# The Societal Benefits of Large Banks

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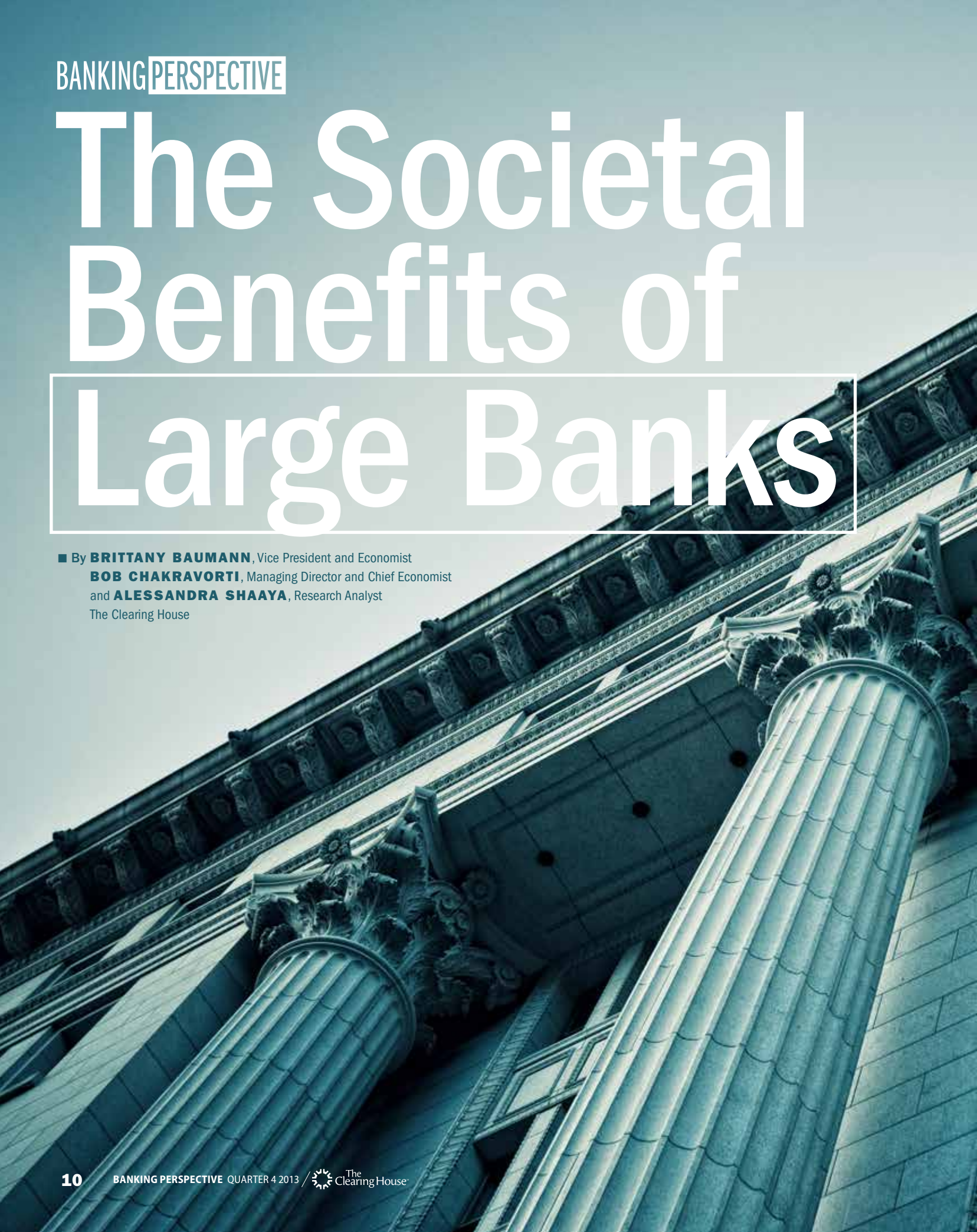

## Introduction

The safety and soundness of the largest banks and the ability to resolve them without major systemic disruptions are key concerns emerging from the 2008 financial crisis. Authorities have responded by proposing and implementing substantial changes to the regulatory framework governing financial institutions. Despite these reforms, calls to break up the largest and most complex banks remain a part of the current policy debate. Yet, the significant benefits that large and complex banks offer to customers, businesses, and the economy are often absent in this post-crisis discussion. In this article, we examine the benefits that large banks provide to society.

