market and probably the entire nation.[13] This appears to be the first bank the FDIC considered too big to fail.[14]

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10. See FDIC (1997, p. 248). More specifically, according to the FDIC (1997), "Also after 1950, and until the passage of the Federal Deposit Insurance Corporation Improvement Act of 1991, the FDIC operated under a cost test for determining which method to use: it was required to estimate the cost of a payoff and liquidation as the standard of comparison, and could adopt an alternative resolution if the alternative was expected to be less costly than the standard. But the FDIC was also allowed to use an alternative method under the essentiality provision, and the statutory language was sufficiently general to provide the FDIC with discretion to extend essentiality beyond local economic dislocation (as was done with Continental). When essentiality was invoked, cost considerations could be ignored." In addition, the "FDICIA as enacted essentially took this road, attempting to place limits on regulatory activities associated with TBTF but still leaving regulators the ability to invoke it under certain circumstances. FDIC resolutions were now required to proceed according to a least-cost test, which would mean that uninsured depositors would often have to bear losses."

11. In the case of the Franklin National Bank, the 20th-largest bank in 1974, all depositors were fully protected and the Federal Reserve did provide advances to it due to enormous deposit outflows. Indeed, by the time the bank was closed, its borrowings from the Federal Reserve had reached $1.7 billion. These borrowings were repaid by the FDIC. Franklin, however, was treated as a purchase and assumption, and not considered to have received open bank assistance under essentiality (FDIC, 1997).

12. The other four banks supported under essentiality were Unity Bank and Trust in 1971, Bank of the Commonwealth in 1972, American Bank and Trust Company in 1974, and Farmers Bank of the State of Delaware in 1976.

13. See FDIC (1997) for a more detail discussion of this issue. The first of the five banks bailed out was Unity Bank in Boston in 1971.

14. It should be noted that, according to the *New York Times,* "The too-big-to-fail doctrine, sometimes called T.B.T.F., goes back at least as far as Brandeis' time, when, in 1914, the Treasury stepped in to provide financial aid to New York City. In the 1980s, when the government rescued Continental Illinois Bank, Stewart B. McKinney, a Connecticut Congressman, declared that the government had created a new class of banks, those too big to fail. The phrase returned and stuck" (*http://www.nytimes.com/2009/06/21/weekinreview/21dash.html*).

As noted earlier, the government defended its bailout of Continental Illinois citing concerns about systemic risk due to the bank's size. Thus, the essentiality condition was invoked to enable open bank assistance, under which the FDIC infused $1 billion in new capital into Continental Illinois Corporation, the bank's holding company, in exchange for preferred stock convertible to 80 percent of the equity.[15] These funds were downstreamed to Continental as equity capital to recapitalize the bank. In addition, the FDIC provided the assurance that all uninsured depositors and creditors of Continental would be protected.[16]

The resolution of that troubled bank focused far greater attention on the question as to whether certain banks or bank holding companies were indeed too big to fail. The reason for Continental's bailout, as noted earlier, was provided by Comptroller Conover in the response to a question by Chairman St. Germain about whether he could "ever foresee one of the 11 multinational money center banks failing." Conover replied, "I admit that we don't have a way right now. And so, since we don't have a way, your premise appears to be correct at the moment" (Conover, 1984, pp. 299–300).

Conover did not identify particular banks, but these firms were easily named—as the *Wall Street Journal* did in listing the 11 largest banks at the time--those therefore considered too big to fail (see table 1).[17] These big banks accounted for nearly one-third of the total assets in the

15. As regards the way in which the government bailed out Continental, Conover wrote: "We had two options. We could put capital in the form of debt directly into the bank. We couldn't put preferred stock into the bank because there were covenants in the bond indentures of the holding company which said you couldn't do that unless you had the permission of the bondholders. In this case, they were holders of bearer bonds which had been sold in Europe. Since we didn't have a chance of getting the bondholders' approval, the FDIC could not have acquired preferred stock in the bank. Its only alternative was to put debt into the bank.

"The disadvantage of putting debt into the bank was that we would have ended up with a very strange looking balance sheet. There would have been a little bit of the remaining shareholders' equity and a big pile of debt. We figured that it was not going to help the bank recover as it published its quarterly financial statements to have a balance sheet that didn't look like a bank balance sheet ought to look.

"So we considered the other option—buying preferred stock in the holding company and having the holding company downstream it into the bank in the form of common stock equity. That satisfied our goal of having a sound looking bank balance sheet when the bank's financial statements were published. It had the undesirable feature of propping up the holding company bondholders and commercial paperholders.

"We knew that at the time, and there was significant debate back and forth about which was the preferable way to go. The Treasury Department felt, and several memos were written to Mr. Volcker and Mr. Isaac and myself, that the alternative of putting debt into the holding company was the preferable one because you could always say "Oh, look, the Federal Government is standing behind this bank, anyway." I felt and my fellow directors at the FDIC felt and Mr. Volcker felt that the appropriate way to go was the way we went—buying preferred stock in the holding company" (Conover, 1984, p. 302).

16. For a more detailed discussion of Continental, see Kaufman (2002), Shull (2010), FDIC (1997) and FDIC (2003).

17. See *Wall Street Journal* (1984).

banking industry at the end of 1983. Notice that the criterion emphasized to identify banks as too big to fail was simply asset size.[18]

Table 1: Eleven banks considered "too big to fail" at year-end 1983

	Bank	Location	Total assets (US$ millions)	% of U.S. total bank assets	Cumulative assets as % of U.S. total bank assets
1	Citibank	New York	104,392	5.2	-
2	Bank of America	San Francisco	104,085	5.2	10.4
3	Chase Manhattan Bank	New York	72,956	3.6	14.0
4	Morgan Guaranty Trust	New York	54,368	2.7	16.7
5	Manufacturers Hanover Trust	New York	54,321	2.7	19.4
6	Chemical Bank	New York	45,956	2.3	21.7
7	Continental Illinois National Bank & Trust	Chicago	39,811	2.0	23.7
8	Bankers Trust	New York	36,949	1.8	25.5
9	Security Pacific National Bank	Los Angeles	34,329	1.7	27.2
10	First National Bank of Chicago	Chicago	33,505	1.7	28.9
11	Wells Fargo Bank	San Francisco	23,390	1.2	30.1
	U.S. total commercial bank assets		2,018,593	30.1	30.1

Sources: *Wall Street Journal*, *The Banker*, Federal Reserve, Milken Institute.

In the case of Continental, it was the holding company that was bailed out; therefore, the holding companies associated with each of the 11 big banks are listed in table 2. As may be seen, the vast majority of the holding companies' assets were their subsidiary banks, ranging from a low of 83 percent to a high of 100 percent. Thus, in most of these cases, any action taken to rescue the bank holding company would not encompass a relatively large percentage of assets beyond those of the subsidiary bank.

The situation has changed quite significantly in recent years, with the repeal of the Glass–Steagall Act[19] and the expansion of banks into broader activities, such as investment banking, market-making, and full-service asset management.

18. TBTF specifically defined as the invocation of the essentiality clause with regard to an institution was used only three times between the resolutions of Continental and the Bank of New England Corporation in January 1991. In the latter case, the FDIC extended guarantees to all uninsured depositors and two affiliated banks. The justification was that the continued operation of the three banks was essential to provide adequate depository services in their respective communities until an acquirer could be found. These three banks were ultimately taken over by the FDIC and sold to Fleet/Norstar Financial Group (see Shull, 2010). The focus of this paper is on open bank assistance to banks deemed too big to fail.

19. The Glass–Steagall Act separated commercial from investment banking in 1933 and was repealed in 1999.

Table 2: Holding companies of 11 big banks considered TBTF at year-end 1983

	Bank name	BHC name	BHC's assets (US$ millions)	Bank assets as % of BHC's assets
1	Citibank	Citicorp	125,974	82.9
2	Bank of America	Bank America Corp.	115,442	90.2
3	Chase Manhattan Bank	Chase Manhattan Corp.	75,350	96.8
4	Morgan Guaranty Trust	J.P. Morgan & Co.	56,186	96.8
5	Manufacturers Hanover Trust	Manufacturers Hanover Corp.	60,918	89.2
6	Chemical Bank	Chemical New York Corp.	47,789	96.2
7	Continental Illinois National Bank & Trust	Continental Illinois Corp.	41,238	96.5
8	Bankers Trust	Bankers Trust New York Corp.	36,952	100.0
9	Security Pacific National Bank	Security Pacific Corp.	38,613	88.9
10	First National Bank of Chicago	First Chicago Corp.	34,871	96.1
11	Wells Fargo Bank	Wells Fargo & Co.	26,522	88.2

Sources: *The Banker*, Milken Institute.

The next important development in the TBTF saga occurred with the enactment of the FDIC Improvement Act (FDICIA) in December 1991.[20] Changes made in FDICIA were heavily influenced by the savings and loan crisis of the 1980s, during which regulators extended substantial forbearance to struggling banks, resulting in the expansion of taxpayer costs to cover the bad loans made by savings and loans.[21] According to Shull (2010), the law limited the FDIC's ability to provide open bank assistance for essential banks by requiring that it receive concurrence from the Federal Reserve and the Treasury secretary, and consult with the president. The law also placed new constraints on Federal Reserve loans to undercapitalized banks.[22] Moreover, FDICIA required federal banking regulators to take prompt corrective action to identify and address capital deficiencies at banks in order to minimize FDIC losses.

At the same time, however, FDICIA provided for a "systemic risk exception" to the requirement that the FDIC resolve troubled institutions using the less costly alternative. The exception was to be based upon the determination that the failure of an insured depository institution would have serious adverse effects on broader economic conditions or financial stability.[23] Thus,

20. It should be noted that in the late 1980s in some cases, the FDIC protected all depositors and creditors of a bank, while letting the parent holding company file for bankruptcy (e.g., First National Bank of Oklahoma City versus its holding company, the first Oklahoma Corporation).
21. See, for example, Barth (1991).
22. Also, see Kaufman (2002, pp. 427–428).
23. The determination was to be made by the Board of Directors of the FDIC, the Board of Governors of the Federal Reserve, and the secretary of the Treasury (in consultation with the president).

FDICIA replaced the FDIA's essentiality condition with the systemic risk exception, although with a set of hurdles clearly meant to limit its use.

II. The U.S. Financial Crisis of 2007–2009 and Too Big to Fail

From late 1991 to the summer of 2008, the systemic risk exception was not invoked by the regulatory authorities. Things changed in the fall of 2008, however. According to Hurley (2010, p. 371), it was then that "[o]ut of concern for the effects of a possible failure, on September 29, the FDIC acted for the first time under the systemic risk exception of the 1991 FDICIA and ordered Wachovia to sell itself to Citigroup." Under the agreement initially made between Citigroup, Wachovia, and the FDIC, Wachovia's creditors were to be protected and the FDIC would take on some of the bank's potential losses in exchange for preferred stock and warrants in Citigroup.

The transaction was heavily motivated by the experience with Washington Mutual a short time earlier, in which the FDIC had imposed unexpected, but legal, losses on WaMu's creditors, leading to an immediate spillover of funding pressures on other banks, including Wachovia, that were seen as risky. Wachovia eventually stepped away from the deal with Citigroup and sold itself to Wells Fargo without FDIC assistance.[24] This first-ever use of the systemic risk exception was to represent an opening of the floodgates.

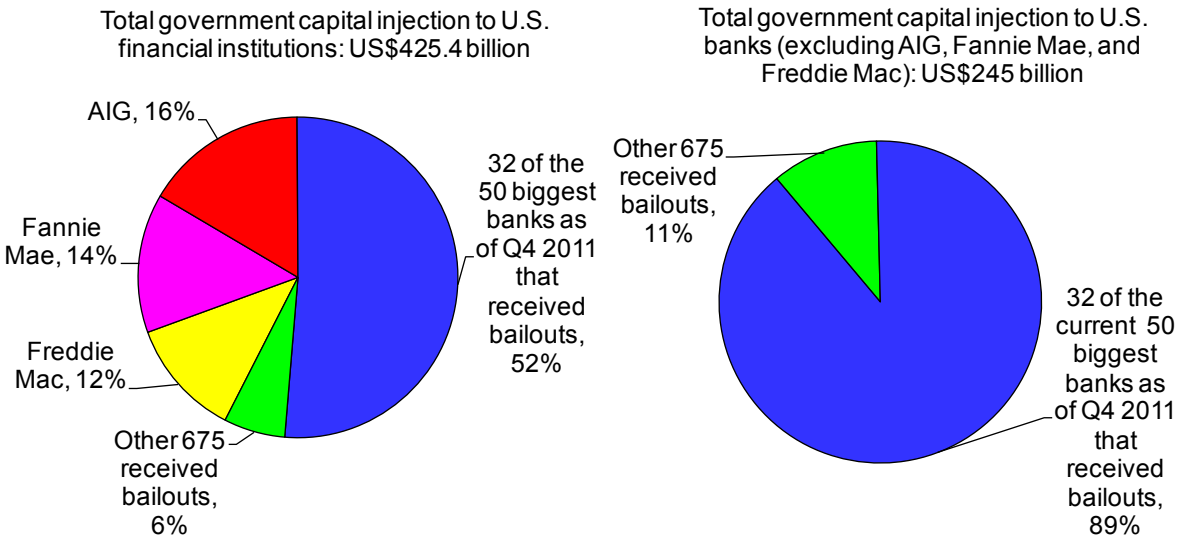
At the time of the Wachovia failure, the United States was experiencing its worst financial crisis since the Great Depression.[25] As part of a broad response, the October 2008 Emergency Economic Stabilization Act (EESA) authorized the secretary of the Treasury, under the Troubled Asset Relief Program (TARP), to spend up to $700 billion to purchase and insure distressed assets. These purchases were expected to consist of mortgage-backed securities, but in the end TARP was used mostly to make capital injections into banks and other firms (eventually including insurance companies and automakers; other TARP funds were spent on foreclosure relief).[26]

Under TARP's Capital Purchase Program, 707 banks received capital injections from the government, amounting to $245 billion (see figure 1). Of these banks, 32 were among the 50 biggest banks in the United States in the fourth quarter of 2011.[27] American International Group (AIG), General Motors, and Chrysler also received capital injections, while auto parts

24. For more detail, see Hurley (2010).
25. For discussion, see Barth et al. (2009), and Swagel (2009), among many others.
26. The capital injections were undertaken in the form of preferred and eventually common stock in banks. These were seen as purchases of troubled assets, though of equity rather than mortgage-backed securities (MBS).
27. See Appendix 1 for information on the 50 biggest banks in the United States and Appendix 2 for information on the 39 financial institutions that received the largest capital injections.

suppliers received guarantees. Fannie Mae and Freddie Mac received government capital injections amounting to $180.4 billion as of early 2012 under the Housing and Economic Recovery Act of 2008 (HERA).

