

Board compensation and fair-value accounting with commercial banks

Abstract

Under US-GAAP, trading securities are measured at fair value through profit or loss. There is some discretion to designate securities into a certain accounting category that might be driven by the structure of board compensation. With U.S. commercial banks listed in S&P 500, we observe a significantly positive association between the ratio of trading securities to total assets and the value of share based board compensation. We find a significantly *negative* association with the value of option based board compensation, though. Correlations are stronger since the SEC increased disclosure requirements of executive compensation in 2006. There is no significant association with the level of available for sale securities. Our results are robust to different model specifications. This evidence suggests that the motive of the discretionary use of designating financial instruments is to improve reporting quality rather than to seek rents.

Board compensation and fair-value accounting with commercial banks

1 Introduction

In a recent study by PricewaterhouseCoopers (2008), 70% of financial services industry executives and commentators claim that the reward systems have contributed to the recent financial crisis and 95% think that the compensation system in the financial services industry needs reform. Other parties have blamed fair-value accounting (FVA) for amplifying and extending the subprime crisis and the severe financial crisis that followed. For instance, the American Bankers Association in its letter to the SEC in September 2008 says: “The problems that exist in today’s financial markets can be traced to many different factors. One factor that is recognized as having exacerbated these problems is fair-value accounting.”

Even though there is evidence that fair value accounting makes commercial banks’ income and equity more volatile (Barth et al., 1995, Hodder et al., 2006, Khan, 2009) one can certainly not blame FVA by itself for the crisis (Laux and Leuz, 2009). Rather, one has to look “behind the curtain”: What drives the extent of FVA within commercial banks?

This paper investigates whether the level of FVA in banks is associated with equity-based board compensation – namely by shares and stock options. While higher levels of FVA tend to improve reporting quality and to increase share prices (Leuz and Verrecchia, 2000, Daske et al., 2008) it also leaves more leeway for management discretion in the absence of so called Level 1 prices in active markets. Discretion is considerable: By the end of 2007, more than 90% of all FV-positions at U.S. financial institutions do *not* reflect Level 1 prices (IMF, 2008: 111). With shares, discretion can be used to overstate earnings. With options, discretion can be used to affect both the level *and* the variability of earnings since the option value is also increasing in the underlyings’ risk. Option based compensation seems to provide stronger incentives for (real) earnings management. Consequently, rational shareholders should have a

stronger interest in limiting FVA with option based compensation than with share based compensation.

To sum up, there are two competing hypotheses. Under the *moral hazard* hypothesis, we expect a positive association between FVA and stock and options based compensation. According to a *contracting* hypothesis, we might expect a negative association, if the costs of FVA exceed its benefits. Since the management might have stronger incentives to opportunistically use FVA with option based compensation, we may rather expect a negative sign with it than with stock based compensation.

We find a significantly positive association between share based board compensation and the level of FVA for listed U.S. commercial banks listed in the S&P 500. We document a significantly *negative* association between option based board compensation and the level of FVA. With regard to option based compensation, correlation coefficients are stronger and significant since 2006 when the SEC made the FASB recommendations to report the fair value of options grants compulsory¹ and increased the disclosure requirements of executive compensation. We find no significant association between the quota of available for sale (afs) securities and share or option based board compensation. This finding indicates that fair value changes in afs-securities may not be relevant for board compensation.

These results suggest that shareholders and executive compensation committees balance the benefits and costs of fair value accounting differently with share based compensation as compared to option based compensation. With shares the benefit of increased disclosure outweighs possible distortions of earnings management. With options, increased volatility of FVA makes it more likely that the board receives high compensation even when real performance was poor.

¹ Before 2004, stock options granted for compensation were reported at intrinsic value which often was zero.

Our results indicate that bank shareholders are aware of the interaction between share and option based compensation and accounting choices. This finding complements previous evidence which shows that option based CEO compensation induces earnings management (Bergstresser and Philippon, 2006), misreporting (Burns and Kedia, 2006) and more aggressive assumptions on pensions plans (Bergstresser et al., 2006). However, this literature looks at non-financial firms and has been performed with datasets before the SEC requirement on option reporting became effective in 2006.² Moreover, we stress the issue of FVA which includes both discretionary accounting choices but also real earnings management with banks.

We add to the scarce literature on how *bank* board compensation affects accounting choices. The above literature looks at non-financial firms only. However, banks are different to non-financial firms with respect to stakeholder interests, management compensation, business and financial accounting. First, hostile take-overs and concentrated ownership are less common with banks than with other industries such that contracts are more important to mitigate moral hazard problems (Adams and Mehran, 2003). Second, next to shareholders, depositors and regulators are important stakeholders, the latter two rather being concerned about the bank's financial stability. This might explain why Houston and James (1995) as well as Adams and Mehran (2003) find the quota of CEO pay in the form of shares and options being lower in the banking industry. Third, the banks' business is generally considered to be relatively opaque which alleviates earnings management (Nichols et al., 2009).

Finally, FVA is especially common with banks because they hold more (financial) assets that can be reliably measured at fair value. Interestingly, compared to non-banks, the extent of FVA with banks does not only reflect discretionary accounting choices but also the *structuring* of transactions in order to alter financial reports (*real* earnings management).

Under US-GAAP and IAS 39, replacing held-to-maturity instruments by trading securities

² For instance, Burns and Kedia (2008) and Bergstresser and Philippon (2006) consider the years 1997-2002 and 1994-2000, respectively.

increases the level of FVA. The costs of real earnings management are low since it is relatively cheap for banks to buy and sell financial securities whereas it is costly for non-banks to buy and sell investment property or machines measured at fair value. Securities measured at fair value are the most important fair value category with banks and fair values are relevant for market pricing (Barth et al., 1994, Hodder et al., 2006).

There are a few papers on the relationship between bank board compensation and income smoothing by loan loss provisions (Greenawalt and Sinkey, 1988). However, loan loss provisioning is neither related to accounting choices on securities nor to real earnings management. Moreover, these studies have been conducted before the SEC changed the regulations on the disclosure of board compensation and on option based compensation in particular. Considering the importance of the banking industry, an analysis on the relationship between bank board compensation and FVA might be of general interest.

The remainder of the paper is organized as follows. Section 2 reviews the literature in more detail and develops the hypotheses. Section 3 describes the research methodology and the dataset. Section 4 contains the basic regression analysis and sensitivity tests for banks listed in the S&P 500. Section 5 shows different results with other listed banks. Section 6 concludes.

2. Literature review and hypotheses

In the first step we review the literature on the benefits and costs of fair-value accounting, in the second step we link board compensation to fair-value accounting. The basic messages are that with banks there is no clear-cut answer whether FVA is suitable to improve disclosure quality and to limit managerial opportunism. Further, other things being equal, FVA is less warranted with option based compensation than with share based compensation.

2.1 Benefits and costs of fair-value accounting

There are two issues related to FVA, the informative role on the valuation of the bank's financial securities and the contracting role for motivating managers. We try to keep these issues distinct.

Fair value accounting (FVA) is generally meant to improve disclosure quality³ and to increase transparency (Laux and Leuz, 2009). Consequently, FVA may reduce adverse selection problems and estimation risks in equity markets (Daske et al., 2008). FVA may also reduce the investors' cost to compare firms across markets and countries (Barth et al., 2010). Improving transparency and comparability might especially be important for banks since the financial business is considered to be relatively opaque. Banks intermediate many types of risks in the debt markets – like credit risks, interest risks and liquidity risks among others – which are difficult to observe for arm's length investors (Nichols et al., 2009).

FVA may not only mitigate adverse selection problems but also moral hazard problems. Laux and Leuz (2009) argue that compared to historical cost accounting (HCA), managers find it more difficult to opportunistically use discretion in accounting choices (see also Barth et al., 2008). HCA may induce bank managers to selectively sell financial instruments with

³ Fair value accounting may also increase disclosure in quantitative terms. In what follows, we stick to the argument of improved disclosure quality.

unrealized gains and to keep those with losses even though it might not be efficient to do so (so-called gains trading). HCA allows bank managers to decide when to realize the gains whereas FVA does not. Further, impairment testing is less strict under HCA than under FVA which better serves managers' incentives to hide or postpone (appropriate) write-downs (Ramanna and Watts, 2007). By limiting managerial discretion and increasing transparency, FVA might be better suited to encourage prompt corrective actions, such as by shareholders, bondholders and regulatory bodies.

