Managerial Overconfidence and the Use of Level 3 Estimates

Evidence from the banking industry

Jan Riepe [a]

This Version: 13.10.2014

Abstract

This project explores the link between managerial overconfidence and banks' asset valuation behavior in the aftermath of the 2007 financial crisis. Thereby, it provides empirical evidence that banks with overconfident CFOs rely more heavily on valuation models designed for inactive markets only, known as Level 3 fair value estimates. External governance by the capital market and more experienced auditors mitigates the effect, pointing toward an inappropriate use of those models by overconfident managers. In line with the managerial job sharing, CEOs do not impact the valuation behavior. Furthermore, competing explanations regarding signaling or the use of private information do not drive the results. While the capital market perceives Level 3 estimates as equally overvalued, the paper provides another channel through which managerial overconfidence impacts firm value.

Keywords: Managerial Overconfidence, Fair Value, Mark-to-Model, Corporate Governance.

JEL-Classification: G14, G21, G34, M41

[a] Department of Banking, University of Tübingen, Nauklerstr. 47, 72074 Tübingen, Germany. j.riepe@uni-tuebingen.de, Phone: +49 707129 78207, Fax: +49 707129 588.

I am indebted to my advisers, Ralf Elsas and Markus Glaser, for their valuable advice and support. Parts of this paper were written while I was a PhD Student at LMU Munich. I would like to thank Christoph Kaserer, Ulf Mohrmann, Andreas Pfingsten, Sascha Steffen, as well as participants of the 2014 Munich Finance Day, and the 2014 Münster Banking Workshop, for valuable comments and insights. All remaining errors are my own.

Managerial Overconfidence and the Use of Level 3 Estimates

Evidence from the banking industry

Abstract

This project explores the link between managerial overconfidence and banks' asset valuation behavior in the aftermath of the 2007 financial crisis. Thereby, it provides empirical evidence that banks with overconfident CFOs rely more heavily on valuation models designed for inactive markets only, known as Level 3 fair value estimates. External governance by the capital market and more experienced auditors mitigates the effect, pointing toward an inappropriate use of those models by overconfident managers. In line with the managerial job sharing, CEOs do not impact the valuation behavior. Furthermore, competing explanations regarding signaling or the use of private information do not drive the results. While the capital market perceives Level 3 estimates as equally overvalued, the paper provides another channel through which managerial overconfidence impacts firm value.

Keywords: Managerial Overconfidence, Fair Value, Mark-to-Model, Corporate Governance.

JEL-Classification: G14, G21, G34, M41

1. INTRODUCTION

If markets are disrupted, i.e., if there are no orderly transactions in active markets, not even of similar assets or model inputs, firms are allowed to rely on internal models with firm-generated, unobservable inputs to determine the value of their fair value assets (SFAS 157). These values are called Level 3 estimates. Nevertheless, there is no objective identification mechanism for disrupted markets, and not even a significant drop in liquidity is sufficient to classify a market as disrupted (Center for Audit Quality, 2007)[1]. In most situations, the management has to rely on market movements, which they perceive as extreme and unusual, to identify a disrupted market. Thereby, it remains in the discretion of a firm's management and its auditors to agree on which markets they perceive as disrupted at a particular point in time. Because of the lacking transparency with respect to the firm's perceptions, this assessment remains opaque and varies from firm to firm.

This paper raises the question if personal characteristics of the managers might explain some of the variation in the use of Level 3 estimates. Thereby, it focuses on the behavioral traits of managerial overconfidence[2]. While overconfidence is "perhaps the most robust finding in the psychology of judgment" (De Bondt and Thaler, 1995), it might heavily distort the expected distribution on an asset's returns, e.g., shift the expected mean upwards or narrow the bandwidth of the expected distribution. As a consequence, observed market movements will more easily be perceived as extreme outcomes due to the too narrow or upward-biased expectations or a distorted self-attribution, i.e., the market will be perceived as disrupted.

[1] Center for Audit Quality (2007, p. 4): "The fact that transaction volume in a market is significantly lower than in previous periods does not necessarily mean that these are forced or distressed sales. Moreover, decreased volumes in a market do not necessarily mean that market has become inactive."
[2] For a recent and detailed literature overview on managerial overconfidence, see Ben-David et al. (2013).

Using a time-variant form of the Net Buyer measure of managerial overconfidence developed by Malmendier and Tate (2005), this study documents a robust link between CFO overconfidence and the use of Level 3 estimates. CEO overconfidence possesses no explanatory power on the use of Level 3 estimates. This finding corresponds to the managerial job sharing (Anantharaman and Lee, 2014) and the responsibility of CFOs for lower level accounting behavior (Jiang et al., 2010). Various control variables, as well as bank and year fixed effects, alleviate concerns regarding omitted influences with respect to the business models, managerial skills, or macroeconomic conditions. In line with the literature, there is a general discount of Level 3 estimates by the capital market. Although overconfident CFOs tend to value a larger share of their balance sheet using Level 3 estimates, evidence indicates no statistically significant differences in the capital market perception; e.g., those assets are not perceived as more reliable or less overvalued. Thus, results are unlikely to be driven by signaling or insider trading based on superior private information, which would correspond with higher market values and represent competing explanations. Furthermore, the larger share of those Level 3 estimates provides another channel through which managerial overconfidence impacts firm value.

The study contributes to the literature in several ways. While there is an active debate on the consequences of managerial incentives with important insights into managerial behavior (e.g., Mehran and Rosenberg, 2007; Fahlenbrach and Stulz, 2011), the empirical evidence on managerial traits in the banking industry is scarce. A recent study by Black and Gallemore (2013) is one of the few exceptions. Examining the provisioning behavior for bad customer loans during the financial crisis, it provides empirical evidence that banks with overconfident CFOs build their provisions at a later point in time and in a lower quantity compared to banks

with non-overconfident CFOs. Looking at those traits in financial firms helps improve our understanding of the financial crisis and bank behavior in troubled markets.

