

# Internal R&D or External Growth?

## A Closer Look at CEO Narcissism and Entrepreneurial Orientation

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# **Internal R&D or External Asset Growth? A Closer Look at CEO Narcissism and Entrepreneurial Orientation**

## **Abstract**

### **Purpose:**

In today's competitive business environment, understanding how leadership traits shape outcomes is critical. CEO narcissism, an intriguing and debated trait, raises questions about its impact on organizational behaviour, particularly regarding entrepreneurial orientation (EO). This study aims to examine how CEO narcissism affects EO, both as aggregate and specific measures, encompassing internal and external growth. It also considers the organizational context by examining how factors such as capital intensity, firm ownership, and CEO duality moderate this relationship.

### **Design/methodology/approach:**

To test our hypotheses, we use a sample of firms drawn from China's ChiNext database (2008-2017). After an initial screening, the final sample consists of 251 CEOs from 239 companies. Data on CEO narcissism are collected from the firm's official website and major online sources, while additional data are extracted from the WIND database. We use multiple regression and ordinary least squares for data analysis.

### **Findings:**

The results show that CEO narcissism leads to external asset growth investment but not internal R&D. There is a positive relationship between CEO narcissism and EO as an

aggregate measure, and also different managerial discretions play varying roles in the relationship. Specifically, capital intensity weakens this relationship, but state ownership strengthens it.

**Originality/value:**

This study helps to clarify the relationship between CEO narcissism and EO and advances the literature by showing that firms' EO actions may take various forms of innovation and venturing as new entry initiations of EO. The study findings have important implications for firms to capitalise on narcissistic CEOs' entrepreneurial tendencies, balance internal R&D and external asset growth, and leverage various managerial discretions.

**Keywords:** CEO narcissism; Entrepreneurial orientation; New initiative; Internal R&D; Innovation; External asset growth; Managerial discretion; State ownership; Capital intensity; China.

## 1. Introduction

Narcissism, a personality characterised by inflated self-views, a sense of entitlement, and a demand for admiration, can drive CEOs toward bold and audacious decisions (Cragun, Olsen, & Wright, 2020; Wales, Patel, & Lumpkin, 2013). These decisions, in turn, impact a firm's strategic trajectory, especially in areas such as risk-taking, innovation, and proactiveness, which are hallmarks of entrepreneurial orientation (EO) (Engelen, Neumann, & Schmidt, 2016). With a noticeable prevalence of narcissistic traits among CEOs (Tang, Tang, & Cowden, 2017; Wales, Covin, & Monsen, 2020), understanding how this trait influences strategic decisions becomes paramount for businesses and investors.

Research examining how CEO narcissism influences entrepreneurial orientation (EO) has gained traction in recent years (Cragun et al., 2020). Most studies have treated EO as an aggregate measure of internal R&D spending and external growth investment (Ingersoll, Glass, Cook, & Olsen, 2019; Zhu & Chen, 2015). However, this method fails to account for the distinctions between the two dimensions of EO (Covin & Wales, 2019), resulting in ambiguity concerning whether narcissistic CEOs assign equal importance to both internal R&D and external growth.

In addition, a recent meta-analysis by Cragun et al. (2020) reveals CEO narcissism's statistically significant relationships with the overall measure of R&D and growth measures, while its relationships with specific innovation and growth facets lack consistency. This calls for further investigation into potential moderating factors (Cragun et al., 2020). Managerial discretion, which refers to the latitude of action available to top executives (Hambrick &

Finkelstein, 1987), could be those factors that strengthen or inhibit the effect of CEO narcissism on EO. Some of the key factors of managerial discretion include capital intensity, firm ownership, and CEO duality. Lower capital intensity enables CEO to have more discretion in making investment decisions (Wangrow et al., 2015). CEOs in state-owned enterprises can exploit institutional advantages to obtain higher discretion (Tang et al., 2017). CEOs who also hold role of the board chair has greater discretion (Finkelstein & D'aveni, 1994). However, prior research has rarely examined how these factor in shaping the CEO narcissism's influence on firm behaviours.

The study aims to bridge the above literature gap by addressing two significant research questions: a) How does CEO narcissism influence entrepreneurial orientation (EO), considering both its aggregate measure and specific dimensions of internal R&D and external asset growth? b) How does the influence of CEO narcissism on EO vary based on the capital intensity of the firm, corporate ownership, and CEO duality?

Drawing upon the upper-echelon theory (Hambrick & Mason, 1984), we propose that CEO narcissism positively affects a firm's EO while concurrently reducing internal R&D investment but increasing external growth investment, with capital intensity, state ownership, and CEO duality expected to either strengthen or weaken these relationships. To test these hypotheses, we collected empirical data from multiple sources, involving a sample of 251 CEOs across 239 firms spanning the years 2008 to 2017, comprising 985 annual observations. The results provide support for our hypotheses.

The study makes two main contributions. First, it enriches the upper-echelon theory by revealing that, while CEO narcissism has a positive influence on the aggregate measure of EO and external asset growth investment, it does not significantly affect in-house R&D initiatives. This provides a nuanced understanding of how CEO narcissism shapes specific aspects of EO. Second, the study enriches our understanding of CEO narcissism and EO by uncovering the moderating effects of managerial discretion, specifically capital intensity and state ownership. It reveals that in state-owned enterprises and for low capital intensity projects, narcissistic CEOs tend to have greater managerial discretion and are more inclined to take greater risks in pursuing external asset growth.

## **2. Theoretical background and hypothesis development**

### ***2.1 CEO narcissism***

Narcissism has gained prominence in psychology and strategy literature (Shabbir & Kousar, 2019). It is commonly defined as an exaggerated, yet fragile self-concept of one's importance and influence (Wales et al., 2013). It is a personality trait that combines an inflated self-view, grandiosity, attention seeking, arrogance, and lack of empathy (Cragun et al., 2020; Judge, LePine, & Rich, 2006). Narcissistic CEOs desire outstanding achievements, dare to take risks, and ignore the decision making bias of being overconfident and underestimating risks (Hirshleifer, Low, & Teoh, 2012; Peterson, Galvin, & Lange, 2012). They adopt audacious strategies, venturing into high-risk projects to counter inflated perceptions of their leadership (Wales et al., 2013).

