

Volume 30, Issue 4**The effect of CEO overconfidence on bank risk taking**

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Abstract

Recent studies document that some CEOs are overconfident. In this note, we examine the effect of CEO overconfidence on bank risk taking. We measure CEO overconfidence using press data, and bank risk taking using the standard deviation of stock returns. Controlling for a number of CEO- and bank-specific variables, we find that banks managed by overconfident CEOs take more risk.

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1 Introduction

One well-documented fact in the social psychology literature is that people tend to be overconfident (e.g., Kidd 1970, and Moore 1977). Recently, researchers find that CEOs are no exception to this rule (e.g., Malmendier and Tate 2005, 2008). Indeed, Goel and Thakor (2008) argue that overconfident managers are more likely to become CEOs. In this note, we examine the effect of CEO overconfidence on bank risk taking.

Theory suggests that CEO overconfidence can affect risk taking in at least two ways. First, overconfident CEOs tend to overestimate the precision of exogenous noisy signals (Gervais et al. 2009, and Goel and Thakor 2008). Second, overconfident CEOs tend to underestimate the riskiness of future cash flows (Hackbarth 2008, 2009). Either way, overconfidence leads to more risk taking.

Empirically, a major difficulty is to construct a plausible measure of overconfidence. In this note, we follow Malmendier and Tate (2008) and measure CEO overconfidence using press data. Specifically, we hand-collect articles published in *The American Banker* that characterize a sample CEO as confident or cautious. We classify a CEO as overconfident if he is more often characterized as confident than as cautious. We are able to collect a large number of articles that meet the selection criteria described in Malmendier and Tate (2008), because *The American Banker* provides an extensive coverage of the U.S. banking industry on a daily basis.

We construct a sample of banks over the period 1993–2006, and a measure of risk taking using the standard deviation of daily stock returns. After controlling for a number of CEO- and bank-specific variables, we find that CEO overconfidence is associated with increased bank risk taking: all else equal, banks managed by overconfident CEOs are 6% riskier.

2 Prior research on bank risk taking

Prior research has identified several determinants of bank risk taking that we briefly discuss below. These include ownership structure, franchise value, CEO compensation, and bank size.

A large body of literature finds that ownership structure affects bank risk taking. In an important paper, Saunders et al. (1990) find a positive relation between insider ownership and bank risk taking. Looking at a different sample period, Chen et al. (1998) find an opposite result. Anderson and Fraser (2000) show that the relation between insider ownership and bank risk taking depends on bank regulation. During periods of relative deregulation, the relation is positive, as documented in Saunders et al. (1990). During periods of re-regulation, the relation can become negative, as documented in Chen et al. (1998). Esty (1998) finds that banks subject to stricter liability rules take less risk. Gorton and Rosen (1995) propose a model of corporate control and find evidence that ownership structure is important in explaining the bank failures in the 1980s. Laeven and Levine (2009) find that bank risk taking varies positively with the comparative power of

shareholders. They also find that the effectiveness of certain bank regulations depends on bank ownership structure. Pathan (2009) finds that strong bank boards positively affect bank risk taking, while CEO power negatively affects bank risk taking.

In banking, franchise value refers to the capitalized value of a bank's future profits. Franchise value is lost when a bank fails. Thus, it provides banks with an incentive to take less risk (Marcus, 1984). In an important paper, Keeley (1990) documents a decline in bank franchise value in the 1960s and 1970s. He also documents a negative relation between franchise value and bank risk. Keeley concludes that increased competition reduced bank franchise value, which then led to increased risk taking. Gan (2004) notes several econometric difficulties associated with previous studies of franchise value and risk taking. To overcome these difficulties, she uses the Texas real estate collapse in the 1980s as a natural experiment, and finds evidence consistent with Keeley (1990). Demsetz et al. (1997) study the interactions between ownership structure and franchise value. They find a positive relation between insider ownership and bank risk taking, but only at low franchise value banks. At high franchise value banks, there is no such relation. They conclude that franchise value can mitigate risk-related agency problems at banks.

