An Alternative Perspective on the Compensation of Financial Executives

by

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1. Abstract

During periods of economic uncertainty, the CEO of a financial firm must steer the business through the volatile waters. In this paper, I study whether high-paid CEOs are more effective at this than their low-paid peers. I consider the impact of four recent financial crises on the profitability of firms with high-paid CEOs. Then I compare this shock to the impact on firms with low-paid CEOs. My analysis shows that the profitability of firms with high-paid CEOs declines after a crisis, but less so than that of firms with low-paid CEOs. I propose that corporate boards are effective at evaluating managerial ability and compensate executives accordingly. I suggest that above all, high-paid CEOs are more experienced and can call upon that experience to lead their firms through tough times. I conclude that it is significantly worthwhile for the shareholders of a financial firm to seek out the most qualified individual and entice him to lead their firm via appropriate financial incentives.

2. Introduction

2.1. Background

In the recent months, the debate over executive compensation has heated up. In general, critics find themselves on one of two sides. On the one hand is the benevolent view that executive compensation is tied to the marginal product of labor[1]. In other words, executives are appropriately compensated for the quality and amount of work that they do. Many practitioners find themselves conforming to this view. One prominent advocate in favor of this analysis is Deutsche Bank CEO Josef Ackermann. He recently claimed that some high-paying banks suffered fewer losses than competitors during the financial crisis[2].

On the other hand is the critical view of executive compensation. People on this side of the debate usually argue that compensation, or overcompensation in this case, is a corporate governance failure[3]. Those that share this view believe that senior management compensation is

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[1] Gian Luca Clementi, et al., "Rethinking Compensation in Financial Firms," Viral V Acharya and Matthew Richardson, <u>Restoring Financial Stability: How to Repair a Failed System</u> (Hoboken: John Wiley & Sons, Inc., 2009) 197-214.
[2] Aaron Kirchfeld and Zoe Schneeweiss, "Ackermann Says High Pay at Banks Didn't Cause Losses," <u>Bloomberg</u> (Frankfurt, 19 February 2010).
[3] Gian Luca Clementi, et al.

a responsibility of the board; therefore the board is at fault to the extent that compensation deviates from shareholder interests. One possible example of a governance failure is Lehman Brothers CEO Richard Fuld. In his 17 year tenure as CEO, Fuld reportedly took home over half a billion dollars while simultaneously leading the firm into bankruptcy[4].

2.2. Literature

With the financial crisis of 2007-2009 barely out of our memory, the media has joined the debate on the critical side. Most viewers look for someone to blame and the media has offered financial CEOs as sacrificial lambs. Members of the media have gone as far as to say that CEOs do not deserve their paychecks. However, research done by Bertrand and Schoar (2003) showed that all investing, financing, and other organizational strategy variables appear to systematically depend on the specific executive in charge. Thus, it is logical to conclude that CEOs of firms that survived the recent crisis deserve as much praise, as the CEOs of firms that did not survive deserve blame. Moreover, research by Waldman, Ramirez, House, and Puranam (2001) showed that certain CEO characteristics like charisma improve firm performance, but only in times of environmental uncertainty.

2.3. Focus and Hypothesis

Unlike Bertrand and Schoar and Waldman et al, I narrowed my sample to just financial firms. The main reason for this was that the debate about CEO compensation has centered on the financial industry. According to Clementi, Cooley, Richardson, and Walter (2009) the issue lies in the unprecedented public bailout of financial institutions. Some $7 trillion in taxpayer guarantees and $350 billion in government equity holdings have unleashed the debate, which

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[4] James Sterngold, "How Much Did Lehman CEO Dick Fuld Really Make?," 29 April 2010, Businessweek, 30 April 2010 <http://www.businessweek.com>.

shows no signs of cooling down. Taxpayers, through their elected representatives, now feel empowered to intervene in the compensation of CEOs of financial firms.

On the other hand, like Waldman et al, I focused my study on periods of economic uncertainty. First, I did this because Waldman et al proved that certain CEO characteristics improve firm performance but only during times of economic uncertainty. It seems natural that CEOs are able to make a greater impact during periods of turmoil. It is during those periods that their leadership and guidance are most needed. Second, I believe that financial firms are particularly challenged during times of economic uncertainty because of their business model. The ability to access credit markets is central to the operations of a financial firm. However, during periods of crisis, that ability becomes increasingly more expensive. Therefore, the impact of a financial CEO may be even more profound during a crisis.

My thesis ties the research of Bertrand and Schoar as well as Waldman et al back to compensation. According to Bertrand and Schoar, CEOs are pivotal to the direction of the firm. Furthermore according to Waldman et al, certain CEO characteristics improve firm performance. My aim was to find whether CEOs are properly compensated for possessing these characteristics that make their firms successful. My hypotheses is that high-paid CEOs are paid well because they possess those characteristics and that those CEOs create value during times of economic uncertainty.

3. Data
3.1.Compensation

The first objective was to create a dataset of financial firms along with the compensation levels of their respective Chief Executive Officers. The primary source for this information was

the Compustat Executive Compensation database. To filter for financial firms, I conducted a conditional search based on the criteria that each firm's Standard Industrial Classification (SIC) was between 6000 and 6999, defined as Finance, Insurance, and Real Estate. The result was over 25,000 observations of annual executive compensation spanning from 1992 to 2008.

Since my research showed the importance of the CEO in the decision making process of the firm, I filtered the dataset to include only executives with the CEO title. I drilled further to include only firms listed on the Standard & Poor's 500 Index. According to Standard & Poor's, the index captures 75 percent coverage of U.S. equities and is widely considered the best single gauge of the large-cap U.S. equities market. Furthermore, leading financial companies are heavily weighted in the index. Figure 1 below shows the S&P 500 broken down by sector; Financials are second only to Telecoms with almost 17 percent market weight. Appendix A shows the list of 84 financial companies that are members of the S&P 500 and have compensation data for their CEO.

Figure 1: S&P 500 Sector Breakdown (as of 16-Apr-2010)[5]
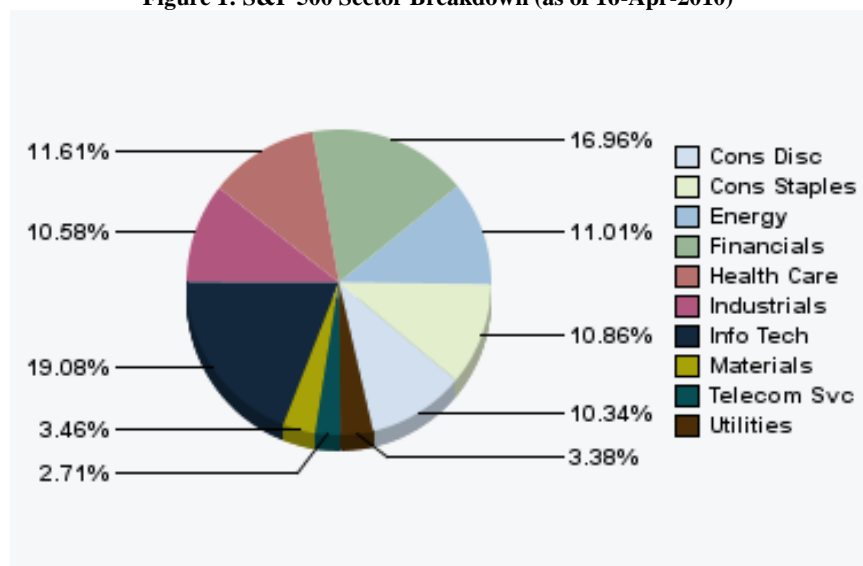
[5] Standard & Poor's, S&P 500, 16 April 2010, 16 April 2010
<http://www.standardandpoors.com>.

At this point, it is important to discuss how executive compensation is measured. The most common measure, employed by Frydman and Saks (2006) and others, consists mainly of the sum of salary, bonuses, long-term incentive payouts, and value of stock and options granted[6]. Clementi and Cooley (2009) propose an alternative measure of compensation, which describes the Year-on-Year change of the portion of the Executive's wealth that is tied to his company's performance. Although this measure comes closest to aligning the incentives of managers and shareholders in the long run, it would create a circular reference in my research[7]. Therefore I chose to use the first definition of executive compensation, which I will refer to as total yearly compensation from here on in. Figure 2 below shows how CEO total yearly compensation varies over time and how my group of high paid CEOs compares to my group of low paid CEOs.

Figure 2: CEO Total Yearly Compensation Over Time
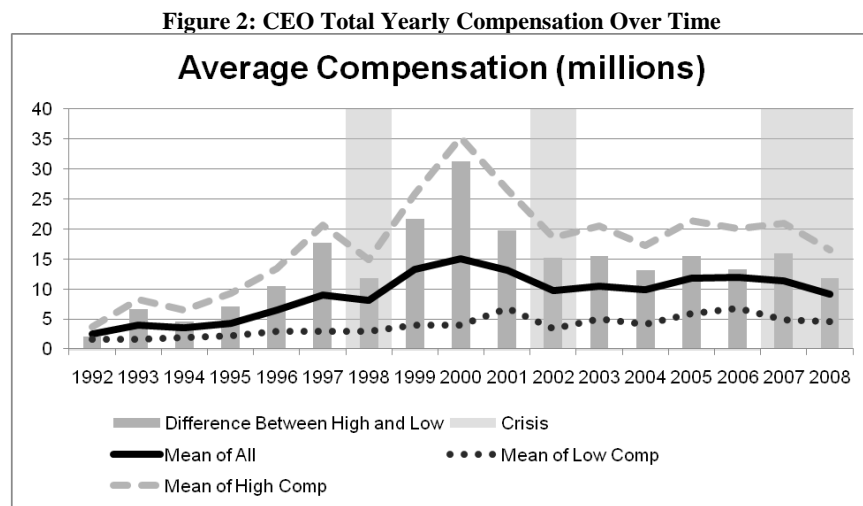
3.2. Crises

Next, it is necessary to define what characteristics are present during times of economic uncertainty. In general, greater uncertainty is defined by higher volatility. Higher volatility also

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[6] Also includes severance payments, debt forgiveness, imputed interest, payouts for cancellation of stock options, payment for unused vacation, tax reimbursement, signing bonuses, 401(k) contributions, life insurance premiums, and all other personal benefits.
[7] My goal is to measure the effect of Executive pay on performance; therefore I cannot use a measure of pay that already takes performance into account.

equates to a higher degree of risk that investors must be compensated for, which is evidenced by

a higher discount rate and hence lower net present value or stock prices. In addition, according

to the Asymmetric Volatility Model, there are higher levels of volatility in market downswings

than in market upswings. Accordingly, to choose appropriate periods of economic uncertainty I

looked at periods in which the S&P 500 Financials Index (S5FINL) suffered a decline and the

CBOE Volatility Index (VIX) traded unusually high. Obviously I was constrained by the

availability of Executive Compensation data only from 1992-2008. Figures 3 and 4 below show

the performance of these indices from 1992-2008.

