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## Essays on the Unintended Consequences of Banking Regulation

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ESSAYS ON THE UNINTENDED CONSEQUENCES OF BANKING REGULATION

A Dissertation

by

JOHN PATRICK NED

Submitted to the Graduate College of  
The University of Texas Rio Grande Valley  
In partial fulfillment of the requirements for the degree of

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ESSAYS ON THE UNINTENDED CONSEQUENCES OF BANKING REGULATION

A Dissertation  
by  
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## ABSTRACT

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The introduction of new financial regulatory reforms is designed to usually provide a positive impact for the firms in the banking system. However, there are some unintended consequences to the firms in the banking industry after the introduction of new banking regulations. In the two essays, I examine the impact of introducing new banking regulation on the different firms in the financial services industry and the impact of the new banking regulation on the commercial banks for remaining in compliance with the new measures.

The first essay examines the effect of the passage of the Dodd-Frank Act (2010) on the systematic risk of financial services firms, specifically the impact on the different segments of the financial services industry including banks, savings institutions, securities firms, and insurance companies. Additionally, the study examines the effect of the passage of the regulation on the earnings of firms in the different segments. The primary hypotheses examine whether the passage of the Dodd- Frank Act cause an increase in the systematic risk of firms in the different segments of the financial services industry, and did the passage of the Dodd-Frank Act have a significant impact on the earnings of firms in the different segments of the financial services industry.

The second essay examines the regulatory burden for U.S. commercial banks after the implementation of large banking regulation using measures of profit, cost and productivity from



1995 to 2014. The large banking regulations that were introduced during this period include the Gramm Leach Bliley Act (1999) and Dodd-Frank Act (2010). The induction of new banking regulations bring additional costs for banks to remain in compliance with the new regulation. What impact does this have on the institutions? Also, the study will examine if the impact of the regulatory change varies depending on the size of the bank. The primary hypotheses examine whether the new banking regulations reduce efficiency for the commercial banks in the U.S., and did the new banking regulations reduce output for the commercial banks in the U.S.

## DEDICATION

The completion of my doctoral studies would not have been possible without the love and support of my family and friends. My sisters, Lola Sinegal and Dana Sinegal, my brothers, David Sinegal, Charles Bradley, Clyde C. Ned, Daren Ned, and Kenneth Ned, and my Aunt Alisha Sinegal, wholeheartedly inspired, motivated and supported me by all means to accomplish this degree. Also, my best friend, Trina L. Jones, who always provided an encouraging word when I needed it during my journey. Lastly, to my nieces and nephews for your understanding when “Uncle Pat” was unavailable to you. Thank you for your love and patience.



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## CHAPTER I

### INTRODUCTION

The financial services industry in the United States is a very highly regulated industry which has evolved over the past 30 years with the introduction of new regulations. The introduction of new financial regulatory reforms and modifications has become necessary due to the increasingly complex nature of the banking industry. The passage of the Gramm-Leach-Bliley Act in 1999 (GLBA) and the Dodd Frank Wall Street Reform and Consumer Protection Act of 2010 (DFA) brought about significant changes in financial regulations. GLBA expanded the powers of financial institutions by allowing them to engage in new financial activities to create “one stop shop” of financial products and services to provide for the consumers. However, DFA was enacted to restructure the financial system of the country after the financial crisis of 2007-2009 by imposing more stringent regulation on the systemically important financial institutions with the aim of preventing the failure of these firms and eliminate the risk of the entire financial system in the country.

In 1999, GLBA, also known as the Financial Services Modernization Act, was passed in Congress which allowed commercial banks to start engaging in investment banking activities. The traditional banking services provided by commercial banks before the enactment of GLBA included accepting deposits and making loans. After GLBA, commercial banks were allowed to underwrite insurance, offer merchant banking services (e.g., credit acceptance and credit

syndication), offer brokerage services, and conduct investment banking activities.

The GLBA fueled growth in the financial services industry by allowing firms to capitalize of new revenue efficiencies and scale and economies of scope that were previously unavailable in the industry prior to the regulation. The “one stop shop” would create economies of scope for the institutions by allowing them to share customers’ information in house with other departments in the bank for potential cross-selling of products offered by the financial institution. Additionally, the economies of scope would benefit the consumers in the form of lower prices for banking products and improved services.

Unfortunately, the GLBA did not provide the great revenue efficiencies as expected because many of the banking organizations were engaging in the activities prior to the GLBA enacted in 1999. The newly created “one stop shop” firms that came into existence after GLBA did not outperform their peers as the existing firms who were already engaged in the commercial and investments banking activities were much stronger. The GLBA only made the process simpler for the banking institutions to conduct the cross-selling activities for investment banking not provide them with the expertise on how to operate effectively which would increase productivity and profitability for the new “one stop shop”.

The highly regulated banking system in the United States is supposedly as “well-functioning banking system” which is designed to make the probability of a banking crisis less likely because of the regulatory requirements that the financial institutions follow. Unfortunately, there was a financial crisis of 2007-2009 which occurred in spite of the regulations that were in place which showed that the changes were needed to the financial regulatory system in the country. In 2010, DFA was enacted the “Volcker Rule” to separate some of the commercial and investment banking activities which many banks were engaged in by limiting the proprietary

trading and private equity activities that were backed by guarantees from the United States government. The DFA was hailed as the greatest financial reform since the Great Depression, however, the regulation its shortcomings because the law does not provide substantial change in the financial industry to prevent a repeat of what occurred several years ago in the industry.

Our empirical analyses will examine how the introduction of new banking regulations have “unintended” consequences which occur after being implemented. The introduction of new banking regulations may provide positive or negative effects to the firms because of the costs associated with the regulation which may be a burden to some firms. Policymakers should be mindful of the potential effects to the firms in the industry when introducing large scale banking regulations as the effects can vary depending on the size and activity of the firm.

As the initial step, we examine the market reaction after the passage of the regulations. First, we examine how DFA impacts risk and earnings of the different segments within the financial services industry. We attempt to identify if there is an increase in the systematic risk in the specific segment of the industry following the implementation of the regulation. Our results cast doubt on the effectiveness of DFA being able to reduce risk of firms within the industry. The four segments which we examine all experience an increase in the systematic risk after the implementation of DFA which indicates uncertainty in the market about the effectiveness of the regulation.

Next, we examine how GLBA and DFA impact the profitability and productivity of the large and small commercial banks by identifying if there is a regime shift post implementation of the regulations. We expect a negative impact to both profitability and productivity for the firms after the implementation of a new financial regulation because of the additional cost burden which the firms incur for remaining in compliance with the new regulation. The results are

consistent with our prediction for both the large and small banks; however, the impact is greater for the small banks.

Our analysis adds to the debate regarding the effectiveness of DFA by providing empirical evidence which suggests that there are mixed reviews of the regulation which aimed to curtail the growth of the systemically important institutions and decrease the risk of the firms. Additionally, our analysis shows how financial regulations have a different impact on the firm depending on the firm's size. These results may have major implications for the future rulemaking and implementations of financial regulations.

## CHAPTER II

### THE ECONOMIC IMPLICATION OF BANKING REGULATION: AN EVENT STUDY OF THE DODD-FRANK ACT (2010)

#### **Introduction**

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank) is the recent federal legislation enacted following the 2008-2009 global financial crisis that some have deemed as “the worst financial crisis since the Great Depression” (Wilmarth, 2011). The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act) was signed into law on July 21, 2010. The Dodd-Frank Act (DFA) is an attempt to restructure the financial system in the United States by restoring confidence in the overall soundness of the financial system. Regulatory reform of the financial system is an urgent priority as the recent financial crisis exposed some of the fundamental weaknesses in the financial regulatory system of the United States (Wilmarth, 2011). Specifically, the regulations introduced with DFA are more restrictive on the Systemically Important Financial Institutions (SIFIs). DFA aims to reduce the systemic risk of the SIFIS by imposing stringent regulation on their banking and trading activities (Skeel, 2011, Barth et al., 2013). Systemic risk refers to risk of the collapse of the entire financial system or market. Section 619 of DFA also known as the Volcker Rule separates banking activity and trading activity in institutions by deterring the firms from using customer deposits that are insured by the FDIC for any speculative activities. DFA establishes that proprietary trading in financial institutions may only come from banking activity.

DFA aims to lay the foundation for substantive reform of financial regulations in the United States (Prasch, 2012) and become the new standard against which all future financial reforms will be compared (Evanoff and Moeller (2012)). The authors suggest that the objectives of DFA are to provide financial regulatory reform, to protect consumers and investors, and to put an end to the “Too-Big-to-Fail” (TBTF) institutions. The development and passage of DFA occurred during a time of anxiety and uncertainty for financial institutions in the United States. DFA also aims to restructure the financial system in the United States, provide more soundness for the financial systems currently in place, and hopefully deter another financial crisis. DFA is already impacting the way that institutions in the financial services industry conduct business, but it is unclear if there are going to be net benefits associated with this legislation.

DFA introduces some of the strongest consumer financial protections in history by protecting consumers from abusive financial services practices that occurred in the recent financial crisis. To enforce the consumer protections introduced by Title X of DFA, the Bureau of Consumer Financial Protection (CFPB) was created within the Federal Reserve System to look out for the best interests of consumers in their interactions with financial institutions. DFA protects consumers from unfair, deceptive, and abusive acts designed to trap the consumer in unaffordable financial products. DFA also provides the states with new authority to apply and enforce their state’s consumer financial protection laws against national banks and federal-chartered savings associations unless those laws interfere with the exercise of power of the national banks (Wilmarth, 2011a).

Since the passage of DFA in 2010, there has been much debate on the merits of the regulation. Supporters hail the regulation as a higher standard that will limit some of the risk-taking activities of financial institutions while also making the financial system in the United

State safer. Additionally, the supporters of DFA assert that the regulation will prevent future taxpayer bailouts of the SIFIs. However, detractors of the regulation argue that DFA is a “government partnership with the large financial institutions and ad intervention” (Wilmarth, 2011). Upon implementation, DFA caused a dramatic decrease in the financial products available to many low-income and minority people across the country with the elimination of products that were targeted towards these groups. In 2009, over 70% of banks in the country offered free checking accounts, but the number of banks which offered the free checking account was only 40% in 2012. The FDIC estimates that nearly 1 million people were shut out from using mainstream banking services for the period of 2009 through 2012. Currently, nearly 20% of the consumers in the United States do not have a “traditional” bank account (e.g., checking account, savings account, certificate of deposit, etc.) and rely on other “non-traditional” services to conduct their banking transactions (e.g., prepaid debit cards, retail check cashing services, payday lending services, etc.)