We concur that these banks should be more resilient to financial shocks and that every bank should be allowed to fail in an orderly manner. There are two ways to achieve this objective. One alternative is to require increases in loss-bearing debt and equity capital, enhanced liquidity that can be available even under stressed financial conditions, and greater reliance on sources of stable funding. Calibrated correctly, these measures should encourage banks to adjust their scale and scope in ways that reduce their systemic risk contribution while maximizing returns for their shareholders. The second alternative is to impose "structural limits" on financial firms that address their size, scope, complexity, or interconnectedness in order to reduce systemic risk. In the United States, recent reforms rely predominantly on the first approach as being more likely to bring about desired prudential improvements while balancing systemic stability and economic efficiency. Recent reforms in the United States have gone a long way in addressing these issues and changing the perceptions that any bank is "too-big-to-fail" (TBTF).[1]

We must note that the definition of 'large' varies. The Basel Committee on Banking Supervision (2013) designated eight U.S. Global Systemically Important Banks (G-SIBs), which include the six largest U.S. bank holding companies (BHCs), each with over $500 billion in assets, along with two custodian banks.[2] Meanwhile, the Board of Governors of the Federal Reserve System (2013) identified 18 banks required to participate in the Comprehensive Capital Adequacy Review (CCAR) "stress tests," suggesting that these banks are also systemically important.[3] The Dodd-Frank Act (Dodd-Frank) defines systemically important financial institutions (SIFIs) as those with greater than $50 billion in assets. Policymakers also classify financial institutions as systemically important based on other characteristics,

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1 TBTF in this context implies that a bank will not be closed by authorities at, before, or after its insolvency because of its systemic importance.

2 The six largest bank holding companies are JPMorgan Chase, Bank of America, Citibank, Goldman Sachs, Morgan Stanley, and Wells Fargo. The custodian banks are Bank of New York Mellon and State Street.

3 Of the 18 CCAR banks, those that are not G-SIBs are Ally Financial, American Express, BB&T, Capital One, Citi, Fifth Third, PNC, Regions, SunTrust, and U.S. Bancorp.

such as interconnectedness, the lack of readily available substitutes or financial institution infrastructure for the services they provide, global (cross-jurisdictional) activity, and complexity (Basel Committee on Banking Supervision, 2013).

In this context, one of the key building blocks in the decision process is a clear understanding of the economic benefits derived from large bank activities that are passed on to consumers, businesses, and the overall economy. Economists and policymakers have voiced their concerns about breaking up financial institutions without first conducting sufficient research on the benefits of large banks. Daniel Tarullo (2012), Federal Reserve Governor, stressed the need for further research on the structure of large banks, noting that "relatively little research has been undertaken" in regards to "scale and scope economies, especially as they relate to policy proposals directed at the too-big-to-fail problem in financial markets." In addition, William Dudley (2012), President of the Federal Reserve Bank of New York, emphasized that "with respect to size limitations, it is important to recognize that a new and much reduced size threshold could sacrifice socially useful economies of scale and scope benefits."

Literature examining the economic benefits of large banks focuses prominently on economies of scale. Recent studies suggest that economies of scale are present even at the largest banks. One academic study finds that breaking up the banks by imposing a $1 trillion size cap would cost society $79.1 billion annually (Wheelock and Wilson, 2012). An industry study estimates that the scale and scope benefits of large banks provide an estimated $50-$110 billion to society (The Clearing House (TCH), 2011). While additional research is warranted to fully quantify the value of large banks, these benefits would go a long way to offset the benefits of bank restructuring. Furthermore, there are various regulatory improvements that will continue to strengthen individual banking organizations and make the financial system more resilient to shocks.

In this article, we will first explore the recent academic and industry literature on the benefits of large banks from the perspective of economies of scale and scope along with the benefits of a large, diverse set of products and services provided by a large bank. Second, we will explore how large banks are able to leverage their broad customer bases to increase the pace and spread of innovations. Third, we will discuss how risk diversification is a key benefit of large banks that augments their resiliency and stability. Finally, we will examine the policy implications of our findings.

Our analysis finds the following:

- The most recent academic and industry research confirms significant scale and scope economies exist in even the largest banks.
- Scale and scope benefits are passed on to customers in the form of cost savings, technological advancements, increased convenience, and global reach.
- Given the continued progress in regulatory reform that increases financial stability and provides a more clearly articulated resolution process for any bank regardless of size, we find that the societal benefits of large banks should not be ignored when considering structural reforms.