Figure 1: Total government capital injections to U.S. financial institutions: US$ 425.4 billion[28]



Note: The "other 675" refers to all types of financial institutions that received financial assistance from the government. The period covered for capital injections is 2008–2009.
Sources: U.S. Treasury Department, Milken Institute.

The fact that 89 percent of the TARP's capital purchase program funds went to 32 big banks,[29] while the other 11 percent went to the 675 smaller institutions, again focused substantial attention on the TBTF issue. Indeed, even the Federal Reserve (2012) stated:

> As a result of the imprudent risk taking of major financial companies and the severe consequences to the financial system and the economy associated with the disorderly failure of these interconnected companies, the U.S. government (and many foreign governments in their home countries) intervened on an unprecedented scale to reduce the impact of, or prevent, the failure of these companies and the attendant consequences for the broader financial system. Market participants before the crisis had assumed some probability that major financial companies would receive government assistance if they became troubled. But the actions taken by the government in response to the crisis, although necessary, have solidified that market view.

28. Of the total disbursed, the government, as of August 31, 2011, has received back a total of $314 billion, representing about three-fourths of all TARP investments. Also, for the banking program, $226 billion out of $245 billion has been repaid (*http://www.treasury.gov/initiatives/financial-stability/briefing-room/news/Documents/TARP%20Three%20Year%20Anniversary%20Report.pdf*).
29. These 32 banks were also among the biggest banks in the United States when they received capital injections.

The Federal Reserve went on to point out that:

> The market perception that some companies are "too big to fail" poses threats to the financial system. First, it reduces the incentives of shareholders, creditors and counterparties of these companies to discipline excessive risk-taking. Second, it produces competitive distortions because companies perceived as "too big to fail" can often fund themselves at a lower cost than other companies. This distortion is unfair to smaller companies, damaging to competition, and tends to artificially encourage further consolidation and concentration in the financial system.

In response to these developments, Benjamin Bernanke (2010), Chairman of the Federal Reserve Board, stated that "if the crisis has a single lesson, it is that the too big to fail problem must be solved."

A major goal of Dodd–Frank and other post-crisis regulatory changes was to mitigate the threat to financial stability posed by banks perceived as too big to fail.[30] To accomplish this goal, the Federal Reserve proposed implementing enhanced prudential standards and early remediation requirements for the largest complex BHCs. These requirements together impose considerable charges and constraints on the behavior of large banks and include requiring them:

(1) to demonstrate their ability to maintain capital above existing minimum regulatory capital ratios, and above a Tier 1 common equity ratio of 5 percent, under both expected and stressed conditions over a minimum nine-quarter planning horizon, as well as to satisfy a quantitative risk-based capital surcharge based on Basel Committee on Banking Supervision (BCBS) guidelines;

(2) to comply with enhanced liquidity risk-management standards, including liquidity stress testing, as well as with the enhanced liquidity requirements for the G-SIBs of Basel III.

(3) to not have a credit exposure to any unaffiliated company that exceeds 25 percent of its capital;

(4) to maintain a debt-to-equity ratio of no more than 15:1, but only upon a determination by the Financial Stability Oversight Council (FSOC) that (a) such company poses a grave threat to the financial stability of the United States and (b) the imposition of such a requirement is necessary to mitigate the risk that the company poses to U.S. financial stability;

30. In particular, Dodd–Frank requires the Federal Reserve to impose a package of enhanced prudential standards on bank holding companies with total consolidated assets of $50 billion or more, and nonbank financial companies the Financial Stability Oversight Council (FSOC) has designated for supervision by the Federal Reserve (together, covered companies and each a covered company) (Federal Reserve, 2012).

(5) to be subjected to early remediation in financial distress, including for emerging or potential issues, before they develop into larger problems.

In the event that one of these BHCs encounters financial difficulty and early remediation efforts fail, the Federal Reserve is to recommend to the Treasury Department and the FDIC that the company be resolved under its new orderly liquidation authority. This means that the company would be placed into FDIC receivership. This is to happen if the secretary of Treasury, in consultation with the president, determines that the company is in default or in danger of default; the default of the financial company would have a serious adverse effect on the financial stability of the United States; no viable private-sector alternative is available to prevent the default; the effect on the claims or interests of its creditors, counterparties, and shareholders, and other market participants is appropriate, given the impact that any action would have on the financial stability of the United States; and an orderly liquidation would avoid or mitigate such adverse effects.

Once the orderly liquidation authority is invoked, the FDIC can put taxpayer funds into the company to keep it afloat for a limited period (which can be lengthy, just not indefinite) and has broad authority to change contracts and impose losses on creditors. Any resources deployed by the FDIC must be collateralized by the assets of the firm in liquidation, and any eventual losses beyond the available assets are to be borne by creditors through an ex-post clawback provision from bondholders. If the losses exceed what can be imposed on bondholders, then other financial firms will be assessed to cover the additional amount of losses —in no case is the government allowed to bear the costs of liquidation without further congressional authorization.

As a result of the FDIC's orderly liquidation authority, the government at long last is trying to resolve the "too big to fail" problem. To re-enforce this point, Dodd–Frank seeks to eliminate open bank assistance by prohibiting the FDIC from taking an equity interest in or becoming a shareholder of any such company.

A reasonable expectation is that the FDIC will use its liquidation authority to inject funding to keep an institution afloat while it arranges for a buyer or for a wind-down if no buyer appears. Losses would be borne by shareholders first (who should expect to be wiped out), and then by bondholders. The FDIC's new role is meant to eliminate government bailouts while providing policymakers with better tools to address the failure of a large, complex financial institution than they had before the enactment of the EESA legislation and the TARP program.

Not everyone, however, is convinced that Dodd–Frank has solved the problem of too big to fail. For instance, Johnson (2011) asserts several potential complications:[31]

31. Also, see Barth, Caprio, and Levine (2012).

> First, the resolution authority under Dodd–Frank is purely domestic—there is no cross-border dimension. This presents a major problem if large financial institutions, which typically have extensive international operations, need to be shut down in an orderly way. U.S. legislation can't specify how assets and liabilities in other countries will be treated; this requires an intergovernmental agreement of some kind. … Second, it has never been clear that any government agency would be willing to use such resolution powers preemptively—before losses grow so large that they threaten to rock the macroeconomy. …Third, who would lose money in any potential liquidation? The fundamental premise of the resolution authority is that some creditors could face losses, but would they be imposed in an orderly and predictable manner to avoid undermining confidence and destabilizing the financial system? Any such thinking today seems far-fetched.

Johnson argues that the problem lies with the biggest banks, and that since they "pose a real threat"…"[t]he only credible way to counter this threat—and the only reasonable way to protect our democracy—is to break them up." Richard W. Fisher (2011), President of the Federal Reserve Bank of Dallas, apparently shares this view, noting that "there is only one fail-safe way to deal with too big to fail. I believe that too-big-to-fail banks are too-dangerous-to-permit. ... I favor an international accord that would break up these institutions into more manageable size." Former FDIC Chair Sheila Bair (2012) also states that "[i]t would surely be in the government's interest to downsize megabanks."

Others disagree with this approach. Krugman (2009), for example, states, "One argument I don't buy … is that we should try to shrink financial institutions down to the point where nobody is too big to fail. Basically, it's just not possible." Federal Reserve Governor Daniel K. Tarullo (2009) likewise has stated that "the conceptual and practical challenges in breaking up the nation's largest financial institutions … [make it] … more a provocative idea than a proposal." Calomiris (2009) agrees that "[l]imiting the size, complexity, and global reach of financial institutions is fraught with downsides for the international economy." He adds, "We can solve the too-big-to-fail problem without destroying global finance. It certainly is worth a try."

A key issue in considering proposals to break up or shrink large financial institutions is to gauge the costs and benefits of these firms. The Clearing House Association (2011) tallies benefits, while Swagel (2011) provides further discussion.

III. How Big Are Big Banks in the United States?

Over time, the notion of which banks are too big to fail has undergone some refinement. The initial view considered asset size, but more recent definitions, while still based on asset size, take into account additional factors including complexity and systemic interconnectedness.[32]

To answer the question posed in the section title, we focus on two measures. The first is asset size. Recall that Dodd–Frank also focuses on asset size. Moreover, as will be seen, regardless of other factors, the banks now subject to the most stringent U.S. regulatory scrutiny all rank among the biggest banks.

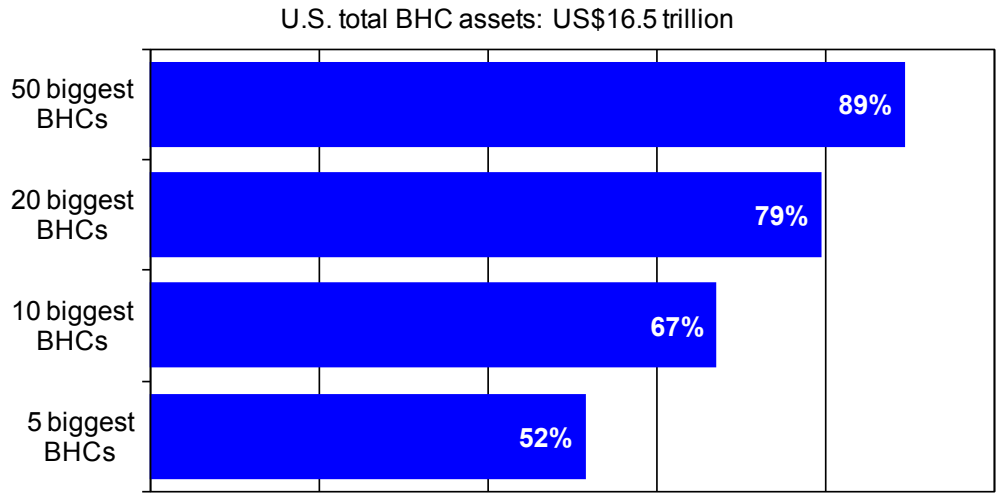
The second measure we use is bank asset size as a percentage of U.S. GDP. This helps to gauge a bank's size relative to the U.S. economy, while recognizing that it compares the stock of assets against the annual flow of income. Simon Johnson and James Kwak (2010, p. 214) argue that "no financial institution [s]hould be allowed to control or have an ownership interest in assets worth more than a fixed percentage of U.S. GDP."

Figure 2 shows the share of total bank holding company assets accounted for by the five largest U.S. BHCs ranging up through the 50 largest companies. The top five BHCs account for slightly over half of all U.S. BHC assets, while the 50 largest BHCs account for 89 percent of total assets; the next 966 BHCs hold the remaining 11 percent of assets.[33] Information on these 50 BHCs is reported in Appendix 1.[34]

Of these companies, eight are included among the 29 G-SIFIs. The biggest BHC, JPMorgan Chase, has $2.3 trillion in assets, while the smallest, Hancock Holding Company, has $20 billion in assets. By comparison, the world's largest publicly traded bank is Deutsche Bank, with $3 trillion of assets; JPMorgan Chase is the ninth largest in the world by assets (see Appendix 5).

32. The 29 G-SIFIs identified by the Financial Stability Board and the Basel Committee on Banking Supervision at the G-20 meeting on November 4, 2011, was based on the following factors, with the individual weights in parentheses: cross-jurisdictional activity (20 percent), size (20 percent), interconnectedness (20 percent), substitutability (20 percent), and complexity (20 percent) (See BCBS, 2011).
33. Appendix 4 shows that the total assets of all U.S. bank holding companies equal $16.5 trillion, while the total assets of all U.S. commercial banks equal $12.6 trillion as of fourth quarter 2011.
34. Appendix 1 also shows that these bank holding companies differ substantially with respect to funding their assets with deposits, ratios of equity to assets, and ratios of market capitalization to equity.