Has the passage of the Dodd-Frank Act had a financial impact on the financial services firms? If so, was this effect positive or negative? Also, was the impact of the regulation the same across different segments of the financial services industry? To address these questions in this study, I examine the economic implication of DFA on the financial performance of firms in the financial services industry. Specifically, I examine the impact of the regulation on the systematic risk and earnings of financial services firms within different segments of the financial services industry. Systematic risk refers to the risk that an entire market segment of an industry faces that is unpredictable and cannot always be avoided. This study differs from previous empirical studies as I examine the impact of DFA on the different segments of the financial services industry whereas other studies have focused more on the “Too-Big-to-Fail” institutions. I



consider the previous studies as motivation to address the efficiency and effectiveness of DFA in the operating risks and earnings for firms in segments of the financial services industry. I add to the literature on the economic consequences of the financial regulation by examining the risk and earnings of different segments in the financial services industry.

The remainder of the chapter is organized as follows. Section 2 provides a review of the literature. Section 3 provides the data sample selection used in the study. Section 4 provides the methodology, and Section 5 presents the results of my analysis. The conclusion is provided in Section 6.

### **Literature review**

The firms in the financial services industry are highly regulated and are controlled by several federal agencies including the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), Securities and Exchange Commission (SEC) as well as the various state agencies (Akhigbe et al., 2006). DFA implements changes that “affect the oversight and supervision of financial institutions, provide for a new resolution for large financial companies, create a new agency responsible for implementing and enforcing compliance with consumer financial laws, introduce more stringent regulatory capital requirements, reform the regulation of credit rating agencies, and implement changes to corporate governance and executive compensation practices” (Banking Laws).

Prasch (2012) suggests that the law lacks the explicit rules that are needed for effective financial regulation, and the industry will remain “business as usual”. Prasch (2012) states that DFA does not enhance the capacity of regulators to enforce current statutes in place nor does it simplify the supervision of regulated institutions. Additionally, DFA does not make any attempt

to break up the large banking holding companies, such as JPMorgan Chase & Co. and Bank of America. This was a deliberate decision on behalf of the Congress to obtain bipartisan support needed to pass the regulation. Wilmarth (2011) argues that the law's provisions are inadequate for preventing future taxpayer-funded bailouts as well as removing other public subsidies for the too-big-to fail institutions as the law does not make structural reforms to eliminate the public subsidies. Wilmarth (2011) suggests stricter enforcement of the Riegle-Neal Interstate Banking and Branching Act of 1994 that imposes nationwide deposit concentration limits "deposit caps" on interstate expansion. Under Riegle-Neal, a banking organization is unable to have more than 10% of total deposits of all depository institutions in the United States or more than 30% of total deposits of all depository institutions within a state. The nationwide and statewide deposit concentration limits are not enforced by DFA. With the proper enforcement of Riegle-Neal, no institution will be able to become a "mega-bank" such as those that exist currently (Wells Fargo, Bank of America, Citigroup). Wilmarth (2011) further suggests that disallowing the FDIC from providing full protection of favored creditors of the Systematically Important Financial Institutions (SIFI), which DFA does not preclude, will require these institutions to engage in less riskier activities as they will no longer have the FDIC as a guarantor. DFA, as it stands currently, allows the FDIC considerable leeway in providing de facto bailouts for the favored creditors of the failed SIFIs thus defeating the purpose of enacting the legislation that no more taxpayer funded bailouts of the large financial institutions will occur.

Another criticism of DFA is that it did not introduce measures designed to change the structure of financial markets or the business strategies of the banking institutions (Tropeano, 2011). Tropeano (2011) mentions that the Volcker rule that was introduced through DFA as a way of prohibiting banks from conducting private equity, hedge fund, or proprietary trading

activities is not strict enough. Under the Volcker rule, banks are allowed to invest up to three percent of total assets in private equity or hedge funds thereby exposing the banks to huge potential losses similar to those that occurred during the financial crisis.

DFA puts the responsibility of avoiding future financial crises on the competence and good intention of regulators but does not address any missteps made by the government during the buildup phase to the crisis (Kane, 2012). Kane (2012) also shows that DFA in its current form is flawed due to the influence of the financial sector lobbyists on the framers of the legislation (Congress). The financial sector lobbyists are the group who helped generate the financial crisis and dictate the terms of the financial bailouts but their dysfunctional culture and behavior are largely ignored by the members of Congress (Kane, 2012).

### **Data sample**

The valuation impact associated with the passage of DFA is examined for separate segments within the financial services industry, specifically banks, savings association, securities firms, and insurance companies. I classify firms into separate segments based on the three-digit standard industrial classification (SIC) code provided by the Standard and Poor's Compustat database (SIC codes between 6000 and 6999) to examine the regulation's impact on different sectors of the financial services industry. The following segments are identified through SIC codes: Banks (SIC code 602X), Savings Institutions (SIC code 603X), Securities firms (SIC code 621X) and Insurance companies (SIC codes 631X, 632X, 633X, 635X, and 636X).

I include all firms for the different segments that have stock return data in the Center for Research in Security Prices (CRSP) to conduct my analyses. The sample selections result in a total sample of 870 financial services firms containing 497 banks, 128 savings institutions, 52 securities firms, and 193 insurance companies. I collect quarterly financial data from Compustat

for the segments within the financial services industry for the period January 1, 2005 through December 31, 2015. Additionally, I obtain daily return data from CRSP and subsequently compute quarterly averages from these daily data observations. This time period was selected because it includes 20 quarters of financial data prior to the passage of DFA and 20 quarters of financial data after its passage. The year 2010 is excluded as an event window (the year the law was signed into legislation).

Additional data for the three Fama-French factors are obtained from Ken French's website (<http://mba.tuck.dartmouth.edu>). These variables include the excess market return (RM) defined as the return on the value-weighted market portfolio of all NYSE, AMEX, and NASDAQ stocks minus the one-month T-bill rate (risk free rate), the average return on portfolios of small cap stocks minus portfolios of large cap stocks (SMB), and the average return on portfolios of high book-to-market stocks minus portfolios of low book-to-market stocks (HML). The SMB variable accounts for the elements of risk associated with firm size, and the HML accounts for elements of risk associated with valuation. As these data are daily, I compute quarterly averages from the daily observation. Lastly, quarterly data on real gross domestic product (GDP), which is used as a measure of economic activity for the United States, are obtained from the Bureau of Economic Analysis (BEA) website. In all, my dataset contains 32,696 quarterly observations for firms in the different segments of the financial services industry.

Table 2.1

Summary Statistics of variables used in regressions across each year

Variable	Banks		Savings Institutions		Securities Firms		Insurance Companies	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Total Assets								
2005	51,893	249,508	5,239	31,806	115,247	314,894	60,508	222,742
2006	52,465	253,112	4,982	31,074	111,355	305,869	58,470	213,015
2007	53,738	258,770	4,797	30,509	107,273	298,772	56,083	201,181
2008	63,542	310,097	3,924	24,545	96,631	282,033	61,438	217,637
2009	64,806	305,317	3,394	24,197	65,585	208,363	56,509	177,621
2010	67,148	307,938	3,512	23,869	73,900	226,438	61,373	181,882
2011	80,237	353,398	3,680	25,820	81,335	242,366	68,222	193,230
2012	84,442	363,177	4,628	32,263	83,003	239,342	71,954	192,626
2013	90,170	363,924	5,500	25,876	81,459	234,854	75,565	194,866
2014	91,457	365,359	5,760	26,939	82,318	240,408	77,606	197,578
2015	93,058	369,098	5,931	27,888	83,206	242,672	78,330	199,859
Market Cap								
2005	5,354	19,186	526	2,670	7,454	19,499	7,068	20,089
2006	4,862	18,193	494	2,397	6,736	18,654	7,001	18,863
2007	4,413	17,982	459	2,258	6,532	18,308	6,803	18,186
2008	3,431	14,170	303	1,014	4,122	12,071	4,667	11,092
2009	3,247	14,587	229	777	3,943	13,380	3,939	9,689
2010	4,075	16,586	269	879	4,300	13,842	4,862	10,489
2011	4,154	16,193	251	733	3,813	11,348	5,113	10,621
2012	4,430	17,321	298	769	3,599	10,099	5,349	10,757
2013	5,886	22,223	403	1,004	5,531	14,586	6,972	12,981
2014	6,018	24,946	489	1,153	5,702	15,719	7,295	14,129
2015	6,194	28,337	540	1,317	5,936	16,316	7,580	16,861
Quarterly Observations	17,779		6,032		2,098		6,787	

The table provides the mean and median for total assets and market capitalization for the different segments within the financial services industry. The values are reported in millions of dollars for each of the variables listed (total assets and market capitalization).

Table 2.1 provides the summary statistics for the total assets and market capitalization for each segment across each year in the data sample, and the values are reported in millions of dollars. The mean total assets for the banks segment monotonically increases over time from \$51893 in 2005 to \$93,058 in 2013. I attribute this 79% increase in mean total assets over the sample period to banks increasing their financial derivatives business activities. Additionally, the savings institutions and the insurance companies segments show increases in their mean total assets over the total sample period of 13% and 29%, respectively, but the results for the two segments show fluctuations over the years in the sample. Although DFA places limitations on proprietary trading activities by banks, they are allowed to invest three percent of total assets in proprietary trading which is a significant amount for those large asset banks. The large standard deviation in the banks segments indicates that there are several mega-banks in the sample as compared to their peers. Although outliers may exist in this segment, I do not remove any observations from the data as the focus of the study is to examine the impact of the regulation on the entire segment.

Additionally, the banks segment shows an increase in market capitalization over the sample period of 14%<sup>1</sup>. However, the impact is different before and after the passage of DFA as the market cap for the banks segment decreased by 26% from 2007-2009 and then increased 49% from 2011-2015. The market cap for the savings institutions and insurance companies segments show the same pattern as the banks. The market cap for savings institutions decreased during the 2007-2009 period by 50% and then had a quick rebound with an increase of 115% from 2011-2015. Insurance companies show a decrease in market cap from 2007-2009 of 42% and an increase in market cap during the 2011-2015 period of 48%. One of the aims of DFA is to

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<sup>1</sup> The increase in the market capitalization for the banks segment was 35% when the sample contained data from 2007-2013.

limit the growth in the size of the firms in the financial services industry. The significant increases in bank size for the segments may shed light on the impact of DFA in limiting the expansion of firms in these segments as the sample period includes the recession period that occurred in the U.S. from November 2007 – June 2009 as determined by the National Bureau of Economic Research (NBER).

### **Methodology**

In light of the findings based on my sample characteristics, I next conduct a more rigorous examination of the valuation impact associated with the passage of DFA on the systematic risk of firms in the separate segments within the financial services industry, specifically banks, savings association, securities firms, and insurance companies. The first hypothesis that I test is whether the passage of DFA has increased the systematic risk of firms in different segments of the financial services industry.

**H1:** The passage of DFA has increased the systematic risk of firms in the different segments of the financial services industry.