The study closely relates to the literature on the economic outcome of managerial overconfidence. Malmendier and Tate (2005; 2008) establish a link between managerial overconfidence and corporate investment inefficiencies in industrial firms. Schrand and Zechman (2012) document an increased probability of financial misreporting of overconfident managers, while Hillary and Hsu (2011) and Libby and Rennekamp (2012) explore the consequences of overconfidence on the managerial forecasting behavior. Ben-David et al. (2013) provide empirical evidence that miscalibrated managers, as one manifestation of overconfidence, follow a more aggressive corporate policy, including a higher level of investment accompanied by a larger share of debt financing. Pointing toward positive consequences of managerial overconfidence, Hirshleifer et al. (2012) provide evidence in favor of increased innovation activity by overconfident managers. Ahmed and Duellman (2013) provide empirical evidence on a negative link between overconfident managers and accounting conservatism. It is further related to a recent study by Bouwman (2014). Looking at industrial firms between 1984 and 1994, Bouwman (2014) documents more earnings smoothing accompanied by smaller earnings surprises by overconfident managers.

Financial firms are especially suited to study this research question since they rely on fair value accounting for large parts of their balance sheet (Laux and Leuz, 2010). Therefore, it is easier to detect a manager's perception of disrupted markets by looking at the firm's reporting behavior.

2. OVERCONFIDENCE AND HYPOTHESIS

Moore and Healy (2008) define overconfidence in three distinct ways. *Overestimation* refers to an individual's tendency to overestimate his or her own ability and chances to succeed. When managers with an overestimation bias are asked to value a security, they overestimate the expected return of their portfolio while correctly assessing its expected standard deviation. In case of downwards markets or in crisis situations, the market will be perceived as disrupted more frequently, as the biased value strongly deviates from observable transaction prices. Nevertheless, abnormally high returns are less likely to be attributed to extreme market movements but are perceived as normal.

Overprecision, or *miscalibration,* in contrast, refers to the systematic underestimation of the range of potential outcomes, producing distributions that are too narrow. Using a 10-year survey panel including more than 13,000 CFO stock forecasts, Ben-David et al. (2013) provide evidence that managerial miscalibration is especially strong during periods of high market uncertainty. Similar to the overestimation bias, the overprecision trait makes it more likely to perceive market movements as extreme and "not normal." The use of Level 3 valuations appears more suitable to an overconfident manager.

Overplacement, or the *better-than-average* effect, refers to the personal trait to overplace one's own ability when compared to others. In case of an overplacement bias, managers might perceive their own skills, e.g., in the asset selection process, to be superior compared to peer managers. As a result, the biased managers expect the own portfolios to outperform the market. Compared to similar assets that are traded in active markets, the managers perceive those assets as noncomparable and the observed market prices as unsuitable to value their own portfolio. In

those situations as well, the manager strives toward a model-based valuation method with unobservable, manager-supplied inputs.

Apart from the three facets of overconfidence by Moore and Healy (2008), a *biased self-attribution* is often associated with overconfidence (Hirshleifer, 2001). Following this self-attribution bias, people attribute good outcomes more often to their abilities, while bad outcomes are attributed to external factors, such as disrupted markets.

Taken together, it is hypothesized that:

Hypothesis: *Overconfident CFOs use a higher share of Level 3 valuation.*

3. VARIABLES, EMPIRICAL APPROACH AND SAMPLE

a) MANAGERIAL OVERCONFIDENCE

The empirical assessment of managerial overconfidence poses several challenges to the researcher. While individual interviews or special questionnaires of managers allow for a more direct identification (Ben-David et al., 2013), they are usually unfeasible for most settings due to the high effort required and low response rates. Therefore, the study relies on a measure based on the managers' personal stock market transactions, which has been established by Malmendier and Tate (2005). The measure relies on the notion that a manager's personal wealth is underdiversified since large parts of the human capital, as well as the wages, are tied to the manager's own company. Malmendier and Tate (2005) show that even for mild forms of risk aversion, rational managers should not engage in open market transactions to increase the risk exposure to their own firm[3]. In contrast to Malmendier and Tate (2005), who determine managers as overconfident when they engage in net buying during a calibration period, a rolling

[3] I deal with investment based on private information and signaling in the robustness section of this paper.

window is used to estimate managerial overconfidence in a time-varying way.[4] Thereby, I follow Billett and Qian (2008), who provide evidence that managerial overconfidence changes over time. Using time-varying overconfidence measures allows to control for firm fixed effects, which alleviates concerns regarding omitted firm-specific variables.

Alternative overconfidence measures based on managerial option exercise behavior, e.g., Malmendier and Tate (2005) or Sen and Turmakin (2009), are not suitable for financial firms during the sample period at hand. Those measures require the exercisable stock options to be in the money, i.e., the respective stock price must exceed the strike price of the option. Stock options are generally granted at the money (Heron and Lie, 2007) in order to incentivize the managers, at least during the vesting period. Since the typical vesting period of managerial stock options is around five years (Malmendier and Tate, 2005), the exercisable options for the sample at hand were granted in the years 2002 to 2007. Those years are characterized by high stock prices and a favorable business environment for financial firms. At the beginning of the recent financial crisis, we saw a dramatic decrease of stock prices for most financial firms. Since the stock prices of the large majority of banks dropped below most options' strike prices, hardly any options could be exercised during the sample period. Furthermore, only the managers of banks that were hardly affected by the financial crisis and substantially outperformed the market possess exercisable stock options. Relying on those observations would induce a strong selection bias.

b) Sample and Descriptives

The study starts with financial statement information for the year 2008, which is the first year of mandatory reporting of the fair value level breakdown. The fair value breakdown allows for

[4] Unreported evidence indicates that the link between CFO overconfidence and Level 3 estimates prevails when using a time-invariant measure of managerial overconfidence.

an identification of those parts of the balance sheet whose values are determined by Level 3 models designed for disrupted markets. Insider trading data and financial statement information are taken from SNL Financial. Capital market information is taken from Thomson Reuters Datastream. Since a special interest lies on the consequences of managerial overconfidence for the use of Level 3 assets, I construct a sample of all U.S. commercial banks (SIC Code: 602) with information on the level breakdown of fair value assets from SNL Financial. To mitigate concerns that the observed managerial self-trading is a consequence of the firms' accounting behavior in a given year, the fiscal information from the end of year t are merged with managerial net buying of the previous year (t_{-2} to t_{-1}). This corresponds to a period of managerial insider trading from 2007 to 2012. Figure 1 illustrates the timing of the variables.

