

How Bank CEO Compensation Changes in a Crisis

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This study examines U.S. bank compensation practices under distressed conditions as the recent crisis by analyzing publicly traded banks from 2003 to 2009. The findings demonstrate increased reliance on non-incentive pay due to the adverse effects of the crisis on incentive pay. Specifically, the results show real growth in CEO base salary despite the crisis. However, only small banks paid significantly higher base salary to offset the loss in cash bonus caused by deteriorating corporate performances during the crisis. Large banks did not experience similar offsetting effects. Evidently, banks changed their compensation practices in response to distressed conditions.

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1. Introduction

In the latter part of the 1980s to the early part of the 1990s, the US market erupted over the controversy of whether CEOs and executives of publicly traded firms are overpaid. The opinion is split into one group which views CEOs and executives of publicly traded firms as overpaid, as their compensation far outweighs corporate performance; and a second group which perceives CEOs and executives to be commensurately paid such that firms may recruit and retain the requisite managerial talent to sufficiently maximize their objectives. In addition, the job of CEO requires unique talents which should be rewarded at the levels at which they are due (Martin, 2006). Despite the attention, executive compensation of publicly traded firms significantly increased into the early 2000s. For the sample of S&P 1500 firms, Bebchuk and Grinstein (2005) report a spurt in CEO compensation, from a mean \$2.4 million in 1993 to \$5.0 million in 2003, with the greatest growth experienced by S&P 500 firms¹. The authors identify the increase in equity-based compensation as one of the contributing factors to the growth in executive pay². Thus, the controversy surrounding executive compensation has been a long-standing one that regained momentum during the financial crisis due to public outcry³. At this time, the controversy was centered on bank CEO compensation.

The US federal government laid partial blame for the initiation and magnitude of the crisis on excessive bank risks induced by compensation practices⁴. Consequently, troubled banks that received government assistance under its Troubled Asset Relief Program (TARP) were required to obtain federal approval to adjust executive pay⁵. In addition to political outcry, market and regulatory scrutiny brought bank CEO compensation to the forefront of the crisis.

The economic shock of the crisis therefore presents a unique opportunity to study compensation in an extreme worst case scenario. Thus, the purpose of this study is to analyze US bank CEO compensation practices under system-wide distressed conditions as the recent

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financial crisis. These findings will highlight changes, if any, in bank compensation practices during an economic downturn and add to the literature on what happens to bank CEO compensation during a financial/banking crisis. These results should also provide a profile of bank compensation practices under extreme worst case scenario. This will also allow for an understanding of how compensation practices respond to economic shocks. This paper examines four compensation components namely, base salary, cash bonus, and other annual compensation (short-term measures), and stock option pay (long term measure). The analysis is conducted for the period, 2003 to 2009, to show the profile of compensation practices before the crisis (2003 to 2006), and during the crisis (2007 to 2009). Additional analyses are conducted on bank-size groups.

Using real compensation data, the result shows real growth in CEO base salary throughout the 7-year period indicating its resilience despite the crisis. The effect is more evident in small banks as they paid significantly more base salary to CEOs during the crisis. Although all bank CEOs experienced significant declines in cash bonus, only small bank CEOs were compensated for their loss with increased base salary. Thus, offsetting incentive pay with non-incentive pay. Large banks did not experience a similar offsetting effect. It was unlikely that large banks would change their compensation strategies to favor their CEOs due to increased market and regulatory scrutiny, legislative debates, and public outcry at the time, on Bank executive compensation. Small bank CEO compensation was under lesser microscope. The significant decline in cash bonus was also sufficient to cause a structural shift in compensation structure as bank CEO base salary accounted for almost three quarters of total compensation during the crisis. Thus, showing increased reliance on non-incentive pay during the crisis. The shift in compensation strategy reflected market and governmental pressures for the financial services industry to change its compensation practices. Evidently, bank compensation practices changed to respond to the distressed conditions presented in the crisis. These findings distinguish this study from others which used nominal data.