## Economies of Scale

A key characteristic of large firms, including banks, is the existence of economies of scale. Economies of scale exist when an increase in cost results in a more than proportional increase in total output. This can be accomplished by the spreading of fixed costs across a large consumer base. Economies of scale not only benefit the producer, customers, and shareholders but also the economy as a whole. Until recently, research could not confirm the existence of scale economies in banks with assets above $100 billion. More recent research, however, finds evidence of economies of scale of all sizes, including the largest banks.[4] These findings are in part due to structural and technological changes in banking, such as the removal of branching restrictions and

4 See Berger and Mester (1997), Bossone and Lee (2004), Dijkstra (2013), Feng and Serilitis (2009), Hughes and Mester (1998) and (2013), Hughes, Lang, Mester and Moon (1996) and (2000), Hughes, Mester and Moon (2001), McAllister and McManus (1993), and Wheelock and Wilson (2001) and (2012).

advancements in information processing, respectively, along with improvements in empirical techniques.

In a recent study using contemporary bank cost-modeling, Hughes and Mester (2013) estimate a cost function to measure how banks' costs change with outputs in a sample of 842 top-tier BHCs in the United States in 2007. If a bank exhibits economies of scale, its estimated inverse cost elasticity with respect to output would be greater than one.[5] Costs include interest and non-interest expenses, cost of equity capital, and non-performing loans, while outputs include loans, liquid assets, securities, trading assets, and off-balance-sheet activities. Their model is more comprehensive than those in prior studies because they incorporate capital and off-balance activities and control for bank risk-taking. In particular, they show that the relevant factor of risk diversification (in addition to the spreading of fixed costs of information technology) can explain scale economies in banking by improving a bank's risk-expected-return tradeoff.[6] The intuition behind this result is the following: as bank scale increases, risks are also better diversified, and better diversification of risk means that the same expected return can be produced at lower risk. Not accounting for this factor can result in scale economies being underestimated.

Hughes and Mester (2013) find evidence of significant economies of scale in all bank sizes. In estimating inverse cost elasticities they find that when including the cost of equity capital and controlling for risk, scale economies intensify for banks of all sizes. Specifically, the average value of scale economies for banks with assets less than $50 billion is in the range of 1.13-1.18. For banks with assets between $50 billion and $100 billion, average scale economies is 1.23, while for banks with assets over $100 billion average scale economies increases to 1.35. Thus, the study finds scale economies in all banks in the sample, and these economies increase with bank asset size.

Like Hughes and Mester (2013), Wheelock and Wilson (2012) utilize an improved methodology of estimating

5 Many econometric studies estimate economies of scale by computing inverse cost elasticities, i.e., the percentage change in output due to a percentage change in cost.

6 Indeed, diversification is also relevant to scope economies and overall bank soundness and will be discussed in later sections.

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scale economies that involves nonparametric estimation of cost elasticities for banks of different sizes.[7] The authors examine a large panel dataset of U.S. banks and BHCs from 1984 to 2006 using a model of production that controls for the book value of equity capital and incorporates off-balance sheet activities.[8] They find evidence of increasing returns to scale in all but one of the banks with assets greater than $100 billion. In particular, they find that inverse cost elasticities lie above one for almost all banks, indicating increasing returns to scale in these banks. Their results are consistent across time and across asset size such that they have evidence of scale economies in each sample year and in each asset size quartile for nearly all banks. In a panel study of European banks covering a period from 2002 to 2011, Dijkstra (2013) also finds significant scale economies.

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An important question in these studies is whether TBTF perceptions of large banks explain economies of scale in large banks, as such factors may impact bank funding costs. Hughes and Mester (2013) conclude that large banks' technological efficiency in the transformation of inputs into outputs, rather than their status as TBTF institutions, accounts for scale economies for three reasons. First, they find evidence of scale economies in banks with assets lower than $100 billion. Second, they re-estimate the cost model without the largest banks, re-compute the scale economies using these costs, and find that economies are even larger on average for banks with assets greater than $100 billion. Finally, they study whether the potential funding cost advantages of larger banks is a factor by re-estimating the model using the funding costs of smaller banks. They find that scale economies remain significant and still increase in size, implying that the funding cost differentials between small and large banks do not explain economies of scale in larger banks. In another study that finds evidence of economies of scale in the largest banks, Anderson and Joeveer (2012) also conclude TBTF factors do not drive their findings.