Following the model of Zhao and He (2014)<sup>2</sup>, I use the Chow test (Chow, 1960) to examine the change in the firms' beta before and after the passage of DFA with the use of a period binary variable in the market model; this variable equals one if after the passage of DFA, and zero otherwise. The market model states that the return of a security is dependent on the return of the market portfolio and how the security responsive to the market as measured by beta.

$$R_{it} = \alpha + \beta_1 R_{mt} + \beta_2 D_i + \beta_3 D_i * R_{mt} + e_i \quad (1a)$$

---

<sup>2</sup> Zhao and He (2014) model incorrectly stated that they used Capital Asset Pricing Model (CAPM). The correct model referenced in their study is the market model.

where  $R_{it}$  is the return of segment  $i$  on quarter  $t$ ,  $R_{mt}$  is the market return for quarter day  $t$ ,  $D_i$  is a binary variable assigned a value of 0 (pre-implementation period) and 1 (post implementation period),  $D_i * R_{mt}$  is the interaction term between the binary variable and the market return, and  $e_i$  is an error term.

Next, I add in the factors from the Fama-French three factor model to expand on the market model from above to account for size and value in addition to the market risk factor captured by the market model. The extended model is described below.

$$(R_{it} - R_f) = \alpha + \beta_1(R_m - R_f) + \beta_2SMB + \beta_3HML + \beta_4D_i + \beta_5D_i*(R_m - R_f) + e_{it} \quad (1b)$$

where  $(R_{it} - R_f)$  is the returns of segment  $i$  for quarter  $t$ ,  $(R_m - R_f)$  which is excess return on the market, SMB is the average return on three small portfolios minus the average return on three big portfolios, HML is the average return on two value portfolios minus the average return on two growth portfolios,  $D_i$  is a binary variable assigned a value of 0 (pre-implementation period) and 1 (post implementation period),  $D_i*(R_m - R_f)$  is the interaction term between the binary variable and the excess return on the market to reflect the impact on the excess returns after the passage of DFA, and  $e_{it}$  is an error term.

A significant positive coefficient for the interaction terms from models 1a and 1b ( $D_i * R_{mt}$  and  $D_i*(R_m - R_f)$ ) indicates that the systematic risk for the segment of the financial services industry has increased with the passage of DFA. In contrast, a significant negative coefficient indicates that the systematic risk for the segment of the financial industry has decreased in the post-period. Should the coefficient for the term lack statistical significance at conventional levels, the finding would suggest that DFA had no major effect on systematic risk.

Additionally, I examine the effect of the passage of DFA on the earnings and market valuation of firms within the each segment of the financial services industry. The second



hypothesis that I test is whether the passage of DFA impacts the association of firm earnings and market valuation with balance sheet items.

**H2:** The passage of DFA has a significant effect on the earnings and market valuation with bank assets/liabilities management (major balance sheet items).

$$\mathbf{ROE}_{it} = \beta_0 + \beta_1 \mathbf{LN}(\mathbf{market\ cap})_{it} + \beta_2 \mathbf{FINLEV}_{it} + \beta_3 \mathbf{GDP}_t + \beta_4 \mathbf{Post\ Dodd-Frank} + \beta_5 \mathbf{LN}(\mathbf{market\ cap})_{it} * \mathbf{Post\ Dodd-Frank} + e_{it} \quad (2)$$

where  $\beta_0$  is the intercept,  $\beta_1$  is the coefficient for the log of the market cap,  $\beta_2$  is the coefficient of the financial leverage (book value of equity/total assets),  $\beta_3$  is the coefficient of the Gross Domestic Product (GDP) for the U.S.,  $\beta_4$  is a binary variable indicating if the observation occurs after the passage on Dodd-Frank,  $\beta_5$  is the effect of market cap after passage of Dodd-Frank, and  $e_i$  is the error term,  $i$ : firm,  $t$ : quarters.

## Results

The fixed effects estimation results of equations (1a) and (1b) are reported in Tables 2.2 and 2.3. I use fixed effects data panel estimation that allows me to control for individual heterogeneity. The use of OLS estimation and fixed effects panel estimation have limitations as they do not solve any potential endogeneity issues that the error term in the equations may be correlated with the regressors. However, the use of the fixed effects estimation produces stronger results compared with the OLS estimation due to the right hand side variables in the fixed effects model being exogenous to the dependent variable in the model.

Table 2.2

Fixed effects estimation of the impact on systematic risk surrounding the passage of Dodd-Frank Act (2010)

Variable	Banks	Savings Institutions	Securities firms	Insurance Companies
$R_{it} = \alpha + \beta_1 R_{mt} + \beta_2 D_i + \beta_3 D_i * R_{mt} + e_{it}$				
<i>Interaction of binary variable</i>	0.011** (4.04)	0.009** (2.53)	0.121 (1.45)	0.026** (4.66)
<i>Abnormal Return (<math>\alpha</math>)</i>	0.003** (4.06)	0.002** (2.81)	0.001** (3.28)	0.001** (3.13)
<i>Market Return of quarter t (<math>R_{mt}</math>)</i>	0.024** (5.38)	0.011** (3.58)	0.099 (1.71)	0.014** (3.77)
<i>Binary Variable (<math>D_i</math>)</i>	0.0001** (3.64)	0.0001** (3.99)	0.0001** (3.93)	0.0001** (4.44)
<i>Quarterly Observations</i>	17,779	6,032	2,098	6,787
<i>Adj. <math>R^2</math></i>	0.33	0.31	0.28	0.37

The table provides the returns surrounding the passage of the Dodd-Frank Act (2010) for segments in the financial services industry. The variables and t-statistics (in parentheses) are reported from fixed effects estimation for the segment returns.  $R_{it}$  is the return of segment  $i$  for quarter  $t$ ,  $R_{mt}$  is the market return of quarter  $t$ ,  $D_i$  is a binary variable assigned a value of 0 (pre-implementation period) and 1 (post-implementation period),  $D_i * R_{mt}$  is the interaction term between the binary variable and market return,  $\alpha$  is the abnormal return,  $\beta_1$  is the segment's beta,  $\beta_3$  is the segment's beta shift, and  $e_{it}$  is the error term. I also report the adjusted  $R^2$  value. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% level, respectively.

In Table 2.2, the coefficients for the binary variable are close to zero but statistically significant. This indicates that there is not a drastic change in the idiosyncratic risk for the four financial services industry segments between the two periods. Therefore, this supports the prediction that any shifts in risk (positive or negative) are related to the passage of the regulation.

In Table 2.2, the coefficient for the interaction term ( $D_i * R_{mt}$ ) is positive and statistically significant for the segments including banks and insurance companies but is not statistically significant at conventional levels for the segments of savings institutions and securities firms. The coefficient for the interaction term ( $D_i * R_{mt}$ ) for the banks segment increased from 0.024 in the pre-period to 0.041 (0.024 + 0.017) in the post-period. Additionally, the coefficient for the insurance companies segment increased from 0.019 in the pre-period to 0.086 (0.019 + 0.067) in

the post-period. The positive and statistically significant coefficient for the banks and insurance segments including banks and insurance companies indicates that the systematic risk is higher in the post-period for these two segments. The increase in the systematic risk for these two segments can be reasonably attributable to the passage of the DFA because the markets perceive that DFA will not be an effective financial regulatory measure. The test results of the regression for equation (1a) strongly support H1 that the systematic risk has increased for different segments of the financial services which are opposite the premise of DFA that aims to decrease systemic risk for the aggregate market.

Table 2.3

Fixed effects estimation of the impact on systematic risk surrounding the passage of Dodd-Frank Act (2010)

Variable	Banks	Savings Institutions	Securities firms	Insurance Companies
$(R_{it} - R_f) = \alpha + \beta_1 (R_m - R_f) + \beta_2 SMB + \beta_3 HML + \beta_4 D_i + \beta_5 D_i *(R_m - R_f) + e_{it}$				
<i>Interaction of Binary Variable and</i>				
<i>Excess Return (<math>D_i *(R_m - R_f)</math>)</i>	0.028** (4.09)	0.016** (4.69)	0.023** (3.42)	0.022** (3.91)
<i>Intercept (<math>\alpha</math>)</i>	0.005** (5.88)	0.002** (2.98)	0.004** (3.51)	0.004** (2.79)
<i>Excess Return on the Market (<math>R_m - R_f</math>)</i>	0.032** (2.23)	0.011 (1.49)	0.039 (1.72)	0.027** (3.05)
<i>Small minus Big (SMB)</i>	0.031** (3.41)	0.022** (4.65)	0.020** (2.82)	0.037** (4.48)
<i>High minus Low (HML)</i>	0.021** (3.26)	0.015* (4.32)	0.011* (3.01)	0.039** (2.64)
<i>Binary Variable (<math>D_i</math>)</i>	0.0001** (2.87)	0.0001** (5.29)	0.0001** (4.32)	0.0001** (4.57)
<i>Quarterly Observations</i>	17,779	6,032	2,098	6,787
<i>Adj. <math>R^2</math></i>	0.33	0.28	0.34	0.29

The table provides the returns surrounding the passage of the Dodd-Frank Act (2010) for segments in the financial services industry. The variables and t-statistics (in parentheses) are reported from  $(R_{it} - R_f)$  is the return of segment  $i$  on quarter  $t$ ,  $(R_m - R_f)$  is the excess return on the market,  $SMB$  is the average return on three small portfolios minus the average return on three big portfolios,  $HML$  is the average return on two value portfolios minus the average return on two growth portfolios,  $D_i$  is a binary variable assigned a value of 0 (pre-implementation period) and 1 (post-implementation period),  $D_i *(R_m - R_f)$  is the interaction term between the binary variable and the excess return on the market,  $\alpha$  is the abnormal return,  $\beta_1$  is the segment's beta,  $\beta_5$  is the segment's beta shift, and  $e_{it}$  is the error term. I report the adjusted  $R^2$  value. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% level, respectively.

In Table 2.3, the coefficients for the binary variable are close to zero but statistically significant similar to the results shown in Table 2.2. This indicates that there is not a drastic change in the risk for the four financial services industry segments between the two periods. Therefore, this supports the prediction that any shifts in risk (positive or negative) are related to the passage of the regulation. The coefficient for the interaction term ( $D_i*(R_m-R_f)$ ) is positive and statistically significant at conventional levels for all four segments suggesting that there is a shift

in the systematic risk in the post DFA period. The coefficient for the interaction term for the banks and insurance companies segments increased from the pre-period to the post-period of .032 to .060 (.032 + .028) and .027 to .049 (.027 + .022), respectively. The increase in the systematic risk for the banks segment and insurance companies segment signals uncertainty in the markets and can be reasonably attributable to the passage of DFA. The test results of the fixed effects estimation confirm our preliminary results discussed above for equation (1a) that strongly supports H1. The test results show that operating risks have increased for banks and insurance companies following the passage of DFA, while the operating risks for savings institutions and securities firms have not been impacted as much by the regulation. The difference in the risk shifts pre- and post-period for the different segments may be attributable to unrelated risk shifts not captured by DFA as well as the U.S economy pulling out of the recession.

