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Does CEO agreeableness personality mitigate real earnings management?

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Abstract: Despite efforts to mitigate aggressive financial reporting, earnings management remains challenging to parties interested in inhibiting its dysfunctional effects. Using linguistic algorithms to assess CEO agreeableness personality from their unscripted texts in conference calls, we find that it is a determinant that mitigates a firm's real earnings management. Furthermore, such an effect is more pronounced when firms confront intensive market competition and financial distress and have weaker managerial entrenchment or when CEOs face stronger internal governance. Our findings persist even after we utilize several alternative real earnings management metrics and control other confounding personalities in prior earnings management studies. The subsample analysis and a two-step endogeneity controlling analysis further support that our results are not driven by the endogeneity in CEO selection process. Our study enriches the upper echelons theory, especially in the personality-situation interaction perspective, and provides insights for firms to incorporate managers' ethical-oriented personality into the mechanisms of curbing real earnings management.

Keywords: Agreeableness, Business ethics, CEO personality, Real earnings management

1. Introduction

While financial scandals such as Enron have revealed how earnings management wrecks a firm, it continues to prevail because of the complex conflicts among interest groups (Arun, Almahrog, & Aribi, 2015; Du, Jian, Lai, Du, & Pei, 2015). Real earnings management (REM) is a prevalent tool whereby managers purposely manipulate firms' near-term earnings based on real transaction activities that depart from normal or optimal practices, thereby misleading stakeholders' perceptions (Roychowdhury, 2006; Zhao, Chen, Zhang, & Davis, 2012). Compared to accrual management (AEM) that may violate Securities and Exchange Commission rules or Generally Accepted Accounting Principles, REM is less detectable but still causes damage to firms' long-term cash flows and market efficiency (Laksmana & Yang, 2014). It is considered a significant ethical issue in accounting (Du et al., 2015). While scholars have explored determinants to curb REM, most extant studies focus on corporate governance mechanisms that undermine managers' self-serving practices (Cheng, Lee, & Shevlin, 2016; Huang, Roychowdhury, & Sletten, 2020), with limited emphasis on managers' traits (Buchholz, Lopatta, & Maas, 2020).

In this regard, the upper echelons theory (Hambrick & Mason, 1984) designates managers' personality as a critical input shaping firm strategies, since personality affects an individual's perception, interpretation, and preference for strategic situations they face (Wang, Holmes Jr, Oh, & Zhu, 2016). Ample literature asserts that CEOs' psychological characteristics manifest in the firms' actions (Freund, Kovacs, Nguyen, & Phan, 2023; Green, Jame, & Lock, 2019). Specifically, a recent study has illustrated the implications of CEOs' Big Five personalities, a dominant and widely used paradigm in personality studies (Harrison, Thurgood, Boivie, & Pfarrer, 2019), on unethical organizational behaviors and contends that CEOs' bright-side personalities contribute to lower odds of unethical behaviors (Van Scotter & Roglio, 2020). In particular, CEO agreeableness reflects prosocial tendencies, such as trust, altruism, and modesty (Sakalaki & Fousiani, 2012; Arıkan, 2020); it is regarded as the strongest antecedent for ethical leadership that influences business practice (Brown & Treviño, 2006; Kalshoven, Den Hartog, & De Hoogh, 2011). Highly agreeable individuals show considerable ethical concern and are unwilling to engage in or justify ethically suspect behaviors (Hirsh, Lu, & Galinsky, 2018; Simha & Parboteeah, 2020). They are also cooperative and compliant on the premise of not violating norms or harming others' welfare because they are more consequence-oriented than others (Brown & Treviño, 2006; Khan, Akbar, Jam, & Saeed, 2016).

This study investigates whether CEO agreeableness, a high-order ethical personality (Simha & Parboteeah, 2020), mitigates firms' propensity for REM. We focus particularly on REM because of its rapidly

rising proportion in practice (Cohen, Dey, & Lys, 2008), its longer duration, and greater regulatory difficulty relative to AEM (Zhao et al., 2012). Besides, this hidden but not necessarily illegal behavior is theoretically more likely to be subject to managers' ethical codes. As Van Scotter and Roglio (2020) contend, although corporates put in rigorous efforts to evaluate and promote candidates, CEO scandals remain challenging. Exploring CEOs' personalities that may inhibit REM help enhance firms' communication with capital markets and reduce the loss of stakeholders and firms' cash flow. Drawing on prior evidence that agreeable individuals avoid opportunistic, risky, and unethical behaviors (Sakalaki & Fousiani, 2012; Soane & Chmiel, 2005), we expect that agreeable CEOs are less likely to engage in REM.

Furthermore, psychology (Furr & Funder, 2019) and upper echelons perspectives (Harrison et al., 2019) suggest that CEOs' choice is a joint function of their personality and situational factors. In this respect, trait activation theory (Tett & Burnett, 2003) provides insights to identify contingent situation factors that activate traits' expression. It posits that individuals' personalities are more likely to be expressed when exposed to trait-relevant situational cues (Greenbaum, Hill, Mawritz, & Quade, 2017). Therefore, we look into potential factors relevant to agreeableness from three levels to obtain a comprehensive picture of the impact of CEO agreeableness on REM, including market environment (product market competition), organizational (financial distress and managerial entrenchment), and management group (internal governance) level.

Specifically, we suppose that agreeable CEOs' avoidance of REM may be more pronounced when firms are under severe operating situations, such as intensive financial distress and product market competition. In these situations, REM behavior may incur higher costs and risks (Shi, Sun, & Zhang, 2018; Zang, 2012), which may activate agreeable CEOs' ethical concerns and risk-averse nature and discourage them from manipulating earnings. Then, weaker managerial entrenchment reflects an organization situation defined by clearer rules to follow (Malhotra, Reus, Zhu, & Roelofsen, 2018); it may be a relevant situational cue for CEOs' compliance and risk-averse nature, strengthening the negative relationship between CEO agreeableness and REM. Finally, internal governance can indicate the incentive and power of firms' core executives to curb REM (Cheng et al., 2016). Given agreeable individuals' strong tendency for cooperation and compliance (Costa Jr, McCrae, & Dye, 1991), we expect stronger internal governance could strengthen agreeable CEOs' avoidance of REM.

Following prior literature (Green et al., 2019; Mairesse, Walker, Mehl, & Moore, 2007), we apply linguistic algorithms suitable for conversation texts to construct our measure of CEO agreeableness from the Q&A section of conference call transcripts. This method relies on social psychology literature contending that language-based analysis constitutes a practical personality measure (Park et al., 2015) because all forms of communication are personal expressions that convey valuable portraits of CEOs' underlying traits (Hanlon, Yeung, & Zuo, 2022).

Our sample involves 10,372 firm-year observations for non-financial Standard & Poor's firms from 2005 to 2019. We find that CEO agreeableness is negatively associated with a firm's REM. This finding echoes our postulation that CEO agreeableness personality is a potential determinant to inhibit a firm's manipulative behavior. Furthermore, this effect is more pronounced when firms confront higher market competition and financial distress and have weaker managerial entrenchment and stronger internal governance. These results are well-matched with agreeable CEOs' attributes, such as ethical, risk-averse, and compliant with norms and social expectations. We document robust evidence for our primary findings when using several metrics of REM and controlling potential confounding personalities (e.g., overconfidence, narcissism) in prior EM studies (Buchholz et al., 2020; Hsieh, Bedard, & Johnstone, 2014). Finally, we analyze the possible endogeneity issues in the CEO hiring process through subsample analysis and a two-step method, and our results still hold.

This study offers several contributions. First, we add to the upper echelons literature by documenting that CEO agreeableness personality affects a firm's strategy choice. Prior studies mostly emphasize CEOs' demographics (Zalata, Ntim, Aboud, & Gyapong, 2019) or psychological characteristics such as narcissism (Ham, Seybert, & Wang, 2018) and overconfidence (Hirshleifer, Low, & Teoh, 2012). We enrich this stream of literature by providing empirical evidence for the impact of CEO agreeableness on firm's outcomes. Second, we offer fresh insights into the literature seeking determinants to minimize earnings management behavior (Du et al., 2015). Distinct from prior studies (Cheng et al., 2016) that emphasize corporate governance, we find that an ethical-oriented personality, especially agreeableness, is an additional determinant that reduces REM. Finally, we supplement the previously overlooked literature on the interaction effect between personality and situational factors. While extant research (Hambrick, 2007; Tett & Burnett, 2003) theorizes that situational cues influence personality manifestation, relevant empirical studies remain scarce. We identify multilevel situation cues that moderate the impact of CEO agreeableness on REM, thereby fortifying the importance of situational factors in understanding CEOs' behaviors in the workplace.

2. Literature and hypothesis development

2.1. REM

REM refers to management actions that depart from normal business practices to temporarily inflate firms' earnings, thereby misleading stakeholders that the firm has achieved certain targets (Roychowdhury, 2006). Common manipulations include underinvestment, overproduction, and reduced product costs (Xue, Mithas, & Ray, 2021). As regulations become increasingly strict, REM has received growing attention from practice and scholars. It also provides a valuable environment to examine upper echelons effects, especially in light of several errors and construct validity concerns that accruals models continue to grapple with (Lapointe-Antunes, Veenstra, Brown, & Li, 2022).

Extant studies have explored the motivations and consequences of REM, suggesting that REM has dual properties of signal transmission and value destruction (Zhao et al., 2012). Agency theory argues that managers are motivated to grab personal interests at the cost of shareholders' interests (Jensen, 1986), and private gains are a common motivation for REM (Du et al., 2015). Signaling theory-based perspective posits that because stakeholders perceive firms' earnings as a signal of operating status to make investment decisions, managers may inflate earnings to positively influence outsiders' perception of firm value (Gunny, 2010). However, REM may induce detrimental consequences, including (1) impairing firms' growth and competitiveness in the future (Shi et al., 2018); (2) destroying shareholders' long-term interests (Zhao et al., 2012); and (3) increasing firms' reputation risk (Haga, Ittonen, Tronnes, & Wong, 2018) and stocking price crash risks (Khurana, Pereira, & Zhang, 2018).

Therefore, although REM is not necessarily illegal, literature regards this practice as a corporate or managers' ethical issue (Du et al., 2015; Kaplan, 2001). This intentionally deceptive strategy will amplify the informational asymmetry (Datta, Iskandar-Datta, & Singh, 2013) and hurt firms' relationship with their stakeholders (Kim, Park, & Wier, 2012). In this study, we take the same position of prior literature (Zhao et al., 2012) that REM is generally a myopic, opportunistic, costly behavior that undermines the firm's value and shareholders' interests.