Although these studies explain increases in bank size on an overall cost basis, they do not suggest how specific products and services are impacted. As highlighted by Hughes and Mester (2013), greater attention should be given to a bank's product mix when considering the measurement of scale economies. Anderson and Joeveer (2012) examine the product mix in large banks and identify wholesale banking activities as an important factor in explaining economies of scale. Additional empirical analysis on specific products is useful and offers insights on the effects of bank restructuring policies, such as caps on non-deposit funding.

Using a different approach, TCH (2011) examines the value of large banks by quantifying economies of scale by product.[9] The four main product categories are retail banking, payments, commercial banking, and capital markets. TCH (2011) finds that of these areas, payments and capital markets offer the highest estimated scale benefits of $10-20 billion and $5-15 billion, respectively. In aggregate, economies of scale deliver an estimated $25-45 billion of total annual value.

Given evidence of scale economies in banking, it is important to discuss how cost savings can be passed on to banks' customers. Competition among banks would suggest that the benefits of scale economies are passed through to customers in the form of lower prices and higher product quality including greater convenience and access. These findings of the incremental scale benefits of

7 New methods include nonparametric estimation, which uses rank statistics rather than directly assuming the data. Non-parametric methods help avoid the problem of misspecification in cost functions.

8 In this context, panel data is comprised of a set of firms over a period of time, allowing for analysis across firms and across time.

9 This study is one of the first to examine scale and scope benefits by product category. Because the study examines a cross-section of a limited number of banks, a necessary extension to this work would be a panel data analysis with a greater number of banks.

large banks provide evidence of the societal benefit of large banks and pave the way for future research in this area.

## Economies of Scope

Bank scope, or a diverse set of financial products offered by the largest banks, has production-side benefits, such as distribution of costs across multiple products, and demand-side benefits, such as product bundling and global footprint. Unfortunately, there are few studies that estimate the production- and demand-side scope benefits in banking.[10] Some studies, including a recent study of eurozone banks, report evidence of economies of scope, i.e., lower costs of joint production of goods within a firm than if a firm produced a single good.[11] Common intuition and recent research suggests that some product bundles provide benefits to consumers and businesses. For example, the spreading of costly information technology platforms, overhead, and monitoring costs over a large customer base suggests economies of scope may exist in large banks (Saunders and Walter, 2013). Moreover, the prevalence of cross-selling through a large and diverse client base is evidence of scope economies in financial intermediaries that are diversified across wholesale and retail activities (Saunders and Walter, 2013).

Calomiris (2009) also finds that the gains from increased scope accrue to customers "in the form of cheaper and better financial services" and of "savings in marketing costs and in the costs of information production." In a recent debate on breaking up big banks, Calomiris (2013) notes that the value of global universal banks comes from their geographic scope and scale; large banks add value to multinational businesses "from the perspective of their global customers" through their "unprecedented combination of products and services, global reach, IT platforms, and capacity to provide strategic financial advice and transactional execution."

As large banks provide a diverse set of products and services, one can quantify the aggregate benefit of these products and services by estimating the value of each product that large banks provide compared to the product provided by a smaller competitor—in other words, the benefits from the products and services that only large banks currently provide. TCH (2011) uses this methodology to quantify the incremental value of large banks' products and services. Similar to its analysis of the benefits of scale economies, TCH (2011) estimates the benefits of scope in four areas of banking: payments, capital markets, commercial banking, and retail banking.[12] As expected, the former two areas provide the largest portions of the total benefits. The total estimated benefit of scope in large banks is $15-35 billion annually, with banks larger than $500 billion in assets providing $10-20 billion of the total value. These values include not only cost benefits, but the benefits of accessing products and services not available at smaller banks. While aggregate values are informative, the study identifies specific products and services generating these benefits. Overall, customer benefits range from convenience and cost savings to liquidity and risk management.

> ...large banks' technological efficiency in the transformation of inputs into outputs, rather than their status as TBTF institutions, accounts for scale economies...

The area providing the highest level of benefits is capital markets, in which large banks play an essential and dominant role in helping companies and governments raise capital and in facilitating mergers and acquisitions of firms. Large banks can offer these services due to geographic and product scope as well as scale in markets and in their balance sheets. Large banks hold over 90 percent

10 See Clark (1988) for a review of the literature. Though the studies reviewed do not present overwhelming body of evidence, some findings confirm cost complementarities between specific products and one study even finds global economies of scope for certain product mixes.