There are also costs to FVA. Observed reporting quality is not only driven by disclosure rules and accounting standards but also by reporting incentives. The definition of fair value according to FAS 157 leaves some discretion: "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date." Managers may use private information and the considerable judgment associated with FVA with opportunistic discretion. The amount of discretion is influenced by many factors such as the country's legal institutions, forces of various markets and the firm's business characteristics. With banks, there is considerable judgment with the measurement of fair value of financial instruments. Quoted prices in active markets are most preferable according to FAS 157 and IAS 39 (Level 1). If those prices are not available, FAS 157 requires to measure the financial instrument based on quoted prices for similar assets and liabilities in active markets or of identical or similar assets in inactive markets or other relevant market data (Level 2 inputs, see also IAS 39.AG74). If Level 1 and Level 2 inputs are not observable, fair value is to be measured based on model assumptions (mark-to-model approach, see also IAS 39.AG75-76). Banks noted that there is considerable judgment, in particular, when Level 3 inputs are used (Morgan Stanley, 2004). The IMF (2008: 111) reports that by the end of 2007, only 6% of all FV-positions at U.S. financial institutions

reflect Level 1 prices whereas it is 22% with Level 3 measurement tools.⁴ To sum up, reporting quality might be impaired when fair values are mainly based on models that are not reliable.⁵ If banks use discretion on fair value accounting to a different extent it is questionable to which extent FVA improves comparability across financial statements of different banks. Even when fair values are based on quoted prices, market inefficiencies and investor irrationality may limit disclosure quality (Laux and Leuz, 2009).

Further, FVA may cause a downward spiral in financial markets when banks (are forced to) sell assets in limitedly liquid markets below the fundamental value (Allen and Carletti, 2008). The reason for the sale might be regulatory capital requirements or incentives for short-term earnings management (Plantin et al., 2008). The consequent drop in market price may become relevant to other financial institutions that are required to mark their asset to market and may force them to sell their assets below fundamental value. FVA may also induce management actions in busts. Asset write-ups allow banks to increase their leverage then which makes them more vulnerable in economic downturns again (Persaud, 2008).

To sum up, it is an empirical question whether FVA is suitable to limit managerial opportunism and to improve disclosure quality. With regard to non-financial firms the empirical evidence is quite clear. Improved disclosure in terms of IFRS adoption in European countries improves accounting quality in terms of less earnings management, more timely loss recognition and more value relevance of accounting amounts in stock markets (Barth et al., 2008). Leuz and Verrecchia, 2000 and Daske et al., 2008 report that with IFRS adoption trading volumes increase, bid-ask spreads decrease and the cost of capital decreases. Market price reactions are more pronounced for banks than for non-banks (Armstrong et al., 2010).

⁴ European financial institutions report 5% of all FV-positions at Level 1 prices and 28% at Level 3 measurement tools.

⁵ Song et al. (2010) report that with banks, the value relevance of level 1 and Level 2 fair values is greater than the value relevance of Level 3 fair values.

Improved disclosure in terms of higher levels of voluntary disclosure lowers bid-ask spreads and cost of debt (Botosan, 1997 and Sengupta, 1998, respectively).

With regard to banks there is less evidence. Barth (1994) finds that fair value estimates of banks' investment securities have significant explanatory power for bank share prices beyond that provided by historical costs. Bernard et al. (1995) provide evidence that mark-to-market accounting induces more reliable estimates on share prices of Danish banks but also induces greater volatility in reported profitability. Similarly, Hodder et al. (2006) find that fair value accounting is more closely related to capital market pricing for U.S. banks and that full-fair-value income is much more volatile than comprehensive income or net income. Barth et al. (1995) find that fair-value based income is more volatile than historical cost income. To sum up, there is evidence that FVA is relevant for the pricing of bank shares but that it also increases volatility.

2.2 Fair value accounting and board compensation

There are two competing hypotheses on the relation between board compensation and financial accounting choices. According to the *contracting* hypothesis, FVA is used in contracting when it is beneficial to the contracting parties, such as mitigating adverse selection and moral hazard and thereby decreasing the cost of capital. However, bank managers may also take advantage of financial accounting choices in order to maximize their own utility even if it is to the expense of the stakeholders (moral hazard hypothesis).

The structure of executive compensation indeed affects financial accounting choices. Healy (1985) and Watts and Zimmermann (1986) were the first to provide evidence on how managerial compensation affects earnings management as measured by discretionary accounting accruals. More specifically, there is evidence that the value of CEO share option holdings induces earnings management (Cheng and Warfield, 2005 and Bergstresser and

Philippon, 2006), misreporting (Burns and Kedia, 2006) and more aggressive assumptions on pensions plans (Bergstresser et al., 2006). This literature looks at non-financial firms and is rather in line with the moral hazard hypothesis.

There is only scarce literature on how *bank* CEO and board compensation affects accounting choices. Adams and Mehran (2003) find that the quota of CEO pay in the form of shares and options is lower in the banking industry than in other industries. Smith and Watts (1992) and Mayers and Smith (1992) find a different compensation structure in regulated industries (banks, utilities) in term of a lower pay-for-performance sensitivity. There is only little evidence that income smoothing via loan loss provisions is affected by compensation policy (Greenawalt and Sinkey, 1988). We were not able to find a more recent study on how share and option based compensation affects earnings management with banks. We are interested in the extent of FVA since this reflects both forms of earnings management, the judgment in financial reporting but also the structuring of transactions to alter financial reports.

Since the empirical results suggest that FVA increases disclosure quality and higher disclosure quality decreases the cost of capital and increases share prices we expect a stronger incentive for fair value accounting with higher levels of share based compensation – in the absence of management opportunism. However, if the board is inclined to use discretion with fair value accounting in order to influence share prices shareholders may rationally be interested in limiting the discretion to do so. We may then expect lower levels of fair value accounting with more share based board compensation. Still, we define hypothesis 1 in the light of the empirical results found in the literature so far which are more in line with the moral hazard hypothesis.

Hypothesis 1: With commercial banks, there is a positive association between *share* based board compensation and the extent of FVA through profit and loss.

We measure FVA through profit or loss by the proportion of trading securities designated at fair value through profit or loss. With commercial banks, also available for sale securities at measured at fair value. However, unrealized gains and losses do not enter the income statement unless there are impairments other-than-temporary. Due to the intention to trade, trading securities are more likely to be marked to market than available for sale securities. Unrealized gains and losses from available for sale securities do not affect regulatory capital as calculated by U.S. banking regulators (Laux and Leuz, 2009) indicating that there is a lower degree of reliability. We may therefore reasonably assume that the income from trading assets is more value relevant. Since we cannot observe the precise features of the compensation contracts we still define hypothesis 2 similar to hypothesis 1.

Hypothesis 2: With commercial banks, there is a positive association between *share* based board compensation and the proportion of available for sale securities.

With regard to *option* based compensation the board still is able to increase the intrinsic value and the fair value of the option by improving disclosure, e.g. by increasing the level of FVA. However, since options imply a convex pay-off function an opportunistic board may use fair value accounting not only to influence the level of share price but also the *volatility* of share prices. There is strong evidence that fair value accounting makes commercial banks' income more volatile (Barth et al., 1995, Hodder et al., 2006, Khan, 2009). Thus, in semi-efficient markets bank boards are able to increase the value of the options by increasing the level of FVA, such as by investing into fair value securities even though this does not necessarily increase firm value. Note that such structuring of transactions to alter financial reports does pay less with share based compensation. Banking supervision agencies and the federal deposit insurance (FDIC) are especially sensitive to high risk exposures of banks and watch board compensation at banks carefully. The FDIC Improvement Act of 1991 (FDICIA) provides

bank regulators with oversight authority concerning the compensation of senior bank management (Houston and James, 1995). Shareholders (and regulators) are supposed to have a stronger interest in limiting FVA with option based compensation than with share based compensation. Still, considering the findings of Bergstresser and Philippon (2006) and Burns and Kedia (2006), we claim:

Hypothesis 3a: With commercial banks, there is a positive association between *option* based board compensation and FVA through profit or loss.

Hypothesis 3a is more likely to hold when arm's length investors find it easy to observe the extent and structure of option based compensation. Since 2004, the FASB recommends firms to report the fair value of option grants eliminating the previous alternative of reporting the intrinsic value if different to zero. Thus, before 2004, boards were better able to hide information on option based compensation such that outside investors were less able to evaluate the incentive effects. In 2006, the SEC made the FASB recommendations compulsory and increased the disclosure requirements of executive compensation. We therefore expect a (stronger) negative association between option based compensation and the extent of FVA since 2006 on.

Hypothesis 3b: Since 2006, the association between *option* based board compensation and the proportion of trading securities designated at fair value through profit or loss is (more) negative.

3. Methodology and data

3.1 Data selection

The basic database is Execucomp which comprises detailed data on executive compensation for listed U.S. corporations from 1992 on. We selected only data on executives from commercial banks (NAICS-Code: 522110). Investment banks have a different business model which is likely to affect investment policy and financial accounting choices. Since we had to match the compensation data with financial accounting data from Bankscope and Bankscope only has data from 2001 on, we started with 3,874 observations from 1,015 executives, 118 banks and 664 bankyears for the years 2001-2008. We had to drop the year 2001 because important data on banks registered in the S&P 500 was missing in Bankscope, e.g., total assets. We left out the year 2009 since by the end of 2008 a big discussion in the media on bank board compensation started which might have affected the compensation structure in 2009.⁶ Therefore, the investigation period is 2002-2008.

