The Impact of Regulation on Financial Services Industry Groups: Evidence from the 2007-2009 Crisis

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ABSTRACT

We examine the market reaction and shift in risk from nine prominent legislations passed in response to the crisis between February of 2007 and July of 2009 on four types of institutions – banks, S&Ls, insurance companies, and REITs. Overall, with the exception of TARP, the legislations were wealth-decreasing and risk-increasing events for financial institutions as a whole. Banking firms, leveraged firms, and firms with higher trading volumes earn significantly lower abnormal returns. For both during- and post-crisis periods, larger firms experience increases in systematic risk; non-U.S. firms and firms with higher trading volumes experience lower changes in systematic risk.

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1. Introduction

The financial shocks of September and October 2008 impaired consumer and business confidence and brought into question the viability of major financial institutions. *"Commercial and investment banks and insurance companies around the world reported more than $1.1 trillion of losses between the outbreak of the financial crisis in mid-2007 and March 2009"* (Wilmarth, Jr., 2009). The world bore witness to the failure of large banks and other financial institutions in the United States and abroad that resulted in a financial meltdown followed by an economic downturn. As a response to the crisis, the U.S. government took various measures, famously known as the economic stimulus[1] in order to stabilize the economy and increase the safety and soundness of the financial markets. In addition to rebuilding the general public's confidence in U.S. financial markets, these stimuli were meant to improve the flow of information to financial markets and to provide liquidity to the markets to ensure market continuity. Yet, there has been spirited disagreement about the impact of such economic stimuli and the regulations that followed[2].

Our objective in this paper is to examine the impact of financial regulations (such as the Emergency Economic Stabilization Act (EESA (2008) and American Recovery and Reinvestment Act (ARRA (2009)) on commercial banks, savings and loans (S&Ls), insurance

[1] http://www.economy.com/mark-zandi/documents/Economic_Stimulus_House_Plan_012109.pdf

[2] In March 1999, Alan Greenspan appeared skeptical that the regulations would alleviate the problems facing the financial institutions industry. He states, "possibility of increased systemic risk does appear to be an issue that requires fuller understanding," arguing that new regulations "would be a major mistake." (What created this Monster? New York Times, March 23rd, 2008). Further, Mr. Nocera notes that support for regulation came from folks such asRep. Barney Frank and some of the most unexpected quarters on Wall Street –Byron Wien of Pequot Capital, Laurence Fink of BlackRock, the economist Alan Blinder, Allan Sinai of Decision Economics, Jamie Dimon of JPMorgan Chase, and even Larry Kudlow, the archconservative host of Kudlow & Company on CNBC". ("A System Overdue for Reform," Joe Nocera, New York Times,March 29, 2008)

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companies and real estate investment trusts' (REITs) stockholder returns. EESA (2008) and ARRA (2009) represent the costliest pieces of legislation in the history of the US banking industry. The legislations also have far reaching implications beyond providing funds for closing and reorganizing the insolvent financial institutions since they alter the legal and regulatory landscape for the industry. The changes in laws governing capital requirements, deposit insurance for banks and S&Ls, products and services offered and mergers and acquisitions fundamentally changes the future structure and operational dimensions of the industry from within. Kauffman (2010) states in his policy brief on banking market crisis that designing and enacting effective corrective public policies requires the correct identification and understanding of the problems and the consequences. Griffiths, Kotomin, and Winters (2011) echo this view in a recent paper and state that "analyses of financial crises allow researchers to determine what market mechanisms went wrong so appropriate policies can be put in place going forward" (page 542).

This paper aims at a step in this direction and adds value to the literature on the financial market crisis. This study also contributes to the literature on the impact of regulations on financial institutions. We examine the market reaction and shift in risk from nine prominent legislations passed between February of 2007 and July of 2009. Specifically, we examine the abnormal returns in the financial sector with a focus on the differential impact of regulations on four types of institutions – banks, S&Ls, insurance companies, and REITs. We also analyze the changes in risk due to the passage of the legislations for these four groups of financial institutions. Finally, we focus on the cross-sectional determinants of abnormal stock returns and risk shifts for the financial institutions.

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Examining the market reaction for 602 financial services firms as a whole, and for each individual sub-group of firms, we find that seven of the nine regulatory events, on average, have a highly significant negative market reaction. Interestingly, the one regulatory event which resulted in a positive market reaction for all groups of firms was the October 3, 2008 legislation which passed the Troubled Assets Repurchase Program (TARP). Among the industry groups examined, our results confirm the market perception that the banking industry was the hardest hit during the crisis. Moreover, we find that alphas for our firms decrease significantly in post-event period, while betas increase for the sample of firms. Thus, overall, the legislations were wealth-decreasing and risk-increasing events for financial institutions as a whole. On the individual group level, we find that the passing of the legislations result in an increase of systematic risk for banks, insurance companies and REITs. The results show that banking firms, leveraged firms, and firms with higher trading volumes earn significantly lower period abnormal returns. We find that larger firms experience increases in systematic risk while non-U.S. firms and firms with higher trading volumes experience lower changes in systematic risk for both the during- and post-crisis periods.

The remainder of the paper is as follows. We describe the background in section 2, while we present the research hypothesis and method in section 3. Section 4 describes the empirical results, and the conclusion is presented in section 5.

2. Background

The rumblings of the financial crisis[3] were felt as far back as early FY 2007 when HSBC announced losses linked to U.S. subprime mortgages and New Century Financial, which

[3] The Global Economic & Financial Crisis: A Timeline by Mauro F. Guillén http://lauder.wharton.upenn.edu/pdf/Chronology%20Economic%20%20Financial%20Crisis.pdf

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specialized in sub-prime mortgages, filed for Chapter 11 bankruptcy protection and cut half of its workforce. However, these warning signs were ignored and not recognized as a problem of avalanche proportions. But that did not last long. Soon after, in mid-2007, the trouble spread to major Wall Street firms such as Lehman Brothers, Bear Stearns, Merrill Lynch, JPMorgan Chase, Citigroup, and Goldman Sachs which led to a vortex of plunging prices in the financial markets by early 2008. As Wilmarth Jr. (2009) points out, seventeen large universal banks accounted for more than half of the $1.1 trillion of losses reported by the world's banks and insurance companies. The rest now is history.

The causes for the crises are manifold with a large convergence toward the following: housing boom in the US, low interest rates that fueled the boom, careless lending and investment decision-making, possible lack of oversight on the part of the regulators till after the collapse and the underestimation of systemic risks emerging out of the housing and mortgage market (Basse et al (2009), Wilmarth Jr. (2009), Kaufman (2010)). Furthermore, the international movement of funds from those nations with a surplus balance to those with a deficit balance such as the U.S. are often noted to have created macroeconomic imbalances which may have further deepened the crisis (Frieden, 2009)). Securitization transformed relatively illiquid financial assets into marketable capital market instruments via derivative financial instruments such as mortgage backed securities (MBS) and collateralized debt obligations (CDOs) (Basse et al (2009)). The nature of lucrative, albeit complex products attracted many participants including banks, savings and loans, investment banks, mortgage banks, insurance companies, REITs and other financial institutions into this market leading them down a slippery slope. By 2007, the weaknesses in many of these instruments started to come undone. Alongside the weaknesses in the mortgage markets with subprime lenders and fraud, banks and S&Ls had over-extended loans. As rates

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rose and foreclosures increased, the real estate bubble burst, further intensifying the decline, thus impacting all financial institutions directly or indirectly. The deepening crisis caused the failure or near-failure of several financial institutions leading to a further financial panic (Basse et al., 2009, Kaufmann, 2010).

Our analyses in this paper focuses on four major types of institutions, namely, Commercial Banks, S&Ls (also called thrifts interchangeably in the paper), Insurance companies, and REITS. Below, we discuss these institutions and the rationale behind their inclusion in our analysis.

2.1 Banks and S&Ls

The amount and rate of losses suffered by bank and S&Ls in 2008 and 2009 and the unprecedented levels of governmental assistance they received put them on the center of the map in the crisis. As more was uncovered about their operations, they were also seen as the main private-sector catalysts for the credit boom that further precipitated the crisis. Wilmarth, Jr., 2009 and Kauffman, (2010 provide excellent summaries of the role of banks in the financial crisis.