11 These studies include Dijkstra (2013), Kim (1986), and Pulley and Humphrey (1993).

12 The total value of direct benefits to customers can be measured by estimating the number of customers using specific products in each area, the benefit each customer receives, and the fraction of this benefit that is uniquely provided by large bank. Moreover, the study attempts to account for activities that can be provided by bank consortiums.

of investment banking services in the United States and underwrite nearly 90 percent of short- and long-term debt for state and local governments.[13] More than half of deals in this sector involve more than one large bank, emphasizing the importance of several large players being present. Due to their size and scope, large banks can make large issuances and underwrite large deals as desired by their clients.[14]

Geographic scope, scale in custody, and scope in related products allow large banks to provide securities services for payments and clearing. Sophisticated IT platforms that large banks can afford play an important role and explain why large scope benefits lead to lower financing costs and overhead. Customers that benefit include large institutional investors who rely on securities services and analytics. In particular, custodian banks serve this function by optimizing investors' returns on portfolios across multiple asset classes, geographies, and jurisdictions.[15]

Scope in products and services creates value to customers in commercial and retail banking. Although small banks provide a multitude of benefits in retail banking, a large bank ecosystem provides numerous additional benefits to retail customers. For example, due to geographic reach and penetration, large banks provide easier access to branches, a larger network of no-fee ATMs, and cost savings to customers moving or traveling.

Large banks' presence in commercial banking is also important for international trade and commerce. As companies continue to become more global, large banks help promote the growth of the international economy through their role in supply chain management and intermediate goods production (Calomiris, 2009). Services, such as international cash management in different currencies and across countries, international lending, financing expansion of operations abroad, facilitating payments to suppliers, and guaranteeing liquidity all are essential to greater access to trade and international capital markets.

## Accessing Large Customer Bases and the Spread of Innovation

For the past several decades, large banks have aided in the spread of technological innovations, particularly in the areas of retail banking and payments and clearing. Large banks' extensive footprint and large, diverse, and dense customer base allow them to contribute to innovation. These attributes enable large banks to spread fixed costs associated with investments in new products and technologies. Hence, economies of scale are a relevant driver to the spread of innovations. Investment in technology is crucial to rendering the "economic benefits to size and scope" of banks, which are "likely to grow further with increasing globalization, complexity, and improved information and management systems" (Bailey and Elliot, 2013).

More specifically, large banks can adopt technologies that are in their early, costly stages, while smaller banks may prefer to wait until prices decline. The high customer density of large banks allows for greater sharing of costs among customers. Eventually, the provision of new technologies spreads to smaller banks, thereby benefiting the rest of the economy. The spread of technological innovations aided by large banks is a vital factor of technological growth.

What are the specific benefits implied by the spread of innovation? TCH (2011) identifies benefits in the same four product areas discussed earlier. Examples of innovations spread by large banks include ATMs, online and mobile banking, securities services development, and cash management and trade finance platforms—all of which provide direct benefits to customers in the form of improved convenience, heightened transparency, more efficient risk management, and reduced overhead. The spread of innovation such as fraud prevention and credit modeling results in more effective data aggregation, greater credit access, and reduced risk and fraud. Finally, the study

13 Investment banking activities include financing customers through equity and bond markets, enhancing firm value through M&A transactions, and providing larger loans or lines of credits by forming larger syndicates of lenders.

14 Other benefits include expertise across equity and debt product combinations, international and cross-market presence and experience, and high deal flow and faster execution across deals in multiple markets.