Figure 2: Biggest U.S. bank holding companies' share of total assets, Q4 2011

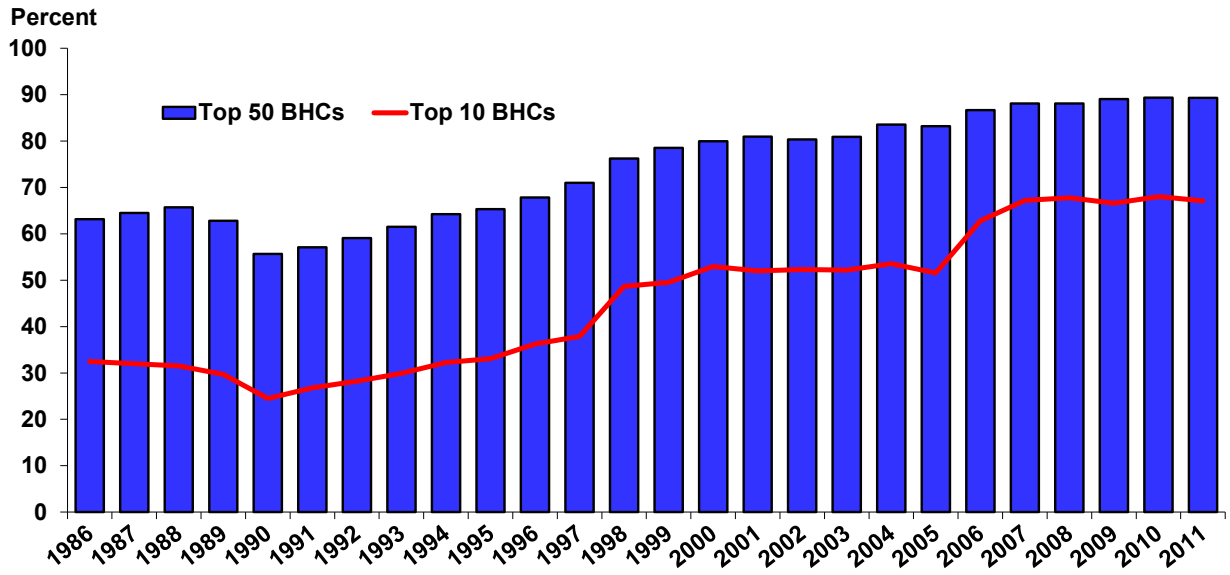


Note: Total assets of U.S. bank holding companies are from reporting forms FR Y-9Cs (consolidated statements). BHCs with total consolidated assets of $500 million or more are required to file this report. These 50 BHCs include all eight U.S. banks on the list of 29 G-SIFIs identified by the Financial Stability Board. Thirty-four of the 50 biggest U.S. BHCs have more than US$50 billion in consolidated assets, which are considered as systemically important financial institutions, or SIFIs.
Sources: Federal Reserve Bank of Chicago, Milken Institute.

Citicorp was the largest U.S. BHC in 1983, with $126 billion in assets (see table 2). As of the fourth quarter of 2011, Citigroup assets had grown to $1,874 billion, an increase of 1,387 percent in nominal terms (Appendix 1). The same growth story is true of other big banks, as seen in a comparison of the information in table 2 and Appendix 1. The biggest banks or bank holding companies have gotten much bigger over time, despite decades of concern over too big to fail.

Figure 3 shows the change in the concentration of the assets of U.S. BHCs among the top 10 and top 50 companies from 1986 to 2011. The top 10 companies accounted for roughly 70 percent of total assets in 2011, while the corresponding figure was only about 30 percent in 1986. This represents more than a 200 percent increase in the share of the top 10 companies. The top 50 companies also accounted for a larger share of total assets over this period. Their share increased from roughly 60 percent in 1986 to 89 percent in 2011. The big are indeed getting bigger.

Figure 3: Concentration of U.S. bank holding company assets, 1986–Q4 2011



Sources: Federal Reserve Bank of Chicago, Milken Institute.

It is useful to point out that the biggest BHCs differ with respect to the importance of their banking subsidiaries on a consolidated basis. For example, in the case of the largest BHC, JPMorgan Chase & Co., its largest bank subsidiary, JP Morgan Chase Bank, accounts for 80 percent of assets on a consolidated basis (Appendix 4). This subsidiary bank is also the largest bank in the United States.

However, not all of the largest banks are subsidiaries of the largest BHCs. Appendix 4 provides a list of the top 50 banks and their parent holding companies, as well as the share of the total consolidated assets accounted for by the subsidiary banks. Based upon these data, it could make a big difference whether a bailout occurs with a bank or a BHC—indeed, a primary purpose of the new resolution authority was to allow the FDIC to intervene at the holding company level, rather than at the bank subsidiary, as previously under FDICIA. During the financial crisis of 2007–2009, a large portion of TARP capital injections went to large BHCs (Appendix 2).[35]

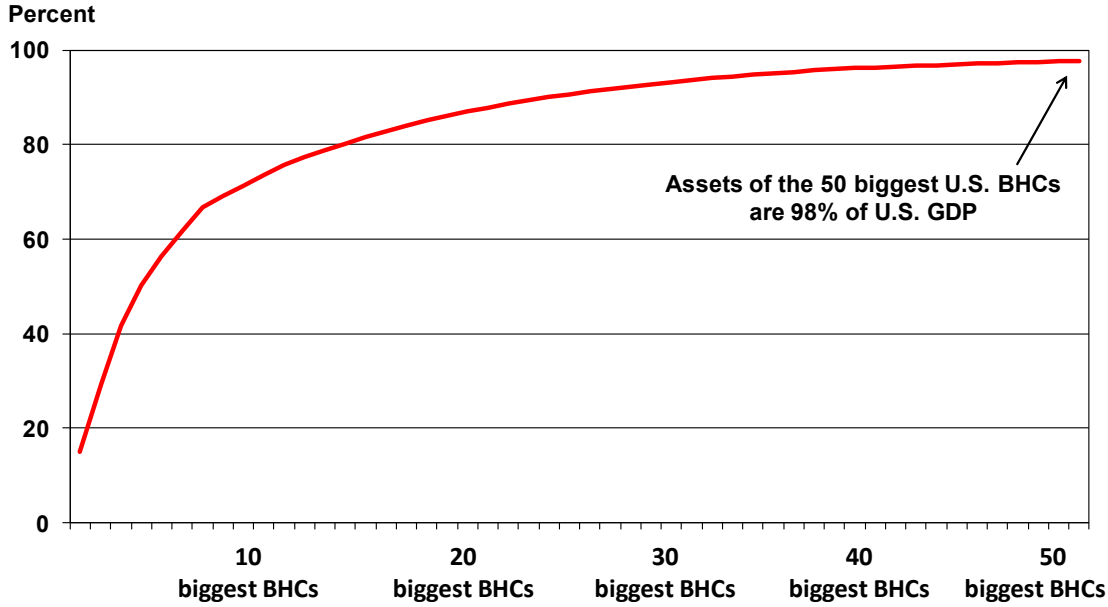
Moreover, the Spearman rank correlation coefficient between asset size and funds received is 0.92 (Appendix 3). This reflects the fact that the TARP capital injections generally equaled 3 percent of banks' risk-weighted assets; thus, larger institutions received more TARP funds.

35. Appendix 2 shows for the 39 companies receiving the most funds, the amount each received. It also shows that the financial condition of the institutions differs substantially, depending upon the capital-to-asset ratio used.

However, the correlation coefficients also indicate that the capital injection is significantly and negatively correlated with both an institution's common and tangible common equity capital-to-asset ratios, while not significantly related to either an institution's Tier1 risk-based or total risk-based capital ratios. This indicates that the injections on average were smaller for the better capitalized institutions, but "better capitalized" based only the two non-risk-based measures of capital (Appendix 3).

The other measure of bank bigness is asset size relative to GDP. Figure 4 shows that as one adds the assets of more BHCs, the cumulative total relative to GDP reaches 98 percent for the 50 biggest companies. The assets of just the 10 biggest companies equal 75 percent of GDP. It could only take trouble at a few large financial companies to sharply curtail available credit and disrupt real economic activity. A catastrophic scenario would be one in which difficulty at key banks disrupts the payments system that constitutes the central nervous system of the U.S. economy. Indeed, fear that the crisis would affect the payments system was a key motivating factor behind the proposal of TARP.

Figure 4: Cumulative assets of the biggest U.S. bank holding companies (% of U.S. GDP), Q4 2011

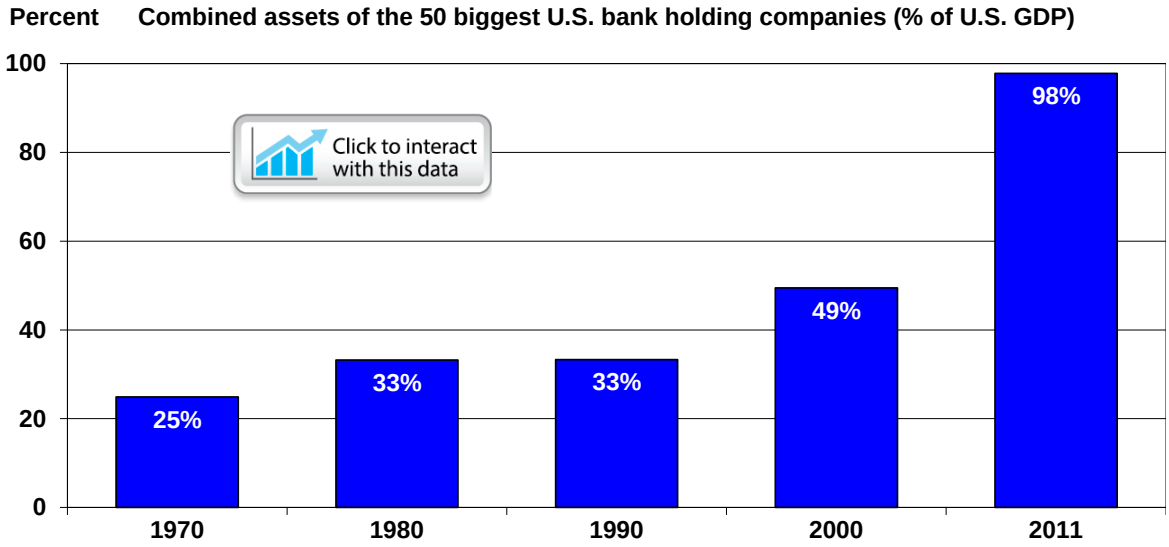


Note: Total assets of U.S. BHCs are from forms FR Y-9C (consolidated statements). BHCs with total consolidated assets of $500 million or more are required to file this report. These 50 BHCs include all eight U.S. banks on the list of 29 G-SIFIs identified by the Financial Stability Board. Thirty-four of the 50 biggest U.S. BHCs have more than US$50 billion in consolidated assets and are considered as systemically important financial institutions.
Sources: Federal Reserve Bank of Chicago, U.S. Bureau of Economic Analysis, Milken Institute.

The 50 biggest bank holding companies have got even bigger over time, as shown in Figure 5. In the fourth quarter of 2011, the combined assets of the five biggest companies totaled about 60

percent of U.S. GDP. By contrast, in 1970 the corresponding figure was only 10 percent. For the top 10 companies, the figures increased from 14 percent to 75 percent. And the assets of top 50 companies are now roughly equal to U.S. GDP, which represents about a four-fold increase in four decades.

Figure 5: Growth of the biggest U.S. bank holding companies over 40 years



Sources: *The Banker*, the Federal Reserve Bank of Chicago, U.S. Bureau of Economic Analysis, Milken Institute.

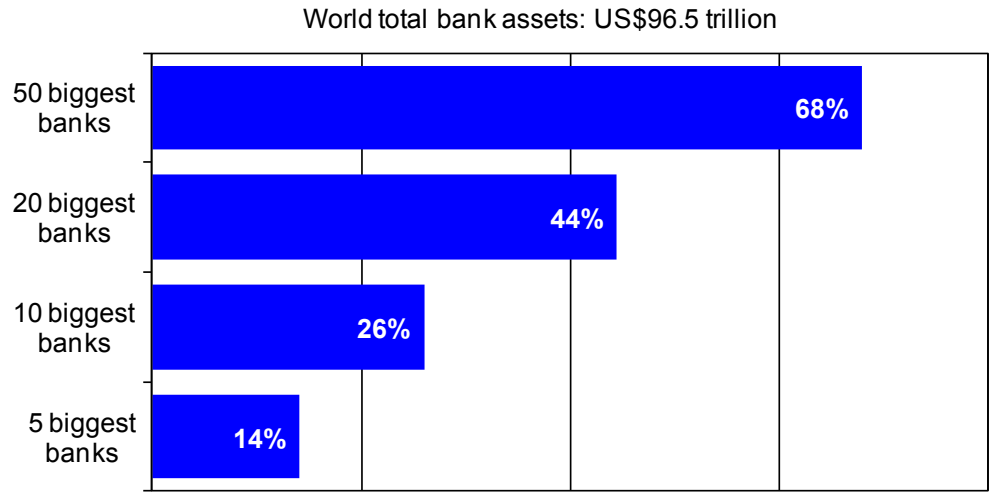
IV. How Big Are the Biggest Banks in the World?

Based on asset size, the five biggest banks in the world accounted for 14 percent of total bank assets in the fourth quarter of 2011.[36] The 50 biggest banks or BHCs account for nearly 70 percent of total bank assets (see figure 6). Although still relatively high, the figures for the concentration of bank assets worldwide are lower than the corresponding figures for U.S. bank assets. Selected information on the 50 biggest banks in the world is provided in Appendix 5.[37] It is seen there that the world's biggest bank is Deutsche Bank, with $3 trillion in assets as of the fourth quarter of 2011. The smallest is Sumitomo Mitsui Trust Holdings of Japan, with $435 billion in assets.

36. The total assets of banks worldwide are based on publicly traded banks in 180 countries and obtained from Bloomberg. The IMF Global Financial Stability Report, September 2011, reports that the consolidated assets of commercial banks worldwide (latest available data) were $100 trillion in 2010. Based on Bloomberg and BankScope, the total assets of publicly traded commercial banks worldwide were $91.5 trillion in 2010 and, in the fourth quarter of 2011, $96.5 trillion.

37. Appendix 5 also shows that these banks or bank holding companies differ substantially with respect to funding their assets with deposits, ratios of equity to assets, and ratios of market capitalization to equity.

