Why do overconfident CEOs issue equity?*

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Abstract

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Keywords: Overconfidence, seasoned equity offering, SEO
JEL classifications: G32, G34

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Abstract

One puzzle is why, overconfident CEOs, despite overvaluing their own companies are more likely to issue equity. This paper shows that overconfident CEOs are more likely to conduct SEOs and raise larger sums when doing so. We hypothesize and show that they do so in order to increase investment (in CAPEX and R&D), stockpile cash, and continue acquisition activity, rather than to pay-down debt. Overconfident CEOs are less likely to market-time SEOs. We find that, on average, overconfident CEOs' SEOs perform no worse than those of other CEOs, consistent with the idea that overconfident CEOs need not reduce shareholder wealth when undertaking actions to increase R&D.

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1 Introduction

Many seasoned equity offerings (SEOs) involve companies with overconfident CEOs. Indeed, in our sample, 63% of the SEOs conducted between 1993 and 2011 involved CEOs who would be classified as overconfident under the *Holder67* option-based measure of CEO overconfidence.[1] This result is curious given that overconfident CEOs tend to have miscalibrated risk/return distributions (Ben-David et al., 2013), leading them to overestimate the value of both their companies and their companies' potential investment projects. This causes overconfident CEOs to believe that the market undervalues their companies. This begs the question of whether and why overconfident CEOs are willing to issue stock despite their beliefs that the market undervalues their companies, and whether such SEOs have negative value-implications for shareholders.

The objective of this paper is to study the circumstances in which overconfident CEOs engage in SEOs. The prior literature suggests that overconfident CEOs tend to invest more in CAPEX and acquisitions than do other CEOs (Kolasinski and Li, 2013; Malmendier and Tate, 2008, 2005). They are also more prone to engage in innovative and risky investments (Galasso and Simcoe, 2011; Hirshleifer et al., 2012). Subsequently, overconfident CEOs tend to pay lower dividends (Deshmukh et al., 2013), presumably in order to retain internal capital to facilitate future investment. Following this literature, we

[1] We obtain this figure from Table 1 of the paper, which pertains to the number of firm-year observations in which there is a SEO in our sample. The *Holder67* measure, per Malmendier et al (2011), is premised on the idea that a CEO's personal capital is undiversified, so a CEO who voluntarily holds deeply in the money vested options is overconfident. Holder67 is an indicator that equals one if the CEO's average vested option is at least 67% in the money on at least two occasions, in which case, *Holder67* equals one from the first such occasion.

hypothesize that while there is no clear prediction about whether overconfident CEOs are more or less likely to undertake SEOs. Consequently, we expect that, compared with other CEOs, overconfident CEOs would increase investment more (and decrease debt less) following an SEO capital raising event.

We explore the impact of CEO overconfidence on SEOs by using a firm-year panel of 18,500 observations from between 1993 and 2011. We use several measures of CEO overconfidence. We construct option-based measures of overconfidence along the lines of Malmendier et al (2011). The logic behind these measures is that an executive's personal wealth is undiversified and is concentrated in their own company, so only an overconfident CEO would retain highly in-the-money options. We also create a trading-based measure (following Kolasinski and Li, 2013), which is premised on the idea that an overconfident CEO is one who purchases his/her own stock and then loses money on that purchase. Finally, we also explore news-based measures of overconfidence (per Hirshleifer et al., 2012), which classify a CEO as overconfident based on media reports vis-à-vis that CEO.

We start by analyzing the likelihood that overconfident executives will issue stock. We find that, on average, overconfident CEOs are more likely to issue stock than are other CEOs. The results are economically important. While CEOs who are classified as overconfident according to the *Holder67* measure of overconfidence are 'only' one percentage point more likely to issue stock than are other CEOs,[2] the finding that they are no less likely to issue stock is interesting. Further, since 3% of our firm-year observations involve a SEO, an increase in SEO-likelihood of one percentage point, indicates that overconfident CEOs are around 33% more likely to conduct a SEO than are other SEOs. This suggests

[2] This 1% statistic is from the marginal effect associated with *Holder67* in Column 9 of Table 4.

that, on average, overconfident CEOs' investment preferences outweigh concerns about issuing stock that they perceive to be undervalued in the market. This contrasts with the alternative hypothesis that overconfident CEOs' concerns about stock undervaluation would cause them to reduce the frequency of SEOs.

We then analyze the post-SEO investment activities of these overconfident CEOs. We find that, after the SEO, overconfident CEOs increase R&D and (to an extent) CAPEX more than do other CEOs. Overconfident CEOs also continue to invest in takeovers after SEOs. While the SEO does not significantly increase overconfident CEOs' acquisition activities, we find evidence that overconfident CEOs engage in more takeovers in general, as in prior literature (per Kolasinski and Li, 2013). Overconfident CEOs continue to do so after the SEO. They additionally are more prone to undertake a diversifying acquisition after a SEO than are other CEOs. Thus, the overconfident CEOs appear to use SEOs to continue their existing strategy of takeover-investment. Together with the foregoing results, this finding suggests that overconfident CEOs issue stock mainly to facilitate investment, and they are more likely to do so than are non-overconfident CEOs.

We additionally assess the relationship between CEO overconfidence and market timing. we do this to ensure that the relationship between executive overconfidence and SEO-likelihood does not merely reflect a need to recapitalize following poorly performing investments. We find that overconfident CEOs are more likely (than other CEOs) to issue equity in both high GDP growth and low GDP growth years. Additionally, they do not appear to issue equity opportunistically; they demonstrate lower pre-SEO stock-price run-ups. This, in itself, could suggest a need to issue equity to recapitalize. But, when combined with the result that they are not more likely to reduce debt, and are more likely to increase

investment, it would tend to suggest they are not issuing to increase corporate-strength following a downturn. Overall, these results indicate that overconfident CEOs neither issue equity opportunistically or to recapitalize (on average), but instead issue equity to invest.

The SEOs of Overconfident CEOs do not appear to decrease corporate value; however, they are associated with a continuation of existing investment practices and a maintenance of any 'overconfidence' discount impounded into overconfident CEOs' firms. We find that CEO overconfidence is insignificantly related to post-SEO long-run stock returns, industry adjusted changes in ROA, and SEO announcement returns. When coupled with the finding that overconfident CEOs tend to increase both R&D and CAPEX on average, and tend to continue existing M&A practices, the results suggest that the SEOs represent a continuation of existing investment practices. While investing in R&D can increase corporate value in overconfident CEOs' firms (Hirshleifer et al., 2012), the investments in CAPEX and takeovers appear to reduce value (Malmendier and Tate, 2008, 2005). Thus, the results suggest that since overconfident CEOs use SEOs to continue existing investment-practices, the SEO does not reduce corporate value, but maintains it at its relatively lower level.

We contribute to the literature in several ways. The primary contribution is to reconcile the curious observation that overconfident CEOs undertake more SEOs than do other CEOs even though those CEOs tend to overvalue their firms. We draw on the prior literature that overconfident CEOs tend to engage in more innovation and investment, and we highlight that such SEOs are generally associated with increases in investment-expenditure in the form of CAPEX and R&D.

2 Hypotheses

This section discusses the hypotheses and empirical predictions. We start by considering the relationship between CEO overconfidence and the likelihood of a SEO. We then discuss the potential motivations for such SEOs, with an emphasis on CAPEX and R&D. Finally, we assess the potential value-implications of such SEOs.

2.1 CEO overconfidence and the likelihood of a SEO

We have mixed predictions about whether an overconfident CEO is more likely to issue stock. Following the pecking order theory, managers prefer to not issue equity. The underlying logic is that the market tends to interpret an equity issuance as a signal that the firm's stock is overpriced, resulting in a negative market-reaction. Overconfident CEOs tend to overestimate the firm's value, which would lead them to believe that the company is underpriced in the market. This should discourage overconfident CEOs from issuing stock (following Myers and Majluf, 1984), leading to the following hypothesis.

Hypothesis 1a: Overconfident CEOs are less likely to issue stock

On the other hand, overconfident CEOs also overestimate the value, and underestimate the risk, associated with the firm's potential investments, causing them to overinvest (Kolasinski and Li, 2013; Malmendier and Tate, 2008, 2005). Thus, if the perceived return from these investments exceeds the

perceived cost of issuing shares that the manager believes to be undervalued, then a CEO would issue stock, leading to the following hypothesis:

Hypothesis 1b: Overconfident CEOs are more likely to issue stock

2.2 Why do they issue equity?

The underlying expectation is that overconfident CEOs issue stock primarily to facilitate corporate investments. This contrasts with issuing stock to pay-down debt or to increase precautionary cash reserves. Our expectation follows from the prior evidence that overconfident CEOs tend to overinvest, or at least invest more than other CEOs *ceteris paribus* (Kolasinski and Li, 2013; Malmendier and Tate, 2008, 2005). Prior literature suggests that this investment includes capital expenditure (Malmendier and Tate, 2005), and R&D (Hirshleifer et al., 2012). The desire to undertake R&D could be an especially important motivator for a SEO given the potential difficulties obtaining debt-financing to undertake such innovation-related activities that might lack clearly defined collateral. Furthermore, overconfident managers tend to undertake more acquisitions, which they could finance by undertaking a SEO. Subsequently we make the following predictions:

Hypothesis 3a: Overconfident CEOs are more likely than are other CEOs to undertake a takeover following a SEO.

Hypothesis 3b: Overconfident CEOs are more likely than are other CEOs to increase CAPEX and R&D following a SEO.

Hypothesis 3c: Overconfident CEOs are less likely than are other CEOs to pay down debt (i.e. reduce their distance to bankruptcy) following a SEO.

Hypothesis 3d: Overconfident CEOs are less likely than are other CEOs to increase cash holdings following a SEO.

The foregoing hypotheses suggest that overconfident CEOs are less likely to issue equity opportunistically to take advantage of strong market returns. CEOs often attempt to take advantage of what they perceive to be strong market conditions, or a significant appreciation in stock price (Autore et al., n.d.; Larrain and Urzua, 2013). However, overconfident CEOs would appear to believe their firms have positive investment prospects (following Malmendier and Tate, 2005). This implies that overconfident CEOs' SEOs are less motivated by market timing than they are by investment. Thus, they would issue equity despite having lower pre-SEO stock returns and issue equity regardless of whether the period exhibits high economic growth. Thus, we make the following hypothesis.

Hypothesis 3e: Overconfident CEOs are less likely to issue equity opportunistically to time the market.

2.3 Value-implications for shareholders

The relationship between CEO overconfidence and post-SEO performance is ambiguous. One possibility, which we call the *value creation hypothesis*, is that overconfident CEOs' SEOs improve performance more than do those of other CEOs. The logic is that overconfident CEOs can be better innovators (Galasso and Simcoe, 2011; Hirshleifer et al., 2012). Further, the increased scrutiny involved in the SEO-issuance process could enhance governance and monitoring, thereby attenuating the harmful aspects of CEO overconfidence. Thus, if the overconfident CEO uses the SEO proceeds to invest in innovation, then CEO overconfidence could enhance shareholder wealth. We capture this in the following hypothesis.

> *Hypothesis 4a (value-creation hypothesis): Overconfident CEOs' companies have better performance following a SEO compared with other CEOs' companies.*

The alternative possibility (the *value-destruction* hypothesis) is that overconfident CEOs' SEOs destroy more value than do those of other CEOs. As indicated above, prior studies highlight that overconfident CEOs' investments tend to reduce shareholder wealth, on average (Malmendier and Tate, 2008, 2005). Thus, given that we expect overconfident CEOs to use SEOs to facilitate further investment, *the value-destruction* hypothesis would suggest that overconfident CEOs' SEOs would reduce firm value.

> *Hypothesis 4b (value-destruction): Overconfident CEOs' companies have worse performance following a SEO compared with other CEOs' companies.*

3 Data

This section describes the data. We begin by detailing how we construct the sample. We then discuss the measures of CEO overconfidence used in this paper. Next we present the summary statistics.

3.1 Sample construction

We construct both a firm-year panel of observations (to analyze which firms issue equity) and a cross-sectional sample of equity-issuers (to examine what such issuers do with the proceeds). We collect data on SEOs conducted between 1993 and 2011. We create this sample by beginning with the set of firms in the CRSP/Compustat universe, which we merge with Execucomp. We restrict the sample to contain only firms that have the data required to compute the control variables and the option-based variables using Execucomp data. We identify SEO activity using SDC Platinum. For each year, we determine whether, and how much, stock the firm issues to the market. We exclude any offering that is a pure secondary offering (i.e. an offering to facilitate a third party selling their shares) or is a PIPE or private placement (as these are qualitatively dissimilar to other securities offerings). However, the results are robust to including secondaries and placements. The sample includes no carve outs or spin offs. We exclude all financials (SIC Codes 6000-6999) and utilities (SIC codes 4900-4999) from the sample. The sample does include offerings that follow from a shelf registration, in which case we deem the date of the offering (not the date of the original registration) as the date on which the firm raises money.

We collect data on various measures of CEO overconfidence (described below) and for other firm-level variables that might influence SEO tendencies. All continuous variables are winsorized at 1%. Appendix I contains the variable definitions. We control for other CEO characteristics including CEO age, CEO

tenure, and CEO stock holdings. We also control for firm-level factors including firm size, institutional ownership, the stock return (and volatility thereof) over the preceding year, book-to-market ('BM'), return on assets ('ROA'), leverage, cash holdings, CAPEX intensity, R&D intensity and industry competition. With all but one exception (R&D) we omit any observation for which we cannot obtain data on the control variables. In the case of R&D, when we use R&D as a control variable, we recode missing R&D values as zero.[3] In the models where R&D is a dependent variable, we require that the observation have R&D data to be in the sample.