Table 2.4

Fixed effects estimation of the impact on systematic risk surrounding the passage of Dodd-Frank Act (2010)

Variable	Banks and Savings Institutions	Banks and Securities firms	Banks and Insurance Companies
$(R_{it} - R_f) = \alpha + \beta_1 (R_m - R_f) + \beta_2 SMB + \beta_3 HML + \beta_4 D_i + \beta_5 D_i *(R_m - R_f) + e_{it}$			
<i>Interaction of Binary Variable and</i>			
<i>Excess Return (<math>D_i *(R_m - R_f)</math>)</i>	0.024** (3.28)	0.031** (4.26)	0.030** (5.32)
<i>Intercept (<math>\alpha</math>)</i>	0.006** (2.70)	0.006** (4.34)	0.005** (7.59)
<i>Excess Return on the Market (<math>R_m - R_f</math>)</i>	0.017* (3.43)	0.044* (5.35)	0.038** (5.71)
<i>Small minus Big (SMB)</i>	0.034** (4.83)	0.026** (6.02)	0.040** (3.81)
<i>High minus Low (HML)</i>	0.024** (4.03)	0.012* (2.65)	0.043** (5.14)
<i>Binary Variable (<math>D_i</math>)</i>	0.0001** (6.72)	0.0001** (7.57)	0.0001** (7.09)
<i>Quarterly Observations</i>	23811	19,877	24,566
<i>Adj. <math>R^2</math></i>	0.41	0.44	0.45

The table provides the returns surrounding the passage of the Dodd-Frank Act (2010) for combined segments in the financial services industry. The variables and t-statistics (in parentheses) are reported from  $(R_{it} - R_f)$  is the return of the combined segment  $i$  on quarter  $t$ ,  $(R_m - R_f)$  is the excess return on the market,  $SMB$  is the average return on three small portfolios minus the average return on three big portfolios,  $HML$  is the average return on two value portfolios minus the average return on two growth portfolios,  $D_i$  is a binary variable assigned a value of 0 (pre-implementation period) and 1 (post-implementation period),  $D_i *(R_m - R_f)$  is the interaction term between the binary variable and the excess return on the market,  $\alpha$  is the abnormal return,  $\beta_1$  is the segment's beta,  $\beta_5$  is the segment's beta shift, and  $e_{it}$  is the error term. I report the adjusted  $R^2$  value. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% level, respectively.

In Table 2.4, we recombine the banks segment with the savings institutions, securities firms, and insurance companies segments to examine if the change in risk for the banks segment impacts the other segments as there are more observations for the banks segment than the total observations for the other three remaining segments combined. We find that when combining the banks segment with another segment, there is an increase in the systematic risk for the other

three segments than when the segments were analyzed individually. Additionally, there is an increase in the excess return for the combined segments versus the standalone segments. For the combined segments, the results confirm our previous results that there was an increase in the operating risks for the banks' segment after the implementation of DFA and provide additional support of H1.

Table 2.5

OLS Estimation of the financial impact of the Dodd-Frank Act of 2010 for financial services industry segments

Variable	Banks	Savings Institutions	Securities firms	Insurance Companies
$ROE_{it} = \beta_0 + \beta_1 \text{LN}(\text{market cap})_{it} + \beta_2 \text{FINLEV}_{it} + \beta_3 \text{GDP}_t + \beta_4 \text{Post Dodd-Frank} + \beta_5 \text{LN}(\text{market cap})_{it} * \text{Post Dodd-Frank} + e_{it}$				
<i>Intercept</i>	0.039** (2.95)	0.036** (4.27)	0.031** (3.09)	0.034** (4.31)
<i>Log of Market Capitalization</i>	0.101** (2.62)	0.089** (3.98)	0.096** (3.43)	0.107** (2.70)
<i>Financial Leverage</i>	0.029** (4.60)	0.028** (3.72)	0.025** (5.54)	0.028** (4.15)
<i>Gross Domestic Product</i>	0.017** (4.36)	0.011** (3.50)	0.011** (5.01)	0.012** (3.99)
<i>Post Dodd-Frank</i>	0.0001** (2.48)	0.0001** (3.88)	0.0001** (3.56)	0.0001** (2.67)
<i>Post Dodd-Frank*Log of Market Capitalization</i>	0.111** (6.23)	0.106* (4.97)	0.078 (1.29)	0.126** (3.86)

The table provides the ROE surrounding the passage of the Dodd-Frank Act for firms in the financial services industry by segment. The variables and t-statistics (in parentheses) are reported from OLS estimations.  $\beta_0$ : intercept,  $\beta_1$ : coefficient for the log of the market cap,  $\beta_2$ : Financial Leverage,  $\beta_3$ : Gross Domestic Product,  $\beta_4$ : binary variable indicating if the firm year observation occurs after the passage on Dodd-Frank,  $\beta_5$ : the effect of market cap after passage of Dodd-Frank,  $e_{it}$ : error term. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% level, respectively.

H2 tests the return on equity for the different segments of the financial services following the passage of DFA by focusing on the market capitalization in the post-period. In Table 2.5, a positive coefficient for the interaction term (*Post Dodd-Frank\*LN(market cap)*) reflects the market's positive expectation of profitability growth as a result of the regulation. The results show that the segments for banks and insurance companies have positive and statistically significant coefficients for the interaction term. These results are consistent with the results of

H1 that an increase in systematic risk will lead to an increase in profitability in the post period. The results are consistent with H2 that DFA has a significant impact on earnings and market valuation.

Table 2.6  
Fixed effects panel data estimation of the financial impact of the Dodd-Frank Act (2010) for financial services firms

Variable	Banks	Savings Institutions	Securities firms	Insurance Companies
$ROE_{it} = \beta_0 + \beta_1 \text{LN}(\text{market cap})_{it} + \beta_2 \text{FINLEV}_{it} + \beta_3 \text{GDP}_t + \beta_4 \text{Post Dodd-Frank} + \beta_5 \text{LN}(\text{market cap})_{it} * \text{Post Dodd-Frank} + e_{it}$				
<i>Intercept</i>	0.035** (4.14)	0.037** (2.66)	0.030** (6.48)	0.029** (7.70)
<i>Log of Market Capitalization</i>	0.100** (3.52)	0.086** (7.91)	0.095** (5.65)	0.111** (6.32)
<i>Financial Leverage</i>	0.026** (3.88)	0.027** (5.05)	0.021** (2.49)	0.026** (2.67)
<i>Gross Domestic Product</i>	0.026** (2.89)	0.022** (4.92)	0.021** (3.53)	0.022** (2.58)
<i>Post Dodd-Frank</i>	0.0001** (5.02)	0.0001** (2.78)	0.0001** (2.45)	0.0001** (4.76)
<i>Post Dodd-Frank*Log of Market Capitalization</i>	0.209** (5.97)	0.205* (2.84)	0.444 (1.56)	0.285** (2.96)

The table explains the ROE surrounding the passage of the Dodd-Frank Act for firms in the financial services industry by segment using fixed effects panel data estimation. The t-statistics are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% level, respectively.

In Table 2.6, the positive coefficient for the interaction term are statistically significant for the banks segment, savings institutions segment, and insurance companies segment, but lack statistical significance for the segment of securities firms. The coefficient for the interaction term for the banks segment increases from 0.100 in the pre-period to 0.209 in the post-period. Also, the coefficient for the savings institutions segment increases from 0.086 in the pre-period to 0.205 in the post-period. Lastly, the coefficient for the insurance companies' segment increases from 0.111 in the pre-period to 0.285 in the post-period. The impact of market capitalization on the segments' earnings in the post-period is greater compared with the pre-period. Since there is a positive relationship between ROE and market cap, the higher ROE for the segment may misrepresent efficiencies that exist by disguising if a firm is highly leveraged. The test results of



the fixed effects panel estimation confirm our preliminary results discussed above for equation (2) that strongly supports H2. The results for H2 from the fixed effects estimation model are very close to the OLS estimation results which I attribute again to the data in the sample being “too balanced”. The test results show that profitability as measured by ROE has increased for banks and insurance companies following the passage of DFA, while the ROE for savings institutions and securities firms has not been impacted by the regulation. As mentioned earlier in the chapter, the sample period in the study covers the time when the U.S. economy was pulling out of the recession which may explain why these two segments did not experience a significant impact on their market capitalizations. The increase in profitability as reflected by ROE is derived from both an increase in value as reflected by the market capitalization and the increase in risk although the model is not sufficient to distinguish value relevance from risk relevance. The results show that banks are still growing in size in the post DFA period which opposes the literature that states DFA aims to curtail firm growth and not create more of the “Too-Big-to-Fail” institutions.

### **Conclusion**

In this study, I focus on the economic implication of regulation on different segments of the financial services industry. Unlike other studies that focus on the impact of regulation on the systemically important financial institutions, my approach is to study the regulation’s impact on different segments across the financial services industry. I use the strength of fixed effect panel data estimation to model the heterogeneous characteristics across the sample as fixed effects have the right hand side variables being exogenous to the dependent variable. This allows me to study the relationship between market returns across time and the relationship between

profitability across time that includes the introduction of new financial regulation, specifically DFA.

This study shows how the introduction of DFA has contributed to a significant increase in operating risks for financial services firms, specifically banks and insurance companies. Additionally, this increase in risk causes an increase in profitability for these same firms. DFA was enacted to curtail risk-taking activities of financial services firms following the recent financial crisis of 2007-2009, however, the results show that systematic risks have increased in the post-period. The systematic risk of financial services firms is a good measure of the effectiveness of the regulation of the financial markets. The increase in systematic risk causes higher uncertainty in the financial markets. My results suggest that the effectiveness of DFA has shown mixed results as two of the segments in the sample had increases in systematic risk in the post-period, while the other two segments did not show any effect in their systematic risk post-period.

I acknowledge that proper identification of financial services segments that are more or less affected by DFA may be difficult due to the interconnectedness that exists in the U.S financial markets. The ultimate impact and effectiveness of DFA will be measured by the actions of regulatory agencies and how well the regulation ends taxpayer-funded bailouts when the next financial crisis occurs. The study provides empirical evidence that may have implications for regulators and policymakers when implementing subsequent financial legislation as DFA has not provided the fundamental overhaul of the U.S. regulatory structure and the system remains fragmented.