The findings of this study will make two primary contributions. First, its results offer insights into how bank CEO compensation strategies change under distressed conditions such as a financial crisis. Second, the results highlight the impact of bank size effects on compensation strategies. This study will also make two secondary contributions. First, while most studies predominantly analyze CEO incentive-based pay, this study also examines bank CEO non-incentive based pay to capture the compensation component changes in CEO pay. Second, the overall findings inform current debates and regulatory efforts to rein executive compensation.

The remainder of the paper is structured as follows. Section 2 highlights relevant literature on executive compensation. Section 3 outlines the data and methodology. Section 4 discusses the findings while section 5 concludes.

2. Literature Review

The finance literature presents multiple theories to explain executive compensation. *Agency theory* suggests that incentive pay can be used to reduce the agency cost of equity (Jiraporn et al., 2005; Jensen and Murphy, 1990) and the agency cost of debt (Benston and Evan, 2006; John and John, 1993). While Martin (2006) and Bebchuk and Grinstein (2005) discuss the

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contrasting *managerial power model* in which CEOs use this power over compensation to 'loot' the firm by overpaying themselves. Hubbard and Palia (1995) highlight the *managerial talent hypothesis* that explains that compensation levels must be competitive and adequate to recruit and retain talented CEOs. This supports Murphy (1985)'s earlier *pay-for-productivity theory* which directs that CEOs contribute significantly to the productivity of firms and should be compensated accordingly.

Studies on the effects of prior financial crises on the banking industry have examined these effects on bank performances, bank risks, and corporate governance, but very little, if any, examined bank executive compensation. Thus, the most recent crisis presents a unique opportunity to study compensation in an extreme worst case scenario. A close proxy is deregulation in the banking industry. Most deregulatory Acts occurred in the 1980's and 1990's resulting in somewhat dated studies. The general consensus of these studies is that deregulation resulted in an increase in bank CEO compensation, and specifically, incentive pay, as managerial discretion and investment opportunities expanded in the banking industry⁶. The economic shock of the crisis would have an opposite effect as it would constrain managerial discretion and investment opportunities. As a result, this study hypothesizes that compensation practices changed during the crisis, as a result of a decline in bank CEO compensation, and specifically, incentive pay. This hypothesis is consistent with agency theory which suggests that incentive pay should reduce during an economic downturn.

Support for agency theory is evident in current studies on bank CEO compensation practices during the crisis by Winkelvoss et. al (2014), Proctor and Murtagh (2014), and Tian and Yang (2014). Winkelvoss et. al (2014), and Proctor and Murtagh (2014), find that bank CEOs were paid significantly more base salary (non-incentive pay), and less cash bonus and stock awards (incentive pay) during the crisis. Winkelvoss et. al (2014)'s sample included only banks that received funding under TARP while Proctor and Murtagh (2014) described only the 50 largest banks. Based on 179 banks between 2005 and 2010, Tian and Yang (2014) observe a significant decline in bank CEO pay during the crisis, and the switch from incentive cash bonus to other incentive pay. This paper however covers a more representative sample and period to show a comprehensive profile of bank compensation practices in a crisis. As there remain only few studies on bank CEO compensation in a crisis, the findings of this paper are limited for comparison to similar studies on bank CEO compensation in other financial market crisis. Thus, further studies should be conducted on bank CEO compensation in other financial market crisis.

There are however other current studies which examine the effect of bank CEO compensation practices, during the crisis, on bank performance indicators such as stock returns (e.g. Fahlenbrach and Stulz, 2011) and bank risk (e.g. Bhagat and Bolton, 2014). However, this is not the focus of this paper.

