

## ARTICLE

# The beguiling behaviour of narcissistic CEOs: Evidence from repurchase announcements

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## Abstract

We study whether Chief Executive Officer (CEO) narcissism affects a firm's share repurchase announcements and their implementations. Using signature characteristics as a measure of narcissism, we find that US firms with narcissist CEOs are more likely to make repurchase announcements and announce higher repurchase dollar amounts. However, these firms are less likely to follow through. Actual repurchases by these firms are less frequent, and they use a smaller amount of cash for share buyback because they have a higher cashflow sensitivity of cash. Narcissist CEOs' repurchase announcements are less driven by market timing and have a lower announcement effect compared to those by other CEOs. The higher rate and amount of repurchase announcements are more pronounced in poorly governed firms with narcissistic CEOs. These results are robust to various specifications including a difference-in-difference set-up using CEOs' exogenous turnover, controlling for other CEO traits and using an alternative measure of narcissism based on pronoun usage in CEO communications. Collectively, the results presented in this study demonstrate that narcissist CEOs play a critical role in the intensity of share repurchase announcements and their executions, particularly for firms with weaker governance structures.

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CEO duality, CEO narcissism, price trends, share repurchases

**JEL CLASSIFICATION**

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## 1 | INTRODUCTION

In recent decades, share repurchase has become the predominant method of payout, and researchers have been trying to fully understand the factors that affect firms' repurchase plans and their timing. According to Goldman Sachs, S&P500 companies repurchased a record US\$806 billion shares in 2018, well above the US\$550 billion in 2017.<sup>1</sup> Substantial research has focused on the timing of repurchase announcements, the influence of firm characteristics and institutional pressures but, thus far, key organizational leaders' role in the repurchase decisions has been missing.<sup>2</sup> Except for Banerjee et al. (2018) that focus on actual repurchases, the effect of a CEO's psychological characteristics on repurchase decisions has been rarely explored. This is surprising considering the documented evidence of firm executives' influence on firm decisions (Bertrand & Schoar, 2003; Hambrick & Mason, 1984). This paper focuses on an important question that the literature has left unanswered: *Do some managerial behavioural traits influence their repurchase announcement decisions?* The study addresses this critical question by focusing on CEO narcissism.

The upper echelons theory suggests that firm executives' decisions are influenced by their personalities, values, limited cognitive mind, experience and available information (Chatterjee & Hambrick, 2007). Moreover, Carpenter et al. (2004) report that top executives of a firm make decisions based on their past experiences, present and future aspirations. Executives focus not only on their self-interest but also on their ambitions, confidence levels, narcissism, pride, arrogance and overestimated abilities (Hayward & Hambrick, 1997). In line with this, executives are likely to make decisions based on their inherent characteristics. Hence, the personal attributes of executives affect the choices they make for a firm. The CEO is the most powerful executives of the firm, and s/he usually has a strong influence in rewarding and punishing employees including other top executives and managers. Considering the power dynamic of their position, a CEOs' personality traits can have a significant effect on the major decisions and strategic choices of their firm. The relative power of the board and top executives with respect to the CEO can influence the degree to which CEO traits sway the decisions. The top executives are also expected to have some room to manoeuvre when implementing the broad policies of the CEO.

Narcissism is a personality trait that has been well researched in the psychology literature (Emmons, 1997; Goncalo et al., 2010; Raskin & Hall, 1979; Wallace & Baumeister, 2002).

Narcissism is defined by the American Psychiatric Association (APA) as 'a multifaceted personality trait that combines grandiosity, attention seeking, an unrealistically inflated selfview, a need for that self-view to be continuously reinforced through self-regulation, and a general lack of regard for others' (American Psychiatric Association [APA] et al., 2013a). Growing research in finance and accounting finds CEO narcissism to be associated with negative firm outcomes. CEO narcissism is distinct from other CEO traits like overconfidence and conservatism that are more likely to be influenced by recent experiences of the CEOs and current circumstances. Buchholz et al. (2020) find that narcissist CEOs take advantage of accounting choices and engage in accrual-based earnings management. Abdel-Meguid et al. (2021) showed that firms with narcissistic CEOs opportunistically exclude recurring expenses from non-GAAP earnings in order to report good performance, and Olsen and Stekelberg (2016) pointed out that such firms engage

<sup>1</sup> See: US companies cling to share buybacks despite collapse in profits financial times.

<sup>2</sup> For repurchase literature see: Bonaimé (2012), Bonaimé et al. (2014), Brav et al. (2005), Comment and Jarrell (1991), Dann (1981), Eisdorfer et al. (2015), Ikenberry et al. (1995), Isa and Lee (2014), Vermaelen (1981)

more in corporate tax sheltering. Ham et al. (2017) compared the impact of CEO and CFO narcissism on firm financial reporting quality. CFOs play a direct role in the financial reporting process, and this study demonstrates that CFO narcissism exerts a greater influence on financial reporting quality compared to CEOs. This finding underscores the significant role of CFOs in shaping the integrity and accuracy of financial reporting within organizations and, in general, indicates that the non-CEO top executives have some room to influence the implementation of the policies, whereas the CEOs make the broad strategic decisions. The literature also finds that narcissistic CEOs are likely to subject their firms to more lawsuits and litigation risk (O'Reilly et al., 2018); associated with overinvestment and poor performance (Ham et al., 2018); place more emphasis on externally oriented CSR activities (Al-Shammari et al., 2019); increase the riskiness of bank policies (Buyl et al., 2019) and sacrifice compensation for media coverage (Aabo et al., 2022). We focus on the impact of CEO narcissism in the context of repurchase decision but try to test how the relative power of the CEO with respect to the board, CFO and other executives might influence the degree of the impact.

Share repurchase is a mode of paying out free cash to shareholders but the timing of the repurchase is often determined by the perceived undervaluation of the company's share price by the insiders. Based on the market timing motivation, we hypothesize that there is a positive relationship between CEO narcissism and the announcement of share repurchases. We base our argument on the unrealistically inflated self-image and overestimated self-intelligence narcissist CEOs (Zajenkowski et al., 2022). The inflated views of their own abilities make narcissistic CEOs more likely to perceive their firm's share more underpriced. Narcissist CEOs are likely to value their shares above the prevailing price of their firm more often. In line with this, these companies are more likely to use the share repurchase announcement as a share price management mechanism rather than a channel to transfer free cash to shareholders.

To empirically examine the relationship between CEO narcissism and repurchase announcement, we follow existing literature (Chou et al., 2021; Church et al., 2020; Ham et al., 2018) and create a narcissism score for each CEO. Chaudhari and Thakkar (2019) provide a survey of the research in the psychology area that establishes that handwriting styles reflect personality. Following Ham et al. (2018), we measure CEO narcissism using the area per character signature size narcissism measure. Using an unobtrusive measure such as signature size reduces the reactivity, researcher expectation and demand characteristics that can weaken the measure's validity (Chatterjee & Hambrick, 2007). We draw a rectangle that touches the CEO signature's edges to measure the area per character signature size. We measure the area by multiplying the length and width of the rectangle. We measure CEO narcissism by dividing the area by the number of characters in the CEO's signed name. According to our prediction, the greater the CEO's narcissism score, as measured by the signature size, the more likely the announcement of repurchases and target a larger dollar amount.

Using a sample of 7816 firm-year observations of S&P500 firms over the period 2000–2018 for which narcissism measures are available, we find strong evidence that narcissist CEO-managed firms are more likely to announce more share repurchases and announce a larger dollar amount than other firms. The results are economically significant: A one standard deviation increase in the area per character narcissism measure leads to a 14.9% increase in the likelihood of a share repurchase announcement. Moreover, a one standard deviation increase in the area per character narcissism measure increases the dollar amount of targeted repurchase by 23.3%.

Next, we examine the likelihood of a narcissistic CEO making an actual repurchase and the dollar amount repurchased. We point out that narcissistic CEOs are more likely to use repurchase as a price adjustment tool due to their inflated self-view causing them to register their disagreement with the current market value of their company rather than a mode of paying out. Furthermore, they may pay out less as parting with cash may be considered more costly by narcissist CEOs due to a higher sense of personal insecurity (Kowalchuk et al., 2021). We find that narcissistic CEOs are less likely to make an actual repurchase, and when they decide to repurchase, they allocate less dollar amount towards such activities. We further analyse why narcissistic CEOs make more announcements but fail to follow through to complete them. One argument is that narcissist CEOs use repurchases announcement as a share price management mechanism rather than for the intention to payout excess cash; hence, there is no incentive to follow through to make actual repurchase unless it is necessary to correct underpricing. We also point out that narcissistic CEO have higher

insecurities and are more like to hold on to a higher portion of operating cash flows as cash balance. Using a partitioned sample based on narcissism score, we find that narcissist CEOs have more demand for liquidity and these firms have a more positive and significant cashflow sensitivity of cash. This suggests that narcissistic CEOs prefer to use additional operating cash flows to increase their liquid assets rather than to transfer this to shareholders in the form of share repurchases.

Considering the frequent repurchase announcement of narcissistic CEOs, it is important to check whether they are able to time the market and influence the price using repurchase announcements. In doing this, we examine the pre and post-cumulative abnormal return around a firm's repurchase announcement. We find negative Cumulative Average Return (CAR) prior to the announcement of repurchase for the average firm consistent with existing literature (Evgeniou & Vermaelen, 2017). However, the narcissist CEO-managed firms have insignificant negative prior CAR. Moreover, we find lower CAR post-repurchase announcements for narcissist CEO-managed firms than other CEOs. This is because narcissistic CEOs are more likely to poorly time the market because of their inflated perceived share price. Therefore, they make frequent repurchase announcements without rationally considering whether their shares are truly undervalued. Another possible reason for the lower market reaction could be due to the market not putting a high probability of the announcement to be implemented. Further, we examine whether CEO narcissism independently drives the post-announcement returns of repurchase announcements. Using different event windows in a multivariate setting, we find that CEO narcissism negatively affects short-term CAR post-repurchase announcements. This indicates that the credibility of a firm's repurchase announcement is negatively influenced by the narcissism of the CEO. The market possibly sees the repurchase announcements of narcissistic CEOs as a stock price signalling mechanism that is less likely to be implemented rather than a channel to transfer free cashflow to shareholders.

Share repurchase is not a short-term decision. Firms require authorization from the board before the announcement. In line with this, it is important to consider the stock performance in prior years to test whether negative prior-year returns influence the repurchase decisions of narcissistic CEOs. Accordingly, using a partitioned sample based on firms with negative and positive prior-year stock return (Comment & Jarrell, 1991), we find narcissist CEOs making repurchase announcements even when they have positive prior-year stock returns.

This suggests that narcissistic CEOs consider the stock price of their companies underpriced more often when stock price increased in the previous because they perceive their companies to have a value above what is reported by the market even when the trend is rising. This distorted view of narcissist CEOs influences them to announce repurchases to indicate their disagreement with how their shares are priced.

CEOs are at the top of the decision chain but firms' strategies can be influenced by other senior executives and the board of directors if they have a bigger say. Using the argument of the moderating effect of good governance on CEO discretion on the firm's risk-taking other strategic decisions by Li and Tang (2010), we predict that a narcissist CEO with more power (*a CEO who is subject to lower levels of scrutiny or opposition*) will announce more share repurchase than other CEOs. A well-governed firm where managerial discretion is strictly monitored is likely to mitigate a narcissistic CEO's impact and control their repurchase announcements. Patton and Baker (1987) report that the dual role of a CEO as chair of the board causes significant agency problems. This is because the board's role in supervising the CEO on behalf of shareholders is lost. Consistent with this view, we find those narcissistic CEOs doubling as the chair of the board of directors announces more repurchases and targets larger dollar amounts than other CEOs.

A potential concern of this study is that the appointment of CEOs can be endogenous. That is, some board members are interested in some personal characteristics of a CEO before an appointment. A firm may appoint a narcissistic CEO because of their narcissistic traits, and hence, such appointments can be endogenous. Ham et al. (2018) find that narcissist CEOs perform poorly, and companies may consider such characteristics before appointments. This may be a motivation for some firms to employ CEOs with some particular characteristics. If firms appointing narcissist CEOs are also more likely to announce share repurchases, there is some level of selection bias. Further, if firms that make frequent repurchase announcements also prefer to appoint narcissist CEOs, there is an endogeneity concern.

The study addresses endogeneity concerns in three ways. First, as narcissism is a stable personality trait (Raskin & Terry, 1988), one key concern in analysing the effect of CEO narcissism on corporate repurchase announcements is to identify an exogenous shock that can change the level of narcissism in the CEO. We adopt a similar approach used by Shang (2021) to address this concern by focusing on CEO exogenous turnover. We employ a difference-in-difference (DiD) estimation method that provides a more robust identification of the relationship between CEO narcissism and repurchase announcement. Using CEO exogenous turnover events, we find an increase (decrease) in the likelihood of repurchase announcements following CEO turnover events where the departing CEO is replaced with another with a higher (lower) narcissism score. This indicates that narcissistic CEOs act differently from other CEOs in terms of repurchase announcement decisions. Second, for each firm-year observation with a narcissist CEO (CEOs with narcissism score greater than the mean of the sample), we match it with other CEO in the same year and industry from a different firm with the closest propensity score calculated based on firm and CEO-related characteristics. Firms with similar characteristics are likely to have an equal probability of appointing a narcissistic CEO. The results regarding both announcements of and actual repurchases remain qualitatively similar when we use this matched sample for the empirical analysis. This assures us that CEO narcissism effect is not explained by firm and CEO observable difference between narcissist-managed firms versus others. Finally, we control for firm fixed effects that remove the impact of time-invariant firm characteristics. Using firm fixed effects, we find CEOs with high narcissism scores announce share repurchases more frequently than firms with other CEOs.