Insert Figure 1 around here

To derive an empirical measure of managerial overconfidence, the study follows Malmendier and Tate (2005) and calculates the Net Buyer measure. Thereby, the study only looks at those transactions that are characterized as open market transactions (Form 4 transaction codes: P, S, L, and J). In total, there are 58,385 unique managerial insider transactions from 5,491 different officers. In the next step, the shares sold and purchased during a given year are aggregated per manager to construct the Net Buyer measure.

Since SNL Financial does not assign clear roles to the managers, the officer title disclosed in insider trading files (Form 4) is used to identify the banks' CFO and CEO. The information is validated with filings from the annual statement and on the firm's web page in cases of unclear matching[5]. Looking at the insider trading of different managerial functions, 698 CFO years show

[5] This was frequently the case when there were two CFOs or CEOs in a fiscal year due to succession. In some cases, the managers were listed with their rank in a subsidiary, e.g., "unit CEO," while only serving as director in the bank holding company.

with at least one open market transaction compared to 995 CEO years. Thereby, about 76% of all manager years are characterized by a net increase in managerial stock holding by the use of open market transactions, while only 24% lead to a managerial stock holding decrease. Since managers frequently receive additional shares as a part of their compensation package, this share seems rather small. A potential explanation might go back to the specific sample period and the managers' expectations of recovering markets.

In the subsequent analysis, only those manager firm years will be treated as Net Buyer, where the respective manager increases the amount of shares using open market transactions. All manager firm years that are characterized by a net reduction or by no open market insider transaction will serve as a control group.

Insert Table 1 around here

Looking at the managerial behavior of the CEO and the CFO in a given year, table 1 indicates a small tendency of a coordinated behavior. While CFOs only engage in net buying in 18% of the firm years in which CEOs are not Net Buyers, the share increases to around 44% of the firm years if the CEO is characterized as a Net Buyer as well. As a potential explanation, there might be a shared mindset in the managerial team in a given year or truly coordinated behavior. Nevertheless, this behavior is far from perfectly correlated.

c) Empirical Approach

In a first step, the study seeks to identify determinants of Level 3 estimates. The share of Level 3 assets on a bank's balance sheet (ShareL3) will serve as the dependent variable. Since it is censored between 0 and 1, an OLS estimator might yield inconsistent results. Following Papke and Wooldridge (1996; 2008), a quasi-binomial population-averaged panel model is used with the canonical link (logit). This approach has already been applied to the share of Level 3

assets by Glaser et al. (2014). Unreported evidence shows that results remain qualitatively unchanged when using an OLS panel model or looking at changes instead of levels. Period and firm fixed effects account for unobserved time- and firm-specific factors.

$$E\left(ShareL3_{i,t} \left| X_{i,t}\right.\right) = exp\ \left(\eta_{i,t}\right)/\left(1 + exp\left(\eta_{i,t}\right)\right), \tag{1}$$

where the linear predictor is given by

$$\begin{aligned}\eta_{i,t} = \beta_0 + \beta_1 CFO\ Net\ Buyer_{i,t-1} + \beta_2 CEO\ Net\ Buyer_{i,t-1} + \beta_3 LnTA_{i,t-1} + \\ \beta_4 RoE_{i,t} + \beta_5 Loss_{i,t} + \beta_6 Dep_{i,t-1} + \beta_7 T1_{i,t-1} + \gamma_i + \mu_t\end{aligned} \tag{2}$$

The main explanatory variable of interest is the overconfidence measure for the CFO. The Net Buyer measure captures managers' open market trading behavior in their own companies' stock in the year before the current fiscal year. The lag structure should ensure that there is no reverse causality. Because of the CFO's responsibility for the accounting behavior of the firm, a positive link between CFO overconfidence and the use of valuation models designed for disrupted markets is hypothesized. In the course of the analysis, the overconfidence measure for the CFO is replaced and later complemented by the overconfidence measure for the CEO. While the CEO is responsible for a bank's general strategy, including the bank's general risk taking, a link between CEO overconfidence and the share of Level 3 assets would suggest that the assets' underlying risk is a driving force for the results rather than a distorted perception of disrupted markets.

To incorporate the monitoring incentives by the auditor and of external capital suppliers, I rely on the auditor's industry expertise and on the weaker monitoring incentives of insured deposit holders in banks. The consequences of external monitoring are explored by looking at the client-auditor relationship. The auditor's industry expertise thereby captures the larger specific knowledge base within a particular industry as well as a larger industry-specific audit

technology (Neal and Riley, 2004). Those industry-specific technologies are especially vital in efficiently auditing model estimates of fair values (Martin et al., 2006; Bratten et al., 2013). Therefore, the model from equations (1) and (2) is extended by a dummy variable (*Industry Expert*), which takes the value of 1 if the auditing firm of the current annual report belongs to the top five auditing firms[6] in the sample[7]. Furthermore, an indicator variable for Big 4 auditing firms, as well as for very small independent auditing firms (*Ind Audit*), accounts for the auditing firms' reputational risk and their bargaining power. To incorporate the monitoring incentives by external capital suppliers, I follow Billett et al. (1998) and rely on the weaker monitoring incentives of insured deposit holders in banks.

The new regression equation is given by equation (3).

$$\begin{aligned}\eta_{i,t} = {} & \beta_0 + \beta_1 CFO\ Net\ Buyer_{i,t-1} + \beta_2 CEO\ Net\ Buyer_{i,t-1} + \beta_3 LnTA_{i,t-1} + \\ & \beta_4 RoE_{i,t-1} + \beta_5 Loss_{i,t-1} + \beta_6 Dep_{i,t-1} + \beta_7 T1_{i,t-1} + \beta_8 AuditExpert_{i,t} + \\ & \beta_9 HighDeposit_{i,t-1} + \gamma_i + \mu_t\end{aligned} \tag{3}$$

The explanatory variables are the bank's size (*LnTA*), the profitability (*RoE, Loss*), and the deposit ratio (*Dep*). In order to test whether the use of Level 3 assets is tied to a bank's regulatory capital ratio, which closely relates to leverage ratios of industrial firms, the Tier 1 capital ratio (*T1*) is included as an explanatory variable. In line with the literature, control variables that refer to balance sheet items are taken from the beginning of the period while items from the profit and loss statement refer to the previous twelve months of a given year.

In a second step, the market perception, measured by Tobin's Q, is taken as dependent variable. As major control variables, the study relies on the managerial net buying, the share of

[6] KPMG (15.77%), Crowe Horwath LLP (11.38%), EY (6.84%), ParenteBeard LLC/Baker Tilly (6.14%), BKD LLP/Praxity (5.04%)
[7] Results remain qualitatively unchanged when using only KPMG (15.77%) and Crowe Horwath LLP (11.38%).