3.2 Measures of CEO overconfidence

We use several measures of CEO overconfidence. While there can be issues with individual overconfidence-variables (Hill et al., 2014; Olsson, 2014), using multiple overconfidence-variables should mitigate this issue and ensure construct validity. The first measures are option-based measures of overconfidence. The logic behind option-based measures of overconfidence is that a CEO's personal wealth, and human capital, is often undiversified, being closely tied to the firm. Thus, a rational CEO would not hold deeply in the money options that have vested. Thus, holding such options could signify overconfidence. We start by collecting data on vested but unexercised options from Execucomp. We start by creating a continuous *ConfidenceOptions* measure defined as *Value-per-vested-unexercised-*

[3] There are several ways of treating missing R&D values (see e.g., Koh and Reeb, 2014). The results are qualitatively similar if we omit firms with missing R&D, replace missing R&D with the industry average R&D and/or include an indicator for whether the firm has missing R&D.

option/ *Average Strike price* (per Malmendier et al., 2011).[4] This continuous measure helps to capture the idea that there is a continuum of confidence-levels, with many CEOs perceiving miscalibrated return-distributions that happen to be miscalibrated to varying degrees (see e.g., Ben-David et al., 2013). We then create an indicator for whether the *ConfidenceOptions* measure is in the top quartile (denoted *ConfidenceOptions75*). We further compute the *Holder67* measure from Malmendier et al (2011). This *Holder67* measure is an indicator that equals one if the *ConfidenceOptions* measure is at least 67% on at least two occasions, in which case *Holder67* equals one from the first time on which *ConfidenceOptions* is at least 67% and equals zero otherwise.

The second set of measures are based on newspaper reports (per Hirshleifer et al., 2012). The news based measures of overconfidence function by analyzing whether the media perceives the CEO to be overconfident. We construct these measures by conducting a Factiva-search for news articles in the *New York Times*, *Wall Street Journal*, *US Today*, and *Business Week* that pertain to the CEO. We search for 'Confident' words ("confident", "optimistic", "positive", and the derivations thereof) and the 'Non-Confident' words ("cautious", "pessimistic", and the converses of the 'Confident') words. We then construct a *ConfidenceNews* measure as the number of 'Confident' articles less the number of 'Non-Confident' articles and a *PosConfidenceNews* that equals one if the number of 'Confident' articles exceeds the number of 'Non-Confident' ones.

[4] The *Value-per-vested-unexercised-option* is the value of those vested but unexercised options scaled by the number of such options, as reported in Execucomp. The *Average Strike price* is the value at the end of the fiscal year (from CRSP/Compustat: prcc_f) less the *Value-per-vested-unexercised-option*. The logic is that the *Value-per-vested-unexercised-option* is approximately equal to $S_t - X$, where S_t is the stock price and X is the strike price.

The next confidence measure, *ConfidenceTrading*, is based on the approach in Kolaskinski and Li (2013). Their measure is premised on the idea that an individual is overconfident about a firm's prospects if he/she purchases the firm's stock and then loses money on that purchase, especially if that individual should be in a position where he/she has access to private information (i.e. as per a CEO). Subsequently, *ConfidenceTrading* is an indicator that equals one if the CEO in year *t*, at any time of the next two years, purchases the firm's stock and that purchase has a negative 180 buy and hold abnormal return (BHAR), where that BHAR is the firm's return less the corresponding return for the firm's CRSP value-weighted size decile.

3.3 Summary statistics

The sample composition by year is in Table 1. Of the 18488 firm-year observations in the sample, 552 firm-year observations involve the firm undertaking a SEO. The SEOs broadly spike in two main market conditions: boom markets (i.e. 2000) and significant market downturns in which firms must recapitalize (i.e. 2009). The results vis-à-vis downturns are not clear-cut: while there is a spike in SEOs in 2009, there is also a significant lull in 2008 and 2010, consistent with firms being reluctant to issue stock when valuations are low (unless there is a clear need to recapitalize). It is important to note that these issuance-fluctuations do not merely reflect the tendencies of financial-firms, which we exclude from the sample.

The summary statistics are in Table 2 and present some interesting sets of findings. The table sorts the sample into 'overconfident' firms (where *Holder67* equals one) and non-overconfident firms (where

Holder67 equals zero). First, roughly half the sample is run by overconfident CEOs. This is consistent with prior studies (see e.g., Malmendier et al., 2011). Second, overconfident firms tend to be smaller (see *Firm Size*) have lower *Book to Market* (i.e. a higher market to book), and a higher *R&D intensity*. This suggests that overconfident CEOs' firms could be more innovative/ higher growth firms (per Hirshleifer et al., 2012). Third, overconfident CEOs and non-overconfident CEOs are of similar ages (55.45, and 54.64, respectively). This suggests that age-related overconfidence (see e.g., Kim, 2013) would not factor into the results. However, overconfident CEOs have significantly longer tenures in our sample. Fourth, interestingly, overconfident CEOs' companies both have higher *Cash holdings*, and lower *Book leverage*. This is interesting in the light of the finding that overconfident CEOs are also more likely to conduct SEOs. This could imply that overconfident CEOs invest so much more than their counter-parts that they must issue stock despite having better access to cash and debt. The correlation matrix in Table 3 largely reiterates the summary statistics.

4 Are overconfident CEOs more (or less) likely to issue stock?

We start by analyzing the impact of CEO overconfidence on the likelihood that a CEO engages in a SEO. Table 4 contains logit models that examine the likelihood that a firm conducts a SEO in year $t + 1$ as a function of CEO overconfidence and other corporate characteristic in year t. The models include year and industry fixed effects. The results in Columns 7-12 indicate that all measures of CEO overconfidence are significantly and positively related to the likelihood of conducting a SEO, even after controlling for other corporate characteristics. Using the *Holder67* measure of overconfidence, overconfident CEOs are 1% more likely to conduct a SEO than are other CEOs. At first glance, this does

not appear to be economically significant. However, the result is economically important given the plausible prior that overconfident CEOs might issue *less* equity (due to their tendency to overvalue their own; and thus, avoid issuing stock when they perceive it to be undervalued in the market). Thus, the finding that overconfident CEOs issue slightly more equity than do other CEOs is important.

The results are similar when examining SEO proceeds (as opposed to the mere likelihood of doing a SEO). In Table 5 we report tobit regressions (with a lower bound of zero) that analyze the proceeds of a SEO. Even after controlling for other corporate factors, overconfident CEOs' firms issue significantly more equity. Using the *Holder67* measure of overconfidence, overconfident CEOs issues are roughly 12.8% larger (as a percentage of the firm's market capitalization).

The coefficients on the control variables are largely consistent with expectations. First, from Table 4, companies tend to issue stock if they lack access to other sources of capital. That is, cash rich firms are less likely to issue stock; highly levered firms are more likely to issue stock. This is consistent with the 'pecking order' theory that firms seek outside equity capital if they lack alternative capital-sources. Second, larger firms and firms with greater operating performance are less likely to issue equity and undertake smaller offerings when doing so. This is unsurprising as such firms are more likely to have access to internal capital; and thus, would less need to undertake an SEO. Third, higher prior stock returns increase the likelihood of undertaking an SEO and the size of such SEOs, consistent with the idea that firms issue equity during periods of higher valuations. Fourth, R&D intensive firms undertake smaller SEOs whereas CAPEX intensive firms undertake larger SEOs (see Table 5). This reflects both the relative capital demands of such activities and the relative ease (or difficulty) with which firms can access the equity markets for such activities.

5 Why do overconfident CEOs issue equity?

The foregoing results suggest that overconfident CEOs are more likely to issue equity. This begs the question of why they do so. One possibility is that overconfident executives are sufficiently positive about their firms' investment prospects that they issue stock even though they are more inclined to think the market undervalues their companies. An alternative possibility, following prior evidence that overconfident CEOs can destroy value (see e.g., Malmendier and Tate, 2008), is that overconfident CEOs are more in need of recapitalization. The former implies that overconfident CEOs increase (or at least continue) their rate of investment in CAPEX, R&D, and takeovers. The latter implies that overconfident CEOs reduce debt. In both cases, the overconfident CEO would be less inclined to 'time' the SEO than other CEOs. An increase in cash holdings would be consistent with both alternatives, but the alternatives have different predictions for *why* overconfident CEOs increase cash. The following sections aim to establish the primary motivation for the average overconfident CEO to issue equity.

5.1 CEO overconfidence and post-SEO capital expenditure

We predict that overconfident CEOs will have greater post-SEO capital expenditure than will other CEOs, even after controlling for pre-SEO capital expenditure. We test the prediction by analyzing the relationship between CEO overconfidence and the firm's CAPEX following the SEO. We also control for other corporate variables, year and industry fixed effects. Further, following Healy et al (1992), we

control for pre-SEO CAPEX. In unreported results, we also check that the results are robust to analyzing the impact of CEO overconfidence on the firm's industry adjusted change in CAPEX.[5]

The results are in Table 6 and are consistent with expectations. The option-based CEO overconfidence measures are positively related to post-SEO CAPEX. The *Holder67* measure of overconfidence suggests that overconfident CEOs' firms spend 1.7% more on CAPEX after a SEO than do other CEOs' firms. This provides some evidence that overconfident CEOs are more likely to use the SEO-proceeds to increase capital expenditure. Unsurprisingly, SEO proceeds are significantly and positively related to changes in CAPEX.

5.2 CEO overconfidence and takeovers

We next test whether overconfident CEOs increase acquisition activity after SEOs. We do this by using data on acquisition activity from SDC Platinum. For each firm undertaking a SEO, we identify if the firm subsequently undertakes a takeover and whether that takeover is a diversifying one (in which the acquirer and target are in different two-digit SIC industries). We require that any such takeover be for at least USD 5 million, must be completed, and the acquirer must obtain 100% of the target through the acquisition and hold less than 50% of the target prior to the acquisition announcement.

[5] In the main reported results we focus on 'levels' regressions, rather than 'changes' regressions, following the critique in Gormley and Matsa (2014) that such a changes regression, where the dependent variable is $\Delta y_{i,(t-1,t+1)} = y_{i,t+1} - y_{i,t-1}$ presupposes that the regressors adequately explain variation in both the $y_{i,t+1}$ *and* the $y_{i,t-1}$ components.

The results indicate that overconfident CEOs use the SEO to continue their existing acquisition strategy; however, are potentially more likely to engage in diversifying acquisitions. We start by comparing overconfident CEOs who do a SEO with non-overconfident CEOs who do a SEO. This test enables us to look at the relative investment outcomes between the two groups (though we later compare overconfident CEOs who do a SEO with overconfident CEOs who do not do so). We do this by constructing an indicator that equals one if the firm does a takeover in the year after the SEO. In this regression we restrict the sample to contain only firms that do a SEO (i.e., it is a cross-sectional logit regression). The results are in Table 7. The results indicate that overconfident CEOs who do a SEO (as compared with non-overconfident CEOs who do a SEO) are neither more nor less likely to conduct a takeover after SEO. However, these results do not tell us how overconfident CEOs who do a SEO compare to overconfident CEOs who do not.

Table 8 further explores the relationship between overconfidence , SEOs, and takeovers. These regressions use a firm-year panel dataset to analyze the likelihood that a firm undertakes a takeover as a function of whether it did a SEO and whether the CEO is overconfident (in addition to other relevant controls). The results suggest that overconfident CEOs are more likely to engage in takeovers in general, which is robust across confidence-measures, and is consistent with prior literature (see e.g., Kolasinski and Li, 2013). However, overconfident CEOs are not any more, or less, likely to engage in takeovers after a SEO. This suggests, that overconfident CEOs continue their acquisition strategies after SEOs, but do not per se use the takeover to increase the rate at which they undertake takeovers over and above their already existing number of takeovers.

In Table 9, we further explore the use of diversifying takeovers after a SEO. The results indicate that overconfident CEOs are more likely to undertake diversifying deals suggests that they may be more confident about pursuing a non-core like of business than are less confident individuals. Thus, overall, it appears that overconfident CEOs use SEOs to continue their existing takeover-strategy (though not per se increase it) and are potentially more confident about undertaking a diversifying deal after that takeover.

5.3 CEO overconfidence and R&D expenditure

The hypothesis is that overconfident CEOs are more likely to use SEO proceeds to increase R&D. This reflects the finding in prior literature that overconfident CEOs tend to be more innovative than are non-overconfident CEOs (Galasso and Simcoe, 2011; Hirshleifer et al., 2012). We capture this by estimating similar levels-models to when analyzing capital expenditure. The dependent variable is the firm's post-SEO R&D. We control for other corporate characteristics, and year and industry fixed effects.

The results (in Table 10) generally support our expectations. The results from Columns 1-6 indicate that CEO overconfidence is associated with significantly higher post-SEO R&D (using all but the trading-based measure of overconfidence). The results in Columns 7-12 suggest that the result is weaker after controlling for other corporate factors.. This result is economically meaningful: under the *Holder67* measure of overconfidence, overconfident CEOs spend around 3.8% more on R&D after SEOs than do other CEOs (after controlling for other corporate characteristics). The SEO proceeds are also significantly and positively related to post-SEO R&D. Interesting, whereas overconfident CEOs (who

tend to hold more options) tend to invest more in R&D, CEOs who have higher stock-holdings invest less. This suggests that whereas undiversified CEOs in general (i.e. those who hold large amounts of their company's stock) aim to reduce corporate risk, overconfident CEOs are more willing to take more risk.