Even prior to the crisis, S&Ls were largely losing favor and declining with many thrifts converting their charter to banks. This crisis is largely considered a banking centered crisis, although “five of the seven biggest financial institution failures in 2007 and 2008 were OTS-regulated thrifts” (McCoy 2009). A forensic analysis of the crisis brings memories of the now infamous Countrywide, FSB and Wachovia, FSB that had shot-gun marriages with large bank holding companies in FY 2008 and Washington Mutual Bank that was among the largest financial institutions to fail. Unlike Wall Street banking conglomerates, thrifts primarily focus on taking consumer deposits, selling mortgages and offering credit cards. They also have their own

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regulator, Office of Thrift Supervision (OTS), their own charter, and, most importantly, their own unique lending requirements. (see Donelson and Zaring, 2009 for a detailed legal description of the working of thrifts and the regulations that surround them). The collapse of the thrifts are blamed on "imprudent-home loans" (that later became famously known as "liar loans" or "No-doc" loans) and some "fundamental regulatory lapses by OTS". (McCoy, 2009). Following the recent crisis, the efficacy and survival of OTS has been brought into question as well. Moreover, AIG, an insurance company whose financial products unit division that infamously had the largest bailout during the crisis held a thrift charter thus also linked to OTS. From 1998-2008, OTS lost a net 45 institutions as an increasing number of thrifts converted to banks (Wall Street Journal 2009).

In a series of two articles, DeYoung and Rice (2004a, 2004b) discuss the spectrum of strategies on how banks make money from employing traditional banking to employing nontraditional strategies. They note a remarkable increase in noninterest income at U.S. commercial banks over the past two decades and argue that regulatory and technological changes are catalysts for this historic change. Stiroh and Rumble (2006) note that while diversification benefits exist for bank holding companies (BHCs) with expansion into non- interest generating activities, they are also associated with increased volatility in returns and lower risk-adjusted profits. Further, Stiroh (2006) in determining equity market risk for U.S. BHCs, finds that (1) higher dependence on commercial and industrial loans, consumer loans and noninterest income activities largely impel increases in risk in BHCs and (2) investment banking, servicing, securitization income, gains from loan sales, gains from other asset sales and other non- interest income largely produce the volatility in returns.

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Along with banks' investment decisions, many economists have blamed central bankers and governmental policy makers for encouraging consolidation and conglomeration within the financial services industry over the past two decades, thus serving as catalysts to this crisis. Following the 1999 Financial Services Modernization Act (also known as the Gramm Leach Bliley (GLB) Act), mergers among commercial and investment banks and other financial service firms produced large financial conglomerates (or universal banks). In order to achieve economies of scope, they offered the gamut of financial services under one umbrella from securities underwriting, syndicated lending, asset backed securities (ABS), over-the-counter (OTC) derivatives, to collateralized debt obligations (CDOs) among others. In order to maximize their non-interest fee-related activity and decrease traditional lending (that is prone to capital requirements, default risk and interest rate risk) and to circumvent regulation, most banks pursued the securitization strategy (Wilmarth Jr., 2009, p. 995). Most of these loans were tied to mortgages due to their homogeneous nature and ease of pooling into 'tranches.' Whether these activities by financial conglomerates benefitted banks or increased risks is still inconclusive. Mamun, Hassan, and Lai (2004) showed that the financial services industry reduced the exposure of financial services to systematic risk by creating diversification opportunities that were afforded to them due to the GLB Act of 1999. They note further that the banking industry and especially larger banks benefitted most from the deregulations created by the GLB act. In contrast, Rajan (2005) discusses the strategy of offloading more plain vanilla risks by banks from their balance sheets into the balance sheets of investment managers, thus building-in an incentive to originate more loans that allows them to shift risk and maximize fee generation (Rajan, 2005, p. 5). Banks followed this strategy and offloaded much of their interest rate risk tied to fixed rate loans (such as mortgage loans) and this was often to an insurance company or pension fund that

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was looking for long term fixed income flows and less regulated than the originating banks. (Rajan, 2005).

As a port-mortem analysis, Wilmarth, Jr., (2009) notes that while revenue generating, these activities also significantly increased systemic risk in both U.S. and global financial markets. Wilmarth, Jr., (2009) describes the mortgage market as akin to a giant Ponzi scheme wherein nonprime borrowers had to keep taking out new loans to pay off their old ones. Thus, when the housing market collapsed in 2007 and large numbers of nonprime borrowers could not refinance, rapidly increasing defaults and foreclosures, the subprime crisis resulted. Thus, the securitization strategy that banks adopted to reduce their capital requirements and increase revenue exposed these institutions to credit risk, liquidity risk, market risk and finally led to systemic risk.

2.2 Insurance companies

The effect of the financial crisis on the insurance industry has been mixed. With the substantial number of bank failures, the housing market bust, and the Federal Reserve at the epicenter of the crisis, the financial crisis has primarily been seen as a banking crisis or a real estate crisis. While financial guarantee insurance companies in the United States and AIG in particular have garnered considerable attention in the media worldwide, the arguments from within the insurance industry regarding their vulnerability have come from both sides. One side argues that insurance companies are minimally affected by the crisis. The argument is as follows. Since insurance companies are largely long term investors with long-term investment horizons compared to other financial institutions, such as commercial banks, they are not heavily impacted by volatility in the markets. Furthermore, the argument pursues that since insurers were

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not originators of subprime mortgages nor were they major investors in mortgage based financial instruments; their risk exposure to the housing market collapse was minimal (Schich, 2009). The flip side of the argument as discussed by Schich, 2009 emphasizes that certain segments of the insurance industry (financial guarantee companies in particular) that are involved in investment-bank like activities, valuations and financial transaction guarantees such as the now infamous credit default swaps contributed to the risk that almost brought down the global economy thus placing the insurance industry in the epicenter of the crisis in step with banks and thrifts.

In a 2009 report by Ernst & Young, model risk and regulatory intervention risk were ranked as 2 of the 10 most severe risks facing the insurance industry[4]. The increase in credit and market risks, especially for the US mortgage and financial guarantee insurance companies, clearly points to systemic risks that affected the financial sector.

2.3 REITs

REITs invest their funds mainly in real estate assets. They receive special tax considerations and typically offer investors high yields, as well as a highly liquid method of investing in real estate which make them very attractive. In the U.S., REITs are also required to designate 90% of their taxable income to shareholders via dividends in return for not having to pay taxes on that money. Thus, investing in REITs is a liquid, dividend-paying means of participating in the real estate market which makes them attractive. Equity REITs invest in and own properties and Mortgage REITs deal in investment and ownership of property mortgages. These institutions loan money for mortgages to owners of real estate, or purchase existing mortgages or mortgage-backed securities. Their revenues are generated primarily by the interest that they earn on the mortgage loans. Whether REITs and the real estate market are closely tied

[4] http://www.insurancejournal.com/news/national/2009/06/23/101637.htm

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is debated in the literature, but literature finds cointegration between REITs and house prices implying tight co-movements and the existence of a stable long term relationship (Pagliari and Webb, 1995; Gilberto, 1990; He, 2000; Glascock, Lu and So, 2000;Nishigaki, 2007). Taking note that REITs behave like utility stocks and are often difficult to classify as stock market or real estate investments, Basse, Friedrick and Bea (2009) examine the relationship between REITs and utility stocks and show a massive structural break in February 2007. They conclude that investing in REITs seems to have become more risky relative to investments in utility stocks.

A Ernst and Young Report ((E&Y Report, 2010) states that by end of 2008, US REITs were deeply burdened with debt and combined with illiquidity in a falling real estate market faced both increased cost of capital and difficulty in finding capital. Taking advantage of an IRS ruling to help REITs survive the crisis, that allowed publicly traded REITs to pay up to 90% of their dividends in stock, some REITs in 2009 in order to conserve cash paid part of their dividends in stock. However, following a very successful capital-raising experience by Simon Property Group Inc., the largest public US REIT, in early 2009, REIT share prices rose rapidly and by the end of FY 2009 REIT shares overall were up about 90% compared to earlier that year (E&Y report, 2010, p. 25-26).

2.4 Financial Regulation

In an unprecedented move due to the threatened failure of very large institutions, the U.S. government had to intervene to mitigate the crisis by enacting several regulations, beginning in 2007. As Udell (2009) notes, "With only $50 billion in the FDIC funds, it is hard for this author to see how the government was going to avoid injecting sizable amounts into the financial

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system…in the face of impending losses in the U.S. residential mortgage, commercial mortgage, construction and development loan, commercial loan, and consumer loan (including subprime) markets …. Some of these losses on U.S. loans will be borne by foreign banks, and some by nonbank financial institutions including life insurance companies and hedge funds." Among the more controversial regulations are the Emergency Economic Stabilization Act (EESA)[5] in October 2008, also commonly referred to as a bailout of the U.S. financial system and in the Feb 2009 American Recovery and Reinvestment Act (ARRA), both of which were passed with the intent to further stabilize the economy. In an effort to restart money and credit markets, the Federal Reserve has vastly expanded its role. The Fed adopted a zero interest rate policy, and in an attempt to decrease long-term interest rates, it made clear that the funds rate will remain there indefinitely. With $700 billion Troubled Asset Relief Program deployed, the government injected capital and became a senior preferred stockholder in many banks, and thus gained sizable ownership stakes in the nation's largest financial institutions[6]. (Gaby and Walker, 2011). The interventions included nationalizing several of the banks and the takeover of Fannie Mae and Freddie Mac, effectively suggesting that the government is implicitly involved in the nation's mortgage lending (Nanto, 2009).