Our focus was on banks listed in S&P 500 which results in 17 banks with 119 bankyear observations. We were interested in S&P 500 banks since we believe that corporate governance works more effectively there than with other banks. Complementary, banks listed in the S&P 500 show high levels of outside ownership suggesting that information asymmetries and moral hazard problems are relatively pronounced and that financial accounting serves an important role to limit information deficits. With higher levels of inside ownership, financial accounting is less necessary to overcome problems of asymmetric information and moral hazard (Burgstahler et al., 2006). Still, we also present regression results for banks that are not listed in the S&P 500.

⁶ The sensitivity analysis in section 4.6 shows results including the year 2009.

We excluded 33 bank-year observations from the sample where data on our main proxy for FVA was missing, but we included a bank-year when trading securities explicitly had the value zero. The final sample comprises of 86 bank-years for 15 banks. In the matched sample we have 10 observations in 2002, 11 observations in each year from 2003 to 2005, 13 observations in 2006 and 15 observations each in 2007 and 2008.

With regard to available for sale securities we excluded 10 bank-years due to missing data. The final sample comprises of 109 bank-years for 17 banks. In the matched sample we have 15 observations in each year from 2002 to 2006 and 17 observations each in 2007 and 2008.

3.2 Descriptive statistics

In this section we describe the main variables: stock based compensation, option based compensation and FVA. The FVA measure is based on the Bankscope database. The compensation variables are based on the Execucomp database which comprises detailed data on the structure of executive compensation for listed U.S. corporations. We matched both databases. Table 1 provides summary statistics on compensation variables of the matched sample. Graph 1 depicts the importance of share and option based compensation relative to fixed salary

Table 1: Descriptive statistics on board compensation variables (S&P 500 banks)

	2002 n=10	2003 n=11	2004 n=11	2005 n=11	2006 n=13	2007 n=15	2008 n=15	2009 n=14	2001- 2009 n=100
Salary in 1,000 \$									
mean	3,268	3,511	3,417	3,202	3,570	3,718	3,510	4,588	3,631
median	3,000	3,191	3,206	2,980	3,254	3,485	3,341	3,402	3,215
Share awards in 1,000 \$									
mean	4,829	3,845	4,772	4,099	7,282	10,387	5,953	12,267	6,997
median	68	1,320	0	0	4,086	4,841	3,427	6,663	2,600
Option awards (OPT) in 1,000 \$									
mean	6,097	7,513	9,130	6,009	7,340	9,186	7,124	4,087	7,074
median	5,146	5,299	4,466	3,633	4,716	4,950	3,939	1,824	4,200
Value of share awards/salary									
mean	0.99	0.80	0.86	0.86	1.74	2.49	1.61	2.97	1.63
median	0.04	0.31	0	0	1.10	1.49	0.99	1.94	0.89
Value of option awards/salary									
mean	1.81	1.96	2.49	1.72	1.97	2.27	1.84	0.93	1.86
median	1.57	1.22	1.57	1.26	1.32	1.65	1.09	0.51	1.31

Salary: The dollar value of the base salary earned by the named executive officer during the fiscal year. Share awards: until 2005: The value of restricted stock granted during the year (determined as of the date of the grant). Since 2006: Fair value of all stock awards during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R. Option awards: until 2005: The aggregate value of stock options granted to the executive during the year as valued using Standard & Poor's Black-Scholes methodology. Since 2006: Fair value of all options awarded during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R.

Graph 1: Importance of share and option based compensation relative to fixed salary (mean values)

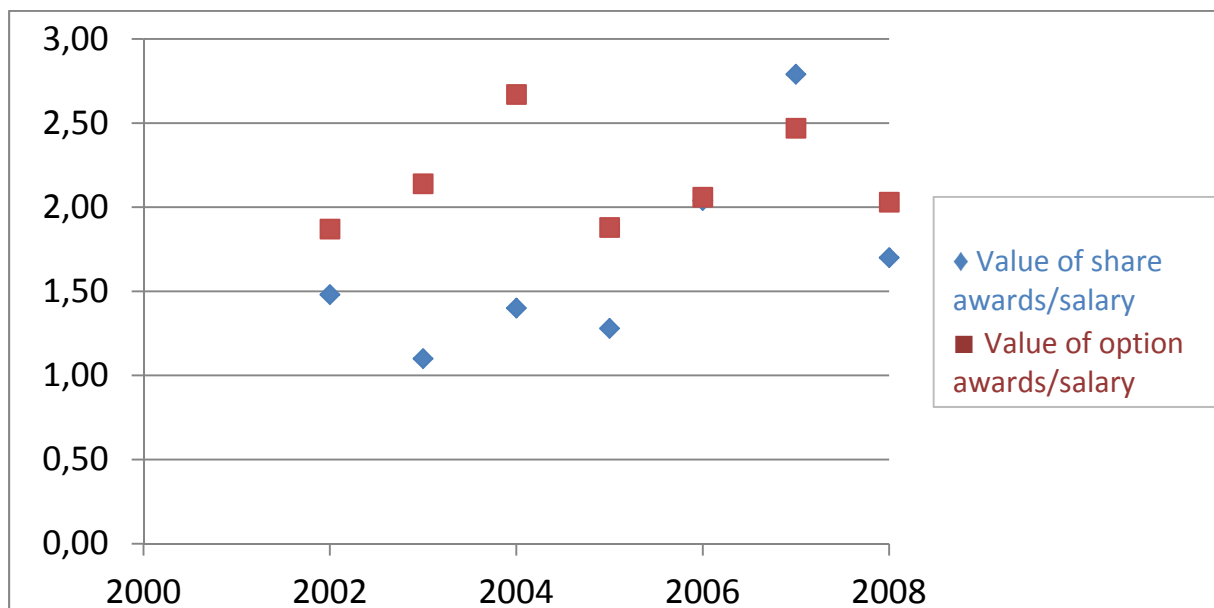


Table 1 shows that the salary has been quite stable in the course of time; moreover, there is not too much variation across banks. Board compensation by shares and options is much more important than salary and varies more both in the course of time and across banks. On average, bank boards receive option and share awards that exceed the fixed salary on average by more than 80% and more than 60%, respectively. Whereas share based compensation becomes relatively more important in recent years, option based compensation is stable in the mean value and declines in median value. The median ratio of the value of option awards to salary is 1.57 in 2002 and 0.51 in 2009. The importance of stock awards is increasing, with a median ratio of share awards to salary of 0.04 in 2002 and 1.94 in 2009. Note that option awards are bigger than share awards in absolute terms until 2008. Note also that changes in option and share awards move in the same direction until 2008. The year 2009 is special for two reasons. First, compared to 2008 share awards are significantly increasing whereas option awards decrease. Second, it is the first year where share awards become more important. We might assume that compensation structure in 2009 already reflects a response to the public discussion on the reward systems in the banking industry. From a statistical point of view, we may consider the year 2009 as being biased.

Compared to previous studies, salary and the relative importance of option awards have increased significantly until 2002. For the period 1980-1990, Houston and James (1995) report a median salary plus bonus of 324'000 \$ and a median ratio of the value of option awards to cash compensation (salary and bonus) of 0.15 for 134 commercial banks included in the *Forbes* annual survey of executive compensation. Adams and Mehran (2003) find the median ratio of value of option awards to salary and bonus to increase from 0.20 in 1991 to 1.22 in 1999. They look at 35 publicly-traded bank holding companies (BHC) that were among the 200 largest top tier BHCs in terms of book value of assets for each year between 1986 and 1996.

The distribution on option and share based compensation is highly skewed in both absolute and relative terms. The maximum option awards in the basic sample amount to 41.1 million \$, which is almost ten times the median value. The maximum ratio of option awards to salary is 10.55 whereas the median is 1.31. The maximum of share compensation is 49.1 million \$ (in 2009), which is almost 19 times the median value. The maximum ratio of share awards to salary is 17.93 (in 2009) whereas the median is 0.89. Maximum salary is 17.4 million \$ (in 2009) which does not exceed the median value of 3.2 million \$ too much.

3.3 Methodology

Since the year 2009 is likely to bias our analysis we leave it out with the main regression. Our main variables are TR, AFS, SHARE and OPT. Bankscope provides financial accounting data on banks since 2001. In 2006, Execucomp changed the format and the name of variables. In order to have sufficient sample size we tried to find items that define share awards and option awards as close as possible. Execucomp provides help which items of the new format are considered to match the items in the previous format best. We split up the sample into subsamples considering the years 2001-2005 and 2006-2008 and qualitative results remain robust. Still, the more recent years show some specific effects which might be related to the stricter SEC disclosure requirements on option based compensation.

We consider trading and available for sale securities since those are the most relevant balance sheet items measured at fair value in banks. Trading securities are measured at fair value through profit or loss whereas a change in fair value of available for sale securities is reported in other comprehensive income. Consequently, only if executives think comprehensive income is relevant to the capital market we might expect a correlation between management compensation and the stock of available for sale securities.

