

Title: Is CEO Optimistic Belief Bad for Workers? Evidence from Corporate Employment Decisions

Running title: CEO Optimism and Employment Decisions

Hang Le^{a,*}, Ishrar Kibria^b and Kun Jiang^{c,*}

^{a,b,c} Business School, University of Nottingham, Jubilee Campus, NG1 8BB, United Kingdom.

^c Business School, Sun Yat-sen University, Shenzhen, China

* Corresponding authors

Email:

hang.le@nottingham.ac.uk, lixik9@exmail.nottingham.ac.uk, jiangk26@mail.sysu.edu.cn

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Evidence from Corporate Employment Decisions

Abstract

Using a behavioural approach, we investigate how CEO optimism, defined as a personality trait where a person has optimistic beliefs about the outcome of future events, influences corporate employment decisions. Using data of publicly traded firms in the U.S. from 1995 to 2017, we show that firms with optimistic CEOs have higher employment growth and exhibit less pronounced employment sensitivity to declining sales than firms with non-optimistic CEOs do. We also find that the impact of optimistic CEOs on employment decisions is larger in financially constrained firms. We deal with potential endogeneity issues with the entropy balancing method, propensity score matching and two-stage least squares regression. Our findings have important implications for the design and implementation of HRM policies.

Key Words: CEO Optimism, Employment Decisions, Sales Growth, Financial Constraints

JEL codes: O15, E24, E32

Practitioner Notes:

What is currently known?

- CEOs play an important role in the design and adoption of HRM policies and practices.
- CEO gender, environmental belief and incentives influence their HRM-related decisions.
- CEOs' optimistic belief influences corporate policies, but little is known about its impact on HRM.

What this paper adds?

- Empirical analysis with a large sample on the impact of CEOs' optimistic belief on employment decisions.
- Evidence that firms with optimistic CEOs have higher employment growth.
- Evidence that firms with optimistic CEOs fire less during bad times and this effect is more pronounced in financially-constrained firms.

The implications for practitioners

- HR practitioners can consider cognitive bias in HRM policies and practices.
- Evidence for HR practitioners in designing pay packages to align CEOs' incentives with those of employees.
- Evidence for HR practitioners in shaping/delivering HRM metrics that are important to firms and investors.

1. Introduction

Corporate employment decisions, i.e., downsizing, recruiting, and when and how to adjust the workforce size through hiring and firing, not only entail short-term costs but also are strategically important (Blatter, Muehleemann, & Schenker, 2012; Datta et al., 2010). The determinants and impacts of corporate employment decisions on firm performance and workers have attracted extensive attention (Kelly & Gennard, 2007; McClean & Collins, 2019; Chen, Gao, & Ma, 2021). With CEOs being the most crucial decision makers in corporations (Boada-Cuerva, Trullen, & Valverde, 2019), despite a growing strand of literature offering insightful accounts on the role of CEOs in the design, implementation or adoption of Human Resource Management (HRM) policies and practices (Arthur, Herdman, & Yang, 2016; Frear, Cao, & Zhao, 2012), to the best of our knowledge, no previous study pays attention to the role of CEOs' optimistic belief in employment decisions. Building on the upper echelon theory (Hambrick & Mason, 1984) and the resource-based theory (Barney, 1991; Nyberg et al., 2014; Collins, 2021), in this paper, we use a behavioural approach to investigate how CEO optimism, an important personality trait, might influence employment decisions.

Both the upper echelon theory and the resource-based theory point out the importance of CEOs' characteristics, such as gender (Ng & Sears, 2017) and environmental belief (Ren, Jiang, & Tang, 2022), in affecting firms' behaviours, strategies, and sustainable competitiveness. In this paper, we focus on CEO optimism, defined as a personality trait where a person has optimistic predictions about outcome of future events¹. The psychology literature attributes such predictions to optimistic

¹ The psychology literature identifies overconfidence, optimism and narcissism as closely related personality traits that reflect positive evaluation of oneself and their ability to influence their environment (Wang et al., 2016). While many studies in management, finance and organisational behavior refer to overconfidence as optimism (e.g., Malmendier & Tate, 2005), our approach is similar to that of Campbell et al. (2011) in distinguishing optimism from

people over/under-estimating the likelihood of good/bad outcomes and/or overestimating their own ability in obtaining good outcomes (Weinstein, 1980; Alicke et al., 1995). In the corporate context, optimistic CEOs tend to view their talents and skills favourably and have optimistic expectation of future outcomes, not only because they believe in their decisions (and their talents/skills) but also because they often believe that good things will happen (Kaplan et al., 2009). This personality trait among CEOs is found to associate with better firm performance and productivity (Hmieleski & Baron, 2009; Peterson et al., 2009; Wang et al., 2016), and larger spending on capital expenditure, M&As, and R&D activities (Malmendier & Tate, 2005; Galasso & Simcoe, 2011).

As a key function of corporate strategy, HRM is a source for competitive advantages (Collins, 2021). To create sustainable competitive advantages from human capital resources, different HRM practices, including recruitment, training, and performance appraisal, should be utilized strategically (*ibid.*). Firms are heterogeneous in HR practices due to their own characteristics and available human capital resources (Barney, 1991; Nyberg et al., 2014). Given the role of CEOs in corporate policies, it is clear to see the vital role of CEOs in adopting HRM policies and practices (Woodrow & Guest, 2014; Mirfakhar, Trullen, & Valverde, 2021). Yet, only recently evidence on the determinants of CEOs' HRM decisions and choices emerges, such as on CEO education background (Frear, Cao, & Zhao, 2012), gender (Ng & Sears, 2017), or their environmental belief (Ren, Jiang, & Tang, 2021).

overconfidence as we focus on how the link between CEO optimism and the firm's investment level on human capital differs with sales shocks.

Our investigation is based on a sample of CEOs of publicly listed U.S. firms during the period 1995-2017, a period including both the rising of internet companies and the 2008-2009 global financial crisis. To measure optimism traits, we draw on prior work that exploits the exposure of CEOs to the idiosyncratic risk of their firms and their observable option-exercising behaviours (e.g., Malmendier & Tate; 2005; Galasso & Simcoe, 2011). In this approach, an optimistic CEO is likely to delay exercising his/her options (i.e., carrying on holding stock options of the firm) even when the price is sufficiently high as the CEO believes in his/her ‘ability to keep the company’s stock price rising’ (Malmendier & Tate, 2005, p. 2663). Our results show that firms with optimistic CEOs have higher employment growth rate compared to firms with non-optimistic CEOs and that optimistic CEOs might also have very different views regarding hiring and firing in response to fluctuations in firm performance. Specifically, in the bad times, e.g. when sales decline and layoffs can be seen as a valid strategic response to improve firm performance by some shareholders (Ataullah et al., 2022), optimistic CEOs might be reluctant to reduce the size of the workforce as they under-react to negative information (Landier & Thesmar, 2009) and/or over-predict good future outcomes (Kaplan et al., 2009; Peterson et al., 2009; Colbert, Barrick, & Bradley, 2014). Consequently, the employment downsizing decisions are less sensitive to negative sales shocks when firms are run by optimistic CEOs. Furthermore, the impact of CEO optimism on reducing employment fluctuations is more pronounced among financially constrained firms. We use multiple approaches to carefully mitigate endogeneity concerns. First, we use a comprehensive set of control variables, along with industry-year and firm fixed-effects. Second, we use three different methods to mitigate key differences in characteristics between firms with optimistic CEOs and those with non-optimistic CEOs: the entropy balancing method, propensity score matching (PSM), and two-stage estimations using an instrument variable (IV). Our findings

are novel and have important implications not only for HR practitioners but also for workers, who are likely to lose jobs when their firms experience bad times.