3. Research Hypothesis

An expansive body of literature surrounds the study of impact of regulation. The earliest seminal work in the area is by Stigler (1971) who proposed that *"regulation is typically sought by the industry and designed primarily to better operations within"*. Other studies have expanded

[5] http://www.govtrack.us/congress/bill.xpd?bill=h110-1424
[6] Congressional Research Service Report RL34730, Troubled Asset Relief Program: Legislation and Treasury Implementation, by Baird Webel and Edward V. Murphy

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on Stigler's arguments either supporting or opposing him (Peltzman, 1976; Needham, 1983). Further, literature also focuses on factors that impact the differential effects of regulation such as size, industry, geography etc (Stigler, 1971; Posner, 1974, Peltzman, 1976; Binder, 1985; Cornett and Tehrenian, (1989, 1990); Goddard, Molyneux and Wilson, 2010).

A few papers examine the stock market impact and risk changes due to regulatory events. Sundaram, Rangan and Davidson (1992) test a sample of banks and S&Ls to analyze the stock market perception of the debate and passage of FIRREA of 1989. Their evidence suggested that the FIRREA produced positive abnormal returns for both banks and S&Ls and the addition of stricter capital standards produced positive returns for S&Ls. They also note the passage of the Act increased the risk for both banks and S&Ls, perhaps due to increased costs of premiums for both groups. Madura and Wiley (2000) study the impact of FIRREA on risk of savings institutions and find that that a reduction in interest rate risk and real estate risk. They also find that the results vary across savings institutions, and smaller institutions and institutions with higher levels of capital exhibit a more marked reduction in risk. Mamun, Hassan, and Lai (2004) find that the financial services industry gained by the passing of the GLB Act in 1999 and that the exposure to systematic risk was significantly reduced in this industry. However risk reduction, they note, was not uniform across the industry and they found that the banking sector gained the most in terms of reduced risk followed by the insurance industry. More recently, Naceur and Omran (2010) use bank-level data from ten countries to assess the impact of financial development, bank regulations, market structure, and institutional factors on bank efficiency and profitability for the 1989-2005 period. They fail to find any significant relationship between macroeconomic variables and bank performance and note that banks operating in a well-developed stock market environment tend to have greater profit

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opportunities. They find that regulatory and institutional variables have an impact on bank performance. Semaan and Drake (2011) study the market's perception of risk associated with deregulation using nine different industries, including financial services. They note that a decrease in market risk of firms following deregulation, except in case of insurance brokers. They also note that the security and commodity brokers' industry and bank holding companies experienced only a very short-term increase in industry-specific risk in comparison to industry systematic risk, concluding that these industries learned faster to adapt to deregulation.

Two recent papers examine the impact of the financial market crisis on institutions. Griffiths, Kotomin, and Winters (2011) examine the commercial paper market in the light of the crisis of 2007-2009. Specifically, they ask whether the problems in the commercial paper market were liquidity-based or credit- based. Using daily commercial paper data for the 1-day and 30-day maturities, they conclude that an increase in perceived credit/counterparty risk was the primary concern in the commercial paper market during the crisis. Liquidity was a secondary concern. They suggest that merely increasing liquidity, therefore, is not an effective measure in solving an issue which is more credit-based. Examining bank risk taking at the onset of the crisis, Fortin, Goldberg, and Roth (2010) analyze the impact of various governance measures on risk taking by bank holding companies. They find that higher managerial control through governance mechanisms reduces the amount of risk undertaken by bank managers; CEOs who achieve greater control through higher share ownership, higher base salaries reduce risk, while those who receive higher options or bonuses increase risk. The authors conclude that their evidence is consistent with the view that bank managers are generally more risk-averse than outside shareholders.

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While literature has largely focused on studying the impact of a legislation on a group or sub-group of financial institutions, the recent crisis presents an opportunity to explore the impact of a series of legislative changes that were enacted in a short span on the financial services industry. The main objective of this paper is to test how the stock market perceived the passing of financial regulations and the enactment of different pieces of financial legislation related to the crisis over the period 2007-2009. Our first hypothesis therefore is as follows:

> ***Hypothesis 1: $H0_1$:*** *The average excess returns for banks, savings and loans, insurance companies and REITs during the announcement period is not significantly different from zero.*

$H0_1$ is tested using a Seemingly Unrelated Regressions (SUR) model in which we regress the returns for a portfolio of banks, savings and loans, insurance companies and REITs against the market returns using a series of dummy variables to control for the release of information about the legislations. In this model, the reaction of banks, savings and loans, insurance companies and REITs to the financial legislations can be measured separately as the new legislations may have impacted these different financial institution groups differently. Our next hypothesis further addresses this issue.

> ***Hypothesis 2: $H0_2$:*** *The announcement period abnormal returns are not different for the four types of financial institutions.*

Typically, literature has shown that besides intra-industry effects, the various legislations may not impact the different institutions the same way due to their portfolio structure and the nature of their business.

Changes in regulation also result in changes in risk of regulated firms. Recent regulations pervaded all of the industry, but portfolio structure of firms may have caused different sub-

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groups within the industry to have different risk impacts. In order to test for structural shifts in risk, we test the following hypothesis.

> ***Hypothesis 3: $H0_3$:*** *The systematic risk remained the same for financial institutions during and after the regulatory period.*

$H0_3$ can be examined in several ways. We test to determine if the slope coefficients for the four types of financial institutions changed during the event period while the regulations was passed and during the post-regulation period.

The next section describes the sample and the methodology utilized to test the above hypotheses.

4. Data and Methodology

4.1 Data

Our analysis requires identification of significant dates surrounding the legislations. As Binder (1985b) notes, due to the complexity of the legislative process and the multiple announcements made, it is often difficult to isolate exactly when new information reaches the market. To identify dates for the regulations, we begin by using the timeline of the financial crisis that is available at the Federal Reserve Bank of St. Louis in a chronological fashion. We peruse this timeline and parse out the significant dates *where laws were proposed (that later became laws) or passed* or some critical information was announced by the SEC, Treasury or the Federal Reserve Board. Table 1 lists nine dates where significant new laws or information regarding legislation following the crisis was received by the market.

[Table 1 about here]

The sample is comprised of all firms in the CRSP database with SIC codes from Banks (6020, 6021, 6022, 6029), Savings and Loans (6035, 6036), Insurance (6311-6399), and Real

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Estate Investment Trusts (6798). A total of 330 Banks, 67 S&Ls, 105 Insurance companies and 100 REITs included results in a total sample of 602 firms. The event period begins on October, 10, 2007 and ends on May 20, 2009 (see Table 1) which is a period of 406 trading days. The sample period extends 100 trading days prior to and after the event period. In order to be included in the final sample, firms must be active for the entire sample period of 606 trading days. Cross-sectional data for our firms is obtained from the Compustat database. Thirteen firms do not have complete cross-sectional data and are omitted from the cross-sectional tests.

We collect return data for all firms in the appropriate SIC code from CRSP. Firms that do not have return data for the entire sample period are removed. The firms with complete returns make up the final sample list of firms for each category. Firms are designated as REIT, S&L, Insurance, or Banking according to their SIC code in CRSP. Financial data are obtained from Compustat for Insurance, REIT, and Savings and Loan firms. Banking financial data are obtained from Compustat Bank Annual. For all firms, financial data is taken from the fiscal year end up to, but not exceeding the month of September, 2007, since the first event date is October 10, 2007.

Panel A of Table 2 presents some descriptive statistics on key variables for our sample. The average firm size is $ 39.8 million with an average trading volume of 94.3 million shares outstanding. Average ROE is about 10.73 percent, average profit margin of 13.92 percent, and average ROA is 1.8 percent for the sample of firms. The average debt ratio for the sample is about 68 percent. Panel B of Table 2 gives details on the breakdown of firms. For the 593 firms with cross-sectional data, the sample comprises of 323 commercial banks, 66 S&Ls, 104 insurance companies, and 100 REITs. 25 firms are incorporated overseas while 26 firms trade on smaller exchanges (OtherOTC). 318 firms use a Big 8 Auditor, with 132 banks using a Big 8

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firm. We report the descriptive statistics by sub-group in Panel C of Table 2. On average, banks comprise the largest firms in terms of total assets ($60.57 million), while insurance firms report the highest mean trading volume (162.3), followed by REITs (101.9). Insurance companies report the highest ROA and ROE (3.91% and 13.89% respectively), while REITs report the highest profit margin (18.85%). The highest debt ratios are found for banks (90.75%) followed by S&Ls (86.75%).