We considered several control variables which presumably affect the level of fair value accounting as well. The accounting literature shows that reporting quality increases with firm size and we therefore would expect higher levels of FVA. Larger banks may also be more involved into investment banking activities because globally operating clients might be more likely to ask for it. Banks with higher ROA may have stronger incentives to report under fair value accounting to better reveal economic performance. Depositors are usually not well informed. Therefore, higher levels of FVA might be suitable to better signal the economic performance. A similar argument holds for ordinary investors. The larger the free float, the more pronounced is the information asymmetry between management (and major shareholders) and ordinary shareholders. Therefore we expect higher levels of FVA with a larger free float. Banks with higher debt ratios have stronger incentives to reveal hidden reserves and are more prone to use FVA. From a regulatory point of view, banks are required to keep up a minimum total capital ratio of 8% to total risk-weighted assets. The closer the bank is to the minimum ratio the more likely the bank is to reveal hidden reserves by FVA. Finally, we also control for the operating risk as reflected by the variation of the bank's share price (VOL). Since compensation by option awards may induce the bank management to increase business risk (Chen et al., 2006 and Dong et al., 2010), we control for this effect. We also control for the financial reporting standard. When Bankscope refers local GAAP, the US-GAAP variable takes the value 1, if Bankscope refers to regulatory GAAP, it is zero. The changes in fair value reported in other comprehensive income are generally excluded from regulatory capital ratios which requires to control for the financial accounting standard (Khan, 2009). Table 2 shows the summary statistics for bankyears 2001-2008.

Table 2: Summary statistics

	Mean	Median	Std. Dev.	Min.	Max.
<i>Dependent variables</i>					
TR: Trading securities at fair value / total assets in % (B # 11150, 2025)	2.029	1.031	2.599	0.001	10.485
AFS: Available for sale securities / total assets in % (B # 11170, 2025)	14.083	13.017	5.295	5.580	31.778
<i>Main independent variables</i>					
SHARE: Share awards / salary (E)	1.416	0.645	1.919	0	8.129
OPT: option awards / salary (E)	2.016	1.391	2.138	0	10.552
<i>Control variables</i>					
US-GAAP (B)	0.837	1	0.371		
SIZE: log(total assets in 1,000 \$) (B # 2025)	18.45	18.29	1.08	16.99	21.32
ROA: return on average assets in % (B # 4024)	1.016	1.231	0.994	-3.896	2.678
VOL: average annual share price movement from mean price, in % (D)	19.13	18.32	3.65	13.74	28.84
DEP: average customer deposits / total assets in % (B # 18385, 4024)	60.29	61.51	8.10	27.02	72.05
REGCR: regulatory total capital ratio in % (B # 38300)	12.70	12.40	1.67	10.2	20.2
DEBT: debt-equity ratio (1/B # 4012)	9.551	9.195	2.083	5.446	14.085
FLOAT: Free float number of shares in % (D)	82.95	88.39	15.56	48.42	100

B: Bankscope, D: Datastream, E: Execucomp. Since 2006, Execucomp has changed the format and name of variables. SHARE: until 2005: The value of restricted stock granted during the year (determined as of the date of the grant). Since 2006: Fair value of all stock awards during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R. OPT: until 2005: The aggregate value of stock options granted to the executive during the year as valued using Standard & Poor's Black-Scholes methodology. Since 2006: Fair value of all options awarded during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R. SALARY: The dollar value of the base salary earned by the named executive officer during the fiscal year. REGCR: Total capital adequacy ratio under the Basel rules. It measures tier 1 and tier 2 capital which includes subordinated debt, hybrid capital, loan loss reserves and the valuation reserves as a percentage of risk weighted assets and off balance sheet risks. FLOAT: The percentage of total shares in issue available to ordinary investors which equals the total number of shares less the strategic holdings. In general, only holdings of 5% or more are counted as strategic.

4. Results

4.1 Board compensation and trading securities measured at fair value

The basic regression model is specified as follows:

$$(1) \quad TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} (+ \alpha_2 OPT_{it}) + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} \\ + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + YEAR_i + \varepsilon_i$$

Table 3: Pooled OLS, share/option based compensation of the bank board and the proportion of trading securities measured at fair value only

$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} (+ \alpha_2 OPT_{it}) + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + YEAR_i + \varepsilon_i$					
	Model 1	Model 2	Model 3	Model 4	Model 5
SHARE	0.817 (3.78)***		0.579 (4.34)***	0.422 (3.67)***	0.515 (6.14)***
OPT		0.049 (0.75)		-0.424 (-5.23)***	-0.378 (-5.50)***
US-GAAP			1.035 (2.26)**	1.348 (3.19)***	1.053 (2.77)***
SIZE			1.110 (4.15)***	1.715 (5.84)***	1.547 (7.23)***
ROA			0.079 (0.54)	0.109 (0.45)	
VOL			0.021 (0.32)	0.094 (1.52)	
DEP			0.004 (0.11)	-0.017 (-0.52)	
REGCR			0.203 (1.49)	0.318 (2.43)**	0.235 (2.29)**
DEBT			0.511 (5.04)***	0.467 (5.19)***	0.508 (6.10)***
FLOAT			-0.014 (-1.03)	-0.017 (-1.39)	-0.027 (-2.84)***
YEAR			included	included	
Constant	0.872 (3.97)***	1.931 (5.91)***	-27.163 (-3.84)***	-39.463 (-5.15)***	-32.970 (-7.83)***
R ²	36.43 %	0.16 %	67.29 %	75.59 %	73.79 %
N	86	86	86	86	86

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

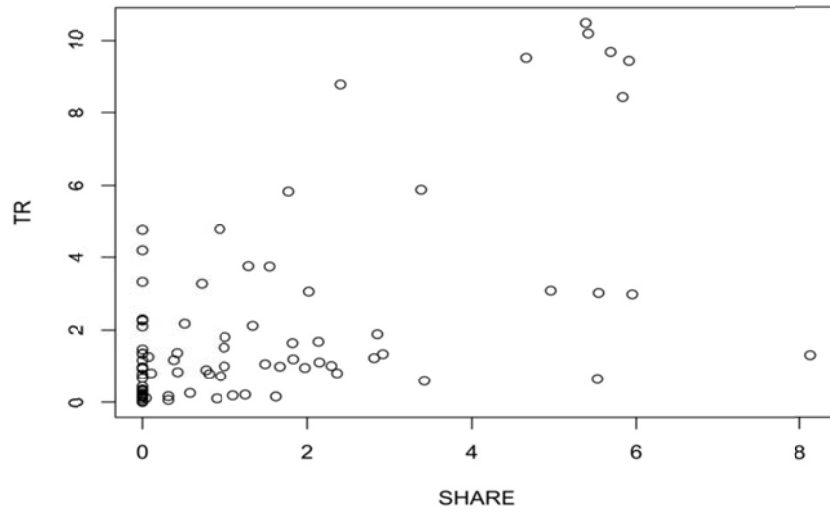
We obtain model 5 by a stepwise robust estimation process. With model 5, three variables turn out to be most significantly correlated with the ratio of trading assets measured at fair value to total assets: total assets, the debt-equity ratio, share based compensation and option based compensation. A beta-analysis clarifies which variables have the largest impact on the independent variable.⁷ We observe highest absolute beta values for the SIZE variable ($\beta=0.64$) and the SHARE and OPT variable ($\beta=0.38$ and $\beta=-0.31$, respectively). This indicates that board compensation structure effectively is associated with the level of fair value accounting in commercial banks.

In economic terms, model 3 suggests that an increase in the ratio of share based compensation to salary from 1 to 2 increases the ratio of trading assets measured at fair value to total assets by about 0.6 percentage point. Given that the mean ratio of trading assets to total assets is 2% this effect is quite substantial in economic terms. Graph 2 shows the correlation between share based compensation and the level of trading securities. Overall, the results strongly confirm hypothesis 1.

With respect to models 3 to 5, Pearson correlation coefficients are highest between SIZE and DEP (-0.58), SIZE and SHARE (0.45) and SIZE and OPT (0.50). Since the model would be misspecified without the SIZE variable and since the correlation coefficients do not indicate a severe multicollinearity problem, we kept the SIZE variable.

⁷ The beta coefficients are the regression coefficients obtained by standardizing all variables to have a mean of zero and a standard deviation of 1.

Graph 2: Scatterplot on the relation between share based bank board compensation and the proportion of trading securities measured at fair value for years 2002 to 2008



4.2 Bank board compensation and available for sale securities

The regression model is specified as in (1) except for AFS_{it} being the dependent variable.