5.4 CEO overconfidence, debt, and cash holdings

The next issue is whether overconfident CEOs use the SEO proceeds to pay-down debt rather than accumulate it as cash holdings. We analyze this by examining the relationship between CEO overconfidence and post-SEO debt levels and cash holdings

We analyze debt levels in Table 11 and cash holdings in Table 14. The results in Table 11 indicate that overconfident CEOs do not have significantly higher or lower post-SEO debt levels, even after controlling for pre-SEO debt levels. This suggests that overconfident CEOs do not use the issuance to reduce financial leverage. We further explore whether overconfident CEOs reduce debt by undertaking logit models in which the dependent variable is an indicator for whether the firm's debt level one year after the SEO is below that one year before the SEO. The results are in Table 12. The core finding is that overconfident CEOs are insignificantly less likely to reduce debt, when using most measures of CEO overconfidence. To explore whether this is sensitive to the pre-SEO debt level, we split the sample into 'high leverage' and 'low leverage' firms based on whether their financial leverage was above or below median prior to the SEO (in Table 13). We find similar results: overconfident CEOs are not more likely

to reduce debt levels in either sub-sample, and, when using some measures of overconfidence, are less likely to reduce debt.

The results in Table 14 indicate that overconfident CEOs have significantly higher post-SEO cash holdings. Together these results suggest that overconfident CEOs do not (in general) use SEOs to deleverage. Nonetheless, they are more likely to hoard cash, potentially in order to facilitate future investment projects. Together with the foregoing CAPEX and R&D results, these indicate that if an overconfident CEO's firm issues stock, then it is primarily to increase expenditure (potentially facilitated by an increase in cash) rather than to reduce leverage. The results are consistent in nature with the prior finding that overconfident CEOs are more prone to invest (and potentially overinvest) than are other CEOs.

5.5 Market timing

We expect that overconfident CEOs will be less likely to market-time their SEOs. In the light of the foregoing evidence, this is based on the overconfident CEOs' propensities to issue for investment purposes (as evidenced by the increase in, or continuation of, CAPEX, R&D, and takeovers). In turn, this implies that overconfident CEOs' issuances are part of a program of continuing investment.

The first set of market-timing related tests analyze whether overconfident CEOs are more likely to issue equity both in strong and in weak economic conditions. We do this by using our firm-year panel sample.

In each year, we identify if the year's GDP growth is low (below median) or high (above median). We then analyze the likelihood that a firm issues equity in each period. The results are in Table 15. The main finding is that overconfident CEOs remain more likely to issue equity irrespective of the economic conditions. This is consistent with the idea that overconfident CEOs are less likely to time the market. It is also consistent with foregoing leverage-results: this is because overconfident CEOs issue equity in both strong and weak GDP conditions, suggesting they are not necessarily more likely to issue to recapitalize during a downturn than are other CEOs.

The second set of market timing regressions assess the relationship between overconfidence and pre-SEO run-up. Here, we aim to assess whether overconfident CEOs are more prone to issue equity after experiencing a strong positive return, which would suggest market timing. Thus, for the sample of firms that conduct SEOs, we run OLS regression models in which the dependent variable is the six-month pre-SEO run up. The results are in Table 16 and indicate that overconfident CEOs actually have a lower pre-SEO run-up. That is, they issue equity notwithstanding poor pre-SEO stock performance. While this *by itself* would be consistent with issuing in order to recapitalize following poor performance, we find no evidence that significantly reduce debt (and find evidence that they *do* increase or maintain investment). Thus, these results indicate that overconfident CEOs, when deciding whether to issue equity, do so primarily because they believe the firm has an attractive investment opportunity set.

6 How do overconfident CEOs' SEOs influence performance?

The next issue is whether overconfident CEOs' SEOs undermine corporate performance. One possibility is that overconfident CEOs use the SEO-proceeds to over-invest in value-destroying projects, thereby undermining shareholder wealth. Alternatively, if the overconfident-issuers tend to be at smaller, higher-growth, firms, it is plausible that the issuers use the SEO proceeds to invest in innovation. Given the prior evidence that overconfident CEOs may be better innovators (Hirshleifer et al., 2012), such actions could create corporate value.

The first set of results focus on the firm's short-run performance around the announcement of the SEO. We analyze the performance around the announcement-date (rather than the 'listing' date) in order to capture the information-effects of the SEO. We obtain the firm's 3-day cumulative abnormal return (CAR) from one day before to one day after the announcement-date. The firm's CAR is the sum of its abnormal returns over the event-period. The abnormal return is the firm's return less the return predicted by an OLS estimation of the market-model over the pre-event period (30 days to 250 days) before the announcement. We obtain qualitatively similar results if we use wider event-windows (i.e. a 5-day or 11-day window). The results in relation to short-run returns are in Table 17 and suggest that overconfident CEOs' SEOs do not perform significantly worse, on average. No measure of CEO overconfidence is significantly related to short-run returns. This is consistent with the results vis-à-vis operating performance.

We next analyze firms' long-run post-SEO stock performance. We analyze the firm's three-year market-adjusted stock return, which is the firm's buy and hold return less the buy and hold return from investing

in the CRSP value-weighted index.[6] The results are in Table 18 and echo the results in relation to short-run returns and operating performance: CEO overconfidence is nog significantly related to post-SEO performance, on average.

We finally analyze the firm's industry adjusted change in operating performance (as proxied by its ROA). We test this by examining the firm's change in ROA from year $t-1$ to year $t+1$, where year t is the year of the SEO (we obtain qualitatively similar results if we examine Healy et al (1992) levels-models instead). The results are in Table 19 and indicate that overconfident CEOs' SEOs do not perform significantly differently from those of other CEOs. That the operating-performance-results support the stock-return-results indicates that the foregoing results do not merely reflect the market anticipating the SEO or that they are merely an artefact of overconfident CEOs engaging in fraud prior to securities offerings, which Schrand and Zechman (2012) propose could occur. In these models, we also find that stronger operating performance tends to be associated with stronger stock returns. Larger firms experience stronger performance, potentially implying benefits of market power. Operating performance increases with corporate leverage, perhaps suggesting that the disciplinary aspects of debt (see e.g., Maloney et al., 1993) help to deter managers from using the SEO's proceeds to engage in self-interested investments. Innovative firms also experience stronger post-SEO operating performance, potentially due to the context in which R&D-intensive firms would undertake a SEO (i.e. to scale up existing innovation).

[6] We also check that the results are robust to using the CRSP equally weighted index or the return on the CRSP value-decile index.

7 Robustness tests and alternative explanations

7.1 Systematic differences between firms with overconfident managers and those with non-overconfident managers

One concern is that the firms managed by overconfident CEOs are qualitatively different from those managed by non-overconfident CEOs. It is notable that this is unlikely to affect the results as requiring data on overconfidence restricts us to examining the S&P 1500 (i.e., Execucomp firms), which are relatively comparable to one-another. Nonetheless, we address the concern by using propensity score matching. This functions as follows. We estimate a logit model to predict the likelihood that the CEO is overconfident (with separate regressions for each of the overconfidence-indicators). Next, we obtain the propensity scores from that model. We then perform one-to-one matching between the overconfident firms and the non-overconfident controls.[7]

We report results for propensity score models in Table 20. We focus on the *Holder67* measure of overconfidence. The report the second stage of the regressions. The findings vis-à-vis *Holder67* are robust to undertaking this propensity score matching, with overconfident CEOs being more likely to issue stock (and to raise more money when doing so). Further, in these models, overconfident CEOs are

[7] When matching observations, we require the propensity scores for the overconfident firm to be within a set distance from those of the matched firms. That is, we impose a radius caliper. We use a radius of 0.0001 for the panel sample and a wider radius of 0.01 for the cross-sectional sample (due to the smaller number of observations).

still more prone to increasing CAPEX, R&D, and cash holdings, though do not significantly alter financial leverage. Overconfidence remains insignificantly related to corporate performance around SEOs.

7.2 Endogeneity concerns

The main concern is that the prospect of doing a SEO might influence market prices, thereby influencing the value of the CEO's options and leading to the appearance of overconfidence according to the option-based measures. We argue that this is not likely to be a concern for several reasons. (1) A SEO , or the prospect thereof, is typically associated with a negative market reaction, which would reduce the value of the CEO's options, leading CEOs to appear less overconfident. Thus, if endogeneity were driving the result, we would expect to find that overconfident CEOs (according to the option-based measure) would be less likely to do a SEO, whereas we find the opposite. (2) Prior literature suggests that overconfidence, or risk-taking behavior closely associated therewith, tends to stem from early-life experiences (Bernile et al., 2014; Malmendier et al., 2011), and/or genetic pre-dispositions (Cesarini et al., 2009; Cronqvist et al., 2014; Cronqvist and Siegel, 2013), which would be exogenous to the SEO.

7.3 "Changes" Regressions

The reported CAPEX, R&D, Debt, and Cash Holdings regressions are "levels" regressions rather than "changes" regressions. However, we check that the results are robust to analyzing the relationship

between overconfidence and industry adjusted changes in CAPEX, R&D, debt, and cash holdings, which are in Panels A-D (respectively) of Table 21. All models include year fixed effects and the controls from the main reported regressions, which we suppress for brevity.

The results are consistent with the main regressions and are both statistically and economically significant. For CAPEX: Column 3 of Panel A indicates that, using the *Holder67* measure of CEO overconfidence, overconfident CEOs' companies experience a 3.8% greater increase in industry-adjusted CAPEX/sales than do other CEOs' companies.[8] Further, using the *Holder67* measure of overconfidence, overconfident CEOs' companies experience at 7.8% greater increase in industry-adjusted R&D. As with the 'levels' regressions, overconfident CEOs' companies do not exhibit a statistically significantly greater (or lesser) change in debt or cash holdings.

8 Conclusion

This paper analyzes whether and why overconfident CEOs issue equity, and explores the value-implications of such equity-offerings. Overconfident CEOs tend to overvalue their own companies; a consequence of having miscalibrated views on the firm's risks and returns (per Ben-David et al., 2013). However, overconfident CEOs also tend to overinvest, reflecting an excessively positive view of the firm's future investment-prospects (Malmendier and Tate, 2008, 2005). Subsequently, we demonstrate that overconfident CEOs are more likely to issue equity and undertake larger offerings when doing so.

We explore the motivation for such equity offerings, and find that it is primarily related to investment. We show that overconfident CEOs increase R&D and CAPEX at a faster rate than their industry peers after an SEO. They are also more likely to continue (though not necessarily increase) their strategy of takeover-investment, which we also find involves undertaking more takeovers than non-overconfident CEOs. However, they are no more likely to alter debt levels. Further, they do not appear to issue equity opportunistically, and are more likely to issue equity whether or not the market exhibits high or low GDP growth. This implies that overconfident CEOs' SEOs are primarily to engage in investment, which begs the question of whether such activities affect shareholder wealth.

The results indicate that overconfident CEOs' SEOs do not significantly affect shareholder wealth. Overconfident CEOs' SEOs are not associated with significantly worse short-run CARs, long-run returns, or long-run operating performance than are other CEOs' offerings. This tends to suggest that overconfident CEOs do not use SEOs to engage in value-destroying investment, on average. Instead, when coupled with the evidence that overconfident CEOs increase R&D after SEOs, it is consistent with the idea that overconfident CEOs can create value (or at least are less prone to destroy it) when investing in R&D (per Hirshleifer et al., 2012). Overall, the value-results indicate that overconfident CEOs' capital raisings are not per se worse than are those of other CEOs.

The results contribute to the CEO overconfidence literature. The results help to reconcile the findings that overconfident CEOs both overvalue their own companies and are more likely to issue stock. The results also highlight an additional factor that is associated with the likelihood of a securities offering – CEO overconfidence.

9 Appendix I: Variable definitions

This table contains the variable definitions. All continuous variables are winsorized at 1%.

