

The Impact of Regulation on Consolidation and Competition in the Banking Industry From 1980 to 2019

Morgen Nations
Eastern New Mexico University

Corey Cole
Eastern New Mexico University

David Hemley
Eastern New Mexico University

The impact of regulation on consolidation and competition in the United States banking industry has been a topic of continued interest. However, there has been a lack of research on this topic after 2010. This study continued the examination of regulation impact by identifying specific pieces of legislation using regression analysis and examining those acts in relation to bank failures, unassisted mergers, and assisted mergers through the period of 1980 to 2019. As a proxy for consolidation, the study analyzed the movement of assets from 2019's ten largest banks using a fold change equation. Our findings show that there are at least three significant acts of banking legislation from 1980 to 2019, each of which appear to have had a negative impact on the number of individual banks. We examined the implications of these findings when compared to the identified factors and ultimately discuss how regulation impacted the relationship between consolidation and competition.

Keywords: banking, consolidation, regulation, competition, interstate banking

INTRODUCTION

The history of banking regulation in the United States (U.S.) banking industry has been well recorded and analyzed; in particular 1975 onward (Sherman, 2009; Markham, 2000). From the banking crisis of the 1980s to the deregulation of the 1990s and the recession response of the early 2010s, the impact of banking regulation has continued to be a source of study in academic literature. One facet of this topic is consolidation within the banking industry. Previous research has used several different methods to explore the impact of regulation on this consolidation.

This paper strived to examine the story of regulation and consolidation by looking at the top 10 banks from 2019 and focused on how regulation impacted their asset growth. By doing so, we contributed a new perspective for measuring the impact of historical regulation on consolidation. We do this by focusing on the research question: how did regulation impact consolidation in the banking industry?

LITERATURE REVIEW

Banking deregulation in the 1980s came in response to the banking failures and "too-big-to-fail" bailouts of the 1970s (Nurisso & Prescott, 2017). In the late 1960s banks, such as the Bank of the Commonwealth, invested in high-yield, long-term municipal securities. However, as the result of a recession in the mid-1970s, interest rates rose, and the value of these securities fell (Nurisso & Prescott, 2017). Ultimately, these banks often failed or had to be bailed out by the government. In the early 1980s the U.S. government started passing acts such as the Depository Institutions Deregulation, the Monetary Control Act of 1980, and the Garn-St Germain Depository Institutions Act of 1982 in order to help banks cope with the rising interest rates (Nurisso & Prescott, 2017).

Additionally, in the early to mid-1980s the agricultural industry started deteriorating and many agricultural banks started failing (Belongia, 1986). These banks represented the majority of a wave of regional bank failures, and ultimately mergers, that extended into the late 1980s (Federal Deposit Insurance Corporation, 1998). These mergers can be classified as assisted mergers wherein a failing institution is absorbed by another institution, or an unassisted merger, wherein the acquired bank is not failing (Wheelock, 2011).

State governments had the ability to decide whether banks from outside the state could acquire a bank within the state (Johnson & Rice, 2008). In 1994, the Riegle-Neal Interstate Banking and Branching Efficiency Act came into effect and allowed interstate banking acquisitions to happen on a federal level. This was partly in hope that the failing regional banks would have a better chance at being acquired as opposed to failing and the government would be able to avoid having to bailout larger state banks (Nurisso & Prescott, 2017). Additionally, it was to prevent U.S. banks from losing market share to foreign banks (Mulloy, 1995). Dr. Astrid Dick (2006) noted that as a result of this act, concentration at the regional level has increased dramatically, but remained steady in urban areas. The 1999 Gramm-Leach-Bliley Act was the next big step in banking deregulation as it repealed limitations put into place by the 1933 Glass-Steagall Act that restricted interaction between commercial banks, investment banks, and securities firms (Omarova & Margaret, 2012). While there has been banking regulation that has subsequently occurred, the 1994 and 1999 acts are the more frequently discussed when analyzing the topic of banking consolidation. After the 2008 recession, the tone on banking regulation has begun to shift. The 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act in particular steps away from the trend of deregulation. One effect of the Dodd-Frank Act is that the cost of compliance to the new regulation has become a barrier of entry to the creation of new banks (Mccord et al., 2015).