Figure 6: Combined assets of the world's biggest banks (% of bank assets worldwide), Q4 2011



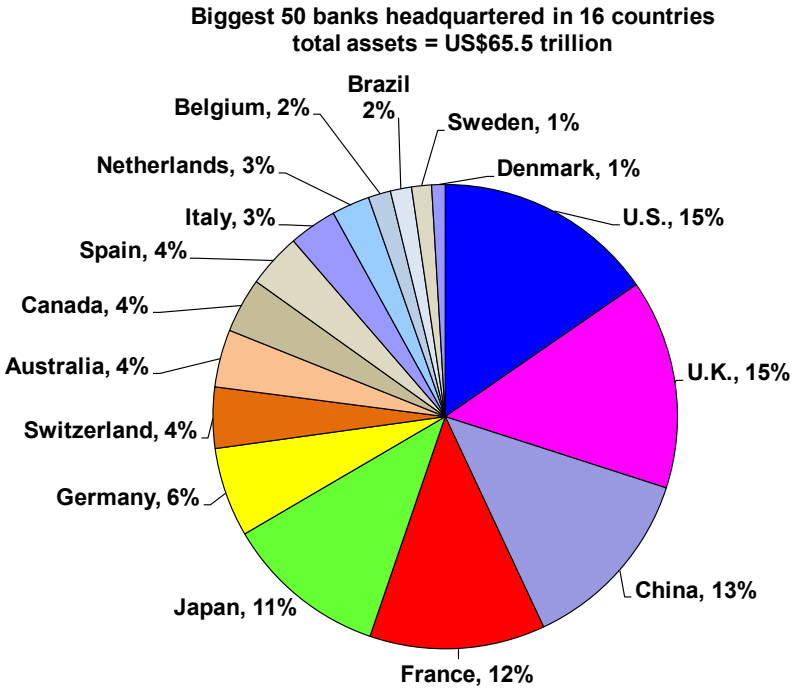
Note: The world's biggest banks ranked by total assets. If bank assets as of Q4 2011 are not available, then data for Q3 2011 are used. Total bank assets are based on all publicly traded banks worldwide, which include both banks and bank holding companies.
Sources: Bloomberg, Milken Institute.

Of these 50 big banking companies worldwide, 27 of the 29 G-SIFIs identified by Financial Stability Board are included.[38] Of the eight U.S. banks identified as G-SIFIs, two (Bank of New York Mellon and State Street) are not among the world's 50 biggest banks. Both banks, however, are included in the list of the 50 biggest U.S. banks; they appear to have been designated as systemic on the basis of the key roles they play in the clearing, and in the custodianship, of assets. The 27 G-SIFIs are shaded in Appendix 5, with 17 of these banks in Europe, four in Asia, and six in the United States.[39]

The geographical distribution of the assets of the world's 50 biggest banks is provided in figure 7. These banks are headquartered in 16 countries that account for 71 percent of world GDP. The United States accounts for the largest share of assets for the 50 biggest banks, at 15 percent, while Denmark accounts for the smallest share, at 0.9 percent.

38. Despite the fact that size only accounts for 20 percent in the determination of which banks are G-SIFIs (see footnote 32), all but two of the 29 of these so identified institutions are among the 50 biggest banks in the world. This suggests that size is highly and positively correlated with the other factors that go into the determination.
39. MetLife Inc. is among the world's 50 biggest banks but is not considered a G-SIFI.

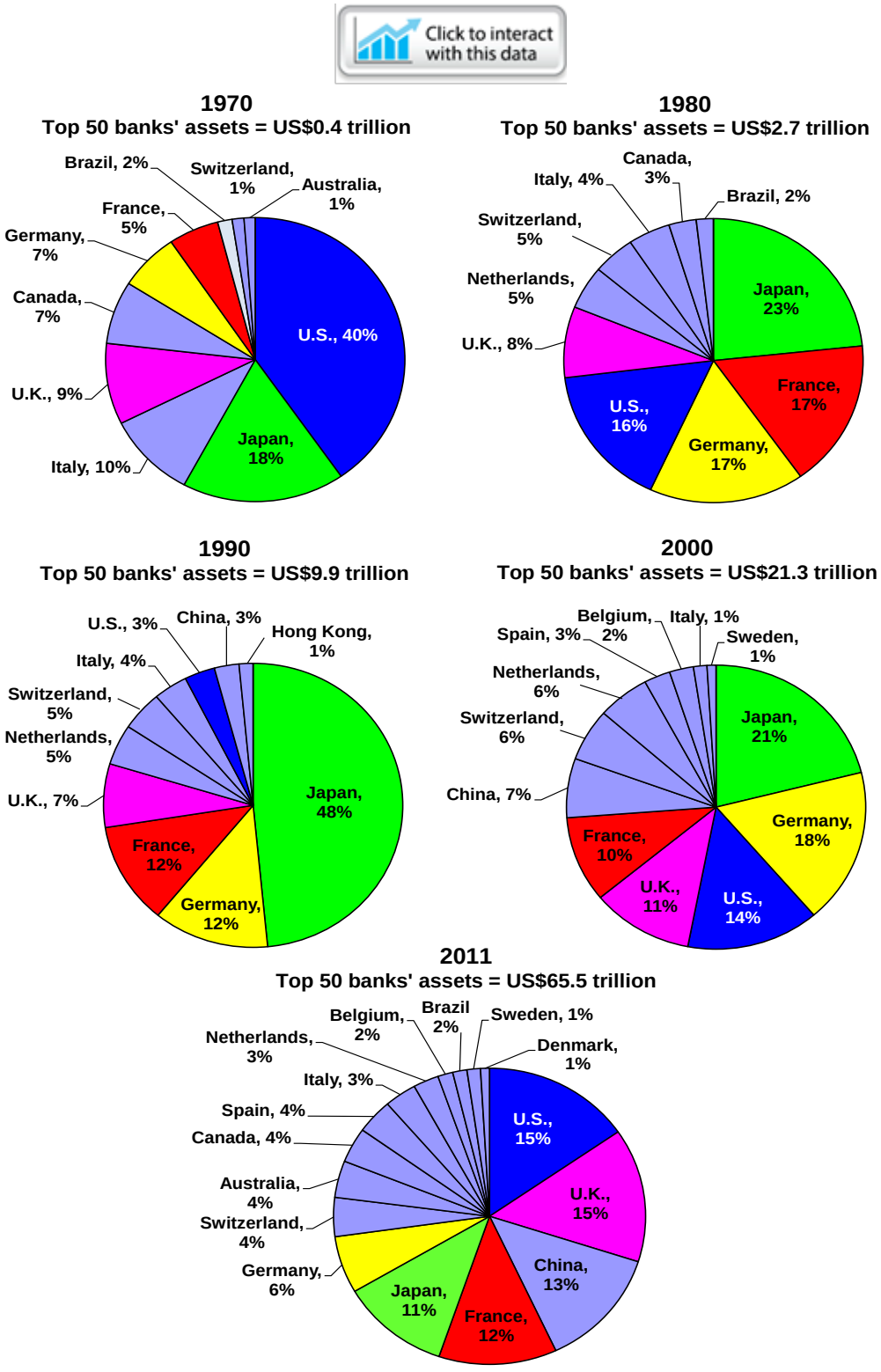
Figure 7: Where the world's 50 biggest banks are headquartered, Q4 2011



Sources: Bloomberg, BankScope, Milken Institute.

Figure 8 shows the distribution of the assets of the 50 biggest banks in the world by country over the past 40 years. In 1970, the United States ranked first; its big banks accounted for 40 percent of the total assets of the 50 biggest banks in the world. Japan took that position in 1980, 1990, and 2000, before turning it back over to the United States in the fourth quarter of 2011. But the U.S. share of assets was 15 percent most recently, far lower than its earlier share. This is also the case for Japan. China's share at the same time increased to 13 percent, only 2 percentage points below that of the United States.

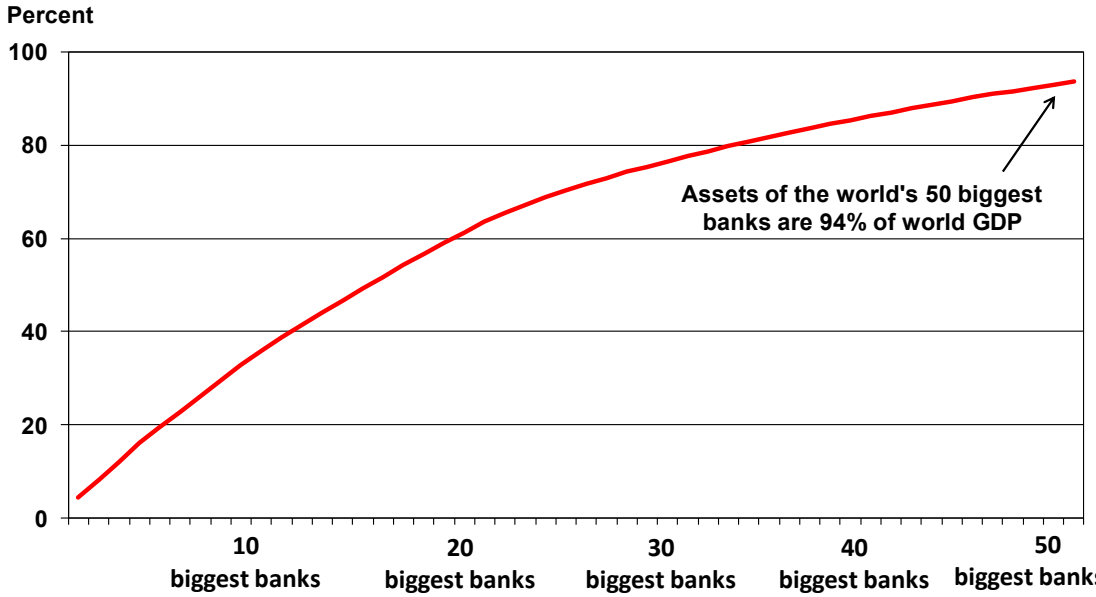
Figure 8: Distribution of world's 50 biggest banks by country over 40 years



Sources: *The Banker,* Bloomberg, BankScope, Milken Institute.

It is interesting to compare the assets of the world's 50 biggest banks to world GDP, similar to the measure taken for U.S. banks.[40] Figure 9 shows that the assets of these 50 big banks were nearly equal to world GDP in the fourth quarter of 2011. Assets belonging to the top 10 banks were slightly more than one-third of world GDP, while adding the next 10 biggest banks increased the figure to almost two-thirds. And the top 30 banks raise the figure to three-fourths of world GDP. Furthermore, seven of these banks have assets that exceed 100 percent of the GDP of their home countries. These banks are indeed big banks, not only in terms of their sheer asset size but also relative to world GDP.

Figure 9: Cumulative assets of the world's biggest banks (% of world GDP), Q4 2011



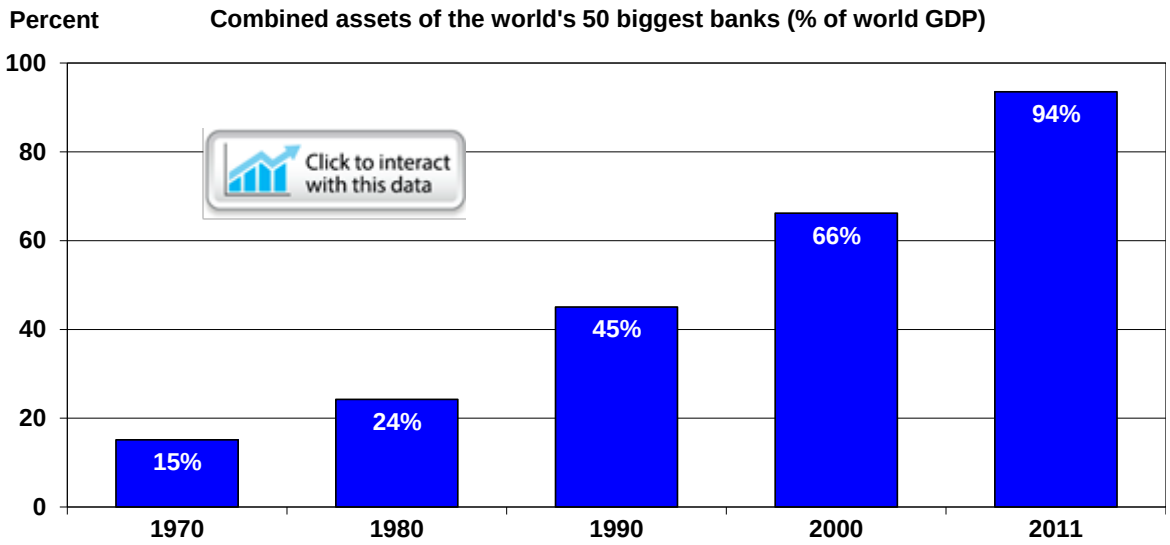
Note: The 50 biggest publicly traded banks in the world ranked by total assets. World GDP is a 2011 IMF estimate.
Sources: Bloomberg, International Monetary Fund, Milken Institute.

These big banks, moreover, have gotten bigger over time. Figure 10 shows that while the assets of the 50 biggest banks in the fourth quarter of 2011 totaled 94 percent of world GDP, the corresponding figure was only 15 percent in 1970. This represents more than a six-fold increase in four decades. The figures for the top five, 10, and 20 banks show similar increases over the period.

40. "Some might argue that since the European Union has a policy to create a single financial market, bank assets should be compared to the EU GDP rather than the national GDP of the country of headquarters, in which case the EU and U.S. figures would be of a comparable order of magnitude. However, such a comparison of aggregates is less relevant from a policy perspective: As the recent crisis brought home forcefully, de facto public guarantees for most banks come from the home country and only from there, a reality aptly summarized by the quip often attributed to Mervyn King that 'international banks are global in life, but national in death.' In truth, the European reality is somewhat blurred by some banks' multiple national allegiances" Goldstein and Veron (2011, p. 13).

in four decades. The figures for the top five, 10, and 20 banks show similar increases over the period.