Variable	Definition
ConfidenceOptions	This is a continuous measure of overconfidence. It is the *Value-per-vested-unexercised-option*/ *Average Strike price*. The *Value-per-vested-unexercised-option* is the value of those vested but unexercised options scaled by the number of such options, as reported in Execucomp. The *Average Strike price* is the value at the end of the fiscal year (from CRSP/Compustat: prcc_f) less the *Value-per-vested-unexercised-option*. The logic is that the *Value-per-vested-unexercised-option* is approximately equal to $S_t - X$, where S_t is the stock price and X is the strike price.
ConfidenceOptions75	An indicator that equals one if the firm's ConfidenceOptions value is in the top quartile of the sample in that year.
Holder67	This is the Holder67 measure per Malmendier et al (2011). We compute this based upon the ConfidenceOptions measure. Here, we obtain the ConfidenceOptions measure for each CEO in each year. Holder67 equals one if ConfidenceOptions is at least 67% on at least two occasions, in which case Holder67 equals one from the first such occasion.
ConfidenceTrading	An indicator that equals one if the CEO in year *t*, at any time of the next two years, purchases the firm's stock and that purchase has a negative 180 buy and hold abnormal return (BHAR), where that BHAR is the firm's return less the corresponding return for the firm's CRSP value-weighted size decile.
ConfidenceNews	We construct these measures by conducting a Factiva-search for news articles *New York Times*, *Wall Street Journal*, *US Today*, and *Business Week* that pertain to the CEO. We search for 'Confident' words ("confident", "optimistic", "positive", and the derivations thereof) and the 'Non-Confident' words ("cautious", "pessimistic", and the converses of the 'Confident') words. We then construct a *ConfidenceNews* measure as the number of 'Confident' articles less the number of 'Non-Confident' articles.
PosConfidenceNews	An indicator that equals one if the number of 'Confident' articles exceeds the number of 'Non-Confident' ones. This corresponds to an indicator that equals one if ConfidenceNews is positive.
SEO Indicator	An indicator that equals one if the firm issues an SEO in year *t* as identified in SDC. This is based on the issue date (as opposed to other dates) as recorded in SDC.
SEO Proceeds	The total proceeds that the firm raises from the SEO(s) it conducts in year *t*.
Industry Adjusted Change in CAPEX	We first obtain the change in the firm's CAPEX/sales (CRSP/Compustat: capx/sale) between year t-1 and year t+1 where year t is the year of the SEO. We then subtract the median CAPEX/Sales for all firms in the subject firm's two digit SIC industry. In the models where this is a dependent variable, we omit all observations with missing CAPEX.
Industry Adjusted Change in R&D	We first obtain the change in the firm's R&D/sales (CRSP/Compustat: xrd/sale) between year t-1 and year t+1 where year t is the year of the SEO. We then subtract the median R&D /Sales for all firms in the subject firm's two digit SIC industry. In the models where this is a dependent variable, we omit all observations with missing R&D.
Industry Adjusted Change in Cash	We first obtain the change in the firm's Cash/Assets (CRSP/Compustat: ch/at) between year t-1 and year t+1 where year t is the year of the SEO. We then subtract

	the median Cash /Assets for all firms in the subject firm's two digit SIC industry. In the models where this is a dependent variable, we omit all observations with missing Cash.
Industry Adjusted Change in Leverage	We first obtain the change in the firm's Debt/Assets (CRSP/Compustat: dltt/at) between year t-1 and year t+1 where year t is the year of the SEO. We then subtract the median Debt/Assets for all firms in the subject firm's two digit SIC industry. In the models where this is a dependent variable, we omit all observations with missing debt.
CEO stock ownership	The CEO's percentage stock ownership as indicated in Execucomp.
Ln (1+CEO age)	The natural logarithm of one plus the CEO's age as sourced from Execucmp. If the CEO's age in year *t* is missing from Execucomp, we search forward and backward to determine if it is reported in any other year and then calculate the age for year *t*. . Any observation for which age-data is still missing is omitted.
Ln (1+CEO tenure)	The natural logarithm of one plus the CEO's tenure, defined as the difference in years between the present year and the year in which the CEO commenced as CEO. The data is from Execucomp.
CEO bonus/salary	The CEO's bonus (Execucomp: bonus) scaled by his/her salary (Execucomp: salary)
CEO turn over	Indicator variable that takes the value of one if a CEO turnover occurs and zero otherwise as sourced from Execucmp.
Institutional ownership	The percentage of stock that institutional shareholders own, as indicated in the Thomson 13f filings.
Past stock return	Buy-and-hold stock return for the past one year.
Stock return volatility	Standard deviation of monthly stock returns for the past three years.
Ln(1+total asset)	The natural log of one plus the firm's total assets (CRSP/Compustat: at) .
BM	The ratio of book equity to market equity. Book equity equals to total assets – (total liabilities + preferred stock) + deferred taxes + conv. debt. Market equity equals to stock price at fiscal year-end times shares outstanding.
ROA	The firm's return on assets, defined as its net income (CRSP/Compustat: ni) scaled by its assets (CRSP/Compustat: at).
Book leverage	Long-term debt (CRSP/Compustat: dltt) plus debt in current liabilities (CRSP/Compustat: dlc) divided by total assets (CRSP/Compustat: at).
Cash holdings	The firm's cash (CRSP/Compustat: ch) scaled by its assets (CRSP/Compustat: at).
R&D intensity	The firm's R&D expenditure (CRSP/Compustat: xrd) scaled by its sales (CRSP/Compustat: sale). We recode missing R&D values as zero when examining R&D as a regressor. When examining R&D as a dependent variable, we omit any observation for which R&D data is missing.
Capital expenditure	The firm's capital expenditure (CRSP/Compustat: capx) scaled by its sales (CRSP/Compustat: sale). We do not recode missing CAPEX values: if the firm's CAPEX is missing, then we omit it from the sample.
Industry competition	Herfindahl-Hirschman Index for the four-digit SIC code industry.

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11 Tables

Table 1: Sample composition by year

This table contains the sample composition by year for the firms in our sample.

Year	Number of SEO firms	Number of SEO firms with Holder67 equals to 1	Number of firms with Holder67 equals to 1	Total number of firms
1993	3	2	53	149
1994	13	8	194	509
1995	28	21	294	768
1996	29	18	377	847
1997	22	14	441	894
1998	25	20	514	934
1999	42	24	560	996
2000	44	27	569	1,061
2001	32	26	586	1,070
2002	41	25	569	1,073
2003	41	21	562	1,113
2004	40	19	620	1,152
2005	25	16	627	1,125
2006	22	15	626	1,113
2007	23	11	540	951
2008	19	16	635	1,189
2009	60	38	574	1,162
2010	28	16	541	1,158
2011	15	11	503	1,224
Total	552	348	9385	18,488

Table 2: Summary Statistics

This table contains the summary statistics for the sample. The summary statistics are means and medians, as indicated in the column header.

	Holder67equals to 1 N=9,385		Holder67equals to 0 N=9,103		Test of Difference (A-B)	
	Mean	Median	Mean	Median	*t*-test p-value	Wilcoxon X^2-test p-value
Firm size ($ billions)	4.961	1.108	7.044	1.254	0.000***	0.000***
Book leverage	0.201	0.185	0.232	0.225	0.000***	0.000***
Cash holdings	0.165	0.089	0.133	0.066	0.000***	0.000***
Profitability	0.152	0.153	0.122	0.125	0.000***	0.000***
Book to market	0.456	0.373	0.591	0.502	0.000***	0.000***
R&D intensity	0.037	0.003	0.033	0.004	0.000***	0.190
Capital expenditure	0.063	0.046	0.054	0.040	0.000***	0.000***
Past stock return	0.242	0.157	0.089	0.039	0.000***	0.000***
Stock return volatility	0.124	0.107	0.120	0.102	0.000***	0.000***
CEO stock ownership	0.024	0.005	0.014	0.002	0.000***	0.000***
CEO age	55.445	55	54.641	55	0.000***	0.000***
CEO tenure	8.659	7	4.923	3	0.000***	0.000***
CEO bonus/salary ($ millions)	1.331	0.920	1.104	0.840	0.000***	0.000***

Table 3: Correlation matrix

This table contains the pairwise correlations.

		A	B	C	D	E	F	G	H	I	J	K	L	M	N
A	**ConfidenceOptions**	1													
B	**CEO holder67**	0.5527	1												
C	**ConfidenceNews**	0.4519	0.3819	1											
D	**CEO stock ownership**	0.058	0.1058	-0.0001	1										
E	**Institution ownership**	0.041	0.1208	0.2209	-0.1379	1									
F	**Past stock return**	0.3995	0.1372	0.0411	0.0397	0.0199	1								
G	**Stock return volatility**	-0.0441	0.0306	-0.024	0.0646	-0.0528	0.0853	1							
H	**Ln(1+total asset)**	-0.0596	-0.0377	0.0517	-0.1915	0.0693	-0.048	-0.3278	1						
I	**BM**	-0.3756	-0.1614	-0.1498	0.0089	-0.0279	-0.3183	0.1162	-0.0207	1					
J	**ROA**	0.2671	0.1451	0.176	0.0226	0.1189	0.134	-0.3268	0.1384	-0.3022	1				
K	**Book leverage**	-0.1448	-0.0868	-0.0898	-0.0653	-0.0574	-0.0834	-0.0247	0.2902	0.0422	-0.0811	1			
L	**Cash holdings**	0.1073	0.0929	0.0461	0.049	0.0721	0.1068	0.2987	-0.3491	-0.1811	-0.1962	-0.3976	1		
M	**R&D intensity**	0.0428	0.0269	-0.0463	-0.0326	-0.0199	0.0179	0.2836	-0.2699	-0.1914	-0.3069	-0.2534	0.563	1	
N	**Capital expenditure**	0.1263	0.0843	0.1188	0.0466	-0.0783	-0.0183	-0.0165	-0.0194	-0.0428	0.2401	0.0267	-0.1785	-0.1204	1

Table 4: SEO Probability and CEO Overconfidence

This table contains the marginal effects from probit models that predict the probability that a firm conducts a SEO in year $t+1$ as a function of characteristics in year t. Figures in parentheses are standard errors. Superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent variable	SEO Indicator											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ConfidenceOptions	0.029***						0.023***					
	(0.0000)						(0.0000)					
ConfidenceOptions75		0.016***						0.010***				
		(0.0000)						(0.0003)				
Holder67			0.013***						0.010***			
			(0.0000)						(0.0000)			
ConfidenceTrading				0.014***						0.009**		
				(0.0023)						(0.0207)		
ConfidenceNews					0.008*						0.009**	
					(0.0822)						(0.0180)	
PosConfidenceNews						0.006*						0.006**
						(0.0950)						(0.0342)
CEO stock ownership							0.067***	0.067***	0.067***	0.070***	0.040	0.040
							(0.0015)	(0.0016)	(0.0020)	(0.0011)	(0.2368)	(0.2439)
Ln (1+CEO age)							-0.020**	-0.021**	-0.021**	-0.022**	-0.009	-0.009
							(0.0298)	(0.0277)	(0.0237)	(0.0225)	(0.4695)	(0.4790)
Ln (1+CEO tenure)							0.001	0.001	-0.000	0.001	0.000	0.000
							(0.5914)	(0.4380)	(0.8101)	(0.3133)	(0.9056)	(0.8431)
CEO bonus/salary							0.001	0.001	0.001	0.001	0.004	0.004
							(0.7166)	(0.6760)	(0.7268)	(0.6281)	(0.1469)	(0.1565)
CEO turn over							-0.002	-0.003	-0.002	-0.004	-0.001	-0.001
							(0.5105)	(0.3929)	(0.5186)	(0.2778)	(0.8951)	(0.8670)
Institutional ownership							0.031***	0.032***	0.031***	0.033***	0.034***	0.035***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Past stock return							0.010***	0.012***	0.013***	0.013***	0.007***	0.007***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0035)	(0.0039)
Stock return volatility							0.050***	0.048***	0.048***	0.049***	0.054***	0.056***
							(0.0035)	(0.0053)	(0.0056)	(0.0055)	(0.0069)	(0.0057)
Ln(1+total asset)							-0.003**	-0.003**	-0.003***	-0.003**	-0.002	-0.002
							(0.0107)	(0.0107)	(0.0085)	(0.0100)	(0.1343)	(0.1629)
BM							-0.002	-0.004	-0.004	-0.006*	-0.003	-0.003

							(0.4613)	(0.1801)	(0.1442)	(0.0658)	(0.4123)	(0.3541)
ROA							-0.096***	-0.093***	-0.093***	-0.090***	-0.089***	-0.089***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Book leverage							0.041***	0.040***	0.039***	0.038***	0.040***	0.039***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Cash holdings							-0.043***	-0.042***	-0.042***	-0.040***	-0.046***	-0.045***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R&D intensity							0.031	0.030	0.029	0.030	0.034	0.034
							(0.2271)	(0.2407)	(0.2684)	(0.2464)	(0.2537)	(0.2642)
Capital expenditure							0.039*	0.044*	0.044*	0.050**	0.024	0.026
							(0.0816)	(0.0530)	(0.0502)	(0.0263)	(0.4560)	(0.4165)
Industry competition							-0.004	-0.005	-0.003	-0.005	-0.016	-0.017
							(0.6377)	(0.5771)	(0.7217)	(0.5882)	(0.1221)	(0.1143)
Observations	17,724	17,724	17,724	17,724	9,230	9,230	17,724	17,724	17,724	17,724	9,230	9,230
Pseudo R-squared	0.051	0.047	0.047	0.043	0.064	0.064	0.118	0.114	0.116	0.113	0.133	0.132
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 5: SEO proceeds

This table contains regressions that analyze the impact of CEO overconfidence on SEO proceeds. The dependent variable is the natural logarithm of the dollar amount of proceeds that the company raises. The variable definitions are in the appendix. The brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent variable	SEO Proceeds											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ConfidenceOptions	0.649***						0.524***					
	(0.0000)						(0.0000)					
ConfidenceOptions75		0.319***						0.219***				
		(0.0000)						(0.0000)				
Holder67			0.147***						0.128***			
			(0.0000)						(0.0000)			
ConfidenceTrading				0.095***						0.059***		
				(0.0000)						(0.0002)		
ConfidenceNews					0.342***						0.439***	
					(0.0000)						(0.0000)	
PosConfidenceNews						0.188***						0.226***
						(0.0000)						(0.0000)
CEO stock ownership							1.394***	1.347***	1.344***	1.340***	2.004***	1.991***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Ln (1+CEO age)							-0.221***	-0.239***	-0.252***	-0.260***	-0.338***	-0.321***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Ln (1+CEO tenure)							-0.010	-0.005	-0.015	0.000	0.021	0.025
							(0.3094)	(0.6004)	(0.1178)	(0.9800)	(0.2186)	(0.1469)
CEO bonus/salary							0.013***	0.011***	0.014***	0.015***	0.132***	0.127***
							(0.0004)	(0.0048)	(0.0001)	(0.0000)	(0.0000)	(0.0000)
CEO turn over							-0.116***	-0.125***	-0.116***	-0.135***	0.047*	0.023
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0729)	(0.3963)
Institutional ownership							-0.041	-0.018	-0.023	-0.002	-0.154***	-0.120**
							(0.1835)	(0.5714)	(0.4704)	(0.9540)	(0.0041)	(0.0243)
Past stock return							0.179***	0.208***	0.237***	0.247***	0.179***	0.177***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Stock return volatility							0.649***	0.594***	0.597***	0.587***	1.209***	1.296***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Ln(1+total asset)							-0.186***	-0.181***	-0.185***	-0.181***	-0.186***	-0.181***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
BM							-0.059**	-0.100***	-0.129***	-0.146***	-0.121***	-0.148***
							(0.0175)	(0.0001)	(0.0000)	(0.0000)	(0.0027)	(0.0002)
ROA							-0.934***	-0.861***	-0.820***	-0.767***	-0.894***	-0.884***