Our study contributes to the literature in two important ways. First, our findings add to the small but growing literature that examines how CEOs' characteristics influence HRM policies (Ng & Sears, 2017; McClean & Collins, 2019; Ren, Jiang, & Tang, 2021; Horton et al., 2021). While these studies focus on CEOs' gender, environmental beliefs, leadership style, or incentives, our focus is CEO optimism, a personality trait. Our work is also relevant to existing studies that have drawn attention to how CEO optimism affects corporate investment (Malmendier & Tate; 2005; Galasso & Simcoe, 2011; Colbert, Barrick, & Bradley, 2014) by focusing on employment decisions, which are directly related to human capital investment. More importantly, we extend these studies by investigating the impact of optimistic CEOs' behaviours in bad times and comparing financially constrained with unconstrained firms. A better understanding of CEOs' decisions contingent on different conditions could be used to better align CEOs' incentives with organizational types and stages of business cycle. Thus, our novel evidence directly answers to the call for more research to examine the role of internal corporate governance and in particular of CEOs in shaping HRM system and their effect on an organization's people (Mullins, 2018; Wood & Budhwar, 2021). It also adds to the strand of literature that utilities psychological theories in the development and application of HRM research (Troth & Guest, 2017).

Second, our findings add to the debate on the value implication of employment decisions. Some studies argue that sub-optimal investment in human resources (over-hiring or under-firing) is value destructive when CEOs prefer the quiet life (Bertrand & Mullainathan, 2003), engage in empire

building (Pagano & Volpin, 2005), or seek private benefits associated with forming relationship with workers (Atanassov & Kim, 2009). Yet, actions of optimistic CEOs might be value enhancing, because retaining workers in the bad time not only allows firms to save employment adjustment costs, retain firm-specific human capital, and boost morale, but also allows firms to be prepared for future growth opportunities, which is consistent with the notion of maintaining optimal investment in employees (Ellul, Pagano, & Schivardi, 2018; Ataullah et al., 2022). Our quantitative analysis draws conclusions from employment growth of a large sample of firms and CEOs. While more nuanced analysis on how optimistic CEOs behave in relation to hiring and firing policies and other HR practices is needed once such data become available, our work complements the growing HRM literature on CEOs' influence using surveys, interviews, questionnaires and case studies. Our findings also have important practical implication given that investors increasingly emphasise HR metrics such as workforce size, employee turnover, and retention rates in equity valuation.

2. Relevant literature and hypothesis development

HRM policies and practices matter for firms' competitive advantages (Barney, 1991; Collins, 2021). For example, recruitment, training, and performance appraisal all play a very important role in encouraging employees to be creative and motivated (Tweedie et al., 2019), supporting firms' business directions, and affecting firm performance, reputation, and valuation (Kelly & Gennard, 2007; McClean & Collins, 2019; Chen, Gao, & Ma, 2021). The HRM literature has examined the effects of different CEOs' characteristics on the development and implementation of HRM policies (Stirpe, Trullen, & Bonache, 2013; Kirton, Robertson, & Avdelidou-Fischer, 2016). For example, Frear, Cao, & Zhao (2012) document that CEO exposure to Western-style ideology would

influence the adoption of Western-style HR practices in foreign-invested enterprises in China. Ng & Sears (2017) report that CEO gender could influence gender-related recruitment practices. More specifically, the presence of a female CEO when combined with active recruitment of women practice could enhance the promotion of women in the workplace. Ren, Jiang, & Tang (2021) show the effect of the environmental belief of CEOs on green HRM, i.e., an HRM system with “the aim of achieving the strategic goals in the environmental domain” (p. 78). Horton et al., (2021) show that CEOs’ financial incentive stemmed from their membership of defined-benefit pension plans plays a key role on pension-provision decisions. However, there is little attention on how CEO optimism affects firms’ employment decision. An exception is the recent work on employee ownership by Li, Shi, & Dasborough (2021) who show that employees are more likely to purchase stock of their firms when CEOs use positive words in their speeches.

In the framework of the resource-based theory (Barney, 1991; Lado and Wilson, 1994), a firm has its unique bundle of resources and capabilities, such as an optimistic CEO and human resources, and that these resources are combined to create capabilities, which makes the firm different from its competitors and contributes to its success. More specifically, optimistic CEOs, who could be the “rare, imperfectly imitable, and non-substitutable resources” for a firm (Barney, 1991), may have insights into the value of the same human resource management practices that non-optimistic CEOs do not have and exploit valuable opportunities from the HRM practices, generating competitive advantages over time. In other words, firms with optimistic CEOs may have different employment growth compared to firms with non-optimistic CEOs, and optimistic CEOs might also have very different views regarding hiring and firing in response to fluctuations in firm performance and when firms are facing financial constraints. In addition, according to the upper

echelon theory, first, characteristics of the top executive team, especially the CEO, partially determine firms' strategies and outcomes (Hambrick and Mason, 1984). Second, CEOs' personal characteristics influence not only their strategic preference and risk-taking propensity, but also their ability to adopt to changing environment (Wang et al., 2016). So, optimistic CEOs not only influence their firms' employment growth but also might also have very different views regarding hiring and firing in response to fluctuations in firm performance as the resource-based theory predicts. Third, the upper echelon theory acknowledges that strategic choices, such as employment decisions, are influenced by both CEOs' characteristics and firms' attributes (*ibid.*). So, it is imperative to understand whether CEO optimism affect firms' employment growth rate and whether such effect, if any, is contingent upon firms' financial constraints.

Given that CEOs can exercise considerable discretion over HRM decisions, CEOs' optimistic belief could have important implication on employment decisions. Optimistic CEOs may induce higher firm performance through constructing a more vibrant environment and recruiting more employees (Peterson et al., 2009; Wang et al., 2016). Optimistic CEOs who exhibit a strong belief in their firms' prospects, not only attract investors but also inspire employees and motivate them to stay. Phua, Tham, & Wei (2018) find that employee turnover rates are low in firms with optimistic CEOs. McClean & Collins (2019) show that a combination of high-commitment HR practices and CEO charismatic leadership could result in low voluntary employee turnover and high firm performance. The evidence of higher employee ownership, which itself is a tool to encourage employee participation and enhance productivity, in firms with optimistic CEOs in Li, Shi, & Dasborough (2021) suggests that optimism belief of CEOs can spread to employees. Furthermore, the well documented overinvestment by optimistic CEOs (as in Malmendier & Tate,

2005) also leads to higher capital expenditure, investment in human capital, and consequently higher employment growth. Thus, we offer the following hypothesis:

H1. Firms with optimistic CEOs have higher employment growth than firms with non-optimistic CEOs.

What is more interesting and perhaps more important here is how and whether optimistic belief influences employment growth in response to fluctuations in firm performance. When firms face adverse shocks such as decreasing sales growth, reducing workforce is often viewed as a means to improve performance (Atanassov & Kim, 2009; Ataullah et al., 2022). While shareholders might welcome employment downsizing at least in the short-run, firms might be reluctant to do so as it imposes substantial costs to both employees and firms (Blatter, Muehlemann, & Schenker, 2012; Ataullah et al., 2022)². How to cope with employees leaving is one of the most challenging issues in HRM (Nelissen et al., 2017) while there are calls for protecting employees from losing their jobs to be core practice of HRM (Stuart et al., 2021).