The upper echelons theory emphasises executives' substantial influence on their organizations through personal values, psychological traits, and past experiences (Chatterjee & Hambrick, 2007). As CEOs hold the pivotal decision-making role, their personal values and dispositions inevitably shape strategic choices. Narcissistic CEOs view themselves as more intelligent than others and tend to take riskier actions (Chatterjee & Hambrick, 2011) to create results that make them look more attractive and powerful (Buyl, Boone, & Wade, 2019). These attention-seeking behaviour and self-enhancing value motivate narcissistic CEOs to pursue EO strategies to leverage their reputations externally (Al-Shammari, Rasheed, & Al-Shammari, 2019). Compelling evidence shows narcissistic CEOs significantly impacting firms' strategic decisions regarding EO, encompassing risk-taking, innovation, growth, and firm performance (Cragun et al., 2020).

## ***2.2 Entrepreneurial orientation***

The concept of EO is rooted in the work of Mintzberg (1973) and Khandwalla (1976), who claimed that entrepreneurially oriented firms tend to take more risks and be more proactive in seeking new business opportunities. As a broad concept, EO is defined as a multi-dimensional construct, encompassing a range of characteristics such as innovativeness, risk-taking, proactiveness, competitive aggressiveness, and autonomy (Wales et al., 2013). This definition led Wales et al. (2020) to classify EO into three categories: EO-as-top management; EO-as-organizational configurations and EO-as-new entry initiatives.

Following the upper echelons theory (Hambrick & Mason, 1984), CEOs' entrepreneurial strategic decisions (EO-as-top management style) shape entrepreneurial firms' structure, and

operation process (EO-as-organizational configuration) that lead to new entry initiatives (EO-as-new entry initiatives). This study focuses on EO-as-new entry initiatives. New entry initiatives offer a definitive indicator of when and how firms are being entrepreneurial in different forms (Covin & Wales, 2012). EO-as-new entry initiatives can be examined along two dimensions: organic growth through in-house R&D over the long term or growth through external investment in the short term (Williams and Lee (2009).

### ***2.3 CEO narcissism and EO***

The extant literature offers strong evidence that CEO narcissism is one of the most influential leader personality traits, which determine the organisational strategy, performance and outcomes (Tang et al., 2017; Wales et al., 2020). Most narcissistic CEOs show four main characteristics: charm, egoism, cheating motivation, and knowledge suppression (Zhu & Chen, 2015). These personality traits lead to narcissistic CEOs being self-centred, self-captivated and self-affectionate. They prefer to use their leadership power and resources not just to gain a sense of self-superiority but to strengthen and promote themselves to the outside world (Zhu & Chen, 2015). Narcissistic CEOs have a risk-taking spirit and self-worship. They have a higher tolerance for an uncertain environment and are more likely to favour challenges than non-narcissistic CEOs (Buyl et al., 2019; Resick, Whitman, Weingarden, & Hiller, 2009).

Given that the primary goal of EO is to identify innovative business opportunities, narcissistic CEOs' personality traits promote them to enhance their high self-enhancing values and exhibit higher levels of risk-taking behaviours, such as more effectively engaging



in new entry initiatives in a bold manner (Cragun et al., 2020). Narcissistic CEOs' personality traits, such as risk taking and competitiveness aggressiveness, encourage them to behave in a highly risky and uncertain situation, thus they are likely to commit greater time and resources to adapt the high level of EO strategy in general.

*Hypothesis 1:* CEO narcissism is positively related to EO as an aggregate measure.

Investing in R&D is vital for firms to innovate and achieve long-term growth (Driver & Guedes, 2012; Yiu, Lam, Yeung, & Cheng, 2020). However, the outcomes of internal R&D take considerable time to materialise, and the likelihood of swift success is relatively low (Su, Tsang, & Peng, 2009). Moreover, R&D investments carry inherent risks – they are more prone to failure compared to conventional investments. Narcissistic CEOs typically pursue rapid accomplishments that boost their personal image. Given that internal R&D does not provide immediate acknowledgment or immediate personal significance. Rather than prioritizing the organization's long-term development and innovative potential, they seek recognition for their individual achievements. This self-centred mindset often results in reduced financial allocation to internal R&D.

Narcissistic CEOs may tend to believe they are invariably correct and may be averse to assuming risks associated with the long-termed R&D investment. Empirical research indicates that a significant proportion of R&D projects, around 80%, do not reach completion (García-Quevedo, Segarra-Blasco, & Teruel, 2018). The challenges of R&D investments are multifaceted – decisions are not easily reversible as resources are invested in employees, equipment, and materials. Abandoning an R&D endeavour translates to no future cash flow.

Furthermore, the unpredictable nature of innovation, which takes time and involves intricate processes, contributes to the uncertainty. Moreover, reaping all the rewards from an R&D project is challenging due to the spillover effects; others can benefit from your discoveries (Driver & Guedes, 2012). Considering these inherent risks in R&D projects, narcissistic CEOs may avoid them to prevent unfavourable outcomes and the potential damage to their self-perception. Instead, they may choose to use the company's funds on initiatives that enhance their personal image, such as acquiring prominent companies or organizing extravagant events (Al-Shammari et al., 2019; Gerstner, König, Enders, & Hambrick, 2013).

Hypothesis 1a: CEO narcissism is negatively related to internal R&D investment.

There is a growing recognition within the literature that narcissistic CEOs tend to have an external orientation because of their strong craving for widespread admiration (Al-Shammari et al., 2019; Gerstner, König, Enders, & Hambrick, 2013). Narcissistic CEOs are driven by their personal narcissistic needs and aim to achieve success that conforms to their self-interest. Therefore, they are likely to invest in ventures that elevate their image in the wider context (Capalbo, Frino, Lim, Mollica, & Palumbo, 2018).