Figure 10: The world's 50 biggest banks have gotten even bigger

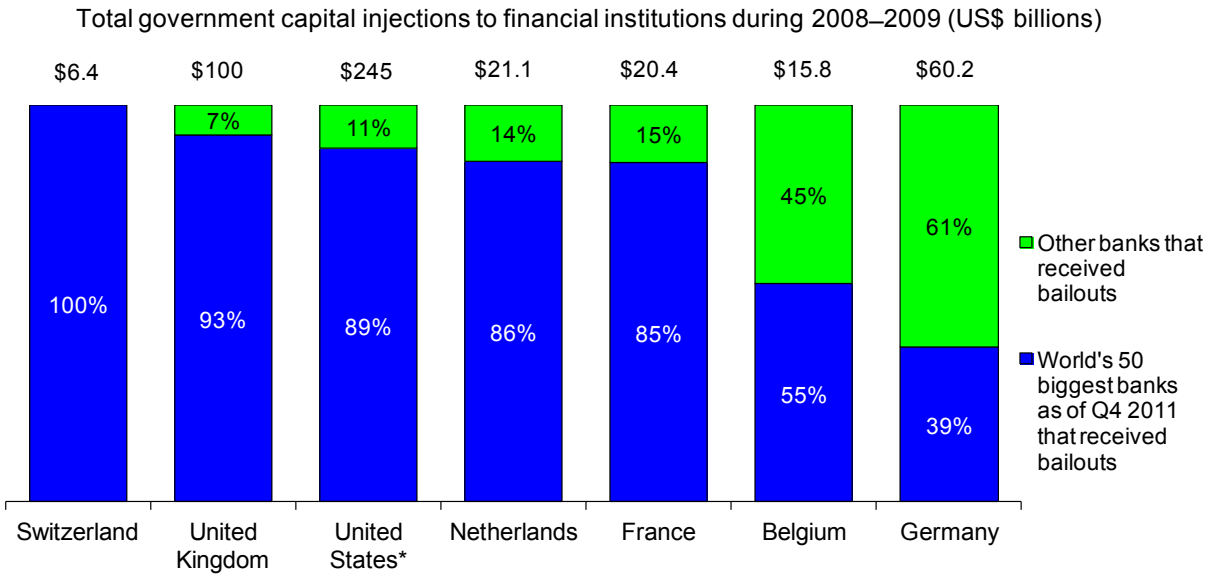


Sources: *The Banker*, Bloomberg, International Monetary Fund, World Bank, Milken Institute.

Figure 11 shows total injections of public capital by governments during the crisis to financial institutions in the countries in which the 50 biggest banks worldwide are headquartered. Information is provided for the 50 biggest banks worldwide that received support, as well as for other financial institutions that received support (also see Appendix 6).

Of the 50 biggest banks worldwide, those receiving injections of public capital were headquartered in only seven of the 16 countries. The biggest banks that received bailouts account for a high of 100 percent of the total bailout amount, in the case of Switzerland, and a low of 39 percent, in the case of Germany. The United States ranks third, at 89 percent of the seven countries, in terms of the percentage of the total public support going to banks included in the top 50 biggest banks in the world. In terms of total bailout funds, however, the United States ranks first, the United Kingdom second, and Switzerland seventh. Overall, in six of the seven countries, over half of the total amount of funds injected into financial institutions went to those banks included among the 50 biggest banks in the world. Almost by definition, it can be costly to support big banks.

Figure 11: Capital injection to financial institutions in selected countries



Note: Seven of the 16 home countries of the 50 biggest banks worldwide provided government capital injections to financial institutions during the financial crisis. See Appendix 2 for selected information of U.S. financial institutions that received government capital injections and Appendix 6 for non-U.S. financial institutions. Data for the United States in this figure exclude government financial assistance to AIG, Freddie Mac and Fannie Mae.
Sources: Bloomberg, Milken Institute.

V. Policy Approaches to Large Banks and the Too Big to Fail Dilemma

In the aftermath of the financial crisis, policymakers have again sought to reduce the likelihood of a recurrence, and to better deal with the next, perhaps inevitable, crisis. Broadly speaking, the measures taken since 2008 fit into three categories, which have distinct purposes but also complement one another, to the extent that they are successful:

4. requiring increased capital and liquidity, with the goal of making firms more resilient to financial market disruptions, and making crises less likely.

5. restricting financial institutions' activities and size, with the hope that this will reduce the risks they take and pose to the financial system.

6. devising a framework in which to deal with failures, including through corporate "living wills," expanded resolution authority, and perhaps eventually international coordination of bankruptcies for multinational financial firms.

The first, requiring additional capital and more secure access to liquidity, is meant to ensure that firms have an increased buffer against losses and a greater ability to survive the strains of a crisis. They also would provide increased protection for taxpayers before the financial institution's failure prompts consideration of a policy intervention.

While most financial institutions are likely to face increased requirements for capital under Basel III, firms seen as systemically important globally have additional requirements. These requirements can come about through both multinational efforts, such as the designation of global systemically important banks; and through domestic regulation, such as Dodd–Frank, which subjects the largest firms, with assets of $50 billion or more, to an enhanced supervisory regime that includes both additional capital charges and other aspects of increased regulatory scrutiny.

Regulators in continental Europe have generally been comfortable with lower capital requirements than have their counterparts in the U.S., the U.K, and Canada; this is often seen as a reflection of the belief that additional public capital would be available to stabilize banks as needed. Continuing difficulties with fiscal positions in Greece, Italy, Spain, and elsewhere could put this belief to the test.[41]

The European approach contrasts with that of U.S., where it is unlikely that another TARP-like authority to inject taxpayer capital into banks will be enacted for a considerable time because of public anger. As we discuss later, the orderly liquidation authority of Dodd-Frank allows the deployment of taxpayer resources, though not for indefinite periods. Since this new authority is untested, it is unclear whether the act in reality facilitates the use of public resources or instead prevents such steps.

Additional capital requirements for large or systemically important firms provide an incentive against size (and perhaps complexity or interconnectedness). These might also be seen as an "incentive" that offsets the possible funding advantages of large firms—a disincentive for size, but not a blunt restriction along the lines of the second category of policy measures.

Alternately, if a large institutional failure imposes costs on society, the additional capital charges could be used to correct for the latent negative externality along the lines of a Pigovian tax, though in this case the implicit revenue from the tax accrues to private suppliers of capital rather than to the government.

It should be kept in mind that there are benefits to society from large financial institutions, as well as costs, a point discussed by the Clearing House Association (2011) and Swagel (2011).[42]

41. For a short description of this problem, see Barth, Li, and Prabha (2011), among many others.
42. It should be noted that only 7 of the 50 biggest banks in the world are U.S. banks (Appendix 5). To the extent that U.S. banks are limited in size they may be put at a competitive disadvantage as compared to the biggest banks in other countries that are not so limited. After all, as banks expand their geographical reach to tap into new markets, they may naturally become bigger in size.

Moreover, the capital charge, as usual with a tax, results in a deadweight loss in the form of reduced lending and economic activity. The quantitative importance of this impact remains a subject of considerable debate. Admati et al. (2010) see little negative impact of higher capital requirements, but Kashyap, Stein, and Hanson (2010) see a meaningful impact on bank funding costs during the transition, while banks are raising additional equity capital, and then a modest ongoing impact. Research from regulators points to modest impacts, while banks and their associations point to greater ones.

In the wake of the recent crisis, it is certain that large financial institutions will hold more capital, both at the insistence of regulators and of their own volition. Given the considerable changes in the financial industry and its regulation, the ongoing impacts of higher capital standards will be understood only over time.

The second category of policy change involves limits on firms' activities and scale. Dodd–Frank imposes some limits on banking-sector concentration, including caps of 10 percent on any one institution's share of total financial-sector liabilities or any institution's share of insured deposits. These limits could affect future merger activity. Other provisions—such as the Volcker Rule, which seeks to limit proprietary trading at banks, and the so-called Lincoln Amendment, which requires certain derivative trading activities to be pushed out of banks into separately capitalized entities—would limit a firm's activities. The presumption behind these policy actions is that simpler institutions pose less risk to the financial system and broader economy because some activities are inherently more risky and because simpler organizations are more easily regulated.

An important concern with such provisions is that it is difficult to evaluate the cost-benefit ratio, largely because there is little evidence on either side. It is not clear, for example, that a meaningful relationship exists between proprietary trading and the recent financial crisis. The losses that led to problems at Lehman, Bear Stearns, WaMu, and other failed institutions were connected to long-term investments, such as mortgage-backed securities and commercial real estate, rather than to losses from the sort of short-term trading activities targeted by the Volcker Rule. In a sense, it is not even easy to pinpoint the problem to which the Volcker Rule is the solution.

This is not to say that there will be no benefits from it. For example, simpler institutions may very well be less prone to problems and thus less apt to contribute to the makings of a future crisis. But this is essentially conjecture, and an uneasy basis on which to reorganize the financial system.

As noted in Swagel (2011), there are likely to be costs in terms of reduced liquidity and increased transactions costs, which in turn translate into less investment, economic growth, and job creation. Indeed, this concern is implicit in the exemption to the Volcker Rule with

respect to trading in Treasury securities. It is also implicit in the entreaties of domestic state and local borrowers, and of foreign governments, for similar treatment.

Similarly, while there may be benefits from separating certain derivatives activities from bank holding companies that encompass insured depository institutions, in terms of a simpler and more readily regulated financial system, there is no evidence either way. Indeed, so far regulators have found it difficult to implement these provisions of Dodd–Frank, raising further concerns about the balance between benefits and costs.

The post-crisis regulatory regime embodied in Dodd–Frank does not seek to break up large financial institutions or to reinstitute broader barriers to their activities, as did the Glass–Steagall Act separating commercial and investment banking. This perhaps reflects the observation that the failures of firms in the crisis are not well correlated with the end of the Glass–Steagall restrictions. Bear Stearns and Lehman Brothers both failed, for example, but they were investment banks, while JPMorgan Chase combined investment banking and commercial banking but weathered the crisis relatively well.

An alternative to Glass–Steagall-like restrictions would be for regulators to focus more intently on activities that appear to pose particular risks, and to act more pre-emptively to head off systemic problems. This approach is embodied in the creation of the Financial Stability Oversight Council (FSOC) as a body meant to look across the financial system.

While Dodd–Frank does not actively seek to break up large banks, and while there appears to be no such movement in other important global financial centers, the recent regulatory process in some ways appears cognizant of the potential dangers that large financial institutions pose. The Federal Reserve's lengthy examination of the acquisition of ING Direct by Capital One, for example, has been interpreted as an implicit cautionary warning about the willingness of regulators to permit acquisitions that give rise to additional large-scale financial institutions.

The third category of policies involves changes to the framework for dealing with the collapse of large or systemically important financial institutions. There are two motivations for such policies: the first, making it easier to ensure the stability of the system, and a second, alerting market participants to the fact that institutions are more likely to be allowed to fail and thus creditors will be forced to take losses. Such recognition in turn may help remove advantages that large firms previously enjoyed from a perception that they were too big to fail and that their creditors would be supported in the event of a crisis.

The requirement for institutions to devise their own "living wills" might be a partly symbolic step in the sense that even the most thoughtful plan could well be discarded in the event of an actual crisis, especially if the genesis of the crisis was not well anticipated. Even so, the preparation of a living will may provide a signal that regulators contemplate failures rather than bailouts.

The new orderly liquidation authority in Title II of Dodd–Frank could fundamentally change the way in which problems at large financial institutions are resolved. As noted earlier, this should have profound impacts on the cost of funding for large, complex financial institutions. Bondholders and other creditors are now more likely to incur losses if a firm fails, even though the Title II authority allows for the deployment of government resources to support a firm and slow its demise. Absent additional Congressional action (which is now harder to imagine, given the unpopularity of the TARP), in the case of a future failure of a large financial institution that involves resolution of the holding company beyond simply the insured depository institution, bondholders will incur losses.

While it is difficult to predict how the resolution authority will be used, it seems likely that the problems following Lehman's demise will lead the FDIC to initially deploy government funds to keep a firm in operation during resolution. The FDIC might then use its new Title II authorities to arrange a debt-for-equity swap that recapitalizes the failing firm, with the former bondholders as the new owners. Such a debt-for-equity recapitalization would be similar to a pre-packaged Chapter 11 reorganization under the bankruptcy code, although the Title II authorities would allow this to be done faster and with the government providing the equivalent of debtor-in-possession financing.

Losses to the government from such financing ultimately would be borne by bondholders. The resolution authority provides government officials with an open checkbook to act through the troubled firm, with bondholders picking up the tab. It seeks to narrow the FDIC's scope of action in resolution by guaranteeing bondholders that they will receive as much in resolution as would have been the case under bankruptcy, but this still gives scope for actions to keep the firm operating under resolution.

The possibility of having such a swap imposed on them should affect the terms under which potential creditors, such as bond buyers, are willing to provide funding to financial institutions that might be taken into resolution. A potentially worrisome implication of the new resolution authority is that it could give providers of funding to banks an incentive to flee at early signs of trouble. Such a run from failing institutions is an important disciplining device, but the regime change could mean a more hair-trigger response and inadvertently prove destabilizing.

The resolution authority will be incomplete and perhaps unworkable until there is more progress on the international coordination of bankruptcy regimes. In the case of Lehman's failure, for example, the U.K. bankruptcy regime disrupted the operations of many U.S.-based firms when it froze their overseas assets. Appendix 7 illustrates the degree to which many large financial institutions work broadly across the global financial system. While 85 percent or more of some large institutions' assets are domestic—those of Bank of America, Mitsubishi UFJ, or especially the large Chinese banks—others, such as Barclays, have more than half of their assets outside their home countries.