[Table 2 about here]

4.2 Methodology

4.2.1 Announcement Effects and Risk Shifts

One of the difficulties with examining the effect of regulation is to select appropriate dates for when value relevant information about the proposed regulations actually became available. Despite the difficulty in pin-pointing exact value-relevant dates, we use most of the dates based on recent literature on the financial crisis that may mark key developments of the regulations such as dates when laws were enacted or proposed and significant announcements/events by the SEC, Treasury or the Fed. The method of analysis is discussed in Binder (1985a,b) and Boardman et al (1997). The model is suitable to a regulatory event that includes multiple event dates. The model is used in a number of studies that have examined wealth effects surrounding regulatory changes including Mitchell and Mulherin (1988), Sundaram et al (1992) and Chhaochharia and Grinstein (2007). We employ the same procedure using portfolios which also alleviates the problem of event day clustering. Specifically, our model is as follows:

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$$r_{j,t} = a_j + a'_j D_P + b_j r_{mt} + b'_j D_0 r_{mt} + b''_j D_P r_{mt} + \sum C_{kj} D_{ik} + e_{jt}$$

r_{jt} =*portfolio return for day t*

a_j = *regression constant*

a'_j = *shift in regression constant after the event period*

r_{mt} = *S&P 500 Index return*

b_j = *coefficient representing beta*

b'_j = *coefficient representing a shift in beta during the event period*

b''_j = *coefficient representing a shift in beta after the event period*

D_0 = *dummy variable equal to 1 during the event period*

D_P = *dummy variable equal to 1 after event period*

D_{ik} = *dummy variable equal to 1 on the day prior to and the day of event i*

C_{kj} = *coefficient of the information dummy variable k for portfolio j*

e_{jt} = *error term for portfolio j.*

The variable D_{ik} is a dummy variable equal to 1 for each of the dates corresponding to our events and the day prior to each event. Nine dichotomous variables, D_1 through D_9, are created marking each of the event dates and the date just prior equal to one. An additional dichotomous variable, D_{10}, is equal to one for all the event dates and all the dates just prior to the event date. D_1 through D_9 produces the cumulative abnormal return for each event date, while D_{10} returns the coefficient representing a cumulative abnormal return for all the event dates combined. Dummy variables are also created equal to one for the period from the first event to the last event (DurDummy), and for the period immediately after the last event to the end of the sample period (PostDummy). The model described above also specifies the systematic risk (beta) and shift in

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beta during and after the event period via the dummy variable D_0 and estimates the beta coefficient for the pre and post event periods.

4.2.2 Cross-sectional analysis:

We next examine the impact of firm-specific characteristics on our full sample of firms via the following model

$$D10 = \beta_0 + \beta_1 Size_j + \beta_2 Big8Auditor_j + \beta_3 DebtRatio_j + \beta_4 OtherOTC_j + \beta_5 ROE_j + \beta_6 NonUS_j + \beta_7 LnVolume + \beta_8 Size * OtherOTC + \beta_9 Bank_j + u_j$$

Research shows that the presence of a Big 8 accounting firm has a reputation effect. For example, Michaely and Shaw (1995) find that in the IPO market, the market perceives IPOs that are associated with more prestigious auditors (Big 8 firms) to be less risky, and that the long-run performance of IPOs is related to the prestige of the auditor used. In his study of the East Asian Crisis of 1997-1998, Mitton (2002) finds that significantly better stock price performance is associated with firms that had indicators of higher disclosure quality, namely auditors from Big Six accounting firms. Thus, we posit a positive relation between auditor reputation (Big 8 Auditor) and abnormal return. Research on bank size and efficiency shows that banks from about $100 million to about $25 billion in size are the most efficient (Berger, 1999). However, Fok, Chang and Lee (2004) argue that large banks' have larger market shares and better access to capital and information which should lead to greater profitability. Hence the relationship between size and abnormal return may be ambiguous. Nevertheless, much of the political debate during the financial crisis focused on the twin issues of "moral hazard" and "systemic risk", and Too-Big-To-Fail became a rallying cry for both proponents and critics of the various legislations. We thus expect to see a positive relation between size and abnormal return for this crisis period.

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Extant agency theoretic perspectives argue that debt can have a monitoring effect and hence higher leverage may align managers to act in the interest of shareholders (Jensen and Meckling (1976), Wiliams (1987) . Berger and Bonarccorsi di Patti (2006) argue that the choice of leverage may be based on the efficient-risk hypothesis or the franchise value hypothesis as follows. More efficient firms (higher profitability or ROE) choose higher leverage since the higher efficiency reduces the costs of bankruptcy and, thus increased profitability (from increased efficiency) protects the firms from future crisis. The franchise value hypothesis is more in line with the reputational capital idea and argues that more efficient firms choose lower leverage (and higher capital) to protect their franchise value (reputation) to avoid any possibility of liquidation. Margaritis and Psillaki (2010) who test these hypotheses find that more leveraged firms have higher abnormal returns. Given the nature of the crisis and the bail outs that ensued we predict a positive coefficient for more leveraged firms and a positive coefficient for Return on Equity (ROE). We also predict a positive sign for non-U.S. firms as we expect that these firms are somewhat sheltered from the impact of the regulations.

We also expect a positive coefficient on trading volume, as research shows that volume increases due to informed trading. Research also discusses the role of trading volume as an information variable and indicates a positive relationship between returns and trading volume (Karpoff (1987), Stickel and Verrachhia, (1994), Brailsford (1996) and Lee and Rui (2002)). Campbell, Grossman and Wang (1993) note that volume tends to be higher when stock prices are increasing than when prices are falling. We predict a negative coefficient for firms that trade on smaller exchanges (OtherOTC), and we also interact size and OtherOTC and posit that abnormal performance is negatively related to larger firms that trade on smaller exchanges. Hegde, Lin and Varshney (2008) find that NYSE spreads are smaller than NASDAQ (OTC) spreads and there

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are a greater number of orders placed with NYSE. Besides, NYSE listed stocks can be traded on other exchanges, while NASDAQ only began their dual listing program in 2004 that allows companies to list on the NASDAQ in addition to the NYSE.

Finally, we estimate the model above for risk shifts in these financial services firms during and after the event.

5. Results

5.1. Announcement Period Returns:

We begin our analysis by examining the overall results for all the regulations and present the regression estimates of our model for each individual event in Table 3. Panel A presents the results for all firms. We find negative and highly significant coefficients for the events D_1, D_3, D_7, D_8, and D_9 for our full sample of firms. Coefficients for D_2 and D_3 are also negative at the 10% and 5% level of significance. Only one event date, D_5, is positive and highly significant. Thus, our results for the full sample of banks show that the market views the announcements of the various legislations as mostly negative events. We discuss the individual legislations and their impact on the different industry groups in more detail below.

[Tables 3 and 3a about here]

Tables 3 and 3a also documents the regression estimates for the individual industry groups. For the sub-sample of banks, events D_1, D_3, D_4, D_5, D_6, D_7, D_8, and D_9 have significant coefficients, . With the exception of D1, which is marginally significant, the rest of the coefficients for the banking sub-sample are highly significant at the 1% level. ; all of which except for d1 are highly significant at the 1% level. The first event date, D_1, in our timeline is the October 10th, 2007 HOPE NOW initiative announced by then Treasury Secretary, Henry

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Paulson along with Housing Secretary Jackson. The intent of HOPE NOW was to help homeowners who may not be able to pay their mortgages. The alliance of credit and homeowners' counselors, mortgage services and mortgage providers was formed to explore methods in which to reach at-reach homeowners, explain alternatives to at-risk borrowers, and to develop standards for mortgage counseling for the same. However, this event results in a marginally negative market reaction for the sub-sample of banks. It is to be noted that at this time, there was just a hint of the financial crisis that was to unfold, and it seems that the market did not want any regulatory interference at this time. While the HOPE NOW initiative had good intentions to help mortgage owners, it seems that the market did not believe that this legislative piece would be quite as beneficial to banks.