We predict that optimistic CEOs are less likely to reduce the workforce size when facing with declining sales growth for at least two reasons. First, optimistic CEOs are less likely to cancel or delay previously planned projects as they overestimate the probability of good future outcomes and their ability to turn things around (Kaplan et al., 2009; Peterson et al., 2009; Colbert, Barrick, & Bradley, 2014). This corroborates with evidence that optimistic CEOs invest more in projects

² A related strand of research attributes employment expansion/contraction beyond optimum levels to managers' opportunistic behaviour aimed at obtaining more security and power, avoiding the difficult decisions and costly effort associated with downsizing (Bertrand & Mullainathan, 2003) or forming coalition with the workforce for their own job security (Pagano & Volpin, 2005).

with high uncertainty (Galasso & Simcoe, 2011; Liu, Le, & Thompson, 2022) and issuing more optimistic forecast (Hribar & Yang, 2015). Second, optimistic CEOs have high persistence in striving for their goals whilst underreacting to negative information and viewing negative shocks as less harmful (Landier & Thesmar, 2009). This is consistent with evidence that optimistic CEOs continued with their plan even if the outcomes were not what they had expected (Adam, Fernando, & Golubeva, 2015). Instead of delaying or cancelling projects, optimistic CEOs are more likely to undertake more risky and challenging activities when their firms experience negative shocks (Li & Tang, 2010). There is evidence that optimistic CEOs are unlikely to be deterred when their firms face high liquidity risk (Huang, Tan & Faff, 2016). Building on the above discussion, we offer the following hypothesis:

H2: Employment growth is less sensitive to negative sales shocks for firm with optimistic CEOs than for firms with non-optimistic CEOs.

Internal cash flow is important for all corporate decisions, especially when optimistic CEOs consider different reactions to an adverse situation such as negative sales growth. Optimistic CEOs prefer internal funds to external funds and are less likely to use external funding (Malmendier & Tate, 2005), so internal cash sources may moderate optimistic CEOs' employment decisions when firms experience negative sales shocks. When facing financing constraints, e.g., the lack of internal cash, optimistic CEOs postpone investment, expecting internal cash will increase and the cost of external financing will decrease soon (Malmendier & Tate, 2005). We predict that the reluctance to use external funding and the belief in improvement in firms' financing capacity, coupled with belief in their ability and good future outcomes, or under-reaction to negative information (Landier

& Thesmar, 2009), would induce optimistic CEOs to avoid employment downsizing when there are negative shocks such as decreasing sales growth even when their firms are in financial constraints. Based on the above discussion, we propose our following hypothesis:

H3: The employment sensitivity to negative sales shocks associated with CEO optimistic beliefs is more pronounced in financially constrained firms.

3. Sample

Our analysis is based on a sample of CEOs of U.S. publicly listed firms, which is the intersection of the following datasets: Execucomp for CEO compensation data, Compustat for accounting and financial variables and the Center for Research in Security Prices (CRSP) for stock returns. Following previous studies, we exclude all financial and utilities firms as they follow different accounting rules. We also exclude firms with missing information on variables needed for the base specifications as explained below. This process yields a final sample of 23,663 firm-year observations for the period of 1995-2017.

4. Research Design

4.1 Variables

The approach used in the psychology literature to measure optimism such as interviews and questionnaires is not practical if we wish to detect this trait among a large group of CEOs of publicly listed firms as it is difficult to get CEOs to respond to lengthy psychological tests. We draw on the literature that infers CEO optimism from their option exercising behaviour. Specifically, following Galasso & Simcoe (2011) who argue that optimism is likely a permanent

trait, we classify a CEO as being optimistic if the CEO delays exercising in-the-money options at least twice during his/her tenure. Options are in-the-money if the underlying stock price exceeds the exercise price by more than 67%. Not exercising an in-the-money option after vesting period indicates the CEO is optimistic about firm future performance and expects stock price will continue to rise in future. As CEOs are often awarded with more than one stock option, we calculate a CEO's average option moneyness as the realizable value per option as in Campbell et al. (2011). We construct *CEO_Optimism* as a dummy variable that takes a value of 1 if a given firm has an optimistic CEO classified using this method, and 0 otherwise.

Our main dependent variable measures firms' annual growth rate in employment. Following Ellul, Pagano, & Schivardi (2018), we use the percentage change in the number of employees between year $t-1$ and year t , where positive growth indicates net hiring while negative growth indicates net firing/layoffs. This measure allows us to examine changes in employment of a large set of firms over a considerably long period of time. However, we recognise that employment growth does not measure exactly the number of new hiring or firing, nor does it measure corporate hiring and firing practices³.

To minimize the possibility that our main results are driven by omitted variables, we control for a set of firm characteristics, including sales growth, return volatility, and changes in profit, leverage, quick ratio, Tobin's Q, and capital expenditure. We also include lag of employment growth and of the number of employees to control for firm-level recent trends and size/scale that might affect

³ Furthermore, this measure does not capture situations where firms hire and fire employees simultaneously or adjust employment in different divisions. We thank an anonymous reviewer for pointing out this issue.

employment decisions. All firm-level non-indicator variables are winsorised at the 1st and 99th percentiles. Variable definitions can be found in Table 1.

[Table 1 about here]

4.2 Identification Strategy

To measure the impact of CEO optimism on employment growth, we use three models similar to those in Faccio & O'Brien (2021). The first model regresses annual growth rate in employment on *CEO_Optimism* an indicator variable on whether the firm has an optimistic CEO, sales growth and a set of control variables. The second model, which aims to examine employment growth in the good times and in the bad times separately, replaces sales growth variable by two variables that measure sales growth when it is positive or negative, respectively. *Positive_Sales_Growth* is a variable that equals to *Sales Growth* if sales growth is positive and zero if growth is negative, and *Negative_Sales_Growth* is a variable that equals to zero if sales growth is positive and *Sales_Growth* if growth is negative. Based on the second model, the interactions between the two variables of positive/negative sales growths and *CEO_Optimism* are introduced into the third model. Control variables, both change (denoted with Δ) and level, are lagged by one year in all specifications to avoid reverse causality. We employ a panel data estimation method which includes firm fixed-effects, to control for firm-level observable and unobservable time invariant variables, and industry-year fixed-effects, to control for industry-year level shocks. The models are described in details in Appendix A1.

The coefficients of interest in the three models are: i) the coefficients of *CEO_Optimism*, which reflect the difference in employment growth between firms with optimistic CEOs and those with non-optimistic CEOs (*H1*); and ii) the coefficients of the interactions between *CEO_Optimism* and positive/negative sales growth variables, which reflect the difference in employment decisions of firms with optimistic CEOs and those with non-optimistic CEOs in response to different types of sales shocks (*H2*). We compare the coefficients from the estimation of the above three models for the sub-samples of more and less financing-constrained firms to examine the role of financial constraints (*H3*). We describe the partition of firms into the two sub-samples in Section 5.

4.3 Endogeneity concern

We acknowledge the concern that endogeneity may arise in the context of our empirical analysis, which if not corrected for would render wrong inferences (see e.g., Abdallah, Goergen, & O’Sullivan, 2015 for discussion of endogeneity concern in business and management research). Appointing a CEO is not a random action and there might be observed and unobserved omitted variables which are correlated with characteristics of appointed CEOs and firms and at the same time determine employment decisions. Firms that pursue certain employment and HRM policies, for example firms with predetermined levels of employment fluctuations, may appoint CEOs who are perceived to be likely to implement those policies (see also Liu, Le, & Thompson, 2022). If these problems are present, our estimation process may suffer from self-selection bias and yield biased and inconsistent estimates.

To alleviate the concern that firms with optimistic CEOs might be systematically different from those with non-optimistic CEOs, we use two different methods: the entropy balancing method and

the PSM. In both methods, we match firms with optimistic CEOs (the treated group) with firms with non-optimistic CEOs (the control group) that have similar firm-level characteristics in the same industry and year. The entropy balancing method exactly adjusts inequalities in the moments of the covariate distributions and searches for the set of weights that satisfy our set balance constraints. This method allows us to utilise all observations, rather than discarding unmatched firms (Hainmueller, 2012). The regressions are re-estimated with the full sample where each observation receives a weight obtained from the matching process. In the PSM, we design a nonrandomized matching (Austin, 2011) and apply the one-to-five nearest-neighbour matching without replacement. The regressions are re-estimated with the sample of treated and matched control firms.