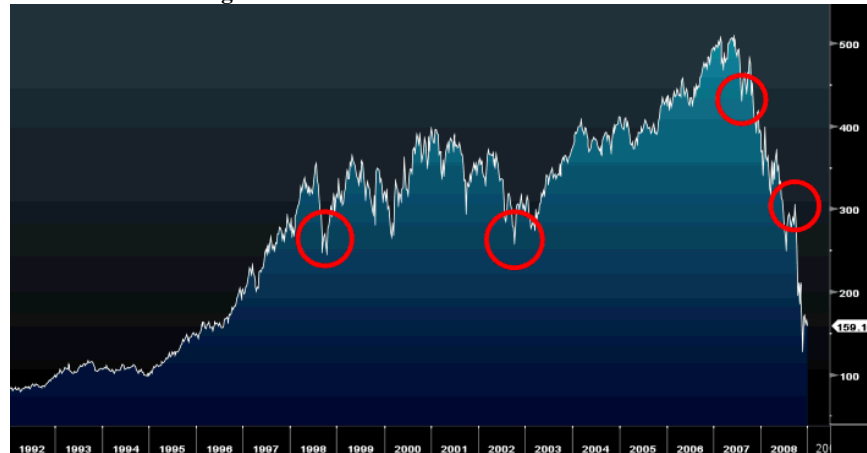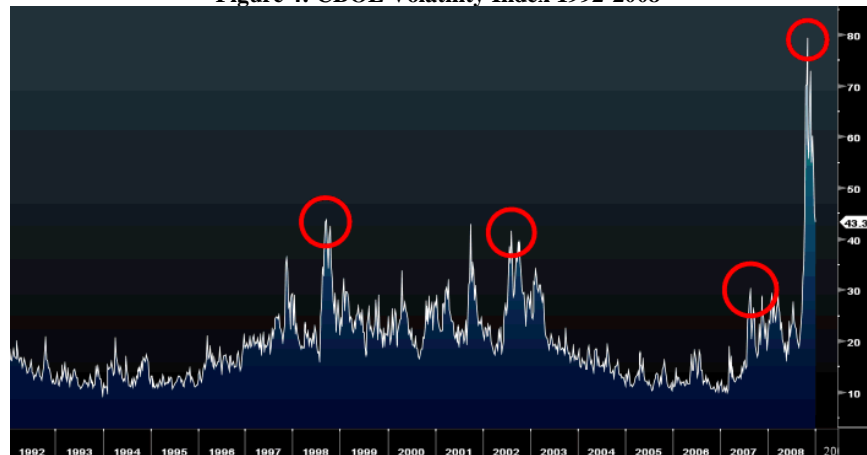**Figure 3: S&P 500 Financials Index 1992-2008[8]**

Figure 4: CBOE Volatility Index 1992-2008[9]

[8] Source: Bloomberg—Prepared by Gary Chalik
[9] Source: Bloomberg—Prepared by Gary Chalik

After identifying the four periods above, which have both lower stock prices and higher volatility, I proceeded to investigate the source of economic variability to ensure that financials are affected. In chronological order the crises above are the *Russian Rouble Crisis, Enron Scandal, Liquidity Crisis,* and *Lehman Collapse*. Each had a particularly strong adverse affect on the financial industry. Appendix B describes each crisis and identifies the key dates of each crisis.

3.3. Response

Subsequently, I chose an appropriate measure of profitability, one that comes closest to measuring the performance of the firm as a whole. I considered several possible quarterly gauges including Stock Returns, Revenue Growth, Income Growth, Return on Equity (ROE), and Return on Assets (ROA). Ultimately I ruled out all but ROA. Stock returns are too volatile and heavily weighed by general sentiment and speculation instead of actual performance. Revenue growth and income growth fail to control for firm size. ROE can be easily manipulated by taking on excessive leverage and takes into account only the return to shareholders. In contrast, ROA, which is calculated as Net Income divided by Total Assets[10], is based on actual performance, controls for firm size, and does not depend on the firm's capital structure. Figure 5 below shows how the ROA of firms in my sample varies over time.

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[10] The data to calculate ROA was pulled from the Compustat Fundamentals Quarterly database. Total Assets is a balance sheet item measured at the end of each quarter. Net Income (Loss) is an income statement item reported each quarter. All ROA calculations are done on a quarterly basis. Any ROA that is reported as an annual figure is found by annualizing the quarterly data.

Average Annual ROA
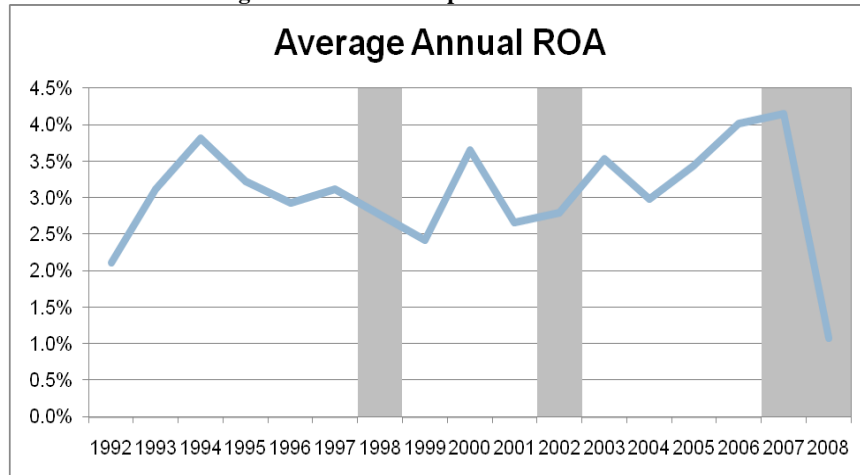
4. Methodology

4.1. Difference in Differences

The aim of my study was to measure the effect of a crisis on the ROA of firms who have high-paid executives. However, it is not enough to simply take the difference between the ROA before and after the crisis because other influences are playing a role. For example, simple time trends may be the main driver behind this difference. Therefore, the method that I use to measure the effect of a crisis introduces a control group under the assumption that everything but the level of CEO pay between the control and treatment groups is the same. This method is called the difference in differences procedure. The basic premise is to compare the difference in ROA around the crisis of the treatment group to the difference in ROA around the crisis of the control group.

4.2. Regression Methodology

To identify this difference I used two techniques. The first was simply to graph the mean ROA of the treatment group against the mean ROA of the control group and to graph the difference between them. Ideally, the difference before the crisis would be horizontal, meaning that the difference between the treatment and control group stays the same. After the crisis, the

difference should move one way or another, meaning that the crisis had an impact on the treatment group. This first technique is a visual representation of the difference in differences method.

The second technique is to run an ordinary least squares multiple linear regression in order to measure the statistical significance of the difference in differences approach. I ran the following regression:

$$ROA = \beta_0 + \beta_1 Time + \beta_2 Comp + \beta_3 Time \times Comp + \varepsilon$$

where "Time" is a time dummy indicator, "Comp" is a state dummy indicator, and "Time X Comp" is the interaction between the time dummy and the state dummy. In other words, β_0 is the average ROA of the control group in the base quarter, β_1 represents the time trend, β_2 represents the difference between the treatment and the control group, and β_3 represents the difference in the changes over time. Hence, β_3 is the difference in differences variable and therefore the one we hope to get a statistically significant result for.

4.3. Treatment and Control Group

Before getting started, it was necessary to split the set of financial companies into a control group with low-paid CEOs and a treatment group with high-paid CEOs. Again, the assumption was that the treatment and control group differ only in their level of executive compensation. I take steps below to control for other possible differences.

My other assumption was that compensation level is a static indicator in the sense that over a short-term horizon an executive's pay will vary, however his relative pay compared to his peers will stay the same. This second assumption may be harder to accept because executive pay, particularly in the financial industry, is so heavily performance based and can vary

tremendously from year-to-year. However the assumption that I base my research around, which I go on to prove below, is that comparable firms in the same industry perform similarly during times of economic predictability. Accordingly, if the firm's performance is in-line with that of its competitors, the firm's CEO's pay should only vary based on the firm's policy on executive pay, which should depend on the board's evaluation of the CEO.

Moreover, since CEO pay is so heavily performance based, it is necessary to rank firms based on compensation outside of the sample period. If I were to rank a firm based on compensation in the same year that I measure the firm's performance, I would see a self-fulfilling study in which CEOs of high-performing firms are highly compensated. In short, I rank firms based on their CEO's pay using a one-year lag from the start of the crisis for the two reasons described above. Figures 6 and 7 below show the compensation of firms ranked from lowest to highest and plotted on a logarithmic scale. The compensation levels in figure 6 are for 1997 because the *Russian Rouble Crisis* occurs in 1998. The compensation levels in figure 7 are for 2007 because the *Lehman Collapse* occurs in 2008. Appendix C shows the distribution of compensation in the years before the other two crises.