2.2. CEO personality and REM

Concerns about REM have stimulated numerous studies exploring its determinants (Buchholz et al., 2020; Zhao et al., 2012). Corporate governance and business ethics are two major mechanisms to constrain this behavior (Du et al., 2015). Most studies emphasize that strong corporate governance is a disincentive for REM (Cheng et al., 2016). However, other literature claims that any corporate system relies strongly on participants' behavior. Once CEOs utilize information

asymmetry to behave unethically, corporate governance may lose efficiency and even stay only on paper (Du, 2013; Buchholz et al., 2020).

In contrast, business ethics incorporate managers' cognition and subjective judgment (Du et al., 2015), and selecting an ethically oriented manager may effectively restrain REM (Du, 2013). In this regard, upper echelons theory postulates that CEOs' personality shapes their choices by affecting psychological schemas, personalized perception, risk preference, and interpretation of the situations they face (Wang et al., 2016). Ethical-oriented personality can also reduce earnings management (Buchholz et al., 2020). Similarly, Walumbwa and Schaubroeck (2009) suggest that managers' personality is a uniquely appropriate determinant to predict ethical leadership because ethical behaviors reflect their deep-seated values. However, empirical research on how managers' personality inhabits REM remains scant, mainly due to the difficulty of obtaining managers' psychometric data.

2.3. Agreeableness personality

The Big Five Model is the most broadly accepted framework for measuring personality in psychology and organizational contexts (Simha & Parboteeah, 2020). It includes five distinct personalities: agreeableness, openness, conscientiousness, extraversion, and emotional stability (Costa Jr et al., 1991). We focus on agreeableness, which may be the most theoretically relevant trait to curtail REM.

Agreeableness reflects individuals' propensity to be trusting, straightforward, sympathetic, altruistic, cooperative, and compliant (Costa Jr et al., 1991; Nandkeolyar, Bagger, & Ekkirala, 2022). Straightforwardness refers to honesty and frankness; this quality is related more to moral philosophy and enables people to be sincere and truthful in all dealings (Costa Jr et al., 1991; Kalshoven et al., 2011). Similarly, altruism implies selflessness and caring for others; it was once called "social interest" and contrasted with greed (Costa Jr et al., 1991). Previous studies argue that agreeable people would share rather than hoard negative news to prevent others from worse consequences (Liu, 2019). Other scholars emphasize agreeableness' cooperative tendency; highly agreeable people prefer maintaining social relations rather than preserving self-interest (King, George, & Hebl, 2005). They are sensitive to the subordinates' needs and may share their power (Kalshoven et al., 2011). Finally, compliance indicates agreeable people's tendency to comply with the laws, social expectations, and norms but avoid harming others' welfare (Khan et al., 2016). They are consequence-oriented because non-compliance will counter their values and result in prosecution and punishment (Alkış & Temizel, 2015; Khan et al., 2016).

Among the Big Five personalities, agreeableness is the only factor consistently and negatively related to all the "Dark Triad personalities[1]" (Van Scotter & Roglio, 2020). It is also a personality with risk avoidance preference (Bansal & Gefen, 2010; Soane & Chmiel, 2005). A prior study identified agreeableness as the personality with the strongest impact on ethical leadership (Brown & Treviño, 2006). For instance, disagreeable people tend to engage in unethical actions that exploit others without guilt and anxiety about negative consequences, including cheating or engaging in risky financial and social behaviors (Van Scotter & Roglio, 2020). Conversely, high agreeableness negatively correlates with workplace deviance and white-collar economic crime (Owusu, Bart-Plange, Koomson, & Arthur, 2021).

2.4. Hypotheses development

We expect that agreeable CEOs are less likely to engage in REM due to their inherent ethical orientation, risk aversion, and compliance tendency. First, prior studies suggest that managers' tendency to earnings management is influenced by their ethical perception of such behavior; this perception relies on their ethical sensitivity (Beaudoin, Cianci, & Tsakumis, 2015; Jones, 1991). Kim et al. (2012) contend that ethical concerns motivate CEOs to provide high-quality financial reports. In this respect, highly agreeable people have strong ethical concerns and are more likely to perceive the negative utility of unethical behavior (Hirsh et al., 2018). They have an acute sense of justice and are unwilling to engage in ethically suspect behaviors that may hurt others (Simha & Parboteeah, 2020).

Regarding REM, people scoring high in such opportunistic behavior target financial success as the primary goal (Sakalaki & Fousiani, 2012). However, agreeable CEOs display prosocial and communal values (King et al., 2005; Nandkeolyar et al., 2022); their motivation to maintain good relationships with others contributes to the avoidance of bad news hoarding (Liu, 2019), economic defection, and opportunistic behavior (Arıkan, 2020; Sakalaki & Fousiani, 2012). This expectation is confirmed by a recent study that documented a negative relationship between agreeableness and stock price crash risk (Liu, 2019). Given that REM will affect the accuracy of stakeholders' judgments and decisions, we expect that agreeable CEOs are more likely to perceive REM as an ethically suspect behavior because manipulating earnings goes against their inherent ethical-oriented attributes (e.g., honesty, altruism, sympathy). Therefore, they would honestly share firms' earnings information to prevent firms and stakeholders from severe consequences rather than defraud them for myopic self-interests.

Second, agreeable CEOs' risk aversion and compliance with social norms also contribute to their avoidance of REM. According to upper echelons theory, CEOs' decision reflects their risk preferences, and risk-averse CEOs prefer more conservative management practices than risk takers (Buchholz et al., 2020). REM is a risky financial behavior (Zalata et al., 2019), cheating stakeholders to violate the virtues of corporate citizenship (Kim et al., 2012). Hope and Wang (2018) argue that a social expectation exists of "doing the right thing" and "avoiding deceptive, unethical manner." Social expectation forms invisible moral scrutiny for CEOs' behaviors; actual and perceived anxiety and reputational costs are high enough to generate a deterrent impact on earning management and reduce the present value of dishonest behaviors (Haga et al., 2018). In line with this logic, agreeable CEOs who emphasize approval of social behaviors have more reasons to avoid risky practices (Arıkan, 2020; Bansal & Gefen, 2010) because it can potentially cost their reputation and social affiliation with others. Overall, we offer the primary hypothesis:

H1. CEO agreeableness is negatively related to the firm's REM likelihood.

Growing upper echelons literature contends that CEOs' motives and actions are strongly affected by a combination of personality and situational factors (Hambrick, 2007; Harrison et al., 2019). In this regard, Trait activation theory (TAT) (Tett & Burnett, 2003; Tett & Guterman, 2000) based on interactionist psychology likened personality to "latent potential." This underlying psychological process can be activated by trait-relevant situational cues to express more evidently. Therefore, situational factors can moderate the relationship between personality and work outcomes (Harrison et al., 2019). Specifically, the "trait situation relevance" occurs when a situation provides cues, responding to which can indicate an individual's standing on this trait (Tett & Guterman, 2000). For instance, the situation where someone calls for help is relevant to the trait of nurturance because responding to this situation by helping others indicates high nurturance (Tett & Burnett, 2003). Furthermore, situation moderators can operate at multiple levels, such as market environment, organizational, and social/group levels (Tett & Burnett, 2003; Wang et al., 2016).

Agreeableness encompasses prosocial, ethical, compliant, and cooperative orientations (Costa Jr et al., 1991; King et al., 2005). Psychology literature posits that situation cues like "helping customers" and "problems involving consumer welfare" can activate the expression of

[1] Dark Triad personalities involves Machiavellianism, psychopathy, and narcissism. Those high in Dark Triad display socially malevolent characteristics related to dominance, manipulation, callousness, and aggressiveness.

agreeableness (King et al., 2005; Tett & Burnett, 2003). Agreeable people also conform to situations with more structure and less ambiguity (Barrick & Mount, 1993). Therefore, we attempt to identify four potential situational moderators relevant to agreeableness in subsequent analysis. We integrate these moderators into three levels: market environment (product market competition), organizational (financial distress, managerial entrenchment), and management group (internal governance) levels.

Product market competition could affect CEOs' propensity to manipulate earnings (Datta et al., 2013). Although some scholars suggest that product market competition exacerbates CEOs' career concerns and increases CEOs' incentive for AEM (Lemma, Negash, Mlilo, & Lulseged, 2018), growing evidence shows that firms under intensive market competition will avoid REM considering its cost and risk (Lemma et al., 2018). Zang (2012) and Laksmana & Yang. (2014) find that competition deters firms from REM because it jeopardizes firms' long-term value and competitive strengths. Product market competition is also perceived as an effective external disciplinary tool that enhances corporate governance (Fama, 1980) and contributes to higher earnings quality (Li, 2010). Because competitiveness enriches the information available for owners to monitor and evaluate CEOs relative to their peers (Lemma et al., 2018), it helps align the benefits of CEOs and shareholders, mitigating CEOs' managerial slack and moral hazard problems (Datta et al., 2013).

Product market competition may activate agreeable CEO's ethical concern and risk-aversion attribute. In competitive markets, while REM allows firms to prosper in the short run, such a costly practice can only undermine firms' competitive strength and shareholders' welfare (Shi et al., 2018). Recall that agreeable people have an acute sense of negative utility in unethical suspect behavior. Hence, these harmful consequences are more likely to trigger their ethical nature (e.g., sympathetic, altruistic) to avoid REM and prevent firms and investors from more severe harm. Furthermore, the disciplinary effects of product market competition are also relevant to agreeable CEOs' risk-aversion tendencies. The market will more harshly punish CEOs if investors notice their misleading management (Marciukaityte & Park, 2009). This expectation echoes the view in the psychology literature (Hirsh, Lu and Galinsky, 2018) that although unethical shortcuts may lead to desired outcomes, people's prospects of "psychological cost" associated with violating a moral norm and "extrinsic cost" associated with anticipated punishment are strong disincentives that decrease unethical acts, which is especially reflected in agreeableness personality. Thus, we hypothesize the following:

H2. The negative association between CEO agreeableness and REM is strengthened when product market competition is stronger.

Financial condition is an organizational level factor that may interfere with real activities manipulation (Zang, 2012). Although a previous study suggests that managers may resort to REM for survival (Graham, Harvey, & Rajgopal, 2005), more recent studies contend that firms in poor financial health are exceptions; they have limited resources to undertake REM, which requires adjustments of business operations (Li, Li, Xiang, & Djajadikerta, 2020). Moreover, worse health condition is also associated with higher costs of manipulating earnings by altering real economic activities (Haga et al., 2018). Therefore, CEOs may perceive deviating from optimal business strategies in distressed conditions as relatively costly because it is contrary to their primary objective of improving firms' operations, thereby leading to a lower probability of REM (Li et al., 2020; Zang, 2012).