Table 4: Pooled OLS, share/option based compensation of the bank board and the proportion of available for sale securities

$AFS_{it} = \alpha_0 + \alpha_1 SHARE_{it} (+ \alpha_2 OPT_{it}) + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + YEAR_i + \varepsilon_i$				
	Model 1	Model 2	Model 3	Model 4
SHARE	0.265 (0.90)		0.296 (0.95)	
OPT		0.287 (1.02)	0.104 (0.34)	
US-GAAP			-4.407 (-3.27)***	-4.807 (-5.37)***
SIZE			-0.195 (-0.32)	
ROA			1.295 (1.56)	1.922 (2.97)***
VOL			-0.043 (-0.24)	
DEP			-0.136 (-1.99)**	-0.131 (-2.94)***
REGCR			0.411 (0.82)	
DEBT			-0.828 (-3.58)***	-0.796 (-3.92)***
FLOAT			0.025 (0.59)	
YEAR			included	
Constant	13.729 (20.78)***	13.444 (19.75)***	26.839 (1.60)	31.637 (8.46)***
R ²	0.79%	1.47%	33.08 %	25.57%
N	109	109	109	109

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. AFS is available for sale securities standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

The analysis shows that there is no significant association between board share/option based compensation and the ratio of available for sale securities to total assets. This finding may

suggest that comprehensive income is not a relevant factor in board compensation. We therefore have to reject hypothesis 2. Rather the regression results suggest that the ratio of afs-securities to total assets is related to factors such as the debt-equity ratio, deposits and the return on assets. The following sensitivity analysis only refers to the model with trading securities.

4.3 Board compensation until 2005 and since 2006

In 2006, the SEC required listed firms to report the fair value of options. Moreover SEC increased the disclosure requirements of executive compensation. We expect that due to more precise information on options shareholders are more careful in granting option based compensation when there are high levels of fair value accounting. Thus, we expect the association between the level of FVA and option based compensation to be more negative since 2006. We therefore divided the sample into two subsamples.

Table 5: Pooled OLS, share/option based compensation of the bank board and the proportion of trading securities measured at fair value, 2002-2005 and 2006-2008

$$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} + \alpha_2 OPT_{it} + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + YEAR_i + \varepsilon_i$$

	Model 1: 2002-05	Model 2: 2002-05	Model 3: 2006-08	Model 4: 2006-08
SHARE	1.153 (4.85)***	1.171 (10.15)***	0.315 (2.02)**	0.388 (3.30)***
OPT	-0.075 (-0.54)		-0.532 (-5.89)***	-0.442 (-4.84)***
US-GAAP	0.572 (0.83)		1.717 (2.08)**	
SIZE	0.723 (1.82)*	0.497 (2.88)***	2.035 (4.52)***	1.720 (5.09)***
ROA	1.038 (1.18)		0.117 (0.43)	
VOL	0.111 (1.08)		0.064 (0.64)	
DEP	0.057 (1.07)		-0.015 (-0.34)	
REGCR	-0.185 (-0.57)**		0.414 (2.17)**	
DEBT	0.318 (2.78)***	0.328 (2.89)***	0.472 (2.78)***	0.369 (2.46)**
FLOAT	0.016 (0.90)		-0.023 (-0.93)	
YEAR	included		included	
Constant	-21.852 (-2.43)**	-11.383 (-3.48)***	-45.812 (-3.95)***	-33.244 (-5.67)***
R ²	87.85 %	86.47 %	70.16 %	62.34 %
N	43	43	43	43

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

The results suggest that FVA was not significantly associated to the option based compensation before 2006. Since 2006 there is a clearly negative association. With regard to share based compensation there is a significant association with FVA in both time periods, however both the economic and the statistical significance levels tend to decrease over time.

4.4 Sensitivity analysis: including the year 2009

The descriptive statistics indicates that the compensation patterns reacted to the discussion on banker's reward systems in the media which results in a significant increase of stock based compensation while decreasing option based compensation. Still, we run the analysis including the year 2009 and obtain weaker economic and statistical results as we expected. However, table 6 also shows that share based compensation and option based compensation are still highly significant.

Table 6: Pooled OLS, share/option based compensation of the bank board and the proportion of trading securities measured at fair value, 2002-2009

	2002-08	2002-08, stepwise	2002-09	2002-09, stepwise
$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} + \alpha_2 OPT_{it} + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + YEAR_i + \varepsilon_i$				
SHARE	0.422 (3.67)***	0.515 (6.14)***	0.243 (1.98)*	0.343 (3.17)***
OPT	-0.424 (-5.23)***	-0.378 (-5.50)***	-0.376 (-4.69)***	-0.248 (-3.54)***
US-GAAP	1.348 (3.19)***	1.053 (2.77)***	1.324 (3.72)***	0.956 (2.81)***
SIZE	1.715 (5.84)***	1.547 (7.23)***	1.632 (5.50)***	1.203 (4.71)***
ROA	0.109 (0.45)		-0.012 (-0.08)	
VOL	0.094 (1.52)		0.097 (1.72)*	
DEP	-0.017 (-0.52)		-0.025 (-0.93)	
REGCR	0.318 (2.43)**	0.235 (2.29)**	0.351 (3.20)***	
DEBT	0.467 (5.19)***	0.508 (6.10)***	0.469 (5.51)***	0.509 (6.15)***
FLOAT	-0.017 (-1.39)	-0.027 (-2.84)***	-0.013 (-0.98)	
YEAR	included		included	
Constant	-39.463 (-5.15)***	-32.970 (-7.83)***	-39.569 (-5.26)***	-25.913 (-5.46)***
R ²	75.59 %	73.79 %	73.22 %	65.23 %
N	86	86	100	100

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural

logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

4.5 Sensitivity analysis: CEO compensation and CEO change

So far, we only looked at bank board compensation since we think that strategic accounting decisions are not made by the CEO alone. Still, the previous literature indicates that CEO compensation is positively associated with earnings management (Bergstresser and Philippon, 2006) and with deliberate aggressive accounting choices (Burns and Kedia, 2008). A change in CEO may also affect accounting choices. We therefore run the analysis for CEO compensation alone. Table 7 reports regression results for the years 2002-2009. The results confirm a significantly positive association of CEO stock compensation with the extent of FVA and a significantly negative association with option based compensation. The variable on CEO change turns out to be insignificant.

Table 7: Pooled OLS, share/option based compensation of the bank *CEO* and the proportion of trading securities measured at fair value, 2002-2009
$$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} + \alpha_2 OPT_{it} + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + \alpha_{11} CEOCHANGE_{it} + YEAR_i + \epsilon_i$$

	2002-09	2002-09, stepwise	2002-09 CEO	2002-09, CEO,stepwise
SHARE	0.243 (1.98)*	0.343 (3.17)***	0.284 (2.23)**	0.300 (2.38)**
OPT	-0.376 (-4.69)***	-0.248 (-3.54)***	-0.207 (-3.52)***	-0.200 (-3.60)***
US-GAAP	1.324 (3.72)***	0.956 (2.81)***	1.303 (3.45)***	1.431 (3.77)***
SIZE	1.632 (5.50)***	1.203 (4.71)***	1.509 (4.96)***	1.556 (5.52)***
ROA	-0.012 (-0.08)		-0.024 (-0.17)	
VOL	0.097 (1.72)*		0.114 (2.11)**	0.097 (2.23)**
DEP	-0.025 (-0.93)		-0.028 (-0.92)	
REGCR	0.351 (3.20)***		0.294 (2.54)**	0.318 (2.99)***
DEBT	0.469 (5.51)***	0.509 (6.15)***	0.467 (4.89)***	0.481 (4.88)***
FLOAT	-0.013 (-0.98)		-0.006 (-0.47)	
CEOCHANGE			0.541 (1.02)	
YEAR	included		included	included
Constant	-39.569 (-5.26)***	-25.913 (-5.46)***	-37.301 (-4.54)***	-40.688 (-5.89)***
R ²	73.22 %	65.23 %	73.18 %	72.01 %
N	100	100	99	99

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %. CEOCHANGE is a binary variable with value 1 if there was a change in CEO and zero otherwise.

4.6 Sensitivity analysis: controlling for outliers

In sections 4.6 and 4.7 we return to the basic regression model and with bank board compensation in the years 2002-2008. In order to control for outliers we perform two tests.

First, we winsorize observations on the SHARE and on the OPT variable, each on the 1% and 99%-percentile. Another regression is based on winsorizing SHARE and OPT at the 5%- and 95%-percentiles. Second, we truncated observations on the SHARE and the OPT variable on the 1% and 99%-percentile and on the 5% and 95%-percentile. We estimate regressions following the step-wise procedure described above. The following table summarizes results with both forms of sensitivity analysis.