3. Data and Methodology

This paper examines bank CEO compensation practices by analyzing compensation levels and structure between 2003 and 2009. The period captures compensation practices during the crisis (2007 to 2009) and allows adequate comparison before the crisis (2003 to 2006). This study emphasizes bank CEO compensation as Ang et. al (2002) find that bank CEOs are

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paid higher than other bank executives and receive more incentive pay. This study is conducted on the sample of publicly traded commercial banks extracted from the Federal Reserve Bank of New York CRSP-FRB database. The analysis covers bank CEO base salary, cash bonus, and other annual compensation⁷, as short term measures of compensation, and new option grants, as long term measure of compensation. Data on base salary, cash bonus, other annual compensation, and stock options are obtained from Schedule 14A – Definitive Proxy Statement filed annually with the Securities and Exchange Commission (SEC). Stock prices and dividend yield used in the Black-Scholes pricing of stock options are obtained from the Center for Research in Stock Prices (CRSP) database and COMPUSTAT, respectively. The appendix describes the methodology that was used to value these options. Data on total assets used to formulate bank size categories is obtained from Reports of Condition and Income (call reports). All amounts reported are deflated to 2003 dollars.

CEO compensation structure is measured by the proportion of base salary (base salary/total compensation), proportion of cash bonus (cash bonus/total compensation), the proportion of the value of new option grants (value of new option grants/total compensation), and the proportion of other annual compensation (other annual compensation/total compensation). Total compensation is computed as the aggregate of base salary, cash bonus, other annual compensation, and value of new option grants.

Additional analysis is conducted based on bank size, measured by total assets. Banks with total assets equal to or greater than \$1 billion are designated “large banks” while banks with total assets less than \$1 billion are designated “small banks”. These size designations are assigned based on total assets in 2003 (or the first year of entry in the sample) and remain throughout the study. T-tests of mean differences are used to identify significant differences in compensation levels and structure before the crisis and during the crisis, and between small and large banks. Using less complex univariate test already captures the full picture of bank CEO compensation practices during the crisis.

4. Findings

4.1 Compensation Levels

Bank CEOs’ average base salary, from 2003 to 2009, shows consistent real growth (except in 2006) from \$379,864 in 2003 to \$439,996 in 2009 indicating its resilience despite the crisis. (Table 1 Panel A). The real growth in CEO base salary is consistent with Hubbard and Palia (1995)’s managerial talent hypothesis that compensation levels must be competitive and adequate to recruit and retain talented CEOs. Despite the real growth in base salary, there is no significant difference in the levels before and during the crisis. (Table 5 Panel A). These results are not consistent with other studies on compensation during the crisis maybe because this study uses real compensation data while others use nominal data. The trend in bank CEO base salary is largely set by small banks that consistently paid their CEOs more despite the crisis (Table 1 Panel C). This resulted in small bank CEOs earning significantly higher base salary during the crisis than before (Table 5 Panel A). Median base salary shows similar results.

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Bank CEOs' incentive-based cash bonus demonstrated the stark effect of financial and market performances on compensation levels in an economic upturn (i.e. before the crisis) and downturn (i.e. during the crisis). Before the crisis, average CEO cash bonus fluctuated above \$420,000 but fell by 36.7% in 2007 to \$310,873, and further by 70.6% to \$91,309 in 2008, its lowest level. (Table 2 Panel A). This is a result of the combination of depressed financial and market performances as well as bonus payment restrictions on TARP-funded banks during the crisis. The additional public scrutiny on bank CEO compensation and the social costs of using the public purse to rescue the financial system also served as constraints on further growth/payment of cash bonus in the crisis. Table 5 Panel A confirms the significant decline in cash bonus during the crisis. These findings are consistent with Winkelvoss et. al (2014), Proctor and Murtagh (2014), and Tian and Yang (2014). These trends permeate both large and small banks (Table 2 Panels B and C) thus showing significant decline in cash bonus paid to both large and small bank CEOs during the crisis. (Table 5 Panel A). The significant increase in base salary paid to small bank CEOs can then be interpreted as an attempt to compensate them for the loss in cash bonus. Thus, substituting some incentive pay for non-incentive pay. Large banks did not experience a similar offsetting effect.

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Table 1: Bank CEO Compensation: Base Salary

The following table provides descriptive statistics for base salary for the sample of banks, and large and small banks, over 2003 to 2009. Large banks are defined by their 2003 assets (or first year of entry to the sample) equal to or greater than \$1 billion while small banks are defined by 2003 assets being less than \$1 billion. All amounts are deflated to 2003 dollars.

