



BANK MERGERS AND SYSTEMIC RISK



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I. INTRODUCTION

Big banks have been a recent topic of much debate. Are banks above a certain size so important that the government should not let them go bankrupt? Where exactly is the separation between too big to fail and the rest of the banking industry? If certain banks do indeed fall into the “too big to fail” category, shouldn’t we do something about it? Would stricter merger enforcement be the answer? Should big banks be broken up? These questions were widely discussed well before the Great Recession and perhaps even more so since then.

This essay begins with a brief description of the regulatory environment and the recent history of bank mergers in the U.S. After that, we discuss the regulatory practices regarding the analysis of the likely effects of bank mergers on the stability of the financial system. The paper contrasts systemic risk analysis as practiced before and after the financial crisis. The paper concludes with suggestions of how current practices might be improved.

II. WHY ARE BANKS REGULATED?

Banking is a special industry. Banks occupy a central place in the economy, and they also

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usually – at least in developed countries – require a special license from supervisory authorities. Governments regulate the banks for two main reasons. The first reason is that individuals and households typically park a significant part of their wealth at the banks, in the form of checking and savings accounts and other financial assets. Since the majority of these individuals and households are neither particularly wealthy nor particularly savvy about their finances, the government tries to protect their interests by regulating the banks. The second reason is that banking, by its very nature, is a risky business. Banks tend to have a much higher debt-to-asset ratio than non-financial companies. Banks typically borrow on a short-term basis, while their investments are long-term. Their high ratio of indebtedness and the liquidity transformation they perform make them vulnerable to “runs.” To prevent runs, banks typically preserve the contractual right to temporarily suspend the payment of deposits. To do their part, the government often provides a deposit insurance scheme and the central bank acts as the lender of last resort.

III. BANK MERGERS IN THE U.S. – HISTORICAL TRENDS

Are U.S. banks too big? Until recently, the concentration of the banking industry used to be far smaller in the U.S. than in other developed countries. The main reason for this was that after the Great Depression and until the 1990s, federal and state laws made it very difficult for banks to acquire other banks or even open branches in states other than their home states. The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 removed many of these restrictions. Moreover, with the passage of the Gramm-Leach-Bliley Act in 1999, Congress repealed certain parts of the Glass-Steagall Act, which for more than half a century, separated commercial banking from investment banking. However, federal law still prevents any bank merger whereby the resulting entity would hold more than 10 percent of the total deposits (and liabilities) nationwide. A merger also cannot be approved if the resulting entity would control more than 30 percent of the total deposits in any state where both the acquirer and the organization to be acquired operate pre-merger.² Although the nationwide deposit cap prohibits interstate acquisitions by a company that controls deposits in excess of the cap, it does not prevent a company from exceeding the nationwide deposit cap through internal growth or through acquisitions entirely within the home state of the acquirer.

Due to the relaxation of regulatory constraints on mergers, banking concentration has systematically increased over the past three decades. The number of banks dropped from about 14,500 in the mid-1980s to about 5,600 in 2015.³ In 2015, of the nation’s total deposits, the top four bank holding companies, Bank of America, JP Morgan Chase, Wells Fargo, and Citigroup held 16 percent, 15 percent, 15 percent, and 6 percent of total deposits, respectively. These banks are, in large part, the outcome of large-scale mergers that occurred

² These provisions were added to Section 3(d) of the Bank Holding Company Act in 1994 when Congress broadly authorized interstate acquisitions by bank holding companies and banks in the Riegle-Neal Act.

³ Kowalik, Davig, Morris, and Regehr (2015), “Bank Consolidation and Merger Activity Following the Crisis,” Economic Review



throughout the 1990s and 2000s.⁴ The recent financial crisis also triggered a wave of mega-mergers, but this time the acquired companies were either bankrupt or nearly bankrupt.⁵ After the financial crisis, merger activity in banking has been relatively subdued. The largest deal since 2009 was Capital One's 2012 acquisition of ING Bank, fsb, whose total assets were USD \$92 billion – this merger was significantly smaller than many of the pre-crisis mergers. Despite the paucity of activity recently, another large-scale merger will eventually be proposed, and it is worth thinking through how authorities are likely to respond.