Table 8: Regressions controlling for outliers on the relation between share/option based compensation and the proportion of trading securities at fair value, step-wise procedure

$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} (+ \alpha_2 OPT_{it}) + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + YEAR_i + \varepsilon_i$				
	Model 1: 1%-99% winsorized	Model 2: 5%-95% winsorized	Model 3: 1%-99% truncated	Model 4: 5%-95% truncated
SHARE	0.547 (5.97)***	0.555 (5.68)***	0.684 (4.60)***	0.531 (2.36)**
OPT	-0.361 (-5.25)***	-0.396 (-5.10)***	-0.641 (-3.76)***	-0.528 (-2.59)**
US-GAAP	1.034 (2.70)***	1.024 (2.68)***	1.489 (2.63)**	
SIZE	1.502 (6.85)***	1.515 (6.79)***	1.466 (4.98)***	1.487 (3.79)***
REGCR	0.229 (2.24)**	0.226 (2.20)**	0.351 (3.35)***	
DEBT	0.497 (5.96)***	0.495 (5.94)***	0.683 (6.77)***	0.502 (4.16)***
FLOAT	-0.026 (-2.79)***	-0.026 (-2.85)***		
ROA				
YEAR 2004			0.922 (2.33)**	
Constant	-32.080 (-7.41)***	-32.174 (-7.41)***	-37.415 (-6.07)***	-30.227 (-4.22)***
R ²	73.97 %	74.07 %	77.17 %	63.53 %
N	86	86	51	45

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

4.7 Sensitivity analysis: Random effects and endogeneity

Random effects. The Hausman test suggests a random effects model. We run the model on trading securities with random year effects and random firm effects and obtain similar qualitative results as the following table shows.

Table 9: Random effects and fixed effects regressions on the relation between share/option based bank board compensation and the proportion of trading securities measured at fair value

	Random year effects	Random firm effects	Fixed year effects	Fixed firm effects
SHARE	0.467 (5.07)***	0.286 (2.74)***	0.422 (3.24)**	0.200 (2.48)**
OPT	-0.412 (-5.68)***	-0.236 (-2.71)***	-0.424 (-5.31)***	-0.181 (-1.80)*
US-GAAP	1.235 (3.23)***	0.637 (0.74)	1.348 (3.29)**	
SIZE	1.599 (6.65)***	1.321 (3.76)***	1.715 (8.05)***	0.090 (0.10)
ROA	0.311 (1.69)*	0.137 (1.15)	0.109 (0.76)	-0.074 (-0.84)
VOL	0.057 (1.05)	0.043 (0.80)	0.094 (1.91)	-0.025 (-0.60)
DEP	-0.006 (-0.19)	0.022 (0.95)	-0.017 (-0.71)	0.008 (0.34)
REGCR	0.221 (1.88)*	0.025 (0.27)	0.318 (2.25)*	0.022 (0.24)
DEBT	0.492 (5.61)***	0.182 (2.18)**	0.467 (7.80)***	0.048 (0.46)
FLOAT	-0.018 (-1.67)*	-0.012 (-1.10)	-0.017 (-1.77)	-0.001 (-0.08)
Constant	-35.370 (-6.10)***	-26.275 (-3.78)	-38.447 (-7.78)**	-0.120 (-0.01)
Overall R ²	74.61 %	68.34 %	72.28 %	25.12 %
N	86	86	86	86

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics for fixed effects model and z-statistics for random model are in parentheses. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

Test for endogeneity. While our regression model investigates the impact of executive compensation on the extent of fair value accounting, what we have found could be merely explained by other factors that determine executive compensation. One could argue that compensation is also endogenously determined. The principal agent model suggests that firm risk may impact the firm's compensation contract design (Chen et al., 2006). Board's equity-based compensation should be decreasing in the standard deviation of firm returns. Even though the empirical evidence does not definitely support this claim (Garen, 1994), the issue of the endogeneity of both the compensation and the risk variable should be investigated. We capture both, the operational risk (VOL) as well as the financial risk by the debt-equity ratio.

The descriptive evidence provided in section 3 suggests that the structure of compensation is affected by bank size as well. Finally, one might argue that return on assets is positively associated to the level of equity-based compensation.

We therefore performed a two-stage-least-squares (2SLS) analysis. The 2SLS estimate has a smaller bias than the OLS estimate (Sawa, 1969), and provides asymptotically correct estimates of the standard errors. We thereby endogenously determine SHARE and OPT using VOL and ROA as instrumental variables since they are likely to be important factors although not being significant in the regressions before.

Table 10: 2SLS-analysis: estimation of SHARE and OPT in a first step

$$SHARE_{it} (OPT_{it}) = \alpha_0 + \alpha_1 OPT_{it} (SHARE_{it}) + \alpha_3 SIZE_{it} + \alpha_4 US-GAAP_{it} + \alpha_5 DEP_{it} + \alpha_6 REGCR_{it} + \alpha_7 DEBT_{it} + \alpha_8 FLOAT_{it} + \alpha_9 ROA_{it} + \alpha_{10} VOL_{it} + v_{share,it} (+ v_{opt,it})$$

Exogenous variable	SHARE _{it}	OPT _{it}
OPT	-0.210 (-1.25)	
SHARE		-0.272 (-1.24)
SIZE	0.780 (2.24)**	1.186 (2.91)***
US-GAAP	0.648 (1.68)*	0.487 (1.03)
DEP	-0.052 (-1.40)	-0.024 (-0.73)
REGCR	-0.088 (-0.62)	0.043 (0.30)
DEBT	-0.026 (-0.22)	-0.048 (-0.42)
FLOAT	0.041 (2.51)**	-0.010 (-0.56)
ROA	0.546 (2.77)***	0.563 (2.31)**
VOL	0.203 (2.86)***	0.087 (1.25)
Constant	-16.419 (-1.90)*	-19.903 (-1.82)*
Adj. R ²	0.3914	0.3643
N	86	86

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

Not surprisingly, the extent of share based compensation is positively affected by the size of the bank and by the free float, but also by higher ROA and higher stock price volatility. Option based compensation is positively affected by bank size and ROA. We tested whether the residuals \hat{v}_{share} and \hat{v}_{opt} from the reduced regression on the endogenous variables SHARE and OPT, respectively, are uncorrelated with the error term ε of the initial regression (1). We cannot reject the null hypothesis that $v_{share,it}$ and $v_{opt,it}$ are uncorrelated with ε . The p-values do

not indicate statistical significance to reject the null hypothesis such that we cannot assume an endogeneity problem to exist.

Still, the following table shows the results of the 2SLS-regression with VOL and ROA being the instrumental variables.

Table 11: 2SLS regression models on the relation between share/option based compensation and the proportion of trading securities measured at fair value only

$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} + \alpha_2 OPT_{it} + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 DEP_{it} + \alpha_6 REGCR_{it} + \alpha_7 DEBT_{it} + \alpha_8 FLOAT_{it} + \varepsilon_i$	
	Model
SHARE	0.847 (3.74)***
OPT	-0.321 (-3.37)***
US-GAAP	0.928 (2.21)**
SIZE	1.299 (5.17)***
DEP	0.014 (0.41)
REGCR	0.209 (2.01)**
DEBT	0.498 (5.52)***
FLOAT	-0.033 (-3.19)***
Constant	-28.774 (-4.74)***
Adj. R ²	0.6958
N	86

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. Z-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

4.8 Sensitivity analysis: S&P 500 banks and other listed banks

Our findings might be affected by the small sample size. In order to increase sample size we run the regression including the banks which are not listed in the S&P 500 and indicate S&P

500 banks by a binary variable SP500. Table 12 indicates that share based compensation and option based compensation have no significant sign for the total sample, but only for S&P 500 banks. That is why we want to analyse non S&P 500 banks in more detail in section 5.

Table 12: Pooled OLS, share/option based compensation of the bank board and the proportion of trading securities measured at fair value, all banks

$$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} + \alpha_2 OPT_{it} + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + \alpha_{11} SP500_{it} + YEAR_i + \varepsilon_i$$

	2002-08, only S&P500	2002-08, only S&P500,stepwise	2002-08, all banks	2002-08, all banks, stepwise
SHARE	0.422 (3.67)***	0.515 (6.14)***	0.080 (1.58)	0.508 (1.11)
OPT	-0.424 (-5.23)***	-0.378 (-5.50)***	0.098 (1.30)	0.122 (1.73)*
SP500			-0.351 (-1.03)	-0.319 (-0.96)
SP500*SHARE			0.599 (3.31)***	0.639 (3.62)***
SP500*OPT			-0.237 (-1.90)*	-0.244 (-2.01)**
US-GAAP	1.348 (3.19)***	1.053 (2.77)***	-0.109 (-0.77)	
SIZE	1.715 (5.84)***	1.547 (7.23)***	0.591 (4.94)***	0.549 (5.48)***
ROA	0.109 (0.45)		0.064 (1.49)	
VOL	0.094 (1.52)		0.001 (0.04)	
DEP	-0.017 (-0.52)		-0.002 (-0.20)	
REGCR	0.318 (2.43)**	0.235 (2.29)**	-0.042 (-1.27)	
DEBT	0.467 (5.19)***	0.508 (6.10)***	0.089 (3.13)***	0.076 (3.20)***
FLOAT	-0.017 (-1.39)	-0.027 (-2.84)***	0.004 (0.89)	
YEAR	included		included	
Constant	-39.463 (-5.15)***	-32.970 (-7.83)***	-9.693 (-4.52)***	-9.230 (-5.68)***
R ²	75.59 %	73.79 %	50.28 %	48.98 %
N	86	86	372	372

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %. SP500 is a binary variable with value 1 if the bank is quoted in the S&P 500 and with value zero otherwise.