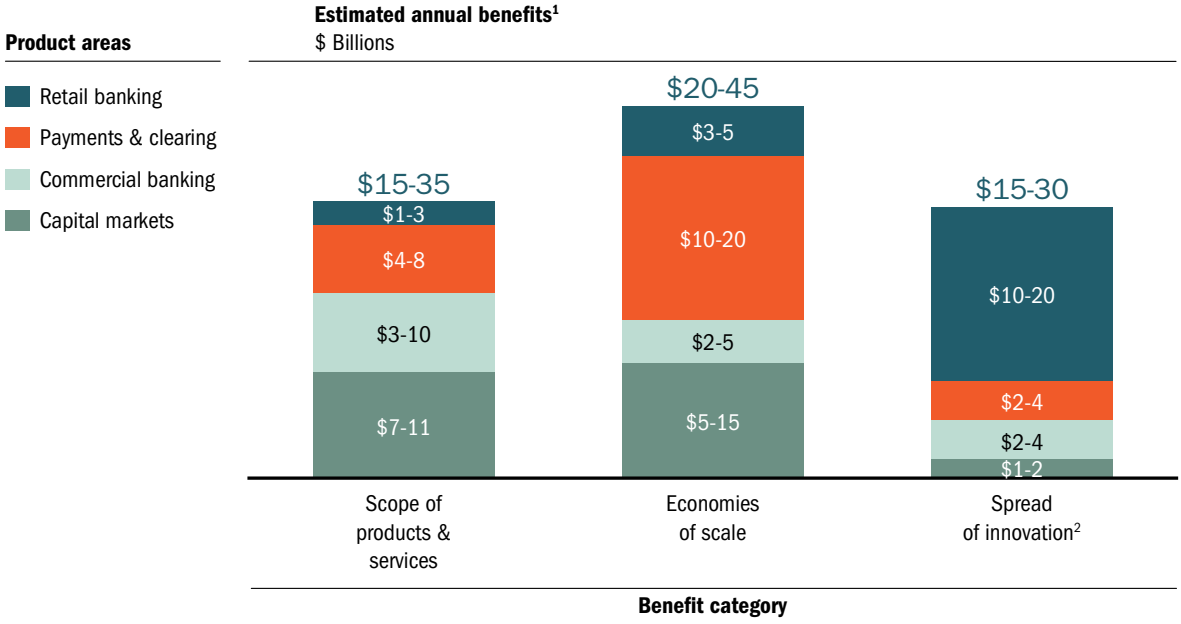
15 Specific benefits are processing a range of domestic securities, cross-border settlement and holding, global reporting and compliance, and related-product offerings.

quantifies these benefits.[16] In aggregate, the contribution of large banks to the spread of innovation is $15-30 billion annually, with benefits found in retail banking constituting over half of this estimate. In aggregating the benefits for scale, scope, and the spread of innovation, the total benefit of large banks to society is an estimated $50-110 billion. The accompanying chart shows the product-by-product breakdown of benefits. Although these are initial estimates and additional research in this area is encouraged, these findings provide critical insights to the policy debate and future lines of investigation.

of products can lead to a lower risk profile, resulting in enhanced stability and a lower likelihood of failure. Moreover, the complexity of large banks allows them to better manage balance sheet risks, reduce systemic vulnerabilities, and increase resilience during crises.

Generally, during financial crises, less diversified banks are more likely to fail or face distress than well-diversified banks. The Savings and Loan (S&L) crisis resulted from stress to mainly one asset class—primarily mortgages supported by one major source of funding,

**BENEFITS FROM LARGE BANKS ARE DISTRIBUTED ACROSS PRODUCT AREAS**




1 Numbers may not sum due to rounding
2 Based on analysis of historical benefit from spread of innovations over the past 30 years
SOURCE: TCH large bank study participant data

## Risk Diversification

One important and overlooked benefit arising from large scale and scope is the diversification of risk. As highlighted earlier, better risk diversification can improve the risk-return tradeoff and enhance scale economies. In effect, diversification reduces a large bank's expected probability of failure. The intuition is that diversification

deposits.[17] The 2008 crisis has demonstrated that more diversified, universal banks such as JPMorgan Chase, BNP Paribas, HSBC, and Banco Santander were more resilient in comparison to monoline financial institutions, such as Bear Stearns, Lehman Brothers, Washington Mutual—all of which failed. As concluded by financial market experts, "diversification of [banks'] activities

16 TCH (2011) quantifies the overall value of the spread of innovations by estimating the product of the average annual benefit per innovation and the average number of innovations spread by large banks in a given year.

17 S&Ls made long-term loans at fixed interest rates using short-term funding with fluctuating interest rates. The monoline business of these S&L banks made them especially vulnerable to increasing interest rates. About 747 S&Ls failed during the crisis, at a total cost of $370 billion.

has been a key component of their resilience" and allow banks to be "more resilient to harsh credit cycles than a series of monoline credit institutions" (van Steenis, 2013). A banking system without large universal banks is not necessarily safer.

As confirmed in recent economic analysis, larger banks are more resilient during crises and are safer because they hold relatively more capital (Benick and Benston, 2005; Loechel, Brost and Li, 2009; Masciantonia and Tiseno, 2013). Large banks also tend to have stronger, more independent risk management, resulting in greater resilience during crises as indicated by lower tail risk, lower non-performing loans as a proportion of assets, and higher return on assets (Ellul and Yerramilli, 2012). Given negative correlation of returns among different products, greater diversification can result in lower overall risk (Nurullah and Staikouras, 2008; Allen and Jagtiani, 2001; Saunders and Walter, 2003). Although greater diversification can lead to less efficient management and conflicts of interest, risk diversification and its implications on the safety and soundness of the banking sector remains an important factor in the policy discussion.