The next significant event date for banks, D_3 (7/15/2008), signifies the passing of the SEC emergency ban on the naked short-selling of Freddie Mac and Fannie Mae, along with other extraordinary emergency measures including the public disclosure of short selling positions of hedge funds and other institutional money managers. Because of the tenuous confidence in financial companies at this time, the SEC also banned the naked short selling in the stock of 799 financial companies, in an attempt to curtail aggressive short selling of institutions which were perceived to be especially fragile. While meant to boost the volatile markets during these tumultuous times, this legislative announcement is again viewed negatively by the market as evidenced by the negative and highly significant coefficient for the bank group. The next negative events for banks are D_6, D_7, D_8, and D_9. The coefficients for these events are highly significant at the 1% level. D_6 (2/10/2009) marks the passage of the Financial Stability Act, creating the Public-Private Investment fund, introduced by Treasury Secretary, Timothy Geithner. Under this Act, the Treasury department, along with the FDIC and the Federal Reserve

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Board, unveiled the Public-Private Investment Programs (PIPP) to buy troubled mortgage loans and mortgage-backed securities from banks. D_7 represents February 17th, 2009, the day that marked the passing of the American Recovery and Reinvestment Act (ARRA), and D_8 marks the passing of the 3/25/09 legislation allowing troubled financial institutions to be put into conservatorship or receivership by the U.S. Government. Finally, D_9 marks the 5/20/09 Helping Families Save their Homes legislation. The ARRA bill, also known as the Stimulus Act, was one of the first major acts passed by President Obama and the new Democratic Congress. ARRA was the focus of fierce partisan debates in Congress and ultimately passed the House with no Republican votes and the Senate with merely three Republican votes. This massive economic stimulus bill was estimated to cost $787 billion when it finally passed. All of these Acts were the subject of bitter wrangling along party lines, and investors and the general public were also suffering from legislative and "bail-out" fatigue by this time. There was also widespread perception that this was mostly a "banking" crisis and it is not surprising to find significantly negative coefficients for the sample of banks.

For banks, D_4 and D_5 are the only announcements which are met with a positive investor reaction, at the 5% and 1% level respectively. D_4 marks the passage of the Housing and Economic Recovery Act (HERA). The intent of HERA was to address issues relating to the mortgage market, specifically to the sub-prime crisis. Through HERA, the Federal Housing Authority (FHA) was allowed to work with at risk borrowers to refinance into more affordable government insured mortgages. HERA also injected capital into Fannie Mae and Freddie Mac and led to government conservatorship of these two institutions. Given the major role of banks in the sub-prime mortgage crisis, the positive market reaction to the passage of HERA is not surprising for the banking industry sub-group. D_5 marks 10/3/2008, the date when the

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Emergency Economic Stabilization Act passed. Better known as TARP, this legislation created the Troubled Assets Recovery Program, established to buy troubled assets from financial institutions. Introduced in September, 2008 and signed by President Bush in October 2008, TARP allowed the Treasury Department to spend up to $700 billion to purchase troubled assets both domestically and internationally. At the time of the passage of TARP, the market was reeling from the meltdown of Lehman Brothers. However, the initial attempt at passing TARP failed, as the House rejected the first version of TARP on Monday, September 29th. Despite a four-hour debate on TARP prior to the vote, the final vote of 228 to 205 against was 13 votes shy of the 218 votes needed for the bill to pass. Stock markets reacted immediately to this and the Dow Jones Industrial Average closed 778 points lower for the day. Leaders of both political parties pleaded for the votes necessary for the bill to pass, and TARP finally passed on October 3rd, 2008, to the relief of investors and both political parties. It appears that the markets believed that the passage of TARP would stem repercussions from the ongoing financial crisis. Our results confirm this.

The banking group reports negative coefficients for six of the nine event dates, while only two of the events have positive coefficients. The perception that this was very much a "banking" crisis seems to be validated by the market reaction. We are not able to document a significant abnormal reaction for only one date, the D_2 (2/13/2008); the passing of the Economic Stimulus Act. This Act passed by President Bush was treated as a catalyst to a weak economy and largely included tax breaks for businesses and payments to select groups of low and middle income individual tax payers who were expected to spend it on the economy and help revive it. The market perception on the probability of the latter was mixed and hence D2 was not found significant.

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We next report the results for the sub-sample of S&Ls in Table 3. We find that market reaction is much more muted for this group of firms, and only one event, D_3, is strongly negative. As mentioned earlier, D_3 marks the date when the SEC announced stringent restrictions in the short-selling of financial company stocks. Similar to the sample of banks, we find that D_5, the passing of TARP is viewed as good news by the market, albeit at the 10% level, as is the event D_6. As noted in Section 2.1, large thrifts such as Countrywide, FSB and Wachovia, FSB were in trouble during the crisis and were merged into banks or were owned by banks. Furthermore, over the 1998-2008 period a large number of S&Ls converted their charter to banks (Wall Street Journal, 2009). Thus the market reaction to the regulations and the stimulus may not distinctly be seen for the S&L group separately from the banks.

The results for Insurance Companies are reported next in Table 3a. We find significant coefficients for two event dates: D_2, D_3, are viewed as negative events by investors (significant at the 5% level). D_2 marks the passage of the Economic Stimulus Act of 2008; one of the first of several economic stimuli attempts to avert a recession and bolster the economy. As aforementioned, the legislation provided business incentives and tax rebates for low and middle-income taxpayers and market reaction toward it was perhaps just lukewarm consistent with our findings. As mentioned earlier, D_3 reflects the date of the SEC bank on short-selling of financial company stock. Unlike the sample of banks, we find no significantly reaction to either the passage of TARP or ARRA, two of the most controversial pieces of legislation during the crisis period. As these two bills were largely for the benefit of banks, it appears that the market perceives them as little benefit to insurance companies.

Finally, we report the reaction for REITs in Table 3a. The regression coefficients show that five of the nine events results in a negative market reaction of REITs, namely D4, D5, D7,

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D8, and D9. We find that all of these events are significant at the 1% level, except for D9, which is significant at the 5% level. While it is not surprising to find negative coefficients for most of these events, including D9; the passage of the very rancorous ARRA Economic Stimuli Bill, we were not expecting a negative coefficient for D4 and D5. Page (2010, p 252) notes that a substantial portion of HERA (D4) deals with helping families, to avoid foreclosure by providing loans wherein lenders take deep discounts. The program was only for owner-occupants and not investors and hence the market did not see this as beneficial for REITs. Similarly, Gaby and Walker (2011, p. 76) discuss TARP (D5) as a program that was implemented to protect the US and global banking systems during the crisis. We had mentioned earlier that the banking sub-group reports a positive market reaction to D4, the passage of HERA, and to D5 (TARP). We conjecture that investors in REITs were concerned that the federal aid packages were primarily focused at helping banks at the expense of REIT investors.

In summary, we are unable to support Hypothesis $H0_1$ which posits no abnormal market reaction for the announcement period returns. For the overall sample of firms, we find that eight of the nine events have abnormal returns that are significantly different from zero. Three of the sub-groups report more negative events than positive, and it appears that the markets do not welcome legislations, despite the intent of these Acts to help the firms via economic stimuli. Banks reports the most number of negative events (six), followed by REITs, which report five negative events. Thus, it appears that the market is penalizing the two segments most closely associated with the crisis – the banking industry and the real estate industry. The passage of HERA, allowing for the government conservatorship of the mortgage finance giants, Freddie Mac and Fannie Mae is viewed as a significantly positive event for banking firms and a negative event for REITs. We find D_3, the date the SEC announces a ban on short selling of financial

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company stock is viewed negatively by our overall sample and by three of the four individual industry sub-groups. Banks report only two positive events, while REITs, as a group, do not report any significantly positive reaction to any of the legislations passed during this period.

We also report the F-tests for significance to examine difference in market reaction among the four sub-industry groups in Table 3. A perusal of the F-test statistics shows that the market reaction for each of the events D_3 through D_9 are significantly different for our four groups. Thus, we do not find support for Hypothesis $H0_2$, which predicts that the abnormal returns are not different among the four groups of firms.

5.2. Risk Shifts during and post crisis Hypothesis $H0_3$:

Table 4 reports the overall results for all events as measured by the variable D_{10} and also the post-event shift in the alpha and beta for the entire sample, and for each group of firms.

[Table 4 about here]

Overall, the legislations passed during the financial crisis of 2008-2009 were viewed as bad news by the market. An examination of the alpha (constant) shows that post-event alpha is negative and highly significant for the full sample of 602 firms. Similarly, post-event beta shift is positive and very significant for all firms. The pre-crisis beta for all firms is 0.7776, and beta increases by 0.2055 during and by 0.2166 after the crisis. Thus, the cumulative effects of the legislative actions are risk-increasing and value decreasing events for our sample. On the individual industry group level, we find similar results for our sample of banks. The aggregate event abnormal returns (D_{10}) are negative and highly significant. The alpha for this group changes from positive to negative and is highly significant. The beta increases during the event as does the post-event beta, indicating that the legislations were not risk-reducing events for banks.

