Self-serving attribution bias and CEO turnover: Evidence from CEO interviews on CNBC

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Abstract

Self-serving attribution bias (SAB, hereafter) is a type of misattribution bias in which CEOs attribute the outperformance of the company to their own abilities, and underperformance of the company to bad luck or the economy. Using the transcripts of CEO interviews on CNBC, we find that the stock market response to the interviews of CEOs with self-referencing behavior is negative. Moreover, the CEOs with SAB are more likely to be fired and more sensitively to performance, especially if the governance is stronger. We also find that the stock market response to the announcement of forced turnovers of CEOs with SAB are significantly more positive by up to 9.7% over the event window of [-1,1] days. While we find the negative tone of the interviewing journalists increases the likelihood of forced CEO turnover and increases the turnover-performance sensitivity, the correlation between turnover and SAB is robust.

Keywords: Self-serving attribution bias, overconfidence, CEO turnover, investment cash flow sensitivity, CNBC, media, corporate governance

JEL classification: G30

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I. Introduction

Self-serving attribution bias (SAB, hereafter) is a type of misattribution bias in which CEOs attribute the outperformance of the company to their own abilities, and underperformance of the company to bad luck or the economy (Miller and Ross, (1975)). Self-serving attribution bias is an important conduit that leads people to become overconfident by attributing their successes to internal factors, such as personal abilities, and their failures to external factors, such as luck (Billett and Qian (2008); Daniel, Hirshleifer, and Subrahmanyam (2001); Gervais and Odean (2001); Hirshleifer (2001); Libby and Rennekamp (2011)). Researchers have found that overconfident CEOs tend to overinvest in projects because of their overestimation of their own ability to generate future returns (Malmendier and Tate (2005)) and that overconfident CEOs tend to overpay for acquisitions (Malmendier and Tate (2008)). Given that CEOs with SAB are more likely to be overconfident, how do investors in the stock market respond when the CEO is revealed to have SAB in his/her interviews on influential financial media, such as CNBC? We hypothesize and find that CEO interviews where the CEO speaks more self-referencing phrases receive significantly lower abnormal returns.

Once the shareholders learn that their CEO has SAB, it *might* be optimal for the shareholders to remove the overconfident CEOs with to prevent future value destruction. However, the relationship between CEO overconfidence and firm value is not uniform. Given that the CEO is risk averse and his/her wealth is not diversified, a rational CEO is predicted to be too conservative in his/her corporate decisions to maximize shareholder value (Jensen and Meckling (1976)). In contrast, since an overconfident CEO (the CEO with SAB) would overestimate his/her ability to deliver the result, a moderately overconfident CEO's corporate

decisions would be less conservative and closer to first best solution (Gervais, Heaton, and Odean (2011)). Consequently, researchers have found that excessively overconfident CEOs are more likely to be fired, while moderately optimistic CEOs are not (Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011); Goel and Thakor (2008)). Also, Gervais, Heaton, and Odean (2011) argue that optimal CEO incentives would be more sensitive to performance if the CEO is extremely overconfident. Consistent with the prediction, we find that CEOs with SAB are more likely to be fired. We also find that turnover of CEO with SAB is more sensitive to performance, especially when the governance is stronger, such as after Sarbanes Oxley Act of 2002.

We measure the self-referencing behavior and the SAB of CEOs using transcripts of 6,931 CEO interviews on CNBC from 1997 to 2006 as in Kim and Meschke (2011). CEO interviews on financial media are close to the ideal setting for this research: the journalist (show host) frequently asks about the firm's past performance and the CEO answers by attributing the firm's success to specific causes. Although many CEOs must go through interview preparation supported by the companies' Public Relations Division, the unobserved effect of PR training would only add noise to our empirical study and bias against finding the results. Moreover, analyzing the linguistic content of the spoken language of the CEO enables us to estimate cross-sectional variation in the psychological bias of the CEOs, namely the SAB.

We use the computational linguistic technique in Li (2010), where he measures the SAB using the management discussion and analyses (MD&A) sections of annual reports of public US public companies. We also use the Linguistic Inquiry and Word Count (LIWC) dictionary. LIWC is one of the most widely used text analysis software developed by James W. Pennebaker, Roger J. Booth, and Martha E. Francis. We first identify the "causal" sentences from the CEOs'

words in the transcripts. We capture whether the singular and plural first-person pronouns (the 22 words in LWIC dictionary under "I" and "We" categories, such as I, me, my, we, our, and us) are used in the sentences, and count it as "causal_we." Equivalently, we capture whether second- or third-person references (the 47 words in LWIC dictionary under "You," "SheHe," and "They" categories, such as you, your, they, and their), including "competitor(s)," "industry," or "economy," are used in the causal sentences, and count them as "causal_other." For each interview, "causal_we" minus "causal_other" divided by the total word count of the CEO is defined as the measure of self-referencing.

We find that the investor response to self-referencing in CEO interviews is significantly negative and permanent. Kim and Meschke (2011) find that CEO interviews on CNBC on average result in the transitory run-up and reversal of the stock price because the CEO cannot release any material information about economic fundamentals of the firm in the financial television interview. Our further analysis of spline regressions clarify that the negative response to self-referencing words of CEO is concentrated only on the top quartile of self-referencing CEOs only. Our test result is consistent with the theoretical prediction by Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011) that shareholders do not like CEOs with extreme overconfidence.

Li (2010) is the most closely related paper to ours in that he studies the relationship between SAB of CEOs and corporate financial decisions. By parsing the texts and analyzing the causal sentences in the management discussions and analysis (MD&A) section of annual reports, he measures CEOs' SAB. He finds that CEOs with SAB tend to show symptoms of overconfidence, such as having (1) issuing more forward-looking statements; (2) issuing

management earnings forecasts with positive biases; (3) higher investment-cash flow sensitivity; (4) negative investor response to acquisitions; (5) higher leverage ratio; (6) more repurchases; and (7) less dividend payouts. We also find that CEOs with SAB show higher investment cash-flow sensitivity. What is unique to our study is that the language contents used is the direct words of the CEO in response to the questions of the journalist. In contrast, Li's (2010) research is based on the MD&A, which may be written and edited by the financial reporting group of the company. In addition, using hand-collected data of forced CEO turnovers of Execucomp firms from 1993 to 2008, we uniquely link the SAB to the forced CEO turnover. Our results are comparable to the results of Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011) who use the conventional executive option based overconfidence measure by Malmendier and Tate (2005) in their CEO turnover model. What is unique to our finding is the larger turnover-performance sensitivity for the CEOs with SAB, especially under better governance, which is a test of Gervais, Heaton, and Odean (2011).

One may argue that the CEO may be rationally using his/her language tone in self-serving manner when cornered by the journalists who interview them. Indeed, Dyck, Volchkova, and Zingales (2008), Kuhnen and Niessen (2011) document significant impact of media on corporate governance. Therefore, in the robustness check section, we test whether our documented result is a spurious correlation because of omitting the variables about the governance role of the media. Specifically, we use the measure of negative tone of the show hosts and interact it with stock performance. As a result, we document significant governance impact of media even in CEO turnover setting, which is a different contribution of this paper. Still, we show that the correlation between SAB and CEO turnover is robust throughout the specifications.

II. Data

The empirical research of this paper is based on two hand-collected databases: (1) CEO interviews on CNBC from 1997 to 2006 as in Kim and Meschke (2011); and (2) CEO turnover data from Execucomp from 1993 to 2008. The transcripts of CEO interviews and news articles are collected from Factiva. We then merge each interview observation with stock price data from the Center for Research in Securities Price (CRSP) and accounting data from Compustat by hand matching the company name in the transcript and the company code in standard databases. To be included in the sample, each CEO interview must have valid stock return data for all 120 trading days of the estimation window [-150, -31] and 20 trading days of the event window [-10, +10]. Each transcript is downloaded in XML format. Since the transcripts have the names of the speakers for each sentence, we first collect and compile the list of CEO names and anchor names. Then we split each transcript into the words of the CEO and the words of the show host. For the words of the CEOs, we parse further and measure "causal_we" and "causal_other" as discussed in the introduction. Then we construct the "self-referencing" measure, which is defined as follows:

$$Self\_referencing = \frac{\text{Causal\_we} - \text{Causal\_other}}{Number\ of\ words\ by\ CEO}$$

Viewership data is obtained from Nielsen Company. We obtain stock price related data from CRSP and accounting related data from Compustat. We obtain institutional ownership from the Thomson Financial 13F database, executive related data from Execucomp, short-sale data from Reg-SHO database, and microstructure data from TAQ database. Appendix B shows the definition of the variables used throughout the paper. The mean, standard deviation, median,

25th percentile and 75th percentile of all the variables used in the CAR regressions of CEO interviews are shown in Panel A of Table 1. The summary statistics of variables used in the rest of the regressions are shown in Panel B of Table 1.