							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Book leverage							0.415***	0.376***	0.344***	0.316***	0.180**	0.116
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0374)	(0.1816)
Cash holdings							-0.798***	-0.772***	-0.767***	-0.746***	-1.522***	-1.478***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R&D intensity							-1.853***	-1.842***	-1.829***	-1.838***	-1.513***	-1.599***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Capital expenditure							0.326**	0.395**	0.492***	0.585***	-1.314***	-1.038***
							(0.0360)	(0.0112)	(0.0017)	(0.0002)	(0.0001)	(0.0021)
Industry competition							-0.351***	-0.375***	-0.376***	-0.400***	-0.383***	-0.410***
							(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0090)	(0.0054)
Observations	18,488	18,488	18,488	18,488	9,840	9,840	18,488	18,488	18,488	18,488	9,840	9,840
Pseudo R-squared	0.137	0.137	0.114	0.111	0.160	0.155	0.235	0.230	0.226	0.223	0.257	0.249
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 6: Capital expenditure after SEOs

This table contains OLS models that analyze the CAPEX/Sales one year after the SEO. We require that the firm's CAPEX is non-missing. The industry adjusted change is the firm's change less the median change for all firms in the subject-firm's two-digit SIC industry. The regressions include year fixed effects and cluster standard errors by firm. Brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	CAPEX/Total assets											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lag-CAPEX/Total assets	0.395***	0.376***	0.361***	0.362***	0.263***	0.260***	0.437***	0.424***	0.421***	0.432***	0.329***	0.327***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ConfidenceOptions	0.047***						0.041***					
	(0.0000)						(0.0028)					
ConfidenceOptions75		0.031***						0.026***				
		(0.0003)						(0.0037)				
Holder67			0.022***						0.017***			
			(0.0001)						(0.0035)			
ConfidenceTrading				0.004						0.000		
				(0.6835)						(0.9910)		
ConfidenceNews					-0.002						-0.007	
					(0.8224)						(0.3656)	
PosConfidenceNews						0.003						-0.002
						(0.5587)						(0.7157)
Ln (SEO Proceeds)							0.008**	0.009**	0.010**	0.011***	0.006**	0.006*
							(0.0307)	(0.0145)	(0.0107)	(0.0070)	(0.0439)	(0.0500)
Primary share ratio							-0.019	-0.015	-0.019	-0.017	-0.018	-0.018
							(0.2124)	(0.2976)	(0.2014)	(0.2514)	(0.3636)	(0.3806)
Shelf registration indicator							0.001	0.001	0.001	0.000	0.002	0.002
							(0.8828)	(0.9070)	(0.8553)	(0.9801)	(0.7379)	(0.7276)
CEO stock ownership							-0.054	-0.055	-0.053	-0.058	-0.064	-0.060
							(0.2670)	(0.2344)	(0.2598)	(0.2229)	(0.2465)	(0.2783)
Ln (1+CEO age)							-0.016	-0.012	-0.013	-0.016	-0.018	-0.018
							(0.4919)	(0.6154)	(0.5938)	(0.5047)	(0.4494)	(0.4302)
Ln (1+CEO tenure)							0.010***	0.009***	0.008**	0.010***	0.006	0.006
							(0.0050)	(0.0064)	(0.0262)	(0.0065)	(0.1069)	(0.1117)
CEO bonus/salary							0.001	0.002	0.001	0.002	0.002	0.002
							(0.4506)	(0.3851)	(0.3900)	(0.2562)	(0.1523)	(0.1353)
Past stock return							-0.002	-0.001	-0.001	0.000	0.008	0.007

							(0.6313)	(0.7681)	(0.8150)	(0.9649)	(0.1506)	(0.1544)
Stock return volatility							0.038	0.038	0.025	0.019	0.064	0.064
							(0.4883)	(0.5040)	(0.6500)	(0.7299)	(0.1956)	(0.2004)
Ln(1+total asset)							-0.009***	-0.010***	-0.011***	-0.012***	-0.006**	-0.006**
							(0.0026)	(0.0016)	(0.0004)	(0.0001)	(0.0174)	(0.0185)
BM							-0.001	-0.002	-0.006	-0.007	-0.001	-0.000
							(0.8303)	(0.7447)	(0.3235)	(0.2453)	(0.8827)	(0.9757)
ROA							-0.001	0.004	0.001	0.008	0.052	0.052
							(0.9783)	(0.9227)	(0.9703)	(0.8507)	(0.1255)	(0.1312)
Book leverage							0.012	0.009	0.007	0.004	0.017	0.020
							(0.4813)	(0.5759)	(0.6612)	(0.8239)	(0.3729)	(0.2895)
Cash holdings							-0.034**	-0.032**	-0.037**	-0.034**	-0.013	-0.014
							(0.0347)	(0.0390)	(0.0220)	(0.0367)	(0.3449)	(0.3158)
R&D intensity							-0.028	-0.026	-0.030	-0.030	-0.007	-0.003
							(0.6108)	(0.6331)	(0.5878)	(0.5859)	(0.8730)	(0.9482)
Observations	578	578	578	578	310	310	551	551	551	551	306	306
R-squared	0.567	0.567	0.561	0.547	0.699	0.700	0.595	0.596	0.591	0.584	0.728	0.727
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 7: CEO overconfidence and M&As after SEOs

This table contains regressions that analyze the likelihood that a firm engages in a M&A in year *t* +1 as a function of CEO overconfidence, if the firm conduct a SEO in year t. We restrict attention to M&A transactions whose value is at least USD 5 million, are completed, and for which the acquirer owns 100% of the target after the acquisition and less than 50% of the target before the acquisition. The regressions control for year and industry fixed effects. Parentheses contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	0.179**					
	(0.0403)					
ConfidenceOptions75		0.046				
		(0.4019)				
Holder67			0.065			
			(0.1715)			
ConfidenceTrading				-0.159**		
				(0.0186)		
ConfidenceNews					0.201**	
					(0.0375)	
PosConfidenceNews						0.125
						(0.1018)
Ln (SEO Proceeds)	0.063**	0.072**	0.071**	0.082***	0.048	0.053
	(0.0353)	(0.0170)	(0.0177)	(0.0074)	(0.2923)	(0.2559)
Primary share ratio	0.104	0.118	0.111	0.136	0.004	-0.020
	(0.3755)	(0.3104)	(0.3414)	(0.2402)	(0.9855)	(0.9266)
Shelf registration indicator	0.075	0.064	0.066	0.061	0.153**	0.153**
	(0.1588)	(0.2275)	(0.2102)	(0.2429)	(0.0177)	(0.0189)
CEO stock ownership	-0.152	-0.175	-0.158	-0.155	-0.808	-0.949
	(0.7681)	(0.7365)	(0.7631)	(0.7554)	(0.3195)	(0.2424)
Ln (1+CEO age)	0.038	0.033	0.045	0.061	-0.102	-0.098
	(0.8160)	(0.8386)	(0.7857)	(0.7146)	(0.7215)	(0.7317)
Ln (1+CEO tenure)	-0.008	-0.008	-0.014	-0.005	0.057	0.062
	(0.7834)	(0.7657)	(0.6069)	(0.8513)	(0.2399)	(0.2009)
CEO bonus/salary	0.068	0.069	0.068	0.070	0.043	0.036
	(0.1595)	(0.1517)	(0.1543)	(0.1465)	(0.5401)	(0.6043)
Past stock return	-0.001	-0.003	-0.001	-0.009	0.012	0.009
	(0.9531)	(0.8752)	(0.9731)	(0.7034)	(0.7662)	(0.8232)
Stock return volatility	-0.820***	-0.825***	-0.821***	-0.842***	-1.754***	-1.747***
	(0.0031)	(0.0030)	(0.0034)	(0.0019)	(0.0002)	(0.0002)
Ln(1+total asset)	-0.067**	-0.074***	-0.074***	-0.085***	-0.096**	-0.096**
	(0.0166)	(0.0085)	(0.0081)	(0.0027)	(0.0217)	(0.0209)
BM	-0.061	-0.084	-0.093*	-0.082	0.042	0.033
	(0.2593)	(0.1203)	(0.0937)	(0.1377)	(0.5950)	(0.6720)
ROA	0.145	0.165	0.153	0.185	0.188	0.192
	(0.5764)	(0.5191)	(0.5500)	(0.4637)	(0.6988)	(0.6935)
Book leverage	-0.005	-0.036	-0.037	-0.026	0.335*	0.285
	(0.9706)	(0.7890)	(0.7885)	(0.8481)	(0.0816)	(0.1352)
Cash holdings	-0.232	-0.230	-0.243	-0.240	0.314	0.325
	(0.2433)	(0.2508)	(0.2245)	(0.2296)	(0.3310)	(0.3081)
R&D intensity	0.056	0.026	0.019	0.012	-0.040	-0.094
	(0.8901)	(0.9493)	(0.9631)	(0.9758)	(0.9583)	(0.8996)
Capital expenditure	-0.715*	-0.679*	-0.709**	-0.628*	-0.752	-0.745
	(0.0508)	(0.0594)	(0.0464)	(0.0722)	(0.2338)	(0.2442)
Observations	532	532	532	532	237	237
Pseudo R-square	0.195	0.190	0.192	0.200	0.236	0.231
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES

Table 8: CEO overconfidence, SEOs and M&As

This table contains regressions that analyze the likelihood that a firm engages in a M&A in year *t* +1 as a function of CEO overconfidence, whether the firm conducts a SEO in year *t* and the interaction thereof. We restrict attention to M&A transactions whose value is at least USD 5 million, are completed, and for which the acquirer owns 100% of the target after the acquisition and less than 50% of the target before the acquisition. The regressions control for year and industry fixed effects. Parentheses contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
SEO indicator: A	0.063*	0.095***	0.101***	0.126***	0.102**	0.096***
	(0.0541)	(0.0001)	(0.0007)	(0.0000)	(0.0215)	(0.0079)
ConfidenceOptions: B	0.083***					
	(0.0000)					
ConfidenceOptions75: C		0.039***				
		(0.0000)				
Holder67: D			0.030***			
			(0.0002)			
ConfidenceTrading: E				0.019		
				(0.1158)		
ConfidenceNews: F					0.043***	
					(0.0031)	
PosConfidenceNews: G						0.031***
						(0.0033)
A*B	0.092*					
	(0.0851)					
A*C		0.030				
		(0.3386)				
A*D			0.023			
			(0.4812)			
A*E				-0.031		
				(0.4835)		
A*F					-0.028	
					(0.6130)	
A*G						-0.018
						(0.6428)
CEO stock ownership	-0.153*	-0.168*	-0.157*	-0.152*	-0.108	-0.112
	(0.0891)	(0.0667)	(0.0830)	(0.0917)	(0.3891)	(0.3722)
Ln (1+CEO age)	-0.111***	-0.112***	-0.115***	-0.117***	-0.139***	-0.140***
	(0.0004)	(0.0004)	(0.0003)	(0.0002)	(0.0010)	(0.0009)
Ln (1+CEO tenure)	0.004	0.003	0.001	0.006	0.008	0.008
	(0.4297)	(0.4728)	(0.8630)	(0.1709)	(0.1855)	(0.1681)
CEO bonus/salary	0.011	0.013*	0.012	0.013*	0.008	0.008
	(0.1383)	(0.0816)	(0.1227)	(0.0884)	(0.4281)	(0.4417)
Past stock return	0.018***	0.023***	0.029***	0.032***	0.016*	0.016*
	(0.0043)	(0.0002)	(0.0000)	(0.0000)	(0.0652)	(0.0699)
Stock return volatility	-0.294***	-0.293***	-0.299***	-0.295***	-0.305***	-0.305***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0003)	(0.0003)
Ln(1+total asset)	0.029***	0.029***	0.028***	0.028***	0.030***	0.030***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
BM	-0.015	-0.021*	-0.023**	-0.028***	-0.017	-0.018
	(0.1823)	(0.0509)	(0.0296)	(0.0091)	(0.2168)	(0.1827)
ROA	0.231***	0.244***	0.245***	0.261***	0.261***	0.264***

	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Book leverage	-0.089***	-0.095***	-0.097***	-0.103***	-0.139***	-0.140***
	(0.0005)	(0.0003)	(0.0001)	(0.0001)	(0.0000)	(0.0000)
Cash holdings	0.066**	0.071**	0.070**	0.074**	0.058	0.060
	(0.0268)	(0.0179)	(0.0196)	(0.0136)	(0.1388)	(0.1289)
R&D intensity	0.051	0.033	0.039	0.037	0.026	0.019
	(0.5692)	(0.7142)	(0.6669)	(0.6816)	(0.8445)	(0.8886)
Capital expenditure	-0.301***	-0.280***	-0.284***	-0.267***	-0.313**	-0.308**
	(0.0014)	(0.0032)	(0.0025)	(0.0042)	(0.0181)	(0.0202)
Observations	18,643	18,374	18,643	18,643	9,811	9,811
Pseudo R-square	0.069	0.069	0.068	0.067	0.069	0.069
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES