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We find that the savings and loans, as a group, do not demonstrate much in terms of pre and post-event shifts, and we find no significant change in alphas or betas, while the cumulative event window return, D_{10}, is negative and marginally significant. For the insurance industry, we find a negative change in alpha after the financial crisis, while the cumulative abnormal return, D_{10}, is negative and highly significant. Examining the shift in beta, during and post-event shows that the legislative actions ensuing from the crisis appear to be risk increasing events for this industry. Finally, we find that for our sample of REITS, both during- and post-event beta increases significantly, while post-event alpha decreases marginally. Once again, the aggregate abnormal return during the crisis is negative and highly significant. Thus, we do not find support for $H0_3$ and find significant differences in the risk shifts that are observed during and after the financial market crisis.

5.3. Cross-sectional results

We report cross sectional results for our sample in Table 5. Panel A reports the results of the coefficient estimates when D_{10} (cumulative abnormal return for all events) is the dependent variable.

[Table 5 about here]

We had hypothesized that firm size, auditor quality (Big 8 auditor), ROE, non-US firms, and trading volume would be positively related to the abnormal return for the event windows. Our cross-sectional results show that non-U.S. firms earn significantly higher abnormal returns (at the 1% level) over the crisis period. Our results do not show that firm size, auditor reputation, or firm performance as measured by ROE impact the event period abnormal returns in any significant manner. We had also predicted a positive relation between firm leverage and

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abnormal return; but we do not find this for the sample. We find that firms with higher debt to total assets ratio earn significantly lower abnormal returns (at the 1% level) in line with Berger and Bonarccorsi di Patti's (2006) franchise value argument that more efficient firms choose lower leverage (higher capital) to protect their value and any hint of liquidation. We had also posited that firms that trade on lesser exchanges (other OTC) will earn significantly lower abnormal returns over the crisis legislative events; our results verify this prediction.

Although we had predicted a positive relation between trading volume and abnormal return, our results document the opposite. Firms with higher trading volume earn significantly lower abnormal returns over our event windows. We had also hypothesized that larger firms which trade on smaller exchanges (size*non OTC) would earn significantly lower abnormal returns. However, we report a positive coefficient for this interaction variable. It appears that larger firms on the smaller exchanges are relatively sheltered from the effects of the crisis. Given the fact that banks were at the nexus of this crisis, our hypothesis was that banks would especially be hard hit during the crisis. The coefficient for our dummy variable, Bank, is negative and significant at the 1% level, documenting that the banking firms in our sample earned significantly lower abnormal returns over the crisis legislations.

Panel A of Table 6 reports the results for the cross-sectional determinants of risk shift during (Beta Shift During Event) the period of the legislative announcements.

[Table 6 about here]

We had hypothesized a positive relation between size, debt to total assets, other OTC, banking firms, and size*other OTC. We find that risk shift during the crisis period is very significantly related to firm size, and bigger firms experience significantly higher increases in systematic risk,

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as measured by the beta. We had also posited non-US firms and firms with higher trading volume will be less risky. Our results show this to be true and we find that the change in systematic risk during the event windows is significantly lower for non-U.S. firms (at the 1% level) and for firms with higher trading volume (at the 5% level). We report the cross-sectional impacts on risk shift after (Beta Shift Post Event) in Panel B of Table 6. Our results are similar to those reported for the determinants of risk shift during the crisis; we find that larger firms experience significantly higher increases in systematic risk, while non-U.S. firms and firms with higher trading volume experience significantly lower shifts in beta. Our results do not find any significant relation between auditor quality, firm leverage, other OTC, ROE and changes in systematic risk. While we recognized earlier in Table 5 that banking firms earned significantly lower abnormal returns during the event windows, our analysis of the shift in beta shows that banking firms do not seem to be riskier than the other industry sub-groups.

6. Conclusion.

We examine the differential market reaction of financial services firms to a series of regulatory events passed in response to the financial market crisis of 2007-2009. Using SUR estimations, we examine market reaction separately for banks, S&Ls, insurance companies and REITs for each of these events and also examine the aggregate market reaction. In addition, we examine pre and post-event shifts in alphas and betas for the firms in our sample. We find that on average, the event date market reaction is negative and significant for all firms in our sample for seven of the nine legislative Acts. For the overall sample, we only find one date, October 3, 2008, passing of the TARP Act results in a positive market reaction. Parsing down by industry

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sub-group, we find that crisis hits the banking industry the hardest; investor reaction for events dates is negative for six out of the nine event dates for our sample of banks. Interestingly, we find that the two event dates which result in positive market reaction for banks are met with the opposite (negative) reaction for the sample of REITs. We conjecture that the investors in REITs may fear that the economic stimuli aid packages benefit banks to the detriment of real estate investors.

Our results also demonstrate a negative post-event shift in alpha for the firms in our sample, along with an overall increased shift in beta. The aggregate event date abnormal returns, D_{10}, are significantly negative for our overall sample. Upon further parsing, we find that the legislative acts are systematic risk increasing events for banks, insurance companies, and REITs.

Our cross-sectional analysis of the determinants of the abnormal returns for all event windows shows that more banking firms, leveraged firms, and firms with higher trading volumes earn significantly lower event period abnormal returns. We also find that non-U.S. firms appear to be relatively sheltered from the impact of the legislative events, perhaps due to diversification. Turning to the determinants of systematic risk shifts during- and post-crisis, we document that larger firms experience significantly higher increases in beta, while non-U.S. firms and firms with higher trading volumes report lower changes in systematic risk.

The implications of our study are as follows. As newer policies and regulations are being deliberated about twin issues of moral hazard and systemic risk and the efficacy of TARP and other legislative moves questioned, out study provides evidence of market reaction to such public policy changes. As laws about capital requirements, especially for banks are being re-examined, our study may point to evidence supporting the increased need for capital as a cushion especially for banks and highly levered firms which clearly show increases in systematic risk.

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Table1. Days of Significant news announcements regarding regulations surrounding the Financial Crisis

Event Number	Event date and description
D1	**October 10, 2007** | Hope Now Press Release | Treasury Department Press Release U.S. Treasury Secretary Paulson announces the HOPE NOW initiative, an alliance of investors, servicers, mortgage market participants, and credit and homeowners' counselors encouraged by the Treasury Department and the Department of Housing and Urban Development
D2	**February 13, 2008** | Public Law 110-185 President Bush signs the Economic Stimulus Act of 2008 (Public Law 110-185) into law.
D3	**July 15, 2008** | SEC Press Release The Securities Exchange Commission (SEC) issues an emergency order temporarily prohibiting naked short selling in the securities of Fannie Mae, Freddie Mac, and primary dealers at commercial and investment banks.
D4	**July 30, 2008** | Public Law 110-289 President Bush signs into law the Housing and Economic Recovery Act of 2008 (Public Law 110-289), which, among other provisions, authorizes the Treasury to purchase GSE obligations and reforms the regulatory supervision of the GSEs under a new Federal Housing Finance Agency.
D5	**October 3, 2008** | H.R. 1424 | Public Law 110-343 Congress passes and President Bush signs into law the Emergency Economic Stabilization Act of 2008 (Public Law 110-343), which establishes the $700 billion Troubled Asset Relief Program (TARP).
D6	**February 10, 2009** | Treasury Department Press Release | Fact Sheet U.S. Treasury Secretary Timothy Geithner announces a Financial Stability Plan involving Treasury purchases of convertible preferred stock in eligible banks, the creation of a Public-Private Investment Fund to acquire troubled loans and other assets from financial institutions, expansion of the Federal Reserve's Term Asset-Backed Securities Loan Facility (TALF), and new initiatives to stem residential mortgage foreclosures and to support small business lending.
D7	**February 17, 2009 |** American Recovery and Reinvestment Act of 2009 President Obama signs into law the "American Recovery and Reinvestment Act of 2009", which includes a variety of spending measures and tax cuts intended to promote economic recovery.
D8	**March 25, 2009** | Treasury Department Press Release | Draft Legislation The U.S. Treasury Department proposes legislation that would grant the U.S. government authority to put certain financial institutions into conservatorship or receivership to avert systemic risks posed by the potential insolvency of a significant financial firm. The authority is modeled on the resolution authority that the FDIC has with respect to banks and that the Federal Housing Finance Agency has with regard to the GSEs. The authority would apply to non-bank financial institutions that have the potential to pose systemic risks to the economy but that are not currently subject to the resolution authority of the FDIC or the Federal Housing Finance Agency.
D9	**May 20, 2009** | FDIC Press Release President Obama signs the Helping Families Save Their Homes Act of 2009, which temporarily raises FDIC deposit insurance coverage from $100,000 per depositor to $250,000 per depositor. The new coverage at FDIC-insured institutions will expire on January 1, 2014, when the amount will return to its standard level of $100,000 per depositor for all account categories except IRAs and other certain retirement accounts. This action supersedes the October 3, 2008 changes.

