

Did the Reversal of the Glass-Steagall Act Lead to the Subprime Mortgage Collapse and the Great Recession?

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Abstract

Did the exponential growth in FHCs following the overturn of the Glass-Steagall Act lead to the Federal Reserve's inability to regulate FHCs and thus serve as the catalyst for the failures in the subprime mortgage sector and finance industry? Could the recession have been avoided if the Glass-Steagall Act was extant or was the recession the result of the simple nature of banking practices? Economists have theorized that the absence of timely government intervention coupled with inefficient monitoring of financial entities and dubious practices within the banking sector were contributing factors to the 2007 economic slowdown. Policymakers have hypothesized that the overturn of the Glass-Steagall Act was the catalyst for banking practices that led to the exponential growth in subprime mortgages and the subsequent mortgage defaults, which imposed negative externalities on the finance industry and U.S. economy. Conversely, other analysts have argued that the nature of the banking sector could have produced economic the downturns observed in the last recession, and that a reversion to antiquated financial policies may not obviate future slowdowns.

I. Introduction

Economists spent the latter part of the 1990s proclaiming the sudden rise in home valuations to be a temporary phenomenon fueled by speculation and ephemeral market gains that was destined to erupt and wreak havoc on the U.S. economy. Known by the appellation "housing bubble," the real estate boom of the late 1990s was marked by steady rises in property values coupled with expansions in home construction, mortgage disseminations, and related professions. By late 2006, the real estate sector had taken an aberrant, downward course; home values began to plummet at near unprecedented rates, real property investments declined, and the real estate sector experienced its most severe sales slump in more than a decade. Market predictions of steady growth were met with stark realizations that the housing boom of the late 1990s was nothing more than an economic bubble, a rise in asset prices not explained by economic fundamentals, which had undoubtedly imploded and enervated the housing market.

A report published by the Center for Economic and Policy Research (CEPR, 2005) confirmed conjecture that the exponential growth in home values was not the derivative of circumstances in the housing market, such as population growth or rent increases, but rather the rise could only be attributed to some unknown factor. The sudden loss of property values left many mortgage holders underwater, unable to repay their loans and faced with the option to abdicate their once promising assets. As mortgage defaults rose, obtaining mortgages became increasingly difficult and home prices continued to plummet at a record-setting pace. By the end of 2007, it was undeniable that the bursting of the housing bubble had crippled the finance industry and driven the United States into its first recession in more than six years. As policymakers searched for a way to resolve America's economic woes, many speculated that government policies were the fulcrum for the maelstrom in the finance industry and that a reversion to policies established under the Glass-Steagall Act could be the only remedy to the nation's financial crisis.

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Coined the Great Recession, the 2007 recession was considered the worst economic slump in the United States following the end of World War II (National Bureau of Economic Research, 2010). The Bureau of Labor Statistics reported a 54%² increase in the unemployment rate between December 2007 and June 2009, with the finance activities sector experiencing a 107%³ rise in unemployment by the end of 2009. An article published by the Bureau of Economic Analysis(2008) stated, "A downturn in the finance and insurance industry group accounted for nearly half of the slowdown in economic growth in 2007" and GDP in the securities, commodity contracts, and investments sector declined 40% from 2007 to 2008.⁴ Additionally, the finance industry reported a subprime mortgage default rate that topped 43% by the fourth quarter of 2007, while the Federal Reserve introduced a program to purchase mortgage-backed securities from government enterprises⁵ (UNC Chapel Hill, 2008). The defaults in subprime mortgages enfeebled lenders in the United States and abroad, reverberated throughout every segment of the economy, and led to significant declines in GDP, GDI, and production. As production declined, inflation rose, the U.S. dollar weakened, exports decreased, and many feared that those were signs of the onset of a second Great Depression.

As news of layoffs, bank closures, and plummeting stock values became ubiquitous, the optimism of the American people faded, and anticipation of a speedy recovery was replaced by doubts of a complete restoration of the U.S. economy. In June 2009, relief reverberated throughout media outlets as reports surfaced that the recession had peaked and a recovery period had begun. The National Bureau of Economic Research (NBER) declared a trough in business activity and an end to the U.S. recession (NBER, 2009). The American people rejoiced in knowing that the worst was over and a proliferation in economic activity would soon begin.

Unfortunately, the end of the recession did not signal a return to the booming economy of the mid-2000s, when GDP rose, 6.4%⁶ annually on average, and unemployment was less than 6%⁷. Instead, the recovery process was sluggish, unpredictable, and plagued with incongruous spurts in stock prices and employment levels. Many challenged the economic resolutions proposed by policymakers, specifically the stimulus packages and the lowering of the federal funds rate, and questioned the veracity of those policies to bolster reform in the economy.

Beginning in 2008, the White House proposed multiple stimulus packages to spur spending and to lift the nation out of its economic slump. The first stimulus package, the Economic Stimulus Act of 2008, was a \$168 billion, two-year package of tax breaks for businesses and consumers, and rebates to taxpayers and low-income Americans (GPO, 2008). Grandiloquent lawmakers lauded the proposals as the "booster shot" for the economy and the solution to the nation's financial melancholy (CNN, 2008). The second stimulus, the Troubled Asset Relief Program (TARP), was designed to assist asset-strapped banks and to allow the U.S. government to purchase "toxic" assets from financial institutions (GPO, 2009). In conjunction with TARP, the Treasury Department created six programs to assist various industries in an attempt to further mitigate the problems in the finance industry.

As the White House signed stimulus plans, the Federal Reserve introduced a program to purchase mortgage-backed securities from government-sponsored agencies and lowered the federal funds rate 50 basis points to 1% (Federal Reserve, 2008).

² The unemployment rate increased from 4.6% in 2007 to 9.9% in June 2009 (Bureau of Labor Statistics, 2013).