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## Policy Implications

Some financial market commentators have argued that banks should be broken up without careful regard to the tradeoff between economic efficiency and systemic stability. On the basis of efficiency, studies on scale and scope benefits along with those on bank risk diversification reveal the potential adverse effects of policies such as setting size caps or restructuring bank activities. On the basis of stability, Dodd-Frank has made important improvements to the soundness and resiliency of banks as well as to their resolvability.[18] Though many provisions have yet to be fully implemented, the current regulatory environment has also contributed to a change in market perceptions. In recent years, expectations of implicit government guarantees have diminished, as indicated by credit rating agencies placing large banks' ratings under review for downgrade, and by findings in academic studies on credit default swap (CDS) markets. Schafer, Schnabel, Di Mauro (2013) find positive impacts of Dodd-Frank announcements on CDS spreads and negative impacts on stock returns in large banks, while Kroszner (2013) finds that CDS spreads in 2012 price much closer to 'standalone' than to 'with support' credit ratings.

Despite these regulatory improvements, would size limitations be effective in reducing the likelihood of banking crises and contagion? Calomiris (2013) claims that breaking up banks by asset class or activity would not eliminate systemic risk "as the bail-out of Continental Bank in 1984 illustrated—even medium-sized banks with narrow scope…that fail will probably be bailed out by risk-averse bureaucrats spending someone else's (that is, the taxpayers') money." According to Calabria (2013), such a policy would create a "more fragmented and less diversified" banking system of small banks, and as history shows, such a system is not a safer one.

Moreover, breaking up banks is "not necessary for avoiding TBTF because there are other less draconian measures—which have not been tried and which are very likely to work" (Calomiris, 2013). Paul Krugman (2010) echoes these views in affirming that "breaking up the big players is neither necessary nor sufficient to protect us against financial crises" because banks of all sizes are inherently risky. One fully-implemented Dodd-Frank provision limits bank concentration by prohibiting consolidations that exceed 10 percent of aggregate consolidated U.S. banking liabilities; this

18 Enhanced capital requirements are an important post-crisis regulation that has substantially increased capital in large banks. For a discussion on capital regulations, see Araten (2013). Other provisions include limits on bank concentration and activities, "living wills," and semi-annual large bank stress tests. Another provision mitigating systemic risk while also helping to eliminate any TBTF perception is Title II of Dodd-Frank and the Orderly Liquidation Authority (OLA) to resolve banks in crisis, which have made bailouts illegal.

regulation is essentially an implied cap on bank asset size as it effectively limits a bank's asset growth and expansion. Upon close consideration of the regulatory impact on large banks' systemic risk and TBTF status, additional regulations affecting size and structure have limited necessity.[19]

Any policy aimed at breaking up banks must consider the financial and economic impact. How would the economy function without large banks? As captured by TCH (2011), if a size cap of $500 billion were to be imposed, an estimated 50-70 percent of the aggregate benefits would be lost. In regards to more targeted measures, recent research on scale and scope suggests that caps on non-deposit funding would be costly in forcing a bank to "sacrifice certain economies of scope or scale to meet a cap" on such funds (Tarullo, 2012). According to Peter Wallison (2013), a world without large U.S. banks would gravely impact the U.S. economy and its global competitiveness: "millions of existing relationships between banks and their individual or company clients would have to be renegotiated; lines of credit that were possible with large banks but not with smaller ones would have to be terminated; employees of large banks engaged in activities that smaller banks would not be able to pursue would have to find other things to do; U.S. companies operating abroad that rely on the assistance of U.S. banks may have to find that assistance, if available at all, from foreign banks." Overall, breaking up banks and their activities would have harsh and unforeseen consequences to the U.S. economy.