The pursuit of new business opportunities through external asset investment growth is an expansion strategy that attracts significant attention from external audiences for narcissistic leaders. External growth investments achieve results in a relatively short timeframe, compared to the protracted commitment demanded by R&D, providing an advantage to the expansion strategy (Roberts & Berry, 1984; Williams & Lee, 2009). Such actions that cater to external audiences received public attention and commendation. Narcissistic leaders can

demonstrate their assertive leadership aspirations by rapidly acquiring new assets through external investments, showcasing their capacity to exert influence over others (Al-Shammari et al., 2019).

Hypothesis 1b: CEO narcissism is positively related to external growth investment.

#### ***2.4 The moderating role of managerial discretion***

If narcissistic CEO personality leads to more EO strategy, then what factors can mitigate its impact? Previous literature, like the upper-echelons theory (Hambrick & Mason, 1984), suggests that the scope of a CEO's managerial discretion (latitude of action) matters to firm decisions and outcomes (Hambrick & Finkelstein, 1987). The higher-level managerial discretion that CEOs have, the greater scope of freedom in determining their strategic choices (Crossland & Hambrick, 2011). Thus managerial discretion can be an important moderating factor of the relationship between narcissistic CEOs and EO strategy choice. Management discretion consists of three dimensions: the environment, the organization, and the executive (Hambrick & Finkelstein, 1987). We focus on three specific variables of managerial discretion: capital intensity, firm ownership, and CEO duality. Capital intensity is related to the organizational dimension. Firm ownership concerns the institutional advantages, addressing the environment dimension, while CEO duality addresses the power and autonomy of the manager and thus the executive dimension.

*Capital intensity* refers to a business process that requires large amounts of investment to produce goods or services (Li & Tang, 2010; Wangrow, Schepker, & Barker, 2015).

Decision-making on the basis of financial factors, such as capital intensity, is of utmost

importance for many companies (Lofstrom, Bates, & Parker, 2014). The previous relevant research largely focuses on the relationships between capital intensity and firms' risks and performance (Lee, 2010). Firms that require less capital intensity have high flexibility and tend to disperse investments, diversifying the investment would provide more chances for narcissistic CEOs to seek innovative opportunities in their EO choices (Hambrick & Abrahamson, 1995; Wangrow et al., 2015). Conversely, literature on capital intensity and firm risk shows that being more capital intensive may increase the value of the business but increase risks (Shapiro and Titman, 1986), therefore, the organizational rigidity and precaution on the decision-making of new investments will put narcissistic CEOs in the difficult position to make their strategic decision such as to focus on their self-interests (Hambrick & Abrahamson, 1995; Li & Tang, 2010). In this regard, capital intensity weakens the effect of CEO narcissism on EO.

Moreover, financial economics literature suggests that capital intensity has a positive relationship with high costs and high risks (Harris, 1988). The capital intensity requirement may constrain a narcissistic CEO's discretion when deciding on new entry initiatives of firms, such as internal R&D and external asset growth investments. Although narcissists make decisions based on biased expectations and are overconfident to pursue new entry opportunities (Wales et al., 2013), the high capital intensity requirement may constrain narcissistic CEOs to pursuing high-costs and long-term projects, particularly if internal R&D and external asset growth investments require intensive capital, the effect of intensive capital

on new entry initiatives may moderate the narcissistic CEOs to be 'too bold' and put firms in the position with a very high level of uncertainty (Hambrick & Abrahamson, 1995). Thus,

*Hypothesis 2:* Capital intensity weakens the relationship between CEO narcissism and EO.

*Hypothesis 2a:* Capital intensity weakens the negative relationship between CEO narcissism and internal R&D investment.

*Hypothesis 2b:* Capital intensity weakens the positive relationship between CEO narcissism and external asset growth investment.

*Firm ownership* may influence a firm's corporate culture, particularly the thrust to compete. The nature of firms' ownership has implications for how much managerial discretion a CEO has (Lioukas, Bourantas, & Papadakis, 1993). Mondal & Chakrabarti (2021) showed that ownership impacts the entrepreneurial behaviour of firms during times of adversity. Although narcissistic CEOs in state-owned companies may face constraints in their decision-making and have less managerial discretion due to informal or formal controls and interventions (Li & Tang, 2010), the institutional advantages of state-owned enterprises, such as relying on the government as their financier, suppliers and distributor, provide them with a favourable situation that allows them to general more personal values from a high level of EO (Tang et al., 2017). In addition, the slack resources of state-owned enterprises provide more opportunities for narcissistic CEOs to maximise the EO. Therefore, it is expected that a high level of self-enhancing value of narcissistic CEOs positively reinforces the EO within the context of state-owned companies.

Having discussed earlier, CEOs' entrepreneurial strategic decisions (EO-as-top management style) lead to new entry initiatives (EO-as-new entry initiatives) (Wales et al., 2020). Either internal R&D activities or external asset investment growth could be used as a mechanism to facilitate new entry initiatives of EO. Li and Tang (2010) indicated that CEOs in state-owned companies are motivated to explore their narcissistic traits by introducing new markets and services, which can be achieved either through internal R&D activities or external asset investments. Slack resources and power CEOs possessed in state-owned enterprises strongly encourage high self-interested orientated narcissistic CEOs preferring actions that are highly visible to large audiences (Chatterjee & Hambrick, 2011), as exhibitionists, narcissistic CEOs are more likely to seek entry initiatives that could quickly gain greater admiration from outside, such as external asset investment growth. Compared with nonstate-owned enterprises, these CEOs in state-owned enterprises possess government-endorsed resources and intend to create self-enhancing values through external asset investment as wealth creation for their companies. Thus,

*Hypothesis 3:* State ownership strengthens the relationship between CEO narcissism and EO.

*Hypothesis 3a:* State ownership strengthens the negative relationship between CEO narcissism and internal R&D investment.

*Hypothesis 3b:* State ownership strengthens the positive relationship between CEO narcissism and external asset growth investment.

*CEOs' duality* is defined as the practice of consolidating the CEO and board chair positions into a single role (Finkelstein & D'aveni, 1994). Monitored by the board of directors (Crossland and Hambrick, 2007), logically, CEOs would make strategic decisions based on the interests of the firm and shareholders to avoid over-risk-taking decisions and choose stable strategies to a certain extent (Wang, DeGhetto, Ellen, & Lamont, 2019). Nevertheless, when CEOs also chair the board, the monitoring function becomes weak, the autonomy from the duality of a narcissistic CEO may advance them to consider a high level of EO. In other words, the CEO-Chair position moderates a narcissistic CEO's sense of using power and preferences of taking entrepreneurial activities (Goyal & Park, 2002), thus strengthening the relationship between narcissistic CEOs and EO.