Table 9: Diversifying takeovers by acquirers

This table analyzes takeovers after SEOs. The sample includes all firms who conduct a SEO and who conduct a takeover – the sample is cross-sectional. The dependent variable is an indicator that equals one if a firm who conducts a SEO engages in a diversifying M&A one year after SEOs. We define diversifying acquisitions as one where the acquirer and the target are in different two-digit SIC industries. We require that the M&A transaction value is above 5 million, the acquirer owns less than 50% of the target before the bid and owns 100% of the target after the bid. The transaction must be complete. The dependent variable equals zero if the firm conducts a M&A that is not diversifying. The sample does not include firms who do not conduct a takeover. The models include year fixed effects, industry fixed effects, and the control variables from the previously reported models. Brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	Diversifying takeover indicator					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	0.402**					
	(0.0177)					
ConfidenceOptions75		0.088				
		(0.3825)				
Holder67			0.169*			
			(0.0521)			
ConfidenceTrading				0.074		
				(0.6930)		
ConfidenceNews					0.042	
					(0.2594)	
PosConfidenceNews						0.071**
						(0.0118)
SEO controls	YES	YES	YES	YES	YES	YES
Firm controls	YES	YES	YES	YES	YES	YES
Observations	236	236	236	236	91	91
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	NO	NO	NO	NO	NO	NO

Table 10: R&D expenditure after SEOs

This table reports the R&D/Assets around SEOs. The sample contains only firms who undertake SEOs and for whom R&D data is available (i.e., the sample omits any observation for which R&D data is missing). The dependent variable is the firm's R&D/Assets one year after the SEO. Variable definitions are in the appendix, parentheses contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	R&D/Total assets											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lag-R&D/Total assets	1.215***	1.231***	1.199***	1.242***	1.430***	1.426***	0.987***	0.987***	0.974***	0.978***	1.332***	1.308***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0003)	(0.0004)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0011)	(0.0011)
ConfidenceOptions	0.166***						0.068*					
	(0.0001)						(0.0541)					
ConfidenceOptions75		0.104***						0.056**				
		(0.0000)						(0.0249)				
Holder67			0.080***						0.038**			
			(0.0029)						(0.0459)			
ConfidenceTrading				-0.055*						-0.026		
				(0.0975)						(0.4059)		
ConfidenceNews					0.138**						0.061	
					(0.0270)						(0.3092)	
PosConfidenceNews						0.101**						0.044
						(0.0177)						(0.2845)
Ln (SEO Proceeds)							0.050***	0.051***	0.054***	0.055***	0.043**	0.043**
							(0.0017)	(0.0017)	(0.0007)	(0.0007)	(0.0156)	(0.0118)
Primary share ratio							0.045	0.037	0.047	0.055	-0.012	-0.009
							(0.5459)	(0.6262)	(0.5284)	(0.4548)	(0.9190)	(0.9373)
Shelf registration indicator							-0.032	-0.032	-0.030	-0.035	-0.024	-0.024
							(0.2394)	(0.2255)	(0.2703)	(0.2017)	(0.5182)	(0.5248)
CEO stock ownership							-0.291*	-0.342**	-0.281*	-0.287*	-0.320	-0.303
							(0.0797)	(0.0445)	(0.0919)	(0.0767)	(0.2369)	(0.2615)
Ln (1+CEO age)							0.095	0.100	0.088	0.093	0.163	0.176
							(0.5083)	(0.4808)	(0.5393)	(0.5223)	(0.3781)	(0.3661)
Ln (1+CEO tenure)							0.001	0.001	-0.005	-0.001	-0.028	-0.030
							(0.9469)	(0.9478)	(0.7062)	(0.9622)	(0.1810)	(0.1731)
CEO bonus/salary							0.002	0.003	0.004	0.005	-0.008	-0.008
							(0.8558)	(0.8239)	(0.7610)	(0.6967)	(0.6659)	(0.6622)
Past stock return							0.023	0.025	0.024	0.027	0.054	0.053

							(0.3494)	(0.3026)	(0.3293)	(0.2731)	(0.1107)	(0.1238)
Stock return volatility							0.018	0.035	0.028	-0.008	0.051	0.043
							(0.9182)	(0.8457)	(0.8755)	(0.9664)	(0.8273)	(0.8527)
Ln(1+total asset)							-0.035***	-0.035***	-0.040***	-0.042***	-0.029**	-0.030**
							(0.0059)	(0.0074)	(0.0019)	(0.0014)	(0.0298)	(0.0280)
BM							0.018	0.016	0.014	0.010	0.041*	0.038*
							(0.2162)	(0.2620)	(0.3080)	(0.4539)	(0.0910)	(0.0933)
ROA							0.225	0.221	0.224	0.234	0.386	0.368
							(0.2500)	(0.2519)	(0.2480)	(0.2271)	(0.1137)	(0.1286)
Book leverage							-0.129*	-0.131*	-0.128	-0.140*	-0.095	-0.112
							(0.0958)	(0.0936)	(0.1070)	(0.0689)	(0.3725)	(0.3025)
Cash holdings							0.273**	0.271**	0.259**	0.268**	0.302**	0.303**
							(0.0266)	(0.0262)	(0.0356)	(0.0312)	(0.0324)	(0.0331)
Capital expenditure							-0.553**	-0.579**	-0.586**	-0.548**	-0.642	-0.624
							(0.0314)	(0.0219)	(0.0239)	(0.0327)	(0.1408)	(0.1496)
Observations	321	321	321	321	193	193	304	304	304	304	186	186
R-squared	0.593	0.589	0.586	0.571	0.621	0.617	0.661	0.664	0.662	0.659	0.700	0.700
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 11: Debt Level after SEOs

This table reports regressions that analyze post-SEO debt levels. The sample contains only firms who undertake SEOs. The dependent variable is the firm's debt/assets one year after the SEO. Variable definitions are in the appendix, parentheses contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Debt/Assets											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lag debt/assets	0.680***	0.604***	0.581***	0.545***	0.759***	0.774***	0.645***	0.621***	0.625***	0.618***	0.740***	0.741***
	(0.0003)	(0.0012)	(0.0027)	(0.0022)	(0.0000)	(0.0000)	(0.0051)	(0.0065)	(0.0064)	(0.0057)	(0.0001)	(0.0001)
ConfidenceOptions	0.358***						0.096					
	(0.0006)						(0.3938)					
ConfidenceOptions75		0.132*						-0.022				
		(0.0781)						(0.7714)				
Holder67			0.063						-0.005			
			(0.3766)						(0.9450)			
ConfidenceTrading				0.107						0.136		
				(0.3323)						(0.1966)		
ConfidenceNews					0.189**						0.100	
					(0.0220)						(0.2421)	
PosConfidenceNews						0.199***						0.132**
						(0.0017)						(0.0458)
Ln(1+SEO proceeds)							0.192***	0.200***	0.199***	0.200***	0.151***	0.144***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0001)
SEO primary ratio							0.205	0.220	0.220	0.220	0.146	0.153
							(0.1768)	(0.1383)	(0.1422)	(0.1357)	(0.2562)	(0.2375)
Shelf registration indicator							0.068	0.065	0.065	0.064	0.115*	0.112*
							(0.2187)	(0.2436)	(0.2462)	(0.2368)	(0.0527)	(0.0572)
CEO stock ownership							-0.883**	-0.904**	-0.902**	-0.898**	-0.850**	-0.769*
							(0.0362)	(0.0309)	(0.0335)	(0.0296)	(0.0336)	(0.0512)
Ln (1+CEO age)							-0.193	-0.195	-0.192	-0.180	-0.025	-0.004
							(0.3424)	(0.3462)	(0.3570)	(0.3689)	(0.9139)	(0.9865)
Ln (1+CEO tenure)							0.012	0.012	0.012	0.008	0.023	0.023
							(0.6650)	(0.6737)	(0.6832)	(0.7670)	(0.4504)	(0.4326)
CEO bonus/salary							0.025	0.027*	0.027*	0.028*	0.022	0.021
							(0.1119)	(0.0816)	(0.0892)	(0.0788)	(0.1068)	(0.1368)
Past stock return							0.005	0.012	0.011	0.012	0.048	0.037
							(0.9032)	(0.7832)	(0.7911)	(0.7664)	(0.2540)	(0.3903)
Stock return volatility							-0.722*	-0.784*	-0.771*	-0.730*	-0.768*	-0.795*
							(0.0902)	(0.0622)	(0.0626)	(0.0780)	(0.0654)	(0.0557)
Ln(1+total asset)							-0.159***	-0.168***	-0.166***	-0.163***	-0.109***	-0.104***

							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0002)	(0.0005)
BM							-0.022	-0.040	-0.036	-0.035	-0.018	-0.020
							(0.6337)	(0.4031)	(0.4259)	(0.4389)	(0.6417)	(0.5803)
ROA							-0.540*	-0.517*	-0.519*	-0.492	-0.297	-0.333
							(0.0840)	(0.0938)	(0.0960)	(0.1109)	(0.4431)	(0.3851)
Cash holdings							-0.363	-0.361	-0.360	-0.338	-0.455**	-0.446**
							(0.1290)	(0.1297)	(0.1304)	(0.1521)	(0.0192)	(0.0216)
R&D intensity							-0.971*	-0.985*	-0.978*	-0.939*	0.784	0.785
							(0.0857)	(0.0814)	(0.0823)	(0.0941)	(0.1583)	(0.1395)
Capital expenditure							-0.430	-0.395	-0.403	-0.472	0.483	0.456
							(0.3827)	(0.4153)	(0.4073)	(0.3362)	(0.2632)	(0.2910)
Observations	568	568	568	568	348	348	542	542	542	542	339	339
R-squared	0.267	0.253	0.249	0.250	0.253	0.270	0.325	0.324	0.324	0.329	0.377	0.386
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 12: Likelihood of reducing debt

This table contains logit models that examine the likelihood of a firm reducing its debt level between year *t*-1 and year *t* +1 when the firm conducts a SEO in year *t*. All models include the full set of control variables, year fixed effects, and industry fixed effects. Brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Pay down debt indicator					
	(1)	(2)	(3)	(4)	(5)	(6)
Confidence1	-0.222*					
	(0.0562)					
Confidence75		0.007				
		(0.9277)				
Holer67			-0.038			
			(0.5579)			
Confidence on stock purchase				-0.085		
				(0.2938)		
CEO confidence-news					-0.202*	
					(0.0820)	
CEO positive-news indicator						-0.178**
						(0.0250)
Observations	475	475	475	475	292	292
SEO control	YES	YES	YES	YES	YES	YES
Firm control	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES

Table 13: Likelihood of reducing debt, by pre-SEO debt level

This table contains logit models that examine the likelihood of a firm reducing its debt level between year *t*-1 and year *t* +1 when the firm conducts a SEO in year *t*. The table splits the sample into sub-samples of firms with above median ('high') pre-SEO leverage and below median ('low') pre-SEO leverage. All models include the full set of control variables, year fixed effects, and industry fixed effects. Brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	High leverage firm						Low leverage firm					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Confidence1	-0.322						-0.341**					
	(0.1339)						(0.0419)					
Confidence75		-0.164						0.015				
		(0.2825)						(0.8658)				
Holer67			0.020						-0.293***			
			(0.8587)						(0.0050)			
Confidence on stock purchase				-0.233*						-0.041		
				(0.0594)						(0.7539)		
CEO confidence-news					-0.677***						-0.232	
					(0.0017)						(0.1418)	
CEO positive-news indicator						-0.364**						-0.370***
						(0.0307)						(0.0033)
Observations	220	220	220	220	160	160	202	202	202	202	101	101
SEO control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 14: Cash holdings after SEOs

This table analyzes the cash holdings (Cash/Assets) around SEOs. The sample contains only firms who undertake SEOs. The dependent variable is the firm's Cash/Assets one year after the SEO. Variable definitions are in the appendix, parentheses contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Cash/Assets											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lag-Cash/Assets	1.773***	1.798***	1.799***	1.843***	1.564***	1.577***	1.032***	1.035***	1.012***	1.023***	0.826***	0.836***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0009)	(0.0008)
ConfidenceOptions	0.446***						0.260***					
	(0.0000)						(0.0055)					
ConfidenceOptions75		0.253***						0.157**				
		(0.0001)						(0.0153)				
Holder67			0.156***						0.092**			
			(0.0001)						(0.0185)			
ConfidenceTrading				-0.089						-0.082		
				(0.1178)						(0.1265)		
ConfidenceNews					0.287***						0.173**	
					(0.0001)						(0.0202)	
PosConfidenceNews						0.216***						0.119**
						(0.0001)						(0.0258)
Ln(1+SEO proceeds)							0.160***	0.169***	0.173***	0.177***	0.138***	0.139***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0004)	(0.0004)
SEO primary ratio							0.125	0.159	0.149	0.163	0.114	0.115
							(0.2345)	(0.1364)	(0.1678)	(0.1283)	(0.2841)	(0.2774)
Shelf registration indicator							-0.033	-0.034	-0.033	-0.040	-0.005	-0.007
							(0.5111)	(0.4913)	(0.5119)	(0.4360)	(0.9299)	(0.8906)
CEO stock ownership							-0.267	-0.290	-0.273	-0.311	-0.630	-0.615
							(0.4984)	(0.4549)	(0.4818)	(0.4246)	(0.1888)	(0.1931)
Ln (1+CEO age)							-0.196	-0.169	-0.175	-0.196	-0.134	-0.114
							(0.3097)	(0.3727)	(0.3618)	(0.3063)	(0.6475)	(0.7006)
Ln (1+CEO tenure)							0.041	0.040	0.029	0.042	0.035	0.036
							(0.1007)	(0.1083)	(0.2684)	(0.1068)	(0.3209)	(0.3072)
CEO bonus/salary							-0.003	-0.001	-0.002	0.001	-0.002	-0.003
							(0.8147)	(0.9504)	(0.8673)	(0.9525)	(0.8743)	(0.7707)
Past stock return							-0.011	-0.001	-0.003	0.003	0.048	0.045
							(0.7697)	(0.9745)	(0.9413)	(0.9381)	(0.2295)	(0.2643)
Stock return volatility							0.249	0.223	0.152	0.096	0.085	0.070
							(0.5262)	(0.5608)	(0.6955)	(0.8030)	(0.8348)	(0.8623)