Like in the case of the 2010 Dodd-Frank Act, regulation can be a reaction to shocks in the macroeconomy. However, Eken, Kale, and Selimler (2013) noted that banking regulation has not been effective in preserving banks during these events. Additionally, they theorized that the indecisive characteristic of banking regulation can introduce enough volatility, that the regulation itself will become ineffective over time. Beck, Demirgüç-Kunt, and Levine (2003) expanded on this and found that countries that have a more competitive environments for banking, as measured by less regulation and barriers to entry, are less prone to systemic crisis. However, they also found that countries with higher level of concentration are also less likely to experience systemic crisis. One theory for these counterintuitive results is that concentration may act as proxy for other influences and that factors such as entry and activity regulations are more illuminating measures when studying competition in the banking industry (Berger et al., 2004).

Research that was conducted before the 21st century focused more on the individual acts of legislation and the impact that legislation might have. However, after the 21st century research shifted its focus on the collective impact of banking legislation. This paper has continued this trend by establishing the correlation between regulation and consolidation, examining the relationship between consolidation and other various factors, and discussing the further implications.

METHODOLOGY

Over the course of about almost 40 years, bank numbers have steadily declined (see Appendix A). Mirroring previous literature, we inferred that a decrease in the number of individual U.S. banks acts as a measure for consolidation (Jayaratne & Hall, 1996). In order to determine the impact of regulation on consolidation, this study first identified significant regulatory acts. The four regulatory acts which have consistently been mentioned in previous research are recognized as potential significant acts. This group is comprised of the following:

- 1987 Competitive Equality Banking Act (CEBA)
- 1994 Riegle-Neal Interstate Banking and Branching Efficiency Act (Riegle-Neal)
- 1999 Gramm–Leach–Bliley Act (GLB)
- 2010 Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd Frank)

The acts were initially examined in respect to the total number of U.S. banks, with a correlation matrix in order to establish whether there is any multicollinearity between regulatory acts.

TABLE 1
CORRELATION MATRIX: BANKING REGULATION AND NUMBER OF BANKS

	Total Banks	Riegle-Neal	CEBA	GLB	Dodd Frank
Total Banks	1				
Riegle-Neal	-0.8958	1			
CEBA	-0.7054	0.5946	1		
GLB	-0.855	0.7746	0.4606	1	
Dodd Frank	-0.6761	0.4472	0.2659	0.5774	1

TABLE 2
CORRELATION MATRIX:
COMBINED BANKING REGULATION AND NUMBER OF BANKS

	Total Banks	CEBA	Riegle-Neal/GLB	Dodd Frank
Total Banks	1			
CEBA	-0.705	1		
Riegle-Neal/GLB	-0.896	0.595	1	
Dodd Frank	-0.676	0.266	0.447	1

Using the first matrix, it appears that there is evidence of multicollinearity between the 1999 Gramm–Leach–Bliley Act and the 1994 Riegle-Neal Act (see Table 1). As such, moving forward the 1999 act and 1994 will be combined. This change is reflected in the secondary correlation matrix (see Table 2).

Next, this paper examined the relationship between each act and their relation to number of U.S. banks. This was first done by using a single variable regression wherein total number of U.S. banks is used as a dependent variable while a dummy variable acts as a proxy for the impact of regulation. Additionally, the dummy variable was lagged by one year in order to see the effects of the regulation. Each act is also examined with a multivariable regression to establish the collective impact on number of U.S. banks. Herein we established the following hypotheses:

H1₀: The CEBA had no impact on the number of banks.

H1_a: The CEBA had an impact on the number of banks.

H2₀: The Riegle-Neal/GLB had no impact on the number of banks.

H2_a: The Riegle-Neal/GLB had an impact on the number of banks.

H3₀: Dodd-Frank had no impact on the number of banks.

H3_a: Dodd-Frank had an impact on the number of banks.