Firms' unhealthy financial conditions may activate agreeable CEOs' ethical concerns. Agreeable individuals are apprehensive of the possible undesirable consequences of deviant behaviors (Bansal & Gefen, 2010). Financial distress may stimulate agreeable CEOs' negative sense of real activity manipulations because they are more likely to perceive it as an unethical action that incurs high costs and deteriorates the firm's operation. Therefore, we hypothesize the following:

H3. The negative association between CEO agreeableness and REM is more pronounced when the firm's financial distress is severer.

Managerial entrenchment reflects a lack of corporate governance provisions that assure the alignment of CEOs' behavior and stakeholders' interests (Bebchuk, Cohen, & Ferrell, 2009; Malhotra et al., 2018). Agency scholars contend that CEOs' entrenchment undermines the threat of punishment, amplifies agency conflicts, and allows CEOs to prioritize their benefits over that of firms and stakeholders (Zhao et al., 2012), leading to suboptimal strategies such as REM (García-Sánchez, Hussain, Khan, & Martínez-Ferrero, 2020). Similarly, Florackis and Ozkan (2009) argue that entrenched CEOs can and are motivated to pursue their interests and plunder shareholders' wealth. Conversely, weaker managerial entrenchment reflects the situation defined by clearer formal and informal rules to be followed, which provides stronger incentives for CEOs to obey them (Malhotra et al., 2018).

An agreeable personality has a strong propensity for compliance; they prefer situations with a high degree of structure and little ambiguity (Barrick & Mount, 1993). Hence, agreeable CEOs with weaker entrenchment are constrained by clearer monitoring and disciplining mechanisms, which may offer a relevant situation for CEOs' compliance nature. Moreover, weaker entrenchment may also be relevant to their risk avoidance nature because agreeable CEOs may consider REM riskier when not protected by entrenchment provisions. Hence, we present the following:

H4. The negative association between CEO agreeableness and REM is more pronounced when the firm's managerial entrenchment is weaker.

Internal governance refers to the process by which core subordinate executives help discipline CEOs and affect corporate decisions (Jain, Jiang, & Mekhaimer, 2016). We emphasize this moderator because (1) core subordinates are the most likely group with the motivation and ability to affect CEOs' decisions. This factor also sheds light on how the management team works together to shape financial reporting (Cheng et al., 2016). (2) The execution of REM is inseparable from subordinates' close cooperation. Internal governance may be more effective than other governance mechanisms on such highly hidden opportunistic behavior.[2]

Prior studies contend that core subordinates have incentives and can curb REM (Cheng et al., 2016). As potential CEO successors, they care more about long-term cash flows that depend on current decisions. They will have more to lose relative to CEOs due to firms' future underperformance because they have longer employment years left[3] (Jain et al., 2016). Thus, they will oppose strategies that sacrifice firms' future value in case of a diminished firm when appointed (Acharya, Myers, & Rajan, 2011). Moreover, CEOs are "forced" to consider core subordinates' preferences because subordinates' effort is a crucial determinant of CEOs' current welfare (Acharya et al., 2011). Evidence shows that internal governance can lower information asymmetry and improve the market's liquidity (Jain et al., 2016).

Agreeable CEOs are cooperative and act in ways that conform to group norms (Judge & Zapata, 2015; Tett & Burnett, 2003). They are also sensitive to subordinates' needs (Kalshoven et al., 2011). Given that core subordinates usually take far-sighted actions (Acharya et al., 2011) and push CEOs to provide the market with transparent information and high-quality financial reporting (Jain et al., 2016), we expect that core subordinates' internal governance could provide additional support for agreeable CEOs to avoid REM. We hypothesize the following:

H5. The negative association between CEO agreeableness and REM is more pronounced when the firm's internal governance is stronger.

[2] Consistent with Acharya et al. (2011) and Cheng et al. (2016), we refer to traditional governance mechanisms other than the monitoring from core subordinate executives collectively as "other governance mechanisms."

[3] We compared the employment years left for CEOs and core subordinates of our sample in Section 4, the result is consistent with this statement.

Our research hypotheses can be integrated into the research framework in Fig. 1.

3. Methodology

3.1. Sample selection

We obtain CEO demographic data from ExecuComp, which includes listed firms on the Standard & Poor 1500 Index. We employ the algorithm on the *WinGo* Textual Analytics Database[4] to extract personality features from conference call transcripts to measure CEOs' personalities. Specifically, we downloaded 159,988 transcripts from seeking alpha from 2005 to 2019.[5] We chose CEOs' speeches in the question-and-answer (Q&A) portion because spontaneous language has less script than presentation sections (Green et al., 2019). We then match the company name in the transcript with those in COMPUSTAT to obtain the complete ticker symbol, a total of 6497 firms for these transcripts. Next, we match the CEO name in the transcript with the same firm in ExecuComp to obtain complete firm–CEO identifiers. After discarding data without firm–CEO identifiers, we obtain 3781 firm–CEO pairs for 3690 CEOs of 2110 firms for these transcripts, involving cases where a CEO appears in multiple firms and a firm has multiple CEOs. Subsequently, we follow prior studies (Bowen, Jollineau, Lyon, Malhotra, & Zhu, 2019) to aggregate Q&A texts of all transcripts for a CEO in a certain firm to extract their personality scores in this firm.[6] Finally, we merge CEOs' demographic data with calculated personality scores and merge financial data from COMPUSTAT. We eliminate observations for financial and utility industries. After discarding observations with missing data for control variables, our final sample comprises 10,372 firm-year observations in 1265 unique firms. Table 1 presents an overview of our sample selection.

We present the sample and COMPUSTAT firms' industry distribution during the sample period by two-digit SIC code in Panel A of Table 2. It shows that our sample exhibits similar distribution to the COMPUSTAT population. The year distribution in Panel B of Table 2 shows that samples are evenly distributed at different periods.

3.2. Measures

3.2.1. Agreeableness

Managers' verbal cues have become an increasingly significant information basis for market participants to make decisions (Hope & Wang, 2018). Mairesse et al. (2007) developed a predictive model to calculate the Big Five personality scores through textual analysis by joining 88 linguistic features from Pennebaker and King (1999) Linguistic Inquiry and Word Count (LIWC) and another 14 features from the MRC Psycholinguistic database (Coltheart, 1981). We apply the LIWC algorithm provided by *WinGo* to extract managers' Big Five personalities from conference call transcripts following previous research (Bowen et al., 2019; Malhotra et al., 2018). Table 3 presents the ten most important linguistic features for agreeableness.

3.2.2. Distinguishing personality from firm attribute

We follow Green et al. (2019) to compare the persistence of agreeableness for the samples of firms with CEO turnover and the same CEO in different firms and distinguish our personality measure from firm invariant attributes. If our measure captures CEOs' characteristics rather than a firm attribute, the agreeableness score of different CEOs in the same firm should be quite different. Moreover, a CEO should have similar personality scores in different firms. We find that the correlation of the agreeableness score between two different CEOs in the same firm is only 0.165, but the correlation of the score of the same CEO in different firms is 0.573. This finding indicates that the agreeableness measure largely maps CEOs' stable personalities rather than firm-level attributes.

3.2.3. REM

We follow prior literature (e.g., Roychowdhury, 2006; Xue et al., 2021) to measure *REM* based on three components, namely, abnormal operating cash flows (*R_CFO*), abnormal discretionary expenses (*R_DISEXP*), and abnormal production costs (*R_PROD*). The underlying idea is that firms' engaging in REM tend to deviate from the normal business practices by reducing per-unit fixed costs and increasing per-unit margin through overproduction, decreasing discretionary expenses such as SG&A, R&D, and advertising expenses, and boosting sales revenue through heavy promotions or favorable credit terms to clients. Among them, a higher *R_PROD* indicates higher levels of *REM*, whereas lower *R_ DISEXP* and *R_CFO* imply higher levels of *REM*. These proxies have also been validated by the *REM* literature (Kim et al., 2012).

Specifically, *R_PROD* is calculated as the residuals of the regression model (1), estimated by year and two-digit SIC industry, where $PROD_{i,t}$ is the sum of the firm *i*'s cost of goods sold and change in inventory in year t.

$$\frac{PROD_{i,t}}{Assets_{i,t-1}}=\beta_0+\beta_1\frac{1}{Assets_{i,t-1}}+\beta_2\frac{Sales_{i,t}}{Assets_{i,t-1}}+\beta_3\frac{\Delta Sales_{i,t}}{Assets_{i,t-1}}+\beta_4\frac{\Delta Sales_{i,t-1}}{Assets_{i,t-1}}+\varepsilon_{i,t} \quad (1)$$

Similarly, *R_ DISEXP* is the residual of the regression model (2), where $DISEXP_{i,t}$ is the sum of the firm *i*'s SG&A, R&D, and advertising expenses.

$$\frac{DISEXP_{i,t}}{Assets_{i,t-1}}=\beta_0+\beta_1\frac{1}{Assets_{i,t-1}}+\beta_2\frac{Sales_{i,t-1}}{Assets_{i,t-1}}+\varepsilon_{i,t} \quad (2)$$

R_CFO is the residuals of the regression model (3), where $CFO_{i,t}$ is firm *i*'s operating cash flows in year *t*.

$$\frac{CFO_{i,t}}{Assets_{i,t-1}}=\beta_0+\beta_1\frac{1}{Assets_{i,t-1}}+\beta_2\frac{Sales_{i,t}}{Assets_{i,t-1}}+\beta_3\frac{\Delta Sales_{i,t}}{Assets_{i,t-1}}+\varepsilon_{i,t} \quad (3)$$

Finally, as the combination of the three measures can capture a more comprehensive REM engagement (Xue et al., 2021), we compute the overall REM by aggregating the individual standardized measures (Cohen et al., 2008; Xue et al., 2021), i.e., standardized *R_PROD* (+), standardized *R_ DISEXP* (−), and standardized *R_ CFO* (−). A higher level of *REM* proxies for more REM.