The current administration of the President of the United States is beginning the process

of repealing many of the provisions of DFA as the regulation is opposed by many of the firms in the financial services industry. In June 2017, the U.S. House of Representatives passed the Financial Choice Act legislation which aims to dismantle many of the provisions of the DFA by exempting some financial institutions, specifically community banks, from the capital and liquidity requirements and weakens the power of the Consumer Financial Protection Bureau by allowing the President to remove the director of the agency at will instead of for cause. Additionally, the Financial Choice Act plans to eliminate the Volcker Rule which bans banks from trading on their gains and limits their ownership in private equity firms and hedge funds. Lastly, the Financial Choice Act aims to remove the Financial Stability Oversight Council which regulates the “Systemically Important Financial Institutions” by eliminating the process put in place with DFA by which these firms are liquidated during distress and replace with a new chapter of the bankruptcy code.

## CHAPTER III

### THE IMPACT OF REGULATORY COMPLIANCE ON COMMERCIAL BANKS IN THE UNITED STATES AROUND NEW BANKING REGULATION

#### **Introduction**

The recent global financial crisis of 2008 inflicted great damage on financial markets and economies around the world. The crisis illustrated the deficiencies regarding the effectiveness of the financial regulatory system by exposing the fundamental weaknesses in the financial regulatory system of the United States thereby making regulatory reform an urgent priority (Wilmarth, 2011). Also, the crisis showed how banking systems were not well-functioning because of the negative impact on economic growth and development.

A well-functioning, self-regulating financial system will allow for growth in economic activity within a country. What is the vision of a self-regulating market such as the one for financial institutions in the United States? Theoretically, the firms that comprise the United States financial system are products of competition that weed out inferior competitors, view mistakes as isolated events, and see the imposition of new rules for the modern financial system as an exercise of hubris. This vision has major implications on regulatory policy (Prasch, 2012). However, in light of the recent financial crisis, regulatory changes are needed to ensure that the financial system remains sound by providing reassurance to the citizens as well reducing the probability of another failure occurring within the financial system. The success of any regulatory reform depends on how well the regulation correctly addresses the problems that were diagnosed.

Regulatory reform success is dependent on the policymakers and government officials conveying accurately to the populace the reasons for the economic policy (Kane, 2012). Some observers contend that many bank regulations have limited effectiveness given the high leverage ratios of banks (John et al., 2000), whereas others contend that the ineffectiveness of bank regulations is caused by the overlap in tasks among federal regulators and between federal and state regulators (Kushmeider, 2007) and the limited capacity and capabilities of the regulators (Prasch, 2012).

There have been many regulatory policies introduced in the United States to address issues that arose from crises in this country. In the early 1980s, there was deregulation of the savings and loan industry which allowed the savings and loan associations to offer more savings products and increase their lending authority. The deregulation provided the savings and loan associations the ability to operate similar to banks but without the same regulatory oversight as banks. However by the late 1980s, there were many failures of savings and loan associations in the country with over 20% of the institutions failing which ultimately cost the taxpayers of the country nearly \$88 billion.

When the Savings and Loan crisis of the 1980s occurred, the Federal Deposit Insurance Corporation (FDIC) introduced the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) designed to restore the public's confidence in the savings and loan industry. The Riegle-Neal Interstate Banking and Branch Efficiency Act of 1994 (Riegle-Neal) was signed in September 1994 with the aim of making the banking system in the country more efficient and make the banks more competitive. Riegle-Neal allowed national banks to operate in any state in the country but limited the banks' nationwide deposit cap to 10%.

Newer regulations such as the Gramm-Leach-Bliley Act of 1999 (GLBA) were introduced that repealed portions of older regulations of the Glass Steagall Act of 1933 by modifying the bank holding act to allow affiliations between banks and insurance companies. The most recent financial crisis of 2008 brought forth the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank) that was designed to provide oversight and supervision of financial institutions (Banking Laws). Additionally, the Basel III accord was introduced by the Basel Committee on Banking Supervision in 2010 to address capital adequacy requirements, stress testing, and market liquidity risk to reduce a potential run on the bank. Basel III has not been implemented as the implementation date was changed from 2015 to March 2019.

The introduction of the Third Basel Accord (Basel III) in 2010 was designed to improve the regulation, supervision, and risk management within the banking sector by reducing the risk of individual bank failures and interconnectivity between institutions. Basel III required banks with assets larger than \$50 billion to maintain “risk-based capital and leverage requirements”. Under Basel III, A bank’s leverage limit is set at 3% (a bank’s total assets including both on and off balance sheet assets should not be more than 33 times bank capital), and a bank’s minimum common equity Tier 1 (equity capital and disclosed reserves) is set at 4.5%, with a capital conservation buffer of 2.5% and minimum total capital is set at 10.5% (including the conservation buffer). The Basel III measures should help banks operate in their own self-interest and prudently manage risk as the Federal Reserve Board will test the banks’ capital and leverage requirements annually, and the regulators would be able to address any weaknesses in the financial condition of the institution at an earlier stage compared to what occurred during the financial crisis (Evanoff et al., 2011).

The increased responsibility of the Federal Reserve to oversee and gather data from financial firms is mandated with the implementation of the Dodd-Frank Act. Banks are required to have greater transparency, communication and disclosure of financial information to show that they are not in danger of collapse or pose a risk to the overall financial system. The transparency of information now required by Dodd-Frank would help the Federal Reserve stabilize the market when necessary if the financial information presented by the banks show any potential weaknesses (Yu 2012).

The introduction of new financial regulatory reforms and modifications has become necessary due to the increasingly complex nature of the banking industry. The response of policymakers to this crisis should be to assess what went wrong and what regulatory reforms are needed to promote a better functioning banking system (Barth et al., 2013). Additionally, the policymakers should conduct a benefit-cost analysis when designing future regulation to determine if the cost of implementing the legislation will have an undue hardship to the banks within the industry. Effective regulation has the potential to make the competition between small and large banks level with the inclusion of workable rules which do not hinder the traditional banking activities in which many small banks operate. However, the compliance cost associated with any new regulation may force the smaller banks out of operation as these firms may no longer be viable economic entities.

The GLBA eliminated many of the barriers between banks and securities firms, insurance companies, and other financial service providers, and allowed these lines of business to be affiliated within a holding company structure. The financial holding company (FHC) is allowed to participate in expanded banking activities, specifically insurance underwriting and securities. GLBA requires strong corporate governance and monitoring as banking institutions expand into

the nonbanking activities to ensure that the firms are not engaging in activities that are not permitted under GLBA such as an affiliation with a company whose primary activities are not “financial in nature” (Pacini et al., 2005).

Several studies highlight the positive association that occurred for firms after GLBA when banks incorporate nontraditional banking activities into their firm’s portfolio. The study by Chen et al. (2004) find that firms with high amounts of subordinated debt in its portfolio experienced positive and significant wealth effects from the passage of GLBA. Carow and Heron (2002) and Neale and Peterson (2005) provide supporting evidence that large nondepository firms such as investment firms and insurance companies experienced higher positive stock returns while the returns are insignificant for banks. Neale and Peterson (2005) find that insurance companies experienced a decrease in risk following the passage of GLBA. Carow and Heron (2002) attribute the higher returns for the nondepository firms to more competition and expectations of future business combinations.

Several studies related the impact of banking regulation examine the positive aspect that comes with implementing new regulation (e.g., Dodd-Frank) such as the increase in deposit insurance or the change in the capital requirements. Some of the studies look at the unforeseen and indirect costs that come with the regulation, but few examine how the regulation will directly impact the banks in the form of new compliance costs. Cyree (2016) examines the impact of “crisis-based” regulation and the regulatory compliance costs for bank holding companies in the United States. Cyree’s study provided mixed results as some regulations caused an increased in the regulatory burden and some regulations showed little evidence that the bank holding companies experience any financial burden. Our study differs from Cyree (2016) in that we examine the impact of specific banking regulations (e.g., GLBA and Dodd-Frank) on the



regulatory burden for commercial banks in the United States, not the bank holding companies. Studying the impact on the bank holding companies may not provide an accurate view of the regulatory impact since the bank holding companies own more than one bank in its portfolio possibly containing large and small commercial banks. Our study will provide the regulatory impact on the commercial banks and whether the impact varies depending on the size of the commercial banks (large versus small commercial banks). Additionally, this study focuses only on banking regulations whereas Cyree uses both banking and nonbanking regulations in the study. Studying the impact of only the banking regulations will provide evidence of the direct costs to the banks for remaining in compliance with the new regulation opposed to examining nonbanking regulations which do not always have direct costs for the commercial banks. The goal of this study is examine if the banking regulations have a negative impact on the firms within the industry as the firms may have increases in direct costs for remaining in compliance with the regulation. Specifically, we examine if the new regulations cause a decrease in efficiency and output for the commercial banks in the United States.

Numerous studies of banking regulation provide evidence that introduction of new regulation may have positive and negative impacts for the firms after implementation. New regulation, specifically Riegle-Neal, provided a positive impact for the banks by allowing them to increase their market share nationally. However, new regulation, specifically Dodd-Frank Act, provided a negative impact for the banks as these firms lost customers and revenue when many of the banks stopped offering their free checking account which was a source of revenue for these institutions. The impact of the loss of revenue may vary depending on the size of the commercial banks (greater than \$10 billion in assets compared with to the banks with less than \$10 billion in assets). This study differs in that it examines the direct costs of the implementation

of regulatory reforms, specifically Gramm-Leach-Bliley Act (GLBA) and the Dodd-Frank Act, on the performance of commercial banks after implementation of the regulation and whether the performance vary with large and small banks. Based on the discussion above, we state the following hypotheses:

**H1:** *Implementation of new banking regulations has a negative effect on the profit of Commercial banks in the United States as measured by pretax return on assets.*

**H2:** *Implementation of new banking regulations has a negative effect on the productivity of Commercial banks in the United States as measured by loans per employee.*

The remainder of the chapter is organized as follows. Section 2 provides a review of the literature. Section 3 provides the data sample selection used in the study. Section 4 provides the methodology, and Section 5 presents the results of my analysis. The conclusion is provided in Section 6.

### **Literature review**

The firms in the financial services industry are highly regulated and controlled by several federal agencies including the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), Securities and Exchange Commission (SEC) as well as the various state agencies (Akhigbe and Martin, 2006). The implementation of new banking regulations by the regulators and Congress arises as a response to address issues within the industry or within the economy. As such, the impact of the new regulations can cause a burden for the commercial banks as they try to remain in compliance with the new regulatory reforms as evidenced in previous studies. Franks, Schaefer, and Staunton (1998) examine the impact of the Financial Services Act (1989) on the compliance costs for firms in the financial services industry of the United Kingdom after implementation. and show that there were higher direct costs for firms after the implementation

of the regulation. Pasiouras, Tanna, and Zopounidis (2009) investigate the impact of the regulations introduced with Basel II (e.g., capital adequacy requirement, separation of credit and operating risks, and reduction of regulatory arbitrage) for 615 commercial banks from 74 countries the period of 2000-2004. The results in the study from Pasiouras, Tanna, and Zopounidis (2009) illustrate how compliance costs increased by nearly 2% for banks after the implementation of the regulation and banks' efficiency were negatively impacted. Similarly, Barth, Lin, Ma, Seade, and Song (2013) investigate if the introduction of Basel II regulation enhances or impedes the operating efficiency of banks from a sample of 72 countries for the period of 1999-2007. The results of their study show that increased bank regulation decreases the banks' efficiency by 3%.