Year	N	Mean	Median	Standard Deviation	Minimum	Maximum
		\$'000	\$'000	\$'000	\$'000	\$'000
<i>Panel A: All Banks</i>						
2003	423	379.864	275.000	316.529	0	3,000.000
2004	416	390.808	286.330	319.745	0	2,418.301
2005	385	412.113	296.841	394.653	0	5,825.260
2006	355	398.084	309.524	265.121	0	2,730.159
2007	313	404.970	326.069	231.115	0	1,415.094
2008	307	405.856	327.963	223.629	0	1,388.889
2009	292	439.996	326.727	468.708	0	5,090.909
<i>Panel B: Large Banks</i>						
2003	218	536.475	421.008	369.973	0	3,000.000
2004	210	549.265	415.156	376.731	0	2,418.301
2005	194	579.158	458.738	491.812	0	5,825.260
2006	183	538.180	442.857	295.287	0	2,730.159
2007	162	528.584	463.313	246.702	0	1,415.094
2008	162	522.012	454.059	236.975	0	1,388.889
2009	154	584.427	456.841	595.463	0	5,090.909
<i>Panel C: Small Banks</i>						
2003	205	213.322	202.912	87.013	0	950.000
2004	206	229.275	215.931	101.641	0	931.373
2005	191	242.445	223.422	107.952	0	922.330
2006	172	249.028	234.425	96.722	31.429	945.055
2007	151	272.350	250.194	107.553	70.755	943.396
2008	145	276.082	256.482	106.525	69.444	944.017
2009	138	278.819	252.652	145.021	70.909	1,493.392

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Table 2: Bank CEO Compensation: Cash bonus

The following table provides descriptive statistics for cash bonus made to bank CEOs for the sample of banks, and large and small banks, over 2003 to 2009. Large banks are defined by their 2003 assets (or first year of entry to the sample) equal to or greater than \$1 billion while small banks are defined by 2003 assets being less than \$1 billion. All amounts are deflated to 2003 dollars.

Year	N	Mean	Median	Standard Deviation	Minimum	Maximum
		\$'000	\$'000	\$'000	\$'000	\$'000
<i>Panel A: All Banks</i>						
2003	423	453.138	78.293	1,908.788	0	29,000.000
2004	416	420.326	97.462	1,289.166	0	16,934.598
2005	385	464.200	111.651	1,454.778	0	18,987,729
2006	355	491.137	95.238	1,651.546	0	19,487.117
2007	313	310.873	70.339	1,108.954	0	13,679.245
2008	307	91.309	0	271.453	0	3,009.259
2009	292	127.033	0	482.037	0	4,900.000
<i>Panel B: Large Banks</i>						
2003	218	811.263	192.416	2,608.641	0	29,000.000
2004	210	748.735	225.609	1,746.859	0	16,934.598
2005	194	816.266	251.951	1,973.474	0	18,987,729
2006	183	840.820	199.228	2,228.161	0	19,487.117
2007	162	525.021	124.548	1,506.662	0	13,679.245
2008	162	140.609	0	363.126	0	3,009.259
2009	154	215.064	0	649.638	0	4,900.000
<i>Panel C: Small Banks</i>						
2003	205	72.301	44.000	124.585	0	1,117.000
2004	206	85.540	49.710	173.967	0	2,147.058
2005	191	106.605	64.118	257.122	0	3,398.058
2006	172	119.091	61.297	304.082	0	2,825.143
2007	151	81.127	47.170	137.040	0	1,403.301
2008	145	36.230	9.259	58.034	0	334.028
2009	138	28.794	0	61.667	0	340.909

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Table 3: Bank CEO Compensation: Value of New Option Grants

The following table provides descriptive statistics for the value of new option grants made to bank CEOs for the sample of banks, and large and small banks, over 2003 to 2009. Large banks are defined by their 2003 assets (or first year of entry to the sample) equal to or greater than \$1 billion while small banks are defined by 2003 assets being less than \$1 billion. Stock options are valued based on Core and Guay's (2002) One-year Approximation Method for Estimating Option Values ("OA Method") and the Modified Black-Scholes Option Valuation methodology utilized by Execucomp. Appendix refers. All amounts are deflated to 2003 dollars.