³ The finance activities industry unemployment rate increased from 289 persons in 2007 to 598 persons in 2009 (Bureau of Labor Statistics, "Household Data Annual Averages, 26. Unemployed persons by industry, class of worker, and sex" table, updated February 12, 2015).

⁴ GDP in the securities, commodity contracts, and investments sector experienced a 40.2% change between 2007 and 2008 (Bureau of Economic Analysis, "GDP in Current Dollars" table, updated December 10, 2015).

⁵ The Federal Reserve's MBS program was revealed in a Press Release on December 30, 2008. Information retrieved from www.federalreserve.gov/newsevents/press/monetary/20081230b.htm.

⁶ Annual GDP growth across all industries ranged from a low of 5.8% to a high of 6.6% from 2003 to 2006 and averaged 6.4% (Bureau of Economic Analysis, "GDP in current dollars" table, updated December 10, 2015). Retrieved from www.bea.gov.

⁷ The proportion of the labor force that was unemployed ranged from 6.0% in 2003 to 4.6% in 2006 (Bureau of Labor Statistics, "Household Data, Annual Averages, 1. Employment status of the civilian noninstitutional population, 1944 to date" table). Retrieved from www.bls.gov/cps/cpsaat01.pdf.

The efforts to stimulate the U.S. economy were audacious and well-intended, but economists were unable to confirm the efficacy of the programs, as GDP and employment continued to decline, and investment failed to grow. Government officials scrambled to find their next solution to America's economic crisis.

In 2009, incoming President Obama signed the American Recovery and Reinvestment Act (ARRA) as well as the Dodd-Frank Wall Street Reform and Consumer Protection Act. Both acts were promised to bolster lending and investment with the intention of creating a ripple effect throughout other segments of the economy. The ARRA was a \$787 billion stimulus package aimed to promote economic recovery through a series of policy initiatives, including job creation/retention, infrastructure improvements, energy modernization, and tax relief. Additionally, the ARRA was designed to provide assurance of the stability of state and local government budgets in addition to extended unemployment benefits, and increased money allowances for U.S. industries (GPO, 2009). The Dodd-Frank Wall Street Reform and Consumer Protection Act was promised to promote accountability and transparency in the finance industry and to protect consumers from the dubious practices of financial institutions. The act established an oversight council to monitor industry practices and interdict deceptive claims made by members of the financial community (GPO, 2010). While both the ARRA and the Dodd-Frank Act were praised for their efforts to buttress consumer confidence in the financial sector and to spur investment, data findings showed only marginal success for the programs, and many deemed the policies to be failures.

A bipartisan group of congressional leaders argued that a full restoration of the U.S. economy could not occur until the origin of the financial crisis was addressed and abated. This group of legislators believed that only a prohibition of the cross-collaboration between banks and other financial entities would restore equanimity in the economy (Carter, Zach, 2013). Advocates proposed that a reversion to bylaws established under the Glass-Steagall Act was the best recourse for negating the devastation of the finance industry and for averting a future occurrence.

The Glass-Steagall Act, deemed the most integral part of the Banking Act of 1933, was created as a response to the banking failures of the late 1920s and early 1930s. The act was created by two members of Congress, Senator Carter Glass and Representative Henry Steagall, to restore confidence in the financial industry and balance in the economy. It limited commercial banks' securities activities and affiliations between commercial banks and securities firms. Additionally, the act established the formation of a bank deposit insurance fund, known as the Federal Deposit Insurance Corporation, with the goal of restoring confidence in the U.S. banking system (FDIC, 2013).

Economists and policy analysts questioned the veracity of the Glass-Steagall Act in averting economic downturns caused by the cross-collaboration of banks and financial institutions, and questioned whether the act was successful in preventing a recurrence of a slowdown similar in magnitude to the Great Depression.

To answer that question, economists analyzed the history of economic downturns in the United States and measured the severity of each. According to the NBER, the United States had experienced 13 recessions following the implementation of the Glass-Steagall Act. The average duration was 11 months, and the longest recession occurred in 2007 for 18 months (NBER, 2010). Because no downturn in the business cycle had ever matched the duration of the Great Depression, whose contractionary period lasted 43 months, many surmised that policies promulgated in the Glass-Steagall Act were successful in preventing a second Great Depression. Although analysts cannot irrefutably confirm that the absence of a second Great Depression was the result of regulations promulgated in the Glass-Steagall Act, many praised the act for its ability to create the FDIC, a safeguard for depositors' accounts; to bolster investment; and to restore trust in the finance industry.

However, in 1999, Congress voted to repeal the Glass-Steagall Act and to replace it with an act that leaders felt would address its anachronism. Known as the Gramm-Leach-Bliley Act (GLBA), or the Financial Services Modernization Act, the newly constructed financial services policies authorized the consolidation of commercial banks with other financial institutions, including those that engaged in activities deemed risky, and allowed commercial banks to offer financial services that were prohibited under the Glass-Steagall Act (GPO, 1999). Because of the expanded permissions of the GLBA, commercial banks were allowed to merge with other financial entities and form what are known as financial holding companies, or FHCs, to offer investment and insurance-related services. Additionally, banks were able to gain greater profit margins resulting from increased economies of scope and shared access to the existing personnel of the partner institutions.

Under the newly formulated regulations of the GLBA, commercial banks were allowed to engage in risky investment practices, underwrite securities using mortgages (also known as mortgage-backed securities), and require potential customers to purchase securities from a company that the bank was underwriting.

It was the underwriting of securities that posed significant risks for commercial banks, as banks would bear the responsibility of selling the underlying securities and the costs of holding the securities until they were sold. Under the new, deregulated banking system, securities were allowed to be backed by mortgages, including subprime mortgages, and used as collateral for loans.