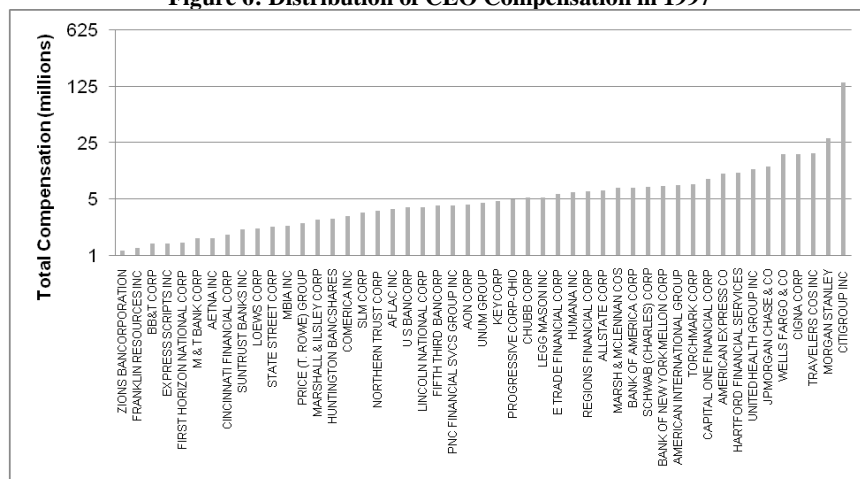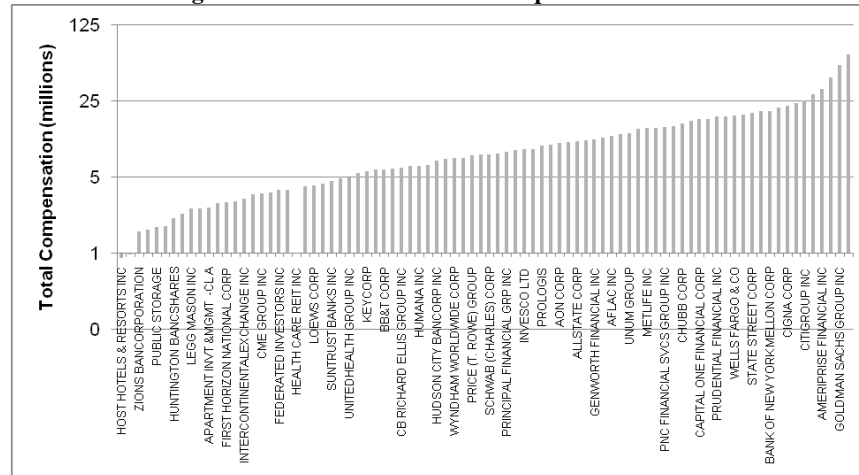**Figure 6: Distribution of CEO Compensation in 1997**

Figure 7: Distribution of CEO Compensation in 2007

Total Compensation (millions)

125

25

5

1

0

HOST HOTELS & RESORTS INC • ZIONS BANCORPORATION • PUBLIC STORAGE • HUNTINGTON BANCSHARES • LEGG MASON INC • APARTMENT INVT &MGMT -CLA • FIRST HORIZON NATIONAL CORP • INTERCONTINENTALEXCHANGE INC • CME GROUP INC • FEDERATED INVESTORS INC • HEALTH CARE REIT INC • LOEWS CORP • SUNTRUST BANKS INC • UNITEDHEALTH GROUP INC • KEYCORP • BB&T CORP • CB RICHARD ELLIS GROUP INC • HUMANA INC • HUDSON CITY BANCORP INC • WYNDHAM WORLDWIDE CORP • PRICE (T. ROWE) GROUP • SCHWAB (CHARLES) CORP • PRINCIPAL FINANCIAL GRP INC • INVESCO LTD • PROLOGIS • AON CORP • ALLSTATE CORP • GENWORTH FINANCIAL INC • AFLAC INC • UNUM GROUP • METLIFE INC • PNC FINANCIAL SVCS GROUP INC • CHUBB CORP • CAPITAL ONE FINANCIAL CORP • PRUDENTIAL FINANCIAL INC • WELLS FARGO & CO • STATE STREET CORP • BANK OF NEW YORK MELLON CORP • CIGNA CORP • CITIGROUP INC • AMERIPRISE FINANCIAL INC • GOLDMAN SACHS GROUP INC

As can be seen by comparing figures 6 and 7, the number of firms in the sample increases from 49 to 84 and the rankings of the firms, changes over time. The reason for the first inconsistency is that more financial companies become public over time at which point they are required by the Securities and Exchange Commission (SEC) to disclose executive compensation. The reason for the second inconsistency can vary; it may be due to a different CEO holding office or a broad change in the company's policy over time. Whatever the reason, these inconsistencies make it impossible to keep the control group and the treatment group static for all four crises. Instead, before testing each crisis, each group must be reconfigured.

Furthermore, in evaluating either figure 6 or 7, several other defining characteristics of the sample arise. First, the range of total yearly compensation varies quite significantly across the sample. For instance, in 1997 the CEO of Citigroup was paid just under $141 million, while the CEO of Zions Bancorporation was paid just over $1 million, a range of $140 million dollars. However, the median in the same year was $4.5 million, which implies that the data is positively skewed. The positive skew pointed me to another observation—there are numerous sub-industries within the sample with various pay practices. Since one of my assumptions was that

the treatment and control group differed only in their level of executive compensation, I needed

to control for the numerous sub-industries. Otherwise I might have found that all the firms in the

treatment group belong to one sub-industry while all the firms in the control group belong to a

different one entirely and that would account for my difference in performance. Figure 8 below

shows the top level breakdown of the S&P Financials Index and Appendix D shows the further

breakdown of the sub-industries.

Figure 8: S&P Financials Sector Breakdown (as of 19-Apr-2010)[11]
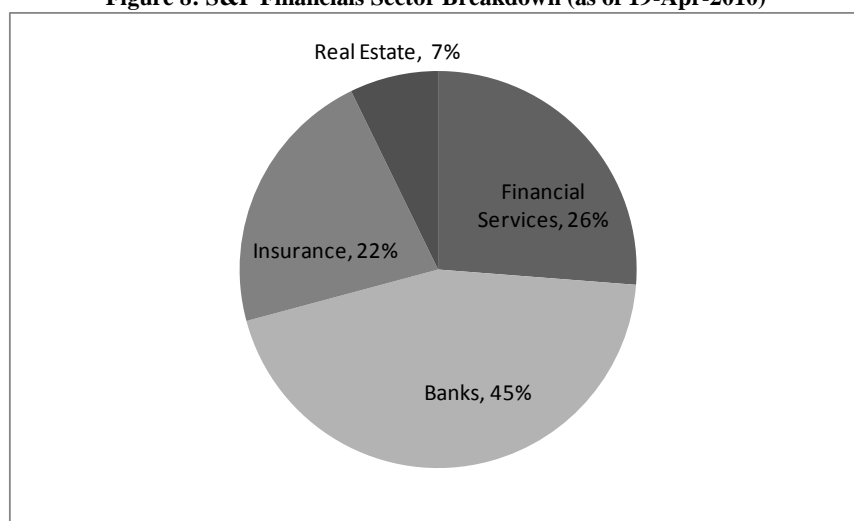
To control for the manifestation of numerous sub-industries in my sample, I developed a

method of ranking the firms while adjusting for the sub-industries. First I grouped all the firms

in their various sub-industries and ranked them within those groups. Next, I adjusted for the

different number of firms in each sub-industry by taking a percent. In other words, the firm

whose CEO received the highest pay will have a ranking of 10 percent in a sub-industry with 10

firms and 20 percent in a sub-industry with 5 firms. I called this percent ranking the *Industry*

Adjustment. Then I found the mean and standard deviation of the industry adjustments of all the

firms in my sample. Each firm with an industry adjustment that was one standard deviation

above the mean went into the control group and each firm with an industry adjustment one

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[11] Source Bloomberg – Prepared by Gary Chalik

standard deviation below the mean joined the treatment group. Firms in between sigma 1 and

sigma -1 were ignored to create a considerable difference between the control group and the

treatment group, which can be seen in figure 2 above. I repeated this process for every year

between 1992 and 2008. Figure 9 below shows the resulting control and treatment groups for the

1997 sample.