[Table 1 about here]

III. Results

We first examine whether the stock market investors respond negatively to the CNBC interviews of the CEOs with a high self-referencing tendency. We replicate the same regression as for Table 5 in Kim and Meschke (2011) and add one explanatory variable of the self-attribution measure.

[Table 2 about here]

The results in Panel A of Table 2 suggest that investors respond negatively to interviews of CEOs with self-referencing behavior on the day of the interview. One standard deviation higher self-referencing measure (0.001939) is associated with 20 basis points lower CAR[0] (significant at the 1% level). The sample average CEO word count is 693 words, and the average self-referencing measure is 0.0004, which implies that there is a 0.28 incidence of net self-referencing in a typical CEO interview. One standard deviation higher manifestation of self-referencing implies 1.34+0.282=1.62 incidences of self-referencing. The effect is somewhat persistent, because the coefficients of the self-referencing on CAR[1,2] regressions are also negative and significant at the 5% level. A one standard deviation higher self-referencing measure is associated with -23 basis points lower CAR[1,2]. The negative response on the day

of the interview is permanent. Therefore, we conclude that investors do not like to see CEOs with self-serving attribution bias. The remaining results are consistent with what is documented in Kim and Meschke (2011). The investor response to a CEO interview is positively correlated with the attention on the day of the interview, but negatively correlated on the days after the interview. The investor response to a CEO interview is positively correlated with the individual investors' order imbalance and negatively correlated with the fraction of short-selling volume.

Some readers may wonder how the supposedly non-informative CEO interviews could provide any information such that the price response to CEOs with self-referencing words could have negative and permanent. However, the non-informative character of the CEO interviews on CNBC is specifically about non-contaminated CEO interviews only. Also, the transitory pricing pressure and reversal is the average pricing pattern. Moreover, Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011) find that shareholders expel the CEOs with extremely high overconfidence. Therefore, it may be that the price response is permanently negative only for the CEOs with extremely high degree of self-referencing in the interview. To identify, we run spline regressions. Specifically, we take the 75^{th} percentile of self-referencing measure as the splitting point and construct dummy variables that are 1{Self-referencing>75^{th} percentile} and 1{Self-referencing≤75^{th} percentile} then interact these dummy variables with the self-referencing measure. We report the regression result in Panel B of Table 3, which confirms that the negative price response to interview is concentrated on the extreme high self-referencing CEOs. For majority of the CEOs, the price response related to self-referencing is indistinguishable from zero.

In the subsection above, we find evidence that investors do not welcome CEO self-referencing behavior in media interview settings. Given that CEOs can choose not to show up for media interviews when the company is hit by negative news, we can interpret the self-referencing in media interviews as attributing good performance to himself/herself or the company. With our evidence that investors dislike the SAB of CEOs, we next investigate whether CEOs with SAB are more likely to be fired, ceteris paribus. Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011) find that overconfident CEOs as well as diffident CEOs are significantly more likely to be fired, because overconfident CEOs are more likely to waste money on negative NPV projects, by overestimating the payoffs of the projects. SAB works as a mechanism to nurture and strengthen overconfidence (Li (2010)). Therefore, we hypothesize that CEOs with SAB are more likely to be fired. Gervais, Heaton, and Odean (2011) theoretically predicts that for excessively overconfident managers, it is optimal for the firm to increase the performance sensitivity of the CEO incentives to gain from shifting risk to the CEO. Therefore, we test whether the CEO turnover is more sensitive to performance if the CEO has SAB. Furthermore, if we divide the sample into better-governed firms and worse governed firms, it would be the better-governed firms that shows higher turnover-performance sensitivity for CEOs with SAB. We assume that corporate governance strength was enhanced after SOX, and we assume that firms with higher institutional ownership have better governance.

The CEO turnover data is based on the Execucomp database. CEO turnover observations over 1992~2001 are graciously provided by Dirk Jenter as in Jenter and Kanaan (2011). Data on CEO turnover from 2002~2008 are hand collected using Factiva as in Kim and Kang (2011). We also follow the classification rule of Parrino (1997) in classifying CEO turnover into either forced or voluntary turnover, as is commonly followed in the literature (Bushman, Dai, and

Wang (2010); (2011); Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011); Fich and Shivdasani (2006); Jenter and Kanaan (2011); Kaplan and Minton (2011); Masulis, Wang, and Xie (2011); and Parrino, Sias, and Starks (2003)). Appendix A describes the procedure in detail. Following Adams and Ferreira (2009), we run a linear probability model of forced CEO turnover with firm and year fixed effects. The linear probability model has an advantage over the logistic model in the sense that (1) the latter often fails to incorporate firm fixed effects in their maximum likelihood procedure, and (2) the interpretation of marginal effects of any interaction terms in the latter model could be problematic as was pointed out by Ai and Norton (2003). Following Li (2010), we construct a SAB measure by regressing the self-referencing measure on firms' abnormal stock market performance, which is measured by the alpha of the Fama-French 4 factor model, using market, size, book to market, and momentum factors (Carhart (1997); Fama and French (1996)), over the estimation window of [-150,-31] trading days prior to CEO interviews.

$$Self\ Referencing = \beta_0 + \beta_1 ALPHA_{FF4F} + \varepsilon$$

Our estimate of β_1 is 0.0273 with a t-statistic of 3.88. We find that CEOs with good abnormal performance tend to attribute the good performance to themselves or their companies as a whole. The SAB measure is constructed as follows:

$$SAB = 1_{\{ALPHA_{FF4F} \geq 0 \wedge \varepsilon \geq 0\}} + 1_{\{ALPHA_{FF4F} < 0 \wedge \varepsilon < 0\}}$$

We label a CEO as having SAB (1) if he/she shows abnormally high self-referencing behavior in a CNBC interview when firm performance is good; and (2) if he/she shows abnormally low self-referencing behavior in a CNBC interview when firm performance is bad.

For CEOs who gave multiple interviews in a given fiscal year, we take the SAB measure from the most recent interview.

Following the literature on CEO turnover, we use the following control variables: (1) One-year stock performance until the fiscal year end; (2) Return on assets, defined as operating income before depreciation and amortization divided by total assets; (3) Idiosyncratic volatility, measured as the root mean squared error of the monthly market model regression with the S&P 500 index; (4) Firm size, measured as the log of assets; (5) Retirement age dummy that is one when the CEO age is in the range of 63 to 66; (6) High CEO ownership dummy that is one if the stock ownership of the CEO is greater than 5%; (7) CEO tenure from Execucomp, which is augmented by hand-collected information from Factiva; (8) Chairman CEO dummy that is one if the CEO is the chairman of the board, which is obtained from the Risk Metrics database; (9) Proportion of independent directors that is obtained from Risk Metrics; and (10) Dummy variable that is one if the CEO had no CNBC interview in the given fiscal year.

[Table 3 about here]

In Table 3, we first run CEO turnover regressions for the firm years in Execucomp where the CEO had a CNBC interview during the fiscal year. We also run regressions with the whole sample of Execucomp firms from 1997 to 2006. If the CEO interview is missing for any firm years, we assign the value of zero to 1{SAB} and assign the value of one to the 1{missing CNBC interview}. We find that the CEOs with SAB are more likely to be fired, other things being equal, which is consistent with Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011). CEOs that have SAB in the CNBC interview have a 1.5% higher probability of being forced out. Given that the unconditional probability of being fired is 2.6%, the economic

magnitude is very large despite the fact that we use a linear probability model. We also find that turnover-performance sensitivity is higher for the CEOs with SAB, which is consistent with the prediction of Gervais, Heaton, and Odean (2011). Moreover, we find that the turnover-performance sensitivity is disproportionately higher for the firms after SOX, which indicates that better governed firms fire the overconfident CEOs more sensitively to the firm performance.