To address the identification concern of unobservable omitted variables, for example corporate HRM cultures that determine the type of appointed CEOs and employment decisions, we conduct two-stage estimation with an instrumental variable (IV). Firms tend to find succeeding CEOs who share the same attributes as their predecessors (Campbell, 2014; Li & Tong, 2022). Building on this evidence, we construct a dummy variable that equals to 1 if a firm had at least one optimistic CEO before the appointment of the new CEO, and 0 otherwise, as our IV. We expect that there is a positive relationship between our IV and CEO optimism, indicating that firms that had at least one optimistic CEO before are more likely to appoint another optimistic CEO. However, it is unlikely that an optimistic CEO who already left his/her post would have any influence on the firm's contemporary employment decisions. Therefore, we are confident that this instrument is likely to satisfy both the relevancy and exogeneity conditions. Details of these methods are provided in Appendix A2, A3 and A4.

5. Results

Appendix B presents descriptive statistics for the full sample and for firms with optimistic CEOs and firms with non-optimistic CEOs. Table 2 presents the estimation for the relationship between CEO optimism and employment decisions with *Employment_Growth* as the dependent variable. The set of control variables includes *Sales_Growth* in specification (1), and *Positive_Sales_Growth* and *Negative_Sales_Growth* in specification (2) along with other firm characteristics. The advantage of specification (2) is that the impact of positive shocks is clearly distinguished from that of negative shocks. The interactions between *CEO_Optimism* and *Positive_Sales_Growth* and *Negative_Sales_Growth* are included in specification (3).

The positive and statistically significant coefficients of *CEO_Optimism* in all specifications (1-3) support our hypothesis 1 that firms with optimistic CEOs have higher employment growth after controlling for firm-level characteristics, time-invariant firm-specific and time-varying industry-specific factors. The significant and positive coefficients of *Lag_Employment_Growth* indicate intuitive relations between employment growth and recent trend in employment growth, i.e., firms with recent increase in employment tend to continue to recruit. To check if the positive change in employment is due to the direct effect of CEO optimism or via the effect of CEO optimism on investment (either capital investment or R&D investment as in Malmendier & Tate, 2005), we include capital expenditure in our estimation. The positive but statistically insignificant coefficients of capital expenditure in Table 2 suggest that the change in employment is a direct effect of CEO optimism and not an outcome of changes in capital investment associated with CEO optimism.

To test hypothesis 2 on the differences between firms with optimistic CEOs and those with non-optimistic CEOs in response to different firm-level sales shocks, we examine the coefficients of the interactions between *CEO_Optimism* and the two sales-growth variables: *Positive_Sales_Growth* and *Negative_Sales_Growth* in specification (3). While the coefficient of the interaction term *CEO_Optimism*Positive_Sales_Growth* is statistically insignificant, the coefficient of *CEO_Optimism*Negative_Sales_Growth* is negative and significant. This suggests that firms with optimistic CEOs exhibit a decreasing employment sensitivity to declining sales. The insensitivity of employment to positive sales shocks may be due to the fact that optimistic CEOs overinvest when they observe positive signals and they prefer internal fund to external financing (Malmendier & Tate, 2005), leaving limited resources for large employment growth. Our results are consistent with hypothesis 2 that firms with optimistic CEOs reduce employment less than firms with non-optimistic CEOs when firms experiencing negative sales growth. This is consistent with the behaviour of optimistic CEOs who continue with their plan despite setbacks as they predict good outcomes and believe in their ability in achieving such outcomes (Li & Tang, 2010; Adam, Fernando, & Golubeva, 2015).

[Table 2 about here]

Table 3 presents the estimation for the relationship between CEO optimism and employment decisions using the entropy balancing method (columns 1-2), the PSM (columns 3-4) and the 2SLS (columns 5-6). As discussed earlier, these methods allow us to address the concern that our results might suffer from endogeneity problems. For brevity, we only report the coefficients of the

variables of interest. The results reported here are similar to those reported in Table 2, which support hypotheses 1 and 2 that firms with optimistic CEOs have higher employment growth and that these firms exhibit a decreasing employment sensitivity to declining sales and suggest that results in Table 2 are not driven by endogeneity issues. Results of the first stage of 2SLS estimation (not reported here) confirm the relevance of our instrument, i.e., firms had optimistic CEOs before are more likely to appoints optimistic CEOs.

[Table 3 about here]

Next, we investigate whether the decreasing sensitivity of employment growth to negative sales shocks for firm with optimistic CEOs are more likely to present in financially-constrained than in unconstrained firms. We calculate the Kaplan-Zingales (KZ) index for each firm-year as in Kaplan & Zingales (1997) and then classify each firm-year as more/less financially-constrained if its KZ index is above/below the median value in the year. Our results remain unchanged when we use the median KZ index for the full period or when we classify firms into being more or less financially-constrained using firm size or cash flow volatility. We estimate the model specifications as in Table 2 for the two sub-samples of firms that are more and less financially-constrained. Results are presented in Table 4 (for brevity, we only report the coefficients of the variables of interest).

[Table 4 about here]

The positive and statistically significant coefficients of *CEO_Optimism* in all specifications in Table 4 suggest that firms with optimistic CEOs have higher employment growth regardless of

their financial conditions. This result again provides support for hypothesis 1. More interestingly, the magnitude of the coefficients of *CEO_Optimism* in the regressions for less constrained firms is smaller than that in the regressions for more financially-constrained firms. This is consistent with evidence that optimistic CEOs have high persistence in striving for their goals despite setbacks (Adam, Fernando, & Golubeva, 2015; Li & Tang, 2010; Huang, Tan, & Faff, 2016), and suggests the impact of optimistic CEOs on employment decisions is larger in financially constrained firms. When we compare the coefficients of the interaction term *CEO_Optimism*Negative_Sales_Growth* between the two groups, the negative and statistically significant coefficient in the estimation of more financially-constrained firms indicates that the decreasing employment sensitivity to declining sales of firms with optimistic CEOs is more likely to present among these firms. This result suggests that CEOs with optimistic view are less likely to make employment downsizing decisions when experiencing bad times in more financially constrained firms, which support both hypotheses 2 and 3. This finding is consistent with the literature that internal cash flow moderates optimistic CEOs' employment decision in response to negative sales shocks, because they are reluctant to raise fund externally.

We carry out a battery of additional analysis and robust checks. We perform the analysis using an alternative measure of CEO optimism, in which a CEO is defined as being optimistic *after* the CEO delays exercising in-the-money options for any two consecutive years of their tenure as in Malmendier & Tate (2005). To address the concern that the 2008-2009 global financial crisis may affect CEO optimism and subsequently their employment decisions, we conduct the analysis for the pre- and post- global financial crisis⁴. We also conduct analysis for firms that perform below

⁴ We thank an anonymous referee for suggesting this check.

their industrial peers. The results of the additional analysis and robust checks are consistent with our main results and are reported in Appendix C. Visual illustration of our results are included in Appendix D.

6. Conclusion, Limitations, and Implications

We investigate how CEO optimism influences employment decisions. We report robust evidence that firms with optimistic CEOs have higher employment growth after controlling for firm-level characteristics, and time and industry-specific factors. We find that firms with optimistic CEOs exhibit a decreasing employment sensitivity to declining sales, while firms with non-optimistic CEOs do not. This decreasing sensitivity is more likely to be present in financially constrained firms.

Our work adds a new perspective to the debate on the agency problems between CEOs and shareholders. By retaining workers in the bad time, which saves employment adjustment costs, retains firm-specific human capital, and boosts morale, optimistic CEOs may get firms to be better prepared for future growth opportunities. In this context, CEO's preferences could become more closely aligned with those of the employees and of the shareholders. Our work offers insights on the role of CEOs in designing and adopting effective HRM to boost firm performance. Our work also adds to the nascent research on the impact of internal corporate governance and in particular of CEOs on shaping HRM policies and practices (Wood & Budhwar, 2021) and the growing strand of HRM literature that builds on psychological development and application (Troth & Guest, 2017).