Mortgage-backed securities (MBS), defined as any number of mortgages pooled together by a lender and sold to a government-sponsored enterprise or securities firm to be used as collateral for the MBS, were riskier than the traditionally used asset-backed securities because mortgages do not have the same guarantee of repayment as other asset-backed securities. Because the securing agent for a loan must be a sound asset, using subprime mortgages as the securing agent poses a greater risk to lenders because subprime borrowers have a higher probability of default than prime borrowers.

By 2006, subprime mortgages in the United States accounted for 20% of all mortgages, with 90% of subprime mortgages being adjustable-rate mortgages (UNC Chapel Hill, 2008). According to the Federal Reserve Bank of Chicago, "When an [adjustable rate mortgage] resets after the initial defined period, the interest rate and . . . the monthly mortgage payment, may go up substantially . . . and some families . . . fall behind on their mortgages" (Federal Reserve Bank of Chicago, 2010). As the higher adjustable rates and monthly payments took effect, mortgage-holders lapsed on their payments and the number of defaults increased. As the default rate amplified, the securities backed by mortgages lost their value and severely hindered the financial industry's ability to recover from the defaults. The failures of the financial industry rippled throughout the U.S. economy and caused steep declines in home prices, reductions in employment, increases in defaults of other loan types, and negative GDP growth.

The delinquency rate in the subprime mortgage sector has been cited as the cause of the collapse of the mortgage sector and the downturns in the finance industry and is regarded as the catalyst for the Great Recession. According to the Mortgage Bankers Association, subprime adjustable rate mortgages represented only 6.8% of outstanding loans in 2007, but they accounted for 43% of the foreclosures that started during the third quarter of that year (UNC Chapel Hill, 2008).

A lack of accountability and monitoring of the practices of the major banks have been identified as a contributing factor in the failure of the financial industry. Nefarious lending policies by financial institutions led to record-breaking foreclosure rates and ongoing fraud settlements. On February 9, 2012, the Department of Justice announced a \$26 billion settlement to consumers of five U.S. banks because of the institutions' "flawed and fraudulent foreclosure practices" (Washington Post, 2012). The U.S. Attorney General and other state attorney generals have filed lawsuits against the major banks for their deceptive mortgage claims to American consumers and their role in the subprime mortgage turmoil.

Many questions were raised regarding the ambiguity of financial policies and the dubious practices of financial institutions that led to the fall of the mortgage sector. Critics questioned the Federal Reserve, as the governing authority for ensuring America's financial stability, for its failure to interdict activities that led to the substantial declines in the subprime mortgage sector and finance industry. While others placed blame on lenders and the laws that allowed them to engage in disingenuous lending strategies, media outlets offered public opinions that criticized foreclosed borrowers and their inability to repay their loans.

According to a report published by the Financial Crisis Inquiry Commission, the financial crisis was "avoidable" and "the result of human action and inaction" on the part of financial entities (GPO, 2011). Additionally, the report concluded that the Federal Reserve failed to closely monitor the actions of bank holding companies (BHCs)⁸ and financial holding companies (FHCs).⁹ Prior to the upending of the Glass-Steagall Act, the Federal Reserve permitted the formation of 40 BHCs, which later became FHCs.

⁸ The Federal Financial Institutions Examination Council defines a bank holding company as a company that owns one or more banks. Retrieved from www.ffiec.gov/nicpubweb/Content/HELP/Institution%20Type%20Description.htm.

⁹ A financial holding company (FHC) is a company that engages in a broad range of financial activities.

Following the repeal of the Glass-Steagall Act, the number of FHCs increased to 591 by 2006 (Federal Reserve and Department of Treasury, 2003; Financial Services Fact Book, 2005).

Did the exponential growth in FHCs following the overturn of the Glass-Steagall Act lead to the Federal Reserve's inability to regulate FHCs and thus serve as the catalyst for the failures in the subprime mortgage sector and finance industry? Could the recession have been avoided if the Glass-Steagall Act was extant? The goal of this study is to determine whether policies promulgated under the Glass-Steagall Act could have prevented the unconventional growth and rapid decline of the subprime mortgage sector and the resultant recession.

II. Theory/Literature Review

Numerous theories have been proposed to identify the origin of the decline of the finance industry and the onset of the 2007 recession. This paper focuses on two prominent factors: (1) the lack of timely government intervention and regulation of the financial industry following the overturn of the Glass-Steagall Act; and (2) the influence of the simple nature of banking practices on the economy. In this paper, six papers will be analyzed and used as opinion sources to aid in assessing the events that led to the Great Recession.

The first paper was written by Victoria Geyfman and Timothy J. Yeager titled, "The Financial Modernization Act: Evolution or Revolution?" The paper included a study of the impacts of the GLBA on the banking industry and whether those impacts were significant enough to lead to market the breakdowns that led to the Great Recession (Geyfman and Yeager, 2002). The authors included information on asset ratios of financial holding companies (FHCs) and bank holding companies (Commercial banks) and compared those data to that of commercial banks. The asset power of FHCs and Commercial banks could have been significant enough to affect other sectors and cause a negative downturn if the assets of FHCs and Commercial banks declined significantly. If true, then the cause of the recession was the decrease in assets of FHCs and Commercial banks, which will add substance to the theory that financial sector practices permitted after the overturn of the Glass-Steagall Act led to the Great Recession.

In the second paper, "A Short History of Financial Deregulation in the United States" written by Matthew Sherman from the Center for Economic and Policy Research, the report chronicled the history of the banking sector and highlighted significant banking regulation events (Sherman, 2009). The author analyzed banking regulations to determine which regulations could have caused/averted the Great Recession. The proposed theories will support the idea that the repeal of the Glass-Steagall Act could have led to the Great Recession.