Finally, the study results are robust after controlling for CEO overconfidence and conservatism. We find that the repurchase announcement activities of narcissistic CEOs are beyond their overconfidence and not driven by their conservatism. Using an alternative measure of narcissism, our results remain significant and robust. We also create residual signature size variables (*Resid narcissism*) from the raw signature size OLS regressions on the CEO demographic characteristics and other traits. Using the residual variable, we find similar and robust results that support our main findings.

Our study contributes to several strands of the literature. First, the results contribute to the literature on the impact of CEO narcissism on corporate decision-making. The study introduces an additional factor in determining repurchase activities: CEO narcissism. This provides an insightful addition that the payout motive may not be the prime motive for share repurchase announcements by narcissist CEOs. The unrealistic inflated image of narcissistic CEOs' makes them more likely to perceive their companies as underpriced and put forward a repurchase plan. However, these CEOs prefer to hold on a higher portion of their operating profit as cash and less likely to actually pay out. The paper also makes some indirect contributions to the corporate governance literature. We find support for Li and Tang (2010) results that poor governance escalates the impact of CEO discretion in firms. We demonstrate this by finding a significant positive relationship between repurchase announcements and a narcissist CEO doubling as the chairperson of the board of directors.

The results of this study have important implications for investors and the board of directors. As firm CEOs are key decision-makers, their psychological traits (narcissism) are essential for the firm's decisions. Although research has associated CEO narcissism with authority, self-reliance and supremacy that can foster leadership effectiveness, promote company performance and be attractive to loyal employees (Hogan & Kaiser, 2005; Maccoby, 2000), narcissistic CEOs are likely to act on their characteristics to perceive their companies as underpriced and announce more repurchases. Thus, when companies are recruiting CEOs, they should consider their narcissistic traits and capabilities, which may also influence the firms' path for the announcement of share repurchases.

The rest of the paper is organized as follows. Section 2 provides the literature and the hypotheses, and Section 3 describes how data are collected, the definition of key variables and the sample construction. Section 4 presents empirical analysis and the main results of the study. Section 5 shows the robustness test, and Section 6 presents our conclusion.

## 2 | BACKGROUND LITERATURE AND HYPOTHESES

### 2.1 | CEO narcissism

Bertrand and Schoar (2003) report that firm executives influence the decisions of organizations. The type of executives in the organization influences the strategic choice and performance of an organization. Theoretically, the influence of firm executives' inherent characteristics on the strategic choices and performance of a firm is rooted in the upper echelon theory. Accordingly, Hambrick and Mason (1984) suggested that executives' perceptions, values and cognitions reflect in the decisions they make for and on behalf of the organizations they lead. Carpenter et al. (2004) reported that top executives of a firm make decisions based on their past experiences, present and future aspirations. Executives focus not only on their self-interest but also on their ambitions, confidence, narcissism, pride, arrogance and overestimated abilities (Hayward & Hambrick, 1997). In line with this, the narcissism of a CEO can affect both the rational and irrational choices of a firm.

Narcissism is defined by the APA's Diagnostic and Statistical Manual for Mental Disorders as a personality trait that combines attention seeking, grandiosity, the need for reinforcement of self-view through self-regulation, unrealistic inflated self-image and a lack of empathy and regard for others (APA, 2013b). *Attention seeking* implies that an individual ensures that he/she becomes the focus of attention. *Grandiosity* is the belief that the individual is better than others. *Self-regulation* is the strategies an individual use to manage and shape their self-image. *Unrealistic inflates self-view* is the overinflated, distorted and biased picture of one's self. Finally, a general lack of regard for others refers to a *lack of empathy* towards others and a tendency to exploit situations and persons for personal gain.

The influence of the executive's personality on firm decisions has heightened researchers' interest in the personality of CEOs and how this can affect the fortunes of a firm (Chatterjee & Hambrick, 2007, 2011). Early research by Kernberg (1967) finds narcissists to exhibit characteristics like grandiose imaginations, self-importance, over-dependence, cleverness, egoism, dominance, ambition, lack of empathy and constant need for supremacy.

CEOs are considered incredibly special in an organization because of the position they hold. Such a position gives them a sense of power and influence which inflate their self-esteem. Considering the status of a CEO in a firm, they are likely to score higher on a narcissism scale compared to an average individual (Chatterjee & Hambrick, 2007).

Other personality traits such as overconfidence have been shown to be related to narcissism (Aktas et al., 2016). Campbell et al. (2011) find a positive correlation between narcissism and overconfidence. Despite some overlapping characteristics between narcissism and overconfidence, overconfidence is a cognitive bias that only relates to a perception of reality, whereas narcissism includes both cognitive bias and behavioural personality trait (Aktas et al., 2016). According to Ham et al. (2018), the constant quest for respect and devotion and the sense of power and willingness to emphasize one's self-interest is the main difference between narcissism and other psychological traits. Empirical support by Bosson et al. (2008) using a betting setting finds that the poor performance of narcissist individuals is not because of their overconfidence alone but the strong propensity to take more risk.

#### 2.1.1 | CEO narcissism and firm outcome

Research has examined the overall impact of CEO narcissism on firm performance but these have provided mixed results. Early studies by Chatterjee and Hambrick (2007) find CEO narcissism engendering the extremes and fluctuations in firm performance. Their results indicate that narcissist-managed firms are no better or worse than other firms. Likewise, Olsen et al. (2014) report that narcissist CEOs have higher earnings-per-share (EPS) compared to other non-narcissist CEOs. Specifically, the study finds that narcissistic CEO-managed firms have higher EPS and share price than other CEO-managed firms. They examine the mechanism driving the observed results and find that narcissistic CEOs are more likely to increase reported EPS through real and operational activities rather than accrual-based

manipulations. However, Ham et al. (2018) find firms led by narcissist CEOs experience lower financial productivity in the form of profitability and operating cash flows.

Exploring the relationship between CEO narcissism and innovation, Kashmiri et al. (2017) argue that narcissist-managed firms are more likely to introduce new products and a greater proportion of radical innovations in their new product portfolios. Moreover, Zhang et al. (2017) find humble narcissist CEOs likely to cultivate an innovative culture and deliver better innovative performance. Ham et al. (2018) argue that CEO narcissism is associated with over-investment through research and development and mergers and acquisition expenditures.

Understanding the risk-taking activities of narcissist CEOs, Buyl et al. (2019) find narcissist CEOs to be associated with risky bank policies, especially when compensation is tied to risk-taking. Similarly, Chatterjee and Hambrick (2011) argue that narcissist CEOs take risky firm decisions for recognition. Further, narcissist CEOs increase the financial leverage of their firms to improve performance (Buyl et al., 2019; Capalbo et al., 2018).

Narcissist CEOs take bold decisions to obtain frequent attention and praise. In pursuit of this, narcissist CEOs are likely to engage in fraudulent activities (Rijsenbilt & Commandeur, 2013). Moreover, CEO narcissism is associated with a low probability of completing acquisition deals that they announce (Aktas et al., 2016). The above discussions indicate that CEO narcissism plays a key role in firm decisions.

## 2.2 | Share repurchase

Shares repurchase programmes begin with authorization by the board of directors. After approval, the firm announces the programme publicly to avoid any liability under insider trading laws. Firms disclose the maximum number of shares, dollar value and how the shares will be acquired. An announcement of a repurchase programme is, however, not a commitment to repurchase. In executing a repurchase programme, the firm employs the services of an investment bank. This helps price manipulations and complies with the safe harbour rules of Securities and Exchange Commission (SEC) Rule 10b-18.

Share repurchase is a major financial decision, and it has been well researched.<sup>3</sup> The literature has focused on the motives of repurchase, market reactions to repurchase-related events, the timing of the announcement, the price paid to acquire shares, the timing of actual repurchase, the short- and long-term performance of shares after the announcement and the actual repurchase (Banerjee et al., 2018; Bonaimé et al., 2014; Dittmar & Field, 2015; Evgeniou & Vermaelen, 2017; Grullon & Michaely, 2004).

Considering the numerous motivations for share repurchase, Dittmar (2000) finds five traditional motives for announcing a share repurchase, including potential undervaluation signalling, transfer of excess cash to shareholders, attaining a targeted leverage ratio, control for the dilution by employee options and to deter takeover activities. These reasons for share repurchases are likely to be affected by the personality traits of a CEO, specifically, the narcissistic personality trait of a CEO.

According to Vermaelen (1981) and Comment and Jarrell (1991), the undervaluation signalling hypothesis suggests that managers of firms use share repurchase announcements to signal that their firms' stocks are undervalued and that their firms have good prospects in the future. With a sample of 243 open market repurchase announcements from 1962 to 1976, Vermaelen (1981) finds that price reactions related to repurchase events are consistent with the undervaluation hypothesis. Isa and Lee (2014) argue that it is logical for management to repurchase their shares if they are confident that the market is undervaluing them. Brav et al. (2005) assert that managers who make share repurchase announcements rank stock undervaluation as a primary reason. This is because share repurchase announcements convey more information about stock valuation than the announcement of dividend payments. They further report that more than 85% of executives in their survey believe that repurchase announcements give investors

<sup>3</sup> Evgeniou and Vermaelen (2017), Dittmar and Field (2015), Grullon and Ikenberry (2000), Grullon and Michaely (2004), Eisdorfer et al. (2015), Isa and Lee (2014), Bonaimé (2012), Brav et al. (2005), Comment and Jarrell (1991), Vermaelen (1981), Dann (1981) and Dittmar (2000).

information and more than 86% of firms repurchase when their stocks are undervalued. However, investors may not consider the repurchase announcement as a prime signal of undervaluation in part due to the increasing use of share repurchases as a mechanism to distribute cash to shareholders (Grullon & Michaely, 2004).

A body of literature points out that firms try to maintain a target capital structure and when they deviate from it, they have several options. Fama and French (2002) explain that a firm could slowly adjust its leverage towards the targeted level. This can be done by issuing equities or reducing debt to decrease leverage and can also be achieved by repurchasing equity or issuing debt to increase leverage. When a firm gives capital back to the shareholders through a repurchase agreement, it increases its leverage ratio. According to the Modigliani Miller theorem, a company's market value can be improved by changing the firm's leverage ratio. When a company increases its leverage by increasing debt, it receives some tax deductions, which enhances the firm's profitability. Dittmar (2000) tests the leverage motive of repurchase by using all firms listed on the Compustat database between 1977 and 1997 and concludes that firms with lower leverage ratios are more likely to repurchase stock to increase their leverage ratio, whereas high-leveraged firms are unlikely to engage in share repurchases activities.

In addition to the economic motives, some personal characteristics and traits of CEOs can influence repurchase decisions. For example, if a CEO is more likely to overvalue their firm, they might want to repurchase more. On the other hand, if a CEO is insecure, they may want to maintain a higher level of cash and payout less. In Section 2.3, we discuss how CEO narcissism influences a firm's repurchase announcement, perceptions about stock valuation and actual execution decisions. We also discuss the trade-off between payout and cash holding in the context of actual repurchase. Our empirical analyses address these issues and contribute to the extant literature on the effects of CEO traits on financial decisions.

## 2.3 | Hypotheses

Brav et al. (2005) report that the prime motive for repurchase announcement is the signalling hypothesis. The signalling hypothesis asserts that firms announce repurchases when their shares are priced lower than what they expect them to be (Comment & Jarrell, 1991; Vermaelen, 1981). Therefore, when firms are confident that their shares are being priced lower by the market, it is logical for them to announce their disagreement through a repurchase plan (Isa & Lee, 2014). The psychology literature finds narcissist individuals to have inflated self-images and overestimated self-intelligence (Zajenkowski et al., 2022). These inflated abilities make narcissistic CEOs value their firm more optimistically and they are more likely to perceive their firm's share as underpriced when they are not. In line with this, narcissist CEOs are more likely to use the share repurchase announcement as a signalling and share price management mechanism relative to other CEOs. We propose and test the following hypothesis:

**Hypothesis 1.** Narcissist CEOs are more likely to announce share repurchases.

Following the same argument, we would expect CEOs who undervalue their stock to be making larger dollar amounts of actual repurchases. Announcing a repurchase plan is, however, easier to do as it could be cheap talk, whereas actual repurchases involve parting with cash which increases the risk profile of the company. Kowalchuk et al. (2021) report that the narcissistic trait is characterized by insecurities. The more insecure a CEO is, the more value he is going to put into cash holding. Narcissistic CEOs are likely payout less and use repurchase announcements as a price signalling tool rather than a payout mechanism. In spite of the expected price reaction to actual repurchases, on the balance, we expect narcissistic CEOs to make actual repurchases less often and repurchase lower dollar amounts when they do. We formally write this hypothesis in the following:

**Hypothesis 2.** Narcissist CEOs are less likely to make actual share repurchases and repurchase lower amounts.



As explained above, narcissistic CEOs are more likely to make repurchase announcements but fail to follow through to completion more often. Operating profits can be used in different ways, including investment, payout or/and increased cash holding. Ham et al. (2018) point out that narcissist CEOs over-invest. Therefore, we would expect narcissistic CEOs to invest more and payout less. The insecurities of the narcissist argument would indicate that narcissist CEOs would want to save more cash than the payout. Both the overinvestment and higher preference for cash holding can explain lower actual repurchase. We try to empirically establish whether narcissistic CEOs are more likely to keep a larger portion of cash flow as liquid assets. We formally state the testable hypothesis in the following:

**Hypothesis 3.** Narcissist CEO-managed firms display a higher cash flow sensitivity of cash relative to other CEOs.

As discussed above, narcissist CEOs are more likely to use repurchase announcements as a price adjustment mechanism, but also likely to overvalue their share because of their inflated self-image. Hence, the effectiveness of market timing of repurchase announcements by narcissistic CEOs is an interesting empirical question. On balance, we expect that the impact of the overvaluation dominates and narcissistic CEOs are more likely to poorly time the market. We may find the stock returns prior to announcement of repurchase less negative for firms with narcissistic CEOs if they are more likely to overvalue their stock and the market may not react to the announcement as strongly. Moreover, if the market believes that narcissistic CEOs are less likely to follow through with their announcement, we would expect to see a negative relationship between CEO narcissism and repurchase announcements.