Several papers examine the effects of CEO compensation on bank risk taking. In an early work, Houston and James (1995) find that bank CEOs are less likely to participate in stock option plans, and receive a smaller percentage of total compensation in stock options than CEOs in other industries. They conclude that CEO compensation in banking is not structured to promote risk taking. This situation has changed, however, following deregulation. In a more recent paper, Chen et al. (2006) find that banks have increasingly employed stock option-based compensation, and such compensation induces risk taking. Using a more accurate measure of CEO risk-taking incentives generated by stock options, Mehran and Rosenberg (2008) obtain similar results.

Finally, size also affects a bank's risk-taking policy. Demsetz and Strahan (1997) find that large banks are better diversified than small banks. They also find, however, that large banks have used their diversification advantage to pursue riskier lending and operate with greater leverage. As a result, better diversification does not translate into reduction in total risk.

3 Sample and variables

3.1 Data sources

We begin with a sample of bank holding companies ("banks") that are included in the Standard & Poor's ExecuComp database during 1993–2006.¹ For these banks, we obtain

¹Our sample starts in 1993, because the starting year for CEO compensation data in the ExecuComp database is 1992, and we use one-year lagged CEO compensation data in our regressions. Our sample ends in 2006, because the recent financial crisis started in 2007. During the crisis, some bank CEOs tried to maintain investor confidence in their banks. Articles based on quotes of such CEOs may not reflect their true characteristics.

stock return data from the Center for Research in Security Prices (CRSP), year-end accounting data from the Federal’s Reserve’s Consolidated Financial Statements for Bank Holding Companies (FR Y-9C), and CEO compensation data from ExecuComp. Since our regression analysis requires the use of lagged data on CEO compensation, we drop all bank-year observations in which there is a change of CEO. We also drop observations with incomplete data. Our final sample includes 739 observations on 121 banks and 177 CEOs.

3.2 Measuring bank risk taking

Following prior literature (e.g., Chen et al. 2006, Demsetz and Strahan 1997, Mehran and Rosenberg 2008, and Saunders et al. 1990), we measure bank risk taking using stock data. For a given bank in a given year, risk is the standard deviation of the bank’s daily stock returns in that year. This measure captures the overall risk-taking activities of a bank.

3.3 Measuring CEO overconfidence

Following Malmendier and Tate (2008), we measure CEO overconfidence using press data. Specifically, we search for articles published in *The American Banker* between 1992 and 2005 that characterize a sample CEO as confident or cautious. An article is categorized as confident if it refers to a sample CEO using the terms “confident,” “confidence,” “optimistic,” or “optimism.” An article is categorized as cautious if it refers to a sample CEO using the terms “cautious,” “conservative,” “practical,” “frugal,” “reliable,” “steady,” “not confident,” or “not optimistic.” We hand-check each article to make sure that the term refers to the CEO in question.

For a given CEO in a given year, we construct an indicator variable, `TOTALconfident`, that equals one if the total number of confident articles until that year exceeds that of cautious articles, and zero otherwise. We construct another variable, `TOTALmentions`, that equals the total number of articles published in *The American Banker* until that year that mentioned the name of the CEO.

Table I reports the summary statistics of the press data for the sample CEOs. There are a total of 352 articles, including 221 articles that characterize a sample CEO as confident, and 131 articles that characterize a sample CEO as cautious. These articles cover a variety of topics such as the CEO, company earnings, a merger or acquisition, and the banking industry in general. Table I also reports the source of assessment, i.e., the identity of the person who characterized the CEO. As in Malmendier and Tate (2008), a larger number of confident articles are based on CEO quote, indicating that confident CEOs are more outgoing and assertive.