3.2.4. Moderators

(1) Product market competition

We utilize Herfindahl–Hirschman Index (*HHI*) to measure the competition intensity of the product market inversely:

$$HHI_{j,t}=\sum_i^{N_j}S_{i,j,t}^2 \quad (4)$$

where $S_{i,j,t}$ denotes the market share of firm *i* in a two-digit SIC industry in year *t*, and *N* represents the number of firms in the corresponding industry in year *t*. The firm's market share is calculated by scaling its sales by the total sales of the same industry. The lower *HHI* indicates more intensive market competition.

(2) Financial distress

Extant literature regards Altman (1968) *Z*-score as the most widely

[4] *WinGo* Database is one of the leading AI-based textual databases building on machine learning techniques on corporate documents released by listed firms.

[5] Our sample starts in 2005 because we can download sufficient transcripts from the seeking alpha from then on to measure personality.

[6] This approach reflects the view that transcripts over many years reflect contextual settings over time and more spoken text yields more reliable scores (Bowen., 2019; Wang and Chen (2020)).

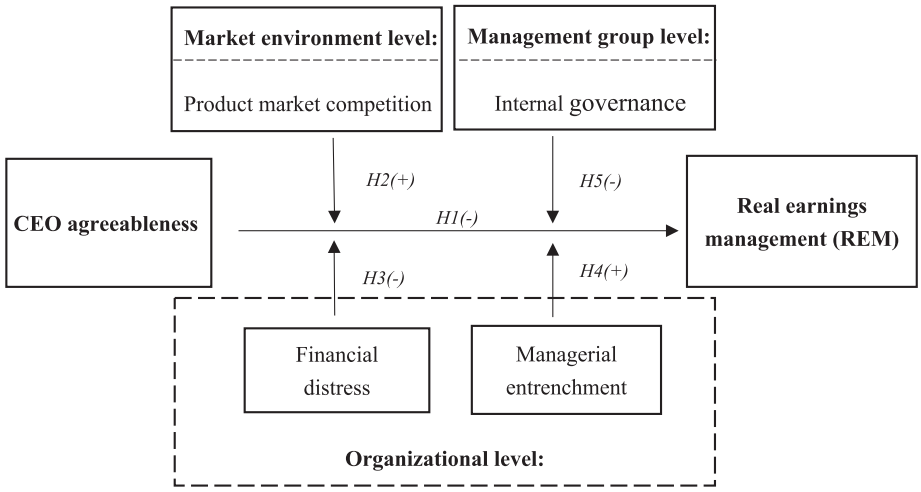

Figure 1. Research framework

Fig. 1. Research framework.
Note: The parentheses show the symbols of the interaction items in our empirical regressions. Notably, we use an inverse proxy for product marker competition (*HHI*).

Table 1
Sample selection procedure.

Sample selection procedures	***N***
Observations of CEO demographic data in *Execucomp* from years 2005–2019	29,742
Less: observations without available CEOs' personality scores	-6643
Less: observations with missing values after merging *COMPUSTAT*	-68
Less: observations in financial and utility industries	-5901
Less: missing observations for variables in the baseline analysis	-6758
Total observations	10,372

Note: This table presents the sample selection procedures for the baseline regression. The sample in cross-sectional analysis varies with moderating variables.

adopted financial health measure (Haga et al., 2018). Following Li et al. (2020), we multiply Z-score by −1 to proxy for firms' financial distress (*Distress*), and thus, a higher *Distress* indicates more severe distress. Z-score is calculated as follows:

$$Z\text{-}score = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5 \quad (5)$$

where *X1* is working capital scaled by total assets, *X2* is the ratio of retained earnings to total assets, *X3* is net income scaled by total assets, *X4* is the ratio of market value to total liabilities, and *X5* is sales to total assets.

(3) Managerial entrenchment

As in prior literature (Huang et al., 2020), we use Bebchuk et al. (2009) *E_index* to proxy managerial entrenchment. It measures the amount of anti-takeover provisions a firm has in the current year, including provisions that limit most shareholders' voting power or defend against a hostile takeover.

Therefore, a greater *E_index* implies higher managerial entrenchment because these provisions will prevent the takeover market from performing the ex-post-settling-up function on self-dealing CEOs. Thus, CEOs may indulge more in real activity manipulations to maximize the private benefits (Zhao et al., 2012).

(4) Internal governance

We follow Cheng et al. (2016) to measure internal governance. Their measure captures the underlying idea of internal governance: this mechanism depends on core subordinates' incentives and actual power to monitor CEOs. We first limit the scope of core subordinates to the top four managers excluding the CEO[7] (Jain et al., 2016). Then, subordinates' monitoring incentives are measured with their decision horizon. We follow Cheng et al. (2016) to assume the retirement age as 65,[8] and *Sub_Horizon* is the number of years between subordinates' average age and 65.[9]

$$Sub\_Horizon = 65 - average\ age\ of\ core\ subordinates \quad (6)$$

Next, subordinates' monitoring power is captured by the average annual compensation of core subordinates scaled by the CEO's annual compensation. Specifically, managers' compensation reflects their influence and structural position in a firm (Finkelstein, 1992). It is scaled because it can better capture core subordinates' power within a firm than unscaled compensation (Cheng et al., 2016). *Sub_Power is*

$$Sub\_Power = \frac{average\ annual\ compensation\ of\ core\ subordinates}{CEO\ annual\ compensation} \quad (7)$$

The comprehensive proxy of internal governance (*Inter_gov*) is measured by summing the standardized *Sub_Horizon* and standardized *Sub_Power*. A higher value *Inter_gov* indicates stronger internal governance.

3.2.5. Control variables

We control additional firm-level and CEO-level characteristics. First, we follow extant literature (Holderness Jr, Huffman, & Lewis-Western, 2019; Le, Kweh, Ting and Nourani, 2022) to include firms' factors that may influence earnings management behavior. These factors are return on assets (*ROA*), capital structure (*Lev*), growth opportunities (*Growth*), firm age (*Lnfirmage*), market-to-book ratio (*M*tb), and firm size (*Size*). To dispel the concern that firms could have a performance tendency, we follow Wang and Chen (2020) to include firms' performance

[7] The positions of core subordinates in our final sample include CFO, COO, President, Executive Vice President, Senior Vice President, Vice President, etc.
[8] Retirement age itself is a cross-sectional constant, and it will not change our regression results other than intercept.
[9] Consistent with Cheng et al. (2016), we focus on subordinates' horizon rather than the relative horizon to CEOs because it is subordinate's horizon itself that motivate subordinate to emphasize firm's long-term value. In contrast, the relative horizon could not necessarily reflect core subordinates' monitoring incentives.

Table 2
Sample distribution of the industry and year.

Panel A: Distribution by industry				
SIC Industry	Sample firms		Execucomp firms	
	Frequency	Percent	Frequency	Percent
1. Business Services	1300	12.53%	2792	12.4%
2. Chemicals & Allied Products	1026	9.89%	2148	9.54%
3. Electronic & Other Electrical Equipment & Components	877	8.46%	1919	8.52%
4. Measuring, photographic, medical, optical goods & clocks	857	8.26%	1570	6.97%
5. Industrial & Commercial Machinery & Computer Equipment	793	7.65%	1532	6.80%
6. Oil & Gas Extraction	454	4.38%	1087	4.83%
7. Transportation Equipment	412	3.97%	756	3.36%
8. Wholesale Trade-durable Goods	346	3.34%	546	2.43%
9. Food & Kindred Products	330	3.18%	729	3.24%
10. Eating & Drinking Places	296	2.85%	488	2.17%
11. Miscellaneous Retail	245	2.36%	482	2.14%
12. Paper & Allied Products	209	2.02%	311	1.38%
13. Primary Metal Industries	209	2.02%	357	1.59%
14. Health Services	202	1.95%	505	2.24%
15. Fabricated Metal Products, Except Machinery & Transportation Equipment	202	1.95%	389	1.73%
16. Others	2614	25.20%	6903	30.66%
Total	10,372	100	22,514	100
Panel B: Distribution by year				
Year	Frequency		Percent	
2005	472		4.55%	
2006	606		5.84%	
2007	737		7.11%	
2008	774		7.46%	
2009	613		5.91%	
2010	594		5.73%	
2011	620		5.98%	
2012	675		6.51%	
2013	706		6.81%	
2014	741		7.14%	
2015	763		7.36%	
2016	785		7.57%	
2017	789		7.61%	
2018	794		7.66%	
2019	703		6.78%	
Total	10,372		100%	

Note: This table displays sample distribution based on two-digit SIC industry category and year, respectively.

in the year before the CEO's appointment (*Tendency*). Additionally, we control for monthly stock volatility of the prior five years (*Stdret*) to capture firms' risk (Khurana et al., 2018) and institutional ownership (*IO*) as external governance from institutional investors.

Second, we follow Malhotra et al. (2018) to control the other four Big Five personalities (e.g., openness, conscientiousness, extraversion, emotional stability) to mitigate spurious association. We also follow Buchholz et al. (2020) and Zalata, Tauringana, and Tingbani (2018) to control demographic variables that may influence CEOs' decision-making, including CEO tenure (*Tenure*) and CEO age (*Age*), an indicator that equals one if the CEO is male, otherwise zero (*Male*). We also include a dummy that equals one if CEO has a doctoral degree and zero otherwise (*Education*). Besides, given that CEO power could affect earnings management (Le, Kweh, Ting and Nourani, 2022), we include three variables for CEO power, i.e., an indicator of CEO duality (*Duality*), an indicator of whether the CEO is a founder of the firm (*Founder*), and CEO ownership (*Ownership*). Finally, we include two-digit SIC and year dummies. Overall, we verify our main hypothesis using the model in Eq. (8).

Table 3
Ten most important linguistic features in measuring agreeableness.

Linguistic feature	Source	Description	Relation with Agreeableness	Weights
Assent	LIWC	The relative frequency of words related to assent, e.g., "ok" and "yes."	+	0.565
Tentat	LIWC	The relative frequency of words related to tentative, e.g., "maybe" and "perhaps."	+	0.377
NPHON	MRC	The distribution of entries in the WORD field by the number of phonemes.	+	0.336
Article	LIWC	The relative frequency of articles used.	+	0.281
NSYL	MRC	The distribution of entries in the WORD field by the number of syllables.	−	0.278
Swear	LIWC	The relative frequency of words related to swear.	−	0.271
Anx	LIWC	The relative frequency of anxiety-related words, e.g., "anxiety" and "fear."	−	0.263
CONC	MRC	The subjective rating of words for concreteness; it is derived from merging three sets of norms: Paivio. (1968), Toglia & Battig (1978), and Gilhooly & Logie (1980).	+	0.260
Humans	LIWC	The relative frequency of words related to humans, e.g., "child" and "man."	+	0.247
Negate	LIWC	The relative frequency of words related to negations, e.g., "no," "not," and "cannot."	−	0.224

Note: This table reports the most important linguistic features in measuring agreeableness. The description is from and Pennebaker and King (1999) and Mairesse et al. (2007).

$$REM_{i,t} = \beta_0 + \beta_1 Agreeableness_{i,j} + \sum Controls_{i,t} + IndustryFE + YearFE + \varepsilon_{i,t} \quad (8)$$

where $REM_{i,t}$ is the real earnings management of firm i in year t and $Agreeableness_{i,j}$ is the agreeableness score of CEO j in firm i. *Controls* denotes all the control variables above. We winsorize continuous variables at 1% and 99% truncation points to exclude the outliers and use standard errors clustered by firm. Appendix A shows variable definitions.