This study has practical significance and implications. Understanding the link between CEO belief and human capital investment is strategically valuable to HR practitioners for designing CEO selection/retention policy and potentially for other top management positions. Given that HR departments are responsible for planning and undertaking workforce adjustment actions such as recruitment and layoffs, such actions require that HR departments and boards of directors fully understand the rationale behind and factors that might influence decisions whether to expand or contract the workforce. Another implication of our study relates to firing decisions, i.e., negative employment growth, which extend beyond HR practitioners and boards of directors. As noted previously, reducing workforce when firms face adverse shocks such as decreasing sales growth could be seen as a means of improving short-run profitability (Atanassov & Kim, 2009; Ataullah et al., 2022). While such decisions could be received favourably by investors especially in the time of uncertainty and adversity, they often raise criticism from the public and negatively affect workers' morale and productivity (*ibid.*). Decisions not to reduce the size of the workforce by CEOs with optimistic belief are important for workers, who are likely to lose jobs when their firms experience bad times, and for firm reputation.

Our work is highly relevant to HR directors in light of recent attention from regulators and institutional investors such as the US Securities and Exchange Commission, UK Investment Association and UK Pensions and Lifetime Savings Association, on HR metrics⁵. Given the investors' shift of focus from executive pay to the matters pertinent to the whole workforce, such as workforce size, employee turnover, and retention rates, our work provides HR directors with

⁵ <https://www.sec.gov/rules/petitions/2017/petn4-711.pdf> and <https://www.hrmagazine.co.uk/content/features/the-metrics-that-matter-to-investors>

evidence on factors that might influence the metrics which are important to the firms and becoming increasingly so to investors.

As with all research, we caution that our findings should be interpreted in light of our research's limitations. Our focus on the employment decisions, which is directly related to human capital investment, allows us to study a large sample of publicly traded firms over a considerable length of time. However, we are not able to examine more specific HR mechanisms and details associated with hiring and firing. Another limitation of our study relates to our sample of publicly listed firms, which are relatively larger and older. Given these limitations, it is imperative to examine the possible influence of CEO optimistic belief in other types of firms such as private firms or in the context of other HRM policies such as recruitment, training, and promotion. Future research could shed more lights on the role of CEO beliefs in shaping HRM policies when such data are available.

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Table 1: Variable Definition

<i>Employment_Growth</i>	Percentage change in the number of employees between the current year and the prior year
<i>CEO_Optimism</i>	Indicator variable that takes a value of 1 for all CEO-years if the CEO postpones the exercise of vested options that are at least 67% in the money at least twice during the tenure, in any two years, or 0 otherwise.
<i>CEO_OptimismMT</i>	Indicator variable that takes a value of 1 if a CEO postpones the exercise of vested options that are at least 67% in the money at least twice during the tenure, in any two years, or 0 otherwise.
<i>Sales_Growth</i>	Percentage change in sales revenue between the current year and the prior year
<i>Positive_Sales_Growth</i>	Variable that takes a value of sales growth if sales growth is positive and 0 otherwise
<i>Negative_Sales_Growth</i>	Variable that takes a value of sales growth if sales growth is negative and 0 otherwise
<i>ROA</i>	Net income divided by the beginning-of-year book value of total assets
<i>Debt_Ratio</i>	Book value of long-term and short-term debt divided by the beginning-of-year book value of total assets
<i>Quick_Ratio</i>	Cash and short-term investments plus receivables divided by total current liabilities
<i>CAPX/Total_Assets</i>	Capital expenditure divided by the beginning-of-year book value of total assets
<i>Ret_Vol</i>	Volatility measured as the standard deviation of weekly stock return within a year
<i>Q</i>	Market value of equity plus book value of liabilities, divided by the beginning-of-year book value of total assets
<i>Log(Employees)</i>	Logarithm of the total number of employees in a year
<i>KZ Index</i>	$(-1.002*ROA + (0.283*Q) + (3.319*Debt_Ratio) - (39.368*(Dividends/Total_Assets) - (1.315*Cash/Total_Assets))$

Table 2: Regressions of Employment Growth on CEO Optimism, Sales Growth and Controls

	(1)	(2)	(3)
<i>CEO_Optimism</i>	0.025*** (0.004)	0.025*** (0.004)	0.020*** (0.005)
<i>Lag Sales_Growth</i>	0.047*** (0.005)		
<i>Lag Positive_Sales_Growth</i>		0.027*** (0.006)	0.027*** (0.009)
<i>Lag Negative_Sales_Growth</i>		0.130*** (0.016)	0.172*** (0.021)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>			0.002 (0.012)
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>			-0.092*** (0.030)
<i>Lag Employment Growth</i>	0.064*** (0.007)	0.063*** (0.007)	0.063*** (0.007)
<i>Lag Log(Employees)</i>	-0.140*** (0.00320)	-0.142*** (0.00321)	-0.142*** (0.00321)
<i>Lag RetVol</i>	0.008 (0.005)	0.009* (0.005)	0.008* (0.005)
Δ <i>Lag ROA</i>	0.0001* (0.001)	0.001 (0.001)	0.001 (0.001)
Δ <i>Lag Debt_Ratio</i>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Δ <i>Lag Quick Ratio</i>	0.026*** (0.003)	0.027*** (0.003)	0.027*** (0.003)
Δ <i>Lag Capex/Assets</i>	0.003 (0.002)	0.002 (0.002)	0.002 (0.002)
Δ <i>Lag Q</i>	0.070*** (0.004)	0.070*** (0.004)	0.070*** (0.004)
<i>Firm FE</i>	Yes	Yes	Yes
<i>Industry-Year FE</i>	Yes	Yes	Yes
<i>N</i>	23,663	23,663	23,663
<i>Adjusted R²</i>	0.037	0.039	0.039

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: CEO Optimism and Employment Growth: Endogeneity Checks

	Entropy Balancing Method		PSM		2SLS	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CEO_Optimism</i>	0.031*** (0.004)	0.029*** (0.001)	0.025*** (0.004)	0.019*** (0.005)	0.025*** (0.004)	0.020*** (0.005)
<i>Lag Sales_Growth</i>	0.083*** (0.005)		0.048*** (0.005)		0.047*** (0.005)	
<i>Lag Positive_Sales_Growth</i>		0.067*** (0.000)		0.026*** (0.010)		0.027*** (0.009)
<i>Lag Negative_Sales_Growth</i>		0.239*** (0.000)		0.170*** (0.022)		0.172*** (0.021)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>		-0.001 (0.941)		0.006 (0.012)		0.002 (0.012)
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>		-0.080** (0.024)		-0.091*** (0.031)		-0.092*** (0.030)
<i>Firm Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry-year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	23,663	23,663	22,545	22,545	23,663	23,663

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Employment Growth of Firms with Different Levels of Financing Constraints

	Less financially constrained firms			More financially constrained firms	
	(1)	(2)	(3)	(4)	(5)
<i>CEO_Optimism</i>	0.021*** (0.006)	0.020*** (0.006)	0.016** (0.006)	0.030*** (0.007)	0.029*** (0.007)
<i>Lag Sales_Growth</i>	0.029*** (0.008)			0.053*** (0.007)	
<i>Lag Positive_Sales_Growth</i>		0.014 (0.010)	0.004 (0.014)		0.031* (0.009)
<i>Lag Negative_Sales_Growth</i>		0.078*** (0.021)	0.105*** (0.027)		0.163*** (0.021)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>			0.020 (0.019)		
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>			-0.060 (0.040)		
<i>Firm Controls</i>	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes	Yes	Yes
<i>Industry-Year FE</i>	Yes	Yes	Yes	Yes	Yes
<i>N</i>	11,732	11,732	11,732	11,720	11,720

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Is CEO Optimistic Belief Bad for Workers?
Evidence from Corporate Employment Decisions

APPENDIX

Appendix A: Identification strategy
Appendix B: Descriptive statistic
Appendix C: Additional analysis and robustness checks
Appendix D: Visual illustration