The third publication, produced by the Financial Crisis Inquiry Commission, a commission created by the U.S. government to determine the cause of the Great Recession, was titled, "The Financial Crisis Inquiry Report", and concluded that the 2007 financial and economic conditions were the result of the Federal Reserve's failure to efficiently monitor the activities of the financial sector (Financial Crisis Inquiry Commission, 2011). The report provided detailed analyses of the Commission's investigative findings as well as a brief history of the formation of financial holding companies following the GLBA. Additionally, the causal relationship between the GLBA, the subprime mortgage sector, and the Great Recession were analyzed. Lastly, the report debunked the idea that the recession was the result of normal business cycle downturns and will lend substantial evidence to the theory that a lack of timely government intervention and regulation of the financial industry led to the recession.

The fourth report was a joint publication by the Board of Governors of the Federal Reserve System and U.S. Department of Treasury titled, "Report to the Congress on Financial Holding Companies under the Gramm-Leach-Bliley Act". The report provided an in-depth understanding of the duties, investments, and financial ventures that banks and FHCs were engaged in following the GLBA (Federal Reserve and Department of Treasury, 2003). The paper examined the sizable increases in the number of FHCs following the implementation of the GLBA, and how those increases hindered the Federal Reserve Board's ability to efficiently monitor the financial industry. The analyses will validate whether the absence of timely government intervention and a failure to properly regulate the financial sector led to the Great Recession. In the fifth paper, written in 2002 by Robert J. Hendershott, Darrell E. Lee, and James G. Tompkins titled, "Winners and Losers as Financial Service Providers Converge: Evidence from the Financial Modernization Act of 1999", a comprehensive analysis of the positive gains financial institutions, insurance companies, and commercial banks experienced after banking deregulation was explained (Hendershott, 2002).

The authors provided data analyses on the assets, losses, and profit margins of financial institutions, insurance companies, and commercial banks after deregulation, and an examination of the changes in the financial market following banking deregulation. The paper aided in determining whether deregulation strengthened commercial banking, in terms of assets, or if the amalgamation of the three sectors led to negative externalities that rippled throughout the financial industry and caused the Great Recession. The findings will provide credibility for the theory that the simple nature of banking practices caused the Great Recession.

The sixth publication titled, "The Gramm-Leach-Bliley Act of 1999: A Bridge Too Far? Or Not Far Enough?" was written by Lawrence J. White and provided a narrative of the banking industry prior to the overturn of the Glass-Steagall Act and how practices in the industry led to the installation of the Gramm-Leach-Bliley Act (White, 2010). The author argued that activities in the banking sector prior to the GLBA could have created the same market inefficiencies that were present in 2007 and that reverting to pre-GLBA standards may not have reversed the economy. The paper will provide evidence to support the theory that the simple nature of banking practices could have caused the Great Recession.

III. Hypotheses

Economists have theorized that the absence of timely government intervention coupled with inefficient monitoring of financial entities and dubious practices within the banking sector were contributing factors to the 2007 economic slowdown. Policymakers have hypothesized that the overturn of the Glass-Steagall Act was the catalyst for banking practices that led to the exponential growth in subprime mortgages and the subsequent mortgage defaults, which imposed negative externalities on the finance industry and U.S. economy. Conversely, other analysts have argued that the simple nature of the banking sector could have produced economic downturns observed in the last recession, and that a reversion to antiquated financial policies may not obviate future slowdowns.

According to the Financial Crisis Inquiry Commission (FCIC), the defaults in subprime mortgages led to the failure of the subprime mortgage sector, rippled throughout the financial sector, and caused a downturn of the business cycle (Financial Crisis Inquiry Commission, 2011). The FCIC concluded that trends in the financial sector in 2007 and 2008 were not the result of normal business cycle slowdowns or the result of simple banking practices, but rather, the downturns resulted from a combination of financial firms taking too great of risks, allowed after the overturn of the Glass-Steagall Act, and the Federal Reserve's lack of timely intervention and regulating of FHCs (Federal Reserve, 2011).

Opponents of the Financial Crisis Inquiry Commission's assertions believe that the repeal of section 20 subsidiaries of the Glass-Steagall Act had already permitted the Federal Reserve Board to authorize the cross-collaboration of banks with other financial entities and to allow for the underwriting and dealings of closed-end securities. Documentation from the Federal Reserve showed that prior to the reversal of the Glass-Steagall Act, the Federal Reserve allowed 40 BHCs to underwrite and deal in securities (Federal Reserve, 2003). Furthermore, opponents of the FCIC's report reasoned that attributing the decline of the financial sector to the overturn of the Glass-Steagall Act was inaccurate, as financial entities were allowed expanded banking privileges prior to the repeal, and that the simple nature of banking practices could have produced the downturns in the financial sector.

IV. Data

The data needed to conduct research in this study consists of subprime mortgage interest rates, subprime mortgage default rates, the net assets of financial holding companies, the net assets of commercial banks, gross domestic product, gross domestic income, personal income per capita, total employment, and U.S. recession statistics. The period of observation, for the first hypothesis, is the year of the repeal of the Glass-Steagall Act to the end of the Great Recession (1999-2009), and the period of observation for the second hypothesis comprises all years following the implementation of the Glass-Steagall Act up to the end of the recession (1933-2009).

The units of analysis for data collected from the Bureau of Economic Analysis are GDP, GDI, personal income per capita, and total employment data. The strength of these data will be their capacity to offer a comparative analysis of movement in each economic indicator, concurrently with changes in the independent variables, throughout the observation period. However, these data may not be able to confirm a causal relationship between the changes in the economy with the declines in the subprime mortgage sector and the overturn of the Glass-Steagall Act.

The units of analysis for data collected from the Federal Reserve and the Census Bureau are the net assets of financial holding companies and the net assets of commercial banks. The capacity of the data to ascertain the influence of changes in the net assets of FHCs and commercial banks to movement in the dependent variables will be the strengths of the data. However, the data may not be able to offer proof of a direct effect of the asset power of FHCs and commercial banks on the overall economy.