Figure 9: Treatment and Control Group for 1997

	Company Name	Industry	Full Name	Total Compensation (000s)	Ranking Overall (Low to High)	Ranking Industry (Low to High)	Industry Adjustment
High Compensation Firms	LEGG MASON INC	Asset Management & Custody Banks	Raymond A. Mason	5,308	29	5	33%
	BANK OF NEW YORK MELLON CORP	Asset Management & Custody Banks	Thomas A. Renyi	7,404	37	6	17%
	AMERICAN EXPRESS CO	Consumer Finance	Harvey Golub	10,358	41	3	33%
	WELLS FARGO & CO	Diversified Banks	Richard M. Kovacevich	18,332	45	3	33%
	MORGAN STANLEY	Investment Banking & Brokerage	Philip J. Purcell	29,080	48	3	33%
	TORCHMARK CORP	Life & Health Insurance	Ronald K. Richey	7,637	39	4	25%
	CIGNA CORP	Managed Health Care	Wilson H. Taylor	18,442	46	4	25%
	HARTFORD FINANCIAL SERVICES	Multi-line Insurance	Ramani Ayer	10,839	42	3	33%
	CITIGROUP INC	Other Diversified Financial Services	Sanford I. Weill	140,918	49	3	33%
	ALLSTATE CORP	Property & Casualty Insurance	Jerry D. Choate	6,415	33	5	33%
	TRAVELERS COS INC	Property & Casualty Insurance	Robert I. Lipp	18,728	47	6	17%
	PNC FINANCIAL SVCS GROUP INC	Regional Banks	Thomas Henry O'Brien	4,204	23	9	27%
	KEYCORP	Regional Banks	Robert W. Gillespie	4,759	26	10	18%
	REGIONS FINANCIAL CORP	Regional Banks	James Stanley Mackin	6,347	32	11	9%
Low Compensation Firms	FRANKLIN RESOURCES INC	Asset Management & Custody Banks	Charles B. Johnson	1,257	2	1	100%
	STATE STREET CORP	Asset Management & Custody Banks	Marshall N. Carter	2,315	11	2	83%
	SLM CORP	Consumer Finance	Lawrence A. Hough	3,445	17	1	100%
	COMERICA INC	Diversified Banks	Eugene A. Miller	3,109	16	1	100%
	AON CORP	Insurance Brokers	Patrick G. Ryan	4,331	24	1	100%
	E TRADE FINANCIAL CORP	Investment Banking & Brokerage	Christos M. Cotsakos	5,837	30	1	100%
	AFLAC INC	Life & Health Insurance	Daniel P. Amos	3,841	19	1	100%
	AETNA INC	Managed Health Care	Ronald Edward Compton	1,674	7	1	100%
	LOEWS CORP	Multi-line Insurance	Laurence Alan Tisch	2,175	10	1	100%
	BANK OF AMERICA CORP	Other Diversified Financial Services	Hugh L. McColl, Jr.	7,040	35	1	100%
	CINCINNATI FINANCIAL CORP	Property & Casualty Insurance	Robert B. Morgan	1,847	8	1	100%
	ZIONS BANCORPORATION	Regional Banks	Harris H. Simmons	1,156	1	1	100%
	BB&T CORP	Regional Banks	John A. Allison IV	1,424	3	2	91%
	FIRST HORIZON NATIONAL CORP	Regional Banks	Ralph Horn	1,465	5	3	82%

5. Results

5.1. All Crises

First I conducted the aforementioned difference in differences procedure on the entire

sample from 1992-2008 in order to get a general representation of my results. In §4.3 I split my

sample into a treatment and control group for every year from 1992-2008. In this case, I took the

average ROA of each of those groups in the year after the executive compensation data was

taken and performed the process described above. Figure 10 below shows the mean ROA of

both groups throughout the sample. Figure 11 below shows the difference between the mean

ROAs of the two groups. On the graph I have noted the difference in the differences around the

time of the crises, which I've superimposed on the graph.

Figure 10: High Comp vs. Low Comp Mean ROA-Entire Sample
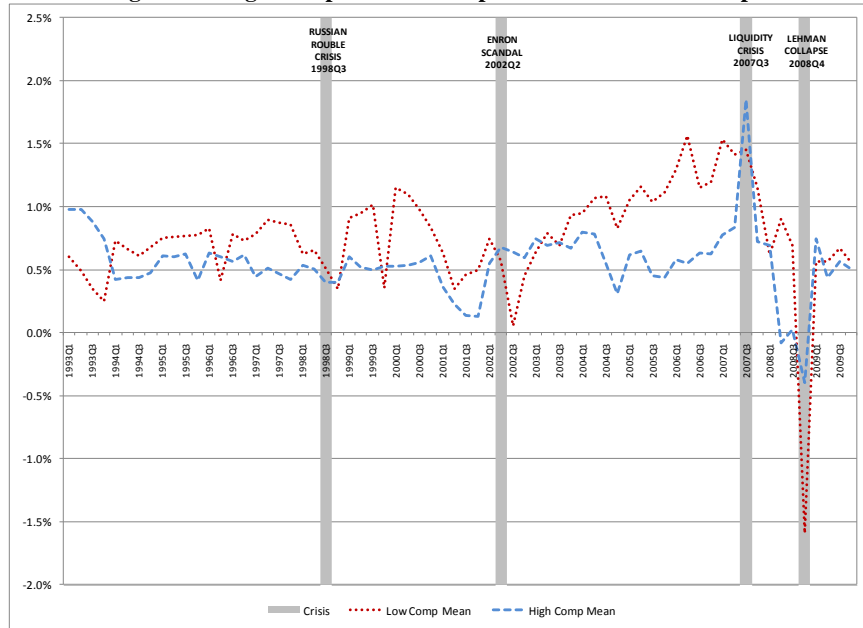
Figure 11: Low Comp Mean minus High Comp Mean-Entire Sample
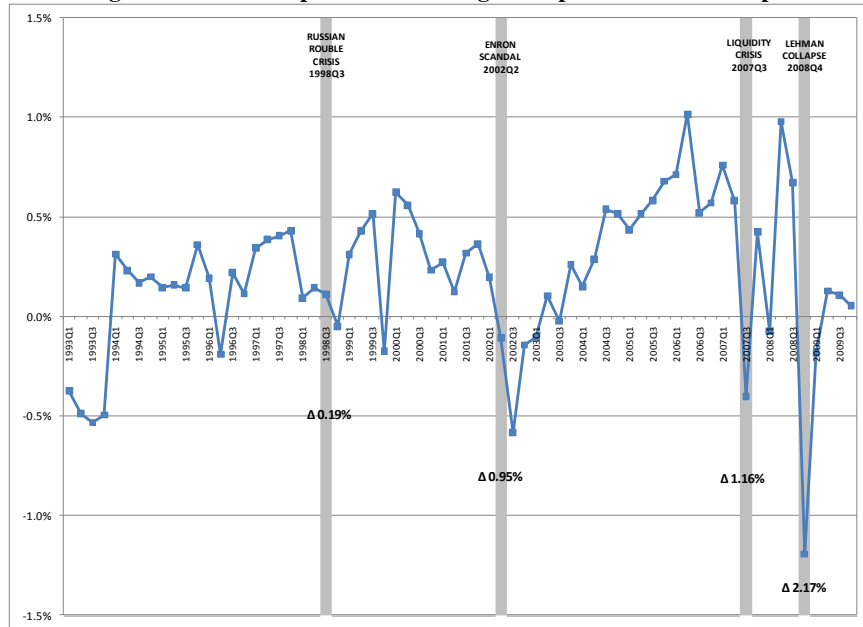
The first noticeable quality of the two graphs above is the apparent impact of each of my chosen crises. Figure 11 shows that the difference between the mean ROA of the control group and the mean ROA of the treatment group breaches negative territory in just eight quarters out of the 68 being tested. Of those eight quarters, four correspond to the four periods of crises that I have chosen above. Moreover, three of the four differences that correspond to my crises are the

three biggest differences in the entire sample. Therefore, from this visual representation it seems that the crises have a significant impact on the ROA of the treatment group. Most notably, the impact of the *Lehman Collapse*, was 2.17 percent of quarterly ROA.

However, there is an issue with these results because the difference in ROAs of the two groups is not horizontal before the crises. Maintaining a horizontal difference before the crises is a necessary condition of the difference in differences approach because that means that the difference in ROA between the two groups remains constant. A constant difference signifies that the only difference between the two groups is the compensation levels of their CEOs, which is one of the basic assumptions of my study. Yet, one of the requirements to maintain a constant difference between the two groups is to preserve the composition of the two groups throughout the sample period and I did not preserve that composition in this particular rendition of the procedure. Again, the reason I did that was to get a general representation of the results. Thus, I maintain that these results are a good starting point for the remainder of the study.

In contrast, when running the regression for all the crises, I did preserve the composition of the two groups. For each of the four crises that I chose above, I formed a treatment group and a control group using the executive compensation data from the year prior to the crisis. I preserved those groups for the eight quarters surrounding the crisis.

Table 1 below, displays the impact of the interaction variable on the response variable, which is ROA. From this output we can see that on average, the treatment group performed 0.3599 percent better quarterly after a crisis at a 94 percent confidence level.

Table 1: Regression Output-All Crises

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	0.9128%	0.0940%	9.71	0.000
Time	-0.3667%	0.1330%	-2.76	0.006
Comp	-0.3739%	0.1330%	-2.81	0.005
Time*Comp	0.3599%	0.1880%	1.91	0.056

Another quality of figures 10 and 11 is that the mean ROA of the Control Group is generally higher than the mean ROA of the Treatment Group before the onset of the crises. This led me to believe that my Control Group was made up of smaller, riskier firms that naturally perform better in good times and worse in bad times. In general, CEOs of larger firms are usually compensated better than CEOs of smaller firms. I believed that I had controlled for size when splitting the firms into groups by choosing S&P 500 companies, an index of the largest U.S. companies. However, to verify that assumption, I added a measure of size to my regression. The measure I used was the natural log of market cap[12] and the output of this second regression is displayed in Table 2. The p-value of the market cap coefficient is greater than 50 percent; therefore it is safe to assume that size does not play a role in determining the difference in ROA of the two groups.

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[12] The data to calculate Market Cap was pulled from the Compustat Fundamentals Quarterly database. The formula that I used was the quarterly closing price multiplied by the number of common shares outstanding at the end of the quarter.

Table 2: Adding Market Cap-All Crises

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	0.6784%	0.4406%	1.54	0.124
Time	-0.3613%	0.1334%	-2.71	0.007
Comp	-0.3928%	0.1374%	-2.86	0.004
Time*Comp	0.3591%	0.1881%	1.91	0.057
Market Cap	0.0253%	0.0466%	0.54	0.586

In addition to adding a measure of size, I also added a measure of valuation to my study. The measure that I used was the Book-To-Market Ratio[13]. Table 3 below displays the output of the regression that I ran that included the Book-To-Market variable. Table 4 displays the regression with both Book-To-Market and Market Cap. In both cases, the Book-To-Market Ratio is statistically significant at the 99 percent confidence level. This means that the Book-To-Market Ratio has an impact on the ROA of the firms. Accordingly, I need to control for this variable and I take steps to do so on a case-by-case basis below. Also, in both tables the p-value of the interaction variable improved to greater than the 95 percent confidence level. Therefore in future regressions, I used both Market Cap and Book-To-Market variables in my models because this model yielded the best result.

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[13] The data to calculate the Book-To-Market Ratio was pulled from Compustat Fundamentals Quarterly database. The formula that I used was the Book Value of the Equity divided by the Market Cap of the firm as calculated above.