Ln(1+total asset)							-0.129***	-0.136***	-0.144***	-0.150***	-0.115***	-0.114***
							(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
BM							0.015	0.009	-0.016	-0.021	0.010	-0.002
							(0.6807)	(0.8052)	(0.6428)	(0.5260)	(0.7923)	(0.9654)
ROA							-0.027	0.007	-0.013	0.007	-0.039	-0.074
							(0.9203)	(0.9775)	(0.9613)	(0.9776)	(0.8882)	(0.7873)
Book leverage							-0.180	-0.194	-0.212	-0.229*	-0.122	-0.161
							(0.1759)	(0.1400)	(0.1079)	(0.0767)	(0.3842)	(0.2419)
R&D intensity							1.210**	1.232**	1.191**	1.171*	1.621**	1.558**
							(0.0391)	(0.0335)	(0.0402)	(0.0519)	(0.0324)	(0.0398)
Capital expenditure							-0.831**	-0.850**	-0.815**	-0.722*	-0.366	-0.337
							(0.0248)	(0.0201)	(0.0276)	(0.0539)	(0.4005)	(0.4348)
Observations	569	569	569	569	349	349	543	543	543	543	340	340
R-squared	0.558	0.550	0.540	0.530	0.585	0.584	0.614	0.614	0.610	0.608	0.644	0.642
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 15: SEO likelihood split by economic conditions

This table contains logit models that analyze the likelihood of a firm issuing equity in a given year. The sample is a firm-year panel sample. The dependent variable is an indicator that equals one if the firm issues equity in year *t* and equals zero otherwise. The table is split into years in which the GDP growth is below median or above median. Brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Low GDP growth period						High GDP growth period					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Confidence1	0.021***						0.021***					
	(0.0006)						(0.0018)					
Confidence75		0.009**						0.008**				
		(0.0287)						(0.0352)				
Holer67			0.013***						0.008**			
			(0.0001)						(0.0232)			
Confidence on stock purchase				0.020***						0.004		
				(0.0012)						(0.3707)		
CEO confidence-news					0.001						0.016**	
					(0.8215)						(0.0425)	
CEO positive-news indicator						0.001						0.008
						(0.7843)						(0.1092)
Observations	8,771	8,771	8,771	8,771	5,494	5,494	8,269	8,269	8,269	8,269	3,168	3,168
Firm control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 16; Six-month pre-SEO run-up

This table analyzes the relationship between CEO overconfidence and pre-SEO run-up. The dependent variable is the firm's buy and hold abnormal return (BHAR) over the six months prior to the SEO (specifically, the period from 125 to 1 day before the SEO). The sample contains only firm-year observations where the firm issues equity. Brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, an 10%, respectively.

	Six month run-up before SEOs					
	(1)	(2)	(3)	(4)	(5)	(6)
Confidence1	-0.337**					
	(0.0117)					
Confidence75		-0.157**				
		(0.0293)				
Holer67			-0.181**			
			(0.0186)			
Confidence on stock purchase				-0.196**		
				(0.0249)		
CEO confidence-news					-0.095	
					(0.5845)	
CEO positive-news indicator						-0.096
						(0.4189)
Ln (SEO Proceeds)	0.101**	0.090**	0.082*	0.066	0.141**	0.140**
	(0.0236)	(0.0460)	(0.0769)	(0.1540)	(0.0216)	(0.0226)
Primary share ratio	-0.009	-0.072	-0.036	-0.077	-0.150	-0.149
	(0.9770)	(0.8175)	(0.9078)	(0.8112)	(0.7199)	(0.7221)
Shelf registration indicator	-0.092	-0.078	-0.079	-0.063	0.076	0.082
	(0.2221)	(0.2974)	(0.2880)	(0.4024)	(0.4520)	(0.4245)
CEO stock ownership	-0.700	-0.728	-0.925	-0.796	-0.495	-0.506
	(0.3582)	(0.3604)	(0.2289)	(0.3108)	(0.6262)	(0.6170)
Ln (1+CEO age)	-0.285	-0.285	-0.332	-0.290	-0.247	-0.265
	(0.2704)	(0.2754)	(0.2133)	(0.2519)	(0.5635)	(0.5366)
Ln (1+CEO tenure)	0.048	0.046	0.069**	0.045	0.027	0.024
	(0.1347)	(0.1541)	(0.0431)	(0.1590)	(0.5333)	(0.5689)
CEO bonus/salary	0.004	-0.008	0.009	0.002	-0.042	-0.043
	(0.9564)	(0.9051)	(0.8901)	(0.9769)	(0.5239)	(0.5235)
Stock return volatility	0.679	0.751	0.621	0.572	0.711	0.714
	(0.1653)	(0.1317)	(0.2218)	(0.2445)	(0.2686)	(0.2585)
Ln(1+total asset)	-0.153***	-0.147***	-0.145***	-0.135***	-0.185***	-0.184***
	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0005)	(0.0005)
BM	0.220**	0.247***	0.266***	0.283***	0.388***	0.385***
	(0.0151)	(0.0091)	(0.0029)	(0.0026)	(0.0053)	(0.0046)
ROA	0.032	0.009	-0.020	-0.018	0.088	0.109
	(0.9120)	(0.9745)	(0.9435)	(0.9498)	(0.8595)	(0.8306)
Book leverage	-0.076	-0.014	-0.035	0.018	-0.175	-0.174
	(0.7124)	(0.9465)	(0.8683)	(0.9289)	(0.5313)	(0.5268)
Cash holdings	0.125	0.143	0.155	0.173	0.022	0.030
	(0.5565)	(0.4945)	(0.4616)	(0.3996)	(0.9403)	(0.9186)
R&D intensity	-0.193	-0.187	-0.137	-0.172	0.162	0.143
	(0.6680)	(0.6736)	(0.7566)	(0.6903)	(0.8340)	(0.8569)
Capital expenditure	0.398	0.349	0.365	0.316	-0.287	-0.282
	(0.4545)	(0.5092)	(0.4858)	(0.5509)	(0.6855)	(0.6878)
Observations	463	463	463	463	262	262
R-squared	0.273	0.267	0.274	0.266	0.368	0.369
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES

Table 17: SEO short-run stock performance

This table contains regressions that analyze the relationship between CEO overconfidence and short-horizon returns around the announcement of the SEO. The cumulative abnormal return is the sum of the abnormal returns from one day before to one day after the SEO announcement. The abnormal return is the firm's return less the predicted return based on an OLS estimation of the market mode from 11 to 210 days before the SEO announcement. Variable definitions are in the appendix, brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	CAR (-1, +1)					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	-0.002					
	(0.8450)					
ConfidenceOptions75		0.000				
		(0.9734)				
Holder67			-0.004			
			(0.4849)			
ConfidenceTrading				0.001		
				(0.8710)		
ConfidenceNews					0.001	
					(0.9172)	
PosConfidenceNews						0.005
						(0.6648)
Ln(1+SEO proceeds)	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005
	(0.1152)	(0.1062)	(0.1193)	(0.1082)	(0.5281)	(0.5236)
SEO primary ratio	0.028**	0.028**	0.029**	0.028**	-0.010	-0.010
	(0.0457)	(0.0486)	(0.0390)	(0.0459)	(0.7361)	(0.7330)
Shelf registration indicator	0.012	0.013	0.012	0.013	0.015	0.015
	(0.1701)	(0.1655)	(0.1748)	(0.1683)	(0.2947)	(0.2937)
CEO stock ownership	-0.120	-0.119	-0.122	-0.120	-0.064	-0.059
	(0.1063)	(0.1089)	(0.1015)	(0.1070)	(0.6424)	(0.6719)
Ln (1+CEO age)	-0.015	-0.015	-0.017	-0.015	-0.046	-0.046
	(0.5013)	(0.5185)	(0.4540)	(0.5064)	(0.2673)	(0.2650)
Ln (1+CEO tenure)	-0.001	-0.001	-0.001	-0.001	-0.003	-0.003
	(0.7608)	(0.7563)	(0.8474)	(0.7565)	(0.6157)	(0.6147)
CEO bonus/salary	0.002	0.002	0.002	0.002	0.014	0.014
	(0.7726)	(0.7676)	(0.7637)	(0.7728)	(0.1324)	(0.1329)
Institutional ownership	-0.016	-0.016	-0.015	-0.016	-0.003	-0.004
	(0.3157)	(0.3033)	(0.3278)	(0.3104)	(0.9198)	(0.8726)
Past stock return	-0.001	-0.001	-0.002	-0.001	-0.004	-0.003
	(0.7419)	(0.7204)	(0.7120)	(0.7447)	(0.6578)	(0.6912)
Stock return volatility	-0.107**	-0.107**	-0.106**	-0.107**	0.027	0.024
	(0.0119)	(0.0121)	(0.0119)	(0.0117)	(0.7520)	(0.7816)
Ln(1+total asset)	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
	(0.2909)	(0.2931)	(0.2770)	(0.3036)	(0.5787)	(0.5811)
BM	-0.007	-0.007	-0.007	-0.007	0.003	0.003
	(0.4592)	(0.4773)	(0.4671)	(0.4686)	(0.8224)	(0.7788)
ROA	-0.026	-0.027	-0.025	-0.026	-0.026	-0.026
	(0.3835)	(0.3746)	(0.3987)	(0.3785)	(0.5813)	(0.5856)
Book leverage	-0.004	-0.003	-0.003	-0.003	-0.053	-0.052
	(0.8603)	(0.8862)	(0.8599)	(0.8696)	(0.1227)	(0.1260)
Cash holdings	-0.034	-0.034	-0.033	-0.034	-0.026	-0.027
	(0.2298)	(0.2279)	(0.2500)	(0.2326)	(0.5694)	(0.5501)
R&D intensity	-0.002	-0.002	-0.003	-0.002	-0.008	-0.002
	(0.9631)	(0.9732)	(0.9506)	(0.9750)	(0.9010)	(0.9807)
Capital expenditure	-0.064	-0.064	-0.061	-0.064	-0.082	-0.091
	(0.1875)	(0.1834)	(0.2131)	(0.1848)	(0.4032)	(0.3725)
Observations	553	553	553	553	239	239
R-squared	0.151	0.151	0.152	0.151	0.243	0.244
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES

Table 18: Post-SEO long run stock performance

This table contains regressions that analyze the relationship between CEO overconfidence and long-run returns following the announcement of the SEO. We compute 'market adjusted' buy and hold returns (BHARs) over the three years after the announcement of the SEO announcement. Variable definitions are in the appendix, brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	3years market adjusted stock performance					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	0.110					
	(0.5473)					
ConfidenceOptions75		0.053				
		(0.6634)				
Holder67			0.103			
			(0.2845)			
ConfidenceTrading				-0.308**		
				(0.0121)		
ConfidenceNews					-0.059	
					(0.7497)	
PosConfidenceNews						-0.054
						(0.7008)
Ln(1+SEO proceeds)	-0.111**	-0.108**	-0.110**	-0.099**	-0.070	-0.069
	(0.0242)	(0.0277)	(0.0227)	(0.0435)	(0.3642)	(0.3634)
SEO primary ratio	-0.026	-0.022	-0.034	-0.025	0.080	0.086
	(0.9055)	(0.9181)	(0.8751)	(0.9062)	(0.8060)	(0.7932)
Shelf registration indicator	0.156	0.151	0.154	0.151	0.226	0.228
	(0.1447)	(0.1568)	(0.1455)	(0.1483)	(0.1267)	(0.1221)
CEO stock ownership	-1.004	-1.035	-0.989	-0.976	-1.908	-1.902
	(0.2431)	(0.2318)	(0.2498)	(0.2613)	(0.2535)	(0.2519)
Ln (1+CEO age)	0.525	0.532	0.540	0.518	1.529**	1.521**
	(0.1477)	(0.1480)	(0.1377)	(0.1545)	(0.0130)	(0.0132)
Ln (1+CEO tenure)	0.012	0.012	0.001	0.017	-0.043	-0.044
	(0.8081)	(0.8055)	(0.9843)	(0.7244)	(0.5690)	(0.5642)
CEO bonus/salary	-0.016	-0.016	-0.015	-0.012	-0.021	-0.020
	(0.8608)	(0.8594)	(0.8740)	(0.8937)	(0.8911)	(0.8926)
Institutional ownership	-0.143	-0.138	-0.144	-0.182	-0.437	-0.433
	(0.5026)	(0.5160)	(0.4984)	(0.3870)	(0.2335)	(0.2411)
Past stock return	0.020	0.020	0.022	0.007	-0.050	-0.051
	(0.7856)	(0.7859)	(0.7702)	(0.9291)	(0.6921)	(0.6864)
Stock return volatility	0.059	0.049	0.066	0.025	-0.152	-0.139
	(0.9223)	(0.9358)	(0.9130)	(0.9674)	(0.8761)	(0.8863)
Ln(1+total asset)	0.085	0.082	0.082	0.066	0.012	0.011
	(0.1794)	(0.1910)	(0.1883)	(0.2973)	(0.8892)	(0.8977)
BM	0.071	0.065	0.060	0.064	0.134	0.134
	(0.5817)	(0.6055)	(0.6323)	(0.6082)	(0.4365)	(0.4343)
ROA	0.553	0.563	0.562	0.519	0.236	0.240
	(0.1383)	(0.1250)	(0.1254)	(0.1555)	(0.7800)	(0.7766)
Book leverage	0.005	-0.013	0.003	0.038	0.229	0.239
	(0.9857)	(0.9621)	(0.9911)	(0.8909)	(0.6151)	(0.5992)
Cash holdings	-0.114	-0.111	-0.145	-0.139	-0.268	-0.263
	(0.7667)	(0.7709)	(0.7054)	(0.7163)	(0.6524)	(0.6575)
R&D intensity	1.196	1.198	1.224	1.105	1.033	1.010
	(0.2413)	(0.2405)	(0.2268)	(0.2700)	(0.6204)	(0.6232)
Capital expenditure	-0.583	-0.565	-0.626	-0.510	-0.038	-0.015
	(0.4014)	(0.4176)	(0.3695)	(0.4685)	(0.9729)	(0.9898)
Observations	527	527	527	527	275	275
R-squared	0.256	0.256	0.257	0.265	0.312	0.312
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES

Table 19: Post-SEO operating performance

This table reports the industry adjusted change in ROA around SEOs. The sample contains only firms who undertake SEOs. The industry adjusted change in ROA is the firm's change in ROA between one year before and one year after the SEO less the average change in ROA over that time period for other companies in the firm's two-digit SIC industry. Variable definitions are in the appendix, parentheses contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Industry adjusted change in ROA around SEOs					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	-0.011					
	(0.3905)					
ConfidenceOptions75		-0.003				
		(0.7250)				
Holder67			-0.004			
			(0.4708)			
ConfidenceTrading				0.001		
				(0.9448)		
ConfidenceNews					0.016	
					(0.1383)	
PosConfidenceNews						0.006
						(0.4266)
Ln(1+SEO proceeds)	-0.003	-0.004	-0.004	-0.004	-0.006	-0.005
	(0.4238)	(0.3646)	(0.3906)	(0.3581)	(0.2709)	(0.2887)
SEO primary ratio	-0.020	-0.020	-0.020	-0.021	0.001	0.000
	(0.1179)	(0.1153)	(0.1160)	(0.1051)	(0.9450)	(0.9986)
Shelf registration indicator	-0.003	-0.002	-0.002	-0.002	-0.009	-0.009
	(0.7229)	(0.7594)	(0.7662)	(0.7777)	(0.2610)	(0.2676)
CEO stock ownership	0.002	0.003	0.001	0.003	0.100	0.089
	(0.9604)	(0.9409)	(0.9786)	(0.9477)	(0.1360)	(0.1974)
Ln (1+CEO age)	0.011	0.010	0.010	0.010	-0.006	-0.004
	(0.6775)	(0.6917)	(0.6974)	(0.6853)	(0.8897)	(0.9121)
Ln (1+CEO tenure)	0.003	0.003	0.004	0.003	-0.001	-0.001
	(0.3203)	(0.3265)	(0.2771)	(0.3288)	(0.7901)	(0.8830)
CEO bonus/salary	-0.015**	-0.016**	-0.016**	-0.016**	-0.009	-0.009
	(0.0361)	(0.0299)	(0.0308)	(0.0289)	(0.2915)	(0.3064)
Past stock return	0.011***	0.011***	0.011***	0.011***	0.014**	0.014**
	(0.0032)	(0.0028)	(0.0032)	(0.0030)	(0.0135)	(0.0198)
Stock return volatility	-0.011	-0.010	-0.010	-0.010	0.001	0.006
	(0.8187)	(0.8454)	(0.8416)	(0.8403)	(0.9899)	(0.9402)
Ln(1+total asset)	0.008**	0.008**	0.008***	0.009**	0.007*	0.007*
	(0.0170)	(0.0102)	(0.0099)	(0.0105)	(0.0854)	(0.0926)
BM	0.003	0.004	0.004	0.004	0.008	0.008
	(0.7243)	(0.6435)	(0.5968)	(0.5946)	(0.3883)	(0.4075)
Cash holdings	-0.020	-0.019	-0.019	-0.019	-0.041	-0.042
	(0.5555)	(0.5797)	(0.5813)	(0.5871)	(0.3997)	(0.3953)
Book leverage	0.060***	0.062***	0.061***	0.062***	0.034*	0.031
	(0.0009)	(0.0007)	(0.0007)	(0.0005)	(0.0996)	(0.1274)
R&D intensity	0.299***	0.301***	0.302***	0.302***	0.291***	0.289***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0003)	(0.0003)
Capital expenditure	0.059	0.058	0.059	0.058	0.046	0.051
	(0.4724)	(0.4803)	(0.4706)	(0.4861)	(0.7218)	(0.7007)
Observations	567	567	567	567	294	294
R-squared	0.214	0.213	0.213	0.213	0.213	0.210
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	NO	NO	NO	NO	NO	NO

Table 20: Propensity score matched models

This table contains the second stage from regressions that use propensity score matching to restrict the set of non-overconfident firms to being similar to the overconfident firms. In the first stage (unreported) we run a regression to predict the likelihood that the firm's CEO is overconfident (using the *Holder67* measure of overconfidence). We then extract the propensity scores from the first stage and perform one-to-one matching of the non-overconfident CEOs to the overconfident CEOs. The first two columns analyze whether the firm does a SEO and its SEO proceeds. Columns 1 and 2 use a firm-year panel sample. Columns 3-9 are cross-sectional regressions that restrict attention to the set of firms that do undertake a SEO. Parentheses contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	SEO Indicator	SEO Proceeds	CAPEX/ Assets	R&D/ Assets	Debt/ Assets	Cash/ Assets	CAR (-1, +1)	3year market adjusted stock performance	ROA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Holder67	0.008***	0.057**	0.022***	0.051**	0.026	0.119***	-0.001	0.135	-0.014
	[0.0092]	[0.0366]	[0.0000]	[0.0243]	[0.7308]	[0.0056]	[0.8956]	[0.1759]	[0.1472]
CEO stock ownership	0.089**	1.323***	-0.049	-0.361*	-1.266**	0.206	-0.125	0.196	0.054
	[0.0467]	[0.0000]	[0.3664]	[0.0720]	[0.0166]	[0.5955]	[0.2344]	[0.8817]	[0.5284]
Ln [1+CEO age]	-0.01	-0.168***	-0.014	0.009	-0.326	-0.427**	-0.021	0.682	0.026
	[0.4765]	[0.0000]	[0.5724]	[0.9314]	[0.2546]	[0.0422]	[0.4352]	[0.1207]	[0.5686]
Ln [1+CEO tenure]	-0.001	-0.046***	0.010**	0.019	-0.039	0.007	-0.001	-0.065	0.003
	[0.5217]	[0.0040]	[0.0123]	[0.1168]	[0.3622]	[0.8062]	[0.8170]	[0.3190]	[0.5940]
CEO bonus/salary	0.002	-0.032***	0.003	0.014	0.016	-0.019	0.002	-0.03	0.003
	[0.3946]	[0.0000]	[0.3987]	[0.3274]	[0.5541]	[0.3458]	[0.7949]	[0.8088]	[0.4170]
Past stock return	0.010***	0.300***	0.005	0.012	-0.03	-0.009	0.003	-0.012	0.005
	[0.0001]	[0.0000]	[0.3810]	[0.7551]	[0.6676]	[0.8582]	[0.4099]	[0.8886]	[0.5901]
Stock return volatility	0.055**	0.1	0.09	0.432*	-1.053	0.011	-0.159***	0.856	-0.076
	[0.0233]	[0.5812]	[0.1467]	[0.0515]	[0.1740]	[0.9829]	[0.0002]	[0.4013]	[0.4813]
Ln[1+total asset]	-0.004***	-0.253***	-0.008*	-0.004	-0.180***	-0.147***	-0.002	0.074	0.008
	[0.0021]	[0.0000]	[0.0711]	[0.7429]	[0.0004]	[0.0000]	[0.6869]	[0.3504]	[0.1745]
BM	-0.008*	-0.307***	-0.012	0.013	-0.056	-0.069	-0.001	0.255	-0.032**
	[0.0810]	[0.0000]	[0.1275]	[0.6004]	[0.5250]	[0.2228]	[0.9276]	[0.2175]	[0.0189]
ROA	-0.094***	-0.876***	0.004	-0.063	-0.21	0.126	-0.009	0.862*	0.391***
	[0.0000]	[0.0000]	[0.9318]	[0.7051]	[0.6012]	[0.6950]	[0.8069]	[0.0772]	[0.0000]
Book leverage	0.045***	0.253***	-0.014	-0.098	0.324	-0.305	0.041*	0.255	0.038
	[0.0000]	[0.0008]	[0.4232]	[0.1851]	[0.3439]	[0.1110]	[0.0715]	[0.4962]	[0.2193]
Cash holdings	-0.038***	-0.841***	-0.025	0.210*	-0.472	1.051***	0.033	-0.61	-0.118**
	[0.0009]	[0.0000]	[0.2002]	[0.0590]	[0.2256]	[0.0002]	[0.5472]	[0.2219]	[0.0175]
R&D intensity	0.019	-2.883***	-0.049	0.594**	-0.866	1.620***	-0.072	2.058**	-0.025
	[0.5979]	[0.0000]	[0.4287]	[0.0173]	[0.2534]	[0.0064]	[0.2117]	[0.0326]	[0.8498]
Capital expenditure	0.011	-0.711***	0.380***	-0.470*	-0.724	-0.772*	-0.082	-0.165	0.228**
	[0.7630]	[0.0067]	[0.0000]	[0.0863]	[0.1881]	[0.0727]	[0.1868]	[0.8540]	[0.0190]
Industry competition	-0.025*	-0.762***							
	[0.0795]	[0.0001]							
CEO turn over	0.001	-0.036							
	[0.8767]	[0.1361]							
Institutional ownership	0.033***	0.200***							
	[0.0000]	[0.0000]							
Ln [SEO Proceeds]			0.009*	0.042*	0.243***	0.181***	-0.008	-0.11	0.001
			[0.0881]	[0.0673]	[0.0000]	[0.0000]	[0.1100]	[0.1033]	[0.9175]
Primary share ratio			-0.004	-0.035	0.192	0.301**	-0.003	-0.051	-0.046*
			[0.8155]	[0.5187]	[0.3697]	[0.0160]	[0.8899]	[0.8916]	[0.0681]
Shelf registration indicator			-0.001	-0.037	0.162	-0.140**	0.034**	0.233	0.009
			[0.9371]	[0.2413]	[0.1190]	[0.0393]	[0.0273]	[0.1003]	[0.5295]
Observations	13036	13848	556	264	532	530	510	516	526
Pseudo R-squared	0.135	0.32	0.661	0.683	0.395	0.664	0.268	0.351	0.672
Year fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 21: "Changes" regressions

This table contains OLS models that analyze the industry adjusted change in CAPEX/Sales from one year before to one year after the SEO. We require that the firm's CAPEX is non-missing. The industry adjusted change is the firm's change less the median change for all firms in the subject-firm's two-digit SIC industry. The regressions include year fixed effects and cluster standard errors by firm. Brackets contain p-values and superscripts ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A	Industry adjusted change in capital expenditure around SEOs					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	0.090**					
	(0.0296)					
ConfidenceOptions75		0.038				
		(0.1914)				
Holder67			0.038*			
			(0.0826)			
ConfidenceTrading				0.041		
				(0.4497)		
ConfidenceNews					0.043	
					(0.1526)	
PosConfidenceNews						0.050**
						(0.0459)
Controls	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	NO	NO	NO	NO	NO	NO
Observations	567	567	567	567	294	294
R-squared	0.129	0.125	0.126	0.124	0.219	0.223

.Panel B	Industry adjusted change in R&D expenditure around SEOs					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	0.123*					
	(0.0888)					
ConfidenceOptions75		0.052				
		(0.1333)				
Holder67			0.078**			
			(0.0293)			
ConfidenceTrading				-0.088		
				(0.1023)		
ConfidenceNews					0.087*	
					(0.0532)	
PosConfidenceNews						0.070*
						(0.0545)
Controls	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	NO	NO	NO	NO	NO	NO
Observations	322	322	322	322	158	158
R-squared	0.289	0.284	0.292	0.287	0.362	0.360

Panel C	Industry adjusted change in leverage around SEOs					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	0.010					
	(0.6117)					
ConfidenceOptions75		-0.006				
		(0.6463)				
Holder67			0.000			
			(0.9804)			
ConfidenceTrading				-0.004		
				(0.8331)		
ConfidenceNews					-0.003	
					(0.9069)	
PosConfidenceNews						0.000
						(0.9775)
Controls	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	NO	NO	NO	NO	NO	NO
Observations	567	567	567	567	294	294
R-squared	0.154	0.154	0.154	0.154	0.163	0.163

Panel D	Industry adjusted change in cash holdings around SEOs					
	(1)	(2)	(3)	(4)	(5)	(6)
ConfidenceOptions	-0.011					
	(0.5444)					
ConfidenceOptions75		-0.001				
		(0.9574)				
Holder67			0.004			
			(0.6459)			
ConfidenceTrading				0.005		
				(0.6899)		
ConfidenceNews					0.007	
					(0.6793)	
PosConfidenceNews						-0.009
						(0.4528)
Controls	YES	YES	YES	YES	YES	YES
Year fixed effect	YES	YES	YES	YES	YES	YES
Industry fixed effect	NO	NO	NO	NO	NO	NO
Observations	567	567	567	567	294	294
R-squared	0.165	0.164	0.164	0.164	0.157	0.158