Level 3 assets, and the link between those two. Thereby, the study can deal with competing explanations regarding the underlying managerial motives of insider trading behavior.

$$\begin{aligned}\text{TobinsQ}_{i,t} = \ & \beta_0 + \beta_1 CFO\ Net\ Buyer_{i,t-1} + \beta_2 CEO\ Net\ Buyer_{i,t-1} + \\ & \beta_3 CEO\ Net\ Buyer_{i,t-1} * ShareL3_{i,t} + \beta_4 ShareL3_{i,t} + \beta_5 ShareL2_{i,t} + \\ & \beta_6 ShareL1_{i,t} + \beta_7 T1_{i,t-1} + \beta_8 RoE_{i,t-1} + \beta_9 Loss_{i,t-1} + \beta_{10} Dep_{i,t-1} + \\ & \beta_{11} LnTA_{i,t-1} + \gamma_i + \mu_t\end{aligned} \tag{4}$$

Additional control variables are similar to the previous section. Standard errors are clustered on the bank level. Bank and period fixed effects account for all time and bank invariant factors.

4. MAIN RESULTS

a) THE INFLUENCE OF MANAGERIAL OVERCONFIDENCE

In the following section, a special interest lies on whether managerial overconfidence is linked to the use of fair value model valuation with firm-supplied inputs. Therefore, the study first explores the distribution of various financial statement items in years that are characterized by CFO Net Buyers. While the CFO Net Buyer measure by Malmendier and Tate (2005) is taken from the period between the years t_{-2} and t_{-1}, the balance sheet items are taken from the annual report of year t.

Insert Table 2 around here

Descriptive statistics from table 2 indicate that bank years that are characterized by CFO Net Buyers show a lower profitability, a higher probability of reporting a loss, and a larger Loan-to-Asset ratio. Furthermore, banks with fewer total assets more likely have net buying CFOs. With respect to the regulatory capital ratio and the share of deposits on a bank's balance sheet, there is no statistically significant difference between CFO Net Buyers and non-Net Buyers.

Looking at the fair value hierarchy, a higher share of Level 3 assets and a lower share of Level 1 assets is observed for bank years with net buying CFOs. The differences are statistically significant at the 5% level. This finding can be seen as first evidence in favor of a link between managerial overconfidence and the use of managerial fair value estimates with Level 3 inputs.

Insert Table 3 around here

The univariate correlations of table 3 support findings from the split sample. The empirical analysis shows a positive and statistically significant relation between CFO overconfidence and the subsequent share of Level 3 assets. Furthermore, a correlation exists between the share of Level 3 assets and lower regulatory capital, lower profitability, and a higher deposit ratio.

b) The Link between Managerial Overconfidence and Level 3 Assets

As suggested by table 2, the use of Level 3 estimates seems to be more pronounced in bank years with overconfident CFOs. In the following section, this link will be further explored in a multivariate setting.

Insert Table 4 around here

As can be seen from column (1) of table 4, the Net Buyer measure of the CFO is positively linked to the share of Level 3 assets. With a z-value of 3.535, the link is statistically significant at the 1% level. The coefficient of 0.169 translated into a multiplicative increase of Level 3 assets by overconfident CFOs, which yields an economically significant impact as well. In column (2) of table 4, there is no statistically significant influence of the CEO Net Buyer measure. Since it is the CFO who is primarily responsible for the financial reporting, results on CEO overconfidence are in line with Jiang et al. (2010). They document a stronger link between CFO equity incentives and earnings management, while CEOs are found to have a much weaker influence on those financial reporting decisions. Column (3) provides empirical evidence that

the link between CFO overconfidence and the use of Level 3 estimates remains robust after controlling for the CEO Net Buyer.

Looking at the control variables, a lower regulatory capital ratio and lower profitability still have explanatory power for the share of Level 3 assets. The deposit ratio does not exert a statistically significant influence on the share of Level 3 assets.

c) Influence of the Auditing Firm

This section explores the influence of external monitoring on the link between managerial overconfidence and the use of Level 3 assets. Since more intense external monitoring reduces the managerial discretion with respect to the accounting policies, personal characteristics, such as managerial overconfidence, should be especially relevant for those firms with weaker external monitoring.

Insert table 5 around here

In column (1) of table 5, there is a strong link between the auditing firm's industry expertise in the banking industry and the share of Level 3 assets. One explanation for this finding might be the higher ability of those auditing firms to restrict the tendentious use of discretion in managerial reporting behavior. In column (2), the Big 4 dummy is also associated with a lower share of Level 3 assets, although the statistical significance disappears (z-value of 1.610) when controlling for the auditor's industry expertise. Throughout all specifications, the link between managerial overconfidence and the share of Level 3 assets remains statistically significant. Therefore, the link between CFO Net Buyer and the share of Level 3 assets is not driven by the client-auditor relationship.

Columns (4) and (5) look at the split sample by the auditors' industry expertise in the banking industry. In column (4), the influence of the CFO Net Buyer measure loses a large amount of its

statistical and economic power for those bank years with an industry expert as auditor. For those bank years with non-top-five industry experts as auditors, the link between the CFO Net Buyer measure and the share of Level 3 assets remains highly significant and the economic magnitude increases. The results are consistent with the notion that those auditing firms with a higher industry expertise are better able to restrict tendentious reporting behavior by the firm's management.

d) Influence of External Monitoring by the Capital Supplier

Similar to the auditing firm, a bank's capital supplier might monitor the bank's management and restrict tendentious reporting behavior.

Insert table 6 around here

In column (1) of table 6, the indicator variable for those bank years with a deposit ratio above the median does not exert a statistically significant influence on the share of Level 3 assets. Furthermore, the link between the CFO Net Buyer measure of managerial overconfidence and the share of Level 3 assets remains unchanged.

When splitting the sample into those firms with a higher-than-median deposit ratio (column (2)) and lower-than-median deposit ratio (column (3)), there is strong evidence that the link between the CFO Net Buyer measure and the share of Level 3 assets is attributed to those observations with a high deposit ratio. They are characterized by weaker external monitoring of the capital supplier, as insured depositors have the weakest incentives for monitoring compared to all other groups (Billett et al., 1998). In contrast, the link turns statistically insignificant in column (3) for those bank years with a lower deposit ratio and thus stronger external monitoring incentives by the capital supplier.