Year	N	Mean	Median	Standard Deviation	Minimum	Maximum
		\$'000	\$'000	\$'000	\$'000	\$'000
<i>Panel A: All Banks</i>						
2003	350	60.000	<0.001	318.665	0	4,323.596
2004	335	78.525	<0.001	503.680	0	6,022.658
2005	338	94.181	<0.001	697.694	0	11,684.346
2006	307	265.734	<0.001	2,831.910	0	47,585.579
2007	269	295.041	<0.001	3,594.506	0	58,227.993
2008	253	74.001	<0.001	558.293	0	6,022.641
2009	235	54.350	0	671.508	0	10,055.209
<i>Panel B: Large Banks</i>						
2003	198	62.641	<0.001	383.676	0	4,323.596
2004	193	84.382	<0.001	585.629	0	6,022.658
2005	179	117.156	<0.001	907.624	0	11,684.346
2006	164	443.398	<0.001	3,852.231	0	47,585.579
2007	146	476.776	<0.001	4,864.377	0	58,227.993
2008	140	69.218	<0.001	538.814	0	5,713.741
2009	132	93.152	0	894.917	0	10,055.209
<i>Panel C: Small Banks</i>						
2003	152	56.559	<0.001	206.469	0	1,662.270
2004	142	70.564	<0.001	365.822	0	3,783.906
2005	159	68.316	<0.001	330.036	0	3,813.125
2006	143	61.979	0	411.539	0	4,524.994
2007	123	79.323	0	416.143	0	3,930.124
2008	113	79.927	0	583.894	0	6,022.641
2009	103	4.623	0	38.063	0	375.852

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Table 4: Bank CEO Compensation: Other Annual Compensation

The following table provides descriptive statistics for other annual compensation made to bank CEOs for the sample of banks, and large and small banks, over 2003 to 2009. Large banks are defined by their 2003 assets (or first year of entry to the sample) equal to or greater than \$1 billion while small banks are defined by 2003 assets being less than \$1 billion. All amounts are deflated to 2003 dollars.

Year	N	Mean	Median	Standard Deviation	Minimum	Maximum
		\$'000	\$'000	\$'000	\$'000	\$'000
Panel A: All Banks						
2003	423	86.047	25.505	226.333	0	3,422.290
2004	416	109.632	26.034	321.731	0	3,519.888
2005	385	111.326	29.126	293.351	0	3,795.199
2006	355	114.511	35.955	627.535	0	11,641.802
2007	313	79.264	35.470	174.172	0	1,848.233
2008	307	80.588	36.291	197.610	0	2,415.844
2009	292	54.000	31.794	69.754	0	469.685
Panel B: Large Banks						
2003	218	127.655	38.637	293.840	0	3,422.290
2004	210	165.398	39.471	427.107	0	3,519.888
2005	194	151.479	48.814	288.108	0	2,404.093
2006	183	185.652	55.170	867.868	0	11,641.802
2007	162	106.323	50.770	203.188	0	1,848.233
2008	162	115.836	50.745	261.223	0.500	2,415.844
2009	154	67.566	37.763	80.901	0	469.685
Panel C: Small Banks						
2003	205	41.801	17.071	101.524	0	1,284.213
2004	206	52.784	18.487	130.896	0	1,257.534
2005	191	70.543	19.517	293.746	0	3,795.199
2006	172	38.821	26.275	49.103	0	409.127
2007	151	50.234	28.543	130.945	0	1,526.925
2008	145	41.206	30.388	61.052	0	676.957
2009	138	38.859	25.520	50.872	0	375.852

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Table 5: Structural Shifts in Bank CEO Compensation levels and structure