Furthermore, Aktas, Andreou, Karasamani, and Philip (2019) showed that CEO duality has a negative effect on investment efficiency. In line with the extant literature, high EO-oriented CEOs undertake investments with uncertainties and utilise innovative behaviours (Lumpkin and Dess, 1966, Wales et al., 2019). Both internal R&D and external asset investment are related to high levels of risk by venturing into unknown new markets, products, and services (Covin & Lumpkin, 2011). However, CEO duality enhances CEOs' power position in which a CEO may have more managerial discretion to allow them to pursue self-captivated and self-centred actions (Wang et al., 2019). Rather than focusing on internal R&D activities, narcissistic CEOs tend to use their CEO-Chair power and position to enhance their external visibility and image, tending to be outward-oriented (Gerstner et al., 2013). Thus,

*Hypothesis 4:* CEO duality strengthens the relationship between CEO narcissism and EO.

*Hypothesis 4a:* CEO duality strengthens the negative relationship between CEO narcissism and internal R&D investment.

*Hypothesis 4b:* CEO duality strengthens the positive relationship between CEO narcissism and external asset growth investment.

Figure 1 summarises the conceptual model.

(INSERT FIGURE 1 ABOUT HERE)

### **3. Methodology**

#### ***3.1 Sample and data collection***

The sampled companies are extracted from China's ChiNext database in the period between 2008 and 2017. ChiNext is a NASDAQ-style subsidiary of Shenzhen Stock Exchange. China's ChiNext Board was officially opened in 2009 for the purpose of promoting independent innovation, entrepreneurship and the development of other growing firms. First, ST (Special Treatment, Abbreviation for "ST") companies and financial firms are excluded to avoid the interference of abnormal values on the results for the study, and thus the sample was 742 firms. The second round of sample screening is conducted on the basis of: a) the CEO's tenure for at least 4 years within the time range of the research sample; b) the available and rich disclosure of the database of the firm, including the CEO narcissism, managerial discretion and EO. Finally, the 251 CEOs in 239 firms from the year 2008 to



2017 were selected. Secondary data relevant to CEO narcissism were collected from the official website of the company and other major websites while the rest of the data come from the *WIND* database. In addition, the data period of the dependent variable (2009-2017) was one year behind that of the other variables (2008-2016) so as to investigate the lagged effect of CEO narcissism on EO.

### **3.2 Variable measures**

*EO*. To capture an EO, we relied on Williams and Lee's (2009) approach. We used the proportion of R&D spending and investment activities of cash flows accounted for the revenue to measure the EO as an aggregate measure. Among these, the proportion of R&D expenditure reflects the degree of investment in innovation. The net cash flow of investment activities reflects the extent of the firm's outward exploration and search for external growth, which is in line with EO's definition, i.e. innovation, risk-taking and pro-activeness (Liu & Liu, 2017). The specific operationalization method is as follows: using  $X_{it}$  represents the ratio of R&D expenditure to sales revenue of the  $i_{th}$  company in the  $t$  year, and  $Y_{it}$  represents the ratio of the net cash flow of investment activities in the  $t$  year to sales revenue of the  $i_{th}$  company in the  $t$  year, and thus the point in the two-dimensional coordinate axis  $(X_{it}, Y_{it})$  reflects the status of EO of the  $i_{th}$  company in the  $t$  year. According to the Euclidean distance formula, the distance from the origin  $(0, 0)$  to the point  $(X_{it}, Y_{it})$  is calculated, and then the EO intensity of the  $i_{th}$  firm in the  $t$  year is measured. The formula is as follows:

$$EO_{it} = \sqrt{(X_{it} - 0)^2 + (Y_{it} - 0)^2} = \sqrt{X_{it}^2 + Y_{it}^2}$$

In the formula,  $EO_{it}$  indicates the EO intensity of the  $i_{th}$  company in the  $T_{th}$  year. The larger the value, the stronger the EO of the company will be, and vice versa.

*CEO narcissism.* As for the key independent variable, a non-intervention index was used to measure the level of CEO narcissism. Drawing on the data processing methods adapted by (Chatterjee & Hambrick, 2007), the narcissistic CEOs' data were only selected in the second year tenure ( $t$ ) and the third-year tenure ( $t+1$ ), the data were averaged to obtain the narcissism index so as to reflect the degree of a CEO's narcissism during the whole term. Due to the complexity of the first year of the CEO's tenure, the validity of relevant indicators may be reduced. Therefore, data in relation to CEOs' tenure for the first year are excluded in this paper. Six indicators are selected to measure CEO narcissism, including relative salary; CEO's exposure to the company's official news website; the proportion of CEO photos in the company's annual report; public speeches; the frequency of the first-person singular in interviews, and the size of personal signatures. The consideration of selecting these indicators is due to two main reasons: a) whether CEOs have a substantive decision on the indicators; b) Emmons (1987) four dimensions of narcissism, I including authority, superiority, self-worship, and power, can be fully embodied in these indicators. Moreover, considering the actual situation of corporate development and the availability of data in China, the following three indexes were finally selected to consider the comprehensive level of CEO narcissism: a) the proportion of the CEO reported news out of the total news released by the company at the company's homepage; b) the ratio of using the first-person (e.g. I, my and my own) to other personal pronouns when the CEO participates an interview and a speech. The sources of

secondary data collected for this paper include *Sina Finance and Economics*, *The First Finance*, *Southern People Weekly*, *Phoenix Weekly*, *China Entrepreneur*, and *CEO public speeches published by large websites*; and c) the CEO's salary compared to the company's second-largest executive.