5. ROBUSTNESS ISSUES

While the managerial net buying is often associated with the overconfidence bias, two alternative explanations might be associated with this behavior. Firstly, the managers might use their private information on the firm when the stock is undervalued (Ke et al., 2003). Secondly, the managers with superior private information might use insider transactions to signal this private information to the market (Damodaran and Liu, 1993). In both cases, one should see an effect on the market value of the firm.

Insert table 7 around here

As can be seen from column (1) of table 7, bank years that are characterized by a net buying behavior of the CFOs in the previous year show a lower Tobin's Q compared to bank years with no previous net buying behavior of their CFOs. The influence is weakly significant in statistical terms. This finding is not in line with competing explanations on managerial signaling or the use of insider knowledge by the management, which would have postulated a positive and statistically significant coefficient. Those findings are in line with Malmendier and Tate (2005), who also find no outperformance of net buying managers. Black and Gallemore (2013) document similar results for overconfident managers in the financial industry. The effects of the control variables are in line with the literature. Especially, there is a discount of Level 3 assets (Song et al., 2010; Mohrmann et al., 2014), which might indicate an overvaluation of those assets (Huizinga and Laeven, 2012; Milbrath, 2012) or a lack of reliability (Kolev, 2008; Chung et al., 2013).

In column (2), there is no effect of overconfident CEOs on the bank's Tobin's Q. This finding again speaks against signaling or private information as the driving force behind managerial net buying. Furthermore, the interaction term of CFO net buying with the share of Level 3 assets

does not show a statistically significant influence. At the same time, the Level 3 discount remains unchanged. This finding indicates that the market does not perceive those Level 3 assets to be more reliable or less overvalued in cases of net buying CFOs. Those findings yield further evidence that rules out signaling as a competing explanation.

6. CONCLUSION

This paper raises the question whether personal characteristics of banks' managers might explain some of the variation of the use of Level 3 estimates. Thereby, I focus on the behavioral traits of managerial overconfidence of more than 500 U.S. banks from 2008 to 2012. Using the Net Buyer measure of managerial overconfidence by Malmendier and Tate (2005), the study documents a robust link between the use of Level 3 estimates and CFO overconfidence. The study presents empirical evidence that it is the CFO's overconfidence that drives Level 3 valuation rather than the CEO's. This finding corresponds to the managerial job sharing (Anantharaman and Lee, 2014) and the responsibility of CFOs for the accounting behavior (Jiang et al., 2010). In line with the literature, there is a general discount of Level 3 estimates by the capital market. Although overconfident CFOs tend to value a larger share of their balance sheet using Level 3 estimates, empirical evidence indicates no differences in the capital market perception of those assets, e.g., they are not perceived as more reliable or less overvalued, leading to a net increase in the total discount. Furthermore, the results are unlikely to be driven by signaling or insider trading based on superior private information as competing explanations.

The results from this study have important consequences for regulatory authorities as well as market participants. When allowing a firm's managers and auditors to deviate from observed market prices whenever they perceive the market to be disrupted (SFAS 157), managerial characteristics such as overconfidence might drive those decisions. Outside transparency on

those markets that are considered disrupted, as well as better corporate governance, might help mitigate those influences. While Level 3 estimates are perceived as equally overvalued by the capital market, the results might show a channel through which managerial overconfidence might lead to a capital market discount for those firms.

REFERENCES

Ahmed, A., Duellman, S., 2012. Managerial overconfidence and accounting conservatism. Journal of Accounting Research 51, 1-30.

Anantharaman, D., Lee, G.L., 2014. Managerial risk taking incentives and corporate pension policy. Journal of Financial Economics 111, 328-351.

Ben-David, I., Graham, J.R., Harvey, C.R. 2013. Managerial miscalibration. The Quarterly Journal of Economics 128, 1547-1584.

Billett, M.T., Garfinkel, J.A., O'Neal, E.S., 1998. The cost of market versus regulatory discipline in banking. Journal of Financial Economics 48, 333-358.

Billett, M.T., Qian, Y., 2008. Are overconfident CEOs born or made? Evidence of self-attribution bias from frequent acquirers. Management Science 54, 1037-1051.

Black, D., Gallemore, J., 2013. Bank executive overconfidence and delayed expected loss recognition. Unpublished working paper, Duke University, University of North Carolina.

Bouwman, C.H.S., 2014. Managerial Optimism and Earnings Smoothing. Journal of Banking & Finance 41, 283-303.

Bratten, B., Gaynor, L.M., McDaniel, L., Montague, N.R., Sierra, G.E., 2013. The audit of fair values and other estimates: The effects of underlying environmental, task, and auditor-specific factors. Auditing: A Journal of Practice & Theory 32, 7-44.

Center for Audit Quality, 2007. Measurements of fair value in illiquid (or less liquid) markets. www.thecaq.org/resources/pdfs/MeasurementsIlliquidMarkets.pdf.

Chung, S.G., Goh, B.W., Ng, J., Yong, K.O., 2014, Voluntary fair value disclosures beyond SFAS 157's three-level estimates. Unpublished working paper, Singapore Management University.

Damodaran, A., Liu, C.H., 1993. Insider trading as a signal of private information. Review of Financial Studies 6, 79-119.

De Bondt, WF.M.., Thaler, R.H., 1995. Financial decision making in markets and firms: A behavioral perspective. In: Jarrow, R.A. et al. (Ed.) Handbook of Finance. Elsevier, Amsterdam.

Fahlenbrach, R., Stulz, R.M., 2011. Bank CEO incentives and the credit crisis. Journal of Financial Economics 99, 11-26.

Glaser, M., Mohrmann, U., Riepe, J., 2014. Fair value accounting and bank default: The effects of level 3 assets on default risk and default costs. Working paper, Munich School of Management, University of Konstanz, University of Tuebingen.

Heron, R.A., Lie, E., 2007. Does backdating explain the stock price pattern around executive stock option grants? Journal of Financial Economics 83, 271-295.

Hillary, G., Hsu, C., 2011. Endogenous overconfidence in managerial forecasts. Journal of Accounting and Economics 51, 300-313.

Hirshleifer, D., 2001. Investor psychology and asset pricing. Journal of Finance 56, 1533-1597.