Next, we investigate the stock price response to the announcement of forced CEO departures and test if the investors welcome the departure of the CEOs with SAB. Given that the stock market response to the revelation of CEOs' SAB through the media is negative and significant, we predict that the investor response to the firing of CEOs with SAB would be positive and significant. We use the Fama-French 4 factor (market, size, book to market, and momentum) model as the asset-pricing model to generate the expected daily return. We set [-150,-31] trading days relative to the first announcement date of a CEO turnover as the estimation window. To determine the cleanest investor response to the CEO dismissal, we remove the CEO turnovers that were confounded by major corporate events that were captured by our exhaustive list from the databases. We start with 728 forced CEO turnovers from 1993 to 2008. The contaminating events are mergers and acquisitions (SDC Platinum), earnings announcements (IBES), restatements (GAO data) augmented by the restatement data used in Meschke and Kim (2011) and Fahlenbrach, Low, and Stulz, (2010), and class action lawsuits (Stanford Lawsuit Clearing House database). For the CEO dismissal announcements confounded by earnings announcements and merger announcements, we remove the observations if the merger or earnings announcements took place 15 calendar days before or after the CEO turnover announcement date. We also follow stricter rules in removing the CEO dismissals that are potentially associated with accounting restatements or class action lawsuits. If these events took

place two years before or after the CEO dismissal, we remove the CEO turnover observation. Using this procedure, we are left with 373 forced CEO turnover observations. We first obtain CAR[-1,1] of forced CEO turnover. Then we run multiple regressions as follows:

$$\begin{aligned}\mathrm{CAR}[-1,1] = {} & \beta_0 + \beta_1 \mathrm{SAB} + \beta_2 \mathrm{SAB} * \mathrm{Viewership} + \beta_3 1\mathrm{YrStkPerf} + \beta_4 1\{\mathrm{Outsider}\} \\ & + \beta_5 \log(\mathrm{Assets})_t + \beta_6 \mathrm{BEME} + \beta_7 \sigma_{\mathrm{idio}} + \beta_8 \mathrm{NewsNegative} \\ & + \beta_9 1\{\text{No CNBC interview}\} + \varepsilon\end{aligned}$$

Where CAR[-1,1] is the cumulative abnormal return from one day prior to the CEO departure announcement to one day after the event. $1\{\text{Outsider}\}$ is the dummy variable that is one if the new CEO is an outsider. In studying the investor response to the announcement of forced CEO turnover, narrowing it down to the perfectly non-confounded events is destined to be imperfect because of the realistically limited databases the researchers have. Therefore, for the unconfounded CEO turnover observations used in the regression, we control for the linguistic tone of news articles about the company over the window of [-10,0] days to control for the qualitative information that is not captured by the conventional databases that we utilize thus far. We obtain all the news articles of the event set in Factiva, where the news sources are the Wall Street Journal and the Dow Jones Newswires. A negative word count is done by referring to the financial words dictionary by Loughran and McDonald (2011). Following Tetlock (2007, 2010), we construct News Negative as the standardized measure of negativity in the linguistic tone of the news articles as follows:

$$NewsNegative = \frac{\%Negative - \mu_{Negative}}{\sigma_{Negative}}$$

$$\%Negative = \frac{\sum_{t=-10}^{T}\sum_{i=1}^{a}\#NegativeWords_{it}}{\sum_{t=-10}^{T}\sum_{i=1}^{a}\#Words_{it}}$$

We set the estimation window of news articles to be a one-year period that stops at eleven calendar days prior to the event date. We divide the estimation window into non-overlapping segments of 11 calendar days. Then, we obtain the %Negative for each segment, which is the total count of negative words divided by total word count of the news articles in the segment. $\mu_{Negative}$ is the average %Negative over the estimation window of a one-year period that stops at eleven calendar days prior to the event date. Across all the segments, we then compute the mean ($\mu_{Negative}$) and standard deviation ($\sigma_{Negative}$). For the unconfounded sample of forced CEO turnover, we have 8,592 news articles over the estimation window and 590 news articles over the event window.

[Table 4 about here]

Table 4 shows the CAR regression result of forced CEO turnover. The results suggest that investors welcome the dismissal of the CEO with SAB. The CAR[-1,1] is 7.8%~9.7% higher depending on the specification with the t-statistic of 2.16. As was previously documented, investor response to a CEO dismissal is negatively correlated with his/her prior performance and is significantly positive if the successor is an outsider (Parrino (1997)).

Given that SAB fosters overconfidence, we find that investors in the stock market do not particularly like the revelation of CEOs' SAB in the media, and the investors tend to consistently punish overconfident CEOs with SAB. We also examine whether the CEOs with SAB are more likely to make their firms' investments sensitive to cash flow because of previous studies' findings. Malmendier and Tate (2005) find that overconfident CEOs are more likely to depend

heavily on internally generated cash flow for investments, instead of external capital markets, because those CEOs are more optimistic about their investment projects than the investors in the external capital market. Li (2010) also finds that firms with CEOs who show more SAB display higher investment-cash flow sensitivity, because SAB is a trait that leads to overconfidence. We test the same hypothesis by running the investment cash-flow sensitivity regressions, following Malmendier and Tate (2005) using firm and year fixed effects. Table 5 indicates that, indeed, CEOs with SAB tend to increase the investment cash-flow sensitivity of the firm. The coefficient of the interaction between SAB and cash flow is positive and significant at the 1% level.

[Table 5 about here]

One of the most important empirical testing ground of the investor response to the CEO's investment decision makings depending on the bias of the CEO is the acquisition announcements. We obtain all the acquisition announcements that were completed from SDC Platinum over the period of 1997~2006 where the deal value is at least 5 million dollars. Further restrictions following Güner, Malmendier, and Tate (2008) are as follows: (1) more than 50% target shares are acquired as a result; (2) the acquirer data has to be available in CRSP and Compustat; and (3) exclude leveraged buyouts, recapitalization, self-tenders, subsidiary acquisition, spin-offs, exchange offers, repurchases, minority stake purchases, privatizations, and remaining-interest acquisitions are excluded. As a result, we have 9,031 acquisition announcements over the sample period for the sample of firms that had CEO interviews on CNBC. For each acquisition announcement, we match the maximum of SAB values (as well as maximum of self-serving word counts) of CEO in the interviews during the fiscal year that ended before acquisition. Using

Fama-French 4 factor model, we compute the cumulative abnormal return over the [-1,1] trading day window for each acquisition announcements and use it as the dependent variable in the regression.

Our key explanatory variables are SAB, self-serving word count, and its square term. The reason we provide the square term of self-serving word count is because theories by Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011), Gervais, Heaton, and Odean (2011) predict that there is an optimal level of CEO overconfidence beyond which the firm value is destroyed. Whereas SAB is simply a dummy variable (first three regressions), self-serving word count enables (last three regressions) to capture a potential concave (hump shaped) relationship between self-serving attribution bias and investor response to acquisition announcements. The Then we follow the literature in providing the control variables such as dummy variable for public targets, dummy variable for diversification, dummy variable for 100% cash deal, size of the firm, and book-to-market. We also run regressions with industry fixed effects and year fixed effects to control for potential omitted variable bias. The first and fourth regressions use 1 digit SIC code in defining diversification merger. The second and fifth regressions use 2 digit SIC code in defining diversification merger. The third and sixth regressions use 3 digit SIC code in defining diversification merger. Since multiple acquisition announcements for the same firm year are used in the sample as separate observations, we use clustered standard error at firm level and year level using two dimension clustering technique by Petersen (2009).

[Table 6 about here]

The results in the first three columns of Table 6 indicate that investors welcome the acquisition announcements by CEOs with SAB. This seems to be at odds with Li (2010) at first

glance, because he finds negative and significant coefficients of SAB variable in the similar regressions. However, the theoretical arguments about overconfidence by Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011) predict that SAB (as a dynamic measure of overconfidence) of the CEO up to a certain degree is preferable from the perspective of the shareholders. The reason is that overconfident CEOs are more willing to take necessary risks than their rational counterparts due to the overestimation of success probability in the projects by overconfident CEO. In the last three regressions, therefore, replace the SAB dummy with the self-referencing measure (continuous variable) and its square term to identify non-linear relationship. We find a hump shaped relation between self-serving attribution bias and investor response to acquisition announcements. The coefficient of the square term of self-serving word count is statistically significant at one percent level. We reaffirm that shareholders welcome the acquisition decision by overconfident CEOs up to a certain degree. However, we find that the investors do not welcome acquisition decisions by extreme overconfident CEOs. This finding is a new contribution to the literature. Malmendier and Tate (2008) identify an overconfident CEO by defining as the CEO who held an option until the expiration even though the package was at least 40% in-the-money entering its last year, and they find negative correlation between overconfidence and investor response to acquisition announcements. Billet and Qian (2008) document negative relation between CEO overconfidence and acquisition announcement abnormal return, but they use a proxy for CEO overconfidence which is one if the acquisition was a second or more deals in recent five years for the same CEO. Doukas and Petmezas (2007) find similar results with Billet and Qian (2008) throughout merger waves and business cycles. To the best of our knowledge, this is the first paper to document the concave relationship by having a direct measure of self-attribution bias.