International coordination of both regulatory regimes for both normal times and during resolution or bankruptcy procedures will be crucial for the continued evolution of the global financial system.[43] As Brummer (2012) points out, "In the absence of detailed, prescriptive global standards, national regulators enjoy considerable discretion with regard to their local approaches. In practice, such flexibility means any one country's efforts to deal with the problem can potentially be undercut by another country's inaction" (p. 250).

Other policy approaches combine the three categories listed in this section. The use of regular stress tests, for example, that provides better information for regulators and market participants, will in turn have an impact on bank behavior; transparency can provide a market-based incentive for prudence. While this will not directly address the potential for financial institutions to become too big to fail, such information and the resulting incentives could help affect behavior in a way that makes it less likely that future failures will transpire.

Conclusion

The idea that some financial institutions are too big to fail is not new. Neither is the challenge that such firms pose for policymakers. The regulatory regime for large, complex financial institutions is undergoing a vast change from that which prevailed before the financial crisis. Firms will now be required to hold more capital, have more robust access to liquidity, undergo increased regulatory scrutiny, and face limitations on certain activities. In the United States and in other countries, many of these changes are evolving as the rulemaking process moves forward and as new regulations are implemented.

These changes will bring both costs and benefits. Higher capital and liquidity requirements, for example, will affect lending activity and thus the overall economy, but the quantitative impact remains to be seen. The new resolution authority is likely to have an impact on creditor behavior and thus on funding costs, but it remains unclear how great this effect will be. It will be necessary for policymakers to monitor such impacts over time and to adjust the regime as needed to ensure that the benefits of improved stability are commensurate with the costs involved.[44]

43. See, for example, Prabha and Wihlborg (2012) for a discussion of this issue as it relates to global bank organizational structure.
44. For a skeptical assessment of recent financial reform efforts and a new approach to improving regulatory performance, see Barth, Caprio, and Levine (2012).

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Appendix 1: U.S. 50 biggest bank holding companies, Q4 2011
(8 of 29 G-SIFIs identified by the Financial Stability Board are highlighted)

Bank holding company	Total assets ($ billions)	Total assets (% of U.S. GDP)	Deposits to Total assets (%)	Common equity to total assets (%)	Market cap to common equity (%)
JPMorgan Chase & Co.	2,266	14.8	49.8	7.8	71.1
Bank of America Corporation	2,137	13.9	48.4	9.9	27.6
Citigroup Inc.	1,874	12.2	46.4	9.6	42.9
Wells Fargo & Company	1,314	8.6	70.1	9.9	111.4
Goldman Sachs Group Inc.	924	6.0	5.0	7.4	67.9
Metlife, Inc.	800	5.2	1.3	7.3	56.7
Morgan Stanley	750	4.9	8.8	9.1	42.5
Taunus Corporation	355	2.3	7.8	1.5	Private
U.S. Bancorp	340	2.2	67.9	9.5	159.6
HSBC North America Holdings Inc.	331	2.2	41.5	9.5	Private
Bank of New York Mellon Corporation	326	2.1	67.4	10.5	70.4
PNC Financial Services Group Inc.	271	1.8	69.3	13.1	85.3
State Street Corporation	216	1.4	72.7	8.7	103.8
Capital One Financial Corporation	206	1.3	62.3	14.4	65.6
TD Bank US Holding Company	201	1.3	81.5	10.6	n.a
Ally Financial Inc.	184	1.2	23.3	6.8	n.a.
SunTrust Banks Inc.	177	1.2	72.3	11.2	47.8
BB&T Corporation	175	1.1	71.6	10.0	100.4
American Express Company	152	1.0	28.3	12.3	292.1
Citizens Financial Group Inc.	130	0.8	71.6	18.0	n.a
Regions Financial Corporation	127	0.8	75.3	10.5	40.6
BMO Financial Corp	117	0.8	64.1	11.2	Private
Fifth Third Bancorp	117	0.8	73.5	11.0	91.0
Northern Trust Corporation	100	0.7	82.5	7.1	134.3
UnionBanCal Corporation	90	0.6	71.8	13.2	n.a
KeyCorp	89	0.6	69.8	10.9	76.1
RBC USA Holdco Corporation	83	0.5	25.5	10.9	Private
BancWest Corporation	78	0.5	70.4	10.9	n.a
M&T Bank Corporation	78	0.5	76.2	10.8	114.2
Discover Financial Services	69	0.5	57.0	12.0	156.7
BBVA USA Bancshares Inc.	63	0.4	73.0	16.7	Private
Comerica Incorporated	61	0.4	78.2	17.2	48.6
Huntington Bancshares Incorporated	54	0.4	79.6	12.6	69.1
Zions Bancorporation	53	0.3	80.7	9.6	59.0
Utrecht-America Holdings Inc.	47	0.3	18.0	9.9	Private
CIT Group Inc.	45	0.3	13.7	4.0	386.8
New York Community Bancorp Inc.	42	0.3	53.1	21.2	60.8
Popular, Inc.	37	0.2	74.8	14.9	25.6
First Niagara Financial Group Inc.	33	0.2	59.6	11.8	78.0
Synovus Financial Corp.	27	0.2	82.5	16.4	24.8
BOK Financial Corporation	25	0.2	73.6	7.4	208.9
First Horizon National Corporation	25	0.2	65.4	11.2	73.9
City National Corporation	24	0.2	86.1	11.3	86.4
East West Bancorp Inc.	22	0.1	79.6	9.8	137.5
Associated Banc-Corp	22	0.1	68.8	10.2	87.5
First Citizens Bancshares Inc.	21	0.1	84.2	13.4	64.2
Commerce Bancshares Inc.	21	0.1	81.3	9.0	182.9
Cullen/Frost Bankers Inc.	20	0.1	82.6	10.6	149.4
SVB Financial Group	20	0.1	83.7	11.4	90.9
Hancock Holding Company	20	0.1	79.4	11.4	120.3
TOTAL ASSETS	14,759				

n.a. = Not available (the company is a subsidiary or has a pending listing).

Sources: Federal Reserve Bank of Chicago, National Information Center, Federal Reserve, Bloomberg, U.S. Bureau of Economic Analysis.

Appendix 2: Financial institutions that received U.S. government capital injections

Bank		Government financial assistance		Current Status		Selected information prior to first receiving funds [1]					
		First received	Funds received ($ billions)	50 biggest BHCs as of Q4 2011	Total assets (US$bn) (Q4, 2011)	Total assets ($ billions)	Risk-weighted assets ($ billions)	Common equity to assets (%)	Tangible common equity to assets ratio (%)	Tier1 risk-based capital ratio	Total risk-based capital ratio
1	AIG	11/25/2008	69.8	N/A	556	1,022	n.a.	7.0	3.6	n.a.	n.a.
2	Fannie Mae	2/25/2009	59.9	N/A	3,211	912	n.a.	-4.1	-4.1	n.a.	n.a.
3	Freddie Mac	11/24/2008	50.7	N/A	2,172[2]	804	n.a.	-3.6	n.a.	n.a.	n.a.
4	Citigroup Inc.	10/28/2008	45.0	Yes	1874	2,050	1,176	4.8	2.1	8.2	11.7
5	Bank of America Corporation	10/26/2008	45.0	Yes	2137	1,831	1,329	7.5	2.5	7.6	11.5
6	Wells Fargo & Company	10/29/2008	25.0	Yes	1314	1,310	1,101	5.2	2.3	7.84	11.83
7	JPMorgan Chase & Co.	10/28/2008	25.0	Yes	2266	2,251	1,261	6.1	3.8	8.9	12.6
8	Morgan Stanley	10/26/2008	10.0	Yes	750	987	297	3.5	3.1	12.7	19.0
9	Goldman Sachs Group Inc.	10/28/2008	10.0	Yes	924	1,082	379	3.9	3.4	11.6	15.2
10	PNC Financial Services Group Inc.	12/31/2008	7.6	Yes	271	146	120	9.8	3.4	8.2	11.9
11	U.S. Bancorp	11/14/2008	6.6	Yes	340	247	223	8.2	3.7	8.5	12.3
12	SunTrust Banks Inc.	11/14/2008	4.9	Yes	177	175	162	10.0	5.8	8.2	11.2
13	Capital One Financial	11/14/2008	3.6	Yes	206	155	n.a.	16.5	8.3	12.0	14.9
14	Regions Financial Corp	11/14/2008	3.5	Yes	127	146	116	9.2	5.0	10.4	14.6
15	Fifth Third Bancorp	12/31/2008	3.4	Yes	117	116	114	8.3	5.0	8.6	12.3
16	Hartford Financial SVCS	6/26/2009	3.4	No	304	276	n.a.	2.8	2.5	n.a.	n.a.
17	American Express Company	1/9/2009	3.4	Yes	152	126	n.a.	9.4	7.0	9.7	11.1
18	BB&T Corporation	11/14/2008	3.1	Yes	175	137	212	9.4	5.2	9.4	14.4
19	Bank of New York Mellon Corp.	10/26/2008	3.0	Yes	326	268	125	10.3	2.0	9.3	12.8
20	KeyCorp	11/14/2008	2.5	Yes	89	101	109	7.9	6.2	8.6	12.4
21	CIT Group Inc.	12/31/2008	2.3	Yes	45	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
22	Comerica Incorporated	11/14/2008	2.3	Yes	61	65	n.a.	7.4	7.2	10.7	14.7
23	State Street Corporation	10/26/2008	2.0	Yes	216	286	75	4.6	2.3	16.0	17.2
24	Northern Trust Corporation	11/14/2008	1.6	Yes	100	82	51	6.0	5.4	13.1	15.4
25	Zions Bancorporation	11/14/2008	1.4	Yes	53	55	52	8.9	5.7	10.2	14.3
26	Huntington Bancshares Incorporated	11/14/2008	1.4	Yes	54	55	47	10.6	4.3	8.8	12.0
27	Discover Financial Services	3/13/2009	1.2	Yes	69	40	n.a.	14.8	13.7	n.a.	n.a.
28	Synovus Financial Corp.	12/19/2008	1.0	Yes	27	34	32	9.8	8.4	8.8	12.2
29	Lincoln National Corp.	7/10/2009	1.0	No	203	167	n.a.	5.4	3.4	n.a.	n.a.
30	Popular Inc.	12/5/2008	0.9	Yes	37	40	31	6.0	4.4	9.1	10.4
31	M&T Bank Corporation	11/14/2008	0.6	Yes	78	66	37	9.4	4.3	8.8	12.8
32	First Horizon National Corporation	11/14/2008	0.9	Yes	25	33	26	7.9	7.1	11.1	16.1

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		First received	Funds received ($ billions)	50 biggest BHCs as of Q4 2011	Total assets (US$bn) (Q4, 2011)	Total assets ($ billions)	Risk-weighted assets ($ billions)	Common equity to assets (%)	Tangible common equity to assets ratio (%)	Tier1 risk-based capital ratio	Total risk-based capital ratio
33	Associated Banc-Corp	11/21/2008	0.5	Yes	22	22	18	10.5	6.2	9.2	11.1
34	Webster Financial Corp.	11/21/2008	0.4	No	19	18	14	9.1	4.8	10.8	13.2
35	City National Corporation	11/21/2008	0.4	Yes	24	16	27	10.2	7.1	9.1	11.0
36	First BanCorp	1/16/2009	0.4	No	14[2]	19	14	5.1	4.9	11.6	12.8
37	East West Bancorp, Inc.	12/5/2008	0.3	Yes	22	12	n.a.	9.4	6.5	8.8	10.6
38	SVB Financial Group	12/12/2008	0.2	Yes	20	8	n.a.	9.1	9.0	9.9	14.3
39	First Niagara Financial Group Inc.	11/21/2008	0.2	Yes	33	9	6	16.0	7.1	7.6	11.3
	Other 668 financial institutions		20.1	No							
Total BHCs that received bailouts and are current among 50 biggest BHCs			Total = $218	32 BHCs	Total = 12,131	Total = 11,954	Total = 7,198				
Average for 32 BHCs which are currently among 50 biggest BHCs								8.7	5.4	9.7	13.1
Average for all publicly traded U.S. banks (prior to the bailout period) [2]								8.7	8.1	14.6	13.8

Note: First Niagara Financial Group is included as the last bank on the list of Capital Purchase Program because it is included in our list of the 50 U.S. biggest banks.

N/A = Not Applicable

n.a. = Not Available

(1) The subsequent quarter is used if the data in the quarter prior to bailout is not available.

(2) As of Q3 2011.

Sources: Bloomberg, Milken Institute.

Appendix 3: Spearman rank correlations (based on information from Appendix 2)

	Funds received	Total assets (Q4, 2011)	Pre-bailout total assets	Pre-bailout risk-weighted assets	Pre-bailout equity to total assets	Pre-bailout tangible common equity to total assets	Pre-bailout Tier1 risk-based capital
Total assets (Q4, 2011)	0.9197** (0.0000) 39						
Pre-bailout total assets	0.9162** (0.0000) 38	0.9677** (0.0000) 38					
Pre-bailout risk-weighted assets	0.9711** (0.0000) 27	0.9571** (0.0000) 27	0.9543** (0.0000) 27				
Pre-bailout equity to total assets	-0.4390** (0.0058) 38	-0.4869** (0.0019) 38	-0.5439** (0.0004) 38	-0.4015** (0.0379) 27			
Pre-bailout tangible common equity to total assets	-0.5865** (0.0001) 37	-0.7189** (0.0000) 37	-0.7508** (0.0000) 37	-0.6536** (0.0002) 27	0.6063** (0.0001) 37		
Pre-bailout Tier1 risk-based capital	-0.1977 (0.2782) 32	-0.1986 (0.2759) 32	-0.1221 (0.5055) 32	-0.2566 (0.1964) 27	-0.2851 (0.1137) 32	0.1471 (0.4216) 32	
Pre-bailout total risk-based capital	0.1186 (0.5178) 32	0.1439 (0.4320) 32	0.1830 (0.3162) 32	0.0979 (0.6271) 27	-0.3697** (0.0373) 32	-0.0626 (0.7337) 32	0.7432** (0.0000) 32

Note: The numbers in parentheses are p-values, and the numbers in the third line are the number of observations.
** indicates the significance level of 5 percent.