If narcissist CEOs are less efficient in timing the market because of their inflated image, we expect a smaller signalling effect following the repurchase announcement compared to other CEOs. Moreover, if the market believes that narcissist CEOs are using repurchase announcements as a stock price management mechanism rather than a payout channel, we would expect to see a negative relationship between repurchase announcement returns and CEO narcissism.

We formally test the hypothesis in the following:

**Hypothesis 4a.** Short-term excess return after repurchase announcement will be smaller for firms with narcissist CEOs.

**Hypothesis 4b.** Prior returns are likely to be less negative for firms with narcissist CEOs compared to other firms.

Although CEOs are the most powerful executives in a company, governance mechanisms often limit their disagreeable activities. We would expect the personality traits of CEOs with more power to have a greater impact on firm decisions. There are several studies on the impact of a CEO also serving as the chairperson of the board of directors on firm outcomes. Early research by Donaldson and Davis (1991) find that CEOs with dual roles as chairs of the board lead to a concentration of power. Even though the separation of the CEO and chair of the board protect shareholders' interest as argued by the agency theory, the study finds that the concentration of power improves operational efficiency. Alternatively, Patton and Baker (1987) report that the dual role of a CEO as chair of the board causes some agency problems. This is because the board's role in supervising the CEO on behalf of shareholders is lost. Moreover, CEO duality can negatively affect a company's performance as the supervision function of the board of directors is weakened by duality.

In line with this, Li and Tang (2010) find that CEO hubris and risk-taking abilities are higher when the CEO has more power and discretion without resistance. Likewise, a narcissist CEO with more power – *a CEO who is not subject to scrutiny or opposition is likely to act on their own beliefs and announce repurchases based on their distorted views*. Tang et al. (2011) report that there are different dimensions of CEO power structural, ownership and expert.

As repurchase announcement requires approval from the board of directors, narcissist CEOs with power over the board are more likely to make more repurchase announcements. One way to increase the power of the CEO on the board is by appointing him/her as the chair of the board of directors (*Duality*). We formally test the hypothesis in the following:

**Hypothesis 5.** The frequent repurchase announcement by narcissist CEOs is more pronounced in firms where the CEO has more power over the board.

### 3 | DATA AND SAMPLE SELECTION

To test the relationship between CEO narcissism and share repurchase announcements, we compile a dataset of signature characteristics and other relevant data of S&P500 constituents over a period between 2000 and 2018 (882 unique firms and 2245 unique CEOs). We start our study period from 2000 because we collect some data from Boardex that do not have data before 2000. We delete financial (SIC codes 6000-6999) and utility (SIC code 4900-499) firms as these firms are subject to regulations and different accounting reporting principles (208 unique firms and 514 unique CEOs were deleted). Further, we delete firms and CEO observations where we are unable to collect information on the CEO narcissism score (97 unique firms and 613 unique CEOs deleted). The final panel dataset consists of 7686 firm-year observations for 577 unique firms and 1118 unique CEOs. To identify repurchase announcements made by the 577 unique firms over the period 2000 to 2018, we search the Thomson One database. A repurchase announcement is included in our sample if the firm reports the dollar value of shares they intend to repurchase. We now define our repurchase presence variable (announcement indicator), which is equal to one when a firm makes a repurchase announcement in a year and zero otherwise. In addition, we examine the intensity of the repurchase announcement which is the dollar amount of shares the firm targets to repurchase. Like Grullon and Michaely (2004), we collect data on actual share repurchases from Compustat. This allows us to create our actual repurchase presence (actual indicator), which takes the value of one when a firm makes an actual repurchase in a year and zero otherwise and examines the dollar amount a firm spends on repurchase in a fiscal year. From Compustat and Boardex, we obtain a set of control variables that might influence a firm and a CEO's decision to announce and/or repurchase shares. We then merge the data on CEO narcissism and other firm and CEO-level control variables that might affect share repurchase decisions.

#### 3.1 | Measuring CEO narcissism

Previous research has indicated that it is challenging to get CEOs to complete the narcissism personality inventory (NPI) as firm executives are reluctant to take a personality test. Hence, an unobtrusive measure such as signature size is used to capture the narcissism traits. Ham et al. (2018) reports that the area per character signature size measure of narcissism correlates with the Narcissistic Personality Inventory (NPI) scores. The authors demonstrate the robustness of this in many ways, even after controlling for overconfidence. In addition to the novel nature of the measure, the study chooses to use it to capture CEO narcissism because it is theoretically grounded in the psychology and personality literature (Dillon, 1988; Jorgenson, 1977; Zweigenhaft, 1970; Zweigenhaft & Marlowe, 1973, 1977). Further, the signature of CEOs is readily available and can be measured. On 27 June 2002, the SEC ordered all CEOs and CFOs of firms with revenue over \$1.2 billion to provide handwritten signatures to attest to the reliability of their financial statement. Before this order, some firms already used to provide their handwritten signatures. For example, Jerald G. Fishman of Analog Devices Inc. has provided handwritten signatures since 1999. We obtain every CEO's most recent handwritten signature from the annual report or the proxy statement from the US SEC. In cases where the CEO's signature is not present in the proxy statement or annual report, we check other online sources for the CEO's signature.

For example, Warren Buffett, CEO of Berkshire Hathaway's signature was retrieved from a report he shared online.<sup>4</sup> The narcissism score is measured as the area per character of the CEO's signature size. A rectangle is drawn around the CEO's signature, where each side of the rectangle touches the extreme endpoints of the signature. The area

<sup>4</sup> See: Warren Buffet signature.

is the *length*  $\times$  *width* (in centimetres) of the rectangle. The number of characters in the CEO's sign name then divides the area. As narcissism is a stable personality trait as detailed by the psychology literature (Raskin & Terry, 1988), we compare the current CEO's signature to that of the early years of the CEO appointment to ensure that the CEO's signature does not change over time. In instances where there is a change in the CEO's signature, we use the most recent signature. For example, Frank Martire of Fidelity National Information Service had different signatures in 2009<sup>5</sup> and 2013.<sup>6</sup> To validate our signature size measure, we compare our descriptive statistics with that of Ham et al. (2018) by limiting our sample to their sample period and find a mean of 0.485, which is similar to 0.493 reported by Ham et al. (2018).

Despite the novel nature of the signature size measure of narcissism, there are other unobtrusive measures of narcissism. Chatterjee and Hambrick (2007, 2011) define a composite measure of narcissism. This measure includes five components: (1) the relative cash pay of the CEO to the next-highest paid executive, (2) the relative non-cash pay of the CEO to the next-highest paid executive, (3) the size of the CEO's picture in the annual report, (4) the number of CEO mentions in company press releases, and (5) the number of first-person singular pronouns used by the CEO during interviews. We do not use this narcissism measure in our study because of the following limitations. First, Brown (2016) argue that Chatterjee and Hambrick (2007) narcissism index has limited empirical validation and may not be directly linked to CEO narcissism. Moreover, the index may measure other personality traits different from narcissism. More specifically, the CEO compensation may be measuring CEO overconfidence. Second, the picture size of a CEO is a time varying measure and also beyond the control of the CEO (Cragun et al., 2020). Further, the two compensation components of the index may be influenced by firm size (Tosi et al., 2000).

Aktas et al. (2016) and Capalbo et al. (2018) use personal pronoun usage as a stand-alone measure of CEO narcissism. This measure uses the speech style of a CEO in interviews and conference calls to measure narcissism. They calculate the narcissism score as the ratio of singular pronouns to plural pronouns used in a CEO speech. We use CEO pronoun usage as an alternative measure to test the robustness of our findings.

### 3.2 | Control variables

Following existing literature, we employ a set of control variables that affect firm repurchase decisions. Data on the firm and CEO-level control variables are collected from Boardex, Datastream and Compustat. Firm-level control variables include firm size, leverage, market-to-book, prior-year stock return, cash holding, cash flow, cash flow volatility, capital expenditure and dividend. CEO-level controls include age, gender, duality, board size, percentage of shares owned by the CEO, CEO tenure, CEO equity-linked compensation and outside directorship. All these variables are defined in the [Appendix](#).

### 3.3 | Descriptive statistics

After merging the hand-collected CEO narcissism score with all firm and CEO-related data, we winsorise all variables at the 1st and 99th percentile to eliminate all outliers, which may influence the study results. From Table 1, we report the descriptive statistics of the full and split samples. We split the sample by whether the CEO's narcissism score is above the sample's median (Narcissist) or below the median (Other). We compare the mean and median of the split sample based on CEO and firm-related characteristics. Columns 1 and 2 report the full sample summary statistics; columns 3 and 4 (5 and 6) report summary statistics of the narcissist CEO sample (other CEO samples).

<sup>5</sup> See: page 6 of 2009 Fidelity National Information Service Annual Report.

<sup>6</sup> See: page 5 of 2013 Fidelity National Information Service Annual Report.

**TABLE 1** Univariate analysis summary statistics.

	Full sample (8637)		Narcissist CEO (4211)		Other CEO (4426)	
	Mean	Median	Mean	Median	Mean	Median
<b>Firm related</b>						
Return on asset	0.06	0.06	0.04	0.04	0.059***	0.059***
Firm size	8.93	8.84	8.97	8.91	8.90**	8.78***
Research and development	0.03	0.00	0.04	0.01	0.03***	0.00***
Market-to-book	1.82	1.42	1.81	1.42	1.83	1.43
Capital expenditure	0.05	0.04	0.05	0.04	0.05	0.04
Cash dividend payout	0.24	0.15	0.24	0.14	0.25	0.16*
Cash flow volatility	0.03	0.02	0.03	0.02	0.03	0.02
Cash flow	0.10	0.10	0.10	0.10	0.11***	0.11***
Slack	0.14	0.09	0.14	0.09	0.13**	0.08***
Book leverage	0.26	0.24	0.27	0.24	0.26*	0.24
Stock return	0.01	0.01	0.01	0.01	0.01	0.01
<b>CEO related</b>						
CEO overconfidence	0.27	0.21	0.26	0.21	0.24**	0.20*
CEO conservatism	0.49	0.00	0.41	0.00	0.59***	1.00***
CEO age	56.09	56.00	56.04	56.00	56.14	56.00
CEO gender	0.97	1.00	0.96	1.00	0.97	1.00
CEO share ownership	5.96	5.83	5.93	5.84	5.98	5.82
CEO tenure	5.22	3.80	5.15	3.80	5.29	3.80
CEO duality	0.71	1.00	0.72	1.00	0.70**	1.00
Equity-linked compensation	0.47	0.53	0.48	0.53	0.47	0.52*
Outside directors	0.80	0.83	0.80	0.85	0.79***	0.83**
<b>Repurchase related</b>						
Announcement indicator	0.17	0.00	0.19	0.01	0.15***	0.00***
Announcement amount	0.03	0.00	0.03	0.01	0.02**	0.00**
Actual repurchase Indicator	0.72	1.00	0.71	1.00	0.74***	1.20***
Actual repurchase Amount	0.04	0.02	0.04	0.01	0.04**	0.02**

Note: The table presents the descriptive statistics of the variables used in this study. All variables are defined in the [Appendix](#). Columns 1 and 2 report the descriptive statistics for the full sample. Columns 3 and 4 (5 and 6) report descriptive statistics for the narcissist (other CEO) managed firm-year observation. \*, \*\* and \*\*\* denote significance difference at 10%, 5% and 1% levels, respectively.

Considering the full sample in columns 1 and 2 in [Table 1](#), on average, 17% of the sample announce a repurchase and 72% make the actual repurchase. The sample mean profitability is 5.7%, with a mean capital expenditure of 5% of total assets; cash is 14% of the total asset on average. The mean CEO age is 56 years, CEO tenure is 5 years, and the female CEOs comprise 3.4% of the sample. On average, CEOs own 6% of company shares, and the average narcissism score is 0.479, ranging from 0.107 to 2.062.

The univariate analysis of the means of firm-related characteristics indicates that narcissist CEOs manage small firms, perform lower than other CEOs and spend more on research and development (Ham et al., 2018). In addition, they have high book leverage and keep more cash. Examining the CEO and board-related characteristics by comparing

the means and medians of the subgroups, we find narcissistic CEO-leaning firms to be more overconfident and less conservative. Second, narcissist learning firms have their CEOs acting as the board's Chairman and have a higher number of outside directors. Finally, we compare the means and medians of the split sample presence and intensity of share repurchase announcements and actual repurchase. On average, the narcissistic CEO sample has a higher likelihood of repurchase announcements and targets a higher dollar amount compared to other CEOs. However, the narcissistic sample is less likely to make an actual repurchase of the shares announced compared to other CEOs.