Robustness Check

Gurun (2011) finds that firms that has directors with media experience are more likely to have significantly larger media coverage and more positive coverage. Also, Kim and Meschke (2011) document that CNBC is more likely to interview the CEOs of larger firms and growth firms. One may be concerned that the omitted variable such as book-to-market, which is highly correlated with having CNBC interview, may also be correlated with the error term of the forced turnover regression. Therefore, we include the book-to-market variable and run the same forced turnover regression in Table 7. The results are robust.

[Table 7 about here]

Kuhnen and Niessen (2011) find that executive compensation is significantly reduced when public opinion measured by the negative tone of the media coverage about executive compensation is high, suggesting significant governance role of the media as in Dyck and Zingales (2002) and Dyck, Volchkova, and Zingales (2008). In every CEO interview, there are CNBC journalists working as the show hosts, i.e. the anchors. These journalists may bring critical questions to the CEO to satisfy the needs of the viewers that are interested in the company's shareholder value, which would increase the viewership of the channel. On the same line of thought, one may argue that the anchors' negative language tone is actually affecting the outcome of implicit incentive (threat of forced turnover), whereas CEOs may be only strategically speaking in more self-serving manner to avoid a decrease in his or her market value of human capital in the CEO labor market. To test this alternative hypothesis, we use the negative tone of the interview hosts and hostesses, and the interaction term between the stock performance and the negative tone of the anchors. The negativity measure is constructed as

follows: Across the entire interview sample, we compute the negative words spoken by the anchor (interview host) and divide by the number of words by the anchor. Then across the interviews, we obtain mean and standard deviation. Then we obtain standardized percentage of negative words. Then for the firm year, we attribute the most recent interview's value of standardized negative words for the firms that had CNBC interview.

[Table 8 about here]

The result in Table 8 suggests that the positive correlation between SAB and forced turnover and the higher turnover-performance sensitivity for the CEOs with SAB is robust to the inclusion of journalists' negative language tone. Thus, the result we document in this study is not a spurious correlation coming from omitted variable bias. Moreover, we find significant governance impact of the media even in CEO turnover setting, which is another contribution to the literature. We find that the negative tone of the anchors increases the likelihood of forced CEO turnover. In addition, it appears that the journalists' negative tone makes the forced CEO turnover more sensitive to the firm performance, especially after SOX.

One may question whether our SAB measure and self-referencing measures are capturing the narcissism measure as in Chatterjee and Hambrick (2007). CEO narcissism measures how much a CEO is obsessed with himself/herself in such a way that his/her words would be densely populated with first-person singular pronouns, such as "I, my, me, mine, and myself" regardless of the context of the CEO dialogue. Chatterjee and Hambrick's measure of CEO narcissism is the ratio of the count of first person *singular* pronouns and the count of total first person pronouns in CEO's interview transcript. More precisely, we refer to LIWC dictionary, and use

the 12 words that belong to "I" category as the first person singular pronouns[2]. We also use the 10 words that belong to "We" category as the first person plural pronouns[3]. We construct the same measure using our CNBC interview scripts, and control for CEO narcissism in our regressions for CEO interview response and CEO turnover.

[Table 9 about here]

Panel A of Table 9 is the CAR regression results surrounding the day of CEO interviews as in Table 2, and shows no significant correlation between CEO's narcissism and investor response to his or her CNBC interviews. In Panel B, we include the self-referencing word measures, and still find no significant coefficient for CEO narcissism. Chatterjee and Hambrick (2007) find that CEO narcissism in and of itself does not have valuation implication, but that the narcissistic CEOs pursue more attention drawing investment activities. Therefore, finding narcissism of the CEO in CNBC interview may not have significant impact on price. In Panel C, we run CEO turnover regressions as in Table 3, using CEO narcissism measure. The correlations we document in Table 3 do not change. However, one interesting pattern emerges. Before SOX, narcissistic CEOs were less likely to be fired, ceteris paribus, but after SOX, there is no difference between narcissistic CEOs and non-narcissistic CEOs. Unlike overconfidence, there is no economic theory that predicts a certain correlation between narcissism and forced CEO turnover. However, even though it is somewhat ad-hoc, the result suggests that when governance was poor, the narcissistic CEOs are less likely to be fired, even after controlling for CEO power such as chairman duality and CEO ownership. In Panel D, we run CAR regressions

[2] "I," "Id," "I'd," "I'll," "I'm," "Im," "Ive," "I've," "me," "mine," "my," and "myself" belong to the "I" category.
[3] "our," "ours," "ourselves," "us," "we," "we'd," "we'll," "we're," "weve," and "we've" belong to the "We" category. We exclude "lets," and "let's" from the dictionary.

based on the announcement of forced CEO turnovers as in Table 4. The result does not change, and the coefficient of CEO narcissism is insignificant. Overall, we confirm that the results that we document in this paper are not driven by narcissism, but by the self-serving attribution bias of the CEO.

IV. Conclusion

Speech reflects the most dominant and consistent personality traits of an individual (Chatterjee and Hambrick (2007)). As long as self-serving attribution bias is a personality trait of a CEO, and as long as the transcripts of CEO interviews capture the spoken language of the CEOs, our dataset enables us to directly quantify the self-serving attribution bias of the top manager. With the novel dataset, we find that stock market investors do not welcome the CEOs who excessively attribute the outperformance of the company to their own ability and the underperformance of the company to bad luck or the economy. In addition, our hand-collected CEO turnover data based on Execucomp enables us to find consistent results with the prediction by Gervais, Heaton, and Odean (2011): CEOs with SAB are more likely to be fired sensitively to performance, especially if the governance is stronger. CEO dismissal event study reveals that the stock market response to the announcement of forced turnover of CEOs with SAB are significantly more positive by up to 9.7% over the event window of [-1,1] days. We also find inverse U-shaped relation between the stock market response to acquisition announcements and the self-attribution bias of the CEO in CNBC interviews.

Given that SAB fosters overconfidence over time, our results have important governance implications. Although shareholders prefer moderately overconfident CEOs due to their

willingness to take more risks with their psychological bias, if the bias is extreme, the shareholders fire the CEO more frequently and sensitively to the firm performance. We also document significant governance impact of financial media as in Kuhnen and Niessen (2011) and Dyck, Volchkova, and Zingales (2008). The CEOs are more likely to be fired, and that, more sensitively to firm performance, if the journalists' language tones in the interview is more negative.

Lastly, we add one more piece of evidence that computational linguistic technique enables the investors in the financial market to identify overconfident CEOs by analyzing the transcripts of CNBC interviews of the CEOs. As King (2011) reports, hedge funds are already trading based on the sentiment captured from the transcripts of CEO interviews on CNBC. Our paper suggests that these investors can now (1) have a better refinement of predicting forced CEO turnover events; (2) better predict the pricing patterns on the day of CEO dismissal announcement; and (3) better predict the pricing patterns around the acquisition announcements through quantifying the degree of SAB of the interviewed CEOs.

Appendix A. Classifying forced versus voluntary CEO turnover following Parrino (1997)

For each turnover event, we search corresponding newspaper articles in Factiva. A succession is classified as forced if the news articles report that the CEO is fired, forced, ousted, or departed due to unspecified policy differences. For the remaining transitions, the CEO is considered to be forced out if the incumbent CEO is under the age of 60 and the news articles do not report the reason for the departure such as death, poor health, or accepting another position (elsewhere or within the firm). In addition, even though the CEO is said to have accepted a position outside the firm, if the firm is not a public company, but a private consulting business, the incidence is considered to be a forced turnover because the move is from a big public corporation (Execucomp firms are typically the top 1500 largest public firms in the US) to a smaller private company. However, moves to the federal or local government are not classified as forced. A ”retirement” announcement of a CEO younger than 60 is considered to be a forced turnover if the succession plan was not announced at least six months prior to the actual transition. Even for departures that were classified as forced, we reclassify them as voluntary if the departure is due to some undisclosed personal or business reasons that are unrelated to the firm’s activities. In total, we find 738 forced turnovers and 2161 voluntary turnovers over the sample period.