The table highlights the structural shifts in compensation levels and structure before the crisis (2003 to 2006) and during the crisis period (2007 to 2009). Compensation components include new option grants which are valued based on Core and Guay's (2002) One-year Approximation Method for Estimating Option Values ("OA Method") and the Modified Black-Scholes Option Valuation methodology utilized by Execucomp. Appendix refers. Compensation structure includes the proportion of base salary measured as base salary/total compensation; proportion of cash bonus measured as cash bonus/total compensation; proportion of new option grant values measured as value of new option grants/total compensation; and the proportion of other annual compensation measured as other annual compensation/total compensation. Large banks are defined by their 2003 assets (or first year of entry to the sample) equal to or greater than \$1 billion while small banks are defined by 2003 assets being less than \$1 billion. All amounts are deflated to 2003 dollars. I also use t-tests of mean differences to identify the statistical significance of structural shifts in compensation levels and structure before the crisis and during the crisis, and between large banks and small banks.

	All Banks		Large Banks		Small Banks	
	2003 – 2006	2007 – 2009	2003 – 2006	2007 – 2009	2003 – 2006	2007 – 2009
Panel A: Compensation Levels	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Base Salary	394.707	416.483	550.485	544.348	232.689***	275.654***
Cash bonus	455.733	178.102***	802.876	294.879***	94.688***	49.486***
New Option Grants	120.841	146.447	166.726	219.129	64.333	56.828
Other Annual Compensation	104.824	71.620***	156.427	97.061***	51.154***	43.601***
Total Compensation	1,057.049	787.763***	1,661.809	1,127.910***	428.069***	413.130***
Panel B: Compensation Structure	%	%	%	%	%	%
Proportion of Base Salary	61.17	74.54***	55.48	72.03***	67.09***	77.31***
Proportion of Cash bonus	25.10	13.25***	32.04	16.03***	17.89***	10.19***
Proportion of New Options Grant Values	5.65	2.26***	4.72	1.81***	6.80**	2.83***
Proportion of Other Annual Compensation	9.88	10.32	9.76	10.36	10.00	10.29

***, **, * Change over prior period is statistically significant at 1%, 5%, 10%, respectively

***, **, * Difference between large banks and small banks in the same period is statistically significant at 1%, 5%, 10%, respectively.

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Although the value of new option grants grew from \$60,000 in 2003 to \$295,041 in 2007, the magnitude of growth was constrained by the crisis. (Table 3 Panel A). Consequently, the staggered effect was realized in 2008 and 2009, as the value of new options grants decreased by 74.9% and 26.6%, respectively. These results show a delayed effect on new option values similar to the findings of Winkelvoss et. al (2014). Despite the trend in bank CEOs' average value of new option grants, there is no significant difference in values before and during the crisis (refer to Table 5 Panel A). The results are similar for large and small banks.

Before the crisis, bank CEOs benefitted from consistent increases in average other annual compensation from \$86,047 in 2003 to \$114,511 in 2006. (Refer to Table 4 Panel A). However, the increased scrutiny of CEO compensation during the crisis resulted in a decline to \$54,000 in 2009. Both large and small bank CEOs experienced similar trends in the crisis. (Table 5 Panels B and C). Overall, the results show that other annual compensation declined significantly during the crisis. (Table 5 Panel A).

In aggregate, the significant decline in cash bonus (incentive pay) influenced the corresponding decline in bank CEO total compensation during the crises. These findings support the hypothesis that total compensation, and specifically incentive pay declined significantly under distressed conditions. The absence of a significant change in total compensation paid to small bank CEOs also confirms the substitution effect of base salary for the loss of cash bonus paid to these CEOs. (Table 5 Panel A).

4.2 Compensation Structure

As a result of the significant decline in cash bonus during the crisis accompanied by a significant increase in base salary (for small bank CEOs), there is an evident shift in compensation structure. Almost three quarters of bank CEO total compensation was paid in non-incentive based pay during the crisis (Table 5 Panel B) compared to 61% before the crisis. The prominence of base salary grew as cash bonus no longer accounted for a quarter of total compensation. Instead the proportion of cash bonus fell significantly to 13% during the crisis. The proportion of new option grant values was also adversely affected. Therefore, these findings show an increased reliance on non-incentive pay during the crisis. In addition to political outcry, market and regulatory scrutiny brought bank CEO incentive based pay to the forefront of the crisis. This pressure forced banks to change their compensation structure.