## Conclusion

The debate on whether or not to break up the largest banks crucially centers on a tradeoff between economic efficiency and financial stability. To add completeness to this debate, we have examined scale and scope economies in banking and how these efficiencies translate into benefits to society. Our evidence on bank scale and scope benefits emphasizes that market forces should determine optimal bank size and complexity in an environment where all banks are allowed to fail. Though these benefits are difficult to measure, economists have made enormous

19 For more details, see Rozansky and Scott (2013).

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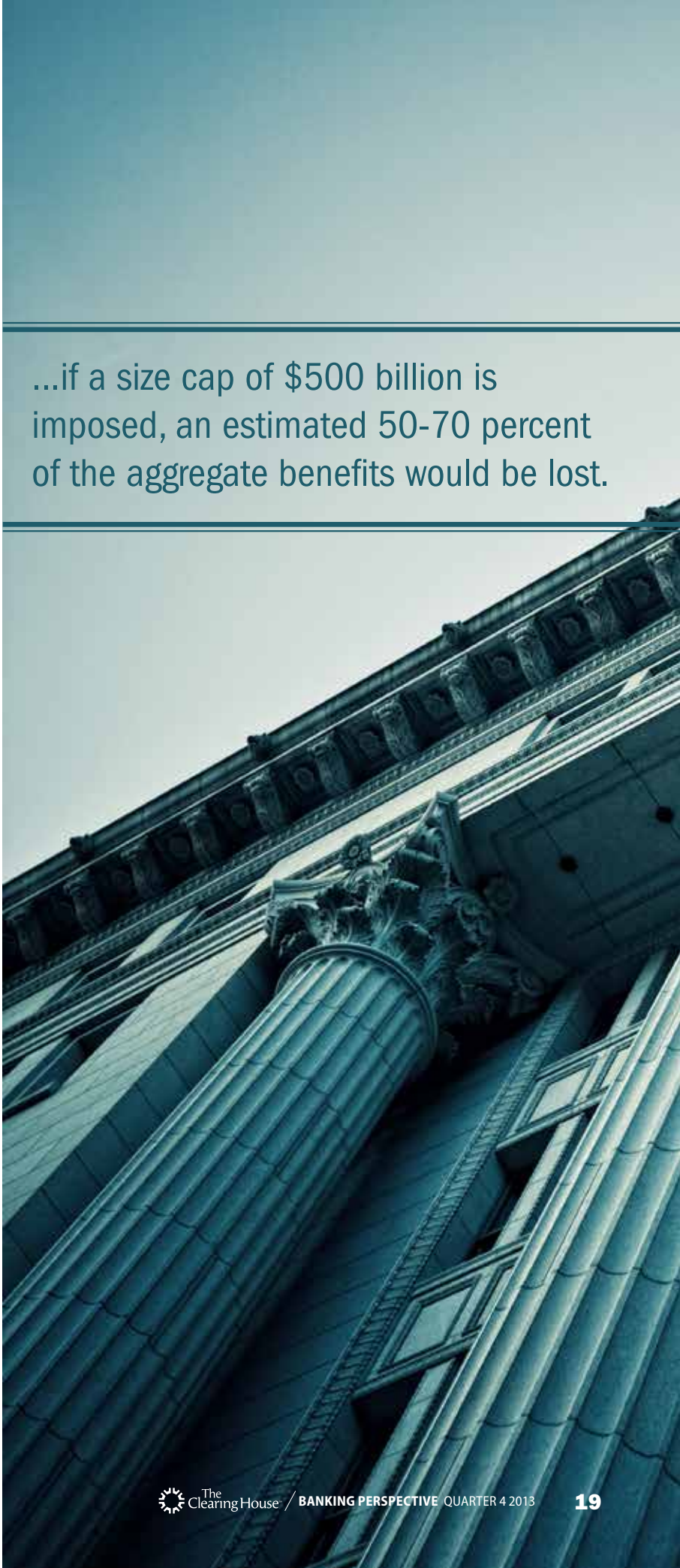

progress in estimating economies of scale. These studies find that economies of scale not only exist for the largest banks, but that they intensify with size. Although research estimating economies of scope is limited, recent work suggests that society benefits from large bank scope as well. Overall, size caps and limitations on bank activities imply that economies of scale and scope would be lost, resulting in higher costs to consumers, businesses, and governments. Given the recent regulatory reforms and changing perceptions of banks' TBTF status, the societal costs associated with the systemic risk of large banks have been substantially reduced. The ongoing debate over whether or not to shrink large banks requires a more comprehensive perspective before drastic restructuring of the banking system is contemplated. As regulation fundamentally cannot prevent the failure of a firm, bank regulation going forward should ensure that any bank can fail without systemic disruption while also preserving the products and services critical to maintaining financial stability and economic growth. ■

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