*Managerial discretion.* Regarding the moderating variables in line with hypotheses 2/3/4, managerial discretion was divided into three dimensions including Capital Intensity, Corporate Ownership and CEO Duality in this study. *Capital Intensity* was measured by the ratio of total assets to sales revenue. *Corporate Ownership* was used by a SOE dummy variable assigned 1 for a state-owned enterprise and 0 if otherwise. In particular, for listed firms in China, the SOEs refer to those whose controlling shareholders are the central or provincial/municipal governments or government agencies. *CEO Duality* is a dummy variable, where 1 is a dual CEO-chair role, and 0 otherwise.

*Control variables* were included at two levels. For the firm-level controls, four indicators are used, including firm size; asset-liability Ratio; ownership concentration, and return of equity (ROE). First, *Firm Size* is measured as the natural logarithm of the total assets. Size reflects the absorption ability and resource acquisition ability of the firm, thus impacting the choices of firm strategy. Second, *The Debt/Assets Ratio* is used to measure the financial status of the firm resources which largely determine strategic selections (Al-Mashari, Al-Mudimigh, & Zairi, 2003). Third, the company's top ten shareholders are used to measure the *Ownership Concentration* ratio. *Return on Assets* is used to measure firm performance.

Furthermore, at the individual level, *CEO Age*, *Gender*, *Tenure*, *Education* (whether having a

post-graduate degree) and *Functional Background* related to Research and Development are also controlled in the models. According to previous studies (Surroca, Prior, & Tribo Gine, 2016), these variables have an impact on CEOs' risk-taking behaviour and tendency towards R&D and asset growth investments.

### 3.3 Test model of data

The baseline ordinary least squares (OLS) regression model is constructed as follows:

$$EO_{it} = \alpha + \beta Narc_{it-1} + \gamma Controls_{it-1} + \delta Province_i + \theta Industry_i + \tau Year_t + \varepsilon_{it} \quad ---(1)$$

In the above equation,  $\alpha$  is the intercept and  $\varepsilon_{it}$  is the regression error. To mitigate endogeneity concerns due to omitted variables, year, province, and industry fixed-effects are included in this model to control for unobservable heterogeneity that is fixed over time, across provinces and industries, respectively. Moreover, to reduce reverse causality concerns, the independent variables, except the fixed effects, are lagged by 1 year. Equivalently in regressions, current period independent variables are regressed against a 1-period forward dependent variable, denoted as F1.EO.

When considering potential moderators for the Narcissism-EO relationship, a revised form of the above model was designed as follows:

$$EO_{it} = \alpha + \rho Narc_{it-1} * Moderator_{it-1} + \beta Narc_{it-1} + \gamma Controls_{it-1} + \delta Province_i + \theta Industry_i + \tau Year_t + \varepsilon_{it} \quad ---(2)$$

## 4. Empirical results

### 4.1 descriptive statistics

Table 1 reports summary statistics of all variables. It is noted that the mean value of entrepreneurial orientation is 0.26 and the standard deviation is 0.21. Its maximum value is further away from the mean compared to the minimum, consistent with the fact that more firms in the sample are entrepreneurial-type start-ups. CEO narcissism has a mean of 1.10 by construction. 11% of the firm/year sample are classified as SOEs (government being the controlling shareholder). Only 6% of the CEOs are also chairs of the board. 91% of the CEOs are male. 34% of CEOs have a background in R&D and 41% have post-graduate education.

(INSERT TABLE 1 ABOUT HERE)

Table 2 presents the descriptive statistical analysis of the main variables of R&D versus growth investments. As shown in Table 2, there are obvious differences between the variables. The results of clustering analysis have practical significance from the perspective of theory and practice (Choi & Beamish, 2004). Since this study selects the firms listed on a *start-up* board from 2008 to 2017, many of them at this stage are willing to take risks, and exhibit strong entrepreneurial tendencies (rather than conservative) as these firms not only have great market opportunities in the context of economic transformation of China, but also prefer to carry out product-market innovation by adopting aggressive entrepreneurial strategies.

(INSERT TABLE 2 ABOUT HERE)

Table 3 presents the descriptive statistics and Pearson correlation coefficient matrix of the variables. The correlation between the major variables CEO Narcissism and EO is 0.07 and significant. Capital intensity is also positively correlated with EO. The correlation

coefficient between pairwise sample variables is less than 0.75, thus the research model can be preliminarily judged to be reasonable.

(INSERT TABLE 3 ABOUT HERE)

#### ***4.2 Main effects***

Linear regression analysis is used to test the relationship between CEO narcissism and EO from the overall population and different structural dimensions of the sample companies. The main results testing hypotheses H1, as well as H1a and H1b are reported in Table 4. First, models 1-3 show that CEO Narcissism is not significantly related to R&D investment.

Although this finding does not support hypothesis H1a, in all 3 regressions, the coefficients on CEO Narcissism are negative while being statistically insignificant. It is suspected that the failure to detect statistical significance is possibly due to the small subsample that is classified as R&D-oriented firms.

Second, results in models 4-6 strongly support H1b that CEO Narcissism facilitates asset growth investment. In particular, the univariate regression model 4 shows that the coefficient on CEO Narcissism is 0.058 and significant at a 5% level. Then in models 5 and 6, the same set of control variables were included, but a lagged structure was used in model 6 compared to the static model 5 to reduce endogeneity concerns due to reversed causality. The results show a strong positive effect of CEO Narcissism on Growth (model 5) and the forward 1-period Growth (model 6).

Third, results in models 7-9 again show strong support to hypothesis H1. Similar to models 4-6, the same model-building approach was adopted and find highly consistent

positive and significant coefficients on CEO Narcissism indicating its facilitation role over overall entrepreneurial orientation.

Fourth, among the control variables that are included in the extended models, it is found that financial leverage reduces all three forms of entrepreneurial orientation (R&D, Growth and ESO). CEO duality reduces R&D but not growth and overall ESO. Male CEOs (dummy Gender = 1) are associated with more R&D, but no impact on Growth and overall ESO. Age reduces overall ESO but not separately for R&D and Growth.

(INSERT TABLE 4 ABOUT HERE)

#### ***4.3 Moderating effects***

The potential moderating effects of managerial discretion were proxied by capital intensity, firm ownership type and CEO duality in Table 5 regressions. To reduce missing variable concerns, each of these regressions included all three interaction variables CEO Narcissism\*Capital Intensity, CEO Narcissism\*SOE and CEO Narcissism\*CEO Duality in addition to those in Table 4 regressions. This way allows a “horse race” that may capture, relatively, which moderating factor plays the strongest role in the CEO Narcissism and Entrepreneurial relationship.