Hirshleifer, D., Low, A., Teoh, S., 2012. Are overconfident CEOs better innovators? Journal of Finance 67, 1457-1498.

Huizinga, H., Laeven, L., 2012. Bank valuation and accounting discretion during a financial crisis. Journal of Financial Economics 106, 614-634.

Jiang, J., Petroni, K.R., Wang, I.Y., 2010. CFOs or CEOs: Who have the most influence on earnings management? Journal of Financial Economics 96, 513-526.

Ke, B., Huddart, S., Petroni, K., 2003. What insiders know about future earnings and how they use it: Evidence from insider trades. Journal of Accounting and Economics 35, 315-346.

Kolev, K., 2014. Do investors perceive marking-to-model as marking-to-myth? Early evidence from SFAS 157 disclosure. Unpublished working paper. Yale School of Management.

Laux, C., Leuz, C., 2010. Did fair-value accounting contribute to the financial crisis? Journal of Economic Perspectives 24, 93-118.

Libby, R., Rennekamp, K., 2012. Self-serving attribution bias, overconfidence, and the issuance of managerial forecasts. Journal of Accounting Research 50, 197-231.

Malmendier, U., Tate, G., 2005. CEO overconfidence and corporate investment. The Journal of Finance 60, 2661-2700.

Malmendier, U., Tate, G., 2008. Who Makes Acquisitions? CEO overconfidence and the market's reaction. Journal of Financial Economics 89, 20-43.

Martin, R.D., Rich, J.S., Wilks, T.J., 2006. Auditing fair value measurements: A synthesis of relevant research. Accounting Horizons 20, 287-303.

Mehran, H., Rosenberg, J., 2007. The effect of CEO stock options on bank investment choice, borrowing, and capital. Staff Report, Federal Reserve Bank of New York 305.

Milbradt, K., 2012. Level 3 assets: Booking profits and concealing losses. Review of Financial Studies 25, 55-95.

Mohrmann, U., Riepe, J., Stefanie, U., 2014. Fool's Gold or Value for Money? The Link between Abnormal Audit Fees, Audit Firm Size, Fair Value Disclosures, and Market Valuation. Working paper. University of Konstanz, University of Tuebingen.

Moore, D.A., Healy, P.J., 2008. The trouble with overconfidence. Psychological Review 115, 502-517.

Neal, T.L., Riley, R.R. Jr., 2004. Auditor industry specialist research design. Auditing: A Journal of Practice and Theory 23, 169-177.

Papke, L., Wooldridge, J., 1996. Econometric methods for fractional response variables with an application to 401(k) plan participation rates. Journal of Applied Econometrics 11, 619-632.

Papke, L., Wooldridge, J., 2008. Panel data methods for fractional response variables with an application to test pass rates. Journal of Econometrics 145, 121-133.

Schrand, C., Zechman, S., 2012. Executive overconfidence and the slippery slope to financial misreporting. Journal of Accounting and Economics 53, 311-329.

Sen R., Turmakin, R., 2009. Stocking up: Executive optimism and share retention. Unpublished working paper, The Hong Kong University, New York University.

Song, C.J., Thomas W.B., Yi, H., 2010. Value relevance of SFAS 157 fair value hierarchy information and the impact of corporate governance mechanisms. The Accounting Review 85, 1375-1410.

FIGURES AND TABLES

Figure 1: Time Structure

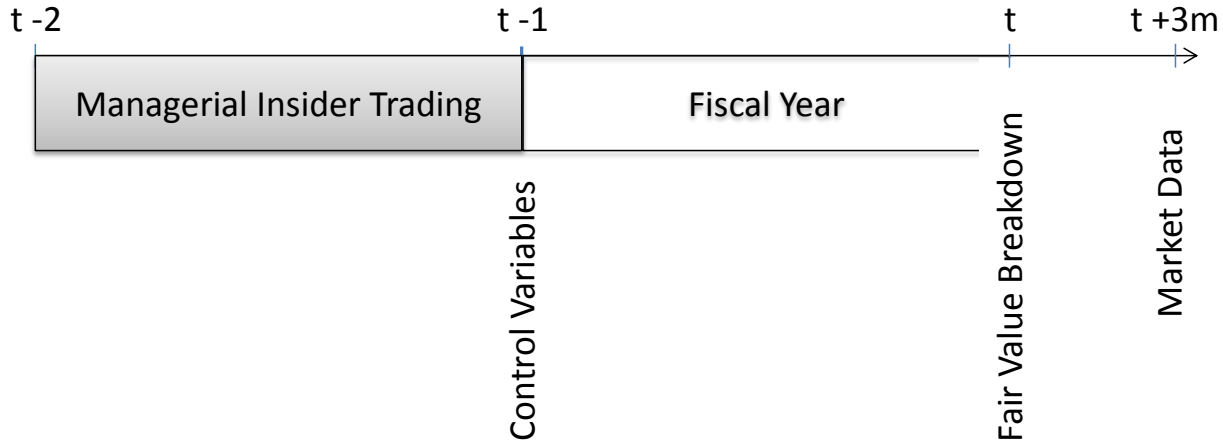

Table 1: Descriptive Statistics of the Managerial Net Buying Behavior

Net Buying of the CEO	Net Buying of the CFO: No	Net Buying of the CFO: Yes	Net Buying of the CFO: Total
No	884	196	1,080
Yes	426	333	759
Total	1,310	529	1,839

Table 2: Descriptive Statistics by Groups
The table 2 displays the differences in means of those U.S. bank-years which are characterized by overconfident CFOs according to the Net Buyer measure of Malmendier and Tate (2005). Variable definitions can be found in Appendix A (*** significant at the 1 % level, ** significant at the 5 % level, * significant at the 10 % level).