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Table 2. Sample Descriptive Statistics (As of October 2011)

Panel A. Firm Characterisitics

Variable	N	Mean	Median	Std. Dev	Minimum	Maximum
Total Assets	593	39,837	1,747	202,208	18	1,965,159
Trading Volume	593	94,376	9,953	371,334	9	6,182,785
ROA	593	0.0180	0.0111	0.0246	-0.0936	0.1944
ROE	593	0.1073	0.1120	0.1476	-2.7586	1.0184
Profit Margin	593	0.1392	0.1340	0.1920	-3.0311	1.1753
Debt ratio	593	0.6818	0.8886	0.3392	0.0000	0.9801

Panel B. Number of Firms

Variable	Total	Bank	S&L	Insurance	REIT
Total Firms	593	323	66	104	100
Other OTC	26	19	5	1	1
Foreign Incorporated	25	24	0	1	0
Big 8 Auditor	318	132	14	94	78

Panel C. Banks Characteristics

Variable	N	Mean	Median	Std. Dev	Minimum	Maximum
Total Assets	323	60,570	1,644	264,554	117	1,965,159
Trading Volume	323	84,014	3,739	463,349	9	6,182,785
ROA	323	0.0099	0.0097	0.0050	-0.0237	0.0293
ROE	323	0.1146	0.1173	0.0584	-0.2263	0.2662
Profit Margin	323	0.1390	0.1396	0.0663	-0.4420	0.3336
Debt ratio	323	0.9075	0.9106	0.0284	0.7652	0.9801

Panel D. S&L Characteristics

Total Assets	66	2,256	787	4,339	174	28,482
Trading Volume	66	26,560	1,175	90,056	26	581,568
ROA	66	0.0058	0.0058	0.0040	-0.0057	0.0143
ROE	66	0.0565	0.0497	0.0436	-0.0330	0.1907
Profit Margin	66	0.0912	0.0936	0.0625	-0.1039	0.1953
Debt ratio	66	0.8675	0.8822	0.0586	0.6645	0.9500

Panel D Insurance Characteristics

Total Assets	104	34,207	4,322	112,299	114	979,414
Trading Volume	104	162,332	35,615	302,531	20	2,129,001
ROA	104	0.0391	0.0369	0.0287	-0.0487	0.1633
ROE	104	0.1389	0.1325	0.0898	-0.1337	0.7796
Profit Margin	104	0.1225	0.1083	0.0860	-0.0480	0.4384
Debt ratio	104	0.0544	0.0415	0.0604	0.0000	0.4921

Panel D REIT Characteristics

Total Assets	100	3,530	2,032	4,566	18	30,716
Trading Volume	100	101,931	72,850	131,837	28	906,919
ROA	100	0.0306	0.0255	0.0415	-0.0936	0.1944
ROE	100	0.0848	0.1070	0.3257	-2.7586	1.0184
Profit Margin	100	0.1885	0.1848	0.4376	-3.0311	1.1753
Debt ratio	100	0.4824	0.4977	0.1914	0	0.8353

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Table 3.: Regression estimates for portfolios of All firms and By Type of Financial Institution and by event

$r_{j,t} = a_j + a'_j D_P + b_j r_{mt} + b'_j D_0 r_{mt} + b'' D_P r_{mt} + \sum C_{kj} D_{ik} + e_{jt}$

r_{jt} =portfolio return for day t; a_j = constant prior to event period; a'_j = constant prior to event period; r_{mt} = S&P 500 Index return; b_j = coefficient representing beta;b'_j = coefficient representing a shift in beta during the event period;b''_j = coefficient representing a shift in beta after the event period;D_0 = dummy variable equal to 1 during the event period;D_P = dummy variable equal to 1 after event period;D_{ik} = dummy variable equal to 1 on the day prior to and the day of event I;C_{kj} = coefficient of the information dummy variable k for portfolio j;e_{jt} = error term for portfolio j

						Informational Dummy variables								
All Firms	Constant			BETA		10/10/2007	2/13/2008	7/15/2008	7/30/2008	10/3/2008	2/10/2009	2/17/2009	3/25/2009	5/20/2009
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D1	D2	D3	D4	D5	D6	D7	D8	D9
Coefficient	0.0006	-0.0008	0.7795	0.2167	0.2068	-0.004	-0.0025	-0.0166	-0.0029	0.0078	-0.0003	-0.008	-0.0039	-0.0074
p-value	0	0.0003	0	0	0	0.0053	0.0882	0	0.0445	0	0.8116	0	0.0071	0
Sig	***	***	***	***	***	***	*	***	**	***		***	***	***
Rsq	0.1419	N	364,729	Pr > F	0.0001	Significance	***							
Banks	Constant			BETA		10/10/2007	2/13/2008	7/15/2008	7/30/2008	10/3/2008	2/10/2009	2/17/2009	3/25/2009	5/20/2009
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D1	D2	D3	D4	D5	D6	D7	D8	D9
Coefficient	0.0012	-0.0025	1.17	0.1613	0.2153	-0.0067	-0.0027	-0.029	0.0121	0.0173	-0.0149	-0.0138	-0.0114	-0.0232
Error	0.0002	0.0006	0.0483	0.0652	0.0495	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.003668
t Value	5.01	-4.33	24.21	2.47	4.35	-1.81	-0.74	-7.91	3.3	4.69	-4.05	-3.76	-3.1	-6.31
Pr > |t|	<.0001	<.0001	<.0001	0.0134	<.0001	0.0698	0.4573	<.0001	0.001	<.0001	<.0001	0.0002	0.0019	<.0001
Sig	***	***	***	***	***	*		***	***	***	***	***	***	***
S&Ls	Constant			BETA		10/10/2007	2/13/2008	7/15/2008	7/30/2008	10/3/2008	2/10/2009	2/17/2009	3/25/2009	5/20/2009
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D1	D2	D3	D4	D5	D6	D7	D8	D9
Coefficient	0.0002	-0.0005	0.4675	0.0756	0.0731	-0.0043	-0.0011	-0.0209	-0.005	0.0073	0.0075	-0.0015	-0.0022	-0.0028
Error	0.0003	0.0007	0.0576	0.0778	0.0591	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044	0.0044
t Value	0.67	-0.71	8.11	0.97	1.24	-0.98	-0.24	-4.78	-1.13	1.66	1.71	-0.34	-0.5	-0.65
Pr > |t|	0.5004	0.4792	<.0001	0.3309	0.216	0.3293	0.8067	<.0001	0.2578	0.0974	0.0874	0.7339	0.6205	0.5171
Sig			***					***		*	*			

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Table 3a: Regression estimates for portfolios of All firms and By Type of Financial Institution and by event

$$r_{j,t} = a_j + a'_j D_P + b_j r_{mt} + b'_j D_0 r_{mt} + b'' D_P r_{mt} + \sum C_{kj} D_{ik} + e_{jt}$$

r_{jt} =portfolio return for day t; a_j = constant prior to event period; a'_j = constant prior to event period; r_{mt} = S&P 500 Index return; b_j = coefficient representing beta;b'_j = coefficient representing a shift in beta during the event period;b''_j = coefficient representing a shift in beta after the event period;D_0 = dummy variable equal to 1 during the event period;D_P = dummy variable equal to 1 after event period;D_{ik} = dummy variable equal to 1 on the day prior to and the day of event I;C_{kj} = coefficient of the information dummy variable k for portfolio j;e_{jt} = error term for portfolio j