Using Pearson correlation matrix between CEO narcissism and our primary dependent and control variables (unreported because of brevity). We find the CEO narcissism score to be positively correlated with the repurchase announcement indicator, whereas there exists a negative correlation between CEO narcissism and actual repurchase. Moreover, firm profitability correlates negatively with CEO narcissism. This is not surprising considering the reported negative relationship between firm performance (ROA) and CEO narcissism (Ham et al., 2018).

Moreover, the area per character signature size measure of narcissism may reflect CEO conservatism. Duong et al. (2021) report that the style and nature of a CEO's handwritten signature capture the conservative traits of the CEO. They classify managers signing their full names as liberal and other variations such as only first name or abbreviation signatures as conservative. Following Duong et al. (2021), we classify our sample CEOs into conservative and liberal. Like the significant difference between the average difference between the conservatism of narcissists and other CEOs, we find a negative and significant correlation between our CEO's narcissism and conservatism proxy. This suggests that narcissism and conservatism do not capture the same trait.

Further, research has indicated some similarities between narcissism and overconfidence, which are well-studied in the finance literature (Campbell et al., 2004). Considering this, a potential concern of this study is that the narcissism measure used might capture a CEO's overconfidence. We construct an overconfidence measure using the CEO's options holdings (Banerjee et al., 2018; Malmendier & Tate, 2005). We find a positive correlation between CEO narcissism and the overconfidence proxy. The coefficient is relatively small (0.02), suggesting that a narcissistic CEO may have some level of overconfidence. However, the narcissism and overconfidence proxy do not capture the same personality trait. Thus, being a narcissist does not necessarily mean you are overconfident or vice versa.

## 4 | EMPIRICAL ANALYSIS

### 4.1 | CEO narcissism and share repurchase announcements

From hypothesis 1, we predict that narcissist CEOs are more likely to announce repurchases compared to other CEOs. We test this empirically using the following equation:

$$\text{announcement}_{i,t} = \alpha + \beta \text{narcissism}_{i,t} + \theta X_{i,t} + \gamma Y_{i,t} + \rho_t + \delta_j + \varepsilon_{i,t} \quad (1)$$

In the above equations, the  $\text{announcement}_{i,t}$  dependent variable takes on two variables: the presence and intensity of the repurchase announcement. Announcement presence is a dummy variable that equals one if a firm announces a repurchase in a fiscal year and zero otherwise. The announcement intensity is the targeted repurchase dollar amount scaled by the firm's total assets at the end of the fiscal year. Narcissism is the area per-character signature measure of CEO narcissism.  $X_{i,t}$  and  $Y_{i,t}$  are vectors of CEO and firm-level control variables that may affect a CEO's decision to announce shares repurchase.  $\rho_t$  and  $\delta_j$  represent year and industry fixed effects, respectively. We estimate the announcement indicator regression with a logit model and the announcement value regression with a tobit model with a lower bound of zero. In both models, standard errors are clustered at the firm level.

The results of the regression analysis are reported in Table 2. Columns 1 and 3 examine the likelihood of a narcissistic CEO announcing a repurchase. Columns 2 and 4 examine the targeted dollar amount of shares a narcissist CEO intends to repurchase. In columns 3 and 4, the primary variable of interest, CEO narcissism, is an indicator

**TABLE 2** Share repurchase announcement and CEO narcissism.

Dependent variable	Announcement	Announcement	Announcement	Announcement
	Indicator	Amount	Indicator	Amount
	(1)	(2)	(3)	(4)
CEO narcissism score	0.550*** (2.98)	0.080*** (3.08)		
High CEO narcissism dummy			0.397*** (3.65)	0.052*** (3.43)
CEO age	-0.016** (-2.46)	-0.003** (-2.05)	-0.016** (-2.49)	-0.002** (-2.05)
CEO gender	0.392* (1.71)	0.021 (0.43)	0.406* (1.69)	0.02 (0.52)
CEO share ownership	0.011 (0.31)	0.003 (0.66)	0.009 (0.27)	0.003 (0.59)
CEO to CFO salary	-0.038 (-0.51)	-0.008 (-0.84)	-0.036 (-0.48)	-0.008 (-0.84)
CEO tenure	-0.016 (-0.98)	-0.003 (-1.59)	-0.017 (-1.05)	-0.004* (-1.68)
CEO duality	-0.038 (-0.32)	-0.007 (-0.40)	-0.034 (-0.29)	-0.006 (-0.34)
CEO equity compensation	-0.106 (-0.81)	-0.017 (-0.92)	-0.104 (-0.81)	-0.018 (-1.00)
Outside directors	2.481*** (3.84)	0.372*** (3.80)	2.485*** (3.84)	0.373*** (3.82)
Past repurchaser	0.640*** (5.38)	0.088*** (4.94)	0.629*** (5.31)	0.086*** (4.88)
Return on asset	4.380*** (3.33)	0.884*** (4.61)	4.389*** (3.36)	0.878*** (4.60)
Firm size	0.122** (2.41)	0.014* (1.91)	0.123** (1.99)	0.014* (3.17)
Research and development	3.847** (2.02)	0.864*** (2.91)	3.859** (2.06)	0.872*** (2.99)
Market-to-book	-0.302*** (-3.71)	-0.033*** (-3.26)	-0.299*** (-4.66)	-0.033*** (-3.20)
Capital expenditure	2.36 (1.40)	0.173 (0.70)	2.044 (1.22)	0.134 (0.54)
Dividend payout	-0.239** (-2.53)	-0.041*** (-2.68)	-0.248*** (-2.66)	-0.042*** (-2.79)
Cashflow volatility	-4.726** (-2.23)	-0.528* (-1.66)	-4.841** (-2.30)	-0.544* (-1.72)

(Continues)

TABLE 2 (Continued)

Dependent variable	Announcement	Announcement	Announcement	Announcement
	Indicator	Amount	Indicator	Amount
	(1)	(2)	(3)	(4)
Cash flow	2.475* (1.77)	0.257 (1.27)	2.386* (1.71)	0.246 (1.23)
Slack	1.115** (2.17)	0.187** (2.53)	1.035** (2.03)	0.176** (2.39)
Book leverage	-0.638* (-1.80)	-0.081* (-1.78)	-0.655* (-1.88)	-0.083* (-1.87)
Lag stock return	-2.715 (-1.44)	-0.604* (-1.88)	-2.726 (-1.45)	-0.604* (-1.88)
Observation	4616	4653	4616	4653
R <sup>2</sup>	0.099	0.159	0.101	0.161

Note: The table reports the logit and tobit regression results of the effect of CEO narcissism on the likelihood of share repurchase announcement and the dollar amount of shares announced. All dependent and independent variables are defined in the Appendix. The models include both year and Fama-French (1997) 48 industry fixed effects. The *t*-statistics reported in parentheses are based on standard errors, clustered by firm. \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% level, respectively.

variable – *High narcissist Dummy* which takes the value of one if the CEO narcissism score is above the 75th percentile score of the sample narcissism and 0 otherwise. This will help us understand the impact of extreme narcissist CEOs. From Table 2, we find a positive significant relationship between CEO narcissism and repurchase announcement (presence and intensity). This suggests that narcissist CEOs have a greater likelihood of announcing share repurchases and target a significantly larger dollar amount of shares to be repurchased. The reported results are economically meaningful; from column 1, a one standard deviation increase in the area per character narcissism measure leads to a 14.9% increase in the likelihood of a share repurchase announcement. Moreover, a one standard deviation increase in the area per character narcissism measure increases the dollar amount of targeted repurchase by 23.3% (see column 2). Further, a high narcissist CEO (above 75% narcissism score) has an 18.7% likelihood of announcing a repurchase and increases the dollar amount of repurchase by 64%.

The above discussions suggest that the unrealistic inflated images of narcissistic CEOs make them perceive their firms as priced lower than what they perceive and therefore motivate them to announce repurchase and announce larger dollar amount to express their disagreement. Moreover, unlike dividends, a narcissistic CEO does not commit to completing or distributing cash regularly to shareholders after announcing a repurchase. The flexible nature of a repurchase allows a narcissistic CEO to take advantage and announce more repurchases.

From Table 2, we find that young CEOs are more likely to announce a share repurchase. The more a CEO grows older, the lesser the frequency of repurchase announcements they make and the dollar value of the targeted amount. The findings are consistent with Hambrick and Mason (1984), suggesting that older CEOs have the less physical and mental ability to be chasing new and challenging ideas and are hence unlikely to take the risk to announce or repurchase shares. Male CEOs are more likely to announce repurchases than female CEOs. From the table, firms with larger cash are likely to announce a repurchase and target a larger dollar amount to repurchase. This explains that companies that do not face financial constraints are more likely to announce repurchases and target a larger dollar amount to repurchase. Moreover, firms with low growth opportunities are likely to announce a repurchase and target a higher dollar amount of shares. Further, good-performing firms are more likely to announce repurchases; firms with high research and development expenditure and high book leverage are less likely to announce repurchases and target

a higher dollar amount; dividend-paying firms are less likely to announce share repurchases. The coefficient of other control variables used in the study is consistent with prior research findings.

#### 4.1.1 | Evidence from exogenous CEO turnover

As CEO narcissism is a stable and intrinsic trait, identifying an exogenous shock that changes CEO narcissism to understand the relations between narcissism and repurchase activities is difficult. Like Shang (2021), we focus on CEO exogenous turnover as a shock that can alter the level of CEO narcissism. If the presence and intensity of the repurchase announcement are explained by the narcissism of the CEO, the change in CEO narcissism caused by the exogenous replacement of CEOs should alter the presence and intensity of the corporate repurchase announcement. It is important to note that the turnover of a CEO can be endogenous. Firms are not required to report the reason behind a CEO departing from the company, and they are most unlikely to do so when the CEO is forced to leave or fired (Schwartz-Ziv & Weisbach, 2013). Using information from board minutes, existing literature has been able to distinguish among different reasons for CEO turnover (Jenter & Lewellen, 2021). A CEO may be forced to leave a firm because of performance, managerial style, competition and personal scandals (Denis & Denis, 1995; Parrino, 1997; Warner et al., 1988). A new CEO may be appointed to implement policies in line with that of the board. In this case, the change in corporate repurchase announcement presence or intensity after turnover may not be directly influenced by the narcissism of the new CEO but rather by other factors that caused the change in the CEO. Given this, this study focuses on only exogenous CEO turnover.

Data for CEO turnover events are collected from the Execucomp database. Execucomp reports reasons for CEO turnover and classifies them into the following categories: death, health, retirement and unknown. For turnover events with reasons missing, we manually search the company website and SEC filings to identify the reason for turnover. Following existing literature, we classify a CEO turnover as exogenous if the CEO departs from a firm because of death, health condition and natural retirement. For a turnover event to be classified as a natural retirement, the CEO must be 60 years or above at the time of departure.

As CEO needs ample time to affect corporate decisions, we require a departing CEO to serve at least 3 years before they depart from the firm and the incoming CEO is also required to stay with the firm for at least 3 years. Using these criteria, we identify 206 exogenous turnover events. We merge the turnover sample with our repurchase data and keep only turnover events where there is at least one share repurchase announcement in the years before or after the exogenous CEO turnover. We then use a DiD specification to empirically examine the impact of changes in CEO narcissism caused by exogenous CEO turnover on the presence and intensity of corporate repurchase announcements:

$$\text{announcement}_{i,t} = \alpha + \beta_1 \text{NasChange}_i \times \text{After}_t + \beta_2 \text{NasChange}_i + \beta_3 \text{After}_t \theta X_{i,t} + \gamma Y_{i,t} + \rho_t + \delta_j + \varepsilon_{i,t} \quad (2)$$

$\text{NasChange}_i$  takes on two variables:  $\text{Nas}_{\text{Coming}}$  and  $\text{Nas}_{\text{Going}}$ .  $\text{Nas}_{\text{Coming}}$  ( $\text{Nas}_{\text{Going}}$ ) is a dummy variable equal to one for firm-year observations where the replacement CEO has a narcissism score greater (less) than the departing CEO and zero otherwise.  $\text{After}_t$  is a dummy variable equal to one for firm-year observations post- and zero pre-turnover. Note that the  $\text{NasChange}$  and  $\text{After}$  dummies are absorbed in the equation above. Although the  $\text{NasChange}_i$  is collinear with the firm fixed effects, the  $\text{After}$  dummy is collinear with the year fixed effects. However, the variable of interest in this analysis is  $\beta_1 \text{NasChange}_i \times \text{After}_t$  and the coefficient  $\beta_1$  captures the impact of CEO narcissism on the presence and intensity of share repurchase announcements.  $X_{i,t}$  is a vector of firm-level control variables. The vector  $Y_{i,t}$  includes CEO-related control variables.  $\rho_t$  is the year fixed effects, and  $\delta_j$  is firm fixed effects. Standard errors are clustered at the firm level.