	CFO Net Buyer		CFO Not Net Buyer		Diff.
	N	Mean	N	Mean	Mean
Tier 1 Regulatory Capital Ratio	529	13.40%	1,310	13.58%	
Return on Equity	529	0.35%	1,310	2.41%	*
Loss Dummy	529	22.68%	1,310	16.41%	***
Deposit Ratio	529	78.38%	1,310	78.69%	
Total Assets [in m. USD]	529	9,555	1,310	30,214	***
Gross Loans To Assets	505	67.7%	1,243	65.6%	***
Share of Level 1 Fair Value Assets	529	0.6%	1,310	0.8%	**
Share of Level 2 Fair Value Assets	529	19.1%	1,310	18.9%	
Share of Level 3 Fair Value Assets	529	2.0%	1,310	1.6%	***

Table 3: Correlation Table

	Net Buyer of CFOs	Tier 1 Regulatory Capital Ratio	Return on Equity	Loss Dummy	Deposit Ratio	Total Assets [in m. USD]	Gross Loans To Assets	Share of Level 1 Fair Value Assets	Share of Level 2 Fair Value Assets
Net Buyer of CFOs	1.000								
Tier 1 Regulatory Capital Ratio	-0.050**	1.000							
Return on Equity	-0.022	0.125***	1.000						
Loss Dummy	0.051**	-0.155***	-0.596***	1.000					
Deposit Ratio	-0.009	-0.210***	-0.038*	0.052**	1.000				
Total Assets [in m. USD]	-0.040*	-0.063***	0.015	-0.008	-0.273***	1.000			
Gross Loans To Assets	0.056**	-0.302***	-0.107***	0.132***	0.083***	-0.174***	1.000		
Share of Level 1 Fair Value Assets	-0.040*	0.034	0.038*	-0.023	-0.070***	0.225***	-0.194***	1.000	
Share of Level 2 Fair Value Assets	0.013	0.124***	0.075***	-0.102***	-0.120***	0.176***	-0.712***	-0.041*	1.000
Share of Level 3 Fair Value Assets	0.052**	-0.091***	-0.270***	0.329***	0.077***	0.075***	0.084***	0.007	-0.139***

Table 4: Managerial Overconfidence and Perceived Market Disruption

Table 4 displays results from quasi-binomial panel models, where the share of Level 3 assets on the bank's balance sheet is used as dependent variable. Year and bank fixed effects are included in all specifications. Variable definitions can be found in Appendix A. Robust standard errors are clustered at the bank level. Robust z-statistics are displayed in brackets (*** significant at the 1 % level, ** significant at the 5 % level, * significant at the 10 % level).

	(1)	(2)	(3)
Net Buyer of CFOs	0.169***		0.179***
	(3.535)		(3.694)
Net Buyer of CEOs		0.004	-0.038
		(0.077)	(-0.678)
Tier 1 Regulatory Capital Ratio	-1.492	-1.554	-1.516
	(-1.138)	(-1.192)	(-1.157)
Return on Equity	-0.676**	-0.642**	-0.671**
	(-2.548)	(-2.405)	(-2.522)
Loss Dummy	0.207**	0.215**	0.209**
	(2.238)	(2.294)	(2.255)
Deposit Ratio	-0.323	-0.403	-0.329
	(-0.552)	(-0.681)	(-0.562)
Ln Total Assets	-0.008	-0.010	-0.009
	(-0.253)	(-0.325)	(-0.283)
Constant	-3.951***	-3.828***	-3.927***
	(-5.488)	(-5.268)	(-5.460)
Year Fixed-Effects	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes
Observations	1,839	1,839	1,839
Cluster	404	404	404
Chi-squared	201.3	197.8	203.9
Prob > Chi-squared	0.000	0.000	0.000

Table 5: Auditor Characteristics, Overconfidence, and Perceived Market Disruption

Table 5 displays results from quasi-binomial panel models, where the share of Level 3 assets on the bank's balance sheet is used as dependent variable. Year and bank fixed effects are included in all specifications. Variable definitions can be found in Appendix A. Robust standard errors are clustered at the bank level. Robust z-statistics are displayed in brackets (*** significant at the 1 % level, ** significant at the 5 % level, * significant at the 10 % level).

	(1)	(2)	(3)	(4)	(5)
				Industry Expert (Top 5) Yes	Industry Expert (Top 5) No
Net Buyer of CFOs	0.196***	0.178***	0.192***	0.121*	0.219***
	(4.067)	(3.697)	(3.993)	(1.697)	(3.494)
Net Buyer of CEOs	-0.042	-0.035	-0.040	-0.039	-0.032
	(-0.770)	(-0.651)	(-0.723)	(-0.471)	(-0.461)
Industry Expert (Top 5)	-0.340***		-0.365***		
	(-4.585)		(-4.666)		
Big4		-0.349***	-0.212**		
		(-3.517)	(-2.201)		
Ind Audit		-0.149*	-0.273***		
		(-1.692)	(-2.935)		
Tier 1 Regulatory Capital Ratio	-1.553	-1.524	-1.441	-2.586*	-1.059
	(-1.173)	(-1.148)	(-1.094)	(-1.900)	(-0.615)
Return on Equity	-0.592***	-0.584**	-0.572**	-0.730*	-0.573*
	(-2.615)	(-2.528)	(-2.495)	(-1.914)	(-1.831)
Loss Dummy	0.220**	0.228***	0.235***	0.142	0.223*
	(2.571)	(2.597)	(2.741)	(1.060)	(1.922)
Deposit Ratio	-0.384	-0.454	-0.501	-0.558	-0.193
	(-0.677)	(-0.800)	(-0.892)	(-0.712)	(-0.247)
Ln Total Assets	0.026	0.035	0.038	0.054	0.015
	(0.858)	(0.969)	(1.097)	(1.237)	(0.394)
Constant	-4.221***	-4.233***	-4.259***	-3.946***	-4.375***
	(-5.992)	(-5.744)	(-5.886)	(-4.216)	(-4.528)
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,839	1,839	1,839	717	1,122
Cluster	404	404	404	177	344
Chi-squared	233.0	220.2	234.7	62.29	207.4
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000

Table 6: External Governance, Overconfidence, and Perceived Market Disruption

Table 6 displays results from quasi-binomial panel models, where the share of Level 3 assets on the bank's balance sheet is used as dependent variable. Year and bank fixed effects are included in all specifications. *High Deposit Ratio* refers to observations with a higher than median share of deposits. Variable definitions can be found in Appendix A. Robust standard errors are clustered at the bank level. Robust z-statistics are displayed in brackets (*** significant at the 1 % level, ** significant at the 5 % level, * significant at the 10 % level).