Appendix 4: Fifty biggest U.S. commercial banks and their holding companies (BHCs), Q4 2011

Bank	Total assets ($ billions)	BHC name	Consolidated BHC total assets ($billions)	Bank's total assets/BHC total assets (%)
JPMorgan Chase Bank, National Association	1,812	JPMorgan Chase & Co.	2,266	80.0
Bank of America, National Association	1,452	Bank of America Corporation	2,137	68.0
Citibank, National Association	1,289	Citigroup Inc.	1,874	68.8
Wells Fargo Bank, National Association	1,161	Wells Fargo & Company	1,314	88.4
U.S. Bank, National Association	330	U.S. Bancorp	340	97.2
PNC Bank, National Association	263	PNC Financial Services Group Inc.	271	97.0
Bank of New York Mellon	256	Bank of New York Mellon Corporation	326	78.6
State Street Bank & Trust Company	212	State Street Corporation	216	98.1
HSBC Bank USA, National Association	206	HSBC North America Holdings Inc.	331	62.2
TD Bank, National Association	189	TD Bank US Holding Company	201	94.0
SunTrust Bank	171	SunTrust Banks Inc.	177	96.8
Branch Banking and Trust Company	169	BB&T Corporation	175	96.7
FIA Card Services, National Association	167	Bank of America Corporation	2,137	7.8
Capital One, National Association	133	Capital One Financial Corporation	206	64.8
Regions Bank	123	Regions Financial Corporation	127	97.1
Chase Bank USA, National Association	122	JPMorgan Chase & Co.	2,266	5.4
Fifth Third Bank	115	Fifth Third Bancorp	117	97.9
RBS Citizens, National Association	107	Citizens Financial Group Inc.	130	82.4
Goldman Sachs Bank USA	104	Goldman Sachs & Group Inc.	924	11.2
The Northern Trust Company	100	Northern Trust Corporation	100	99.6
BMO Harris Bank, National Association	97	BMO Financial Corp	117	82.9
Union Bank, National Association	89	UnionBancal Corporation	90	99.2
KeyBank National Association	86	KeyCorp	89	97.1
Ally Bank	85	Ally Financial Inc.	184	46.4
Manufacturers & Traders Trust Company	77	M&T Bank Corporation	78	98.7
Capital One Bank USA, National Association	71	Capital One Financial Corporation	206	34.5
Discover Bank	68	Discover Financial Services	69	97.5
Morgan Stanley Bank, National Association	67	Morgan Stanley	750	8.9
Compass Bank	63	BBVA USA Bancshares Inc.	63	100.0
Bank of the West	62	BancWest Corporation	78	79.9
Comerica Bank	61	Comerica Incorporated.	61	99.7
The Huntington National Bank	54	Huntington Bancshares Incorporated	54	99.5
Deutsche Bank Trust Company Americas	51	Taunus Corporation	355	14.4
Wells Fargo Bank South Central, National	34	Wells Fargo & Company	1,314	2.6
First Niagara Bank, National Association	33	First Niagara Financial Group Inc.	33	99.8
First Republic Bank	28	Independent bank	N/A	N/A
RBC Bank USA	27	RBC USA Holdco Corporation	83	32.7
Synovus Bank	27	Synovus Financial Corp	27	98.9
Metlife Bank, National Association	26	Metlife, Inc.	800	3.2
BOKF, National Association	25	BOK Financial Corporation	25	99.5
First Tennessee Bank, National Association	25	First Horizontal National Corporation	25	99.1
City National Bank	23	City National Corporation	24	98.5
East West Bank	22	East West Bancorp Inc.	22	100.0
Associated Bank, National Association	22	Associated Banc-Corp	22	99.0
First-Citizens Bank & Trust Company	21	First Citizens Bancshares Inc.	21	98.5
Commerce Bank	20	Commerce Bancshares Inc.	21	99.2
The Frost National Bank	20	Cullen/Frost Bankers Inc.	20	99.9
TCF National Bank	19	TCF Financial Corporation	19	100.0
Silicon Valley Bank	19	SVB Financial Group	20	93.9
Webster Bank, National Association	19	Webster Financial Corporation	19	98.3
		Number of BHCs = 45‡		
Total assets of 50 biggest banks: $9.8 trillion		**Total assets of 45 BHCs that control top 50 banks: $14.4 trillion**		
Total assets of all U.S. banks: $12.6 trillion		**Total assets of all U.S. BHCs: $16.5 trillion**		
Top 50 banks account for 77.8% of total bank assets		**These 45 BCHs account for 87% of total all BHC assets**		

‡ All but 2 of 45 holding companies (TCF Financial Corporation and Webster Financial Corporation) are on the list of the 50 biggest BHCs in Appendix 1. Total assets of U.S. bank holding companies are from reporting forms FR Y-9Cs (consolidated statements). BHCs with total consolidated assets of $500 million or more are required to file this report.

Sources: National Information Center, Federal Reserve, Federal Deposit Insurance Corporation, Milken Institute.

Appendix 5: World's 50 publicly traded biggest banks and bank holding companies, Q4 2011 (27 of 29 G-SIFIs identified by the Financial Stability Board are highlighted)

Bank	Home country	Total assets ($ billions)	Assets (% of home country GDP)	Deposits to assets (%)	Common equity to assets (%)	Market cap to common equity (%)
Deutsche Bank AG	Germany	3,082	84.9	25.8	2.4	46.8
BNP Paribas	France	2,746	97.8	25.8	3.2	53.7
Mitsubishi UFJ Financial Group	Japan	2,722	46.5	58.3	4.7	51.5
HSBC Holdings Plc	United Kingdom	2,716	109.5	46.8	5.9	85.4
Barclays Plc	United Kingdom	2,390	96.3	25	3.4	41.3
Industrial & Comm. Bank of China	China	2,380	34.1	80.3	6.0	164.7
Crédit Agricole	France	2,349	83.7	19.8	2.7	22.5
Royal Bank of Scotland Group Plc	United Kingdom	2,315	93.3	35.8	4.6	17.4
JPMorgan Chase & Co.	United States	2,266	14.8	49.8	7.8	71.1
Bank of America Corporation	United States	2,137	13.9	48.4	9.9	27.6
Mizuho Financial Group	Japan	2,057	35.1	49.1	2.9	59.7
Citigroup Inc	United States	1,874	12.2	46.4	9.6	42.9
China Construction Bank	China	1,852	26.5	82.7	6.6	181.3
Agricultural Bank of China	China	1,824	26.1	83.7	5.4	136.7
Bank of China Limited	China	1,814	26	68.8	6.2	125.4
ING Groep NV	Netherlands	1,731	201.7	35.8	3.5	46
Banco Santander SA	Spain	1,688	109.9	45.6	5.6	68.4
Société Générale	France	1,684	60	26.7	3.9	26.6
Sumitomo Mitsui Financial Group	Japan	1,673	28.6	63.2	3.9	67.5
UBS AG	Switzerland	1,605	241	22.9	3.9	72.6
Lloyds Banking Group Plc	United Kingdom	1,567	63.2	40.9	4.6	38.3
Wells Fargo & Company	United States	1,314	8.6	70.1	9.9	111.4
UniCredit SpA	Italy	1,283	57.1	41.3	5.8	53.4
Credit Suisse Group AG	Switzerland	1,178	176.8	29.7	4.6	52.5
Commerzbank AG	Germany	997	27.5	30.7	3.4	25.8
Goldman Sachs Group Inc.	United States	924	6	5	7.4	67.9
Nordea Bank AB	Sweden	906	158.5	27.6	3.8	91.6
Intesa Sanpaolo	Italy	901	40.1	28.1	9	42.5
Banco Bilbao Vizcaya Argentaria SA	Spain	789	51.4	44	7.1	75.5
Metlife, Inc.	United States	800	5.2	1.3	7.3	56.7
Royal Bank of Canada RBC	Canada	755	42.9	56.5	5.1	181.5
Morgan Stanley	United States	750	4.9	8.8	9.1	42.5
Commonwealth Bank of Australia	Australia	713	47.3	52.8	5.2	235.6
National Australia Bank	Australia	712	47.3	42.7	5.3	128.1
Toronto Dominion Bank	Canada	689	39.2	68.4	6.3	157.7
Bank of Communications Co. Ltd	China	686	9.8	72.5	6	124.8
Natixis	France	654	23.3	14	4	29.8
Westpac Banking Corporation	Australia	643	42.6	46.4	6.5	144.6
Danske Bank	Denmark	613	175.7	26.3	3.8	51.1
Bank of Nova Scotia	Canada	578	32.9	65.2	5.8	172.4
Standard Chartered Plc	United Kingdom	568	22.9	60.4	6.7	136.7
Banque Populaire (1)	France	563	20.1	31.4	4.9	N/A
Dexia	Belgium	557	105.2	10.7	0.3	49.3
Australia and NZ Banking Group	Australia	555	36.8	49.7	7	130
Resona Holdings Inc	Japan	527	9	81.2	1.5	147.1
Banco do Brasil S.A.	Brazil	512	20.4	42.7	5.8	120.9
Bank of Montreal-Banque de Montreal	Canada	479	27.3	59.1	5.4	147.1
Fortis Bank -BNP Paribas Fortis	Belgium	465	87.9	45.9	5.7	68.2
Itaú Unibanco Holdings	Brazil	452	17.9	26.1	8.2	112
Sumitomo Mitsui Trust Holdings	Japan	435	7.4	64.6	5.3	25.5
TOTAL ASSETS		65,470				

Note: Q3 2011 data are used if Q4 2011 data are not available. GDP is from 2011 IMF estimates.

(1) Data as of 2009. In that year, the Banques Populaires and the Caisses d'Epargne merged into the BPCE Groupe.

Sources: Federal Reserve Bank of Chicago, BankScope, Bloomberg.

Appendix 6: Selected information of non-U.S. financial institutions worldwide that received government capital injections and biggest non-U.S. banks and bank holding companies

Country	Bank	Government financial assistance		Current Status		Selected information prior to first receiving funds[1]					
		First received	Funds received ($ billions)	50 biggest banks in the world as of Q4 2011	Total assets ($ billions) Q4 2011[2]	Total assets ($billions)	Risk-weighted assets ($billions)	Common equity to assets (%)	Tangible common equity to assets ratio (%)	Tier1 risk-based capital ratio	Total risk-based capital ratio
Six home countries of the world's current 50 banks that provided capital injections to financial institutions (excluding the United States)											
Belgium	KBC Groep	10/27/2008	7.12	No	382	540	207	3.7	2.7	8.8	12.5
	Fortis	9/29/2008	6.08	Yes	465	1,119	394	4.4	4.2	8.6	n.a.
	Dexia	9/30/2008	2.59	Yes	557	981	191	1.4	1.0	11.4	12.3
France	BNP Paribas	10/22/2008	6.60	Yes	2,746	2,860	765	2.4	1.7	7.6	11.0
	Société Générale	10/21/2008	4.40	Yes	1,684	1,693	536	2.9	2.3	8.2	10.9
	Crédit Agricole	10/21/2008	3.88	Yes	2,349	2,305	504	2.3	0.9	8.9	9.6
	Crédit Mutuel Group	10/21/2008	1.55	No	790	812	282	4.2	4.1	9.8	9.5
	Groupe Caisse d'Epargne	10/21/2008	1.42	No	907	907	31	2.6	2.4	8.1	9.6
	Dexia	9/30/2008	1.29	Yes	557	981	191	1.4	1.0	11.4	12.3
	Banque Populaire	10/21/2008	1.23	Yes	n.a.	563	n.a.	4.9	4.6	n.a.	9.4
Germany	Deutsche Bank AG	N/A	N/A	Yes	3,082	2,899	449	1.7	1.2	10.3	12.7
	Commerzbank AG	11/3/2008	23.54	Yes	997	838	322	2.4	2.1	7.6	11.3
	Bayerische Landesbank	12/18/2008	14.44	No	430	606	2,395	2.6	2.0	6.4	11.5
	Hypo Real Estate Holding	3/28/2009	7.37	No	515	586	133	-0.4	-0.4	6.2	8.6
	WestLB	1/23/2008	6.47	No	300	399	161	2.3	2.2	6.5	9.7
	Landesbank Baden-Wurttemberg	12/15/2009	6.47	No	500	787	274	1.7	1.6	n.a.	11.1
	IKB Deutsche Industriebank	2/13/2008	1.94	No	45	79	48	2.3	2.3	6.0	9.8
Netherlands	ING Groep NV	10/20/2008	12.94	Yes	1,731	1,935	485	1.7	1.2	n.a.	n.a.
	Fortis	9/29/2008	5.18	Yes	465	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Aegon	11/30/2008	3.00	No	448	418	n.a.	3.2	-0.5	n.a.	n.a.
Switzerland	Credit Suisse Group AG	N/A	N/A	Yes	1,178	1,242	283	2.8	2.0	10.4	14.6
	UBS AG	10/16/2008	6.42	Yes	1,605	1,780	296	2.3	1.6	10.8	14.9
United Kingdom	HSBC Holdings Plc	N/A	N/A	Yes	2,716	2,547	1,232	5.0	3.4	8.8	11.9
	Barclays Plc	N/A	N/A	Yes	2,390	2,719	702	1.6	1.0	7.9	12.6
	Standard Chartered Plc	N/A	N/A	Yes	568	397	201	5.1	3.4	8.5	15.1
	Royal Bank of Scotland Group Plc	10/13/2008	70.45	Yes	2,315	3,745	1,282	3.3	0.9	9.1	13.2
	Lloyds Banking Group Plc	10/13/2008	17.48	Yes	1,567	732	306	2.9	2.3	8.6	11.3
	Northern Rock	8/5/2008	5.26	No	103	197	53	1.6	1.6	5.1	10.2
	HBOS	10/13/2008	4.64	Yes[3]	1,0001	1,357	660	3.0	2.5	7.3	10.9
	Bradford & Bingley	9/29/2008	2.24	No	701	104	35	2.2	2.1	7.6	14.0