Appendix B. Variable Definition

Self referencing is measured as follows: From the CNBC interview scripts, we narrow them down to only the words spoken by the CEOs. We identify causal sentences where CEO said "because" or "hence." For the sentences with "because," we search whether first person pronouns, e.g. "we" or "I", were spoken subsequently. For sentences with "hence," we search whether first person pronouns were spoken in the previous sentence. If we identify these pronouns , we count it as one case of self-referencing ("causal_we"). We do the same exercise to find the cases of referencing others in causal sentences by using the list of words in the LWIC (Linguistic Inquiry and Word Count) dictionary by Pennebaker, Booth, and Francis under "You" "SheHe" and "They" following Li (2010). In addition, we use "economy," "industry," and "competitor(s)" as the third-person pronoun category, because attributing poor performance of the company to industry competitors and the economy would be a manifestation of self-serving attribution bias. If we identify these words, we count it as one case of other-referencing (causal_other). For each interview script, we count the number of words by the CEO and measure the net self referencing using the following definition:

$$Self\_referencing = \frac{\text{Causal\_we} - \text{Causal\_other}}{Number\ of\ words\ by\ CEO}$$

Viewership is the viewership of CNBC from the Nielsen Company, and is given in million people units. Institutional ownership is obtained from the Thomson Financial 13F database.

Average share turnover is the average number of shares traded divided by the total number of shares outstanding over the estimation window of [-150, -31] trading days before the interview.

Illiquidity is the mean adjusted illiquidity measure by Amihud (2002). For each trading day, we take the absolute value of the return divided by the total dollar volume of the stock. Then, over the one-year period prior to the interview, we take the average illiquidity of the stock and divide it by the average of the illiquidity measure of all the stocks in the CRSP universe over the same period.

Firm age is the year of the interview minus the minimum of two: the first year that the company appeared in Compustat or the first year the company appeared in CRSP.

Ln(BEME+1) is the natural log of the book to market of the firm prior to the interview plus one.

Ln(ME) is the natural log of the market value of equity as of the fiscal year end prior to the interview.

Abnormal small order imbalance is the order imbalance of small trades on the day of the interview minus the average order imbalance of small trades over the estimation window of the [-80,-11] trading day window. Small order imbalance is the dollar volume of buyer-initiated trades minus seller-initiated trades divided by the aggregated dollar volume of trades whose order signs are determined using the Lee-Ready (1991) algorithm. Small trade size group is trades with a dollar volume of less than or equal to $5,000 in 1991 real US dollars.

Fraction of short volume is the short selling volume in the Reg SHO database divided by the total trading volume on the day of the interview.

1{Laughter} is a dummy variable that is one if any of the speakers in the interview laughed during the interview. The laughter is captured in the transcript as "(laughter), (laughs), or (laughing)." CEO (Host)

Word Count is the count of the words spoken by the CEO (Host) in the transcript.

CEO (Host) Hesitate is the count of hesitating words of the CEO (Host) in the transcript that are recorded as "--," "……," "(unintelligible)," or "(inaudible)" divided by the total word count of the CEO (Host).

CEO (Host) Positive is the count of positive words of the CEO (Host) in the interview divided by the total word count of the CEO (Host).

CEO (Host) Negative is the count of negative words of the CEO (Host) in the interview divided by the total word count of the CEO (Host).

Article Word Count is the aggregate count of words about the company in all the newspapers in Factiva over the [-7,0] calendar days relative to the interview.

Article Positive (Negative) is the aggregate count of positive (negative) words about the company in all the newspapers in Factiva divided by the aggregated word count of the news articles over the [-7,0] calendar days relative to the interview. We use the Harvard IV Dictionary to count the words of each category, such as positive and negative.

SAB is defined as follows: We first run the following regression based on the whole CNBC interview sample.

$$Self\ Referencing = \beta_0 + \beta_1 ALPHA_{FF4F} + \varepsilon$$

Then the SAB measure is constructed as follows:

$$SAB = 1_{\{ALPHA_{FF4F} \geq 0 \wedge \varepsilon \geq 0\}} + 1_{\{ALPHA_{FF4F} < 0 \wedge \varepsilon < 0\}}$$

1yr Stock performance is the one-year stock market return until the end of fiscal year t.

ROA is operating income before depreciation and amortization divided by assets.

Idiosyncratic volatility, measured as the root mean squared error of the monthly market model regression with the S&P 500 index.

Firm size, measured as the log of assets.

Retirement age dummy that is one when the CEO age is in the range of 63 to 66.

High CEO ownership dummy that is one if the stock ownership of the CEO is greater than 5%.

CEO tenure from Execucomp, which is augmented by hand-collected information from Factiva.

Chairman CEO dummy that is one if the CEO is the chairman of the board, which is obtained from Risk Metrics database.

Proportion of independent directors that is obtained from Risk Metrics.

Investment is defined as the capital expenditure divided by lagged property, plant, and equipment.

Cash flow is defined as the net income plus depreciation divided by lagged property, plant, and equipment.

Q is Tobin's Q, which is defined as book value of assets plus market value of equity minus book value of equity divided by book value of assets.

CEO narcissism is the ratio between the number of first person *singular* pronouns ("I" words) in the CEO's interview transcript and the number of all first person pronouns ("I" words and "We" words) in the CEO's interview transcript.

$$\text{CEO Narcissism} = \frac{\#\text{"I" words}}{\#\text{"I" words} + \#\text{"We" words}}$$

We refer to LIWC (Linguistic Inquiry and Word Count) dictionary by Pennebaker, Booth, and Francis. "I," "Id," "I'd," "I'll," "I'm," "Im," "Ive," "I've," "me," "mine," "my," and "myself" belong to the "I" category. "our," "ours," "ourselves," "us," "we," "we'd," "we'll," "we're," "weve," and "we've" belong to the "We" category. We exclude "lets," and "let's" from the dictionary.

Table 1. Summary Statistics

Panel A. CEO interview sample summary statistics

Variable	N	Mean	Std. Dev.	25th percentile	Median	75th percentile
Self-referencing	6931	0.0004	0.0017545	0	0	0.0005
Viewership	6931	0.3223	0.1015	0.2470	0.3150	0.3860
Institutional Ownership	6931	0.5637	0.2786	0.4093	0.6236	0.7728
Average Share Turnover	6931	0.0123	0.0205	0.0043	0.0078	0.0150
Firm Age	6931	32	19	16	30	49
Illiquidity	6931	0.0026	0.0063	0.0001	0.0002	0.0014
Ln(BEME+1)	6931	0.3541	0.4022	0.1445	0.2693	0.4384
Ln(ME)	6931	8.2262	1.9383	6.9199	8.2327	9.5948
Abnormal Small Order Imbalance	1757	0.0187	0.2103	-0.0602	0.0241	0.1185
Fraction of Short Volume	1022	0.2095	0.3184	0.1325	0.1852	0.2500
1{Laughter}	6931	0.0584	0.2346	0.0000	0.0000	0.0000
CEO Word Count	6931	702	392	491	603	759
CEO Hesitate	6931	0.0027	0.0064	0.0000	0.0000	0.0034
CEO Positive	6931	0.0524	0.0162	0.0429	0.0516	0.0615
CEO Negative	6931	0.0138	0.0107	0.0075	0.0118	0.0173
Host Word Count	6931	330	176	224	300	392
Host Hesitate	6931	0.0025	0.0049	0.0000	0.0000	0.0035
Host Positive	6931	0.0375	0.0147	0.0277	0.0359	0.0452
Host Negative	6931	0.0179	0.0097	0.0112	0.0166	0.0231
Article Word Count	2047	3,767	10,143	491	1,246	3,332
Article Positive	2047	0.0502	0.0195	0.0400	0.0493	0.0591
Article Negative	2047	0.0218	0.0112	0.0146	0.0211	0.0282