	(1)	(2)	(3)
		High Deposit Ratio	
		Yes	No
Net Buyer of CFOs	0.197***	0.261***	0.083
	(4.084)	(3.707)	(1.256)
Net Buyer of CEOs	-0.043	-0.057	0.035
	(-0.773)	(-0.791)	(0.448)
High Deposit Ratio	0.063		
	(0.792)		
Auditor Industry Expert (Top 5)	-0.338***	-0.429***	-0.199**
	(-4.584)	(-4.012)	(-1.994)
Tier 1 Regulatory Capital Ratio	-1.610	-0.457	-1.385
	(-1.208)	(-0.209)	(-0.888)
Return on Equity	-0.589***	-0.786**	-0.422
	(-2.610)	(-2.460)	(-1.288)
Loss Dummy	0.218**	0.142	0.248**
	(2.541)	(1.143)	(2.042)
Deposit Ratio	-0.687	1.929	-1.105
	(-0.980)	(1.155)	(-1.430)
Ln Total Assets	0.025	0.003	0.043
	(0.845)	(0.064)	(1.283)
Constant	-4.006***	-6.086***	-3.911***
	(-5.202)	(-3.450)	(-4.391)
Year Fixed-Effects	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes
Observations	1,839	919	920
Cluster	404	288	284
Chi-squared	232.3	168.8	81.69
Prob > Chi-squared	0.0000	0.0000	0.0000

Table 7: Market Valuations of Overconfidence and Level 3 Assets

Table 7 reports the results from the OLS estimation for the pooled sample that regresses Tobin's Q on the displayed variables. Variable definitions can be found in the Appendix A. Robust standard errors are clustered on the bank level. Robust t-statistics are displayed in brackets (*** significant at the 1 % level, ** significant at the 5 % level, * significant at the 10 % level).

	(1)	(2)
Net Buyer of CFOs	-0.192	-0.284
	(-0.802)	(-1.013)
Net Buyer of CEOs	-0.125	-0.129
	(-0.605)	(-0.625)
Interaction Term:		5.258
Net Buyer of CFOs * Share of Level 3 Assets		(1.252)
Share of Level 3 Assets	-6.594**	-8.651**
	(-2.049)	(-2.135)
Share of Level 2 Assets	-6.626***	-6.628***
	(-2.660)	(-2.662)
Share of Level 1 Assets	-4.105	-4.028
	(-0.635)	(-0.625)
Tier 1 Regulatory Capital Ratio	-12.339***	-12.269***
	(-2.967)	(-2.959)
Return on Equity	0.208	0.201
	(0.707)	(0.687)
Loss Dummy	-0.368	-0.380
	(-1.565)	(-1.611)
Deposit Ratio	10.426***	10.448***
	(3.757)	(3.752)
Ln Total Assets	0.954*	0.967*
	(1.931)	(1.964)
Constant	-11.091***	-11.178***
	(-2.610)	(-2.631)
Year Fixed-Effects	Yes	Yes
Bank Fixed-Effects	Yes	Yes
Observations	1,783	1,783
R-squared	0.471	0.471
Cluster	394	394
Prob > F	0.000	0.000

APPENDIX A

Variables	Definition	Source [Key]
Big 4	The dummy takes the value of one if the auditing firm is one of the following: KPMG, PwC, Deloitte, or Ernst & Young.	Thomson Reuters
CFO Buyer	CFO Buyer refers to CFO-firm-year where the respective CFO buys shares of her own company using open market transactions.	SNL Financial [Online Access]
CFO Net Buyer	CFO Net Buyer refers to CFO-firm-year where the respective CFO increases the amount of shares of her own company using open market transactions.	SNL Financial [Online Access]
CEO Buyer	CEO Buyer refers to CEO-firm-year where the respective CEO buys shares of her own company using open market transactions.	SNL Financial [Online Access]
CEO Net Buyer	CEO Net Buyer refers to CEO-firm-year where the respective CEO increases the amount of shares of her own company using open market transactions.	SNL Financial [Online Access]
Deposit Ratio	Amounts in customers' banking deposits; any accounts subject to federal banking deposit insurance, including any portions in jumbo deposits that are not insured but subject to the FDIC deposit regulations scaled by Total Assets at the beginning of the quarter.	SNL Financial [131933; 131929]
Gross Loans to Assets	Total loans to customers, including any loans held at amortized cost, available for sale, fair value through profit and loss and trading scaled by Total Assets at the beginning of the quarter.	SNL Financial [248740; 131929]
High Deposit Ratio	Bank-Year observations with a higher-than-median deposit ratio.	SNL Financial [131933; 131929]
Ind Auditor	The dummy takes the value of one if the audit firm is not a member in a national or international audit network.	Thomson Reuters
Industry Expert [Top 2 / Top 5]	Industry Expert refers to Firm-Year observations, where the auditing firm belongs to the top 2 / top 5 auditing firms in an industry.	Thomson Reuters

Level 1 Assets	Value of assets measured at fair value based on unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets.	SNL Financial [217256]
Level 2 Assets	Value of assets measured at fair value based on quoted prices in markets that are not considered to be active or financial instruments for which all significant inputs are observable, either directly or indirectly.	SNL Financial [217257]
Level 3 Assets	Value of assets measured at fair value based on prices or valuations that require inputs that are both significant to the fair value measurement and unobservable.	SNL Financial [217258]
Ln Total Assets	Natural logarithm of total assets.	SNL Financial [131929]
Loss Dummy	Dummy taking the value of one if the bank's net profit is smaller than zero.	SNL Financial [131961]
Return on Equity (RoE)	Net profit scaled by the market value of equity at the beginning of the quarter.	SNL [131961]; Worldscope [MV]
Share of Level 1 FVA	Level 1 fair value assets scaled by total assets at the end of the quarter. The share is winsorized on the 1 % level to reduce the impact of outliers.	SNL Financial [217256; 131929]
Share of Level 2 FVA	Level 2 fair value assets scaled by total assets at the end of the quarter. The share is winsorized on the 1 % level to reduce the impact of outliers.	SNL Financial [217257; 131929]
Share of Level 3 FVA	Level 3 fair value assets scaled by total assets at the end of the quarter. The share is winsorized on the 1 % level to reduce the impact of outliers.	SNL Financial [217258; 131929]
Tier 1 Regulatory Capital Ratio	Tier 1 capital as a percentage of total risk-adjusted assets. For European banks, this excludes transitional capital adjustments when available.	SNL Financial [131989]
Total Assets	All assets owned by the company as of the date indicated, as carried on the balance sheet and defined under the indicated accounting principles.	SNL Financial [131929]