Table 3: Adding Book-To-Market Ratio-All Crises

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	1.0444%	0.0953%	10.96	0.000
Time	-0.3066%	0.1314%	-2.33	0.020
Comp	-0.3501%	0.1310%	-2.67	0.008
Time*Comp	0.3941%	0.1853%	2.13	0.034
Book/Market	-0.2959%	0.0500%	-5.91	0.000

Table 4: Adding Market Cap and Book-To-Market Ratio-All Crises

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	1.1855%	0.4425%	2.68	0.007
Time	-0.3094%	0.1317%	-2.35	0.019
Comp	-0.3387%	0.1357%	-2.50	0.013
Time*Comp	0.3948%	0.1854%	2.13	0.033
Market Cap	-0.0151%	0.0464%	-0.33	0.744
Book/Market	-0.2984%	0.0506%	-5.89	0.000

5.2. Russian Rouble Crisis

Before controlling for the Book-To-Market ratio, I repeated the process above for each individual crisis to measure the impact of each event. This time I maintained the composition of both the treatment and control groups throughout the crisis, both for the visual representation and the statistical one. The first crisis that I tested was the *Russian Rouble Crisis*. Since the treatment event occurred in August 1998, I used compensation data from 1997 to choose firms for the treatment and control groups.

Figures 12 and 13 below display the Mean ROA of the treatment and control group and the difference between the means in the 8 quarters around August 1998. The relationship seen

above for all the crises is seen in these graphs as well. For the four quarters before the event the average ROA of the two groups is almost parallel and the difference between them is within a 0.1 percent range. After the event there is a noticeable decline in the ROA of the control group. Meanwhile, the ROA of the treatment group trends in the same direction. Consequently, the difference between their ROAs changes by 0.16 percent from the third quarter of 1998 to the fourth quarter.

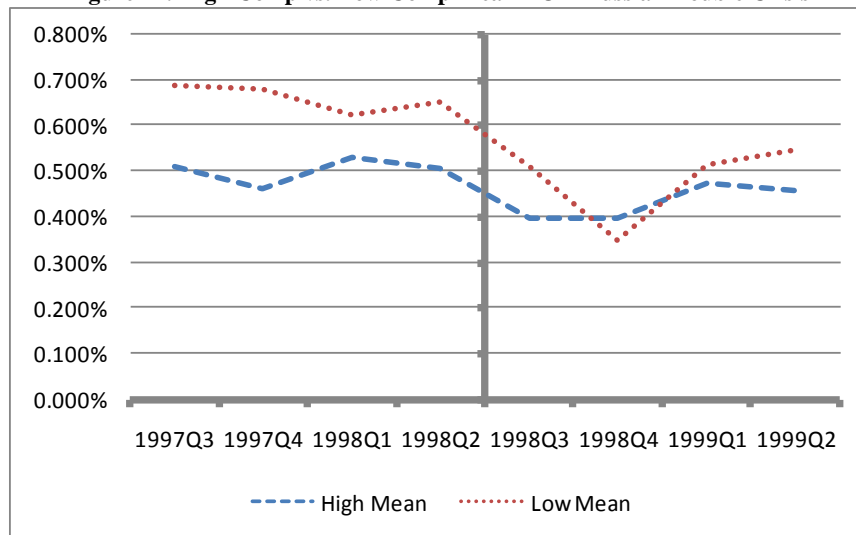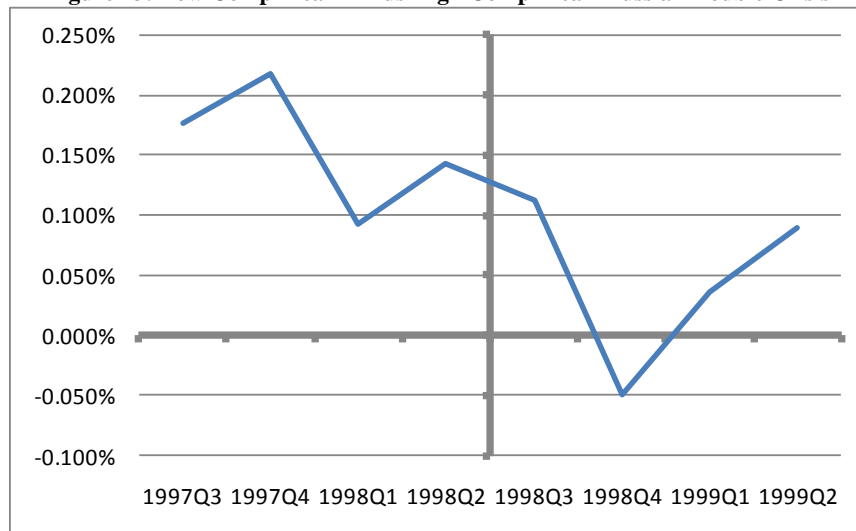**Figure 12: High Comp vs. Low Comp Mean ROA-Russian Rouble Crisis**

Figure 13: Low Comp Mean minus High Comp Mean-Russian Rouble Crisis

Despite what appears to be a significant change in the differences, running a regression to find the impact of the Russian Rouble Crisis, showed that the interaction variable was not statistically significant. Table 5 below displays the output of this regression. With a p-value greater than 0.5, we do not have enough evidence to say that firms with high paid CEOs performed better after the Russian Rouble Crisis.

Table 5: Russian Rouble Crisis-Regression Output

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	0.6988%	0.4235%	1.65	0.100
Time	-0.1652%	0.1179%	-1.40	0.163
Comp	-0.1757%	0.1216%	-1.44	0.150
Time*Comp	0.1075%	0.1659%	0.65	0.518
Market Cap	-0.0129%	0.0453%	-0.29	0.776
Book/Market	-0.4017%	0.1875%	-2.14	0.033

5.3. Enron Scandal

The next crisis I tested was the *Enron Scandal*. I used the second quarter of 2002 as the crisis event so I used compensation data from 2001 to form my control and treatment groups. Figures 14 and 15 display the graphs of the Mean ROA of the control group and the Mean ROA of the treatment group as well as their differences. From these graphs it can be seen that the difference in ROA before the crisis event is nearly zero. After the crisis the average ROA of the control group suffers a strong decline, while the average ROA of the treatment group continues to trend higher as it was before. Consequently, the difference between the ROAs changes by 0.30 percent from the first quarter of 2002 to the second quarter.

Figure 14: High Comp vs. Low Comp Mean ROA-Enron Scandal
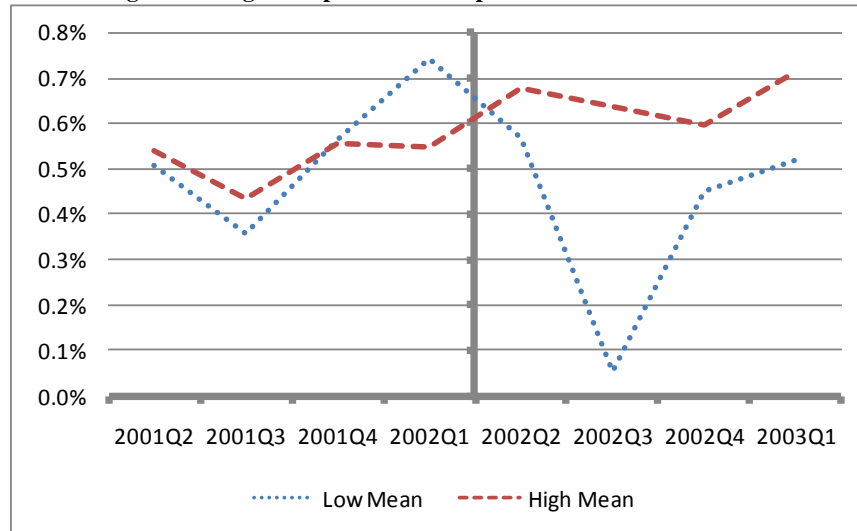
Figure 15: Low Comp Mean minus High Comp Mean-Enron Scandal
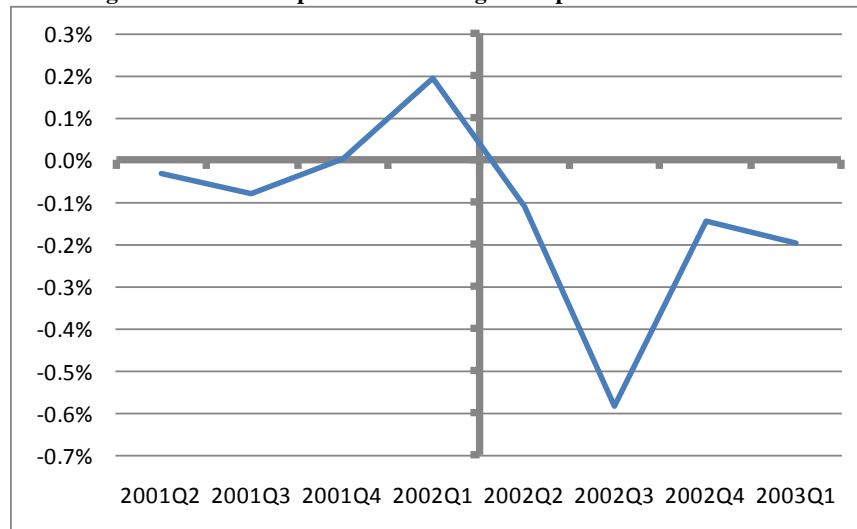
Given that the visual representation of the difference-in-differences method demonstrates the stronger impact of the *Enron Scandal*, it is no surprise that the regression results also improve. Table 6 below displays the output of that regression. From this output it can be seen that the p-value of the interaction variable is 0.147, which is significant at the 85 percent confidence level. Nevertheless, 85 percent confidence is still insignificant under most statistical studies.