Several studies examined how the banks' financial performance was impacted after the implementation of a single regulatory event. Zou, Milller, and Malamud (2011) find that the return on assets (ROA) and the net interest margins increased for the commercial banks after the passage of the Riegle-Neal Interstate Banking and Branch Efficiency Act (1994). Nippani and Green (2012) also show that the ROA is higher for commercial banks after Riegle-Neal, but their results were not statistically significant.

The literature shows that significant changes in risk occurred in the financial services industry following the passage of the Gramm-Leach-Bliley Act of 1999. Akhigbe and Whyte (2004) examine the impact on the changes in risk surrounding the passage of the GLBA in 1999 using data 300 days before the event period and 300 days after the event period. They show that banks experienced an increase in risk following the passage of GLBA regardless of whether the banks entered in to the investment banking activities. Additionally, the authors show that banks, insurance companies and securities firms experienced a decrease in their systematic risk

following the passage on GLBA, but banks and insurance companies' experienced a significant increase in their unsystematic risk following the passage of GLBA.

Yildirim, Kwag, and Collins (2006) examine the wealth effects of the passage of the GLBA on segments for the financial services industry for the period of January 1998 through December 2000. The authors examine the abnormal returns around the announcement dates of the legislation and show that investment banks and insurance companies are in a better position to benefit from product-line diversification allowed with the GLBA compared to commercial banks. Yildirim, Kwag, and Collins (2006) provide supporting evidence that commercial banks do not benefit as much as the other lines of business due to increased costs from competition from other segments within the industry.

Along those same lines, Yeager, Yeager, and Harshman (2007) find that within-firm productivity and profitability remained unchanged after the passage of GLBA from the pre-period to the post-period when a banking holding company (BHC) became a financial holding company (FHC). Additionally, the findings of Yeager, Yeager, and Harshman (2007) provided evidence that there were not significant synergies between commercial banking, investment banking and merchant banking suggesting that the profitability of financial holding companies declined after the passage of GLBA. Lastly, the findings Yeager, Yeager, and Harshman (2007) that significant synergies exist between commercial banking and investment banking for bank holding companies with an increase in efficiency post GLBA are expected as the previous research of Yildirim, Kwag, and Collins (2006) found that firms benefit from product diversification. However, the study of Filson and Olfati (2014) find that the commercial banks have higher financial performance after GLBA with positive cumulative abnormal returns due to the diversification of their products.

Zhao and He (2014) investigate the impact of the passage of the GLBA on the largest bank holding companies (BHCs) by comparing the market risk pre-and post-implementation periods. The study by Zhao and He (2014) shows that the systematic risk for the BHCs increased significantly post-implementation as banks expanded into market-sensitive activities (specifically investment banking activities). Their results were opposite of the view that diversification decreases risk as the GLBA regulation did not decrease risk for the BHCs through product diversification. Lin, Tsai, and Huang (2012) also document a similar result that commercial banks do not benefit from broadening their product mix to include insurance underwriting due to insurance asset quality being relatively low.

The most recent financial regulation implemented in the United States is the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank) which is considered to be the most comprehensive regulatory reform enacted in the country since the Great Depression of the 1930s with more than 400 new mandates that commercial banks have to follow. Although all of the components of the Dodd-Frank regulation have not been fully implemented (e.g., capital and liquidity requirements must be met by 2019; only 75% of derivatives rules regulating “over the counter trading” have been finalized, orderly liquidation plan of large, failing financial institutions not finalized), several studies discuss the then-potential impact the regulation could have on the operating costs for banks including Feldman, Heinecke, and Schmidt (2013) who show that smaller commercial banks (less than \$500 million in assets) will have an increase in operating costs and a decrease in ROA by hiring additional personnel who will be needed to monitor the compliance issues brought forth with Dodd-Frank.

### **Data**

In this study, the data for the commercial banks are obtained from the Federal Reserve Bank of Chicago Call Reports on Condition and Income (RCI). These quarterly data are

winsorized at the 1% and 99% levels because of extreme outliers that would impact the results. The evaluation period selected includes the quarter in which the banking regulation was enacted and 18 total quarters after the passage of the regulation. The banking regulations reviewed in the study include the Gramm Leach Bliley Act which is examined for 18 quarters from 1999Q4 through 2004Q1 and the Dodd-Frank Act which is examined for 18 quarters from 2010Q3 through 2014Q4. Beck et al. (2010) show that large banking regulations have a long-term impact rather than a short-term impact; thus, the use of 18 quarters to examine the regulations' impact is valid.

Observations that show zero or missing values are deleted from the dataset as well as banks in the United States territories including American Samoa, Guam, the Virgin Islands, and Puerto Rico. The concentration measures for these banks are higher than for other banks operating in the continental United States as they serve a limited number of local depositors. Additionally, observations that do not have at least three quarters of bank data are deleted meaning all observations contain all quarterly bank data in any year for the commercial banks.<sup>3</sup> Quarterly data on real gross domestic product (GDP) are obtained from the Bureau of Economic Analysis (BEA) website. Data for the treasury rates are obtained from the Federal Reserve Bank of St. Louis (FRED) website.

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<sup>3</sup> The total number of data observations with zero or missing values and without at least three quarters of data was insignificant as the deleted amount of observations was 860.

TABLE 3.1 Means and Medians of Selected Variables for Large Banks with Assets > \$10 Billion

Variable	Entire Sample Period 1995 - 2014		After Implementation of Gramm-Leach-Bliley Act (1999Q4 - 2004Q1)		After Implementation of Dodd-Frank Act (2010Q3 - 2014Q4)	
	Mean	Median	Mean	Median	Mean	Median
Pretax Return on Assets (PREROA)	0.013	0.015	0.012	0.014	0.015	0.013
Loans per Employee (LOANPEREMPL)	3.367	3.241	3.473	3.392	3.630	3.275
Assets Per Employee (ASSETPEREMPL)	3.423	3.184	3.438	3.300	3.445	3.194
Number of Employees (NUMEMPL)	541	459	593	466	621	488
Total Assets (TOTASSET)	\$163,659,666	\$29,611,583	\$161,732,458	\$26,607,758	\$166,300,113	\$27,195,753
Log of Totals Assets (LNTOTASSET)	18.91	17.20	18.90	17.10	18.93	17.12
Log of Total Assets per Employee (LNTOTASSETPEREMPL)	0.03	0.04	0.03	0.04	0.03	0.04
Percent of firms with Loss	11.30%		8.70%		19.13%	

Note: N = 9,016 bank-quarters (115 firms).

TABLE 3.2 Means and Medians of Selected Variables for Small Banks with Assets &lt; \$10 Billion

Variable	Entire Sample Period 1995 - 2014		After Implementation of Gramm-Leach-Bliley Act (1999Q4 - 2004Q1)		After Implementation of Dodd-Frank Act (2010Q3 - 2014Q4)	
	Mean	Median	Mean	Median	Mean	Median
Pretax Return on Assets (PREROA)	0.013	0.012	0.012	0.014	0.016	0.015
Loans per Employee (LOANPEREMPL)	2.319	1.997	2.375	2.033	2.400	2.075
Assets Per Employee (ASSETPEREMPL)	3.130	2.607	3.142	2.625	3.158	2.632
Number of Employees (NUMEMPL)	207	173	231	181	248	187
Total Assets (TOTASSET)	\$1,917,257	\$1,634,642	\$1,825,810	\$1,580,340	\$1,867,325	\$1,630,340
Log of Totals Assets (LNTOTASSET)	14.47	14.31	14.42	14.27	14.44	14.30
Log of Total Asstes per Employee (LNTOTASSETPEREMPL)	0.07	0.08	0.06	0.08	0.06	0.08
Percent with Loss	7.24%		5.83%		12.15%	

Note: N = 101,433 bank-quarters (1,629 firms).

We begin the discussion with a review of the descriptive statistics which are shown in Tables 3.1 and 3.2. The sample is split into large commercial banks and small commercial banks to identify if there is advantage to the larger banks that may have more resources to remain in compliance when new banking regulations are introduced. The Federal Deposit Insurance Corporation (FDIC) defines a large bank as an institution with total assets greater than \$10 billion and a small bank as an institution with total assets less than \$10 billion. Table 3.1 provides the descriptive statistics for the sample of large commercial banks in the United States with total assets greater than \$10 billion, and Table 3.2 provides the descriptive statistics for the sample of small commercial banks in the United States with total assets under than \$10 billion. The means and medians are listed for the dependent variables along with the total assets in tables 3.1 and 3.2 and were adjusted for inflation using the Consumer Price Index (CPI) all urban consumers, seasonally adjusted data from the Bureau of Labor Statistics (BLS) website. The non-uniformed observations of the variables included in the analysis show that the data are



unbalanced. However, having a balanced panel is not necessary for this study since the data have sufficient observations of the key variables including our dependent variables: pretax ROA and loans per employee.

The majority of the commercial banks in this study are classified as small commercial banks with the number of firms being 1,629. The number of large commercial banks in the study is 115. The average pretax ROA for the large commercial banks over the entire sample period is 130 basis points and the median is 150 basis points. The average pretax ROA for the small commercial banks over the entire sample period is 130 basis points and the median is 120 basis points. When examining the pretax ROA for the period after implementation of GLBA, the average ROA for both the large banks and small banks is 120 basis points and the median is 140 basis points for both segments. When examining the pretax ROA for the period after implementation of Dodd-Frank, the average pretax ROA for large commercial banks is 150 basis points and the median of 130 basis points, and the average pretax ROA for small commercial banks is 160 basis points and the median is 150 basis points. The average loans per employee for the large commercial banks are \$3 million compared to the small commercial banks of \$1.78 million. The average total assets for the large commercial banks are \$164 billion compared to the average total assets for the small commercial banks of \$2 billion. The average number of employees in the large commercial banks is 541 which is nearly three times the size of the number of employees in the small commercial banks of 207. When examining the specific 18 quarters after implementation of the regulations, both small and large commercial banks experienced an increase in the average number of employees suggesting that the firms are adding employees to address the compliance needs from the new regulation.

In analyzing the data, we test the data to determine if the means of the data are

statistically significant between the two subsample periods (post implementation of GLBA and post implementation of DFA) and between the large and small commercial banks. We conduct an analysis of variance between the subsample periods and between the different size banks to determine if the means differences between the groups are significant. At the 95% confidence interval, we conclude that the means between the two subsample periods and the means between the large and small banks are both statistically significant as the p-values between the two subsample periods and between the large and small banks are less than .05.