After establishing the impact of certain regulatory acts on consolidation, this study looked at the top 10 banks holding the largest amount of domestic assets as of December 2019 (see Appendix B) in order to better discuss the deeper implications of these regulatory acts. This group will collectively be referred to as the 'Alpha Group'.

The total assets held by each bank in the 'Alpha Group' was collected from 1980 to 2019 using Uniform Bank Performance Reports (UBPR). Additionally, the overall total assets held in the U.S. banking industry, number of assisted mergers, number of unassisted mergers, and bank failures were also collected over the same time period (see Appendix C). In order to have a symmetrical and magnified comparison of growth in assets held in the Alpha Group' versus growth in overall assets within the banking industry, a Log2 fold change was applied to the asset data using the following equation:

$$FC_n = \log_2(A_n/C_n)$$

FC = fold change

N = year

C = total assets in banking industry during current year minus sum of total assets in the Alpha group

A = sum of total assets in the Alpha group

When the fold change is negative, this can be interpreted as more overall assets in the banking industry held outside of the 'Alpha Group'. Conversely, when the fold change is positive, more overall assets in the banking industry are held within the 'Alpha Group'. It can be inferred that when there is a positive trend in the fold change, more assets are moving into the 'Alpha Group'. As such, the fold change has been used as proxy for understanding consolidation in the U.S. banking industry.

RESULTS

TABLE 3
SINGLE VARIABLE REGRESSION RESULTS:
BANKING REGULATION AND NUMBER OF BANKS

Regulation	Coefficient
CEBA	-6127.73**
Riegle-Neal/GLB	-6107.37**
Dodd Frank	-5153.37**

**significant at 5%

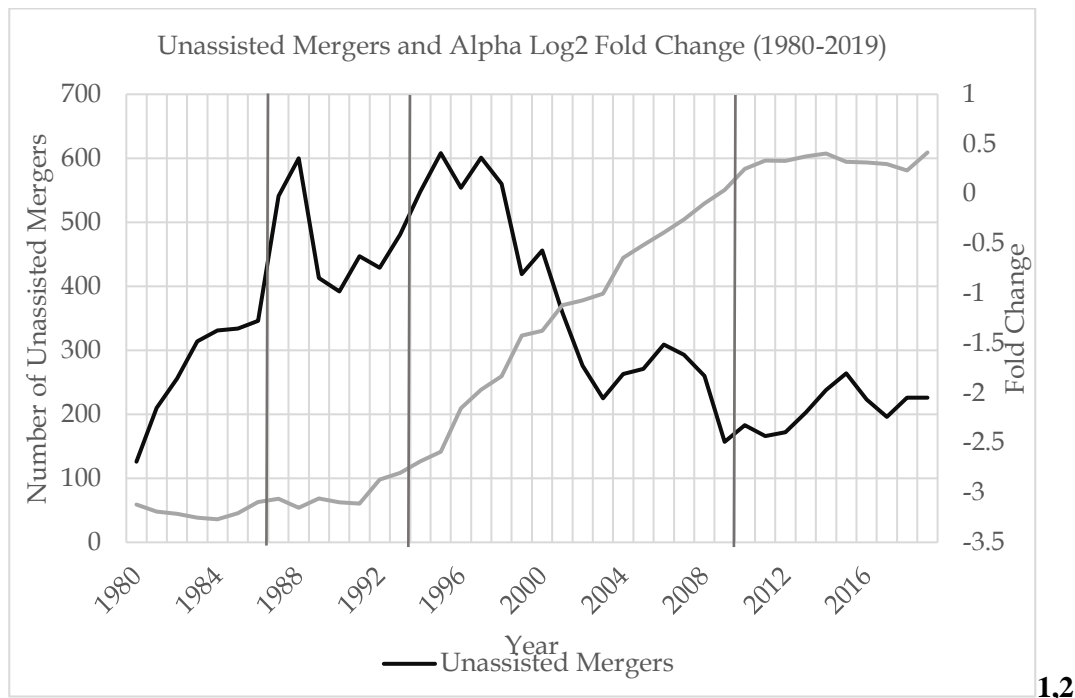
TABLE 4
MULTIVARIABLE REGRESSION RESULTS:
BANKING REGULATION AND NUMBER OF BANKS