5. Results for quoted banks that are not listed in the S&P 500

So far, we have not analysed the relation between board compensation and FVA for banks not listed in the S&P 500. The following tables first show descriptive statistics on board compensation variables, second summary statistics and third the regression results for those banks.

Table 10: Descriptive statistics on board compensation variables (quoted banks not listed in S&P 500)

	2002 n=44	2003 n=49	2004 n=44	2005 n=40	2006 n=53	2007 n=51	2008 n=48	2009 n=46	2001- 2009 n=375
Salary in 1,000 \$									
mean	2,574	2,345	2,172	2,095	2,011	1,951	1,923	1,846	2,109
median	2,030	1,751	1,745	1,865	1,933	1,949	1,912	1,821	1,870
Share awards in 1,000 \$									
mean	2,888	2,355	1,446	1,942	1,860	1,433	572	376	1,601
median	0	0	0	310	105	226	0	100	20
Option awards (OPT) in 1,000 \$									
mean	3,768	2,753	1,574	1,978	1,108	1,072	788	352	1,644
median	1,414	851	481	830	223	241	285	0	398
Value of share awards/salary									
mean	0.45	0.61	0.42	0.78	0.72	0.66	0.27	0.19	0.52
median	0	0	0	0.21	0.05	0.15	0	0.09	0.01
Value of option awards/salary									
mean	0.97	0.92	0.65	0.79	0.42	0.46	0.35	0.16	0.58
median	0.65	0.49	0.35	0.44	0.14	0.10	0.16	0	0.27

Salary: The dollar value of the base salary earned by the named executive officer during the fiscal year. Share awards: until 2005: The value of restricted stock granted during the year (determined as of the date of the grant). Since 2006: Fair value of all stock awards during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R. Option awards: until 2005: The aggregate value of stock options granted to the executive during the year as valued using Standard & Poor's Black-Scholes methodology. Since 2006: Fair value of all options awarded during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R.

Not surprisingly, the total of salary, share based and option based compensation is smaller with banks not listed in the S&P 500. The total is about 5.7 million \$ per year on average whereas it is 17.2 million \$ with banks listed in the S&P 500 (see table 1). The weight of share based and option based compensation is lower with banks not listed in the S&P 500. Remarkably, whereas share and option awards are similarly important for bank board compensation in the S&P 500, share based compensation does not exist with almost half of

the banks not listed in the S&P 500. The summary statistics in the following table reveals additional differences.

Table 11: Summary statistics for banks not listed in S&P 500

	Mean	Median	Std. Dev.	Min.	Max.
<i>Dependent variable</i>					
TR: Trading securities at fair value / total assets in % (B # 11150, 2025)	0.375	0	1.199	0	9.699
<i>Main independent variables</i>					
SHARE: Share awards / salary (E)	0.562	0	1.254	0	9.850
OPT: option awards / salary (E)	0.639	0.335	1.044	0	9.131
<i>Control variables</i>					
US-GAAP (B)	0.675	1	0.469		
SIZE: log(total assets in 1,000 \$) (B # 2025)	15.96	15.75	1.17	13.51	20.48
ROA: return on average assets in % (B # 4024)	1.051	1.233	1.285	-15.038	4.431
VOL: average annual share price movement from mean price, in % (D)	22.03	21.37	5.09	12.16	39.34
DEP: average customer deposits / total assets in % (B # 18385, 4024)	68.09	69.76	9.47	33.00	89.17
REGCR: regulatory total capital ratio in % (B # 38300)	12.79	12.20	2.07	8.38	25.39
DEBT: debt-equity ratio (1/B # 4012)	9.778	9.544	2.796	3.434	32
FLOAT: Free float number of shares in % (D)	76.95	80.01	16.81	21.78	100

B: Bankscope, D: Datastream, E: Execucomp. Since 2006, Execucomp has changed the format and name of variables. SHARE: until 2005: The value of restricted stock granted during the year (determined as of the date of the grant). Since 2006: Fair value of all stock awards during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R. OPT: until 2005: The aggregate value of stock options granted to the executive during the year as valued using Standard & Poor's Black-Scholes methodology. Since 2006: Fair value of all options awarded during the year as detailed in the Plan Based Awards table. Valuation is based upon the grant-date fair value as detailed in FAS 123R. SALARY: The dollar value of the base salary earned by the named executive officer during the fiscal year. REGCR: Total capital adequacy ratio under the Basel rules. It measures tier 1 and tier 2 capital which includes subordinated debt, hybrid capital, loan loss reserves and the valuation reserves as a percentage of risk weighted assets and off balance sheet risks. FLOAT: The percentage of total shares in issue available to ordinary investors which equals the total number of shares less the strategic holdings. In general, only holdings of 5% or more are counted as strategic.

Compared to banks listed in the S&P 500, trading securities measured at fair value are less common. Further, size is considerably smaller: The median bank has total assets of 6.9 billion \$, whereas it is 87.7 billion \$ with the median bank listed in the S&P 500. Free float is also smaller. Both factors indicate that problems of asymmetric information might be less pronounced between management and arm's length shareholders. Still, there might be more inside ownership which we are not able to directly observe. Volatility is higher with banks not

listed in the S&P 500. Debt ratio, regulatory capital ratio and ROA do not differ too much between the two groups of banks.

Table 12: Pooled OLS, share/option bank board based compensation and the proportion of trading securities at fair value, banks not listed in the S&P 500

$$TR_{it} = \alpha_0 + \alpha_1 SHARE_{it} + \alpha_2 OPT_{it} + \alpha_3 US-GAAP_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 VOL_{it} + \alpha_7 DEP_{it} + \alpha_8 REGCR_{it} + \alpha_9 DEBT_{it} + \alpha_{10} FLOAT_{it} + YEAR_i + \varepsilon_i$$

	Model 1:	Model 2:	Model 3: 2006-08	Model 4: 2006-08
SHARE	0.243 (2.43)**		0.098 (1.92)*	0.059 (1.07)
OPT		0.441 (3.25)***		0.217 (2.82)***
US-GAAP			0.016 (0.12)	0.050 (0.37)
SIZE			0.483 (4.05)***	0.400 (3.85)***
ROA			0.019 (0.76)	0.002 (0.07)
VOL			0.000 (0.00)	-0.003 (-0.28)
DEP			-0.003 (-0.47)	-0.003 (-0.50)
REGCR			-0.031 (-1.03)	-0.031 (-1.04)
DEBT			0.021 (1.19)	0.015 (0.83)
FLOAT			0.006 (1.63)	0.008 (1.91)*
YEAR			included	included
Constant	0.238 (4.34)**	0.093 (1.56)	-7.611 (-3.75)***	-6.389 (-3.54)***
R ²	6.44%	14.72%	27.80 %	30.14 %
N	329	329	329	329

*, **, *** indicate significance at the 10%-, 5%-, 1%-level, using a two-tailed test. T-statistics (in parentheses) are based on standard errors which are adjusted for heteroskedasticity and clustering at the firm level. TR is trading securities at fair value standardized by total assets in %. SHARE is share based awards standardized by salary. OPT is option based awards standardized by salary. US-GAAP is a binary variable with value 1 if the bank reports under US-GAAP and with value 0 if it reports under regulatory GAAP. SIZE is the natural logarithm of total assets in 1,000 \$. ROA is the return on average assets in %. VOL is the average annual share price movement from mean price in %. DEP is average customer deposits over total assets. REGCR is the regulatory total capital ratio in %, including tier 1 and tier 2 capital. DEBT is the debt-equity ratio. FLOAT is the free float number of shares in %.

The regression shows that only banks' size and option based compensation are significantly associated with the level of FVA. Different to the banks listed in S&P 500, option based compensation shows a significantly positive sign. Moreover, in the multiple regression

analysis there is no significant association between share based compensation and the level of FVA. This is not surprising since share based compensation is much less common than option based compensation with banks not listed in the S&P 500 such that there is much less variation in the SHARE variable.

There might be two reasons why option based compensation is more common with banks not listed in the S&P 500. Those banks are much smaller, such that they might be less intensively monitored by regulatory bodies. Regulatory agencies might be especially afraid of large banks taking excessive risks and hence, might be more cautious about option based compensation at those banks.

Smaller banks are also more likely to have inside ownership such that information and moral hazard problems might be less severe. Further, the proportion of (fixed) salary on total compensation is clearly larger with smaller banks. Both factors weaken the incentive for excessive risk-taking. This allows for more option based compensation in return. We cannot rule out another explanation, though. Corporate governance might be weaker with banks not listed in the S&P 500 such that board members find it easier to seek rents.