The units of analysis for the subprime mortgage data are subprime mortgage interest rates and subprime mortgage default rates. The interest rates will be used to assess the causal relationship between changes in interest rates and movement in mortgage default rates. Data from the Federal Reserve, Census Bureau, and Bureau of Economic Analysis will be used to conduct the studies and to confirm correlated movements amongst the variables. The veracity of these data will center on their capacity to reveal relationship patterns between the dependent variable (default rates) and independent variable (interest rates) as well as identify aberrant behavior trends in the variables. However, the data cannot be used to analyze the effects of changes in interest rates and default rates on fluctuations in the observed economic indicators.

Lastly, business cycle data from the National Bureau of Economic Research, the Federal Deposit Insurance Corporation, and other sources will be used to chronicle the history of U.S. recessions and banking practices. The timeline comparison will allow for the confirmation of a relationship between deviations in the economy and changes in banking practices. However, confirming the existence of a relationship may not constitute causality or preclude the economic variations from being the result of some other exogenous factor.

V. Variables

For this study, the dependent variables are GDP, GDI, personal income per capita, total employment, and subprime mortgage default rates; the independent variables are subprime mortgage interest rates, net assets of financial holding companies, and net assets of commercial banks. Additionally, data from the National Bureau of Economic Research, the Federal Deposit Insurance Corporation, and other internet sources will be used to delineate the history of U.S. recessions and changes in banking practices following the implementation of the Glass-Steagall Act.

The changes in the dependent variables will measure the impact of the independent variables on various economic indicators. The effect of the independent variables on the dependent variables (the economic indicators) will show the causal influence of the independent variables in facilitating movement in the economic indicators, which follow the NBER's definition of a recession, "a significant decline in economic activity spread across the economy...normally visible in real GDP, real income, employment..." (NBER.org, 2010). The effects of the overturn of the Glass-Steagall Act will be measured by changes in the net assets of FHCs and commercial banks, where substantial increases in assets would be attributed to the deregulation of the finance industry.

The econometric equations needed to measure the relationships between the dependent and independent variables are:

- (1) $GDP_i = \beta_0 + \beta_1 FHC_net_assets_i + \beta_2 CommBank_net_assets_i + u_i$, where GDP is national GDP, FHC_net_assets is the total value of net assets held by FHCs, $CommBank_net_assets$ is the total value of net assets held by commercial banks, $i =$ year 1999, year 2000, year 2001, year 2002, year 2003, year 2004, year 2005, year 2006, year 2007, year 2008, and year 2009;
- (2) $GDI_i = \beta_0 + \beta_1 FHC_net_assets_i + \beta_2 CommBank_net_assets_i + u_i$, where GDI is national GDI, and all other variables are the same as in equation 1;
- (3) $Personal_Inc = \beta_0 + \beta_1 FHC_net_assets_i + \beta_2 CommBank_net_assets_i + u_i$, where $Personal_Inc$ is personal income per capita, and all other variables are the same as in equation 1;
- (4) $Employment = \beta_0 + \beta_1 FHC_net_assets_i + \beta_2 CommBank_net_assets_i + u_i$, where $Employment$ is employment across all sectors, and all other variables are the same as in equation 1;
- (5) $Defaults = \beta_0 + \beta_1 int_rates_i + u_i$, where $Defaults$ are the number of subprime mortgage defaults, int_rates are the average mortgage interest rates on subprime mortgages, and $i =$ year 1999, year 2000, year 2001, year 2002, year 2003, year 2004, year 2005, year 2006, year 2007, year 2008, and year 2009.

VI. Analysis/Findings

To test the first hypothesis, three methods will be used to determine the relationships between the dependent and independent variables. First, the correlation coefficient analysis will be performed using Microsoft Office Excel to determine the effects of changes in the independent variables on the dependent variables. Next, a regression analysis will measure the percentage of movement in the dependent variables that was caused by changes in the independent variables. Lastly, line graphs will convey a visual representation of the relationship between the independent and dependent variables.

For the second hypothesis, data from various sources will be used to delineate the history of U.S. recessions and changes in banking practices that proceeded with those downturns.

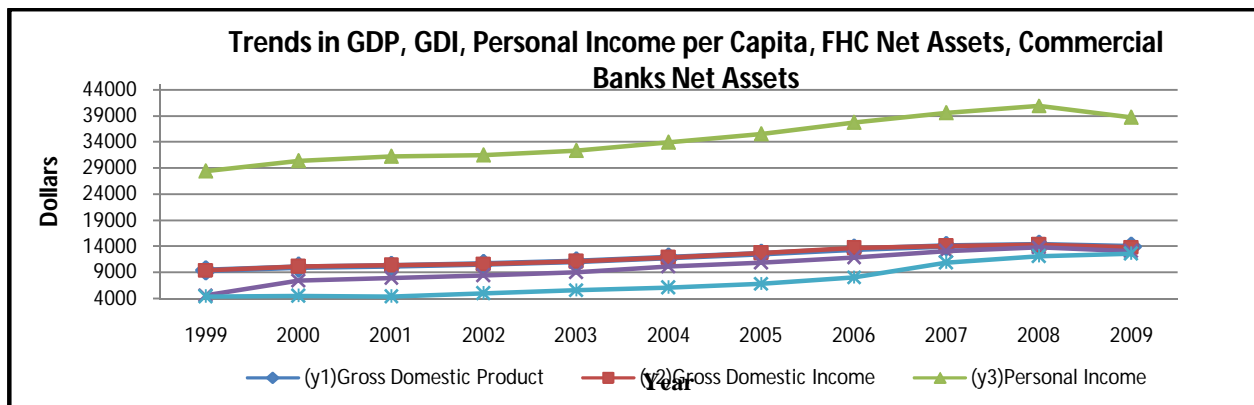
Equations 1, 2, and 3

The correlation coefficient analysis revealed that GDP, GDI, and personal income were strongly correlated with the independent variables FHC net assets and commercial bank net assts. A line graph of the four variables showed that all four variables moved in the same direction from 1999-2009. The results of the regression analyses for GDP, GDI, and personal income in relation to FHC net assets and commercial bank net assets had an adjusted R² greater than .92, which suggests at least 92% of the movement in the dependent variable was caused by changes in the independent variables. Based on the analytical results, it is very likely that FHC net assets affected GDP, GDI, and personal income. The results of the correlation coefficient analysis and the line graph are displayed in Figure 1 and Figure 2.