Panel B. CEO turnover sample summary statistics

Variable	N	Mean	Std. Dev.	25th percentile	Median	75th percentile
1{Forced CEO turnover}	15386	0.0268	0.1614	0.0000	0.0000	0.0000
SAB	2146	0.0630	0.2429	0.0000	0.0000	1.0000
1 yr Stock performance	15386	0.1514	0.5221	-0.1296	0.0978	0.3384
ROA	15386	0.1520	0.1248	0.0825	0.1409	0.2100
Idiosyncratic volatility	15386	0.1061	0.0622	0.0670	0.0928	0.1291
Size:Ln(Assets)	15386	7.6728	1.6722	6.4651	7.4719	8.7223
1{CEO Retirement Age}	15386	0.0898	0.2858	0.0000	0.0000	0.0000
1{CEO High Ownership}	15386	0.1283	0.3344	0.0000	0.0000	0.0000
CEO Tenure	15386	7.8875	8.0059	2.0000	5.0000	11.0000
1{Chairman CEO}	15386	0.7470	0.4347	0.0000	1.0000	1.0000
%Ind.Directors	15386	0.6607	0.1745	0.5556	0.6667	0.8000
Chg.TDC1	13417	0.3570	3.5675	-0.7493	0.1865	1.5311
Investment	14851	0.2933	1.2429	0.1264	0.2075	0.3416
Cash Flow	14851	0.8406	6.4782	0.1642	0.3959	0.8836
Q	14851	2.0436	1.7100	1.1961	1.5570	2.2703

Table 2. Investor response to CNBC interviews with self-referencing CEOs

Panel A. Interview CAR regression with self-referencing measure

Dependent Variable:	CAR[0]	CAR[0]	CAR[1,2]	CAR[1,2]
Self Referencing	-103.375 ***	-108.62 ***	-122.884 **	-124.232 **
	(-3.057)	(-3.066)	(-2.334)	(-2.478)
Viewership	1.832 **	1.31	-1.989 **	-1.128
	(2.11)	(1.44)	(-2.179)	(-1.168)
Abnormal Small Order Imbalance	5.205 ***	5.151 ***	0.666 **	0.752 **
	(6.45)	(6.35)	(1.97)	(2.47)
Fraction of Short Volume	-0.01	-0.142	-0.286 ***	-0.232 ***
	(-0.072)	(-1.132)	(-4.176)	(-2.983)
Institutional Ownership	0.452	0.32	0.468	0.561
	(0.91)	(0.65)	(1.06)	(1.30)
Avg. Turnover	-11.866 **	-12.181 **	-12.339 **	-12.094 **
	(-1.969)	(-2.040)	(-2.270)	(-2.253)
Firm Age	0.006	0.008	0.006 *	0.006 *
	(1.32)	(1.62)	(1.79)	(1.65)
Illiquidity	-18.105	-13.076	-75.725 ***	-80.205 ***
	(-0.744)	(-0.531)	(-3.029)	(-3.205)
Ln(BEME+1)	-0.597 **	-0.551 **	0.4 ***	0.409 ***
	(-2.294)	(-2.037)	(2.97)	(3.17)
Ln(ME)	-0.445 ***	-0.456 ***	-0.005	0
	(-5.086)	(-5.041)	(-0.125)	(-0.003)
1{Laughter}		0.565 *		-0.13
		(1.81)		(-0.716)
CEO Word Count		-0.356 ***		0.179 ***
		(-5.317)		(2.58)
CEO Hesitate		-0.146 **		-0.041
		(-2.070)		(-0.666)
CEO Positive		0.368 ***		-0.113 *
		(3.38)		(-1.726)
CEO Negative		-0.117		0.022
		(-1.555)		(0.27)

(continued in the next page)

Dependent Variable:	CAR[0]	CAR[0]	CAR[1,2]	CAR[1,2]
(continued)				
Host Word Count		0.162 *		0.017
		(1.87)		(0.26)
Host Hesitate		-0.007		0.174 ***
		(-0.092)		(2.99)
Host Positive		0.201 ***		0.053
		(2.59)		(0.85)
Host Negative		-0.062		-0.011
		(-1.097)		(-0.176)
Article Word Count		0.036		0.052
		(0.26)		(0.62)
Article Positive		0.064		0.217 **
		(0.61)		(2.51)
Article Negative		0.215		0.088
		(1.02)		(0.77)
1{Missing Order Imbalance}	0.072	-0.053	0.164	0.252 *
	(0.19)	(-0.141)	(1.43)	(1.82)
1{Missing Fraction of Short Turnover}	-0.429 **	-0.335 *	0.359 **	0.445 **
	(-2.471)	(-1.732)	(2.07)	(2.49)
1{Confounded Interview}	-0.663	-0.688	0.234	0.244
	(-1.471)	(-1.483)	(0.64)	(0.69)
1{Unconfounded Interview}	0.27	0.221	0.096	0.131
	(1.63)	(1.32)	(0.72)	(1.01)
noarticles		-0.261		0.166
		(-1.457)		(0.69)
constant	8.059 **	8.463 *	-9.632 **	-10.083 **
	(2.00)	(1.85)	(-2.107)	(-2.180)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	6931	6931	6931	6931
Adj.R2	0.018	0.022	0.018	0.019

Linear regressions are used. For variable definition, please refer to Appendix B. Standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, 1% levels by a two-tailed test.

Panel B. Spline regression by the interval of self referencing

Dependent Variable:	CAR[0]	CAR[0]	CAR[1,2]	CAR[1,2]
Self Referencing*1{Self Ref. <=75%}	-30.822	-4.959	-39.374	-54.43
	(-0.313)	(-0.048)	(-0.332)	(-0.452)
Self Referencing*1{Self Ref. >75%}	-111.34 ***	-119.98 ***	-132.051 **	-130.309 ***
	(-3.006)	(-3.187)	(-2.538)	(-2.587)
Other explanatory variables	Yes	Yes	Yes	Yes
Transcript content variables	No	Yes	No	Yes
News article variables	No	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	6931	6931	6931	6931
Adj.R2	0.018	0.022	0.018	0.019

Linear regressions are used. For variable definition, please refer to Appendix B. Standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, 1% levels by a two-tailed test.

Table 3. SAB and CEO turnover

Linear probability model of forced CEO turnover and firm year fixed effects

Sample: Execucomp	Firm year with CEO Interviews			All Firm Years		
	All	SOX		All	SOX	
		Before	After		Before	After
1{SAB}	0.015 *	0.008	0.024 *	0.015 *	0.007	0.017 *
	(1.83)	(0.67)	(1.95)	(1.93)	(0.59)	(1.73)
1{SAB}*1yrStock Perf.	-0.015 **	-0.015 **	-0.024 **	-0.022 *	-0.01	-0.042 **
	(-2.51)	(-2.09)	(-2.21)	(-1.72)	(-0.75)	(-2.20)
1year Stock performance	-0.016	-0.001	-0.09 ***	-0.01 ***	-0.009 ***	-0.007
	(-1.34)	(-0.07)	(-3.00)	(-4.39)	(-3.62)	(-1.52)
ROA	-0.055	-0.068	-0.017	-0.101 ***	-0.106 ***	-0.122 ***
	(-1.52)	(-1.25)	(-0.39)	(-4.61)	(-3.26)	(-3.03)
idiosyncratic volatility	0.111	0.027	0.22	0.08	0.093	-0.094
	(1.07)	(0.23)	(1.16)	(1.60)	(1.64)	(-0.86)
ln(Assets)	0.003	-0.001	0.006	-0.012 **	-0.006	-0.018
	(1.04)	(-0.12)	(1.35)	(-2.01)	(-0.72)	(-1.44)
1{CEO Retirement Age}	-0.009	-0.011	-0.01	-0.013 ***	-0.013 **	-0.009
	(-0.64)	(-0.51)	(-0.52)	(-3.86)	(-2.45)	(-1.51)
1{CEO High Ownership}	-0.022 *	-0.019	-0.039 **	-0.021 **	-0.013	-0.036 *
	(-1.91)	(-1.04)	(-2.47)	(-2.25)	(-1.04)	(-1.96)
CEO Tenure	0	0	0	0.02	-0.019 ***	0.048
	(-0.06)	(0.44)	(-0.50)	(0.42)	(-2.64)	(0.54)
1{Chairman CEO}	-0.003	-0.006	0.001	-0.007	0.004	-0.013
	(-0.24)	(-0.30)	(0.04)	(-1.34)	(0.66)	(-1.52)
%Ind.Directors	-0.043 *	-0.048 *	-0.036	0.006	-0.037 *	0.043
	(-1.94)	(-1.80)	(-1.01)	(0.41)	(-1.85)	(1.52)
1{Missing CNBC Interview}				0.002	0	0.003
				(0.38)	(-0.05)	(0.38)
constant	0.01	0.034	0.058	0.021	0.165 **	-0.139
	(0.27)	(0.62)	(0.58)	(0.17)	(2.01)	(-0.27)
Industry FE	Yes	Yes	Yes	No	No	No
Firm FE	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2146	899	1247	15386	7762	7624
R2	0.012	0.012	0.012	0.03	0.033	0.036

Linear regressions are used. For variable definition, please refer to Appendix B. The dependent variable is one if the firm has a forced CEO turnover in fiscal year t+1. For missing SAB in the regressions, we attribute the value of zero and we identify it using the 1{Missing CNBC interview} dummy. All the explanatory variables and controls are measured as of fiscal year t. Standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, 1% levels by a two-tailed test.