Regulation	Coefficient
CEBA, Riegle-Neal/GLB, and Dodd Frank	
1. CEBA	-2321.75**
2. Riegle-Neal/GLB	-3974.05**
3. Dodd Frank	-2624.6**

**significant at 5%

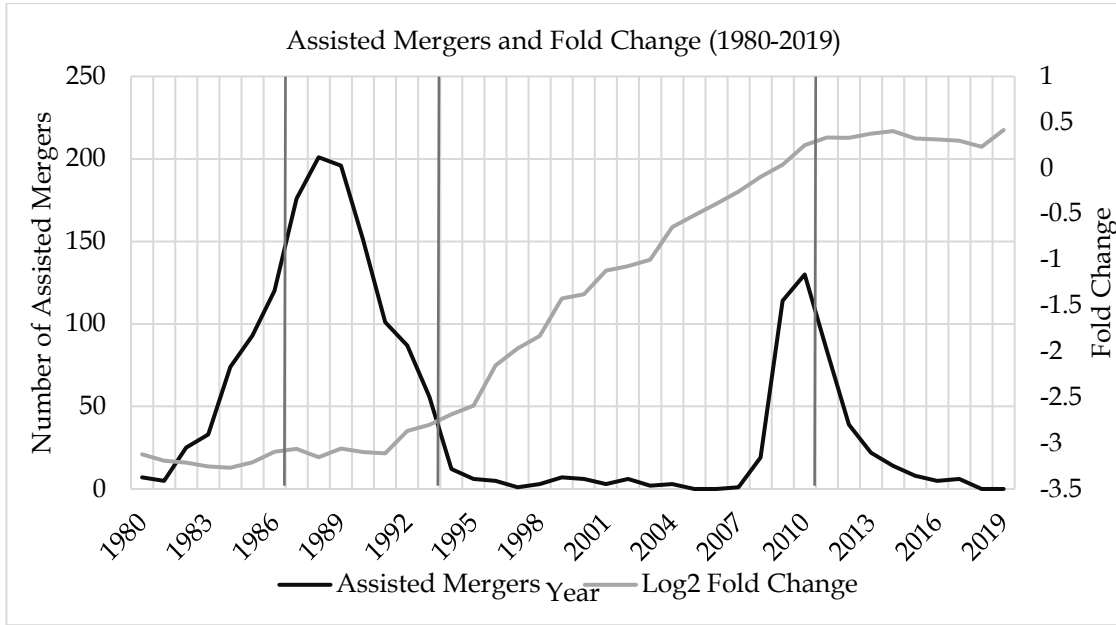
The single variable regression of each individual regulatory act each showed a negative impact on total bank numbers. This seems to suggest that the introduction of these regulatory acts lead to consolidation within the banking industry. Individually, the 1987 Competitive Equality Banking Act showed the most substantial negative impact on bank numbers while the 2010 Dodd-Frank Act showed the smallest negative impact. In a multivariable regression, the 1994 Riegle-Neal showed the greatest negative impact. In both the single variable regression and the multivariable regression, all variables are significant. As such, we can reject all three null hypotheses. Based on the fact all three regulatory acts have a significant negative impact on the number of banks, we next looked to the fold change results in relation to assisted mergers, unassisted mergers, and bank failures.

FIGURE 1
UNASSISTED MERGERS AND FOLD CHANGE (1980-2019)