Appendix A: Identification Strategies

A1. The models

To measure the impact of CEO optimism on corporate employment decisions, we use three models similar to those in Faccio and O'Brien (2021). The first model is where the dependent variable is annual percentage changes in employment (*Employment_Growth*) for firm i between year $t-1$ and year t , which is regressed on *CEO_Optimism*, a dummy variable that takes a value of 1 if a given firm i has an optimistic CEO in year t and 0 otherwise, and sales growth (*Sales_Growth*). The coefficient of interest is β , which reflects the difference in employment growth between firms with optimistic CEOs and those with non-optimistic CEOs.

$$y_{it} = \alpha + \beta \times CEO_Optimism_{it-1} + \delta \times Sales_Growth_{it-1} + \zeta \times Controls_{it-1} + v_i + \mu_{jt} + \varepsilon_{it} \quad (1)$$

We include firm characteristics to control for differences between firms with optimistic CEOs and those with non-optimistic CEOs. Control variables, both change (denoted with Δ) and level, are lagged by one year in all specifications to avoid reverse causality. We include firm fixed effects v_i to control for firm-level observable and unobservable time invariant variables and industry-year fixed effects μ_{jt} to control for industry-year level shocks. ε_{it} is the random error. We use the one-way error correction models, which allow for time-specific variation in the dependent variable.

In Specification 1 of Table 1 we include *Sales_Growth* as a control variable. In Specification 2, instead of controlling for *Sales_Growth*, we include *Positive_Sales_Growth*, a variable equal to *Sales Growth* if growth is positive and zero if growth is negative, and *Negative_Sales_Growth*, a variable equal to zero if growth is positive and *Sales_Growth* if growth is negative. The second

model aims to examine the employment decisions in the good times and in the bad times separately.

$$y_{it} = \alpha + \beta \times CEO_Optimism_{it-1} + \delta_{12} \times Positive_Sales_Growth_{it-1} + \delta_{22} \times Negative_Sales_Growth_{it-1} + \zeta \times Controls_{it-1} + \nu_i + \mu_{jt} + \varepsilon_{it} \quad (2)$$

In Specification 3, we further include the interactions between *Positive_Sales_Growth* and *Negative_Sales_Growth*, and *CEO_Optimism*. The coefficients of interest are δ_1 and δ_2 which reflect the differences in employment decisions of firms with optimistic CEOs in response to different types of sales shocks.

$$y_{it} = \alpha + \beta \times CEO_Optimism_{it-1} + \delta_1 \times Optimism_{it-1} \times Positive_Sales_Growth_{it-1} + \delta_2 \times Optimism_{it-1} \times Negative_Sales_Growth_{it-1} + \delta_{12} \times Positive_Sales_Growth_{it-1} + \delta_{22} \times Negative_Sales_Growth_{it-1} + \zeta \times Controls_{it-1} + \nu_i + \mu_{jt} + \varepsilon_{it} \quad (3)$$

We estimate the above models with the panel data estimation with firm- and industry-year fixed effects.

A2. The entropy balancing method

We employ the entropy balancing which exactly adjusts inequalities in the moments of the covariate distributions rather than simply discarding units to improve the covariate balance like other matching and propensity score methods (Hainmueller, 2012). We impose all firm-level control characteristics and industry and year factors as specified in models (1) to (3) as balance constraints and pre-specify that the covariate distributions of the firms with optimistic CEOs and the firms with non-optimistic CEOs match exactly on the first two moments of the distributions.

The entropy balancing searches for the set of weights that satisfy our set balance constraints, which are subsequently used in the regression estimation. This method allows us to alleviate the concern about possible unobservable firm characteristics that are related to employment decisions as well as the decisions to appoint (non)optimistic CEOs. As the entropy balancing method assigns different weights to units rather than discarding them, it has desirable advantages compared to other matching and propensity score matching (PSM) methods (Hainmueller, 2012). But we also apply PSM method for robustness checks.

A3. The Propensity Score Matching

To control for ex-ante self-selection effect that firms with certain characteristics are more likely to appoint certain types of CEOs, we employ the PSM algorithm proposed by Rosenbaum and Rubin (1985) to construct a control sample. Conditional on the observed characteristics, including lag value of employment growth rate, sales growth, return volatility, and changes in profit, leverage, quick ratio, Tobin's Q, and capital expenditure, we design a nonrandomized matching to mitigate the selection issues of a randomized trial (Austin, 2011). In the context of our study, the propensity score is the predicted probability that a firm will appoint an optimistic CEO. Specifically, we apply the one-to-five, nearest-neighbour PSM without replacement to identify firms with non-optimistic CEOs (the control group) that match with firms with optimistic CEOs (the treated group) in terms of firm-level control characteristics, industry and year factors, and we also impose common support restrictions during matching. We then examine the effects of CEO optimism on this newly matched sample, and the results are presented in Table 2.

A4. The 2SLS and instrumental variable

To further address unobserved omitted variables, following the referee's suggestion, we employ two-stage estimations using an instrument variable (IV). Our IV is a dummy variable, indicating whether the firm at least had an optimistic CEO in the past. We expect that there is a positive relationship between our IV and CEO optimism, indicating that firms that had at least one optimistic CEO before are more likely to appoint another optimistic CEO. However, it is unlikely that an optimistic CEO who already left his/her post would have any influence on the firm's contemporary employment decisions. Therefore, this instrument is likely to satisfy both the relevancy and exogeneity conditions.

Appendix B: Descriptive Statistics

B1. Descriptive statistics (full sample)

This table presents information on the characteristics (and changes in characteristics) of our sample firms. Data for all sample firms are obtained from Compustat, Execucomp and CRSP.

	<i>Sample Firms</i> (<i>N</i> = 23,663)		
	<i>Mean</i>	<i>Median</i>	<i>Stan. Dev.</i>
<i>Employment_Growth</i>	0.066	0.031	0.224
<i>Lag Sales_Growth</i>	0.110	0.057	0.305
<i>Lag Log(Employees)</i>	8.453	8.517	1.679
<i>Lag Ret_Vol</i>	0.307	0.224	0.292
<i>Lag ROA</i>	0.037	0.055	0.121
<i>Lag Debt_Ratio</i>	0.210	0.192	0.184
<i>Lag Quick_Ratio</i>	1.732	1.232	1.660
<i>Lag CAPX/Total_Assets</i>	0.056	0.039	0.053
<i>Lag Q</i>	2.091	1.650	1.384
Δ <i>Lag ROA</i>	-0.185	-0.068	3.168
Δ <i>Lag Debt_Ratio</i>	0.346	0.000	2.459
Δ <i>Lag Quick_Ratio</i>	0.071	0.002	0.463
Δ <i>Lag CAPX/Total_Assets</i>	0.087	-0.015	0.584
Δ <i>Lag Q</i>	0.034	0.006	0.309

B2. Descriptive statistics for firms with optimistic CEOs and non-optimistic CEOs

This table presents information on the characteristics (and changes in characteristics) of our sample firms. Data for all sample firms are obtained from Compustat, Execucomp and CRSP. Sample firms are classified as firms with "Non-Optimistic CEOs" or "Optimistic CEOs" based on the measure of CEO optimism as in Galasso and Simcoe (2011). *t*-statistics for mean differences and *z*-statistics (using Wilcoxon-Mann-Whitney tests) for median differences between "Non-Optimistic CEOs" or "Optimistic CEOs" firms are calculated. ***, **, * denote statistical significance of these differences at the 1%, 5%, and 10% levels, respectively.