IV. BANK MERGER REVIEW IN THE U.S.

In the U.S., bank mergers are subject to a dual review. Merger proposals are reviewed by both the Department of Justice (“DOJ”) and the relevant federal banking regulator.⁶ The DOJ's review focuses on traditional analysis of market concentration and structure. The banking regulator reviews the proposed transactions according to criteria set out in various banking laws.⁷ The principal purpose of the regulatory review is to ensure that the merged entity has adequate assets and managerial resources to conduct business in a prudent manner and that it continues to serve the diverse interests of the local community. The Dodd-Frank Act of 2011⁸ added to this list a requirement that the regulator consider whether a proposal would result in greater or more concentrated risks to the stability of the nation's banking or financial

⁴ In 1998, Travelers Group, an insurance giant, acquired Salomon Brothers, then one of the largest securities firms in the U.S. In the same year, Citigroup merged with Travelers Group. This was one of the largest mergers at the time, resulting in an entity holding more than USD \$700 billion in assets. Bank of America acquired FleetBoston in 2003, MBNA in 2006, and then U.S. Trust and LaSalle Bank in 2007. Each of these acquisitions increased the asset size of Bank of America by more than USD \$100 billion. In 2000, JP Morgan merged with Chase Manhattan, resulting in a combined entity with USD \$650 billion in assets. In 2004, JP Morgan Chase acquired Bank One, the largest commercial bank in the Midwest. Wachovia acquired First Union in 2001 and SouthTrust in 2004. Wells Fargo acquired First Interstate Bancorp in 1996, the Northwest Holding Company in 1998, First Security in 2000, and Wachovia in 2008.

⁵ Bear Stearns, one of the largest investment banks at the time, suffered heavy losses from its exposures to subprime mortgages and was near collapse in March 2008. Despite the Federal Reserve's efforts, the company could not be saved, and was sold to JP Morgan Chase. In September 2008, Washington Mutual, the largest thrift organization in the U.S., went bankrupt and was sold again, to JP Morgan Chase. After the collapse of Lehman Brothers, fearing that Merrill Lynch might be the next to fall, the government pressured Bank of America into acquiring the former. Finally, in December 2008, seeing its imminent failure, the government took receivership of Wachovia and the bank was sold to Wells Fargo.

⁶ The Federal Reserve Board supervises bank holding companies and state-chartered banks that are members of the Federal Reserve System. State-chartered banks that are not members of the Federal Reserve System are supervised by the Federal Deposit Insurance Corporation (“FDIC”). Finally, banks that were issued a federal charter and are not bank holding companies, are supervised by the Office of the Comptroller of the Currency (“OCC”), a division of the U.S. Treasury Department.

⁷ At the federal level, the principal banking statutes that govern bank mergers are the Bank Holding Company Act of 1956 and the Bank Merger Act of 1960. There are additional federal laws that have important implications on the regulatory review process, including the Home Owners' Loan Act and the Change in Bank Control Act.

⁸ Officially referred to as the Wall Street Reform and Consumer Protection Act (Pub.L. 111–203, H.R. 4173).



system.⁹

V. SYSTEMIC RISK IN THE MERGER REVIEW PROCESS BEFORE DODD-FRANK

Systemic risk is a key concern for regulators charged with safeguarding overall financial stability. Systemic risk arises when there is a potential for multiple banks to fail and to impose costs on the financial system, and ultimately, threatening the stability of the whole economy. The failure or weakness of multiple banks at the same time could arise through four main mechanisms: (i) direct bilateral exposures between banks (“domino effect”); (ii) correlated exposures of banks to a common source of risk; (iii) feedback effects from endogenous fire-sale of assets by distressed institutions; (iv) informational contagion: whereby market participants conclude from the firm’s distress that other firms holding similar assets or following similar business models are likely themselves to be facing similarly dire problems.¹⁰

Prior to Dodd-Frank, the systemic risk aspect of bank mergers was not a high priority for bank regulators. When it came to financial stability, the Federal Reserve Board (“Fed”) was simply required to consider the financial and managerial resources and the future prospects of the banks involved in the merger proposal. There has not been a lot of detail made public about these past analyses.¹¹ From the reports released after the investigations closed, it can be inferred that the Fed’s analysis was limited to checking capital adequacy measures. To pass the test, the merging parties simply needed to show that they had enough capital relative to their balance sheets. The Fed also considered the extent to which the merger was financed through the issuance of new debt (as opposed to cash or equity shares), because issuing new debt negatively influenced capital adequacy ratios.¹² Beyond that, the Fed only considered some less quantitative factors such as whether the parties involved were sufficiently “well managed” and whether they had adequate risk management systems and policies in place.