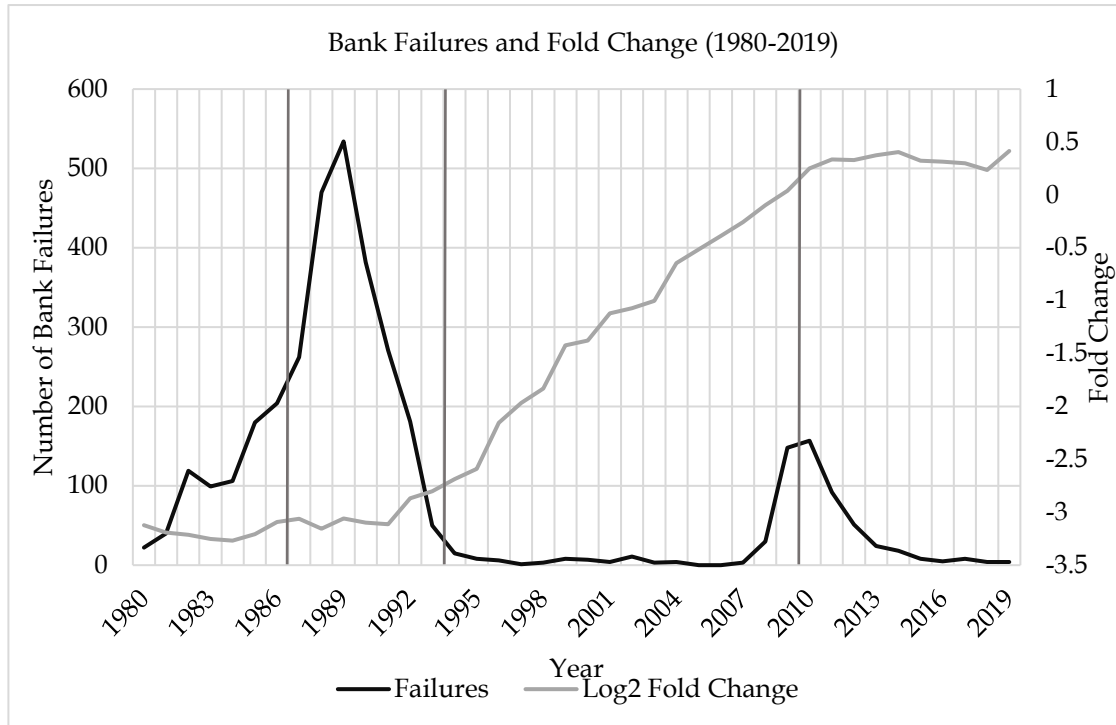
It appears as though the number of unassisted mergers increase from 1980 to 1989 before decreasing in the early 1990s (see figure 1). Afterwards, unassisted mergers once again start increasing. This trend lasts until the late 1990s when it starts decreasing again. Finally, it appears to begin leveling out in the 21st century.

FIGURE 2
ASSISTED MERGERS AND FOLD CHANGE (1980-2019)



It appears as though the number of assisted mergers increases from 1981 to 1989 before decreasing in the mid -1990s (see figure 2). Assisted mergers then appeared to stay relatively steady through the 2000s before increasing in 2008. By 2011, assisted mergers appeared to once again be decreasing.

FIGURE 3
BANK FAILURES AND FOLD CHANGE (1980-2019)



It appears as though the number of bank failures increases from 1981 to 1989 before decreasing in the early 1990s (see figure 3). Bank failures then appeared to stay relatively steady through the rest of the 1990s and early 2000s before increasing in 2009. By 2010, bank failures appeared to once again be decreasing.

IMPLICATIONS

When looking at fold change trend in relation to assisted mergers and bank failures, it is apparent that even though the peak of both occurred in late 1980s, the fold change does not start significantly growing until the early 1990s. This suggests that while there was great number of mergers occurring in the 1980s, the ‘Alpha Group’ did not start substantially increasing their assets until the mid-1990s. One theory for this occurrence is that most of mergers happening occurred in-state, but the banks in the ‘Alpha Group’ started acquiring regional banks when the 1994 Riegle-Neal Act came into effect. This theory is echoed when looking at the unassisted mergers chart (see figure 2). It can be seen that as the occurrence of unassisted mergers started growing in the early 1990s and this positive growth is mirrored by the fold change. Around the late 1990s, unassisted mergers started decreasing but the amount of assets held by the ‘Alpha Group’ compared to the overall banking industry was still increasing. It was not until 2010 when both unassisted mergers and the fold change started leveling off. This may suggest that with the implementation of the 1994 Riegle-Neal Act the ‘Alpha Group’ banks were able to take over the regional banks that had, themselves, acquired small community banks within the state. The assisted merger and failure trends suggest that the regional state banks had acquired community banks that were already failing. However, the rise in unassisted mergers suggest that the regional banks that the ‘Alpha Group’ acquired were not banks that were failing.