Figure 1: Correlation Coefficient Analysis of Dependent Variables and Independent Variables

	(y1)Gross Domestic Product	(y2)Gross Domestic Income	(y3)Personal Income	(β3)FHC_net_assets	(β4)CommBank_net_assets
(y1)Gross Domestic Product	1				
(y2)Gross Domestic Income	0.998708628	1			
(y3)Personal Income	0.992897242	0.992809794	1		
(β3)FHC_net_assets	0.981923175	0.979313132	0.981816618	1	
(β4)CommBank_net_assets	0.934108286	0.921612218	0.937631497	0.903452716	1

Figure 2: Line Graph of Dependent Variables and Independent Variables



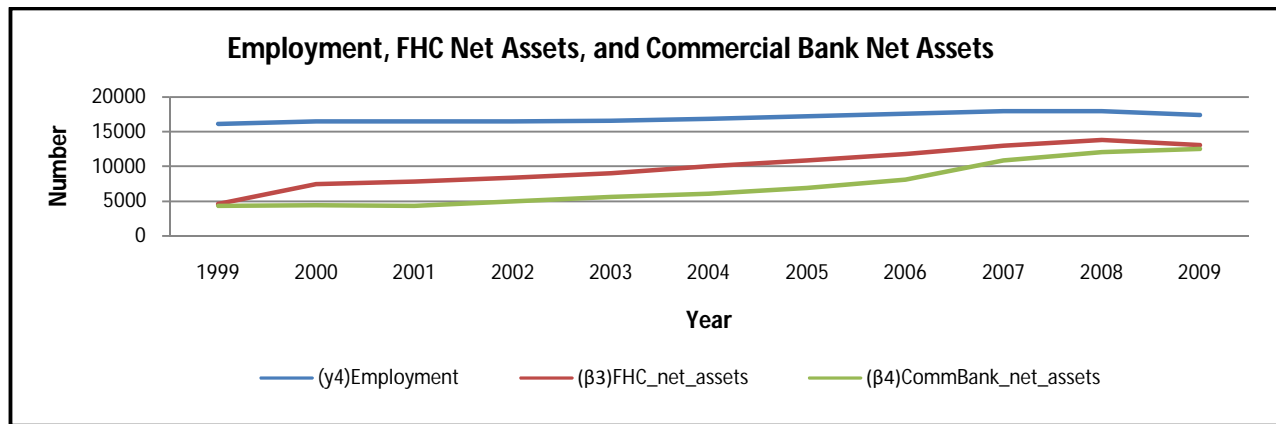
Equation 4

The correlation coefficient of employment and FHC net assets showed a strong relationship between the dependent variable (employment) and the independent variables (FHC net assets and commercial bank net assets). A line graph analysis showed a positive relationship between the dependent variable and the independent variables, with synchronized movements in the variables over the 1999-2009 observation period. The results of the regression analysis revealed an adjusted R² greater than 0.88, which suggests that at least 88% of the movement in the dependent variable was caused by changes in the independent variables. Therefore, it is very likely that FHC net assets affected employment. The results of the correlation coefficient analysis and the line graph are displayed in Figure 3 and Figure 4.

Figure 3: Correlation Coefficient Analysis of Dependent Variables and Independent Variables

	(y4)Employment	(β3)FHC_net_assets	(β4)CommBank_net_assets
(y4)Employment	1		
(β3)FHC_net_assets	0.949167655	1	
(β4)CommBank_net_assets	0.888434792	0.903452716	1

Figure 4: Line Graph of Dependent Variables and Independent Variables



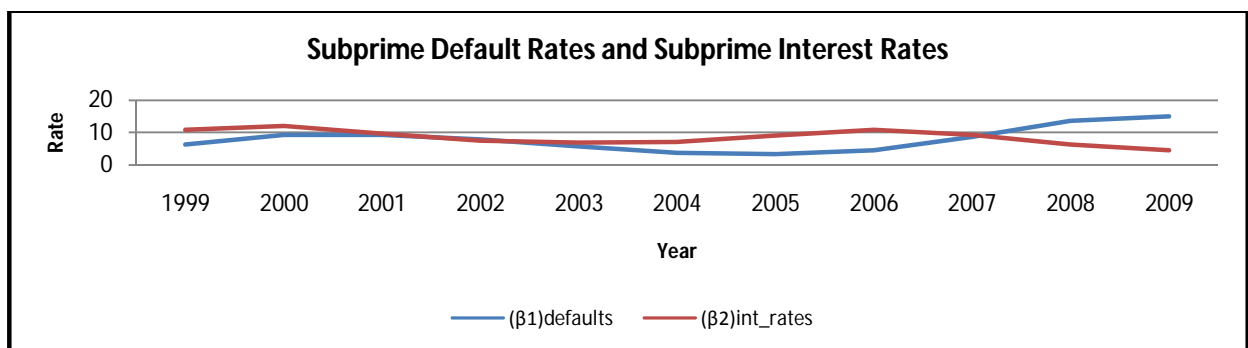
Equation 5

The correlation coefficient analysis for subprime mortgage default rates and subprime mortgage interest rates showed a negative correlation. A line graph of subprime mortgage default rates and subprime mortgage interest rates showed that the two rates were inversely related for the majority of 1999-2009 observation period. The results of the regression analysis revealed an adjusted R² of 0.1, which suggests that only 10% of movement in subprime mortgage default rates is explained by variations in subprime mortgage interest rates. Based on the results of the analyses performed, there is no correlated or causal relationship between subprime mortgage interest rates and subprime mortgage default rates. The results of the correlation coefficient analysis and the line graph are displayed in Figure 5 and Figure 6.