VI. SYSTEMIC RISK IN THE MERGER REVIEW PROCESS AFTER DODD-FRANK

⁹ This requirement was added by Section 604(d) of the Dodd-Frank Act, which amended Section 3(c) of the Bank Holding Company Act.

¹⁰ For an excellent discussion of these transmission channels see, for example, Nier, Yang, and Alentorn (2008) “Network Models and Financial Stability” and Upper (2011).

¹¹ The Fed has published its orders regarding those bank mergers the Board has reviewed from 1996 through 2016: <https://www.federalreserve.gov/newsevents/press/orders/2016orders.htm>.

¹² For example, in the approval of the Bank of America/Fleet Boston merger, the Fed stated: “Bank of America and FleetBoston and their subsidiary banks are well capitalized and would remain so on consummation of the proposal. The Board has considered that the proposed merger is structured as a share-for-share transaction and would not increase the debt service requirements of the combined company. The Board also has carefully reviewed other indicators of the financial strength and resources of the companies involved, including the earnings performance and asset quality of the institutions.” In terms of how the merger would affect the stability of the financial system, nothing else appears to have been considered. The quoted statement appears to be fairly representative of the merger reviews conducted prior to 2011.



The adoption of the Dodd-Frank legislation reflects the significantly greater focus on systemic risk among politicians and economists. In fact, financial stability has become an entirely new chapter in the orders that conclude merger reviews. To assess the proposed transaction's likely effect on the stability of the U.S. banking or financial system, the banking regulator is now required to consider a variety of metrics that purport to capture the systemic "footprint" of the merged firm and the incremental effect of the transaction on the systemic footprint of the acquiring firm. These metrics include the size of the resulting firm; the availability of substitute providers for any critical products and services offered; the inter-connectedness of the resulting firm with the banking or financial system; the extent to which the resulting firm contributes to the complexity of the financial system; the extent of international activities of the resulting firm; and the opaqueness and complexity of an institution's internal organization that are indicative of the relative degree of difficulty of "resolving" the resulting firm in the event it becomes bankrupt.

Academic research is often several steps ahead of regulatory practice. Such is the case to a certain degree when it comes to the analysis of a merger's effects on systemic risk. After discussing two current analytical practices, we draw on academic work to comment on them.

VII. FINANCIAL CONTAGION DUE TO INTER-BANK ASSETS AND LIABILITIES

The first practice is how the Fed assesses the "inter-connectedness" of the merging parties. The Fed does this by relying on two metrics: the bank's share of total U.S. intra-financial system assets, and the bank's share of total U.S. intra-financial system liabilities.¹³ Typically, if the combined entity's share of intra-financial assets and liabilities remain small after the merger, the Fed does not raise concerns from the standpoint of systemic risk. To conclude that the intra-financial share is small, the Fed sometimes compares it to the merged entity's share of the total assets/liabilities of the U.S. financial system.¹⁴

The problem with this line of analysis is that it is not sufficient for the task; considering only two nodes of the network fails to analyze the network of bilateral exposures as a whole. In order to accurately assess the stability of the inter-bank market, the entire network of bilateral relationships needs to be considered because financial contagion might spread through direct bilateral exposures between banks. Starting with the seminal article of Allen

¹³ Intra-financial system assets and liabilities represent the amount of financial obligations of U.S. banks vis-a-vis other U.S. and foreign financial firms. These metrics, along with short-term funding liabilities, are used to measure the inter-connectedness of U.S. banks.