The results of the DiD specification are reported in Table 3 (panel A). Columns 1 and 2 (3 and 4) have the  $\text{Nas}_{\text{Coming}}$  ( $\text{Nas}_{\text{Going}}$ ) as our main independent variable. From columns 1 and 2, the  $\text{Nas}_{\text{Coming}} \times \text{After}$  has a positive and significant



**TABLE 3** Exogenous CEO turnover events.

Panel A – Exogenous CEO turnover events				
	Indicator	Indicator	Amount	Amount
	(1)	(2)	(3)	(4)
Nas_Coming × After	0.204*** (2.61)	0.038* (1.75)		
Nas_Going × After			−0.034 (−0.66)	−0.031 (−1.30)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observation	849	849	1059	1059
R <sup>2</sup>	0.122	0.141	0.16	0.179
Panel B – Evidence from exogenous CEO turnover – Callaway and Sant’Anna (2021)				
	Indicator	Indicator	Amount	Amount
	(1)	(2)	(3)	(4)
Nas_Coming × After	0.125*** (3.07)	0.035*** (2.84)		
Nas_Going × After			0.03 (0.76)	0.02 (0.22)
Observation	2412	2411	2428	2428
Pretrend test (Chi sq.)	32.91	41.61	54.39	51.84
p-Value	0.16	0.03	0.00	0.00

Note: Panel A presents estimates from the difference-in-difference (DID) regressions of the association between CEO narcissism and share repurchase announcements around CEO turnover events (−3, +3). For each CEO turnover occurring in year  $t$ , we classify firm-year observation into per  $[t - 3, t - 1]$  and post  $[t + 1, t + 3]$  turnover period. The post variable takes the value of one in  $[t + 1, t + 3]$  and zero in  $[t - 3, t - 1]$ .  $Nas_{Coming}$  ( $Nas_{Going}$ ) is a dummy variable equal to one for firm-year observations where the replacement CEO has a narcissism score greater (lower) than the departing CEO and zero otherwise. The interaction term of the  $Nas_{Coming}$  ( $Nas_{Going}$ ) and post dummy is our variable of interest. The dependent variable is repurchase indicator (announcement amount) in columns 1 and 2 (3 and 4). All control variables are defined in Appendix.  $t$ -Statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

coefficient. The results suggest that firms replacing the outgoing CEO with a more narcissistic CEO tend to experience an increase in the presence and intensity of share repurchase announcements. In addition, the coefficient of the  $Nas_{Going} \times After$  is negative and insignificant (see columns 3 and 4), suggesting that firms that replace departing CEOs with less narcissistic CEOs may not care about the presence and intensity of repurchase announcements. The above results from the DiD specification support our baseline results that narcissist CEOs increase the presence and intensity of corporate share repurchase announcements.

Recent economics literature has questioned the validity of the use of the two-way fixed effects (TWFE) staggered DiD setting in empirical analysis. Baker et al. (2022) and Goodman-Bacon (2021) assert that estimating  $\beta_1$  from Equation 2 above is problematic because the TWFE estimation compares treated firm-year observation to firm-year observations that were treated in prior years. More specifically, an exogenous change in narcissism in prior years could be used as a control in subsequent years in a TWFE estimation. These previous exogenous changes in narcissism are not valid controls for subsequent years because such firm-year observations contain part of the treatment effect itself.

Therefore, using the TWFE can bias the  $\beta_1$  coefficient depending on the heterogeneity of the post-treatment dynamics and treatment effect (Cookson et al., 2022).

Following Callaway and Sant'Anna (2021) and Sun and Abraham (2021), we estimate the causal effect coefficient  $\beta_1$  that allows for arbitrary effect heterogeneity and post-treatment dynamics. This setup alleviates the issue by estimating group time treatment effects based on treated versus control and before versus after comparisons. This provides weighted aggregate averages of group-time effects. Table 3 (panel B) reports the overall average treatment effect using Callaway and Sant'Anna (2021) estimation method. Columns 1 and 2 (3 and 4) present average treatment effect for  $Nas_{Coming}$  ( $Nas_{Going}$ ) treatment group. Columns 1 and 3 (2 and 4) use the announcement indicator (announcement amount) as the dependent variable for the estimation. From column 1 of Table 3 (panel B), we find a significant positive causal relationship between narcissism and the presence of share repurchase announcements. More specifically, firms that experience an exogenous increase in CEO narcissism score experience an increase in the presence of share repurchase announcements. Considering the parallel trend assumption in column 1 of Table 3 (panel B), we find no significant difference between the treated and control cohort prior to the exogenous increase in CEO narcissism for the presence of share repurchase announcement. However, we do not find any significant difference in share repurchase amount before and after the exogenous decrease in CEO narcissism despite a positive significant causal relationship between CEO narcissism and the targeted repurchase dollar amount announced. Moreover, we do not find any causal relationship and difference in share repurchase presence and dollar amount before and after an exogenous decrease in CEO narcissism ( $Nas_{Going}$ ).

## 4.2 | Are narcissist CEOs more likely to make actual share repurchases?

From the above discussion, it is essential to examine the likelihood of a narcissist CEO making an actual repurchase of the shares announced. This is examined using a logit model, where the dependent variable is an actual repurchase indicator (presence) that is equal to one when a firm makes an actual repurchase in a year as reported by Compustat and zero otherwise. The study uses a tobit model to examine the relationship between narcissism and the dollar amount of actual repurchase (intensity). Using the same independent and control variables in Equation (1) above, the study examines these relationships.

The results of the regression analysis are reported in Table 4. Columns 1 and 3 examine the likelihood of a narcissistic CEO making an actual repurchase. Columns 2 and 4 examine the actual dollar amount of shares a narcissist CEO repurchases. In columns 3 and 4, the main variable of interest, narcissism is an indicator variable – Highly narcissist Dummy equal 1 if the CEO narcissism score is greater than the 75th percentile score of sample CEO narcissism and 0 otherwise.

The results in Table 4 show a negative relationship between CEO narcissism and the likelihood of actual repurchase and the dollar amount of actual repurchase. This holds even in regression with or without control variables. The results in column 1 of Table 4 indicate that a one standard deviation increase in the area per character narcissism measure leads to a 14.7% less likelihood of a narcissist CEO making an actual repurchase. Moreover, from column 3, a high narcissist CEO (above 75% narcissism score) has a 15.6% less likelihood of making an actual repurchase and this is significant at 5%. Bonaimé (2012) suggested that there is a reputational cost of not completing a repurchase announcement. The study finds that larger firms are more likely to make an actual share repurchase. This is consistent with Jagannathan and Stephens (2003), who find large firms to be frequent repurchases. Moreover, the study finds profitable firms to be efficient repurchasers. This explains that profitable firms have enough cash to cater for existing investment opportunities and also transfer cash to shareholders.

Consistent with expectations, the study finds CEOs with more control in the organization by holding a dual role as the chairperson and CEO to be positively related to the likelihood of an actual repurchase. This means that CEOs with dual roles have more influence on the board, which enables them to undertake actual repurchase activities without resistance. Further, the number of outside directors on the board is positively related to the frequency of actual

**TABLE 4** Actual share repurchase and CEO narcissism.

	Actual indicator (1)	Actual amount (2)	Actual indicator (3)	Actual amount (4)
Narcissism score	-0.674** (-2.45)	-0.012** (-2.32)		
High narcissistic dummy			-0.366** (-2.41)	-0.005* (-1.67)
CEO age	-0.004 (-0.33)	0 (-1.16)	-0.005 (-0.38)	0 (-1.17)
CEO gender	0.55 (1.50)	0.015** (2.03)	0.537 (1.50)	0.015** (2.02)
CEO share ownership	-0.057 (-1.20)	-0.002 (-1.46)	-0.054 (-1.13)	-0.002 (-1.36)
CEO tenure	-0.019 (-1.11)	0 (-0.03)	-0.017 (-1.02)	0 (-0.02)
CEO duality	0.384** (2.43)	0.008** (1.98)	0.387** (2.42)	0.008* (1.94)
CEO equity-linked compensation	-0.118 (-0.86)	0.002 (-0.76)	-0.108 (-0.76)	0.002 (-0.81)
Outside directors	1.775** (2.56)	0.056*** (3.28)	1.752** (2.51)	0.055*** (3.17)
Return on asset	6.938*** (4.12)	0.355*** (8.39)	6.896*** (4.11)	0.356*** (8.38)
Firm size	0.305*** (4.32)	0.003** (2.25)	0.302*** (4.24)	0.003** (2.19)
Research and development	-2.23 (-0.88)	0.225*** (2.67)	-2.114 (-0.83)	0.225*** (2.68)
Market-to-book	-0.188** (-2.13)	-0.001 (-0.37)	-0.192** (-2.18)	-0.001 (-0.39)
Capital expenditure	-4.331** (-2.04)	-0.205*** (-4.40)	-4.140* (-1.95)	-0.204*** (-4.39)
Cash dividend payout	-0.128 (-1.51)	-0.007*** (-3.49)	-0.119 (-1.43)	-0.007*** (-3.51)
Cash flow volatility	-4.733*** (-2.67)	-0.080* (-1.65)	-4.674*** (-2.67)	-0.079 (-1.64)
Cash flow	2.299* (1.70)	0.120*** (3.14)	2.454* (1.82)	0.122*** (3.20)
Slack	1.616** (2.31)	0.032 (1.62)	1.639** (2.36)	0.033* (1.67)
Book leverage	-0.905* (-1.83)	0.014 (-1.06)	-0.898* (-1.83)	0.014 (-1.09)

(Continues)

TABLE 4 (Continued)

	Actual indicator (1)	Actual amount (2)	Actual indicator (3)	Actual amount (4)
Stock return	-1.605 (-1.12)	-0.125*** (-2.91)	-1.684 (-1.17)	-0.128*** (-2.97)
Con	-3.216*** (-2.68)	-0.105*** (-4.23)	-3.432*** (-2.94)	-0.111*** (-4.53)
Observation	4646	4653	4646	4653
R <sup>2</sup>	0.233	0.379	0.233	0.378

Note: The table reports the logit and tobit regression results of the effect of CEO narcissism on the likelihood of actual share repurchase and the dollar amount of actual shares repurchased. All dependent and independent variables are defined in the Appendix. The models include year and Fama-French (1997) 48 industry fixed effects. The t-statistics reported in parentheses are based on standard errors, clustered by firm. \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% level, respectively.

repurchases. This explains that firms with more outside directors on their boards are likely to uphold their reputation by fulfilling their repurchase announcement promise. Finally, like Stephens and Weisbach (1998), the study finds that actual share repurchases are negatively related to prior-year stock performance, indicating that firms are likely to make more actual repurchases depending on their prior-year stock return.

From the above discussions, a key question of concern is why narcissist CEOs announce more share repurchases but only purchase a few of them. In order to understand this, we test how sensitive narcissist CEOs are to cash. From our hypothesis above, we should expect a strong positive relation between cashflow and the changes in cash holding for narcissist CEO-managed firms. Other firms in contrast should display no such relation. Following Almeida et al. (2004), we empirically test this with the model as follows:

$$\Delta \text{CashHoldings}_{i,t} = \alpha + \beta \text{Cashflow}_{i,t} + \theta \text{Controls}_{i,t} + \varepsilon_{i,t} \quad (3)$$

Like Almeida et al. (2004),  $\text{CashHoldings}_{i,t}$  is the ratio of cash and cash equivalents to total assets,  $\text{Cashflow}_{i,t}$  is the ratio of earning before extraordinary items, depreciation and dividend to total assets. We control for CEO and firm-related variables including investments (research and development and capital expenditure) and dividends. We estimate the sensitivity for the narcissist CEOs and other CEO samples and report our results in Table 5.

From Table 5, columns 1 and 2 (3 and 4) report regression results for the narcissist (other CEO) sample. Columns 1 and 3 include year and industry fixed effects, whereas columns 2 and 3 include year and firm fixed effects. From Table 5, we find the cash flow sensitivity of cash to be close to and not statistically different from zero for the other CEO sample. However, we find a positive and significant cashflow sensitivity of cash for our narcissism sample. This result supports our hypothesis that narcissist CEOs are more likely to hold more cash because of their insecurities (Kowalchuk et al., 2021).

### 4.3 | EO narcissism and stock returns around repurchase

Table 6 reports the CAR for five subperiod around share repurchase announcements for the narcissist and other CEO samples. For each event, we calculate the Fama and French three-factor model betas using 60 days before day -10 of the repurchase announcement. Using the betas computed, we calculate the CAR for the subperiod reported in Table 6.