Figure 5: Correlation Coefficient Analysis of Dependent Variables and Independent Variables

	(β1)defaults	(β2)int_rates
(β1)defaults	1	
(β2)int_rates	-0.436364344	1

Figure 6: Line Graph of Dependent Variables and Independent Variables



U.S. Recession Timeline

Recession statistics and data on the history of banking practices, after the implementation of the Glass-Steagall Act, were used to test the second hypothesis. If the second hypothesis holds true, then the nature of banking practices would preclude analysts from citing the reversal of the Glass-Steagall Act as the catalyst for the Great Recession. Based on the results of the timeline comparison, downturns in the business cycle did not correlate with changes in banking practices. Additionally, U.S. recessions, following the repeal of the Glass-Steagall Act, had varying origins that ranged from Presidential intervention to post-war adjustments and changes in consumer preferences. The timeline is displayed in Figure 7.

Figure 7: Timeline of U.S. Recessions, Causes, and Changes in Banking Practices

History of U.S. Recessions after the Glass-Steagall Act				
Recession ¹			Cause ²	Contributing Change in Banking Practice ²
Peak	Trough	Duration		
1937	1938	13	President Roosevelt cut spending and relief programs	None
1945	1945	8	Post-war (WWII) production declined	None
1948	1949	11	Post-war (WWII) adjustment	None
1953	1954	10	Post-war (Korean War) adjustment	None
1957	1958	8	Contractionary monetary policy ³	None
1960	1961	10	Unknown/disputed	None
1969	1970	11	Rapidly rising oil prices	None
1973	1975	16	High oil prices and other factors	None
1980	1980	6	85% of the S&Ls lost money; 15% were bankrupt	Depository Institutions Deregulation and Monetary Control Act of 1980
1981	1982	16	High oil prices, stagflation, and other factors	None
1990	1991	8	Savings and loan crisis	None
2001	2001	8	Bursting of the dot-com bubble	None
2007	2009	18	Subprime mortgage defaults; finance industry declines	Gramm-Leach-Bliley Act (1999)

Sources:

1. www.nber.org/cycles.html
2. www.fdic.gov/about/history/timeline/1930s.html
3. http://www.facu.edu/HR/files/3013471_X_G_Recession_FINAL.pdf

VII. Conclusion

The objective of this research paper was to study the causal relationship of the reversal of the Glass-Steagall Act on the subprime mortgage sector and the Great Recession. Two hypotheses were created to present competing arguments on the causes of the recession: (1) the repeal of the Glass-Steagall Act was the fulcrum for the exponential growth in the subprime mortgage sector and the eventual downturns in the economy, and (2) the simple nature of banking practices initiated the regressions in the finance industry that led to the recession.

The first hypothesis explored assumptions explained in the Financial Crisis Inquiry Report, which asserted that failures in the finance industry, and the subsequent recession, resulted from inept monitoring of FHCs and commercial banks by the Federal Reserve in addition to deceptive lending practices by financial entities. GDP, GDI, personal income per capita, and employment data from the Bureau of Economic Analysis were used to determine the relationship between the dependent variables (GDP, GDI, personal income, and employment) and the independent variables (net assets of FHCs and net assets of commercial banks). A regression analysis was used to determine the magnitude of influence the independent variables held over changes in the dependent variables, and a correlation coefficient analysis was performed to determine if a relationship existed between the independent variables and dependent variables. Additionally, data from the Census Bureau were used to assess the causal relationship of subprime mortgage interest rates on subprime mortgage default rates. Analyzing the influence of subprime mortgage interest rates on subprime mortgage default rates would reveal the probability of loan defaults resulting from increases in the mortgage interest rates.

The second hypothesis evaluated the nature of banking practices and probed whether simple banking procedures led to failures in the subprime mortgage sector, the finance industry, and downturns in the economy.

Patterns of banking activity following the implementation of the Glass-Steagall Act would provide evidence of a correlation between changes in banking practices with downturns in the business cycle. Data on U.S. recession and U.S. banking practices after the implementation of the Glass-Steagall Act were used to test the second hypothesis.

Research analyses performed in this study confirmed that the reversal of the Glass-Steagall Act cultivated the environment for the exponential growth and subsequent decline of the subprime mortgage sector and the finance industry. Data revealed a causal relationship between declines in the net assets of financial holding companies and commercial banks with the downturns in the levels of GDP, GDI, personal income per capita, and total employment (the dependent variables). Results of the regression analyses for GDP, GDI, and personal income in relation to FHC net assets and commercial bank net assets revealed an adjusted R^2 greater than .92, which suggests at least 92% of the movement in the dependent variable was caused by changes in the independent variables; the adjusted R^2 for total employment relative to the net assets of FHCs and commercial banks was 0.88. Additionally, data analysis of recessions and banking regulations showed no correlation between downturns in the economy following changes in banking regulations.

Appendix

Appendix 1

Data Table

Year	Gross Domestic Product ¹	Gross Domestic Income ¹	Personal Income ⁶	Employment ²	FHC Net Assets ³	Commercial Bank Net Assets ⁴	Subprime Defaults ⁵	Subprime Interest Rates ⁵
1999	9353.5	9424.6	28333	16153.1	4648.7	4356	6.32	10.8
2000	9951.5	10085.5	30319	16537.1	7461.9	4454	9.35	12.03
2001	10286.2	10389.5	31157	16551.0	7868.5	4326	9.35	9.71
2002	10642.3	10664.4	31481	16506.3	8436	4944	7.97	7.47
2003	11142.2	11125.5	32295	16601.0	9075	5639	5.63	6.92
2004	11853.3	11875.6	33909	16902.7	10105.6	6031	3.82	7.14
2005	12623	12718	35452	17255.1	10878.3	6865	3.33	8.99
2006	13377.2	13619.5	37725	17612.5	11861.5	8082	4.53	10.76
2007	14028.7	14040.7	39506	17989.0	13033.0	10832	8.65	9.35
2008	14291.5	14294	40947	17964.5	13841.2	12025	13.7	6.39
2009	13973.7	13855.4	38637	17422.6	13087.2	12511	15.1	4.55

Footnotes:

1. Gross Domestic Product and Gross Domestic Income in billions of dollars. Dollar estimates are in current dollars. Data retrieved from www.BEA.gov, Table 1.17.5. *Gross Domestic Product, Gross Domestic Income, and Other Major NIPA Aggregates*. Revised December 20, 2012.