4. Results

4.1. Summary statistics

Table 4 details the summary statistics of the variables. The mean (median) values of *REM* and *Agreeableness* are 0.015 (0.103) and 3.264 (3.271), respectively, which are comparable to those reported in Malhotra et al. (2018). The descriptive statistics of controls and moderators are similar to those presented in extant literature (Malhotra et al., 2018; García-Sánchez, Hussain, Khan, & Martínez-Ferrero, 2020). The mean of the core subordinates' decision horizon (*Sub_Horizon*) is 12.427 years, which is larger than those of CEOs' mean horizon of 9.056 years, echoing the notion that core subordinates are usually younger and have longer horizons than CEOs (Cheng et al., 2016).

Table 5 presents the correlation coefficient matrix. We find a significantly negative correlation between *Agreeableness* and *REM*, providing primary evidence that CEO agreeableness personality helps curb REM. The untabulated mean (maximum) variance inflation factor

Table 4
Descriptive Statistics.

Variable	*N*	*Mean*	*SD*	*p1*	*p25*	*p50*	*p75*	*p99*
REM	10,372	0.015	1.676	−5.205	−0.845	0.103	0.910	5.165
Agreeableness	10,372	3.264	0.317	2.423	3.061	3.271	3.467	4.055
ROA	10,372	0.098	0.091	−0.201	0.056	0.093	0.141	0.359
Size	10,372	7.855	1.639	4.147	6.725	7.724	8.902	12.001
Mtb	10,372	3.327	1.309	0.727	1.538	2.500	4.462	8.120
Lev	10,372	0.528	0.234	0.097	0.368	0.520	0.658	1.265
PPE	10,372	0.244	0.217	0.009	0.082	0.170	0.345	0.885
Growth	10,372	0.108	0.269	−0.335	−0.016	0.055	0.154	1.469
Lnfirmage	10,372	3.071	0.560	1.386	2.708	3.178	3.526	3.784
Tendency	10,372	0.095	0.119	−0.416	0.052	0.094	0.152	0.441
Stdret	10,372	0.109	0.048	0.042	0.075	0.099	0.130	0.289
IO	10,372	0.799	0.187	0.194	0.723	0.848	0.933	1
Lntenure	10,372	1.535	0.818	0	1.099	1.609	2.197	2.996
Lnage	10,372	4.016	0.124	3.689	3.932	4.025	4.094	4.304
Founder	10,372	0.077	0.266	0	0	0	0	1
Duality	10,372	0.440	0.496	0	0	0	1	1
Male	10,372	0.960	0.196	0	1	1	1	1
Education	10,372	0.058	0.234	0	0	0	0	1
Ownership	10,372	0.020	0.052	0	0.001	0.004	0.011	0.336
Consc	10,372	6.063	0.485	4.791	5.757	6.055	6.364	7.271
Extra	10,372	6.736	0.614	4.649	6.421	6.793	7.147	8.007
Emoti	10,372	3.170	0.476	1.446	2.922	3.229	3.487	4.103
Openn	10,372	5.716	0.510	4.488	5.377	5.698	6.047	7.085
HHI	10,372	0.065	0.057	0.021	0.032	0.044	0.077	0.374
Distress	10,041	−5.032	4.450	−26.91	−5.929	−3.955	−2.636	2.838
E_index	7797	2.950	1.069	0	2	3	4	5
Sub_Power	9849	0.392	0.150	0.109	0.287	0.365	0.477	0.835
Sub_Horizon	9849	12.427	4.452	1.000	9.500	12.500	15.500	23.500
Inter_gov	9849	0.066	1.224	−2.652	−0.982	−0.214	0.795	3.359

Note: This table reports the summary statistics for variables in our sample. Variables definitions are presented in Appendix A.

(*VIF*) values of our variables are 1.41 (2.31), suggesting that our analysis does not suffer a multicollinearity problem.

4.2. Empirical results

4.2.1. Baseline results

Column (1) of Table 6 examines how a CEO's agreeableness personality influences a firm's REM. The coefficient of *Agreeableness* is negative and significant at a 1% level (−0.431, t-statistic = − 2.865), indicating that firms with highly agreeable CEOs are less likely to engage in REM. Statistically, a one-standard-deviation increase in *Agreeableness* is accompanied by a 13.7% (= 0.431*0.317) decrease in a firm's real activity manipulations, supporting Hypothesis 1.

Our results for control variables are generally close to prior literature. For instance, *ROA*, *Size*, and *MTB* coefficients are negatively significant (−4.908, t-statistic = −10.181 for *ROA*; −0.164, t-statistic = −5.437 for *Size*; −0.027, t-statistic = −3.956 for *MTB*); they are consistent with Cheng et al. (2016). *Lev* and *Lnfirmage* are positively related to *REM* (Cho & Chun, 2016).

4.2.2. Cross-sectional analysis

We analyze the moderating effects by adding each moderator and interaction term between the moderator and *Agreeableness* to Eq. (8). We also mean-centered all continuous variables used in interactions to reduce the potential multicollinearity issue.

Hypothesis 2 predicts that product market competition is more likely to activate agreeable CEO's ethical concern and risk-aversion attribute, contributing to a lower REM likelihood. Column (2) of Table 6 reveals that the coefficient for the interaction terms between *Agreeableness* and the inverse proxy of competition (*HHI*) is positive and significant at a 1% level (6.331, t-statistic = 2.706), supporting Hypothesis 2.

Column (3) of Table 6 provides the results when adding the interaction terms of financial distress (*Distress*) with *Agreeableness* in Eq. (8). We still observe a significantly negative relation between *Agreeableness* and *REM* (coefficient = −0.411, t-statistic = −2.714 for *Agreeableness*). The coefficient for *Agreeableness*Distress* is negative and significant at a 5% level (−0.038, t-statistic = −2.318). The results confirm our speculation that when firms confront unhealthy financial conditions, agreeable CEOs are less likely to choose the costly real activities manipulations that could aggravate the firm's poor condition, supporting Hypothesis 3.

Column (4) of Table 6 shows how managerial entrenchment (*E_index*) moderates the association between CEO agreeableness and REM. The coefficient of the interaction term *E_index*Agreeableness* is positive and significant at 1% (0.315, t-statistic = 2.868), revealing that the negative influence of CEO agreeableness on REM is more pronounced when managerial entrenchment is lower, and thus, Hypothesis 4 is supported.

Column (5) of Table 6 reports the results of examining the association between *Agreeableness* and *REM* conditioned on internal governance (*Inter_ gov*). The coefficient for *Agreeableness* remains significantly negative (−0.411, t-statistic = −2.712), and the coefficient for *Agreeableness*Inter_Gov* is also negative and significant at 1% level (−0.178, t-statistic = −2.695), suggesting that the mitigating effect of CEO agreeableness personality on REM is pronounced when the CEO is in a situation with stronger internal governance, supporting Hypothesis 5.

4.3. Robustness checks

4.3.1. Alternative measurements for REM

Thus far, we have focused on the comprehensive metric of *REM*. Prior studies posit that firms adopt one or all three REM strategies (Haga et al., 2018). The three individual components of REM may exert various effects on earnings, although they may dilute the results using the composite measure (Cohen, Mashruwala, & Zach, 2010). Other studies compute integrated proxies for REM based on two of the three individual components (Holderness Jr et al., 2019; Zang, 2012) because simply adding three components may result in offsetting or double counting (Cohen, Mashruwala, & Zach, 2010). Therefore, we first examine the separate effect of three individual proxies, namely *R_PROD*, *R_DISEXP* (multiply −1), and *R_CFO* (multiply −1). We then follow Cheng et al. (2016) and Zalata et al. (2019) to derive another two composite metrics.