	<i>Non-Optimistic CEOs</i> (<i>N</i> = 11,005)			<i>Optimistic CEOs</i> (<i>N</i> = 12,658)		
	<i>Mean</i>	<i>Median</i>	<i>Stan. Dev.</i>	<i>Mean</i>	<i>Median</i>	<i>Stan. Dev.</i>
<i>Employment_Growth</i>	0.037	0.010	0.215	0.091***	0.048***	0.228
<i>Lag Sales_Growth</i>	0.079	0.035	0.292	0.137***	0.076***	0.314
<i>Lag Log(Employees)</i>	8.527	8.556	1.655	8.474***	8.537***	1.662
<i>Lag Ret_Vol</i>	0.291	0.215	0.277	0.320***	0.232***	0.305
<i>Lag ROA</i>	0.023	0.045	0.129	0.049***	0.062***	0.112
<i>Lag Debt_Ratio</i>	0.220	0.200	0.188	0.201***	0.184***	0.180
<i>Lag Quick_Ratio</i>	1.645	1.181	1.590	1.809***	1.281***	1.714
<i>Lag CAPX/Total_Assets</i>	0.053	0.038	0.051	0.058***	0.041***	0.055
<i>Lag Q</i>	1.877	1.489	1.241	2.276***	1.808***	1.472
Δ <i>Lag ROA</i>	-0.272	-0.119	3.441	-0.110***	-0.032***	2.907
Δ <i>Lag Debt_Ratio</i>	0.319	0.000	2.260	0.369	-0.009***	2.619
Δ <i>Lag Quick_Ratio</i>	0.062	-0.004	0.453	0.080***	0.007***	0.472
Δ <i>Lag CAPX/Total_Assets</i>	0.076	-0.022	0.574	0.096*	-0.009***	0.593
Δ <i>Lag Q</i>	0.015	-0.005	0.286	0.050***	0.018***	0.326

Appendix C: Additional Analysis

C1. Regression of employment growth on sales growth and controls using the Malmendier and Tate (2005)'s optimism measure

	(1)	(2)	(3)
<i>CEO_Optimism</i>	0.036*** (0.004)	0.036*** (0.00358)	0.032*** (0.00432)
<i>Lag Sales_Growth</i>	0.047*** (0.005)		
<i>Lag Positive_Sales_Growth</i>		0.027*** (0.006)	0.028*** (0.008)
<i>Lag Negative_Sales_Growth</i>		0.133*** (0.016)	0.180*** (0.020)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>			-0.001 (0.011)
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>			-0.123*** (0.030)
<i>Lag Employment Growth</i>	0.061*** (0.007)	0.061*** (0.007)	0.060*** (0.007)
<i>Lag Log(Employees)</i>	- 0.143*** (0.003)	-0.144*** (0.003)	-0.145*** (0.003)
<i>Lag RetVol</i>	0.007 (0.005)	0.007 (0.005)	0.007 (0.005)
Δ <i>Lag ROA</i>	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Δ <i>Lag Debt_Ratio</i>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Δ <i>Lag Quick Ratio</i>	0.026*** (0.003)	0.026*** (0.003)	0.026*** (0.003)
Δ <i>Lag Capex/Assets</i>	0.003 (0.002)	0.002 (0.002)	0.002 (0.002)
Δ <i>Lag Q</i>	0.070*** (0.004)	0.070*** (0.004)	0.070*** (0.004)
<i>Firm FE</i>	Yes	Yes	Yes
<i>Industry-Year FE</i>	Yes	Yes	Yes
<i>N</i>	23,663	23,663	23,663
<i>Adjusted R²</i>	0.040	0.042	0.042

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

C2: CEO Optimism and employment growth: Endogeneity checks using the Malmendier and Tate (2005)'s measure

	Entropy Balancing Method		PSM		2SLS	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CEO_Optimism</i>	0.027*** (0.001)	0.023*** (0.001)	0.037*** (0.004)	0.032*** (0.004)	0.036*** (0.004)	0.031*** (0.004)
<i>Lag Sales_Growth</i>	0.080*** (0.002)		0.048*** (0.005)		0.047*** (0.005)	
<i>Lag Positive_Sales_Growth</i>		0.065*** (0.001)		0.027*** (0.008)		0.027*** (0.008)
<i>Lag Negative_Sales_Growth</i>		0.251*** (0.002)		0.180*** (0.020)		0.180*** (0.020)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>		-0.002 (0.874)		0.004 (0.012)		-0.000 (0.011)
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>		-0.117*** (0.002)		-0.128*** (0.031)		-0.123*** (0.030)
<i>Firm Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry-year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	23,663	23,663	22,545	22,545	23,663	23,663

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

C3: Employment growth of firms with different levels of financing constraints using the Malmendier and Tate (2005)'s measure

	Less financially constrained firms			More financially constrained firms		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CEO_Optimism</i>	0.027*** (0.005)	0.027*** (0.005)	0.021*** (0.000)	0.043*** (0.006)	0.043*** (0.006)	0.040*** (0.007)
<i>Lag Sales_Growth</i>	0.030*** (0.008)			0.053*** (0.007)		
<i>Lag Positive_Sales_Growth</i>		0.014 (0.010)	0.007 (0.01370)		0.030*** (0.009)	0.039*** (0.012)
<i>Lag Negative_Sales_Growth</i>		0.080*** (0.021)	0.112*** (0.026)		0.165*** (0.024)	0.225*** (0.031)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>			0.0185 (0.019)			-0.014 (0.016)
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>			-0.089** (0.042)			-0.147*** (0.047)
<i>Firm Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry-Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	11,732	11,732	11,732	11,720	11,720	11,720
<i>p-value</i>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

C4. Regression of employment growth on sales growth and controls for pre- and post- 2008-2009 global financial crisis

In this analysis, we re-estimate our models using the two sub-samples, before and after the 2008-2009 global financial crisis. The coefficients of *CEO_Optimism* are positive and statistically significant in all specifications, although the size of the coefficients is larger in the post-crisis period compared with that in the pre-crisis period. The coefficients of the interaction term *Optimism*Negative_Sales_Growth* are negative and although only statistically significant in the pre-crisis period. Overall, this result provides strong supports for our hypotheses and further confirms results reported for the main paper.

	Before crisis				After crisis	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CEO_Optimism</i>	0.020*** (0.007)	0.019*** (0.007)	0.019** (0.008)	0.033*** (0.007)	0.032*** (0.007)	0.032*** (0.008)
<i>Lag Sales_Growth</i>	0.057*** (0.009)			0.010 (0.006)		
<i>Lag Positive_Sales_Growth</i>		0.025** (0.010)	0.039*** (0.015)		-0.014* (0.008)	-0.008 (0.012)
<i>Lag Negative_Sales_Growth</i>		0.204*** (0.026)	0.250*** (0.035)		0.098*** (0.019)	0.116*** (0.026)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>			-0.021 (0.018)			-0.012 (0.015)
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>			-0.101** (0.049)			-0.041 (0.037)
<i>Firm Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry-Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	13,077	13,077	13,077	10,586	10,586	10,586