### **Methodology**

To study the costs and effects of regulatory change, several alternative response variables are used. First, pretax return on assets (ROA) is used as a measure of overall bank accounting performance. Although ROA is an accounting measure of performance, it is an effectively used variable for intricate measures (e.g., efficiency) as evidenced in the study by Hasan et al. (2012) where the authors use ROA as an efficiency measure to examine the impact of retail payment market on performance. Additionally, pretax ROA is a good measure because some commercial banks are S corporations and not subject to federal income taxes; so, the use of pretax figures helps mitigate the tax effects. If regulatory burden increased without an offsetting reduction in costs or increase in revenue, pretax ROA would decline.

Second, loans per employee are used as measure of output. Previous studies such as Coelho, de Mello, and Rezende (2013) directly use loans per employee to measure output as loans are usually the largest asset category for banks. Also, loans per employee are a natural measure of production. If the efforts of current employees are switched to manage the responsibility from the new regulation, then loans per employee would decline. A negative sign for the dependent variable is consistent with an increase in regulatory burden. If the commercial

banks add employees to maintain the current production of lending operation and also assign the current employees to compliance tasks, then loans per employee would be statistically equal or even rise, but other measures, such as employee headcount, would change.

We follow the Cyree (2016) model which provides estimates of the regulatory impact on productivity and output in a panel regression model with firm fixed effects and yearly fixed effects that is shown below will be used for testing  $H_1$  and  $H_2$ :

$$Y_{i,t} = \alpha + \sum_{j=1}^N \alpha_j + \sum_{k=1}^{20} YEAR_k + \beta_1 Q1_t + \beta_2 Q2_t + \beta_3 Q3_t + \beta_4 LNASSETS_{i,t} + \beta_5 CAPRATIO_{i,t} + \beta_6 NETINTINC_{i,t} + \beta_7 TOTALLOANS_{i,t} + \beta_8 TOTALDEPOSITS_{i,t} + \beta_9 ALLL_{i,t} + \beta_{10} GDPGROWTH_t + \beta_{11} INTLEVEL_t + \beta_{12} INTSLOPE_t + \beta_{13} GLBA_t + \beta_{14} DODDFRANK_t + \varepsilon_{i,t},$$

where  $Y_{it}$  is the dependent variable that measures (1) pretax return on assets (ROA) and (2) loans per employee with the dependent variables estimated separately in the model. The subscript  $i$  refers to the number of banks in a particular year and the subscript  $t$  refers to the bank year and quarter. The subscript  $k$  on the year indicator variable in the second summation term shows that each year  $k$  is 1 for that particular year and 0 otherwise. Q1, Q2, and Q3 are indicator variables equal to 1 if quarter 1, 2, or 3, respectively with Q4 serving as the reference group. The quarterly indicator variables are common control variables and reflect the seasonality that exists within the data which is important for their inclusion in the regression model. The two regulatory variables are examined to determine if the banking regulations cause a regime-shift and economic impact after being implemented: GLBA, an indicator variable equal to 1 if 1999Q4 through 2004Q1, to cover the period after the passage of the Gramm Leach Bliley Act, and DODDFRANK, an indicator variable equal to 1 if 2010Q3 through 2014Q4 to identify the period after the passage of the Dodd-Frank Act. LNASSETS is the log of total assets which is used to control for size differences. CAPRATIO is the equity-to-assets ratio which is used as a measure of bankruptcy risk where higher ratios reduce the possibility of a failure.

Several bank-specific control variables are used in the regression model to control for bank variations. NETINTINC is net interest income (interest income less interest expense) scaled by total assets which is used to represent the traditional banking activities of lending and deposits. TOTALLOANS is total loans, and TOTALDEPOSITS is total deposits. These two variables are used as a measure of economic activity for the banks. ALLL is the allowance for loan and lease losses which is used as a measure of future credit risk for the commercial banks for loans that will be charged off in the future.

Additionally, business-cycle variables are included in the regression model. GDPGROWTH is the annualized quarterly growth rate in gross domestic product (GDP) which is used as a measure of economic activity. INTLEVEL is the 10-year treasury rate to account for different interest rate environments. INTSLOPE is the difference in the 10-year and 3-month treasury rates which is used as a measure of expected economic activity.

## **Results**

The regression results examine the impact of banking regulatory acts on the profitability, costs, and lending production on commercial banks in the United States since 1995. Additionally, the results will review if the regulations' impact varies for large commercial banks versus small commercial banks. The primary focus of discussion in the results is the indicator variables. The control variables are reviewed at the end of this section.

TABLE 3.3 Pretax Return on Assets (ROA) Panel Regression Results

Variable	Large Banks with Assets > \$10 Billion	Small Banks with Assets < \$10 Billion	Statistically Different
Gramm-Leach-Bliley Act	-0.0006** (-3.49)	-0.0004** (-2.96)	Yes
Dodd-Frank Act	-0.0007** (-5.03)	-0.0010** (-3.81)	Yes
Intercept	-0.0202** (-2.70)	-0.0149** (-4.57)	Yes
Quarter 1	-0.0038** (-2.85)	-0.0056** (-5.59)	Yes
Quarter 2	-0.0033** (-4.09)	-0.0041** (-7.63)	Yes
Quarter 3	-0.0019** (-5.66)	-0.0028** (-4.69)	Yes
Log of Total Assets	0.0011** (4.99)	0.0027** (3.60)	Yes
Capital Ratio	0.0555** (4.64)	0.2605** (5.01)	Yes
Net Interest Income	0.0712** (4.86)	0.3467** (2.42)	Yes
Total Loans	-0.0115 (-1.01)	-0.2643 (-0.29)	No
Total Deposits	0.0005 (1.47)	0.0024 (1.32)	No
Allowance for Loan and Lease Losses	-0.3558** (-4.91)	-0.5033** (-3.01)	Yes
Gross Domestic Product Growth	0.0019 (1.55)	0.0014 (1.72)	No
Interest Rate (INTLEVEL)	0.0010 (1.56)	0.0004 (1.41)	No
Interest Slope (INTSLOPE)	-0.0003 (-0.97)	-0.0002 (-1.73)	No
$R^2$	0.4739	0.3882	

Note: The data are from the quarterly files of the Call Reports on Condition and Income from the Federal Reserve Bank of Chicago from 1995Q1 through 2014Q4 and contains firm and yearly fixed effects. Q1, Q2, and Q3 are indicator variables equal to 1 if in quarter 1, 2, or 3, respectively. LNASSETS is the log of total assets. CAPRATIO is the equity-to-assets ratio. NETINTINC is net interest income, scaled by assets. TOTALLOANS is total loans. TOTALDEPOSITS is total deposits. ALLL is allowance for loans and lease losses. GDPGROWTH is the annualized quarterly growth rate in U.S. gross domestic product. INTLEVEL and INTSLOPE are the 10-year Treasury rate level and the difference between the 10-year and 3-month Treasury rates, respectively. GLBA is an indicator variable equal to 1 from 1999Q4 through 2004Q1. DODDFRANK is an indicator variable equal to 1 from 2010Q3 through 2014Q4 after the passage of the Dodd-Frank Act. The t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level, respectively.

Table 3.3 contains the results for the panel regression model with pretax ROA as the dependent variable for both large banks and small banks. The indicator variables are examined to

determine if there was a regime-shift after the introduction of the banking regulations. The indicator variables for GLBA and DODDFRANK show that the pretax ROA is lower for both large and small commercial banks, which is consistent with increased regulatory burden causing costs to increase for the commercial banks. The impact is smaller for the small commercial banks after the passage of GLBA as their pretax ROA was lower by 4 basis points when compared with large commercial banks that have lower pretax ROA of 6 basis points. However, the impact is greater for small commercial banks after the passage of DODDFRANK as their pretax ROA was lower by 10 basis points when compared with large commercial banks that have lower pretax ROA of 7 basis points. The results show that regulatory changes cause a negative impact on pretax ROA which is significant for all commercial banks regardless of size. The results show that the profits of large commercial banks were impacted more after GLBA, whereas, the profits of small commercial banks were impacted more after DODDFRANK. These findings are important because they provide empirical evidence in support of the hypothesis that the implementation of new banking regulation has a negative effect on the profitability of all firms regardless of the size. The findings illustrate that there is a cost burden (i.e., “unintended consequences”) to the commercial banks when new regulations are implemented which policymakers may not consider when crafting the legislation.

TABLE 3.4 Loans per Employee (in \$ Millions) Panel Regression Results

Variable	Large Banks with Assets > \$10 Billion	Small Banks with Assets < \$10 Billion	Statistically Different
Gramm-Leach-Bliley Act	-0.0773** (-4.75)	-0.0659** (-3.04)	Yes
Dodd-Frank Act	-0.0856** (-7.28)	-0.0644** (-5.89)	Yes
Intercept	-3.5024** (-2.52)	-4.7066** (-3.93)	Yes
Quarter 1	-0.4429** (-2.94)	-0.5509** (-2.22)	Yes
Quarter 2	-0.2703** (-3.68)	-0.5001** (-4.44)	Yes
Quarter 3	-0.1818** (-5.50)	-0.3929** (-6.69)	Yes
Log of Total Assets	0.3954** (8.03)	0.2603** (6.97)	Yes
Capital Ratio	-0.0991** (-2.88)	-0.0696** (-3.05)	Yes
Net Interest Income	3.0349** (4.08)	4.1323** (4.26)	Yes
Total Loans	1.8931** (2.23)	2.1749** (2.72)	Yes
Total Deposits	-0.9121** (-4.78)	-0.1293** (-3.96)	Yes
Allowance for Loan and Lease Losses	4.0367** (2.18)	5.5074** (2.60)	Yes
Gross Domestic Product Growth	0.0288 (1.15)	0.0324 (1.27)	No
Interest Rate (INTLEVEL)	0.0021 (1.38)	0.0018 (0.12)	No
Interest Slope (INTSLOPE)	0.0022 (0.68)	0.0016 (1.09)	No
$R^2$	0.7844	0.6137	

Note: The data are from the quarterly files of the Call Reports on Condition and Income from the Federal Reserve Bank of Chicago from 1995Q1 through 2014Q4 and contains firm and yearly fixed effects. Q1, Q2, and Q3 are indicator variables equal to 1 if in quarter 1, 2, or 3, respectively. LNASSETS is the log of total assets. CAPRATIO is the equity-to-assets ratio. NETINTINC is net interest income, scaled by assets. TOTALLOANS is total loans. TOTALDEPOSITS is total deposits. ALLL is allowance for loans and lease losses. GDPGROWTH is the annualized quarterly growth rate in U.S. gross domestic product. INTLEVEL and INTSLOPE are the 10-year Treasury rate level and the difference between the 10-year and 3-month Treasury rates, respectively. GLBA is an indicator variable equal to 1 from 1999Q4 through 2004Q1. DODDFRANK is an indicator variable equal to 1 from 2010Q3 through 2014Q4 after the passage of the Dodd-Frank Act. The t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level, respectively.