3.4 Other control variables

We control for a number of CEO- and bank-specific factors. Several papers find that CEO compensation affects bank risk taking (e.g., Chen et al. 2006, and Mehran and

Rosenberg 2008). However, in a recent paper, Fahlenbrach and Stulz (2011) find that banks with higher option compensation for their CEOs did not perform worse during the recent financial crisis. To account for CEO compensation incentives, we include delta and vega in the regressions. Delta is the change in the dollar value of the CEO's wealth for a one percentage point change in the bank's stock price. Vega is the change in the dollar value of the CEO's wealth for a 0.01 change in the annualized standard deviation of the bank's stock returns. We calculate delta and vega using the one-year approximation method developed in Core and Guay (2002).

Demsetz and Strahan (1997) find that bank size affects risk taking. Large banks are better diversified, but they also operate with higher leverage and engage in riskier activities. We measure size as the natural logarithm of total assets (in thousands of dollars).

Capital can affect bank risk in at least two ways. First, all else equal, higher capital implies lower probability of default. Second, higher capital implies that bank owners have weaker incentives to take risk. We measure capital as the ratio of book value of equity to book value of assets.

Franchise value also affects bank risk taking. A higher franchise value means that the bank has more to lose in case of bankruptcy (e.g., Keeley 1990, and Marcus 1984). This reduces the risk-taking incentives of the bank. Following prior literature (e.g., Keeley 1990), we measure franchise value as the ratio of market value of assets to book value of assets. Market value of assets is the sum of market value of equity and book value of liabilities.

Several papers find that banks have shifted toward activities that generate noninterest income, and greater reliance on noninterest income is associated with higher risk (e.g., DeYoung and Roland 2001, and Stiroh 2004, 2006). Following Stiroh (2006), we measure a bank's exposure to noninterest activities as the ratio of noninterest income to the sum of net interest income and noninterest income.

3.5 Summary statistics

Table II reports the summary statistics of the sample. Average risk is 0.017 with a standard deviation of 0.006. Average delta is \$603,950 and average vega is \$182,587. The variation in either delta or vega is substantial, which is not surprising since the optimal compensation contract for a CEO is likely to be affected by a number of factors such as the degree of risk aversion of the CEO and the investment opportunity set of the bank. The TOTALconfident variable shows that about 26% of CEOs in our sample are overconfident. An average bank in our sample has a franchise value of 1.117 and a noninterest income of 0.364.

4 Empirical results

To examine the effect of CEO overconfidence on bank risk taking, we estimate the following equation:

$$\begin{aligned}
 Risk_{i,t} = & \beta_0 + \beta_1 \cdot TOTALconfident_{i,t-1} + \beta_2 \cdot TOTALmentions_{i,t-1} \\
 & + \beta_3 \cdot Delta_{i,t-1} + \beta_4 \cdot Vega_{i,t-1} + \beta_5 \cdot Size_{i,t-1} + \beta_6 \cdot Capital_{i,t-1} \\
 & + \beta_7 \cdot Franchise\ value_{i,t-1} + \beta_8 \cdot Noninterest\ income_{i,t-1} + \gamma_t + \varepsilon_{i,t},
 \end{aligned} \tag{1}$$

where γ_t are year fixed effects, and $\varepsilon_{i,t}$ is the error term. All the independent variables except year fixed effects are lagged by one year to avoid endogeneity problems.² We estimate equation (1) using pooled ordinary least squares with clustering of standard errors at the bank level.

Column (1) of Table III reports the regression results. The coefficient on TOTALconfident is positive and significant, indicating that banks managed by overconfident CEOs take more risk. To gauge the economic significance of this effect, we note that the average risk for banks in our sample is 0.017 (see Table II). Thus the coefficient on TOTALconfident implies that, all else equal, banks managed by overconfident CEOs are 6% riskier.