¹⁴ In 2012, when reviewing the proposed merger between Capital One and ING Bank, the Fed noted that "[t]he combined entity's use of wholesale funding, as a share of the entire U.S. financial system ("USFS") wholesale funding usage, is less than 1 percent and is well below its corresponding share of USFS consolidated assets. The combined entity's shares of USFS intra-financial system assets and liabilities also are less than 1 percent." In the same year, regarding the proposed merger between PNC and RBC Bank, the Fed noted that "[t]he pro forma merged entity's expected use of wholesale funding is lower relative to all U.S. financial institutions than is its corresponding share of consolidated assets."



and Gale,¹⁵ there has been a wealth of literature about contagion effects through a network of bilateral relationships.¹⁶ This and many follow-on papers show how network properties influence the likelihood and the severity of financial contagion.¹⁷ A merger of two entities could make the network more or less stable depending on the circumstances. A recent paper published in the *American Economic Review* argues that the relationship between inter-connectedness and stability is not monotone.¹⁸ At low levels of inter-connectedness, a more densely connected financial network (corresponding to a more diversified pattern of inter-bank liabilities) enhances financial stability. However, beyond a certain point, dense inter-connections serve as a mechanism for the propagation of shocks, leading to a more fragile financial system. Since bank regulators have ample access to relevant data, they are well-positioned to conduct analyses that take the entire inter-bank network into consideration.¹⁹

VIII. FINANCIAL CONTAGION DUE TO COMMON EXPOSURES

The second practice concerns how financial contagion can arise from a common source of risk. What motivates this practice is the possibility that the merging parties have similar types of assets that gain and lose value in a parallel fashion, which could trigger large losses to the merged entity. To address this issue, the Fed investigates whether there are certain counterparties to which both of the merging parties are significantly exposed. In 2012, when reviewing a proposed merger between PNC and RBC Bank, the Fed noted that “[o]n a pro forma basis, the transaction also would not concentrate exposure to any single counterparty that was among the top three counterparties of either PNC or RBC Bank before the merger.” Similarly, in the same year when evaluating Capital One’s acquisition of ING Bank’s U.S. assets, the Fed noted that “[t]he transaction under review in this case also would not increase exposure to any single counterparty that is among the top three counterparties of either Capital One or [ING Bank] before the merger.”

The problem with this approach is that it only addresses one type of correlated

¹⁵ Franklin Allen and Douglas Gale (2000), “Financial Contagion”, *Journal of Political Economy*, Vol 108, Issue 1, pp. 1-33.

¹⁶ Allen and Gale compare two network structures: a “complete” network, in which all banks lend to and borrow from all other banks, and an “incomplete” network, in which each bank borrows from only one bank and lends to only one other bank. In the case of the complete network, banks benefit from diversified funding streams. A liquidity shock to one bank is less likely to cause the bankruptcy of another bank since the shock can be distributed among all banks in the system. In the incomplete network, funding is not diversified. A liquidity shock to one bank is more likely to cause liquidity problems at other connected banks because the same shock is spread over fewer banks and is therefore larger and more destabilizing.

¹⁷ Anne-Caroline Hüser (2015), “Too Interconnected to Fail: A Survey of the Interbank Networks Literature”, SAFE Working Paper No. 91 gives an excellent survey about this literature.

¹⁸ Daron Acemoglu, Asuman Ozdaglar, and Alireza Tahbaz-Salehi, “Systemic Risk and Stability in Financial Networks,” *American Economic Review* 2015, 105(2): 564–608.

¹⁹ Some argue that inter-bank linkages are often complex and opaque, and the sources of contagion are therefore hard to predict. For example, in September 2008, policy makers reasoned that market participants and policy makers had had several months after the rescue of Bear Stearns to prepare for the failure of Lehman Brothers, so allowing it to enter bankruptcy should not be disruptive. That assumption turned out to be very wrong.



exposures. It addresses commonality in counterparties, but it does not address commonality of asset types. What if both parties have large exposures to subprime mortgages in a particular geographic area? What if both parties have significant long (or short) positions in the same over-the-counter derivative? What if both parties have entered into similar Credit Default Swap deals (i.e. they speculated for or against the default of the same entity)? These commonalities are not addressed by analysis that solely identifies whether the merging parties have common counterparties.²⁰ Again, since bank regulators have access to high quality data, they could, in principle, consider various kinds of commonalities when assessing the effects of a proposed merger.