First, once again, largely due to a small R&D subsample, the results do not show a statistically significant relationship between CEO Narcissism and R&D investment in model 1, hence alternative hypotheses H2a/H3a/H4a are not supported by model 1 regression results. Model 2 result shows that the ownership type of a firm is an important moderator for CEO Narcissism and Growth investment. In particular, the coefficient on CEO

Narcissism\*SOE is 0.164, positive and significant at a 5% level. Hence, hypothesis H3b is supported. In this model, coefficients on the other two interactions are not significant, suggesting they are not important moderators especially after controlling for CEO Narcissism\*SOE, hence H2b and H4b are not supported. Model 3 examines alternative hypotheses associated with CEO Narcissism and the overall Entrepreneurial Orientation measure ESO. This regression strongly supports hypothesis H2 that capital intensity weakens this relationship (the coefficient on CEO Narcissism\*Capital Intensity is -0.035 and significant at a 5% level) and hypothesis H3 that state ownership strengthens this relationship (the coefficient on CEO Narcissism\*SOE is 0.211 and significant at 1% level), but not hypothesis H4 (the coefficient on CEO Narcissism\*CEO Duality is insignificant).

(INSERT TABLE 5 ABOUT HERE)

## **5. Discussion**

The empirical results support the main hypothesis that CEO narcissism affects both entrepreneurial orientation (EO) as an aggregate measure and external asset growth investment as a sub-dimension of EO. However, the results do not indicate a significant impact of CEO narcissism on in-house R&D initiatives. This implies that narcissistic CEOs might channel their efforts toward external EO actions to fulfill their narcissistic needs, especially in terms of attracting public attention (Al-Shammari, et al., 2019). The study advances the EO literature by identifying the positive relationship between CEO narcissism and external asset growth investment. Consequently, it suggests that employing an aggregate EO measure may not fully capture the diversity and intricacies of various EO actions. EO



activities in firms can take multiple forms, many of which hold relevance for new entry initiatives (Covin & Wales, 2019; Wales et al., 2020).

The study enriches our understanding by examining the moderating effects of managerial discretion in CEO narcissism and EO research. Specifically, the study reveals that capital intensity weakens the CEO narcissism-EO relationship. Additionally, state ownership significantly moderates the connections between CEO narcissism and both aggregate EO and separate EO measures. State-owned enterprises historically benefit from resource advantages tied to soft budget constraints, including implicit governmental guarantees (Bruton et al., 2015). As such, top executives within state-owned companies leverage institutional advantages through political connections, especially in emerging economies (Li and Tang, 2010). These advantages empower narcissistic CEOs with resources, enabling them to invest in large external projects for short-term asset growth. This EO decision mirrors the grandiose personality trait of narcissistic CEOs (Chatterjee & Hambrick, 2007; Cragun et al., 2020; Judge et al., 2006; Shabbir & Kousar, 2019; Wales et al., 2013).

This study contributes to the existing EO literature by showing that while CEO narcissism has an impact on the EO as an aggregate measure, its impact on the two separate dimensions, internal R&D and external asset growth is different. As argued by Wales (2018), firms' EO actions may take many different forms and these forms are not explicitly researched. This study is among the first to unveil the connection between CEO narcissism and the assertive-asset external growth of EO action. The findings suggest that narcissistic CEOs are inclined to prioritise rapid external asset growth over long-term internal R&D

investment. This inclination is attributed to their inflated self-view and attention-seeking traits (Judge et al., 2006; Shabbir & Kousar, 2019; Wales et al., 2013), they promote a grandiose image of themselves to the outside world (Buyl et al., 2019; Chatterjee & Hambrick, 2011; Resick et al., 2009; Zhu & Chen, 2015). These findings contribute to the upper echelons theory and EO literature, and the emerging perspectives of EO-as-top management style and EO-as-new entry initiatives (Wales et al., 2019).

Finally, the results of this study suggest that a comprehensive understanding of the intricacies of CEO narcissism and EO requires going beyond the aggregate measure. Incorporating separate and distinct measures of the general EO construct may enhance research understanding. In addition, the study emphasises the dynamic nature of EO by examining how CEO narcissism affects EO using a panel data structure. In doing so, this research provides a more nuanced understanding of the various EO variations influenced by CEO narcissism.

## **6. Conclusions**

This study systematically tests the relationship between CEO narcissism and EO behaviour, its two distinct forms. The results of the study advance the EO literature and have two important practical implications.

First, it is important to know that a narcissistic CEO tends to choose externally oriented asset investment activities over internally oriented R&D activities as new entry initiatives. At the individual level, recognising their tendency can guide narcissistic CEOs to make sound strategic decisions to balance the two approaches of internal R&D and external asset growth

investments to maximise their firm's performance outcome, rather than letting their narcissism run wild. From an organisational perspective, the establishment of a robust governance system is critical to reduce or even mitigate excessive external asset investments by a narcissistic CEO who aggressively pursues his individual interests but neglects the long-term strategic goal of the firm.

Second, for organisations in developing countries, managerial discretion should be used appropriately to enhance the positive role of a narcissistic CEO in promoting the implementation of certain forms of entrepreneurial new entry initiatives. Specifically, the governance team should be aware that in state-owned enterprises and for low capital intensity projects, narcissistic CEOs tend to have greater managerial discretion and are likely to take greater risks in pursuing external asset growth. Indeed, as indicated by Bouncken, Cesinger and Tiberius (2020), all three dimensions of the Dark Triad, narcissism, Machiavellianism and psychopathy, suppress the positive effects of EO on firm performance. Therefore, in order to mitigate the negative effects of CEO narcissism, other stakeholders should be aware of the CEO's behaviour and provide a quicker governance response to maximise the 'bright' side of a narcissistic CEO and mitigate the 'dark' side effects (Wales et al., 2013).