The regression results for control variables are generally consistent with our expectations. The coefficient on TOTALmentions is not significant, indicating that the total number of articles is not directly related to subsequent bank risk taking. The coefficient on either delta or vega is not significant, indicating that CEO compensation is not related to bank risk taking during our sample period. This result is consistent with Fahlenbrach and Stulz (2011), but differs from Mehran and Rosenberg (2008).³

The coefficient on size is negative and significant. This result is consistent with the view that large banks are better diversified (Demsetz and Strahan 1997). The coefficients on capital is negative but not significant. The coefficient on franchise value is not significant. The coefficient on noninterest income is positive and significant, indicating that greater reliance on noninterest income is associated with higher risk. This result is consistent with the findings of DeYoung and Roland (2001) and Stiroh (2004, 2006).

To check whether the documented effect is present in both large and small banks, we split the sample banks into groups of large and small banks, and estimate equation (1) separately for each group. Column (2) reports the regression results for large banks. The

²Press coverage suffers from an important endogeneity problem (see Malmendier and Tate 2008). For example, when a CEO engages in high-risk activities, he may be perceived as confident by the press, or he may try to convey confidence to investors. To alleviate this concern, we lag TOTALconfident and TOTALmentions by one year. To further alleviate this concern, we note that most articles in our sample are not directly related to risk taking (see Table I).

³When we estimate equation (1) using the same sample period (1993–2002) as in Mehran and Rosenberg (2008), we find a result very similar to theirs. Namely, vega is positively and significantly related to risk taking, and delta is not related to risk taking. Thus, the difference between our result and that of Mehran and Rosenberg (2008) is mainly due to the difference in sample period.

coefficient on TOTALconfident is positive and significant. Column (3) reports the regression results for small banks. The coefficient on TOTALconfident is not significant. However, in terms of sign and magnitude, it is very similar to the one reported in column (1) for the full sample regression.⁴ These results indicate that the effect of CEO overconfidence on bank risk taking is likely to present in both large and small banks.

We recognize that CEO overconfidence may be endogenous. For example, riskier banks may be more likely to hire overconfident CEOs (perhaps because overconfident CEOs underestimate risk and thus require a lower compensation). A usual empirical method to overcome endogeneity is to use instrumental variables. Unfortunately, we are not able to find valid instruments for CEO overconfidence. This remains a challenge for future research.

5 Discussion

Our finding adds to the banking literature that examines the determinants of bank risk taking. Prior studies have identified several factors (such as ownership structure, managerial compensation, and bank size) that affect the risk-taking behaviour of banks. Our finding suggests that CEO overconfidence also affects bank risk taking.

Our finding also adds to the risk-related literature in general. It is well-known that managers usually have weaker risk-taking incentives than do well-diversified shareholders (e.g., Amihud and Lev 1981, and Jensen and Meckling 1976). One way to mitigate risk-related agency problems is through managerial compensation (e.g., Coles et al. 2006, and Smith and Stulz 1985). More recently, researchers have developed models in which CEO overconfidence can also mitigate risk-related agency problems (e.g., Gervais et al. 2009, and Goel and Thakor 2008). Our finding provides some empirical support to their models.

Our finding has an important policy implication. In many countries bank regulators rely primarily on capital requirements to constrain banks from taking excessive risk. A major rationale is that higher capital requirements imply higher loss for bank shareholders in case of bankruptcy, and thus provide them with an incentive to take less risk. Our finding suggests that some banks take high risk because they are managed by overconfident CEOs. Increasing capital requirements may not cause such banks to reduce risk taking, because overconfident CEOs believe that they are acting in the best interests of shareholders. Thus, additional regulations, such as restrictions on bank investment activities, may be warranted.

⁴This lack of statistical significance is likely due to the fact that CEOs of smaller banks receive less press coverage. (The correlation between TOTALmentions and Size is 0.67 in our sample.) Thus, it is difficult to accurately measure overconfidence of CEOs of small banks using press data. The large standard error of the coefficient on TOTALconfident is consistent with this interpretation.