Table 4. Stock market response to the forced turnover announcement of CEOs with SAB

Dependent Variable: CAR[-1,1] of forced CEO turnover announcement			
1{SAB}	0.058 *	0.078 **	0.097 **
	(1.93)	(2.16)	(2.16)
1Yr.Stk.Perf.	0.008	-0.032 *	-0.039 *
	(0.24)	(-1.74)	(-1.77)
1{Outsider Succession}	-0.014	0.038 **	0.042 **
	(-0.33)	(2.14)	(2.18)
Size:Ln(Assets)	0	0.009	0.007
	(0.01)	(1.58)	(1.12)
BEME	-0.041	0.022	0.022
	(-0.71)	(1.49)	(1.50)
idiosyncratic volatility	-0.455 **	0.145	0.123
	(-2.33)	(0.84)	(0.75)
News Negative [-10,0]	0.029	0.001	0.003
	(1.33)	(0.11)	(0.49)
1{No Interview}		0.039	0.05 *
		(1.46)	(1.68)
constant	0.057	-0.141 **	-0.198 ***
	(0.70)	(-1.98)	(-2.82)
Year FE	No	No	Yes
N	28	337	337
R2	0.357	0.091	0.122

Linear regressions are used. For variable definition, please refer to Appendix B. Standard errors are clustered at firm level. *, **, *** indicate statistical significance at 10%, 5%, 1% level by two-tailed test.

Table 5. SAB and investment cash flow sensitivity

Dependent Variable: Investment		
Self-serving Attribution Bias		-0.186 **
		(-2.47)
SAB*Cash Flow		0.197 **
		(2.26)
Cash Flow	0.056 **	0.056 **
	(2.30)	(2.30)
Q	0.15	0.144
	(1.32)	(1.28)
Q*Cash Flow	-0.062 ***	-0.063 ***
	(-2.78)	(-2.88)
Size:Ln(Assets)	0.169 ***	0.154 **
	(2.59)	(2.48)
%Ind.Directors	-0.13	-0.139
	(-1.54)	(-1.62)
1{No Interview}	-0.016	-0.037
	(-0.62)	(-1.06)
constant	-1.254 *	-1.082
	(-1.71)	(-1.50)
Firm FE	Yes	Yes
Year FE	Yes	Yes
N	14851	14851
R2	0.661	0.674

The dependent variable is Investment, which is defined as the capital expenditure divided by lagged property, plant, and equipment. Linear regressions are used. For variable definition, please refer to Appendix B. Cash Flow is defined as the net income plus depreciation divided by lagged property, plant, and equipment. Q is Tobin's Q, which is defined as the book value of assets plus the market value of equity minus the book value of equity divided by the book value of assets. For missing SAB in the regressions, we attribute the value of zero and we identify it using the 1{No Interview} dummy. Standard errors are clustered at the firm level. *, **, *** indicate statistical significance at the 10%, 5%, 1% levels by a two-tailed test.

Table 6. Investor response to acquisition announcement and CEO's SAB

Dependent Variable: CAR[-1,1]						
SIC code different for diversification	1 digit	2 digit	3digit	1 digit	2 digit	3digit
1{SAB}	0.002 **	0.002 **	0.002 **			
	(2.39)	(2.41)	(2.45)			
Self-referencing				1.64 **	1.603 **	1.611 **
				(2.38)	(2.35)	(2.34)
Self-referencing^2				-466.118 ***	-465.257 ***	-467.851 ***
				(-2.91)	(-2.92)	(-2.91)
1{Public Targets}	-0.014 ***	-0.014 ***	-0.014 ***	-0.014 ***	-0.014 ***	-0.014 ***
	(-5.41)	(-5.42)	(-5.42)	(-5.42)	(-5.43)	(-5.43)
1{Diversification}	-0.004 *	-0.002	-0.002	-0.004 *	-0.002	-0.002
	(-1.75)	(-1.07)	(-0.91)	(-1.75)	(-1.04)	(-0.87)
1{Cash Deal}	0.006 ***	0.006 ***	0.006 ***	0.006 ***	0.006 ***	0.006 ***
	(3.13)	(3.09)	(3.09)	(3.15)	(3.11)	(3.11)
ln(MVE}	0	0	0	0	0	0
	(0.46)	(0.46)	(0.46)	(0.71)	(0.72)	(0.72)
BEME	0	0	0	0	0	0
	(-0.29)	(-0.31)	(-0.27)	(-0.16)	(-0.17)	(-0.14)
constant	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005
	(-0.17)	(-0.19)	(-0.20)	(-0.22)	(-0.24)	(-0.25)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	8925	8925	8925	8925	8925	8925
R2	0.033	0.032	0.032	0.033	0.033	0.032

Dependent variable is the cumulative abnormal return on the day of announcement of acquisition by the company that had CEO interviews in the same fiscal year when CEO was interviewed. CAR was estimated using Fama-French 4 factor model over the estimation window of [-150,-31] trading days. Merger related data is from SDC Platinum. Linear regressions are used. For variable definition, please refer to Appendix B. 1{Public target} is a dummy variable that is one if the acquisition target is a public company. 1{Diversification} a dummy variable that is one if the SIC code of the target is different from that of the acquirer. The difference of SIC codes is measured at the 1 digit, 2 digit, and 3 digit SIC code level. 1{Cash Deal} is a dummy variable that is one if the acquisition is a 100% cash transaction. Standard errors are clustered firm level and year level using Petersen (2009). *, **, *** indicate statistical significance at 10%, 5%, 1% level by two-tailed test.

Table 7. CEO turnover with SAB controlling for BEME

	All	SOX		Inst.Own.	
		Before	After	Before	After
Self-Serving Attribution Bias	0.014 *	0.005	0.017 *	0.005	0.017 *
	(1.82)	(0.38)	(1.75)	(0.38)	(1.75)
1year Stock Performance	-0.009 ***	-0.008 ***	-0.004	-0.008 ***	-0.004
	(-3.73)	(-3.29)	(-0.76)	(-3.29)	(-0.76)
SAB*1yr Stock Perf.	-0.022 *	-0.008	-0.044 **	-0.008	-0.044 **
	(-1.73)	(-0.68)	(-2.28)	(-0.68)	(-2.28)
ROA	-0.097 ***	-0.108 ***	-0.109 ***	-0.108 ***	-0.109 ***
	(-4.41)	(-3.31)	(-2.71)	(-3.31)	(-2.71)
Idiosyncratic volatility	0.049	0.094	-0.167 *	0.094	-0.167 *
	(1.19)	(1.57)	(-1.79)	(1.57)	(-1.79)
ln(Assets)	-0.014 **	-0.011	-0.019	-0.011	-0.019
	(-2.37)	(-1.38)	(-1.49)	(-1.38)	(-1.49)
1{CEO Retirement Age}	-0.013 ***	-0.014 **	-0.008	-0.014 **	-0.008
	(-3.70)	(-2.49)	(-1.36)	(-2.49)	(-1.36)
1{CEO High Ownership}	-0.021 **	-0.013	-0.04 **	-0.013	-0.04 **
	(-2.29)	(-1.05)	(-2.09)	(-1.05)	(-2.09)
CEO Tenure	0.019	-0.019 ***	0.047	-0.019 ***	0.047
	(0.40)	(-2.70)	(0.52)	(-2.70)	(0.52)
1{Chairman CEO}	-0.006	0.004	-0.012	0.004	-0.012
	(-1.25)	(0.59)	(-1.33)	(0.59)	(-1.33)
1{No Interview}	0.002	-0.001	0.003	-0.001	0.003
	(0.32)	(-0.15)	(0.35)	(-0.15)	(0.35)
%Ind.Directors	0.005	-0.04 *	0.045	-0.04 *	0.045
	(0.32)	(-1.96)	(1.57)	(-1.96)	(1.57)
BEME	0.007 *	0.005	0.014	0.005	0.014
	(1.94)	(1.59)	(1.44)	(1.59)	(1.44)
constant	-0.058	0.353 ***	-0.126	0.353 ***	-0.126
	(-0.09)	(3.29)	(-0.24)	(3.29)	(-0.24)
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
N	15116	7611	7505	7611	7505
R2	0.031	0.034	0.037	0.034	0.037

The dependent variable is one if the firm has a forced CEO turnover in fiscal year t+1. Linear regressions are used. For variable definition, please refer to Appendix B. Standard errors are clustered firm level. *, **, *** indicate statistical significance at 10%, 5%, 1% level by two-tailed test.