Next, we examine the impact that regulatory events have on the output of commercial banks. Table 3.4 provides the results for the panel regression model with loans per employee as the dependent variable for both large banks and small banks. As mentioned in the previous paragraph, the indicator variables are examined to determine if there was a regime-shift after the introduction of the banking regulations. The coefficients for GLBA and DODDFRANK are negative and statistically different from zero for both the large and small commercial banks which is consistent with decreased lending activity due to increases in operating costs to comply with the new banking regulations, *ceteris paribus*. For the large commercial banks, the indicator variables show that loans decreased by \$0.0773 million and \$0.0856 million after the passage of the Gramm Leach Bliley Act and the Dodd-Frank Act, respectively. The trend of the indicator variables is the same for the small commercial banks as the loans decreased by \$0.0659 million and \$0.0644 million, respectively. The results show that there is strong evidence of the regime-shift after the passage of the two banking regulations. These findings are important because they provide additional evidence of the burden placed on the banks after implementation of a regulation. The new regulations cause the firms to hire new employees to address the compliance needs or “transfer” productive employees from their existing roles (e.g., lending activity) to the new role of compliance. Although there may be a decrease in loan demand during an economic downturn in the economy, we feel that the inclusion of the economic variables in the model along with the year fixed effects and firm fixed effects will capture some of the decline in lending activity.

Many of the estimated coefficients on the control variables used in the study are statistically significant and conform to conventional wisdom. Banks with larger capital (CAPRATIO) have higher pretax ROA but lower loans per employee, *ceteris paribus*.



Additionally, larger commercial banks (LNASSETS) have higher pretax ROA and loans per employee, ceteris paribus. Higher net interest income (NETINTINC) is positively related to pretax ROA and loans per employee. Loans per employee is positively related to allowance for loans and lease losses (ALLL) which indicates a reduction in lending for risky current loans.

The control variables for loans (TOTALLOANS) and deposits (TOTALDEPOSITS) vary in significance across the models. Banks with larger proportions of loans have lower pretax ROA but higher loans per employee. Banks with higher deposits have lower loans per employee but higher pretax ROA. The GDP growth coefficients (GDPGROWTH) as well the variables related to interest rates (INTLEVEL and INTSLOPE) are insignificant across the models which are similar to results in the literature.

### **Conclusion**

In this study, we investigate the impact of banking regulations, specifically the Gramm Leach Bliley Act (1999) and the Dodd-Frank Act (2010), on bank costs, profitability, and loan production for large and small commercial banks in the United States from 1999Q1 through 2014Q4. The data for large commercial banks are defined as those with greater than \$10 billion in assets and small commercial banks are defined as those with under \$10 billion in assets. Our fixed effects panel regression approach, which considers heterogeneity of bank characteristics over the 20-year period, takes advantage of the longitudinal nature of the Call Reports on Condition and Income data to study the individual variations within each bank. We are aware that the data include the period of the financial crisis and subsequent recession from 2007-2009, where the severe downturn in the economy impacted the profit and productivity of the commercial banks. Excluding data for the financial crisis (2007-2009) from the sample does not

significantly change the results of the study as we focused on the periods after the regulations were implemented to examine the regime shift.

The hypotheses presented earlier in the study that the implementation of new banking regulations has a negative effect on the profit and productivity of Commercial banks in the United States are not rejected because there were negative changes in profit and productivity for the commercial banks after the passage of the banking regulations. The findings of the study are consistent with increased regulatory burden having a negative impact on the commercial banks as firms have increased costs and more personnel required to remain in compliance of the new regulation which ultimately impacts the firm's bottom line. Small and large commercial banks show reductions to the pretax ROA and lower loan productivity because of increases in operating costs due to the introduction of the two banking regulations. The pretax ROA for the small commercial banks were impacted more than the large commercial banks after the passage of the Dodd-Frank Act when compared to the period after the passage of the Gramm Leach Bliley Act. The small commercial banks pretax ROA decreased by 10 basis points after the Dodd-Frank Act but only decreased by 4 basis points after the passage of the Gramm Leach Bliley Act. The lower loan productivity experienced after both regulations for the commercial banks is consistent with firms shifting resources (e.g., employees) away from lending activities to compliance activities. The banks increase their number of employees during the periods after the passage of the two regulations in order to remain in compliance.

The results presented in the study provide empirical evidence that commercial banks face increased costs with the introduction of banking regulation. However, the results do not include all of the cost measures and additional expenses that banks deal with for remaining in compliance with the regulation. The data used for the study (e.g., total number of employees)

provide the evidence of increased costs, both direct and indirect, which impact the banks' productivity. A key implication of the study is that banking regulations have an added cost burden which are passed on to the firms for remaining in compliance with the regulations and ultimately passed on to the consumers of the products offered by the banking institutions.

As with any empirical study, there may be other factors not included that influence the results even though we provide evidence consistent with the increased regulatory burden facing commercial banks regardless of size. Future research may focus on how the political climate in the United States impacts future banking regulations or the dismantling of the regulations in place. The President of the United States Donald Trump through the issuance of his executive order on financial regulations is planning to decrease many of the banking regulations, specifically the Dodd-Frank Act, which increased the compliance costs and reporting standards for banks. If the President is successful at removing the financial regulations, a key task for future research is to identify the benefits (e.g., productivity and profitability gains which are added to the firms) from deregulation in the financial services industry.

## CHAPTER IV

### CONCLUSION

Financial institutions have had a many regulations introduced over the years including GLBA in 1999 and DFA in 2010. Banking regulations do not always produce the desired results as evidenced from the studies relating to GLBA and DFA. The introduction of new banking regulation creates additional compliance costs for the financial institutions to stay in compliance with the regulation which ultimately impacts the firms' viability as an ongoing entity.

DFA has shown mixed results in its effectiveness as some segments within the financial services industry had increases in systematic risk in the post-period while other segments did not show any effect in their systematic risk post-period. DFA has contributed to a significant increase in operating risks for financial services firms, specifically banks and insurance companies. Additionally, this increase in risk causes an increase in profitability for these same firms. The systematic risk of financial services firms is a good measure of the effectiveness of the regulation of the financial markets. The increase in systematic risk causes higher uncertainty in the financial markets.

GLBA was designed to provide many new opportunities for the financial institutions to gain revenue sources from creating the "one stop shop" financial firm which provided commercial, investment, and merchant banking services in one firm. The idea behind the "one stop shop" concept was good in theory but did not provide the greater profitability and productivity to the firms that the regulators thought GLBA would provide. GLBA did not

provide the significant benefits to the firms after implementation that was expected because there were many regulatory loopholes that existed that allowed the commercial banks to conduct investment banking activities prior to 1999 when GLBA was enacted.

Banking organizations did experience some growth after GLBA but the growth was not a response to the implementation of GLBA. The growth was attributed to the earlier deregulation of the industry in the 1980s. Along the same lines, DFA did not curtail growth of the “Too-Big-To-Fail” institutions which was one of the aims of DFA. These systemically important firms have increased in size since DFA was enacted in 2010. DFA was enacted to curtail risk-taking activities of financial services firms following the recent financial crisis of 2007-2009, however, the results show that systematic risks have increased in the post-period. Therefore, how effective are the financial regulations when the introduction of new regulations (GLBA and DFA) did not address the loopholes from prior deregulation? The ultimate impact and effectiveness of any new banking regulation which is introduced will be measured by how well the regulation curtails a catastrophic impact in the financial system when there is a crisis in the financial markets. Policymakers should review the effectiveness of the previous regulations to ensure the new regulation being contemplated will address any shortcomings from the previous regulations.

The recent financial crisis showed that more work is needed for effective regulatory reform on the financial services industry in the United States to mitigate a future banking crisis. More supervision and monitoring of the banks are needed to provide more transparency and to ensure that the financial system remains sound. Additionally, the political climate in the United States may have a big impact on the introduction of future banking regulations or the dismantling of the regulations in place.

The President of the United States Donald Trump through the issuance of his executive

order on financial regulations is planning to decrease many of the banking regulations, specifically the Dodd-Frank Act, which increased the compliance costs and reporting standards for banks. If the President is successful at removing the financial regulations, a key task for future research is to identify the benefits (e.g., productivity and profitability gains which are added to the firms) from deregulation in the financial services industry. Unfortunately, this may not occur under the current administration of President Trump who wants to ease some of the banking regulations in place because he feels that they hinder growth and competition in the economy. White (2017) documented that President Trump referred to DFA as a “disaster” and within hours of the declaration the President issued an executive order to scale back provisions DFA. The ultimate goal of the President is to dismantle all parts of DFA.

The current administration of the President of the United States is beginning the process of repealing many of the provisions of DFA as the regulation is opposed by many of the firms in the financial services industry. In June 2017, the U.S. House of Representatives passed the Financial Choice Act legislation which aims to dismantle many of the provisions of the DFA by exempting some financial institutions, specifically community banks, from the capital and liquidity requirements and weakens the power of the Consumer Financial Protection Bureau by allowing the President to remove the director of the agency at will instead of for cause. Additionally, the Financial Choice Act plans to eliminate the Volcker Rule which bans banks from trading on their gains and limits their ownership in private equity firms and hedge funds. Lastly, the Financial Choice Act aims to remove the Financial Stability Oversight Council which regulates the “Systemically Important Financial Institutions” by eliminating the process put in place with DFA by which these firms are liquidated during distress and replace with a new chapter of the bankruptcy code.

Although DFA has some imperfections and needs to be tweaked, the complete dismantling of the regulation without having a new regulation to replace it with is not what the financial services industry needs. The President and his economic advisors should work with the Congress to craft a regulation that will provide a benefit to all stakeholders of the industry not only the large financial institutions that have effective lobbyists.

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## BIOGRAPHICAL SKETCH

John Patrick Ned was born in Jennings, Louisiana. After completing his studies at Jennings High School in Jennings in 1989, John entered Louisiana Tech University in Ruston, Louisiana. During the fall of 1990, he enrolled at McNeese State University in Lake Charles, Louisiana. He received a Bachelor of Science with a major in accounting from McNeese State University in May 1993. During the following six years, he was employed as a personal banker for Bank United of Texas in Houston, Texas. In January 1999, he entered graduate school at the University of Houston-Victoria. He received a Master of Business Administration from the University of Houston-Victoria in December 2000. Over the next decade, he was employed in different roles in the commercial banking industry for several institutions including JPMorgan Chase and Frost Bank. In August 2013, he entered the doctoral program at The University of Texas Rio Grande Valley. In August 2017, he successfully completed my doctoral program at the University of Texas Rio Grande Valley. His email address is john.p.ned@gmail.com.