The contributions of this study are accompanied by research limitations. First, there is a contextual challenge of the availability of collecting sufficient breadth of secondary data that apply the study's criteria to select narcissistic CEOs. Second, this study may be biased by focusing on a single country, China. There is a need for future research to conduct comparative cross-country studies. Third, it is suggested to examine CEO narcissism by

disaggregating different types of narcissism, namely reactive narcissistic CEOs and self-deceptive narcissistic CEOs (Wales et al., 2013). Finally, by simply differentiating between internal R&D and external asset growth investments, it is hoped that the findings will inspire additional research by other innovation strategy researchers to further examine different types of EO.

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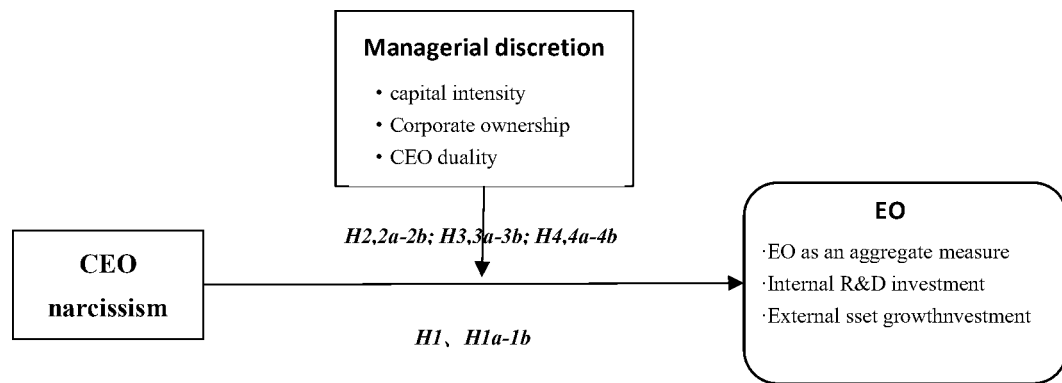
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**Figure 1. Conceptual model**

**Table 1: Summary statistics of variables**

Variable	Obs.	Mean	Std. Dev.	Min	Max
Entrepreneurial Orientation	963	0.26	0.21	0.01	1.18
CEO Narcissism	963	1.10	0.38	0.18	1.99
Capital Intensity	963	2.60	1.74	0.53	28.07
SOE	963	0.11	0.32	0	1
CEO Duality	962	0.06	0.23	0	1
CEO Age	963	46.04	6.51	27	65
CEO Gender	963	0.91	0.28	0	1
CEO Tenure	963	4.45	2.21	1	14
CEO R&D_Fun	963	0.34	0.47	0	1
CEO Post-grad	963	0.41	0.49	0	1
Firm Size	963	11.59	0.83	9.17	15.24
Debt/Assets	963	0.27	0.16	0.01	0.76
Ownership Con.	963	0.54	0.26	0.00	1.00
Return on Assets	963	0.12	0.10	-0.27	0.87

**Table 2: Subsample Statistics on *R&D versus Growth orientations***

Variables	R&D (n=163)			Growth (n=800)			Levene test for variance equations	
	Mean	Median	S.D.	Mean	Median	S.D.	F value	Sig.
EO	.652	.585	.193	.1795	.161	.100	196.890	.000
CEO Narcissism	1.149	.999	.407	1.088	.998	.375	6.649	.010
Capital Intensity	3.553	2.994	2.729	2.406	2.116	1.389	29.007	.000
SOE	.089	.000	.281	.120	.000	.325	6.634	.010
CEO Duality	.061	.000	.241	.058	.000	.233	.145	0.703
CEO Age	45.742	46.000	6.549	46.098	46.000	6.499	.044	.834
CEO Gender	.872	1.000	.336	.924	1.000	.266	17.990	.000
CEO Tenure	4.564	4.000	2.036	4.433	4.000	2.242	1.001	.317
CEO R&D_Fun	.350	.000	.478	.340	.000	.474	.217	.642
CEO Post-grad	.387	.000	.488	.411	.000	.492	1.611	.205
Firm Size	11.619	11.559	.803	11.588	11.572	.832	.072	.789
Debt/Assets	.2157	.1756	.1539	.276	.242	.165	1.549	.214
Ownership Con.	.533	.591	.256	.545	.625	.259	.081	.776
Return on Assets	.1189	.105	.092	.121	.101	.101	1.293	.256

**Table 3: The correlations matrix of variables**

		(1)	(2)	(3)	(4)
	Entrepreneurial				
(1)	Orientation	1.00			
(2)	CEO Narcissism	0.07*	1.00		
(3)	Capital Intensity	0.34*	0.05	1.00	
(4)	SOE	-0.04	0.10*	0.01	1.00
			-		-
(5)	CEO Duality	0.02	0.09*	0.23*	0.09*
(6)	CEO Age	-0.03	0.12*	0.05	0.03
		-			
(7)	CEO Gender	0.09*	0.06	0.02	0.02
(8)	CEO Tenure	-0.01	0.00	0.15*	-0.02
(9)	CEO R&D_Fun	0.07*	0.00	0.22*	-0.02
(10)	CEO Post-grad	0.01	0.02	0.08*	0.06
(11)	Firm Size	-0.01	0.03	0.27*	0.03
		-		-	
(12)	Debt/Assets	0.23*	0.01	0.27*	0.00
(13)	Ownership Con.	0.01	-0.03	0.20*	0.04
				-	
(14)	Return on Assets	-0.02	0.01	0.37*	-0.03

(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1.00								
-0.03	1.00							
0.06	-0.01	1.00						
0.03	0.09*	-0.03	1.00					
0.02	0.17*	-0.01	0.07*	1.00				
-0.01	0.10*	-0.02	0.23*	0.29*	1.00			
0.01	0.15*	0.10*	0.39*	0.13*	0.27*	1.00		
-	-		-	-	-			
0.07*	0.10*	0.06	0.03*	0.17*	0.04*	0.13*	1.00	
							-	
0.01	0.06	-0.02	0.18	0.23*	0.24	0.31*	0.30*	1.00
	-		-	-	-	-		-
-0.04	0.14*	-0.02	0.31*	0.19*	0.25*	0.44*	0.20*	0.53*