In both the narcissist and other CEO samples, we find a negative CAR 10 days before the repurchase announcement, which is consistent with prior literature on repurchase announcement (Dann, 1981; Evgeniou & Vermaelen,

**TABLE 5** CEO narcissism and the cashflow sensitivity of cash.

Dependent variable	Narcissist sample		Other sample	
	$\Delta$ CashHolding	$\Delta$ CashHolding	$\Delta$ CashHolding	$\Delta$ CashHolding
	(1)	(2)	(3)	(4)
Cashflow	0.101*	0.165**	-0.012	0.022
	(1.97)	(2.09)	(-0.18)	(0.28)
CEO age	0.000**	0.00	0.00	0.00
	(-2.57)	(-0.19)	(-0.47)	(-1.01)
CEO gender	0.00	0.013	-0.012**	-0.012*
	(0.01)	(1.31)	(-2.31)	(-1.85)
CEO share ownership	0.00	0.00	-0.001	-0.002
	(0.58)	(0.04)	(-1.14)	(-1.38)
CEO tenure	0.00	0.00	0.00	0.00
	(-1.27)	-0.52	(-0.29)	-0.43
CEO duality	-0.002	-0.002	-0.004**	-0.004
	(-1.16)	(-0.44)	(-1.97)	(-1.14)
CEO equity-linked compensation	-0.003	-0.003	-0.002	0.001
	(-1.13)	(-0.75)	(-0.66)	-0.23
Outside directors	-0.01	-0.037**	-0.006	-0.001
	(-1.09)	(-2.13)	(-0.75)	(-0.07)
Return on asset	-0.085*	-0.12	0.01	-0.017
	(-1.75)	(-1.61)	-0.16	(-0.22)
Firm size	-0.001	-0.007**	0.00	-0.008*
	(-1.58)	(-2.05)	-0.12	(-1.94)
Research and development	-0.018	-0.193*	-0.065	-0.136
	(-0.62)	(-1.82)	(-1.44)	(-0.71)
Market-to-Book	0.00	0.00	0.003**	0.004*
	(0.29)	(0.21)	(1.99)	(1.83)
Capital expenditure	-0.114***	-0.338***	-0.112***	-0.322***
	(-3.27)	(-4.89)	(-2.99)	(-4.09)
Cash dividend	-0.002	-0.003	-0.006**	-0.008**
	(-1.28)	(-1.57)	(-2.29)	(-2.48)
Book leverage	0.002	-0.011	-0.002	-0.005
	(0.48)	(-0.81)	(-0.30)	(-0.30)
Cons	0.007	0.095***	0.01	0.116***
	(0.50)	(2.71)	(0.72)	(2.85)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	No	Yes	No
Firm fixed effect	No	Yes	No	Yes
Observation	2731	2731	2742	2742
R <sup>2</sup>	0.046	0.06	0.068	0.076

(Continues)

**TABLE 5** (Continued)

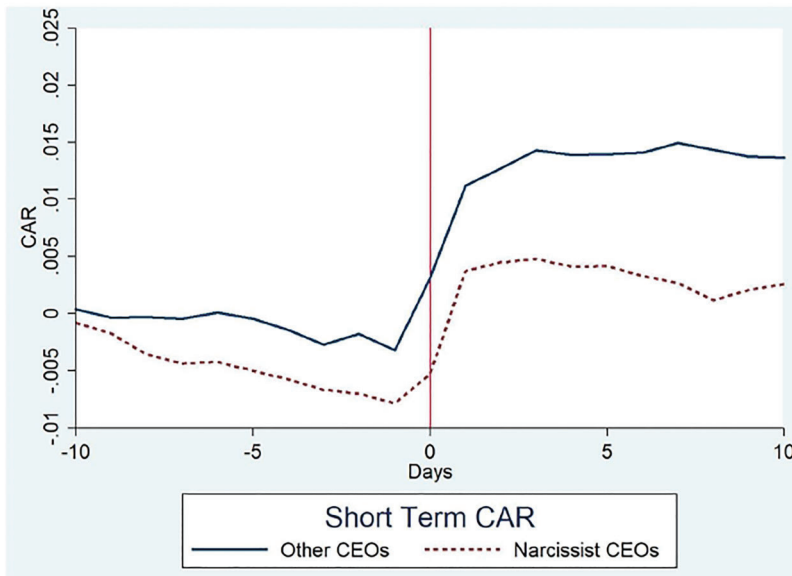
Note: The table reports the regression results of the relationship between CEO Narcissism and cashflow sensitivity of cash. All dependent and independent variables are described in the Appendix. The models include year and Fama-French (1997) 48 industry fixed effects. The t-statistics reported in parentheses are based on standard errors, clustered by firm. \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% level, respectively.

**TABLE 6** Short-term excess return of repurchase announcement.

Days	Narcissist CEO sample		Other CEO sample	
	(1)	(2)	(3)	(4)
	Cum. average return (%)	t-Statistics	Cum. average return (%)	t-Statistics
Day (-10, -1)	-0.66	-1.51	-0.20	-1.75*
Day (0, +1)	1.26	9.83***	1.48	8.07***
Day (-1, +5)	1.38	6.50***	1.66	6.02***
Day (0, +10)	1.33	6.28***	1.68	5.42***

Note: The table present the short-term average cumulative abnormal return around repurchase announcements for various even windows before and after the announcement for the narcissist and other CEO samples. We compute the Fama and French three-factor model betas using 60 days before day -10 from the repurchase announcement. We then estimate the CAR using these betas and the daily returns for the window period around the announcement. \*, \*\* and \*\*\* denote statistical significance at 10%, 5% and 1% respectively.

Abbreviation: CAR, Cumulative Average Return.

**FIGURE 1** Short-term average cumulative return.

2017). Moreover, the narcissist CEO sample has a higher negative CAR than other CEOs. However, the narcissist CEO sample negative CAR is insignificant. The large abnormal returns of the other CEO sample indicate that the repurchase announcement of narcissistic CEOs is driven by their perceived undervaluation rather than a channel to transfer free cash flow to shareholders. Considering CAR after the announcement day, we find a positive and significant abnormal return for both the narcissist and other CEO samples. However, the narcissist CEO sample

experience lower abnormal returns compared to the other CEO sample. For example,  $CAR(0, +1)$ , which is the sum of abnormal returns for day 0 and day +1, we find a CAR of 0.35% higher in the other CEO sample than in the narcissist CEO sample. The other CEO sample dominates in CAR throughout the sub-event period reported in Table 6. This result suggests that the other CEO sample does better in return after repurchase announcements. This supports our hypothesis that narcissist CEOs are less efficient in timing the market because of their inflated image, hence experiencing a smaller signalling effect following the repurchase announcement compared to other CEOs.

From Figure 1, on average, share repurchase announcements by narcissist CEO-managed firms generate economically and statistically lower short-term excess returns compared to other CEO-managed firms. This holds from day -10 to day +10 as indicated in Figure 1.

We further test whether CEO narcissism independently drives short-term returns after share repurchases announcement. We test this using the cross-sectional regression equation as follows:

$$CAR = \alpha + \beta \text{narcissism}_{i,t} + \theta X_{i,t} + \gamma Y_{i,t} + \rho_t + \delta_j + \varepsilon_{i,t} \quad (4)$$

In the above equations, the CAR is the cumulative abnormal returns for different event windows, and all other variables remain as defined in Equation (1) above. Columns 1-3 of Table 7 present cross-sectional regression results for the effect of CEO narcissism on short-term cumulative abnormal return for event window  $CAR(0, +1)$ ,  $CAR(-1, +5)$  and  $CAR(0, 10)$ , respectively. From Table 7, controlling for CEO and firm-related characteristics, we find that CEO narcissism negatively affects short-term CAR. These results support our hypothesis that the market believes that narcissistic CEOs are using repurchase announcements as a stock price management mechanism rather than a pay-out channel. This suggests that the credibility of a firm's repurchase announcement is negatively influenced by CEO narcissism.

Share repurchase is not a short-term decision. Firms require authorization from the board before the announcement. In line with this, it is important to consider the stock performance in prior years to test whether negative prior-year returns influence the repurchase decisions of narcissistic CEOs. Accordingly, Comment and Jarrell (1991) assert that firms with recent negative returns are more likely to repurchase their shares. In examining this, we divide the sample into two groups - negative prior stock return and positive prior stock return, consistent with Comment and Jarrell (1991). A firm is said to have a negative return if the previous year's stock return is negative, and otherwise. We further introduce an additional sample for this analysis called highly positive return (unreported for brevity). This sample includes only firms with prior-year stock returns greater than the 75th percentile of the sample stock return. This is to help understand whether the inflated view of a narcissistic CEO affects their repurchase activities despite their company shares being far away from negative returns. We would expect narcissistic CEOs to announce repurchase even when their firms have a positive prior-year stock return. We run the same regression as in Equation (1) above using the samples and report results in Table 8.

In Table 8, columns 1 and 2 report regression results for the negative prior-year return sample, and columns 3 and 4 report result for the positive prior-year return sample. From the results, there is a positive relationship between narcissist CEOs and the presence of share repurchase announcements in firms with negative prior-year stock returns. However, this is insignificant. Moreover, in instances where a narcissistic CEO in negative prior-year stock return firms announces a repurchase, they target a larger dollar amount (see column 2). This is expected because when firms have negative prior-year stock returns, CEOs who are even not narcissists are likely to announce a large dollar amount of shares to be repurchased Comment and Jarrell (1991). Further, we find the relationship between narcissism and share repurchase to be positive and statistically significant for both the presence and intensity in firms that have positive prior-year stock returns. Further to the above, the unreported high positive return sample also exhibits a positive relationship between CEO narcissism and the presence of share repurchase announcements and targeted dollar amounts.

Considering the above, the presence and intensity of repurchase announcements in narcissist managed firms are driven by the distorted views of their CEOs due to their unrealistic inflated self-view. Like Brav et al. (2005), who report

**TABLE 7** Short term excess return and CEO narcissism.

Dependent variable	CAR days (0, +1) (1)	CAR days (-1, +5) (2)	CAR days (0, +10) (3)
CEO narcissism	-0.011* (-1.66)	-0.015* (-1.70)	-0.015* (-1.67)
CEO age	0.001 (-0.36)	0.001 (-0.78)	-0.001 (-1.07)
CEO gender	0.011 (1.44)	0.011 (1.39)	0.011 (1.13)
CEO share ownership	-0.004*** (-2.82)	-0.005*** (-2.86)	-0.002 (-1.19)
CEO tenure	0.001 (1.19)	0.001 (1.05)	0 (0.46)
CEO duality	0.003 (0.73)	0.009* (1.66)	0.004 (0.67)
Equity-linked compensation	-0.004 (-0.76)	-0.001 (-0.19)	-0.009 (-1.20)
Outside directors	-0.005 (-0.24)	-0.013 (-0.48)	0.015 (-0.53)
Profitability	-0.097 (-1.37)	-0.035 (-0.32)	-0.06 (-0.56)
Firm size	-0.001 (-0.55)	-0.001 (-0.33)	-0.003 (-1.05)
Research and development	0.130** (1.98)	0.241*** (2.75)	0.164* (1.67)
Market-to-book	0.002 (0.83)	-0.001 (-0.29)	-0.004 (-0.98)
Capital expenditure	0.007 (0.10)	0.095 (0.72)	-0.015 (-0.12)
Cash dividend payout	0.001 (0.15)	0.004 (0.45)	0.002 (0.21)
Cash flow volatility	0.044 (0.62)	0.055 (0.45)	0.171 (1.45)
Cash flow	0.088 (0.99)	0.064 (0.36)	0.109 (0.72)
Slack	-0.015 (-0.84)	-0.023 (-0.83)	-0.008 (-0.30)
Book leverage	-0.01 (-0.81)	-0.008 (-0.45)	-0.008 (-0.46)
Cons	0.002 (0.05)	-0.012 (-0.32)	-0.072* (-1.66)

(Continues)



**TABLE 7** (Continued)

	CAR days (0, +1)	CAR days (-1, +5)	CAR days (0, +10)
Dependent variable	(1)	(2)	(3)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observation	1000	1000	1000
R <sup>2</sup>	0.098	0.095	0.102

Note: The Table presents the cross-section regression of the relationship between CEO narcissism and the short-term excess returns of repurchase announcements. All dependent and independent variables are defined in the [Appendix](#). The models include both year and Fama-French (1997) 48 industry fixed effects. The t-statistics reported in parentheses are based on standard errors, clustered by firm. \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% level, respectively.

that managers who announce share repurchase rank negative prior-year return as the prime motive. Our results in Table 8 indicate that unrealistic inflated views of narcissist CEOs influence how they view their companies. They consider the stock price of their companies underpriced, whereas they are not because they perceive their companies to have a value above what is reported by the market. This distorted view of narcissist CEOs influences them to announce repurchases to indicate their disagreement with how their shares are priced. The above discussion shifts the attention squarely from the signalling hypothesis to CEO narcissism as an explanation for the growing share repurchase announcements.