Table 5
Spearson correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1.*REM*	1																						
2. *Agreeableness*	**−0.061**	1																					
3.*ROA*	**−0.263**	**−0.042**	1																				
4.*Size*	**−0.137**	−0.024	**0.303**	1																			
5.*Mtb*	**−0.167**	−0.014	**0.163**	**0.189**	1																		
6.*Lev*	**0.162**	**−0.081**	−0.014	**0.153**	−0.011	1																	
7.*PPE*	**0.079**	**−0.040**	**−0.058**	**0.030**	**−0.092**	**0.123**	1																
8.*Growth*	**−0.187**	0.023	**0.097**	**0.074**	**0.085**	**−0.076**	**−0.069**	1															
9.*Lnfirmage*	**0.114**	**−0.025**	0.01	**0.280**	**−0.028**	**0.157**	**0.046**	**−0.169**	1														
10.*Tendency*	**−0.034**	**−0.058**	**0.429**	**0.172**	**0.013**	−0.019	0.021	**−0.034**	**−0.058**	1													
11.*Stdret*	0.013	0.043	**−0.318**	**−0.538**	**−0.118**	0.006	**0.088**	0.018	**−0.284**	**−0.254**	1												
12.*IO*	0.012	0.016	**0.076**	0.021	−0.009	−0.013	**−0.037**	0.018	**−0.120**	**0.033**	**−0.097**	1											
13.*Founder*	**−0.076**	0	**−0.033**	**−0.072**	**0.039**	**−0.114**	**−0.074**	**0.073**	**−0.217**	**−0.070**	**0.079**	**−0.052**	1										
14.*Duality*	0.003	−0.015	**0.044**	**0.115**	0.011	**0.044**	**0.052**	−0.003	**0.062**	**0.028**	**−0.069**	**−0.027**	**0.122**	1									
15.*Lntenure*	−0.005	**0.053**	0.023	**0.044**	0.005	**−0.055**	**0.032**	−0.001	**0.129**	**0.038**	**−0.094**	−0.007	**0.180**	**0.270**	1								
16.*Lnage*	**0.052**	**−0.068**	0.020	**0.069**	**−0.033**	**0.041**	**0.100**	**−0.046**	**0.220**	**0.027**	**−0.100**	**−0.043**	**0.027**	**0.217**	**0.380**	1							
17.*Male*	0.002	**0.091**	−0.01	0.018	**−0.032**	−0.024	**−0.035**	0.008	**0.027**	**−0.029**	0.009	−0.003	0.017	**0.053**	**0.056**	**0.050**	1						
18.*Education*	**−0.121**	**0.045**	**−0.052**	**−0.058**	0.004	**−0.171**	**−0.100**	**0.032**	**−0.031**	**−0.099**	**0.053**	**−0.029**	**0.167**	**−0.029**	**0.067**	**0.079**	−0.01	1					
19.*Consc*	**−0.051**	**0.378**	0.013	**0.063**	0.008	**−0.068**	**−0.158**	−0.009	**0.061**	−0.014	−0.018	0.004	0.020	0.008	**0.067**	**0.044**	0.01	**0.114**	1				
20.*Extra*	**0.029**	**−0.282**	**0.066**	**0.142**	0.016	**0.083**	**0.076**	−0.001	0.025	**0.115**	**−0.124**	**0.045**	−0.01	0.006	**0.031**	**−0.070**	0.020	**−0.153**	0.013	1			
21.*Emoti*	0.015	**0.434**	−0.011	**0.098**	−0.01	0.017	**0.085**	**0.028**	0.023	0.010	**−0.048**	**0.075**	**−0.037**	−0.018	**0.047**	**−0.115**	**0.075**	**−0.071**	−0.004	**0.186**	1		
22.*Openn*	**−0.059**	**0.230**	**0.026**	**0.055**	**0.036**	0.007	**−0.167**	−0.006	**0.035**	−0.002	**−0.054**	**−0.029**	0.007	**−0.058**	**−0.078**	**−0.070**	**−0.059**	**0.080**	**0.690**	−0.004	**−0.147**	1	
23.*Ownership*	−0.022	**−0.032**	−0.005	**−0.186**	0.017	**−0.139**	0.001	**0.026**	**−0.157**	0.016	**0.096**	**−0.233**	**0.368**	**0.198**	**0.183**	**0.104**	**0.052**	**0.082**	**−0.030**	−0.018	**−0.055**	**−0.039**	1

Note: The correlation coefficient in bold indicates a significance level of 1% or less. Variables definitions are presented in Appendix A.

Table 6
The association between CEO agreeableness and REM.

	Dependent variable: *REM*				
	(1)	(2)	(3)	(4)	(5)
Agreeableness	**−0.431*** **	**−0.379** **	**−0.411*** **	**−0.380** **	**−0.411*** **
	(−2.865)	**(−2.533)**	**(−2.714)**	**(−2.197)**	**(−2.712)**
Agreeableness×HHI		**6.331*** **			
		(2.706)			
HHI		2.054			
		(1.614)			
Agreeableness×Distress			**−0.038** **		
			(−2.318)		
Distress			0.031***		
			(3.623)		
Agreeableness×E_index				**0.315*** **	
				(2.868)	
E_index				0.012	
				(0.268)	
Agreeableness×Inter_gov					**−0.178*** **
					(−2.695)
Inter_gov					−0.094***
					(−3.855)
ROA	−4.908***	−4.893***	−4.437***	−5.373***	−5.004***
	(−10.181)	(−10.217)	(−8.937)	(−10.303)	(−10.337)
Size	−0.164***	−0.161***	−0.157***	−0.202***	−0.159***
	(−5.437)	(−5.346)	(−5.182)	(−6.185)	(−5.333)
Mtb	−0.027***	−0.028***	−0.023***	−0.027***	−0.026***
	(−3.956)	(−4.075)	(−3.616)	(−4.066)	(−3.740)
Lev	1.142***	1.151***	0.858***	1.026***	1.023***
	(5.946)	(6.045)	(4.308)	(4.895)	(5.439)
PPE	0.727**	0.754**	0.830***	0.557*	0.785***
	(2.473)	(2.576)	(2.824)	(1.696)	(2.702)
Growth	−0.653***	−0.654***	−0.525***	−0.479***	−0.617***
	(−8.423)	(−8.429)	(−6.707)	(−5.762)	(−7.767)
Lnfirmage	0.296***	0.287***	0.308***	0.248***	0.246***
	(3.480)	(3.383)	(3.494)	(2.658)	(2.888)
Tendency	0.491	0.446	0.556	−0.042	0.569
	(1.304)	(1.185)	(1.460)	(−0.106)	(1.515)
Stdret	−4.950***	−4.930***	−4.521***	−5.879***	−4.526***
	(−5.728)	(−5.713)	(−5.220)	(−5.575)	(−5.300)
IO	0.266	0.280	0.394	−0.014	0.275
	(1.107)	(1.233)	(1.536)	(−0.063)	(1.319)
Founder	−0.226	−0.230	−0.181	−0.259	−0.200
	(−1.405)	(−1.441)	(−1.120)	(−1.496)	(−1.269)
Duality	0.030	0.030	0.028	0.076	0.028
	(0.419)	(0.422)	(0.384)	(1.025)	(0.390)
Lntenure	−0.044	−0.043	−0.039	−0.055	−0.048
	(−1.087)	(−1.073)	(−0.958)	(−1.285)	(−1.181)
Lnage	0.633*	0.592*	0.487	0.693*	0.431
	(1.857)	(1.771)	(1.419)	(1.944)	(1.260)
Male	0.077	0.078	0.085	−0.004	0.071
	(0.359)	(0.364)	(0.413)	(−0.020)	(0.323)
Education	−0.467***	−0.465***	−0.460***	−0.512***	−0.500***
	(−3.084)	(−3.070)	(−3.082)	(−3.239)	(−3.243)
Consc	0.148	0.137	0.173	0.151	0.124
	(1.227)	(1.141)	(1.426)	(1.205)	(1.014)
Extra	−0.018	−0.028	−0.027	−0.063	−0.043
	(−0.304)	(−0.472)	(−0.453)	(−0.926)	(−0.706)
Emoti	0.191*	0.185*	0.170*	0.230**	0.174*
	(1.841)	(1.897)	(1.704)	(2.061)	(1.737)
Openn	−0.146	−0.136	−0.177	−0.160	−0.112
	(−1.164)	(−1.087)	(−1.383)	(−1.247)	(−0.866)
Ownership	−0.107	−0.079	0.162	−0.742	0.056
	(−0.119)	(−0.087)	(0.180)	(−0.599)	(0.065)
Constant	−1.117	−2.257	−1.997	−1.456	−1.434
	(−0.688)	(−1.434)	(−1.245)	(−0.872)	(−0.888)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster(firm)	Yes	Yes	Yes	Yes	Yes
N	10,372	10,372	10,041	7797	9849
Adj. R^2	0.2255	0.2294	0.2290	0.2370	0.2318

Note: This table reports the estimated results. Column (1) reports the results of examining the association between CEO agreeableness personality and REM (*H1*). Columns (2) to (5) are the results of the moderating effects of product market competition (*H2*), financial distress (*H3*), managerial entrenchment (*H4*), and internal governance (*H5*), respectively. Notably, *HHI* is an inverse measure of product market competition. Variables definitions are presented in Appendix A. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

RM_RROD_DISEXP is the sum of *R_PROD* and *R_DISEXP* (multiply −1), and *RM_DISEXP_ CFO* is the sum of *R_DISEXP* (multiply −1) and *R_CFO* (multiply −1). We standardized the components before generating the composite metrics following Holderness Jr et al. (2019).

Table 7 presents the results of replicating our baseline regression when replacing *REM* with the above alternative metrics. We expect that they are all negatively associated with *Agreeableness*. Columns (1) to (3) provide the results using three individual metrics as dependent variables. The coefficients of *Agreeableness* are all negative and significant (−0.049, t-statistic = −2.642 for Column (1); 0.035, t-statistic =1.672 for Column (2); 0.021, t-statistic = −2.639 for Column (3)). Columns (4) and (5) are the results for two composite metrics. The coefficient of *Agreeableness* remains significantly negative at 1%. Overall, our main results are robust to different REM measures.

4.3.2. Benchmark-based measure for REM

Previous literature posits that managers may intentionally engage in REM to meet or exceed important earnings benchmarks for personal gains (Erickson, Hewitt, & Maines, 2016; Francis, Hasan, & Li, 2016). These benchmarks commonly include zero-earning benchmark, earnings changes benchmark, and analyst forecast benchmark (Hsieh et al., 2014; Roychowdhury, 2006). Specifically, managers are motived to report earnings that either equal or slightly exceed zero, report the same or slightly higher earnings compared to the prior period, or earnings that just meet or slightly beat analysts' forecast earnings. Consequently, existing literature suggests that the above phenomena are likely to signal

Table 7
Alternative measures of real earnings management.