Table 8. CEO turnover with SAB and journalist's negative tone

Sample: Execucomp	Firm year with CEO Interviews			All Firm Years		
	All	SOX		All	SOX	
		Before	After		Before	After
1{SAB}	0.015 *	0.007	0.023 *	0.015 *	0.006	0.02 *
	(1.76)	(0.57)	(1.81)	(1.90)	(0.56)	(1.70)
1{SAB}*1yrStock Perf.	-0.016	-0.004	-0.084 ***	-0.021 *	0.005	-0.065 **
	(-1.35)	(-0.37)	(-2.79)	(-1.69)	(0.61)	(-2.29)
%Anchor Negative Words	0.007	-0.007	0.012 *	0.008 **	-0.005	0.014 **
	(1.40)	(-1.17)	(1.79)	(1.97)	(-0.72)	(2.41)
%Anchor Neg.Wrd*1Yr Stock Perf.	-0.013 **	-0.01	-0.013 *	-0.003	0.002	-0.015 **
	(-2.45)	(-1.08)	(-1.75)	(-0.53)	(0.26)	(-2.35)
1year Stock performance	-0.017 ***	-0.015 **	-0.029 **	-0.011 ***	-0.02 ***	-0.033 ***
	(-2.75)	(-2.12)	(-2.55)	(-4.57)	(-6.75)	(-6.76)
ROA	-0.055	-0.066	-0.019	-0.103 ***	-0.019	-0.014
	(-1.51)	(-1.23)	(-0.43)	(-4.70)	(-1.22)	(-0.96)
idiosyncratic volatility	0.102	0.029	0.198	0.081	0.127 ***	0.145 ***
	(0.98)	(0.25)	(1.04)	(1.64)	(2.63)	(2.87)
ln(Assets)	0.003	0	0.005	-0.011 **	0.001	0.002
	(0.94)	(-0.02)	(1.22)	(-2.03)	(0.56)	(1.25)
1{CEO Retirement Age}	-0.008	-0.01	-0.009	-0.012 ***	-0.015 ***	-0.014 ***
	(-0.58)	(-0.47)	(-0.49)	(-3.57)	(-3.66)	(-3.63)
1{CEO High Ownership}	-0.023 *	-0.019	-0.04 **	-0.018 *	-0.011 **	-0.003
	(-1.95)	(-1.02)	(-2.52)	(-1.88)	(-2.53)	(-0.52)
CEO Tenure	0	0	0	0.021	-0.001 ***	-0.001 ***
	(0.01)	(0.40)	(-0.39)	(0.45)	(-3.04)	(-2.73)
1{Chairman CEO}	-0.004	-0.006	-0.001	-0.008 *	-0.009 *	-0.017 ***
	(-0.31)	(-0.30)	(-0.05)	(-1.77)	(-1.74)	(-3.83)
%Ind.Directors	-0.042 *	-0.045 *	-0.036	0.007	0.004	0.005
	(-1.90)	(-1.69)	(-1.00)	(0.50)	(0.37)	(0.36)
1{Missing CNBC Interview}				0.002	0.004	0
				-0.36	-0.54	-0.04
constant	0.009	0.031	0.068	-0.132	0.019	-0.009
	(0.24)	(0.56)	(0.68)	(-0.20)	(0.94)	(-0.40)
Industry FE	Yes	Yes	Yes	No	No	No
Firm FE	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2146	899	1247	15986	7762	8224
Adj.R2	0.013	0.011	0.013	0.029	0.014	0.015

The dependent variable is one if the firm has a forced CEO turnover in fiscal year t+1. Linear regressions are used. For variable definition, please refer to Appendix B. %Anchor Negative Words is constructed as follows. Across all the interview sample, we compute the negative words spoken by the anchor (interview host) and divide by the number of words by the anchor. Then across the interviews, we obtain mean and standard deviation. Then we obtain standardized percentage of negative words. Then for the firm year, we attribute the most recent value of standardized negative words for the firms that had CNBC interview. Standard errors are clustered firm level. *, **, *** indicate statistical significance at 10%, 5%, 1% level by two-tailed test.

Table 9. CEO's narcissism versus self-serving attribution bias

Panel A. Stock price response to CEO interviews on CNBC using CEO narcissism

	CAR[0]	CAR[0]	CAR[1,2]	CAR[1,2]
CEO Narcissism	0.332	0.461	-0.269	-0.31
	(0.69)	(0.95)	(-0.759)	(-0.849)
Other controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	6931	6931	6931	6931
Adj.R2	0.017	0.021	0.017	0.017

Linear regressions are used. For variable definition, please refer to Appendix B. We use heteroskedasticity robust standard errors that are adjusted for clustering by firm. All the "other controls" are the control variables used in Table 2.

Panel B. Stock price response to CEO interviews on CNBC using CEO narcissism and Self-referencing

	CAR[0]	CAR[0]	CAR[1,2]	CAR[1,2]
Self-Referencing	-102.334 ***	-107.273 ***	-123.917 **	-123.874 **
	(-3.049)	(-3.050)	(-2.360)	(-2.463)
CEO Narcissism	0.305	0.435	-0.302	-0.34
	(0.63)	(0.90)	(-0.855)	(-0.934)
Other controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	6931	6931	6931	6931
Adj.R2	0.018	0.022	0.018	0.019

Linear regressions are used. For variable definition, please refer to Appendix B. We use heteroskedasticity robust standard errors that are adjusted for clustering by firm. All the "other controls" are the control variables used in Table 2.

Panel C. CEO turnover regressions with CEO narcissism

Sample: Execucomp	Firm year with CEO interviews			All firm years		
	All	SOX		All	SOX	
		Before	After		Before	After
1{SAB}	0.015 *	0.008	0.025 *	0.015 *	0.008	0.017 *
	(1.84)	(0.66)	(1.96)	(1.94)	(0.64)	(1.73)
CEO narcissism	-0.021	-0.038 *	-0.011	-0.01	-0.061 ***	-0.004
	(-1.21)	(-1.87)	(-0.44)	(-0.56)	(-2.70)	(-0.14)
1 year Stock Performance	-0.015 **	-0.015 **	-0.024 **	-0.01 ***	-0.009 ***	-0.007
	(-2.50)	(-2.08)	(-2.20)	(-4.37)	(-3.57)	(-1.51)
1{SAB}*1yrStockPerf.	-0.016	-0.001	-0.091 ***	-0.022 *	-0.01	-0.042 **
	(-1.36)	(-0.10)	(-3.01)	(-1.73)	(-0.81)	(-2.21)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2146	899	1247	15386	7762	7624
R2	0.012	0.013	0.011	0.03	0.034	0.036

Linear regressions are used. For variable definition, please refer to Appendix B. We use heteroskedasticity robust standard errors that are adjusted for clustering by firm.

Panel D. Stock market response to the forced turnover announcement of CEOs with CEO narcissism

Dependent Variable: CAR[-1,1] of forced CEO Turnover announcement		
1{SAB}	0.078 **	0.097 **
	(2.16)	(2.16)
CEO Narcissism	0.055	0.036
	(0.51)	(0.34)
Other controls	Yes	Yes
Year FE	Yes	Yes
N	337	337
R2	0.091	0.122

Linear regressions are used. For variable definition, please refer to Appendix B. We use heteroskedasticity robust standard errors that are adjusted for clustering by firm.

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