#### 4.4 | Does CEO power facilitate repurchase announcements by narcissistic CEOs?

Narcissistic CEOs with more power in an organization are likely to face less resistance from the board and make more repurchase announcements. Considering the nature of repurchase announcement authorization, narcissist CEOs with more power in the form of power over the board of directors, as evidenced by their dual role as CEO and chair of the board of directors, are likely to act on their distorted views and announce more share repurchases as such CEOs are insulated from internal discipline. CEO's overall power and his/her relative power over the CFO may also affect the degree to which repurchase announcement policy of narcissistic CEO's diverges. We test how CEO power and CEO narcissism interact to impact repurchase announcement decisions with the models as follows:

$$\text{announcement}_{i,t} = \alpha + \beta_1 \text{narcissism}_{i,t} \times \text{Power}_{i,t} + \beta_2 \text{narcissism}_{i,t} + \beta_3 \text{Power}_{i,t} + \theta X_{i,t} + \gamma Y_{i,t} + \rho t + \delta_j + \varepsilon_{i,t} \quad (5)$$

In Equation (5) above, Power takes on three variables: CEO board power, CEO overall power and CEO-CFO power. CEO board power is an indicator variable equal to one if the CEO holds a dual role as chair of the board and zero otherwise. This is also referred to as CEO duality in the literature. Following Tang et al. (2011), we measure CEO overall power using variables based on structural, ownership and expert dimensions of CEO power. The structural CEO power dimension is measured using three indicator variables: CEO pay slice (CPS), CEO duality and board independence. We create CPS as an indicator variable that takes the value one if the CEO has a compensation ratio with respect to total pay of other top executives greater than the median of our sample, and zero otherwise. Finally, we create a dummy variable that equals one if the ratio of the number of independent directors to the total number of directors is less than the median of our sample and zero otherwise. We measure the ownership power dimension using the founder status and equity ownership. Founder CEO takes the value one if the CEO is the founder or in close relations with the founding family, and zero otherwise; CEO ownership takes the value one if the CEO percentage of equity ownership is above the sample median, and zero otherwise. Expert power is a dummy variable equal to one if the CEO has tenure as CEO above the sample median, and zero otherwise. We create a CEO overall power index by adding the indicator

**TABLE 8** CEO narcissism and stock return.

Dependent variable	Negative return		Positive return	
	Announcement	Announcement	Announcement	Announcement
	Indicator	Amount	Indicator	Amount
	(1)	(2)	(3)	(4)
CEO narcissism score	0.497 (1.36)	0.066*** (4.26)	0.648*** (2.93)	0.086*** (2.86)
CEO age	0.001 (0.04)	0.002*** (12.33)	-0.026*** (-2.64)	-0.004** (-2.52)
CEO gender	0.36 (0.61)	-0.027** (-2.36)	0.34 (1.36)	0.016 (0.39)
CEO share ownership	-0.052 (-0.81)	-0.014*** (-8.19)	-0.028 (-0.74)	-0.002 (-0.36)
CEO tenure	-0.007 (-0.29)	-0.002** (-2.23)	0.001 (0.06)	-0.001 (-0.32)
CEO duality	0.168 (0.78)	0.032*** (3.30)	-0.117 (-0.94)	-0.016 (-0.88)
CEO compensation (equity)	-0.136 (-0.69)	-0.023** (-2.52)	-0.056 (-0.37)	-0.011 (-0.53)
Outside directors	1.156 (1.09)	0.169*** (12.30)	1.950*** (3.02)	0.288*** (3.10)
Return on asset	3.758* (1.94)	0.878*** (15.93)	4.895*** (2.88)	0.936*** (3.96)
Firm size	0.035 (0.42)	0.001 (1.14)	0.152*** (2.58)	0.021** (2.57)
Research and Dev.	2.843 (0.96)	0.827*** (7.88)	4.130** (2.01)	0.876*** (2.90)
Growth	-0.245** (-2.25)	-0.037*** (-8.47)	-0.323*** (-4.00)	-0.032*** (-2.73)
Capital expenditure	5.343 (1.57)	0.680*** (5.68)	2.086 (1.09)	0.061 (0.24)
Dividend	-0.271** (-2.04)	-0.043*** (-9.88)	-0.255** (-2.27)	-0.035** (-2.21)
Cash flow volatility	-5.72 (-1.11)	-0.775*** (-5.04)	-3.429 (-1.38)	-0.368 (-0.96)
Cash flow	2.338 (1.03)	0.247*** (4.39)	2.229 (1.21)	0.224 (0.83)
Slack	1.155 (1.31)	0.212*** (5.76)	1.227** (2.06)	0.195** (2.28)
Leverage	-1.595** (-2.27)	-0.201*** (-8.33)	-0.302 (-0.74)	-0.035 (-0.68)

(Continues)

TABLE 8 (Continued)

Dependent variable	Negative return		Positive return	
	Announcement	Announcement	Announcement	Announcement
	Indicator	Amount	Indicator	Amount
	(1)	(2)	(3)	(4)
Stock return	10.477*	1.093***	-4.740**	-0.523
	(1.66)	(4.21)	(-1.99)	(-1.48)
Cons	-3.353*	-2.248***	-1.449	-0.466***
	(-1.79)	(-19.98)	(-1.44)	(-3.25)
Observation	1282	1358	3268	3295
R <sup>2</sup>	0.157	0.262	0.097	0.154

Note: The table reports the regression of the relationship between repurchase announcements and CEO narcissism of negative and positive prior-year return firms. All models include industry and year-fixed effects and are clustered by firm. Detailed variable definitions are indicated in the [Appendix](#). Statistical significance at the 1%, 5% and 10% is denoted by \*\*\*, \*\* and \*, respectively, with t-statistics in parenthesis.

variables based on the three-power dimension. CEO-CFO Power is the ratio of CEO to CFO total compensation. We modify the baseline model to include an interaction of power and CEO narcissism score. All other variables are defined in the [Appendix](#). Table 9 reports the regression results of Equation (5). Columns 1 and 2 report results for the CEO board power interaction, columns 3 and 4 report results for the CEO overall power interaction, and columns 5 and 6 report results for the CEO-CFO Power interaction.

The results in Table 9 indicate that the coefficient of the interaction term  $\beta_1$  is positive and significant in both the presence and intensity of repurchase announcement regressions in CEO Overall and Board Power. This indicates that narcissist CEOs with more power evidenced by their dual role as chairperson of the board and higher overall power are likely to announce more repurchases and target to repurchase a larger dollar amount of shares.

The reported results are economically meaningful; a one standard deviation increase in the narcissism of a CEO with a dual role as the chair of the board will increase the likelihood of a repurchase announcement by 32.1%. Comparing this to the above results in Table 2, the dual role of a narcissist CEO as the chair of the board increases the frequency of announcing a repurchase by approximately 5%. Moreover, a one standard deviation increase in the narcissism of a CEO with a dual role as the chair of the board will increase the dollar amount of targeted repurchase by 30.1%. The above analysis indicates that the presence and intensity of narcissist CEOs' repurchase announcement activities are more pronounced in poorly governed firms. Unreported results indicate that excluding CEO board power from the overall CEO power measure leaves the interaction insignificant. Additionally, from columns 5 and 6 of Table 9, we do not find any significant relationship between narcissist CEO-CFO power and repurchase announcement.

These sets of results indicate that the relative power of the board can reduce the divergence in repurchase announcement behaviour of narcissistic CEOs from the other CEOs, but the relative powers of the CFO or other executives have little impact on this divergence. As discussed earlier, senior executives like the CFOs may have some room to adjust the top level policies of firms approved by the board at the implementation level, and these adjustments could be influenced by the relevant senior executive's preferences and biases. For example, Ham et al. (2017) show that CFO narcissisms add to CEO influence on financial reporting quality. The literature also points out that narcissistic CEOs have a significant influence on broad policies and headline news of firms in the context of investment, externally oriented CSR activities, risk taking and so on (Al-Shammari et al., 2019; Buyl et al., 2019; Ham et al., 2018). Repurchase announcement is a headline policy and we find that, although a relatively powerful board can influence this decision at the approval level, CFO and other senior executives have no significant impact on the announcement decision.

TABLE 9 Narcissistic CEO power and share repurchase announcement.

	Announcement Indicator (1)	Announcement Amount (2)	Announcement Indicator (3)	Announcement Amount (4)	Announcement Indicator (5)	Announcement Amount (6)
CEO narcissism	-0.041 (-0.12)	-0.015 (-0.30)	-0.241 (-0.50)	-0.026 (-0.41)	0.621** (2.10)	0.094*** (2.58)
COE/board power	-0.498** (-2.24)	-0.075** (-2.28)				
CEO overall power			-0.076 (-1.14)	-0.01 (-1.16)		
CEO/CFO power					0.076 -0.37	0.006 -0.24
COE/board power × CEO narcissism	0.925** (2.21)	0.148** (2.42)				
CEO overall power × CEO narcissism			0.217* (1.95)	0.028* (1.88)		
CEO/CFO power × CEO narcissism					-0.145 (-0.38)	-0.034 (-0.73)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
N	4616	4653	3380	3399	3380	3399
R <sup>2</sup>	0.1009	0.1574	0.1047	0.174	0.11	0.1724

Note: The table reports the regression results of the impact of CEO power on narcissist likelihood of share repurchase announcement. All dependent and independent variables are defined in the Appendix. The models include both year and Fama-French (1997) 48 industry fixed effects. The t-statistics reported in parentheses are based on standard errors, clustered by firm. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

## 5 | ROBUSTNESS TESTS

### 5.1 | Propensity score matching

The baseline results suggest that there is a strong association between CEO narcissism and the likelihood of a share repurchase announcement. However, firms managed by CEOs with high narcissism scores may be fundamentally different from those managed by lower narcissism scores CEOs. If this is the case, the control variables used in the baseline regression will be inadequate. This could bias the reported results. To account for these biases, we create two samples of our CEO narcissism score variable that are comparable in all control variables used in the baseline regression except CEO narcissism. We create two samples based on the CEO narcissism score: Narcissistic CEOs are defined as CEOs with a narcissism score greater than the mean of the sample CEOs' narcissism score. The remaining CEOs, referred to as *other CEOs* have a narcissism score less than the mean of the sample. Following Aktas et al. (2019), we use the propensity score matching, we match firm-year observations with narcissist CEOs in our sample with other CEOs having comparable control variables. In doing this, we use a logit regression to estimate the propensity score, based on the probability of a firm having a narcissistic CEO condition on control variables. We then use the nearest neighbour propensity score specification to find a firm-year observation with other CEO-managed firms and comparable control variables. We use an absolute difference in propensity score of 0.05 to ensure that we have a suitable match. We only match other CEO firm-year observations with the smallest propensity score when more than one firm meets the criteria above. We find 1813 unique pairs of matched sample firm-year observations.

We report the difference in means of control variables for the unmatched (columns 1 and 2) and matched (columns 3 and 4) sample in panel A of Table 10. In columns 1 and 2, we find a significant difference between the narcissist and other CEO samples. Specifically, we find narcissist-managed firms to be performing poorly; larger in size; have lower cash flow; have more directors; take more risk (research and development cost and leverage) compared to other CEOs. This suggests that narcissist-managed firms are fundamentally different, and the results in the baseline may pick up some non-linear effects of the control variables used in the estimation. Columns 3 and 4 report the matched sample mean difference where we find no significant difference between the narcissist and other CEO samples. Using the matched sample, we run our baseline estimation using Equation (1) above and report the results in panel B of Table 10. Columns 1 and 2 report regression results for the repurchase announcements, whereas columns 3 and 4 report actual repurchase regression. From columns 1 and 2 of Table 10, we find a significant positive relationship between CEO narcissism and the presence and intensity (dollar amount) of repurchase announcements. However, in columns 3 and 4, we find a negative relationship between CEO narcissism and actual repurchase. The results confirm our baseline analysis; hence, our results are not driven by misspecification biases.

### 5.2 | Controlling for firm fixed effects

Adding to the list of control variables used in the baseline regression analysis, controlling for firm fixed effects alleviate any concern of firm unobserved heterogeneity. However, CEO narcissism is a stable and intrinsic trait, therefore, a CEO fixed effect. In line with this, examining the direct effect of CEO narcissism on the presence and intensity of repurchase announcements with a fixed effect model is impossible because the CEO narcissism effect on repurchase is absorbed by the fixed effects. Using fixed effects in our analysis can only be possible when there is a within-firm variation of CEO narcissism. That is when the narcissism score of a newly appointed CEO is different from the previous CEO. To use firm fixed effect in our analysis, we limit our sample to firms with at least two CEO changes and run a panel fixed effect regression and report results in Table 11.

From Table 11, we find a positive and significant (10%) coefficient for the relationship between CEO narcissism score and the presence of share repurchase announcement. However, we do not find any significant relationship

**TABLE 10** Propensity score matching.

Panel A: Narcissistic CEOs and other CEOs mean difference				
Variables	Unmatched sample		Matched sample	
	Mean Diff	t-Stat	Mean Diff	t-Stat
Return on asset	-0.009***	-2.652	0.000	0.312
Firm size	0.179***	4.467	-0.072	-0.083
Research and development	0.003***	2.121	0.001	0.316
Market-to-book	0.001	0.029	0.039	0.942
Capital expenditure	0.000	0.100	0.000	0.273
Cash dividend payout	0.000	0.006	-0.006	-0.283
Cash flow	-0.006**	-2.516	0.000	0.053
Slack	0.003	0.646	0.002	0.471
Book leverage	0.016***	2.943	-0.004	0.776
CEO age	-0.115	-0.626	0.055	0.278
Gender	-0.001	-0.197	0.002	0.387
CEO share ownership	-0.134***	-2.693	0.018	0.335
CEO tenure	-0.179	-1.263	0.083	0.541
Duality	0.037	2.642	-0.018	1.165
Equity-linked compensation	0.017	1.218	-0.001	0.039
Outside directors	0.011***	3.68	-0.004	1.274
<b>Observation</b>				
Full sample		4186		3626
Narcissist sample		2108		1813
Rational sample		2078		1813
Panel B: Regression with a matched sample				
	Announcement Indicator (1)	Announcement Amount (2)	Actual Indicator (3)	Actual Amount (4)
CEO narcissism	0.596** (2.57)	0.093*** (2.87)	-0.489* (-1.71)	-0.010* (-1.75)
Controls	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Observation	3217	3247	3195	3247
R <sup>2</sup>	0.105	0.166	0.261	0.411

Note: Panel A presents the mean difference and t-statistics of each of the control variables used in the analysis for both the unmatched and matched samples. For each control variable, we present the difference in means for the narcissist and other samples. Columns 1 and 2 (3 and 4) report mean difference statistics for the unmatched (matched) sample. Panel B reports regression results using the matched sample. All dependent and independent variables are defined in the [Appendix](#). t-Statistics are reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

**TABLE 11** Firm fixed effects.

	Announcement Indicator	Announcement Amount	Actual Indicator	Actual Amount
Dependent variable	(1)	(2)	(3)	(4)
CEO narcissism score	0.091* (1.66)	0.011 (0.92)	-0.105* (-1.71)	-0.008* (-1.83)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observation	1854	1854	1854	1854
R <sup>2</sup>	0.059	0.043	0.125	0.241

Note: The table reports the firm fixed effects panel regression results of the effect of CEO narcissism on the likelihood of share repurchase announcement and the dollar amount of shares announced. All dependent and independent variables are defined in the [Appendix](#). The models include both year and firm fixed effects. The t-statistics reported in parentheses are based on standard errors, clustered by firm. \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% level, respectively.

between CEO narcissism and the dollar amount of repurchase announced. This may be due to the small sample size used in this analysis. Moreover, for the actual repurchase analysis, we find a negative and significant relationship between CEO narcissism and the likelihood of actual repurchase and the dollar amount of shares purchased. The above results confirm our baseline results that CEO narcissism increases the presence of share repurchase announcements but fail to follow through to complete the purchase of what was announced.