6. Conclusion

This paper analyses whether and how the extent of fair value accounting (FVA) is related to share and option based compensation for U.S. commercial banks listed in the S&P 500. We find a statistically and economically significant relation between share and option based compensation and the relative amount of trading securities measured at fair value through profit or loss. We do not find an association between board compensation and the relative amount of available for sale securities. This indicates that only the income from trading securities is considered to affect share and option based compensation.

Further, we find that the association between share based compensation and trading securities is positive whereas it is negative with option based compensation. The first result is in line with previous empirical findings that higher quality of disclosure lowers cost of capital and increases share prices. The second result indicates that shareholders are aware of the distorted incentives for excessive risk-taking implied by option based compensation. Remarkably, the sign on option based compensation is clearly negative since 2006 when arm's length investors became better informed. In that year, the SEC made the FASB recommendations on reporting the fair value of options grants compulsory and increased the disclosure requirements of executive compensation.

This evidence suggests that the motive of the discretionary use of designating financial instruments by commercial banks listed in the S&P 500 is to improve reporting quality rather than to seek rents.

We should mention some limitations of the study. We do not prove causality but only show a positive association between board compensation and FVA. However, the board and especially CEOs may rather have discretion to affect financial accounting choices than compensation. Board compensation as well as some control variables like bank operating risk or leverage might be endogenous. When we fail to find evidence that is consistent with the moral hazard hypothesis that does not necessarily imply that there are no opportunistic financial accounting choices with S&P 500 banks. They might be driven by other factors, though, such as by the existence of blockholders.

Most importantly, one should be cautious with the results since sample size is relatively small. We may also be cautious to transfer results to other countries since legal systems, corporate governance patterns and the regulatory framework differ. However, a cross-country study on this subject is certainly warranted.

References

- Adams, René and Hamid Mehran (2003): Is Corporate Governance Different for Bank Holding Companies? *Federal Reserve Bank of New York Economic Policy Review*, 9, 123-142.
- Allen, F. and Carletti, E. (2008). Mark-to-market Accounting and Liquidity Pricing, *Journal of Accounting and Economics*, 45, 358-378.
- American Bankers Association (2008): Letter to SEC. September 23, 2008.
- Armstrong, Christopher S, Mary E. Barth, Alan D. Jagolinzer and Edward J. Riedl (2010): Market Reaction to the Adoption of IFRS in Europe. *The Accounting Review*, 85, 31-61.
- Barth, Mary E. (1994): Fair Value Accounting: Evidence from Investment Securities and the Market Valuation of Banks. *The Accounting Review*, 69, 1-25.
- Barth, Mary E., Wayne R. Landsman and James M. Wahlen (1995): Fair Value Accounting: Effects on Banks' Earnings Volatility, Regulatory Capital, and Value of Contractual Cash Flows. *Journal of Banking & Finance* 19, 577-605.
- Barth, Mary E., Wayne R. Landsman and Mark H. Lang (2008): International Accounting Standards and Accounting Quality. *Journal of Accounting Research*, 46, 467-498.
- Benston, G.J. (2008): The Shortcomings of Fair-Value Accounting described in SFAS 157. *Journal of Accounting and Public Policy*, 27, 101-114.
- Bernard, Victor L., Robert C. Merton and Krishna G. Palepu (1995): Mark-to-Market Accounting for Banks and Thrifts: Lessons from the Danish Experience. *Journal of Accounting Research*, 33, 1-32.
- Bergstresser, Daniel and Thomas Philippon (2008): CEO Incentives and Earnings Management. *Journal of Financial Economics*, 80, 511-529.
- Bergstresser, Daniel, Mihir Desai and Joshua Rauh (2006): Earnings Manipulation, Pension Assumptions and Managerial Investment Decisions. *Quarterly Journal of Economics*, 121, 157-195.
- Botosan, C. (1997): Disclosure Level and the Cost of Equity Capital. *The Accounting Review*, 72, 323-349.
- Burgstahler, D., Luzi Hail and Christian Leuz (2006): The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms. *The Accounting Review*, 81, 983-1016.

Burns, Natasha and Simi Kedia (2006): The Impact of Performance-based Compensation on Misreporting. *Journal of Financial Economics*, 79, 35-67.

Chen, Carl R., Thomas Steiner and Ann Marie Whyte (2006): Does Stock Option-based Executive Compensation induce Risk-taking? An Analysis of the Banking Industry. *Journal of Banking & Finance* 30, 915-945.

Cheng, Q. and T.D. Warfield (2005): Equity Incentives and Earnings Management. *The Accounting Review*, 80, 441-476.

Daske, Q. Luzi Hail, Christian Leuz and Rodrigo Verdi (2008): Mandatory IFRS Reporting around the World: Early Evidence on the Economic Consequences. *Journal of Accounting Research*, 46, 1085-1142.

Dong, Zhiyong, Cong Wang and Fei Xie (2010): Do Executive Stock Options induce excessive Risk Taking? *Journal of Banking & Finance* 34, 2518-2529.

Garen, J.E. (1994): Executive Compensation and Principal-Agent Theory. *Journal of Political Economy*, 102, 1175-1199.

Greenawalt, Mary Brady and Joseph F. Sinkey Jr. (1988): Bank Loan-Loss Provisions and the Income-Smoothing Hypothesis: An Empirical Analysis, 1976-1984. *Journal of Financial Services Research*, 1, 301-318.

Healy, P.M. (1985): The Effect of Bonus Schemes on Accounting Decisions. *Journal of Accounting and Economics*, 7, 85-107.

Hodder, Leslie D., Patrick E. Hopkins and James M. Wahlen (2006). Risk-relevance of fair-value income measures for commercial banks. *The Accounting Review*, 81(2): 337-375.

Houston, J.F. and C. James (1995): CEO Compensation and Bank Risk: Is Compensation in Banking Structured to Promote Risk-Taking? *Journal of Monetary Economics*, 36, 405-431.

International Monetary Fund (2008). Financial distress and deleveraging: macro-financial implications and policy, Global Financial Stability Report, October 2008, <http://www.imf.org/External/Pubs/FT/GFSR/2008/02/index.htm>.

Jarque, Arantxa (2008): CEO Compensation: Trends, Market Changes, and Regulation, *Economic Quarterly*, 94: 265-300.

Khan, U. (2009). Does fair value accounting contribute to systemic risk in the banking industry? Working Paper, University of Columbia, December 2009.

- Laux, Christian and Christian Leuz (2009): The Crisis of Fair-Value Accounting: Making Sense of the Recent Debate. *Accounting, Organizations and Society*, 34, 826-834.
- Leuz, Christian and Robert E. Verrecchia (2000): The Economic Consequences of Increased Disclosure. *Journal of Accounting Research*, 38, 91-124.
- Maronna, R.A., R.D. Martin and V.J. Yohai (2006): Robust Statistics. Theory and Methods. John Wiley & Sons, Chichester.
- Mayers, D. and Clifford Smith (1992): Executive Compensation in the Life Insurance Industry. *Journal of Business*, 65, 51-74.
- Morgan Stanley (2004). Letter to FASB. September 11, 2004.
- Nichols, D. Craig, James M. Wahlen and Matthew M. Wieland (2009): Publicly-traded versus privately-held: Implications for Conservatism in Bank Financial Reporting. *Review of Accounting Studies* 14, 88–122.
- Penman, S.H. (2007): Financial Reporting Quality: Is Fair Value a Plus or a Minus? *Accounting and Business Research Special Issue: International Accounting Policy Forum*, 33, 44.
- Persaud, A. (2008) Regulation, Valuation and Systemic Liquidity. Banque de France, Financial Stability Review – Special Issue on Valuation, No. 12, October 2008.
- Plantin, G., H. Saprà and Shin, H.S. (2008). Marking-to-market: Panacea or Pandora's Box? *Journal of Accounting Research*, 46, 435-460.
- PricewaterhouseCoopers (2008). *Reward: A new Paradigm?* September 2008.
- Ramanna, K. and Ross L. Watts (2007): Evidence on the Effects of Unverifiable Fair-Value Accounting. Harvard Business School Working paper no. 08-014.
- Ryan, S.G. (2008): Accounting in and for the Subprime Crisis. *The Accounting Review*, 83, 1605-1638.
- Sawa, T. (1969): The Exact Sampling Distribution of Ordinary Least Squares and Two Stage Least Square Estimators. *Journal of the American Statistical Association* 64, 923-937.
- Sengupta, P. (1998): Corporate Disclosure Quality and the Cost of Debt. *The Accounting Review*, 73, 459-474.

Smith, Clifford and Ross Watts (1992): The Investment Opportunity Set and Corporate Financing, Dividend and Compensation Policies. *Journal of Financial Economics*, 32, 263-292.

Song, Chang J., Wayne B. Thomas and Han Yi (2010): Value Relevance of FAS No. 157 Fair Value Hierarchy Information and the Impact of Corporate Governance Mechanisms. *The Accounting Review*, 85, 1375-1410.

Watts, Ross and J. Zimmermann (1986): *Positive Accounting Theory*. Prentice Hall, Englewood Cliffs, New Jersey.