Table 6: Enron Scandal-Regression Output

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	1.6091%	0.4554%	3.53	0.001
Time	-0.0507%	0.1333%	-0.38	0.704
Comp	-0.0669%	0.1350%	-0.50	0.621
Time*Comp	0.2684%	0.1843%	1.46	0.147
Market Cap	-0.0759%	0.0436%	-1.74	0.083
Book/Market	-0.7635%	0.2137%	-3.57	0.000

However, it is possible that given the low p-value of the Book-To-Market Variable, the valuation of the firms was contaminating the results of the regression. Therefore, I went on to control for the Book-To-Market ratio by matching each firm in the treatment group with the firm from the control group that had the closest Book-To-Market ratio. Accordingly, not all the firms from the control group were matched. Firms that were not matched were left out of the control group for the subsequent regression. Table 7 displays the results of this regression. As predicted, both the coefficient and p-value of the interaction variable improve significantly. With a p-value of 0.045, we can reject the null hypothesis and say with greater than 95 percent confidence that firms with high-paid CEOs perform better after the *Enron Scandal*.

Table 7: Enron Scandal-Regression Output After Book-To-Market Matching

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	2.2639%	0.5511%	4.11	0.000
Time	-0.2266%	0.1865%	-1.22	0.226
Comp	-0.2998%	0.1662%	-1.80	0.073
Time*Comp	0.4674%	0.2310%	2.02	0.045
Market Cap	-0.1102%	0.0499%	-2.21	0.028
Book/Market	-0.9960%	0.2819%	-3.53	0.001

5.4. Liquidity Crisis

The third crisis that I looked at was the *Liquidity Crisis*. This crisis event occurred in August 2007; therefore I used compensation data from 2006 to compile my treatment and control groups. In Figures 16 and 17, I display the graphs of the Mean ROA of the control group and the Mean ROA of the treatment group as well as their differences. This graph demonstrates slightly different results from what I had seen up to that point. There is still a 0.98 percent change in the difference in ROA from the second quarter of 2007 to the third quarter. However, in this crisis event, the difference is caused by a sharp increase in the ROA of the treatment group instead of a decrease in the ROA of the control group.

Figure 16: High Comp vs. Low Comp Mean ROA-Liquidity Crisis
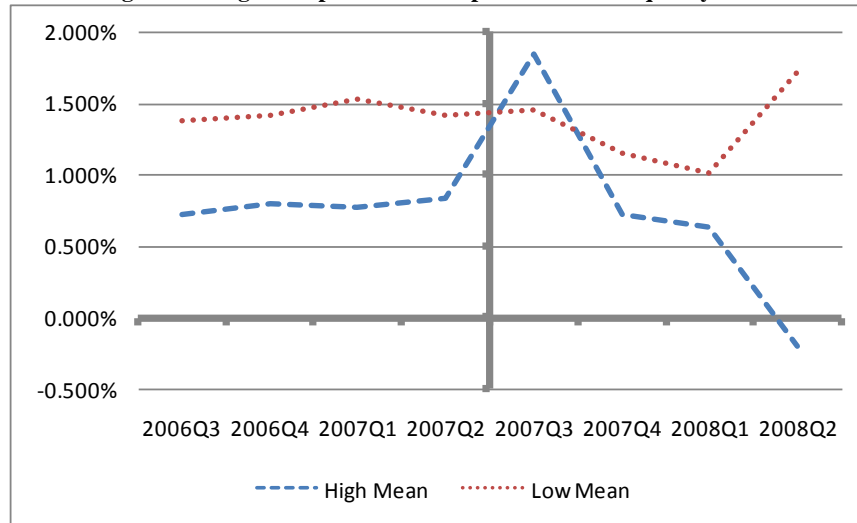
Figure 17: Low Comp Mean minus High Comp Mean-Liquidity Crisis

Table 8 below displays the output from the regression for this crisis. Like in the *Russian Rouble Crisis*, the p-value of the interaction variable is quite high. Therefore, again, we do not have enough evidence to say that firms with high paid CEOs performed better after the Liquidity Crisis. Farther on, I propose several reasons for why the *Russian Rouble Crisis* and *Liquidity Crisis* yielded such results.

Table 8: Liquidity Crisis-Regression Output

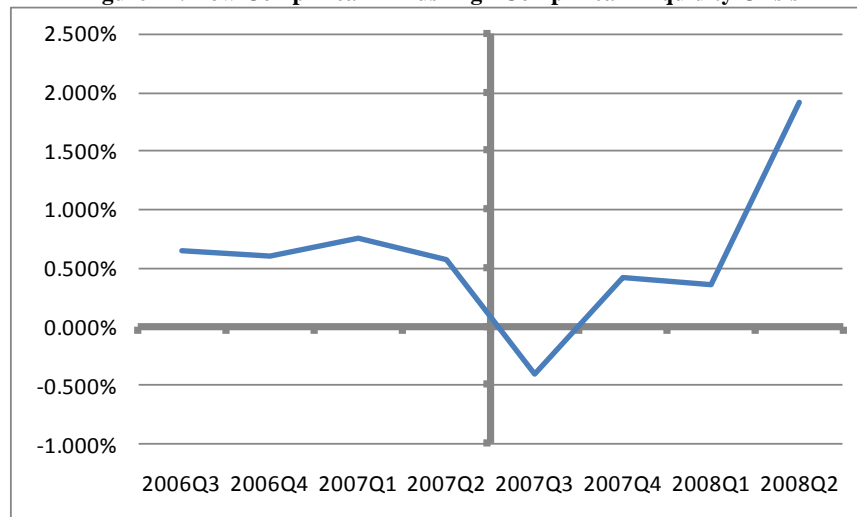| Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	5.8495%	0.9408%	6.22	0.000
Time	0.1443%	0.2536%	0.57	0.570
Comp	0.1754%	0.2632%	-0.67	0.505
Time*Comp	0.1240%	0.3526%	0.35	0.725
Market Cap	-0.3819%	0.0975%	-3.91	0.000
Book/Market	-2.0493%	0.3160%	-6.49	0.000

5.5. Lehman Collapse

The final crisis that I looked at was the *Lehman Collapse*, which took place in September 2008. Accordingly, I used 2007 compensation data to assemble my treatment and control groups. Figures 18 and 19 are the graphs of the mean ROAs of the two groups as well as the difference in ROA of the two groups. From the difference graph, the *Lehman Collapse* appears to have had the greatest impact on the ROA of firms with high-paid CEOs. The change in the difference from the third quarter of 2008 to the fourth quarter of 2008 was a whole 1.87 percent.
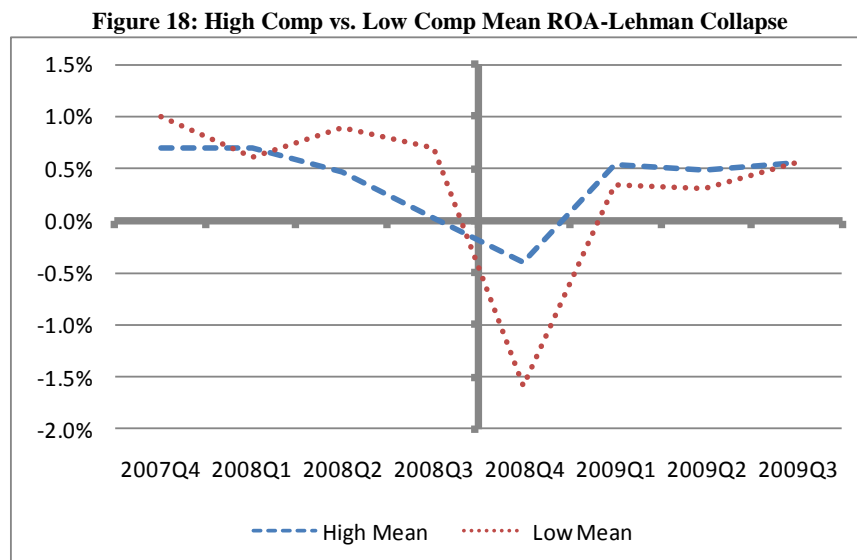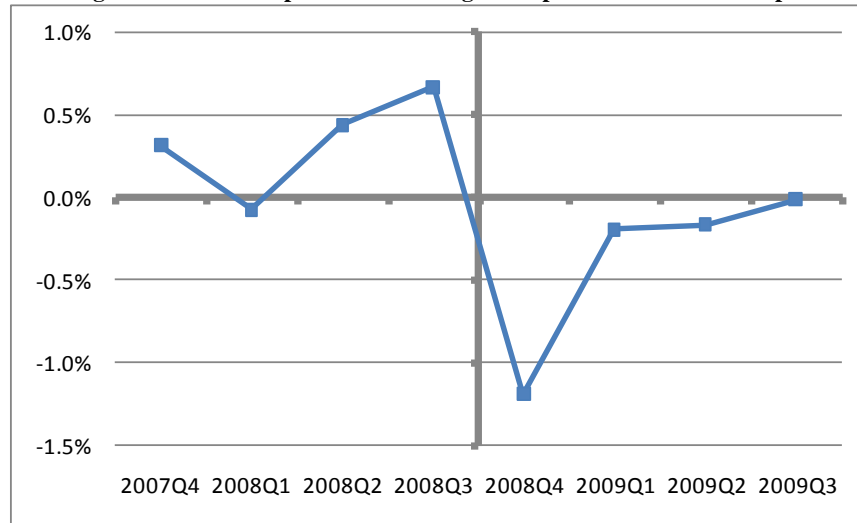

Figure 18: High Comp vs. Low Comp Mean ROA-Lehman Collapse

Figure 19: Low Comp Mean minus High Comp Mean-Lehman Collapse

Unsurprisingly, the regression output supports the graphs above. Table 9 demonstrates that the interaction coefficient and significance level were highest after the *Lehman Collapse*. With greater than 95 percent confidence, we can reject the null hypothesis and state that firms with high paid CEOs performed 0.92 percent better each quarter after the *Lehman Collapse.*

Table 9: Lehman Collapse-Regression Output

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	-0.7210%	1.0850%	-0.66	0.507
Time	-0.7247%	0.3207%	-2.26	0.024
Comp	-0.5316%	0.3241%	-1.64	0.102
Time*Comp	0.9168%	0.4451%	2.06	0.040
Market Cap	0.1725%	0.1124%	1.53	0.126
Book/Market	-0.1856%	0.0725%	-2.56	0.011

Although, given the significant result, no further tweaking to this model was necessary; I attempted to improve the results even further by doing book-to-market matching. I repeated the procedure that I did for the *Enron Scandal*, and found that coefficient of the interaction variable increased even further. However, the results yielded a p-value just a tad lower than before but

still one with almost 95 percent significance. In addition, the book-to-market variable lost all of

its significance in this rendition, meaning that the treatment and control groups appear to be

perfectly inline with the assumptions of the difference in differences method. Table 10 below

displays the results of this regression output.