5. Conclusion

In the latter part of the 1980s to the early part of the 1990s, the market erupted over the controversy of whether CEOs are overpaid. The controversy surrounding executive compensation has been a long-standing one such that the debate relating to its multi-issues regained momentum due to public outcry during the crisis. However, deliberations were centered on financial sector CEO compensation. The purpose of the study is to analyze bank CEO compensation practices under distressed conditions as the recent financial crisis. The findings of this study are important in understanding bank compensation practices under extreme worst case scenario and add to the literature on what happens to bank CEO compensation during a financial/banking crisis. This study emphasizes two dimensions of CEO compensation, namely compensation levels and structure,

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and four components of CEO compensation, namely, base salary, cash bonus, and other annual compensation (short-term measures), and stock option pay (long term measure). The study covers 2003 to 2009 to demonstrate how compensation practices shifted before the crisis (2003 to 2006) and during the crisis (2007 to 2009). All amounts are deflated to 2003 dollars. This paper is distinguished from others as it utilizes real compensation data compared to others that analyze nominal data.

The results show real growth in average CEO base salary that persisted in the crisis. Despite the growth, only small bank CEOs were paid significantly higher base salary during the crisis. The higher base salary compensated these CEOs for the loss in cash bonus during the crisis. Large bank CEOs did not experience similar offsetting effects despite also receiving significantly less cash bonus during the crisis. As a result, there was increased reliance on non-incentive pay (base salary) than incentive pay (cash bonus and new option grants) during the crisis. Overall, these findings show that banks changed their compensation practices in response to the distressed conditions presented in the crisis.

As there remain only few studies on bank CEO compensation in a crisis, the findings of this study are limited for comparison to similar studies on bank CEO compensation in other financial market crisis. Thus, further studies should be conducted on bank CEO compensation in other financial market crisis. Also, further studies in this area should compare compensation practices in the post crisis period to determine how they have progressed in an economic upturn and the extent to which they may resemble practices that existed before the crisis.

Endnotes

¹ CEOs of S&P 500 firms experienced a 146% growth in compensation between 1993 and 2003, while CEOs of S&P Mid-Cap 400 and Small-Cap 600 experienced respective growths of 81.8% and 53.9%.

² The proportion of CEO equity-based pay increased from an average 45% in 1993 to 52% in 2003. S&P 500 firms experienced the greatest increase to 59% in 2003 (1993: 41%).

³ Public outcry peaked when media attention centered on the \$165 million bonus package paid to AIG executives after the company received governmental commitment of \$180 billion in 'taxpayers' rescue funds. (See Story, L., and E. Dash, "U. S. to propose wider oversight of compensation", *The New York Times* cited on *June 7, 2009*).

⁴ Treasury Secretary Geithner stated in a report to Reuters Television on May 8, 2009, that "this crisis was caused in part by the fact that compensation practices just got way divorced from reality...so it is very important that the financial industry change those compensation practices so that they are no longer providing strong incentives for excessive short-term risk taking." In other appearances, Treasury Secretary Geithner indicated that while the financial crisis had multiple causes, executive compensation was a contributing factor.

⁵ Other measures under TARP include limiting the payment of bonuses to the top 25 executives to no more than one third their respective salaries. However, this bonus must be in the form of long-term incentives such as restricted stocks which cannot be liquidated until TARP funds are repaid.

⁶ Becher et al. (2005); Bryan et al. (2005); Collins et al. (1995); Crawford et al. (1995); Cuñat and Guadalupe (2009); Fields and Fraser (1999); Hubbard and Palia (1995); Kole and Lehn (1997); Yang (2011).

⁷ Other annual compensation may include perquisites and other personal benefits such as payment for membership in professional or social associations, car service, etc.