IX. WHAT DETERMINES OPTIMAL INVESTMENT AND FINANCING DECISIONS?

When reviewing bank mergers for their potential effects on financial stability, the standard regulatory analysis does not treat the merging parties as strategic agents, whose incentives and consequent business decisions might change as a result of the merger. The analysis more or less assumes that the parties' business decisions remain unchanged.

First, when it comes to capital adequacy, the assumption is essentially that the total assets of the merged entity will be equal to the sum of the assets of the parties, and the total debt will be equal to the sum of the debts of the parties. In this sense, estimating post-merger capital-adequacy ratios is purely an accounting exercise. But, the merger might change the calculus that determines the optimal level of debt and equity. It might also change the calculus of the optimal division between long-term and short-term debt. For example, an acquisition might give a bank access to a larger customer base, allowing this bank to substitute wholesale financing with deposits (which is considered a more stable form of financing). These possibilities are usually not addressed by the regulatory review.

Second, when it comes to inter-connectedness due to bilateral exposures in the inter-bank markets, the analysis largely assumes that the merged entity will inherit the bilateral exposures of the parties. The regulators likely net out offsetting positions, i.e. if one of the parties was lending to some third party while the other was borrowing from the same third party, those relationships cancel out when calculating post-merger inter-bank assets and liabilities. But what is not accounted for is the possibility that the successor entity will not necessarily follow the same inter-bank financing and investment strategies as its predecessors did.

Third, when it comes to commonality of assets, the regulator's assumption is essentially that the successor will inherit the assets of its predecessors. This may be a plausible assumption for long-term, less liquid investments, but less so for short-term, more liquid investments. For example, consider the possibility that the merging parties have large but opposing derivative positions. Suppose that one of the merging parties is long while the other is short in interest rate swaps, that is, one of them stands to profit from an increase in

²⁰ Beale et al. (2011) "Individual versus Systemic Risk and the Regulator's Dilemma," presents a model of financial contagion arising from commonalities on the asset-side of banks' balance sheets.



interest rates, while the other stands to profit from a decrease in interest rates. The regulator may just assume that since these positions cancel each other out, the merged entity will not be exposed to any interest rate risk. But it is far from clear that the merged entity will in fact keep a neutral position.

It has long been an area of interest for Industrial Organization (“IO”) economists and antitrust practitioners how a merger changes the behavior of the parties and their competitors. How the merger induces changes in prices and products offerings is in fact the main focus of the competitive review of mergers. However, financial economists and banking regulators typically assume away the strategic interactions that give rise to these kinds of merger effects. Perhaps the justification for doing so is the assumption that financial markets are perfectly competitive. But many financial markets are far from perfectly competitive. Instead, they are characterized by large firms with significant market shares and sustained positive economic profits. Consequently, economists and regulators cannot afford to ignore the kinds of strategic interactions that may induce merger effects.²¹

X. CONCLUSION

With the adoption of Dodd-Frank, the review process now devotes significantly greater attention to bank merger effects on the stability of the financial system an area that generated relatively little interest prior to the financial crisis. This is not to say that policies and regulatory practices that contributed to the creation of large banks were responsible for the financial crisis. By international standards, the U.S. banking system is still relatively unconcentrated. Since legislative changes made it a priority to look for systemic risk, it is worthwhile to investigate how effective banking regulators are in this regard. This paper made a few suggestions where current practices might be improved. The financial crisis spun a wealth of academic research on financial inter-connectedness, financial contagion, and many other topics that are immensely relevant for regulators that watch over the stability of the financial system. Theoretically, these methodologies improve our abilities to measure and forecast risks, but it would also be important to know how much of an improvement they represent. Quantitative evidence to date appears to be scarce, yet this seems to be a key area of future research.

²¹ A similar argument was made by Fed governor Daniel K. Tarullo, in a conference speech a few years ago: “Industrial Organization and Systemic Risk: An Agenda for Further Research”, Conference on Regulating Systemic Risk, in Washington DC, September 15, 2011.