Dependent variables	(1)	(2)	(3)	(4)	(5)
	R_PROD	*R_DISEXP *(−1)*	*R_CFO *(−1)*	*RM_PROD & DISEXP*	*RM_DISEXP & CFO*
Agreeableness	−0.049***	−0.035*	−0.021***	−0.320**	−0.207***
	(−2.642)	(−1.672)	(−2.639)	(−2.378)	(−2.908)
ROA	−0.543***	−0.088	−0.383***	−2.752***	−2.495***
	(−9.659)	(−0.993)	(−11.488)	(−5.837)	(−9.743)
Size	−0.016***	−0.009*	−0.021***	−0.042	−0.087***
	(−4.195)	(−1.881)	(−11.314)	(−1.535)	(−6.024)
Mtb	−0.002***	−0.005***	−0.000	−0.026***	−0.016***
	(−3.017)	(−4.762)	(−1.350)	(−4.227)	(−4.539)
Lev	0.108***	0.058*	0.085***	0.659***	0.671***
	(4.603)	(1.894)	(7.637)	(3.625)	(7.218)
PPE	0.103***	0.190***	−0.056***	1.062***	0.279**
	(2.790)	(4.911)	(−3.566)	(4.100)	(2.028)
Growth	−0.018**	−0.116***	−0.041***	−0.445***	−0.561***
	(−2.021)	(−8.492)	(−6.487)	(−6.244)	(−12.878)
Lnfirmage	0.026**	0.038***	0.012***	0.225***	0.180***
	(2.475)	(3.179)	(2.955)	(2.982)	(4.517)
Tendency	0.013	0.160**	−0.006	0.599	0.451**
	(0.293)	(2.316)	(−0.259)	(1.636)	(2.291)
Stdret	−0.576***	−0.443***	−0.221***	−3.913***	−2.519***
	(−5.549)	(−3.326)	(−4.732)	(−4.912)	(−5.799)
IO	0.028	0.106	0.041	0.453	0.125
	(1.009)	(1.344)	(1.487)	(1.054)	(1.425)
Founder	−0.019	−0.037	−0.006	−0.191	−0.133*
	(−0.990)	(−1.627)	(−0.764)	(−1.352)	(−1.696)
Duality	−0.001	0.001	0.003	0.003	0.025
	(−0.058)	(0.101)	(0.870)	(0.049)	(0.724)
Lntenure	−0.001	−0.013**	0.002	−0.047	−0.035*
	(−0.258)	(−2.378)	(0.781)	(−1.337)	(−1.851)
Lnage	0.054	0.160***	−0.019	0.715**	0.414**
	(1.306)	(3.088)	(−0.958)	(2.325)	(2.465)
Male	0.010	0.046	−0.021**	0.169	0.034
	(0.395)	(1.124)	(−2.192)	(0.783)	(0.300)
Education	−0.062***	−0.002	−0.029***	−0.292**	−0.181**
	(−3.403)	(−0.093)	(−2.934)	(−2.214)	(−2.557)
Consc	0.020	0.017	−0.004	0.140	0.051
	(1.314)	(0.997)	(−0.548)	(1.342)	(0.902)
Extra	0.000	−0.010	0.000	−0.024	−0.021
	(0.012)	(−1.086)	(0.070)	(−0.434)	(−0.713)
Emoti	0.017	0.018	0.006	0.131	0.082*
	(1.452)	(1.228)	(1.022)	(1.506)	(1.843)
Openn	−0.018	−0.013	0.001	−0.124	−0.051
	(−1.129)	(−0.788)	(0.236)	(−1.157)	(−0.872)
Ownership	0.005	−0.145	0.054	−0.394	−0.086
	(0.049)	(−1.055)	(1.203)	(−0.470)	(−0.200)
Constant	−0.118	−0.678***	0.224**	−2.818*	−0.880
	(−0.598)	(−2.605)	(2.139)	(−1.880)	(−1.080)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster(firm)	Yes	Yes	Yes	Yes	Yes
N	10,372	10,372	10,372	10,372	10,372
Adj. R^2	0.1848	0.3895	0.5924	0.1786	0.2434

Note: This table reports the results of using alternative measures of REM as dependent variables. Columns (1) to (3) report the results of replacing dependent variable with *R_PROD*, *R_DISEXP (*multiply −1), and *R_CFO* (multiply −1), respectively. In Column (4), *RM_PROD & DISEXP* is the sum of standardized *R_PROD* and standardized *R_DISEXP (multiply − 1)*. In Column (5), *RM_DISEXP & CFO* is the sum of standardized *R_DISEXP* (multiply −1) and standardized *R_CFO* (multiply −1). Detailed variables definitions are presented in Appendix A. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

a firm's intentional earnings manipulation using REM (Francis et al., 2016; Zang, 2012).

Therefore, we construct an alternative measure for REM by comprehensively considering three critical earnings benchmarks following the method in previous studies. Specifically, we identify firm-years that reach zero-earning benchmark when reported earnings (*ROA*) falls in [0, 0.005) (Roychowdhury, 2006; Zang, 2012). Similarly, we identify firm-years that reach earnings changes benchmark when the difference between reported earnings and the previous year's earnings ($\triangle ROA$) falls in [0, 0.005). We identify firm-years that reach analyst forecast benchmark when the difference between firms' actual earnings per share (EPS) and analysts' consensus forecast falls in the range of [0, 1 cent). Consistent with Roychowdhury (2006), we consider all analysts' most current forecasts before the annual earnings release date to avoid stale forecasts; consensus analyst forecast is the mean value of these forecasts. Then, we assign the value of one to an indicator *Bhmark* if any of these conditions is satisfied, otherwise zero.

Table 8 displays the results of replicating the baseline regression when replacing *REM* with *Bhmark*, which is conducted based on logistic model. We still observe a significantly negative coefficient for *Agreeableness* (coefficient = −0.280, t-statistic = −2.097), implying that agreeable CEOs are less likely to engage in REM to achieve earnings benchmarks.

Table 8
Benchmark-based measure of real earnings management.

Dependent variable	*Bhmark*
Agreeableness	−0.280**
	(−2.097)
ROA	0.151
	(0.342)
Size	0.042
	(1.620)
Mtb	0.003
	(0.510)
Lev	0.031
	(0.199)
PPE	0.457*
	(1.816)
Growth	−0.385***
	(−3.507)
Lnfirmage	−0.010
	(−0.138)
Tendency	−0.536*
	(−1.672)
Stdret	−4.139***
	(−3.911)
IO	−0.013
	(−0.063)
Founder	−0.176
	(−1.406)
Duality	0.093
	(1.370)
Lntenure	0.065
	(1.563)
Lnage	0.166
	(0.543)
Male	0.138
	(0.859)
Education	−0.396***
	(−2.784)
Consc	0.108
	(1.069)
Extra	0.097
	(1.616)
Emoti	−0.009
	(−0.115)
Openn	−0.003
	(−0.029)
Ownership	−0.384
	(−0.535)
Constant	−2.911*
	(−1.885)
Year	Yes
Industry	Yes
Cluster(firm)	Yes
N	10,372
Pseudo R^2	0.0330

Note: This table reports the regression result when we use a benchmark-based measure as the alternative measures of REM. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

4.3.3. Controlling for other personalities

In the above analysis, we have controlled CEOs' other four Big Five personalities without other personalities considering that Big Five has provided the broadest level and comprehensive trait framework (Wang & Chen, 2020). However, most extant literature on earnings management focuses on managers' traits of narcissism (Buchholz et al., 2020) and overconfidence (Hsieh et al., 2014). We further involve them in our baseline analysis to dispel the concern that these personalities influence our results.

We follow Hirshleifer et al. (2012) to measure CEO's overconfidence using an indicator that equals one if the CEO postpones exercising his options that are at least 67% in-the-money (moneyness) at least twice during his tenure, otherwise zero. The underlying premise is that risk-averse CEOs would exercise their options early following price rises to "lock in" their gain (Hall & Murphy, 2002). Following prior research, CEO narcissism is measured using the size of the CEO's handwritten signature in annual reports (Ham, Seybert, & Wang, 2018). We manually retrieved 748 CEOs' signatures from firms' proxy statements in EDGAR, which caused a substantial reduction in our sample size.[10]

Table 9 reports the results of controlling CEO overconfidence and narcissism in our Eq. (8). The coefficients of *Agreeableness* remain negative and significant at a 1% level (−0.425, t-statistic = −2.837 for Column (1); −0.746, t-statistic = −2.939 for Column (2)). However, we do not observe a significant association between overconfidence and narcissism with *REM*. Our main results are robust when controlling for CEOs' other traits.

4.3.4. Evidence from CEO replacement

Considering the occurrence of CEO replacements within the same firm, we further conduct a robustness test by examining whether the CEO replacement could lead to changes in the firm's REM level.

We begin this analysis by creating a sub-sample of CEO replacements; each replacement event involves two distinct individuals: the outgoing CEO and the incoming CEO. Following existing research (Cai, Kim, Li, & Pan, 2019), we require that the departure of the outgoing CEO is voluntary, because voluntary turnovers can effectively mitigate the reverse causality between firms' policy change and CEO replacement. We identify voluntary CEO turnovers events in our sample using Gentry, Harrison, Quigley, and Boivie (2021) open-source dataset, which records the reasons for CEO turnover in S&P 1500 firms. We obtain 392 CEO replacement events in total.

We then use the model shown in Eq. (9) to test whether CEO replacements lead to changes in the firm's REM level. Specifically, if the firm experiences the outgoing CEO's turnover in year t, we calculate the changes in each firm's REM as the difference between the average of REM during the period after year t and the average of REM during the period before year t (DREM). Besides, *DAgreeableness* is the difference of agreeableness scores between the incoming CEO and the outgoing CEO, and the variables in $\sum DControls_{i,t}$ are measured using a similar way to DREM. We expect to see a negative association between *DREM* and *DAgreeableness*.

[10] We cannot obtain some firms' proxy statements in EDGAR or some proxy statements do not have CEOs' handwritten signature.

Table 9
Controlling CEO overconfidence and narcissism.

Dependent variables	(1) *REM*	(2) *REM*
Agreeableness	−0.425***	−0.746***
	(−2.837)	(−2.939)
ROA	−4.862***	−4.853***
	(−10.124)	(−6.082)
Size	−0.163***	−0.184***
	(−5.379)	(−4.024)
Mtb	−0.027***	−0.032***
	(−3.959)	(−3.171)
Lev	1.144***	1.395***
	(5.955)	(4.692)
PPE	0.708**	1.100**
	(2.397)	(2.242)
Growth	−0.637***	−0.761***
	(−8.327)	(−6.286)
Lnfirmage	0.291***	0.453***
	(3.412)	(3.781)
Tendency	0.452	0.319
	(1.195)	(0.551)
Stdret	−4.962***	−5.583***
	(−5.741)	(−4.547)
IO	0.255	0.899***
	(1.122)	(3.072)
Founder	−0.216	−0.257
	(−1.350)	(−1.264)
Duality	0.034	−0.077
	(0.477)	(−0.725)
Lntenure	−0.030	0.053
	(−0.732)	(0.962)
Lnage	0.633*	−0.001
	(1.857)	(−0.002)
Male	0.077	0.044
	(0.357)	(0.124)
Education	−0.469***	−0.387
	(−3.103)	(−1.402)
Consc	0.147	0.501***
	(1.224)	(2.999)
Extra	−0.008	−0.004
	(−0.139)	(−0.041)
Emoti	0.197**	0.044
	(2.002)	(0.315)
Openn	−0.147	−0.444***
	(−1.167)	(−2.843)
Ownership	−0.166	−0.938
	(−0.185)	(−1.099)
Overconfidence	0.103	
	(1.261)	
Narcissism		−0.153
		(−1.008)
Constant	−1.166	1.435
	(−0.715)	(0.574)
Year	*Yes*	*Yes*
Industry	*Yes*	*Yes*
Cluster(firm)	*Yes*	*Yes*
N	10,372	4229
Adj. R^2	0.2263	0.3090

Note: This table reports the results of estimating the robustness tests. Columns (1) and (2) report the results of further controlling CEO overconfidence and narcissism in Eq. (8), respectively. Detailed variables definitions are presented in Appendix A. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

$$DREM_{i,t} = \beta_0 + \beta_1 DAgreeableness_{i,t} + \sum DControls_{i,t} + IndustryFE + YearFE + \varepsilon_{i,t} \quad (9)$$

In Table 10, the coefficient of *DAgreeableness* is negative and significant at 5% level (coefficient = −0.290, t-statistic = −2.362), implying that the firm will experience a reduction (or increase) of REM when the incoming CEO has a higher (or lower) score of agreeableness than the outgoing CEO. This result reinforces our finding that CEO agreeableness personality mitigates firms' REM.