Even though mergers had started to decline, the assets in the ‘Alpha Group’ continued to grow disproportionately compared to the assets outside of the group; this implies something more substantial happened. We theorize that the ‘Alpha Group’ focused on acquiring regional banks in the early 1990s. However, by the early 2000s most regional banks could no longer compete against the ‘Alpha Group’; meaning the assets in the ‘Alpha Group’ continued to grow because regional competition was essentially dominated by the group. This is perhaps why, in 2010, when there was a spike in bank failures and mergers, the fold change continued to only show a slight positive growth from 2010 to 2011. Wheelock (2011) noted that between 2006 and 2010, about 75% of closing banks were unassisted mergers. The majority of banks failing at this time were regional and community banks (Mccord et al., 2015; Wheelock, 2011). This information, relative to the fold change trend, suggests that even if a member of the ‘Alpha Group’ acquired one of these banks, the amount of assets the institution contributed was relatively small.

FUTURE RESEARCH

It should be considered that the fold change did not show a negative trend during the 2008 recession or after the implementation of the 2010 Dodd–Frank Act. This raises question of whether or not future banking regulation would have a significant impact on the top ten banks. One benefit of using a fold change ratio as opposed to percent change is that a log fold change normalizes data so that it is symmetrical in nature. Future research could test the impact banking regulation has on the top 10 banks in the late 20th century as well as in the modern era. Additionally, future research could add economic variables to examine whether economic activity magnifies the impact regulation has on consolidation in the banking industry.

CONCLUSION

While regulatory acts aimed toward the banking industry hoped to promote competition, the actual impact of this legislation may have very well accomplished the opposite. Specifically, the 1994 Riegle-Neal Act allowed national banks to compete in regions that had previously been closed off. These national banks could then start acquiring regional banks. After a certain point, these national banks were not growing their assets through acquisitions, but through their position as the main competitors in these regions. It is

likely that the barrier to entry in these regions increased, making it difficult for new charters to enter the market. By looking at the top 10 banks as of 2019, and examining their collective history, it is worth considering that regulation may have stymied competition, which in turn is what led to consolidation in the banking industry. This consolidation then stifled regional competition. The extreme measures of banking regulation may have worked in the short term, but the long-term consequence of the regulation has likely led to an outcome that is dichotomous to the original intention.

ENDNOTES

1. The three identified regulatory acts are represented by bold vertical gridlines.
2. All charts use a secondary y axis. Unassisted mergers, assisted mergers, and bank failure are not relatively scaled against each other.