Table 10: Lehman Collapse-Regression Output after Book-To-Market Matching

Predictor	Coef	SE Coef	T-Statistic	P-Value
Constant	-0.9010%	1.2200%	-0.74	0.461
Time	-0.9580%	0.4503%	-2.13	0.034
Comp	-0.3946%	0.3981%	-0.99	0.322
Time*Comp	1.0661%	0.5437%	1.96	0.051
Market Cap	0.1750%	0.1258%	1.39	0.165
Book/Market	-0.1813%	0.2316%	-0.78	0.435

6. Conclusion

6.1. Marginal Income Per Dollar

While it is useful to know the impact of a crisis on a firm's profitability, my question was

whether or not the CEO creates value. A simple calculation can be done to answer that question.

Looking back to Table 4 above, we found that, on average, firms with high-paid CEOs

performed 0.395 percent better in the 4 quarters after a crisis. By annualizing this figure, we find

that firms with high-paid CEOs outperform competitors by 1.58 percent of assets. Hence, the

next step was to find the average total assets of all the firms in each of my treatment and control

groups. I found that to be just over $99 billion. Thus, on average, firms with high-paid CEOs

made an additional $1.568 billion in the year after a crisis. Finally, the last step was to find the

average premium paid to CEOs in my treatment group. I found that to be $13.7 million[14].

Therefore, on average, every dollar spent on the CEO prior to a crisis, yields $114[15] of outperformance during the crisis.

Similarly, we found in Tables 7 and 10 that the *Enron Scandal* and the *Lehman Collapse* had an even greater impact on the ROA of firms with high-paid CEOs. The same calculations can be done as those above to find that, on average, every dollar spent on the CEO prior to the *Enron Scandal* and the *Lehman Collapse*, yields $142 and $664 of outperformance respectively. Each of the three values that I found can be proven with a high degree of statistical significance.

6.2. Takeaways

Given the statistical significance of the results above, it is safe to reject the null hypothesis and accept alternative A, which is that high-paid CEOs create rather than destroy value in the period after a crisis. The results indicate that Josef Ackermann was correct when he said that "Those [banks] who paid well had significantly fewer losses." Furthermore, in the debate over executive compensation, this study supports the view that boards are effective at evaluating managerial expertise and appropriately compensating for it.

Several questions arise from these results, the first of which is how do high-paid CEOs manage to outperform their competitors. I propose that first and foremost, the answer is experience. To that point, I offer the example of Sanford I. Weill of Citigroup and Richard Fuld of Lehman Brothers. Both are known to have been paid extremely well, however, Weill's compensation during his tenure as CEO was unmatched. I suggest that Weill's compensation

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[14] In Figure 2 I calculated the premium paid to CEOs in my treatment group for each year. To calculate the average premium, I summed the premiums from 1997, 2001, 2006, and 2007 and divided by 4.

[15] $1,568,094,118 / $13,732,287 = $114

was well deserved given his experience in the financial industry. Weill rose to the top job after having started his own securities firm and serving as CEO of that firm for 19 years. During those 19 years, the firm completed over 15 acquisitions to become the country's second largest securities brokerage firm. After selling this firm to American Express, Weill landed in the top job at Citigroup after successfully turning a troubled consumer finance company into the largest U.S. bank through a series of mergers and acquisitions. In short, Weill had abundant experience as a CEO of financial firms before he took on the top job at Citigroup. Additionally, he had successfully navigated through numerous crises in the past. Hence, it is no surprise that Citigroup was one of the companies that outperformed its competitors after the *Russian Rouble Crisis* and the *Enron Scandal*. After all, Weill had held the top job during both of those events.

In contrast, Richard Fuld's background was exclusively at Lehman Brothers. He started his career at the firm as a trader and never looked back. I do not doubt that Fuld was very successful as a trader, however, I do question his ability to translate that skill into managerial prowess. In *Liar's Poker*, Michael Lewis attributes the success of a trader with his ability to exploit other's weaknesses and intimidate other people to listen to you. I would also add unparalleled confidence in yourself and in your positions. Those characteristics can definitely be seen in Fuld's leadership. In fact, he is infamous for believing in Lehman Brothers and refusing to ask for help to the very last moment. Three months prior to filing for bankruptcy, Fuld is quoted as saying, "Our core franchise and our culture are strong. Our capital and liquidity positions have never been stronger."[16] I believe that the board of Lehman Brothers recognized Fuld's lack of relevant experience and compensated him accordingly.

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[16] Rick Newman, "10 Gaffes by Doomed CEOs," 3 September 2009, US News & World Report, 16 April 2010 <http://www.usnews.com>.

Another question that arises regarding the results of my study is why certain crises have a larger impact on the profitability of firms with high-paid CEOs. I propose that the impact is stronger depending on the severity of the crisis. The same reasons that apply to evaluating a CEO's performance during a period of crisis rather than a period of certainty also apply to the severity of the crisis. In my study, I found that the *Russian Rouble Crisis* and the *Liquidity Crisis* did not have statistically significant impacts on the profitability of firms with high-paid CEOs. My suggestion is that these two crises failed to introduce as much uncertainty as the crises that were impactful. For instance, the *Russian Rouble Crisis* was an event that occurred entirely outside of the U.S. While some U.S. firms were certainly affected, that affect was constrained to a small number of firms. At the same time, the *Lehman Collapse* was centered on the U.S. financial industry and almost every firm felt some repercussions.

6.3. Further Research

There are several areas where my studies can be improved or expanded upon. For one, the study can be expanded to industries outside of finance. While I believe that the impact of crises is most profound in the financial industry, it is possible that the results can be replicated elsewhere in the economy. Another area to expand on is to control for other CEO characteristics. It would be interesting to see how much pay accounts for characteristics like charisma, which Waldman, Ramirez, House, and Puranam concluded improved firm performance. Finally, it would be interesting to study at what level CEO pay actually starts to destroy value. Although my study concludes that high-paid CEOs provide additional income to the firm, I am not so naïve to believe that every additional dollar paid to the CEO contributes equally to the bottom line. I think that a maximization function can be made to find the ideal level of CEO pay.

For the meantime, I believe I have produced a study that adds perspective to the heated debate over CEO compensation—a debate that has turned increasingly one-sided. Additionally, as governments all over the world begin to push for new regulation, most of it motivated by populist rhetoric, my study provides lawmakers a reason to take a step back. My results conclude that CEOs are compensated appropriately. Any attempt to restrain that compensation could cause a migration of qualified CEOs into unregulated industries or countries. Those places where shareholders are willing to pay qualified CEOs for the expertise and success they can bring to their firms.

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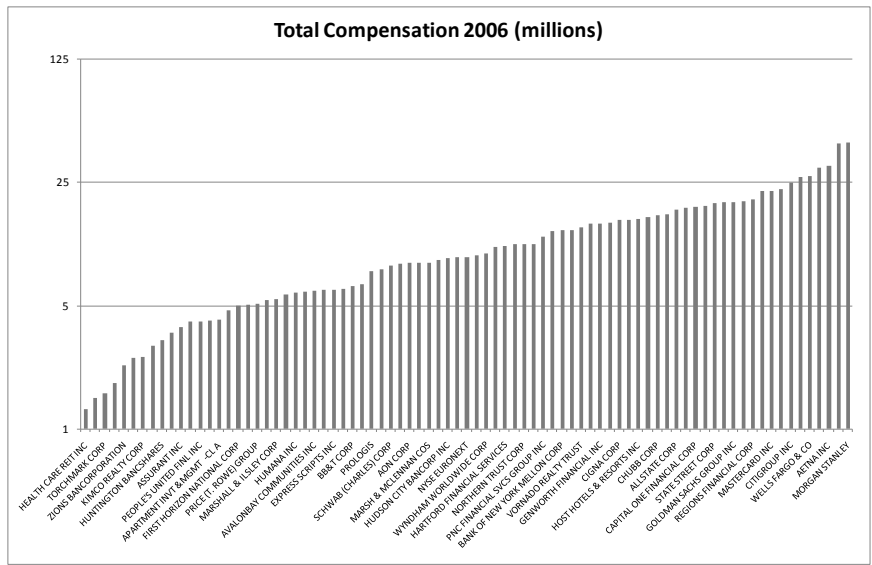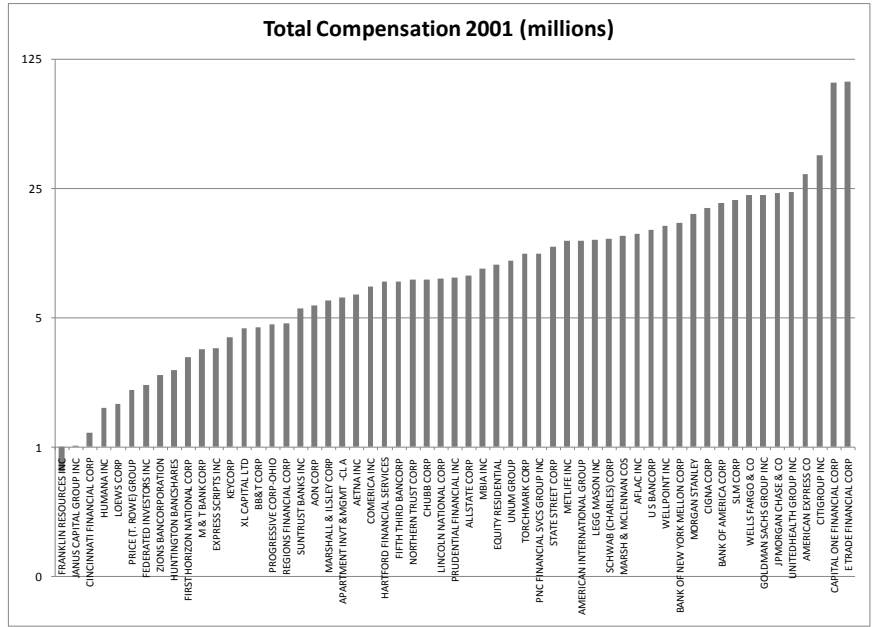
9. Appendices