### 5.3 | Controlling for other CEO traits

Research has indicated some similarities between narcissism and other behavioural traits like overconfidence which has been well studied in the finance literature.<sup>7</sup> Considering this, a potential concern of this study is that the CEO narcissism measure used might be measuring the overconfidence of a CEO. Moreover, it is important to establish that the narcissist's likelihood to announce repurchases and target a larger dollar amount is beyond their overconfidence. To ensure that the overconfidence of a CEO does not influence our results, we construct an overconfidence measure using the CEO's options holdings (Banerjee et al., 2018; Malmendier & Tate, 2005). CEOs have their human capital concentrated in the company they manage and would rationally exercise and cash out any stock option that is in the money to diversify their firm-specific risk (Korczak & Liu, 2014). However, keeping a highly vested in the money stock option would indicate some form of overconfidence in the CEO. CEO overconfidence is defined as the measure of how in the money CEO options are, which is calculated by dividing the value per option<sup>8</sup> by the share price at the end of the fiscal year. Like Banerjee et al. (2018), we use a continuous overconfidence variable.

Moreover, the signature size proxy measure of CEO narcissism may reflect CEO conservatism.

For example, Duong et al. (2021) report that the style of a CEO's signature reflects some conservative or liberal traits of a CEO. Duong et al. (2021) conjectured that CEOs signing full names or first and last names are liberal and those with the first name or abbreviation signatures are classified as conservative. CEO conservatism takes a dummy variable one if the CEO sign with first name only or abbreviations and zero otherwise. To test this concern, we follow Duong et al. (2021) and use signature style as a proxy of CEO conservatism and control for this in our analysis.

<sup>7</sup> For overconfidence literature see: Banerjee et al. (2018), Malmendier and Tate (2005), Campbell et al. (2011), Deshmukh et al. (2013), Goel and Thakor (2008) and Ho et al. (2016).

<sup>8</sup> Value per option is defined as the value of unexercised exercisable option divided by the number of the unexercised exercisable option.

**TABLE 12** Controlling for other CEO traits.

Dependent variable	Announcement	Announcement	Actual	Actual
	Indicator	Amount	Indicator	Amount
	(1)	(2)	(3)	(4)
CEO narcissism	0.601*** (2.98)	0.088*** (3.17)	-0.58** (-2.09)	-0.013** (-2.35)
CEO overconfidence	0.137 (0.81)	0.02 (0.87)	0.266 (0.92)	-0.007 (-1.17)
CEO conservatism	0.027 (0.25)	0.002 (0.15)	0.237* (1.67)	-0.001 (-0.13)
CEO-related control variables	Yes	Yes	Yes	Yes
Firm-related control variables	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observation	4614	4651	4614	4651
R <sup>2</sup>	0.1	0.156	0.099	0.154

Note: The table reports the baseline regression after controlling for CEO Overconfidence. All firm and CEO-related variables are described in the [Appendix](#). The models include both year and industry-fixed effects. The *t*-statistics reported in parentheses are based on standard errors, clustered by firm. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

Further, we create another CEO narcissism (*Resid Narcissism*) variable by taking the residuals from OLS regressions of CEO narcissism on CEO demographics, overconfidence, conservatism and all other covariate used in the baseline regression (unreported for brevity). Although the correlation among our narcissism measure, demographics and firm covariates are not that high, creating a Resid Narcissism variable further eliminates their impact. We report our results for overconfidence and conservatism in Table 12. From columns 1 and 2 of Table 12, the coefficient of the CEO narcissism variable remains qualitatively similar and significant after controlling for CEO overconfidence and CEO conservatism. From Table 12, the narcissistic CEO's frequent repurchase announcements and failure to follow through to completion are beyond their overconfidence and are not driven by their conservatism.

## 5.4 | Alternative measure of CEO narcissism

In an attempt to check the robustness of our baseline results in this study, we use an alternative measure of CEO narcissism. Raskin and Terry (1988) find a correlation between the ratios of first-person singular pronouns to first-person plural pronoun usage with the NPI scores. This is robust after controlling for some traits like extraversion, neuroticism and locus of control. Using this measure of CEO narcissism, Aktas et al. (2016) find CEO narcissism to be associated with high bid premiums in acquisitions and a low probability of deal completion. We replace the area per character signature size measure of narcissism with the pronoun usage of a CEO in the quarterly conference call. Using machine learning software (R-studios), we tabulate the personal pronoun usage by CEOs in the quarterly conference calls in the first 2 years in office as a CEO. We only focused on the questions and answers section of the conference call as the presentation aspect can be scripted and may be difficult for narcissistic CEOs to express their narcissistic features. The narcissism score is measured as the ratio of first-person singular pronouns to total first-person pronouns in the CEO speech in the questions and answers section of the quarterly conference calls. Replacing pronoun usage as the main independent variable in Equation (1), we test the baseline analysis and report the results in Table 13.



**TABLE 13** Alternative measure of narcissism.

Dependent variable	Announcement indicator	Announcement amount
	(1)	(2)
CEO narcissism score (pronouns)	0.278*** (2.62)	0.039** (2.39)
CEO age	-0.020* (-1.91)	-0.002 (-1.24)
CEO gender	0.154 (0.64)	-0.019 (-0.38)
CEO share ownership	-0.053 (-1.31)	-0.008 (-1.22)
CEO tenure	-0.008 (-0.38)	-0.002 (-0.78)
CEO duality	-0.107 (-0.85)	-0.011 (-0.59)
CEO compensation (equity)	-0.083 (-0.57)	-0.014 (-0.69)
Outside directors	2.244*** (3.45)	0.296*** (2.86)
Return on asset	3.660** (2.39)	0.776*** (3.47)
Firm size	0.175*** (2.86)	0.021** (2.33)
Research and development	4.384** (2.19)	0.966*** (3.06)
Market-to-book	-0.295*** (-3.75)	-0.031** (-2.57)
Capital expenditure	1.617 (0.79)	0.101 (0.33)
Cash dividend payout	-0.189* (-1.94)	-0.030* (-1.95)
Cash flow volatility	-4.950** (-2.08)	-0.587 (-1.63)
Cash flow	3.538** (2.29)	0.405* (1.70)
Slack	0.82 (1.31)	0.156* (1.71)
Book leverage	-0.715 (-1.58)	-0.08 (-1.37)
Stock return	-1.495 (-0.81)	-0.411 (-1.31)

(Continues)

TABLE 13 (Continued)

Dependent variable	Announcement indicator	Announcement amount
	(1)	(2)
Con	-2.864*** (-2.83)	-0.553*** (-3.53)
Observation	3636	3676
R <sup>2</sup>	0.1092	0.1614

Note: The table report regression results using another measure of narcissism (CEO pronoun usage). All dependent and independent variables are described in the [Appendix](#). The *t*-statistics reported in parentheses are based on standard errors, clustered by firm. \*, \*\* and \*\*\* indicate significance at the 10%, 5% and 1% levels, respectively.

The estimated coefficients of the pronoun usage for the announcement indicator and value regression are 0.278 and 0.039, respectively, which are all statistically significant. These results further confirm our baseline analysis that narcissist CEOs are more likely to make repurchase announcements and announce large repurchase values.

## 6 | CONCLUSION

In this paper, we contribute to the existing literature on managerial characteristics and their impact on corporate decisions by examining the influence of CEO narcissism on their repurchase activities. The existing literature has focused on how narcissism affects performance, earnings management and CEOs' risk-taking activities. This paper aims to extend the literature by examining how the narcissism of a CEO affects their share repurchase activities.

The study uses the area per character signature size (Ham et al., 2018; Zweigenhaft, 1977) to measure CEO narcissism. We find that narcissist CEOs are more likely to announce a share repurchase and target to repurchase a higher dollar amount. Further, narcissist CEOs do not repurchase shares because of the signalling hypothesis documented by Comment and Jarrell (1991) and Dittmar (2000). Narcissistic CEO announces repurchases because of their unrealistic inflated self-view which make them perceive their firms as underpriced when they are not. They show their disagreement through the announcement of repurchases.

Moreover, we find governance to play a role in the repurchase behaviour of a narcissistic CEO. Firms, where a narcissist CEO holds a dual role as the board of directors chairperson, are more likely to act on their behavioural biases and announce more repurchases. However, we find that narcissist CEOs are less likely to make an actual repurchase and allocate less dollar amount to the actual repurchase in the firm they manage.

The findings of this paper contribute to the literature on CEO narcissism and share repurchases. The growing repurchase activities in corporate America have attracted many debates, and our results indicate that repurchase activities are more prone to some particular types of firms. Narcissistic managed firms are more likely to perceive their firms as priced lower because of their unrealistic inflated self-view influencing them to announce more repurchases to disagree with how the market is pricing them. The paper's findings indicate that proper governance is essential to control the excessive repurchase activities of these CEOs.

The results of this study have important implications for policymakers and managers. As firm CEOs are key decision-makers, their psychological traits – narcissism – are essential for the firm's decisions. Although research has associated CEO narcissism with authority, self-reliance and supremacy that can foster leadership effectiveness, promote company performance and be attractive to loyal employees (Hogan & Kaiser, 2005; Maccoby, 2000). Narcissistic CEOs are likely to act on their unrealistic inflated self-views to perceive their companies stock as priced lower and announce more repurchases. Thus, when companies are recruiting CEOs, they should consider their psychological traits and capabilities, which may also influence the firms' path for share repurchases.

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## DATA AVAILABILITY STATEMENT

All data used are publicly available secondary data. They are downloaded from subscription datasets or are freely available in sources cited in the paper. We will be able to share the raw data subject to limitations imposed by subscription providers.

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## APPENDIX: DESCRIPTION OF VARIABLES

Firm related	Description	Source
Return on Asset	Net income scaled by the book value of totals assets	Compustat
Cash flow	Income before extraordinary items plus depreciation, scaled by book value of total assets	Compustat
Cash flow volatility	Standard deviation of annual operating cashflow (OIBDP) scaled by total assets over the previous 3 years	Compustat
Research and development	Ratio of research and development cost to total asset	Compustat
Slack	Cash and short-term investments scaled by the book value of total assets	Compustat
Market-to-book	Market value of Asset scaled by the book value of asset	Compustat
Firm size	Natural logarithm of the book value of total assets	Compustat
Capital expenditure	Measured as capital expenditures (CAPX) over total assets (AT)	Compustat
Cash dividend payout	Annual cash dividends scaled by net incomes (NI) during the measurement period When net incomes are zero or negative, cash dividend payout is set to missing	Compustat
Book leverage	Long-term debt plus current debt, scaled by the book value of the asset	Compustat
Announcement indicator	This is an indicator variable equal to one if a firm announces a repurchase in a year and zero otherwise	Thormsonone
Actual repurchase indicator	An indicator variable equal to one if a firm make an actual repurchase in a year and zero otherwise	Thormsonone/ Compustat

(Continues)

Firm related	Description	Source
Announcement value	Target repurchase dollar amount scaled by total asset	Compustat
Actual repurchase value	Actual cash repurchase scaled by total assets	Compustat
Prior repurchaser	Dummy variable equal to one if a firm makes a repurchase announcement in year $t - 1$ or/and $t - 2$	CRSP
Return	Measured as the average monthly return for a year	CRSP
CEO related	Description	Source
CEO Age	Age of a CEO in a year	Execucomp
CEO tenure	Measured as the number of years that the CEO has been the CEO of the company	Execucomp
CEO gender	This is an indicator variable that is equal to one if the CEO is a male and zero otherwise	Execucomp
Equity compensation	Equity-linked compensation as a percentage of total compensation (TDC1). Equity-linked compensation is defined as option awards plus stock awards. Suppose equity-linked compensation based on this definition cannot be calculated because of missing data. In that case, equity-linked compensation is alternatively defined as total compensation (TDC1) - salary plus bonus (TOTAL_CURR) - non-equity compensation (NONEQ_INCENT)	Execucomp
CEO share ownership	CEO share ownership is the natural logarithm of the number of shares that are owned by the CEO at the end of the year excluding options granted	Execucomp
CEO duality	Duality is an indicator variable which is one when the CEO is also the chairman of the board and zero otherwise	Datastream
Outside directors	Outside directors is measured as the ratio of the number of outside directors to total directors on the board of the company at the end of a year	Execucomp
Executive option grant	Executive option is the natural log of the total option granted to executives in year $t + 1$	Execucomp
CEO to CFO salary	The ratio of CEO to CFO salary	Compustat
Narcissism variable	Narcissism score is the area per character signature size measure of narcissism	
High narcissism dummy	An indicator variable that is equal to 1 if a CEO's narcissism score is greater than the 75th percentile and zero otherwise	