REFERENCES

- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). *Bank concentration and crises* (NBER Working Paper No. 9921). National Bureau of Economic Research. Retrieved from <https://www.nber.org/papers/w9921>
- Belongia, M. (1986). The farm sector in the 1980s: Sudden collapse or steady downturn? *St. Louis Fed Economic Review*, 68(9), 17–25. Retrieved from <https://research.stlouisfed.org/publications/review/1986/11/01/the-farm-sector-in-the-1980s-sudden-collapse-or-steady-downturn>
- Berger, A., Demirgüç-Kunt, A., Levine, R., & Haubrich, J. (2004). Bank concentration and competition: An evolution in the making. *Journal of Money, Credit and Banking*, 36(3), 433–451. Retrieved from <https://www.jstor.org/stable/3838945?seq=1>
- Dick, A. (2006). Nationwide Branching and Its Impact on Market Structure, Quality, and Bank Performance. *The Journal of Business*, 79(2), 567–592. Retrieved from https://www.jstor.org/stable/10.1086/499131?seq=1#metadata_info_tab_contents
- Eken, M.H., Kale, S., & Selimler, H. (2013). The evolution of regulations in banking: A cycle based approach. *Journal of Finance and Risk Perspectives*, 2(2), 15–26. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2406882
- Federal Deposit Insurance Corporation. (1998). *Managing the crisis: The FDIC and RTC experience — chronological overview*. FDIC. Retrieved from <https://fdic.gov/bank/historical/managing/chronological/index.html>
- Jayarathne, J., & Hall, C. (1996). Consolidation and competition in second district banking markets. *New York Fed Current Issues*, 2(8). Retrieved from https://www.newyorkfed.org/research/current_issues/ci2-8.html
- Johnson, C., & Rice, T. (2008). Assessing a Decade of Interstate Bank Branching. *Washington and Lee Law Review*, 65(1), 73–127. Retrieved from <https://scholarlycommons.law.wlu.edu/cgi/viewcontent.cgi?article=1091&contet=wlulr>
- Markham, J. (2000). Banking regulation: Its history and future. *Banking Institute Journal*, 4(1), 221–286. Retrieved from <https://scholarship.law.unc.edu/ncbi/vol4/iss1/10/>
- Mccord, R., Prescott, E., & Sablik, T. (2015). Explaining the decline in the number of banks since the Great Recession. *Richmond Fed Economic Brief*, pp. 1–5. Retrieved from https://www.richmondfed.org/~media/richmondfedorg/publications/research/economic_brief/2015/pdf/eb_15-03.pdf
- Mulloy, P. (1995). The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994: Responding to global competition. *Journal of Legislation*, 21(2), 255–273. Retrieved from <https://scholarship.law.nd.edu/jleg/vol21/iss2/8/>
- Nurisso, G., & Prescott, E. (2017). The 1970s origins of too big to fail. *Cleveland Fed Economic Commentary*, 2017–17. Retrieved from <https://www.clevelandfed.org/en/newsroom-and->

events/publications/economic-commentary/2017-economic-commentaries/ec201717-origins-of-too-big-to-fail.aspx

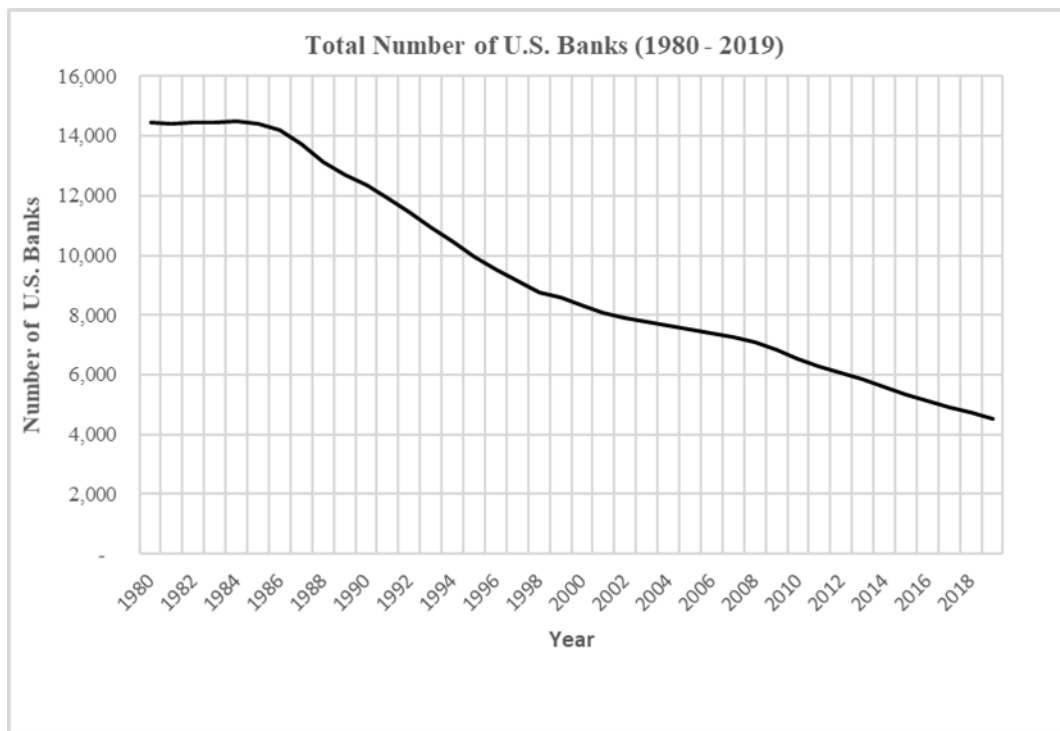
Omarova, S., & Margaret, T. (2012). That which we call a bank: Revisiting the history of bank holding company regulations in the United States. *Cornell Law Faculty Publications*, 31, 113–198.