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

C5. Analysis for outperforming and underperforming firms

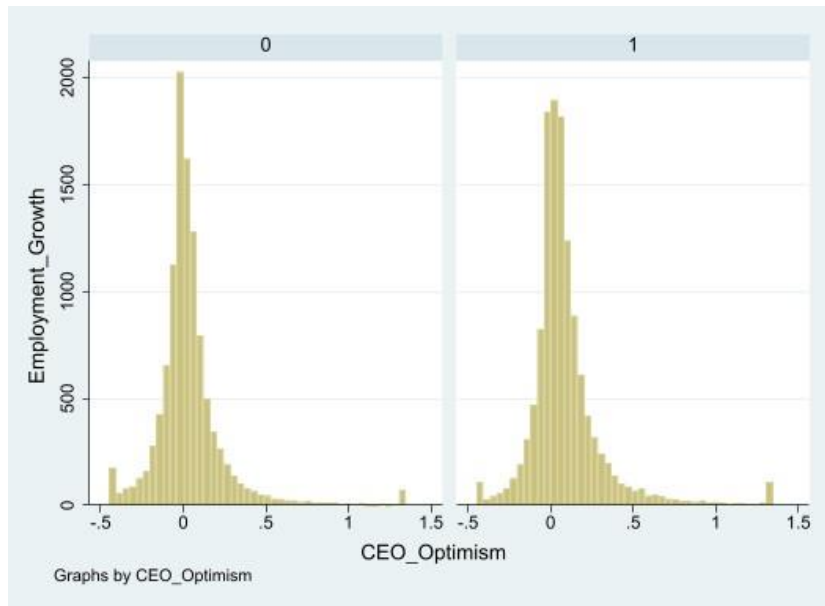
In this analysis, we re-estimate our models using two sub-sample of firms that underperform compared with their industry peers whose sales growth is below the 3-digit SIC industry average sales growth, and those outperform their industry peers whose sales growth is above the 3-digit SIC industry average sales growth. The coefficients of *CEO_Optimism* are positive and statistically significant in all specifications, confirming that firms with optimistic CEOs have higher employment growth rates regardless whether they underperform or outperform their industry peers, which is consistent with hypothesis 1. The coefficient of the interaction term *Optimism*Negative_Sales_Growth* is negative and statistically significant in under-performing firms (compared with industry peers), indicating that the decreasing employment sensitivity to declining sales of firms with optimistic CEOs is stronger in underperforming firms. This provides robustness checks for hypotheses and further confirms results reported for the main paper.

	Below industry average			Above industry average		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CEO_Optimism</i>	0.022*** (0.005)	0.022*** (0.005)	0.011* (0.006)	0.028*** (0.007)	0.028*** (0.007)	0.032*** (0.009)
<i>Lag Sales_Growth</i>	0.069*** (0.010)			0.030*** (0.008)		
<i>Lag Positive_Sales_Growth</i>		0.046*** (0.015)	0.027 (0.021)		0.028*** (0.009)	0.042*** (0.013)
<i>Lag Negative_Sales_Growth</i>		0.100*** (0.018)	0.159*** (0.023)		0.070 (0.055)	0.133* (0.076)
<i>CEO_Optimism*Lag Positive_Sales_Growth</i>			0.041 (0.029)			-0.022 (0.016)
<i>CEO_Optimism*Lag Negative_Sales_Growth</i>			-0.128*** (0.033)			-0.142 (0.108)
<i>Firm Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Firm FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry-Year FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	13,767	13,767	13,767	9,896	9,896	9,896

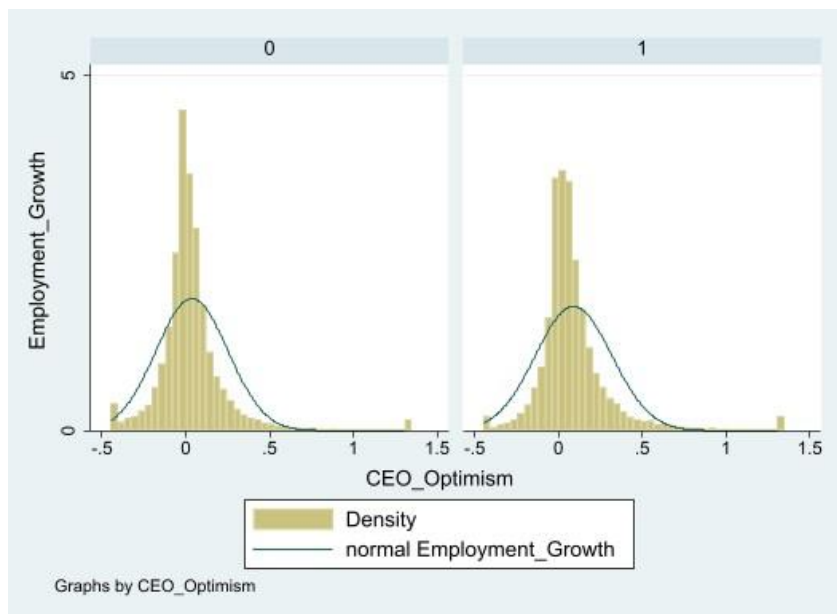
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Appendix D: Visual Illustration

Graphs D1(a) and D1(b) below show that the employment growth is higher in firms with optimistic CEOs than in firms with non-optimistic CEOs.

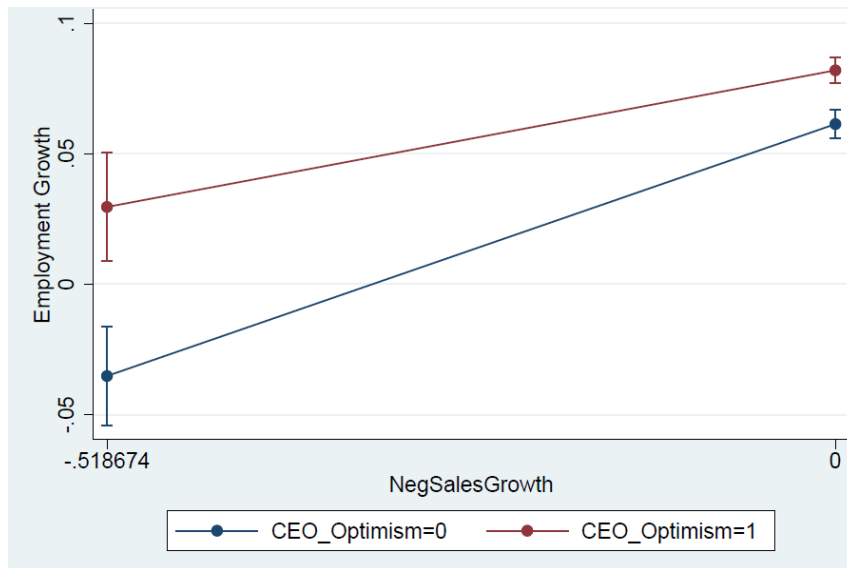


Graph D1(a): Percentage distribution of *Employment_Growth* by *CEO_Optimism*

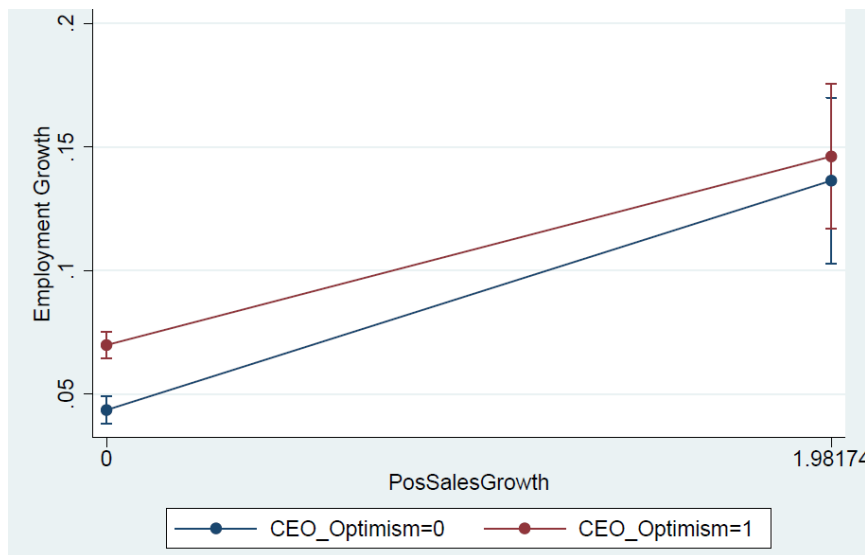


Graph D1(b): Density distribution of *Employment_Growth* by *CEO_Optimism*

Graphs D2(a) and D2(b) show that firms with optimistic CEOs exhibit a decreasing employment sensitivity to declining sales, but not to increasing sales.



Graph D2(a): the relationship between employment growth and negative sales growth for firms with optimistic and non-optimistic CEOs



Graph D2(b): the relationship between employment growth and positive sales growth for firms with optimistic and non-optimistic CEOs