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Appendix – Stock Option Valuation

Stock options are valued based on Core and Guay's (2002) One-year Approximation Method for Estimating Option Values ("OA Method") and the Modified Black-Scholes Option Valuation methodology utilized by Execucomp. Option values are computed as:

$$\text{Option value} = \left[S e^{-dT} N(Z) - X e^{-rT} N\left(Z - \sigma T^{\frac{1}{2}}\right) \right]$$

Where:

- Z -
$$\frac{\ln\left(\frac{S}{X}\right) + T\left(r - d + \frac{\sigma^2}{2}\right)}{\sigma T^{\frac{1}{2}}}$$
- N - Cumulative probability function for the normal distribution
S - Market price per share
X - Exercise price or strike price per share
 σ - Expected stock-price volatility over the life of the option
r - Natural logarithm of the risk-free interest rate
T - Term of the grant in years
d - Natural logarithm of expected dividend yield over the life of the option

The exercise price for new option grants and previously-granted exercisable and unexercisable options for 2006 to 2009 are directly obtained from Schedule 14A. Data prior to 2006 for previously-granted exercisable options and unexercisable options were extrapolated. These values are estimated using Core and Guay's (2002) OA Method. Exercise prices of previously-granted exercisable and unexercisable options are determined using the average realizable values of options. The average realizable values are determined by dividing the realizable values of exercisable and unexercisable options by the respective number of exercisable and unexercisable options. However, the realizable values and number of exercisable and unexercisable options are firstly adjusted for newly issued option grants which are accounted for separately. The result of the mathematical division yields an average realizable value recognized as the excess of the stock price over exercise price. The average realizable value is then subtracted from the current stock price to determine the exercise price. This is based on Core and Guay (2002)'s assumption that exercise prices for out-of-the-money stock options equal their current stock prices. The market price per share is obtained from CRSP. In the absence of current market price data, using Execucomp's assumption, the current market price equals the strike price per share.

Based on the OA Method, new option grants are assigned a time to maturity of 10 years unless otherwise stated in Schedule 14A. Terms of previously-issued exercisable and unexercisable option grants for 2006 to 2009 are readily obtained from Schedule 14A. Previously-issued exercisable and unexercisable option grants prior to 2006 are assigned a time to maturity of 6 and 9 years, respectively. Execucomp approximates risk-free rate of interest using the average yield on a 7-year treasury bond. The yield on a Treasury bond is used to exemplify a risk free indicator and a 7-year term is used to reflect the assumption that stock option grants carry 10-year terms to maturity of which majority of executives exercise their options after 70% of the term has expired. The average yields for 2003 to 2006 are obtained from Execucomp, while average yields for 2007

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to 2009 using 7-year Treasury bond yields accessed from the U.S. Department of the Treasury at www.treas.gov are computed.

Execucomp approximates stock price volatility using the prior 60-month stock price volatility. Stock price volatilities must lie between the 5th and 95th percentiles of the average volatility of the S&P 1500. Thus, volatilities outside the range are increased or decreased accordingly to reduce the effect of outliers. The 60-month stock price volatilities are estimated for the sample of banks using stock prices from CRSP and applying the 5th and 95th percentile haircuts for 2003 to 2006 obtained from Execucomp. The haircuts for 2007 to 2009 are computed by estimating stock price volatilities for the S&P 1500 firms and apply them to the remaining volatilities for the sample of banks for 2007 to 2009. Execucomp requires that as many months are utilized in the computation of stock price volatilities for stocks which are traded for less than 60 months. The average volatilities for the S&P 1500 are utilized for stocks which are traded for less than 12 months. Thus, the average volatilities for the S&P 1500 for 2003 to 2006 are obtained from Execucomp and the average volatilities for 2007 to 2009 are computed using stock prices on the S&P 1500 firms obtained from CRSP for stocks that traded for less than 60 months. Execucomp estimates dividend yield using the 3-year average dividend yield. Estimated dividend yields are reduced to the 95th percentile of the dividend yield of the S&P 1500 to reduce the effect of outliers. Dividends yields on sample firms and S&P 1500 firms are obtained from COMPUSTAT. The 95th percentile haircuts for 2003 to 2006 are obtained from Execucomp and the 95th percentile haircuts for 2007 to 2009 are computed using the dividend yields of S&P 1500 firms obtained from COMPUSTAT.