Insurance Companies	Constant			BETA		10/10/2007	2/13/2008	7/15/2008	7/30/2008	10/3/2008	2/10/2009	2/17/2009	3/25/2009	5/20/2009
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D1	D2	D3	D4	D5	D6	D7	D8	D9
Coefficient	0.0008	-0.0001	1.003	0.174019	0.1791	-0.0042	-0.0095	-0.0075	-0.0042	0.0056	0.0034	-0.0045	-0.0027	-0.0063
Error	0.0002	0.0006	0.051	0.0688	0.0522	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039
t Value	3.23	-0.12	19.68	2.53	3.43	-1.09	-2.45	-1.95	-1.09	1.44	0.87	-1.17	-0.69	-1.64
Pr > |t|	0.0012	0.907	<.0001	0.0114	0.0006	0.2772	0.0141	0.0515	0.2736	0.1506	0.383	0.2433	0.4885	0.1018
Sig	***		***	**	***		**	**						
REITs	Constant			BETA		10/10/2007	2/13/2008	7/15/2008	7/30/2008	10/3/2008	2/10/2009	2/17/2009	3/25/2009	5/20/2009
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D1	D2	D3	D4	D5	D6	D7	D8	D9
Coefficient	0.001353	-0.00094	1.065663	0.4881	0.4194	-0.00304	0.00057	-0.00359	-0.00947	-0.00926	0.001777	-0.01638	-0.01599	-0.00794
Error	0.000219	0.000535	0.045079	0.060841	0.046211	0.003426	0.003423	0.003423	0.003428	0.003432	0.003429	0.003432	0.003422	0.003421
t Value	6.18	-1.75	23.64	8.02	9.08	-0.89	0.17	-1.05	-2.76	-2.7	0.52	-4.77	-4.67	-2.32
Pr > |t|	<.0001	0.0802	<.0001	<.0001	<.0001	0.3756	0.8679	0.294	0.0057	0.007	0.6043	<.0001	<.0001	0.0203
Sig	***	*	***	***	***				***	***		***	***	**
F test for comparing coefficients among the four types of financial institutions					F value	1.32	1.64	20.9	5.95	9.22	5.57	8.32	7.1	10.82
					Pr > F	0.261	0.1622	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001
					Sig			***	***	***	***	***	***	***

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Table 4: Regression estimates for portfolios of All firms and By Type of Financial Institution

$r_{j,t} = a_j + a'_j D_P + b_j r_{mt} + b'_j D_0 r_{mt} + b'' D_P r_{mt} + \sum C_{kj} D_{ik} + e_{jt}$

PANEL A: All Firms	Constant		BETA			Overall Informational Dummy (D10)
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D10
Coefficient	0.0006	-0.0008	0.7796	0.2166	0.2055	-0.0042
p-value	0	0.0003	-	0	0	0
Significance	***	***	***	***	***	***
Rsq=0.1415		No. of Obs =364729		Pr > F = 0.0001		Significance ***
PANEL B: Type of Financial Institution						
Banks	Constant		BETA			All events
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D10
Coefficient	0.001177	-0.00248	1.170916	0.160347	0.217708	-0.00801
Error	0.000235	0.000575	0.048342	0.065281	0.049547	0.001247
t Value	5.01	-4.32	24.22	2.46	4.39	-6.42
Pr > |t|	<.0001	<.0001	<.0001	0.014	<.0001	<.0001
Significance	***	***	***	***	***	***
S&Ls	Constant		BETA			All events
Variable	Intercept	Post alpha	S&P Return	Post Event	During Event	D10
Coefficient	0.000186	-0.00048	0.466314	0.076788	0.070964	-0.00257
Error	0.000280	0.000684	0.057555	0.077722	0.058990	0.001484
t Value	0.67	-0.70	8.10	0.99	1.20	-1.73
Pr > |t|	0.5050	0.4811	<.0001	0.3232	0.2290	0.0835
Significance			***			*
Insurance Companies	Constant		BETA			All events
Coefficient	0.000796	-0.00007	1.002462	0.174607	0.176237	-0.00336
Error	0.000247	0.000605	0.050897	0.068731	0.052166	0.001313
t Value	3.22	-0.11	19.70	2.54	3.38	-2.56
Pr > |t|	0.0013	0.9098	<.0001	0.0111	0.0007	0.0104
Significance	***		***	**	***	***
REITs	Constant		BETA			10/10/2007
Coefficient	0.001353	-0.00094	1.068470	0.485339	0.417894	-0.00703
Error	0.000219	0.000535	0.045034	0.060814	0.046157	0.001161
t Value	6.19	-1.75	23.73	7.98	9.05	-6.05
Pr > |t|	<.0001	0.0800	<.0001	<.0001	<.0001	<.0001
Significance	***	*	***	***	***	***
F-test for comparing coefficients among the four types of financial institutions			F value	18.40	Pr > F	0.0001
					Significance	***

*** Significant at 1 percent level; ** Significant at 5 percent level; * Significant at 10 percent level

r_{jt} =portfolio return for day t; a_j = constant prior to event period; a'_j = constant prior to event period; r_{mt} = S&P 500 Index return; b_j = coefficient representing beta;b'_j = coefficient representing a shift in beta during the event period;b''_j = coefficient representing a shift in beta after the event period;D_0 = dummy variable equal to 1 during the event period;D_P = dummy variable equal to 1 after event period;D_{ik} = dummy variable equal to 1 on the day prior to and the day of event I;C_{kj} = coefficient of the information dummy variable k for portfolio j;e_{jt} = error term for portfolio j.

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Table 5: Cross-Sectional regressions of determinants of abnormal returns

$$D10 = \beta_0 + \beta_1 Size_j + \beta_2 Big8Auditor_j + \beta_3 DebtRatio_j + \beta_4 OtherOTC_j + \beta_5 ROE_j + \beta_6 NonUS_j + \beta_7 LnVolume + \beta_8 Size * OtherOTC + \beta_9 Bank_j + u_j$$

Dependent Variable: All event abnormal returns (D10)					
Independent Variable	Coefficient	Standard Error	t Value	Pr > |t|	Significance
Intercept	0.00610	0.00199	3.07	0.0023	***
Size	-0.00013833	0.00034959	-0.40	0.6925	
Big8	-0.00082759	0.00098998	-0.84	0.4035	
Debt to Assets	-0.00606	0.00237	-2.56	0.0108	***
Other OTC	-0.04515	0.01145	-3.94	<.0001	***
ROE	0.00141	0.00261	0.54	0.5888	
Banker	-0.00373	0.00090257	-4.13	<.0001	***
Non US	0.00546	0.00214	2.55	0.011	***
Lnvol	-0.00077469	0.00025161	-3.08	0.0022	***
Size_otc	0.00648	0.00156	4.15	<.0001	***
Rsq	Adj R-Sq	F-Value	Pr > F	Significance	
0.0968	0.0829	6.95	<.0001	***	

*** Significant at 1 percent level; ** Significant at 5 percent level; * Significant at 10 percent level
LnSize is Size of the Financial Institution; Big 8 Auditor is a proxy for auditor quality to see if the Financial institution uses a Big 8 Auditor or not; Debt to Total Assets ratio represents the debt ratio of the firm; Other OTC is if the firm is traded in any of the lesser exchanges, ROE is the Return on equity Non US is if the firm is a Non US firm or not; LnVol is trading volume; Size_OTC is an interaction variable to examine smaller firms that trade in small exchanges; Banker is if the firm is a bank or not.

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Table 6: Cross-sectional determinants of risk shift

Beta shift (during/post)= $\beta_0 + \beta_1 Size_j + \beta_2 Big8Auditor_j + \beta_3 DebtRatio_j + \beta_4 OtherOTC_j + \beta_5 ROE_j + \beta_6 NonUS_j + \beta_7 TradingVolume + \beta_8 Siz * OtherOTC + \beta_9 Bank_j + u_j$

Dependent Variable:	Panel A: Beta Shift During Event			Panel B: Beta Shift Post Event		
Independent Variable	Coefficient	p-value	Significance	Coefficient	p-value	Significance
Intercept	-0.37087	0.0019	***	-0.36145	0.0369	**
Size	0.10125	<.0001	***	0.08229	0.0211	**
Big 8 Auditor	-0.03326	0.5293		-0.03766	0.6252	
Debt to Total Assets	0.04274	0.8995		0.27343	0.5794	
OtherOTC	-0.52205	0.3222		-0.50693	0.5096	
ROE	-0.53378	0.1906		-0.15615	0.7927	
NonUS	-0.39082	0.0003	***	-0.51815	0.001	***
LnVol	-0.02898	0.0565	*	-0.0155	0.4834	
size_otc	0.08115	0.26		0.06255	0.5513	
Bank	0.08415	0.1569		0.07704	0.3738	
	Rsq=0.0518			Rsq=0.0179		

*** Significant at 1 percent level; ** Significant at 5 percent level; * Significant at 10 percent level

Size of the Financial Institution is captured using LnAssets; Big 8 Auditor is a proxy for auditor quality to see if the Financial institution uses a Big 8 Auditor or not; Debt to Total Assets ratio represents the debt ratio of the firm; Other OTC is if the firm is traded in any of the smaller exchanges, ROE is the Return on equity Non US is if the firm is a Non US firm or not; Ln Vol is the Trading Volume; Size_OTC is an interaction variable to examine smaller firms that trade in small exchanges; Bank is if the firm is a bank or not.

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