Retrieved from <https://scholarship.law.cornell.edu/facpub/1012/>

Sherman, M. (2009). *A short history of financial deregulation in the United States*. Center for Economic and Policy Research. Retrieved from <https://cepr.net/report/a-short-history-of-financial-deregulation-in-the-unitedstates/>

Wheelock, D. (2011). Banking industry consolidation and market structure: Impact of the financial crisis and recession. *St. Louis Fed Economic Review*, 93(6), 419–38. Retrieved from <https://research.stlouisfed.org/publications/review/2011/11/01/banking-industry-consolidation-and-market-structure-impact-of-the-financial-crisis-and-recession>

APPENDIX A



APPENDIX B

Company		RSSD
JP Morgan Chase	JPM	852218
Bank of America	BAC	480228
Wells Fargo	WFC	451965
Citibank	C	476810
US Bank	USB	504713
Truist Bank	TFC	852320
PNC Bank	PNCB	817824
TD Bank	TD	497404
Capital One	COF	112837
Bank of New York Mellon	BK	541101

APPENDIX C

Year	Top Ten Sum		Failures	Unassisted Mergers	Assisted Mergers
	Assets (\$ millions)	Assets (\$ millions)			
1980	\$1,855,687	\$191,274	3	126	7
1981	\$2,028,982	\$200,226	2	210	5
1982	\$2,193,339	\$213,458	7	256	25
1983	\$2,342,101	\$222,358	12	314	33
1984	\$2,508,870	\$235,914	4	331	74
1985	\$2,730,672	\$266,661	22	334	93
1986	\$2,940,698	\$308,420	21	346	120
1987	\$2,999,948	\$320,725	11	541	176
1988	\$3,130,795	\$316,196	6	600	201
1989	\$3,299,362	\$353,468	9	413	196
1990	\$3,389,489	\$354,481	8	392	151
1991	\$3,430,682	\$355,566	4	447	101
1992	\$3,506,170	\$422,336	11	429	87
1993	\$3,707,088	\$465,185	5	481	56
1994	\$4,012,106	\$539,730	0	548	12
1995	\$4,315,175	\$614,181	0	608	6
1996	\$4,582,164	\$840,963	0	554	5
1997	\$5,018,532	\$1,022,661	0	601	1
1998	\$5,442,603	\$1,194,144	0	560	3
1999	\$5,735,134	\$1,557,646	0	419	7
2000	\$6,245,559	\$1,737,111	0	456	6
2001	\$6,552,293	\$2,066,249	0	359	3
2002	\$7,076,844	\$2,282,085	4	276	6
2003	\$7,601,000	\$2,532,213	0	225	2
2004	\$8,420,099	\$3,285,544	0	263	3
2005	\$9,046,945	\$3,725,430	0	271	0
2006	\$10,097,741	\$4,375,097	0	309	0
2007	\$11,181,900	\$5,095,174	0	293	1
2008	\$12,313,141	\$5,950,346	0	260	19
2009	\$11,826,781	\$5,991,080	6	157	114
2010	\$12,069,442	\$6,557,702	3	183	130
2011	\$12,650,468	\$7,055,040	0	166	84
2012	\$13,387,499	\$7,455,910	1	172	39
2013	\$13,673,056	\$7,720,169	1	203	22
2014	\$14,474,657	\$8,244,594	0	238	14
2015	\$14,893,214	\$8,274,195	0	264	8
2016	\$15,627,781	\$8,661,239	0	223	5
2017	\$16,217,881	\$8,942,718	0	196	6
2018	\$16,728,102	\$9,040,454	0	226	0
2019	\$16,910,521	\$9,663,367	0	226	0