Country	Bank	Government financial assistance		Current Status		Selected information prior to first receiving funds[1]					
		First received	Funds received ($ billions)	50 biggest banks in the world as of Q4 2011	Total assets ($ billions) Q4 2011[2]	Total assets ($billions)	Risk-weighted assets ($billions)	Common equity to assets (%)	Tangible common equity to assets ratio (%)	Tier1 risk-based capital ratio	Total risk-based capital ratio
Other nine home countries of the world's current 50 banks that did not provide capital injections to financial institutions[4]											
Australia	Commonwealth Bank of Australia	N/A	N/A	Yes	713	467	197	5.3	3.7	8.2	11.6
	National Australia Bank	N/A	N/A	Yes	712	519	271	4.6	3.8	7.4	10.9
	Westpac Banking Corporation	N/A	N/A	Yes	643	347	154	4.0	2.8	7.8	10.8
	Australia & New Zealand Banking Group	N/A	N/A	Yes	555	372	218	5.5	4.7	7.7	11.1
Brazil	Banco do Brasil S.A.	N/A	N/A	Yes	512	239	n.a.	6.1	6.1	13.0	13.6
	Itaú Unibanco Holding	N/A	N/A	Yes	452	206	n.a.	8.0	n.a.	14.7	14.9
Canada	Royal Bank of Canada RBC	N/A	N/A	Yes	755	621	248	4.1	2.4	9.4	11.6
	Toronto-Dominion Bank	N/A	N/A	Yes	689	496	180	5.8	2.4	9.5	13.4
	Bank of Nova Scotia	N/A	N/A	Yes	578	451	220	4.1	3.6	9.8	13.9
	Bank of Montreal-Banque de Montreal	N/A	N/A	Yes	479	366	178	4.1	3.6	9.9	12.3
China	Industrial & Commercial Bank of China	N/A	N/A	Yes	2,380	1,674	804	5.4	5.3	10.0	12.1
	China Construction Bank	N/A	N/A	Yes	1,852	1,107	615	6.2	6.1	10.2	12.2
	Bank of China Ltd.	N/A	N/A	Yes	1,814	946	575	6.7	6.7	10.9	13.8
	Agricultural Bank of China	N/A	N/A	Yes	1,824	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Bank of Communications Co. Ltd.	N/A	N/A	Yes	686	355	185	5.7	5.7	10.0	14.1
Denmark	Danske Bank	N/A	N/A	Yes	613	663	175	3.0	2.2	10.1	13.9
Italy	UniCredit SpA	N/A	N/A	Yes	1,283	1,668	864	5.3	2.8	6.5	10.1
	Intesa Sanpaolo	N/A	N/A	Yes	901	892	560	8.0	n.a.	6.9	10.0
Japan	Mitsubishi UFJ Financial Group	N/A	N/A	Yes	2,722	1,827	1,034	3.6	3.2	7.6	10.6
	Mizuho Financial Group	N/A	N/A	Yes	2,057	1,443	607	1.5	1.4	7.4	11.5
	Sumitomo Mitsui Financial	N/A	N/A	Yes	1,673	1,046	597	2.8	2.5	7.1	10.3
	Resona Holdings Inc.	N/A	N/A	Yes	527	432	n.a.	-0.6	-0.7	n.a.	15.1
	Sumitomo Mitsui Trust Holding	N/A	N/A	Yes	435	161	n.a.	2.7	2.3	n.a.	n.a.
Spain	Banco Santander SA	N/A	N/A	Yes	1,688	1,436	665	5.3	3.2	7.9	11.4
	Banco Bilbao Vizcaya Argentaria	N/A	N/A	Yes	789	744	393	5.0	3.4	7.8	12.3
Sweden	Nordea Bank AB	N/A	N/A	Yes	906	619	272	4.0	3.4	n.a.	n.a.
Average for non-U.S. banks that received bailout funds and are currently among 50 biggest banks worldwide						1,607	495	2.7	2.0	9.0	11.6
Average for non-U.S. banks that *did not* receive bailout funds and are currently among 50 biggest banks worldwide						963	457	4.4	3.3	9.1	12.4

Note: This list includes financial institutions that received financial assistance from governments from 15 countries in which the 50 current biggest banks in the world are headquartered. The information for U.S. bank holding companies is provided in Appendix 2. Some financial institutions have assets that exceed the assets of some of the 50 biggest banks in the world, but they are not listed in Appendix 5 because they are not publicly traded or classified as banks or bank holding companies.

N/A = Not Applicable

n.a. = Not Available

(1) The subsequent quarter is used if the data in the quarter prior to bailout is not available.

(2) Q3 2011 data are used if Q4 2011 data are not available.

(3) Subsidiary of Lloyds Banking Group Plc.

(4) Selected information of banks that did not receive funds is as of the third quarter of 2008.

Sources: Bloomberg, Milken Institute.

Appendix 7: Ratio of domestic assets (revenue) relative to foreign assets (revenue), ranked by bank total asset size as of 2010

Bank	Home country	Total assets, 2010 ($ billions)	Domestic assets/total assets (%)	Total net revenue ($ billions)	Domestic net revenue/total net revenue (%)
BNP Paribas	France	2,671	48.0	58.2	34.9
Deutsche Bank AG	Germany	2,532	n.a.[1]	37.9	30.8
HSBC Holdings Plc	United Kingdom	2,455	50.9	80.0	34.3[8]
Royal Bank of Scotland Group Plc	United Kingdom	2,266	64.2	49.3	64.3
Bank of America Corporation	United States	2,265	85.6	110.2	79.1
Mitsubishi UFJ Financial Group	Japan	2,184	85.2[2]	53.0	79.0[9]
Credit Agricole	France	2,130	77.7	26.7	51.1
JPMorgan Chase & Co.	United States	2,118	61.0[3]	102.7	78.4
Industrial & Comm. Bank of China	China	2,038	96.3	56.3	97.1
UBS AG	Switzerland	2,003	9.9	30.8	39.6
Barclays Plc	United Kingdom	1,951	40.8	45.6	44.1[2]
Citigroup Inc.	United States	1,914	55.8[3]	86.6	30.8
Mizuho Financial Group	Japan	1,672	88.6	31.8	86.1[9]
ING Groep NV	Netherlands	1,667	51.7	72.8	31.3
China Construction Bank	China	1,640	97.5	48.1	97.9
Banco Santander SA	Spain	1,627	41.0	n.a.	n.a.
Bank of China Ltd.	China	1,587	81.5	40.9	80.3
Agricultural Bank of China	China	1,569	73.7	43.2	99.4
Lloyds Banking Group Plc	United Kingdom	1,546	88.1	36.2	100.0
Société Générale	France	1,513	71.9	35.0	49.5
Sumitomo Mitsui Financial Group	Japan	1,318	87.2	45.0	89.3
UniCredit SpA	Italy	1,242	41.7	34.0	36.9
Wells Fargo & Company	United States	1,227	100.0	85.2	100.0
Credit Suisse Group AG	Switzerland	1,105	17.9	30.2	29.3
Commerzbank AG	Germany	1,008	65.0[1]	16.8	63.4
Goldman Sachs Group Inc.	United States	911	99.9[3]	39.2	55.1
Intesa Sanpaolo	Italy	880	93.2	22.1	77.1
Morgan Stanley	United States	808	72.2	31.6	68.5
Nordea Bank AB	Sweden	777	22.9	12.4	34.8
Banco Bilbao Vizcaya Argentaria	Spain	739	66.0[4]	n.a.	n.a.
Metlife Inc.	United States	731	68.0	52.7	82.6[9]
Royal Bank of Canada RBC	Canada	714	55.6	27.8	67.8
National Australia Bank	Australia	662	73.2	18.1	64.3
Danske Bank	Denmark	655	82.4[5]	8.5	56.0
Westpac Banking Corporation	Australia	652	42.5	21.0	80.3[9]
Dexia	Belgium	651	90.5[6]	7.4	42.7
Natixis	France	612	76.4	5.3	60.1[2]
Toronto-Dominion Bank	Canada	609	57.3	21.9	63.4[2]
Bank of Communications Co. Ltd.	China	600	91.1	15.5	96.4
Bank of Nova Scotia	Canada	578	n.a.	n.a.	n.a.
Banque Populaire	France	536	n.a.	n.a.	n.a.
Standard Chartered Plc	United Kingdom	517	22.8[7]	16.1	9.5
Resona Holdings Inc.	Japan	516	100.0	8.7	100.0
Australia and NZ Banking Group	Australia	513	62.2	17.4	85.7[2][10]
Banco do Brasil S.A.	Brazil	484	98.6	38.4	100.0
Bank of Montreal-Banque de Montreal	Canada	480	n.a.[1]	11.8	75.1
Fortis Banque	Belgium	465	78.9	3.9	66.3[9]
Itaú Unibanco Holding	Brazil	438	n.a.[1]	n.a.	n.a.
Commonwealth Bank of Australia	Australia	425	80.3[5]	45.8	88.1[9]
Sumitomo Mitsui Trust Holding	Japan	160	100.0	3.9	84.3

Sources: Bloomberg; companies' representatives, FDIC, Milken Institute.
(1) Information obtained from companies' representatives.
(2) Data based on either 2009 or 2011.
(3) Data are the ratio of domestic assets to total assets of the FDIC-insured subsidiaries of the holding company. The ratio for the holding company could not be obtained from companies' representatives.
(4) Domestic assets are those from Spain and Portugal combined.
(5) The data are as of December 31, 2007.
(6) The data are as of December 31, 2008. Domestic assets are those in European Union countries.
(7) Americas, U.K., and the group's head office combined.
(8) Data on foreign revenues are based on revenue from other European countries.
(9) Data based on gross revenue.
(10) Domestic net revenue is from Australia and New Zealand combined.

About the Authors

James R. Barth is the Lowder Eminent Scholar in Finance at Auburn University, the senior finance fellow at the Milken Institute and a fellow of the Wharton Financial Institutions Center. His research focuses on financial institutions and capital markets, both domestic and global, with special emphasis on regulatory issues. An appointee of Presidents Ronald Reagan and George H.W. Bush, Barth was chief economist of the Office of Thrift Supervision and previously the Federal Home Loan Bank Board. He has also held the positions of professor of economics at George Washington University, associate director of the economics program at the National Science Foundation, and Shaw Foundation Professor of Banking and Finance at Nanyang Technological University. He has been a visiting scholar at the U.S. Congressional Budget Office, the Federal Reserve Bank of Atlanta, the Office of the Comptroller of the Currency and the World Bank. Barth's expertise has led him to testify before the U.S. House and Senate banking committees on several occasions. He has authored more than 200 articles in professional journals and has written and edited several books, including *Guardians of Finance: Making Regulators Work for Us, Fixing the Housing Market, The Rise and Fall of the U.S. Mortgage and Credit Markets: A Comprehensive Analysis of the Meltdown, China's Emerging Markets: Challenges and Opportunities, The Great Savings and Loan Debacle, The Reform of Federal Deposit Insurance*, and *Rethinking Bank Regulation: Till Angels Govern.*

Apanard (Penny) Prabha is an economist in the Financial Research Group at the Milken Institute. Her research focuses on financial institutions, open economy macroeconomics, emerging market economies, and financial crises. Her work has been published in the *Journal of International Money and Finance, International Review of Finance, Open Economies Review, The Journal of International Financial Markets, Institutions & Money*, and the *International Journal of Economics and Finance*. Prior to joining the Institute, Prabha was an assistant professor of economics at the University of Illinois at Springfield. While completing her Ph.D., she also held visiting scholar positions at the Claremont Institute for Economic Policy Studies and the Freeman Program in Asian Political Economy at the Claremont Colleges as well as a lecturer of economics at Pitzer College and the University of Redlands. Prabha received a Ph.D. in economics from Claremont Graduate University.

Phillip L. Swagel, a senior fellow at the Milken Institute, is a professor at the University of Maryland School of Public Policy, where he teaches classes on international economics and is an academic fellow at the Center for Financial Policy at the university's Robert H. Smith School of Business. Swagel was assistant secretary for economic policy at the Treasury Department from December 2006 to January 2009. In that position, he served as a member of the TARP

investment committee and advised Secretary Paulson on all aspects of economic policy. He previously worked at the American Enterprise Institute, the White House Council of Economic Advisers, the International Monetary Fund, and the Federal Reserve, and taught economics at Northwestern University, the University of Chicago Booth School of Business, and the McDonough School of Business at Georgetown University. He received a bachelor's degree in economics from Princeton University and a Ph.D. in economics from Harvard University.

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MILKEN INSTITUTE

1250 Fourth Street
Santa Monica, CA 90401
Phone: 310-570-4600

1101 New York Avenue NW, Suite 620
Washington, DC 20005
Phone: 202-336-8930

137 Market Street #10-02
Singapore 048943
Phone: 65-9457-0212

E-mail: info@milkeninstitute.org • www.milkeninstitute.org