9.1. Appendix A

	Ticker	Company	Industry		Ticker	Company	Industry
1	AET	AETNA INC	Managed Health Care	43	HCP	HCP INC	Specialized REITs
2	AXP	AMERICAN EXPRESS CO	Consumer Finance	44	PGR	PROGRESSIVE CORP-OHIO	Property & Casualty Insurance
3	AFL	AFLAC INC	Life & Health Insurance	45	MBI	MBIA INC	Property & Casualty Insurance
4	AIG	AMERICAN INTERNATIONAL GROUP	Multi-line Insurance	46	SCHW	SCHWAB (CHARLES) CORP	Investment Banking & Brokerage
5	BK	BANK OF NEW YORK MELLON CORP	Asset Management & Custody Banks	47	CINF	CINCINNATI FINANCIAL CORP	Property & Casualty Insurance
6	CI	CIGNA CORP	Managed Health Care	48	PBCT	PEOPLE'S UNITED FINL INC	Thrifts & Mortgage Finance
7	JPM	JPMORGAN CHASE & CO	Other Diversified Financial Services	49	XL	XL CAPITAL LTD	Property & Casualty Insurance
8	CB	CHUBB CORP	Property & Casualty Insurance	50	KIM	KIMCO REALTY CORP	Retail REITs
9	AOC	AON CORP	Insurance Brokers	51	ESRX	EXPRESS SCRIPTS INC	Health Care Services
10	CMA	COMERICA INC	Diversified Banks	52	HUM	HUMANA INC	Managed Health Care
11	C	CITIGROUP INC	Other Diversified Financial Services	53	ALL	ALLSTATE CORP	Property & Casualty Insurance
12	FITB	FIFTH THIRD BANCORP	Regional Banks	54	EQR	EQUITY RESIDENTIAL	Residential REITs
13	RF	REGIONS FINANCIAL CORP	Regional Banks	55	SPG	SIMON PROPERTY GROUP INC	Retail REITs
14	MTB	M & T BANK CORP	Regional Banks	56	IVZ	INVESCO LTD	Asset Management & Custody Banks
15	USB	U S BANCORP	Diversified Banks	57	AVB	AVALONBAY COMMUNITIES INC	Residential REITs
16	FHN	FIRST HORIZON NATIONAL CORP	Regional Banks	58	PLD	PROLOGIS	Industrial REITs
17	BEN	FRANKLIN RESOURCES INC	Asset Management & Custody Banks	59	AIV	APARTMENT INVT &MGMT -CL A	Residential REITs
18	HCN	HEALTH CARE REIT INC	Specialized REITs	60	COF	CAPITAL ONE FINANCIAL CORP	Consumer Finance
19	HBAN	HUNTINGTON BANCSHARES	Regional Banks	61	HIG	HARTFORD FINANCIAL SERVICES	Multi-line Insurance
20	LM	LEGG MASON INC	Asset Management & Custody Banks	62	TRV	TRAVELERS COS INC	Property & Casualty Insurance
21	LNC	LINCOLN NATIONAL CORP	Life & Health Insurance	63	ETFC	E TRADE FINANCIAL CORP	Investment Banking & Brokerage
22	L	LOEWS CORP	Multi-line Insurance	64	BXP	BOSTON PROPERTIES INC	Office REITs
23	HST	HOST HOTELS & RESORTS INC	Specialized REITs	65	FII	FEDERATED INVESTORS INC	Asset Management & Custody Banks
24	MMC	MARSH & MCLENNAN COS	Insurance Brokers	66	GS	GOLDMAN SACHS GROUP INC	Investment Banking & Brokerage
25	MI	MARSHALL & ILSLEY CORP	Regional Banks	67	HCBK	HUDSON CITY BANCORP INC	Thrifts & Mortgage Finance
26	BAC	BANK OF AMERICA CORP	Other Diversified Financial Services	68	MET	METLIFE INC	Life & Health Insurance
27	NTRS	NORTHERN TRUST CORP	Asset Management & Custody Banks	69	JNS	JANUS CAPITAL GROUP INC	Asset Management & Custody Banks
28	WFC	WELLS FARGO & CO	Diversified Banks	70	PRU	PRUDENTIAL FINANCIAL INC	Life & Health Insurance
29	PNC	PNC FINANCIAL SVCS GROUP INC	Regional Banks	71	WLP	WELLPOINT INC	Managed Health Care
30	KEY	KEYCORP	Regional Banks	72	PFG	PRINCIPAL FINANCIAL GRP INC	Life & Health Insurance
31	STT	STATE STREET CORP	Asset Management & Custody Banks	73	CME	CME GROUP INC	Specialized Finance
32	PSA	PUBLIC STORAGE	Specialized REITs	74	NDAQ	NASDAQ OMX GROUP INC	Specialized Finance
33	SLM	SLM CORP	Consumer Finance	75	AIZ	ASSURANT INC	Multi-line Insurance
34	STI	SUNTRUST BANKS INC	Regional Banks	76	GNW	GENWORTH FINANCIAL INC	Multi-line Insurance
35	TMK	TORCHMARK CORP	Life & Health Insurance	77	MA	MASTERCARD INC	Data Processing & Outsourced Services
36	UNH	UNITEDHEALTH GROUP INC	Managed Health Care	78	ICE	INTERCONTINENTALEXCHANGE INC	Specialized Finance
37	VNO	VORNADO REALTY TRUST	Diversified REITs	79	AMP	AMERIPRISE FINANCIAL INC	Asset Management & Custody Banks
38	ZION	ZIONS BANCORPORATION	Regional Banks	80	NYX	NYSE EURONEXT	Specialized Finance
39	BBT	BB&T CORP	Regional Banks	81	WYN	WYNDHAM WORLDWIDE CORP	Hotels, Resorts & Cruise Lines
40	MS	MORGAN STANLEY	Investment Banking & Brokerage	82	WU	WESTERN UNION CO	Data Processing & Outsourced Services
41	TROW	PRICE (T. ROWE) GROUP	Asset Management & Custody Banks	83	DFS	DISCOVER FINANCIAL SVCS INC	Consumer Finance
42	UNM	UNUM GROUP	Life & Health Insurance	84	CBG	CB RICHARD ELLIS GROUP INC	Real Estate Services

9.2. Appendix B

Name	Date	Description
Russian Rouble Crisis	August 17, 1998 (Q3)	Brought on by the Asian Financial Crisis, which started in July 1997, and the ensuing decline in commodity prices. Climaxed with the devaluation of the Rouble and the restructuring of Rouble denominated debt. Costs went far beyond Russia as investors feared global contagion and sold European and Japanese bonds to buy US Treasuries. Long Term Capital Management, a hedge fund, lost $4.6 billion in the four months following the crisis and was bailed out by a consortium of Wall Street banks.
Enron Scandal	December 2, 2001 (Q4-Q2)	Part of a series of large corporate frauds that occurred between 2000 and 2002, the most highly-publicized of which were Enron, WorldCom, and Tyco. Enron represented the furthest fall from grace as the company was voted "most innovative company in America" six straight years including 2001, the same year it revealed accounting irregularities and declared bankruptcy in December. The series of scandals threatened investor confidence in corporate America and led to the passing of the Sarbanes-Oxley Act on July 30, 2002 in an attempt to restore confidence.
Liquidity Crisis	August 9, 2007 (Q3)	Sparked by a plunge in home prices and a surge in foreclosures, the liquidity crisis marked the onset of the subprime mortgage crisis. Numerous hedge funds suddenly began to experience unprecedented losses as a result of what is believed to be liquidations by some managers eager to access cash. On August 9, 2007, BNP Paribas suspended three investment funds that invested in subprime, due to a "complete evaporation of liquidity" in the market. Eventually, the contagion effect of subprime spilled over into radically different business areas and led to a systematic failure of the financial system.
Lehman Collapse	September 15, 2008 (Q3-Q4)	As a result of the continuing subprime mortgage crisis, Lehman Brothers faced unprecedented losses and was forced into the largest bankruptcy filing in U.S. history on September 15, 2008. The fallout of Lehman's downfall was felt throughout the global economy. Lehman was counterparty to numerous financial firms, prime broker for many funds, and was heavily relied upon for financing. What followed was a dramatic plunge in equity markets, the bankruptcy of numerous firms and nations, and unparalleled measures by global governments to revive the global economy.

9.3. Appendix C

Total Compensation 2001 (millions)

Total Compensation 2006 (millions)

9.4. Appendix D

Financial Services Breakdown

- Asset Managers, 22%
- Investment Services, 42%
- Specialty Finance, 2%
- Consumer Finance, 34%

Insurance Breakdown

- Life Insurance, 33%
- Reinsurance, 32%
- Property & Casualty Insurance, 24%
- Insurance Brokers, 6%
- Full Line Insurance, 4%

Real Estate Breakdown

- Residential REITS, 17%
- Hotel REITS, 7%
- Office REITS, 22%
- Specialty REITS, 31%
- Retail REITS, 23%