2. Total employment in ten thousands. Dollar estimates are in current dollars. Data retrieved from www.BEA.gov, Table *SA04 State income and employment summary*. Revised September 25, 2012.

3. FHC net assets in billions of dollars. Dollar estimates are in current dollars. Data retrieved from www.fdic.gov, Table 1177. *FDIC-Insured Financial Institutions—Number, Assets and Liabilities*. Internet release date September 30, 2011.

4. Commercial bank net assets in hundreds of millions. Data retrieved from www.federalreserve.gov/releases/h8.

5. Rates expressed as percentages. Data retrieved from www.census.gov, Table 1197. *Money Market Interest Rates and Mortgage Rates*. Internet release date September 30, 2011. To estimate the subprime mortgage interest rate, 2.8 was added to prime interest rates for 1999-2006; add 1.3 was added to prime interest rates for 2007-2009. This methodology follows analysis published in *The Subprime Lending Crisis: Causes and Effects of the Mortgage Meltdown* by Katalina M. Bianco, et al.

Subprime defaults are expressed as the percentage of loans in the foreclosure process at year-end, not seasonally adjusted. Data retrieved from www.census.gov, Table 1194. Mortgage Originations and Delinquency. Internet release data September 30, 2011.

6. Personal income per capita is the total personal income divided by the total midyear population. Dollar estimates are in current dollars. Data retrieved from www.BEA.gov, Table SA1-3 *Personal income summary*. Revised September 25, 2012.

Appendix 2 - Equations

Equation 1: Regression Analysis

(A) Y = GDP, X = FHC net assets
SUMMARY OUTPUT (GDP)

Regression Statistics

Multiple R	0.98192317
R Square	0.96417312
Adjusted R Square	0.96019236
Standard Error	358.38069
Observations	11

(B) Y = GDP, X = commercial bank net assets
SUMMARY OUTPUT

Regression Statistics

Multiple R	0.93410829
R Square	0.87255829
Adjusted R Square	0.8583981
Standard Error	675.920954
Observations	11

Equation 2: Regression Analysis

(A) Y = GDI, X = FHC net assets
SUMMARY OUTPUT

Regression Statistics

Multiple R	0.97931313
R Square	0.95905421
Adjusted R Square	0.95450468
Standard Error	378.339122
Observations	11

(B) Y = GDI, X = commercial bank net assets
SUMMARY OUTPUT

Regression Statistics

Multiple R	0.92161222
R Square	0.84936908
Adjusted R Square	0.83263231
Standard Error	725.660844
Observations	11

Equation 3: Regression Analysis

(A) Y = personal income, X = FHC net assets
SUMMARY OUTPUT

Regression Statistics

Multiple R	0.98181662
R Square	0.96396387

(B) Y = personal income, X = commercial bank net assets
SUMMARY OUTPUT

Regression Statistics

Multiple R	0.9376315
R Square	0.87915282

Adjusted R Square	0.95995986
Standard Error	839.595141
Observations	11

Adjusted R Square	0.86572536
Standard Error	1537.51409
Observations	11

Equation 4: Regression Analysis

(A) Y = employment, X = FHC net assets
SUMMARY OUTPUT (Employment)

(B) Y = employment, X = commercial bank net assets
SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.94916765
R Square	0.90091924
Adjusted R Square	0.88991026
Standard Error	211.189395
Observations	11

<i>Regression Statistics</i>	
Multiple R	0.88843479
R Square	0.78931638
Adjusted R Square	0.76590709
Standard Error	307.958944
Observations	11

Equation 5: Regression Analysis

Y = subprime mortgage default rates, X = subprime mortgage interest rates

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.43636434
R Square	0.19041384
Adjusted R Square	0.10045982
Standard Error	3.63296476
Observations	11

Appendix 3

Census Bureau data table for Median and Average Sales Prices of New Homes Sold in United States

Year	Median	Average	Year	Median	Average	Year	Median	Average
1980	\$64,600	\$76,400	1990	\$122,900	\$149,800	2000	\$169,000	\$207,000
1981	\$68,900	\$83,000	1991	\$120,000	\$147,200	2001	\$175,200	\$213,200
1982	\$69,300	\$83,900	1992	\$121,500	\$144,100	2002	\$187,600	\$228,700
1983	\$75,300	\$89,800	1993	\$126,500	\$147,700	2003	\$195,000	\$246,300
1984	\$79,900	\$97,600	1994	\$130,000	\$154,500	2004	\$221,000	\$274,500
1985	\$84,300	\$100,800	1995	\$133,900	\$158,700	2005	\$240,900	\$297,000
1986	\$92,000	\$111,900	1996	\$140,000	\$166,400	2006	\$246,500	\$305,900
1987	\$104,500	\$127,200	1997	\$146,000	\$176,200	2007	\$247,900	\$313,600
1988	\$112,500	\$138,300	1998	\$152,500	\$181,900	2008	\$232,100	\$292,600
1989	\$120,000	\$148,800	1999	\$161,000	\$195,600	2009	\$216,700	\$270,900
						2010	\$221,800	\$272,900

Retrieved from www.census.gov/const/uspriceann.pdf

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