**Table 4: Baseline results on the relationship between CEO narcissism and Entrepreneurial Orientation**

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep. Var.	F1.R&D	R&D	F1.R&D	F1.Growth	Growth	F1.Growth	F1.ESO	ESO	F1.ESO
<b>CEO Narcissism</b>	<b>-0.011</b>	<b>-0.013</b>	<b>0.003</b>	<b>0.058**</b>	<b>0.026**</b>	<b>0.065**</b>	<b>0.052**</b>	<b>0.057**</b>	<b>0.059**</b>
	<b>(-0.60)</b>	<b>(-0.72)</b>	<b>(0.13)</b>	<b>(1.98)</b>	<b>(2.16)</b>	<b>(2.18)</b>	<b>(1.98)</b>	<b>(2.54)</b>	<b>(2.20)</b>
Capital Intensity		0.003	0.003		0.007	0.036***		0.037***	0.021
		(0.87)	(1.36)		(1.47)	(2.88)		(4.68)	(1.53)
SOE		-0.002	-0.018		0.003	0.014		0.000	0.016
		(-0.12)	(-0.43)		(0.23)	(0.49)		(0.01)	(0.63)
			-						
CEO Duality		-0.045**	0.058***		-0.008	0.019		-0.031	0.047
		(-2.19)	(-2.70)		(-0.48)	(0.43)		(-1.01)	(1.30)
CEO Age		-0.001	-0.002		-0.001	-0.002		-0.003**	-0.003*
		(-0.74)	(-1.33)		(-0.96)	(-1.26)		(-2.44)	(-1.71)
CEO Gender		0.057***	0.075***		-0.008	-0.066		-0.060*	-0.064
		(2.76)	(2.77)		(-0.43)	(-1.34)		(-1.78)	(-1.48)
CEO Tenure		0.004	0.002		-0.003*	-0.006		-0.005	-0.006
		(1.49)	(0.66)		(-1.69)	(-1.08)		(-1.26)	(-1.26)
CEO R&D_Fun		0.018	0.023		0.003	0.038*		0.016	0.039**
		(0.79)	(0.95)		(0.32)	(1.70)		(0.92)	(1.97)
CEO Post-grad		0.019	0.012		0.015	-0.027		0.026	-0.020
		(0.96)	(0.46)		(1.59)	(-1.32)		(1.59)	(-1.00)
Firm Size		-0.003	0.004		0.003	-0.015		-0.021*	-0.017

		(-0.26)	(0.32)		(0.40)	(-0.99)		(-1.83)	(-1.14)
						-		-	-
Debt/Assets		-0.116**	-0.138*		-0.071**	0.231***		0.265***	0.331***
		(-2.52)	(-2.00)		(-2.29)	(-3.32)		(-4.93)	(-4.75)
Ownership Con.		-0.046**	-0.036		0.044**	-0.070		-0.031	-0.096**
		(-2.08)	(-1.10)		(2.35)	(-1.36)		(-0.85)	(-2.16)
Return on Assets		-0.044	0.142		0.066	0.338**		0.154	0.289**
		(-0.53)	(1.39)		(1.14)	(2.25)		(1.56)	(2.05)
Observations	163	158	115	800	794	580	963	952	695
R-squared	0.692	0.768	0.801	0.163	0.201	0.310	0.164	0.271	0.293

Notes: All regressions are OLS regressions in which we control for province, industry and year fixed effects. To further reduce endogeneity concerns due to reversed causality, in Models 1/3/4/6/7/9 the dependent variables are forward 1-period values denoted as F1.R&D, F1.Growth and F1.ESO. Models 2/5/8 use concurrent value of R&D, Growth and ESO, respectively, as a robustness check. Robust t-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



**Table 5: Moderating factors, CEO narcissism and Entrepreneurial Orientation**

Model	1	2	3
Dep. Var.	F1.R&D	F1.Growth	F1.ESO
CEO Narcissism*Capital			
Intensity	<b>-0.014</b> <b>(-1.49)</b>	<b>0.009</b> <b>(0.32)</b>	<b>-0.035**</b> <b>(-1.99)</b>
CEO Narcissism*SOE	<b>0.072</b> <b>(0.58)</b>	<b>0.164**</b> <b>(2.04)</b>	<b>0.211***</b> <b>(2.82)</b>
CEO Narcissism*CEO			
Duality	<b>0.112</b> <b>(1.64)</b>	<b>-0.019</b> <b>(-0.16)</b>	<b>0.090</b> <b>(1.04)</b>
CEO Narcissism	<b>0.036</b> <b>(1.01)</b>	<b>0.025</b> <b>(0.38)</b>	<b>0.108**</b> <b>(2.24)</b>
Capital Intensity	0.026 (1.66)	0.024 (0.72)	0.068*** (2.86)
SOE	-0.144 (-0.69)	-0.181* (-1.96)	-0.229*** (-2.70)
CEO Duality	-0.181** (-2.66)	0.029 (0.30)	-0.041 (-0.50)
CEO Age	-0.002 (-1.67)	-0.002 (-1.17)	-0.002 (-1.53)
CEO Gender	0.084*** (2.91)	-0.067 (-1.34)	-0.075* (-1.70)
CEO Tenure	0.002 (0.52)	-0.006 (-1.06)	-0.006 (-1.21)
CEO R&D_Fun	0.020 (0.84)	0.034 (1.51)	0.036* (1.87)
CEO Post-grad	0.011 (0.43)	-0.032 (-1.52)	-0.029 (-1.43)
Firm Size	-0.014 (-0.94)	-0.014 (-0.89)	-0.020 (-1.48)
Debt/Assets	-0.100 (-1.43)	-0.262*** (-3.76)	-0.325*** (-5.35)
Ownership Con.	-0.024 (-0.71)	-0.073 (-1.38)	-0.083* (-1.85)
Return on Assets	0.164 (1.58)	0.328** (2.15)	0.352*** (2.60)
Observations	115	580	695
R-squared	0.814	0.316	0.309

Notes: All regressions are OLS regressions controlling for province, industry and year fixed effects. The dependent variables are forward 1-period values denoted as F1.R&D, F1.Growth and F1.ESO. Robust t-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



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