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Table I. Summary statistics of the press data

This table presents the summary statistics of all the articles published in The American Banker between 1992 and 2005 that characterize a sample CEO as confident or cautious. The articles are categorized using the criteria developed in Malmendier and Tate (2008). An article is categorized as confident if it refers to a sample CEO using the terms “confident,” “confidence,” “optimistic,” or “optimism.” An article is categorized as cautious if it refers to a sample CEO using the terms “cautious,” “conservative,” “practical,” “frugal,” “reliable,” “steady,” “not confident,” or “not optimistic.” Source of assessment is the identity of the person who characterized the CEO.

	Full sample	Confident	Cautious
Number of articles	352	221	131
Article type (percent)			
About the CEO	19%	20%	18%
About company earnings	29%	29%	27%
About a merger or acquisition	18%	14%	24%
About banking industry	13%	15%	8%
About other (e.g., dividend)	22%	22%	21%
Source of assessment (percent)			
CEO quote	44%	54%	27%
Journalist’s assessment	41%	39%	44%
Other assessment (e.g., analyst)	15%	6%	30%

Table II. Summary statistics of the sample

The sample consists of 739 observations on 121 banks and 177 CEOs from 1993 to 2006. Risk is the standard deviation of the bank's daily stock returns in a given year. For a given CEO in a given year, TOTALconfident is an indicator variable that equals one if the total number of confident articles published in The American Banker until that year exceeds that of cautious articles, and zero otherwise. TOTALmentions is the total number of articles published in The American Banker until that year that mentioned the name of the CEO. Delta is the change in the dollar value of the CEO's wealth for a one percentage point change in the bank's stock price. Vega is the change in the dollar value of the CEO's wealth for a 0.01 change in the annualized standard deviation of the bank's stock returns. Size is the natural logarithm of total assets (in thousands of dollars). Capital is the ratio of book value of equity to book value of assets. Franchise value is the ratio of market value of assets to book value of assets. Noninterest income is the ratio of noninterest income to the sum of net interest income and noninterest income.

	Mean	Standard Deviation	25th Percentile	Median	75th Percentile
Dependent variable					
Risk	0.017	0.006	0.013	0.016	0.020
CEO characteristics					
Delta (\$ thousands)	603.950	876.997	120.251	277.571	701.524
Vega (\$ thousands)	182.587	288.384	27.619	70.539	198.411
TOTALconfident	0.263	0.440	0.000	0.000	1.000
TOTALmentions	28.959	44.340	5.000	13.000	30.000
Bank characteristics					
Size	16.859	1.313	16.751	15.757	17.716
Capital	0.083	0.017	0.072	0.081	0.093
Franchise value	1.117	0.095	1.055	1.096	1.151
Noninterest income	0.364	0.163	0.251	0.324	0.430

Table III. The effect of CEO overconfidence on bank risk taking

This table reports regression results that relate bank risk taking to various CEO and bank characteristics. All regressions include year-fixed effects but their coefficients are not reported. Intercepts are not reported. Standard errors are clustered at the bank level and reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Full Sample	Large Banks	Small Banks
TOTALconfident	0.00110** (0.000516)	0.000899* (0.000477)	0.00102 (0.000984)
TOTALmentions	3.84e-06 (8.23e-06)	-4.36e-06 (7.44e-06)	-3.06e-05 (3.42e-05)
Delta	7.08e-07 (5.26e-07)	8.04e-07 (6.06e-07)	1.12e-06** (4.70e-07)
Vega	-8.98e-07 (1.30e-06)	-1.78e-06 (1.26e-06)	-2.14e-06 (3.70e-06)
Size	-0.000965*** (0.000326)	0.000496 (0.000459)	-0.00267*** (0.000521)
Capital	-0.0244 (0.0155)	-0.0320* (0.0173)	-0.0183 (0.0204)
Franchise value	0.00366 (0.00356)	0.00870** (0.00413)	0.00140 (0.00524)
Noninterest income	0.00581*** (0.00185)	0.00530*** (0.00146)	0.00592* (0.00329)
Number of observations	739	371	368
R-squared	0.644	0.791	0.595