Table 10
Changes in REM around CEO replacements.

Dependent variable	*DREM*
DAgreeableness	−0.290**
	(−2.362)
DROA	−2.843***
	(−2.608)
DSize	−0.016
	(−0.169)
DMtb	−0.024**
	(−2.581)
DLev	0.023
	(0.070)
DPPE	−1.303
	(−1.146)
DGrowth	−0.112
	(−0.438)
DLnfirmage	0.595
	(1.339)
DTendency	−0.213
	(−0.544)
DStdret	−1.422
	(−1.162)
DIO	−0.359
	(−1.099)
DFounder	−0.261
	(−1.260)
DDuality	0.107
	(1.258)
DLntenure	−0.063
	(−1.047)
DLnage	−0.302
	(−0.986)
DMale	−0.081
	(−0.590)
DEducation	−0.157**
	(−2.274)
DConsc	0.009
	(0.099)
DExtra	−0.050
	(−0.842)
DEmoti	0.077
	(1.103)
DOpenn	0.061
	(0.693)
DOwnership	2.377
	(1.621)
Constant	0.972**
	(2.415)
Year	Yes
Industry	Yes
Cluster(firm)	Yes
N	392
Adj. R^2	0.1264

Note: This table reports the estimated result of the changes in REM around CEO replacements. *DREM* is the difference between the two-year average REM after the outgoing CEO's turnover year and the two-year average *REM* before the turnover year. The measurements of *DAgreeableness* and control variables are similar to that of *DREM*.*, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

4.4. Addressing possible endogeneity in CEO selection

Although our research design and various controls contribute to conservative verifications for our hypotheses, we may fail to rule out potential endogeneity concerns. Prior literature contends that CEOs with specific personalities may be drawn to firms with certain characteristics, which could result in endogeneity bias (Kashmiri, Nicol, & Arora, 2017). Therefore, we adopt two approaches to address the possible endogeneity in CEO selection.

4.4.1. Subsample analysis

We restrict the sample to firm years during which CEO-firm matching is relatively less important (Hirshleifer et al., 2012; Ham, Seybert, & Wang, 2018). The underlying notion is that the matching effect between CEO's persistent personality and the firm's time-varying characteristic is expected to be strongest when a CEO is initially appointed (Hirshleifer et al., 2012). Therefore, we eliminate observations for the first and second years of the CEO's tenure. Suppose our results are solely motivated by the initial matching between agreeable CEOs and firms valuing such traits. In that case, the strength of new results when removing early-year observations will significantly decrease.

Table 11 presents the results of dropping the first-year CEO tenure observations. In column (1), the coefficient of *Agreeableness* is −0.451 and significant at 1% (t-statistic = −2.764), which does not significantly decrease compared to that in Table 6. Columns (2) to (5) are the results of the cross-sectional analysis. The coefficients of the interaction terms remain robust. In Table 12, we further drop the observations of the second year of the CEO's tenure. The coefficient of *Agreeableness* and interaction terms are close to those in Table 6.

4.4.2. Endogeneity control

We also follow prior literature (Kashmiri et al., 2017; Kiefner, Mohr, & Schumacher, 2022) to address this issue by adopting Chatterjee and Hambrick (2007) two-step approach. First, we regress CEOs' agreeableness scores against firm-specific antecedents and CEO-related contemporaneous variables. The antecedents highlight critical firm characteristics relevant to CEO's entry, including firm size (*Ante_Size*), firm age (*Ante_Lnfirmage*), firm revenues (*Ante_Revt*), firm performance (*Ante_ROA*), and year dummies (Chatterjee & Hambrick, 2007; Agnihotri & Bhattacharya, 2021). These variables are measured in the year preceding a CEO's tenure. The contemporaneous variables include CEO age (*Comte_Lnage*), CEO education (*Education*), *Founder*, and an indicator of whether the CEO is inside promoted (*Initial*). Consistent with Chatterjee and Hambrick (2007) and Malhotra et al. (2018), we utilize the coefficients of significant determinants to estimate the predicted score of CEO agreeableness and subsequently incorporate the predicted score as an endogeneity control in all the regressions.

Appendix B presents the results of the first step. We observe no explanatory variables significantly associated with *Agreeableness*, except for *Comte_Lnage* (coefficients = −0.175, t-statistic = −2.668), which is not surprising because some existing literature did not find any significant determinants for their personality variables (Kashmiri et al., 2017; Agnihotri & Bhattacharya, 2021).

Table 13 presents the estimation results of the second step, wherein we control the predicted value of *Agreeableness* (*CEO_Selection*). Column (1) shows the results of our baseline regression. The coefficient of *Agreeableness* remains negative and significant at a 1% level (−0.467, t-statistic = −3.011). The results for interaction terms still hold. These results indicate that our findings do not have possible endogeneity in CEO selection.

4.5. Further analysis: Interaction effects between different personalities

In the above analysis, our primary focus is on the individual effect of agreeableness personality on REM. However, previous literature suggests that the effect of personality on the individual's behavior may be influenced by the presence and levels of other traits, especially when these traits are related to the behavior under investigation (Gylfason, Halldorsson, & Kristinsson, 2016; Witt, Burke, Barrick, & Mount, 2002). In this study, the relationship between agreeableness and REM is likely to be influenced by the four other Big Five personalities, namely, conscientiousness, extraversion, emotional stability, and openness. Therefore, we centered these personality variables and generated four interaction terms (i.e., *Agreeableness*×*Consc*, *Agreeableness*×*Extra*, *Agreeableness*×*Emoti*, *Agreeableness*×*Openn*) and add them to regression model (8), respectively.

In Column (1) of Table 14, we observe significantly negative coefficient of *Agreeableness*×*Consc* (−0.141, t-statistic = −2.031), indicating that conscientiousness personality can strengthen the mitigation effect of agreeableness on REM. This finding aligns with prior research that identifies conscientiousness as an additional moral personality that is less likely to engage in unethical behavior (McFerran, Aquino, & Duffy, 2010; Simha & Parboteeah, 2020). Our results demonstrate that the likelihood of REM will be reduced to a greater extent if the CEO scores high in both agreeableness and conscientiousness simultaneously. Furthermore, the results in Column (2) reveal a positive coefficient of *Agreeableness*×*Extra* (0.306, t-statistic = 2.568), suggesting that the association between agreeableness and REM would be weakened by high extraversion score. Existing literature documents that extraversion personality has natures of agency, dominance, assertiveness, and excitement seeking (Holmes Jr, Hitt, Perrewe, Palmer, & Molina-Sieiro, 2021; Liao, Nguyen, & Truong, 2023), which may prompt individuals with high extraversion to pursue personal rewards and exhibit deceptive or counterproductive work behaviors (Apostolou & Panayiotou, 2019; Gylfason et al., 2016; Holmes Jr et al., 2021). Our results show that extraversion personality may hinder the ability of agreeableness to restrain REM.

We do not observe significant coefficients for interaction terms in Column (3) and Column (4). These findings align with existing research on the association between emotional stability and ethical outcomes, revealing no statistically significant link between this trait and ethical outcomes (Colquitt, Scott, Judge, & Shaw, 2006; Van Scotter & Roglio, 2020). Similarly, prior studies on openness argue for an absence of significant correlation between this trait and ethical behavior (Colquitt et al., 2006; Simha & Parboteeah, 2020). Hence, emotional stability and openness are less likely to interfere with the influence of agreeableness on the ethical suspect behavior of REM.

5. Discussion

This study examines the role played by CEO agreeableness personality in inhabiting firms' REM. We find that agreeable CEOs are less likely to engage in REM. Moreover, CEO agreeableness is more pronounced when firms are in a competitive market environment, with an unhealthy financial status and have weak managerial entrenchment or when CEOs are under strong internal governance. Our results hold to a battery of sensitivity tests. Overall, our results align well with our conjecture that agreeable CEOs' ethical orientation and their compliance with social expectations decrease the incentive for opportunistic behavior.

5.1. Theoretical implications

This study has several contributions. First, we contribute to the growing upper echelons literature linking CEOs' psychological characteristics and corporate outcomes. Despite recent studies on managers' personalities alleviating the "black box problem," they mainly focus on a narrow scope of personality, such as extraversion (Malhotra et al., 2018) and narcissism (Ham, Seybert, & Wang, 2018). Our results reveal that CEO agreeableness embedded in communication texts is also a critical upper-echelon characteristic that translates into a firm's strategic choices.

Second, we enrich empirical evidence for restraining REM from a business ethic perspective. Prior literature on how to curb earnings manipulation behavior mainly emphasizes corporate governance mechanisms (Cheng et al., 2016). Despite growing insights that CEO's psychological characteristics play a significant role in shaping business ethics (Van Scotter & Roglio, 2020), which and how CEO's personality influences REM likelihood is still not fully understood. Our results highlight that agreeable CEOs may avoid real activity manipulations out of ethical inclination and obedience to social expectations. This finding confirms that managers' ethical codes underlying their personalities are

Table 11
Subsample analysis: excluding sample of the first year in CEO's tenure.

	Dependent variable: *REM*				
	(1)	(2)	(3)	(4)	(5)
Agreeableness	**−0.451*** **	**−0.396** **	**−0.440*** **	**−0.415** **	**−0.442*** **
	(−2.764)	**(−2.444)**	**(−2.689)**	**(−2.279)**	**(−2.702)**
Agreeableness×HHI		**6.970*** **			
		(2.764)			
HHI		2.526*			
		(1.810)			
Agreeableness×Distress			**−0.050*** **		
			(−3.031)		
Distress			0.034***		
			(3.666)		
Agreeableness×E_index				**0.316*** **	
				(2.626)	
E_index				0.013	
				(0.277)	
Agreeableness×Inter_gov					**−0.145* **
					(−1.914)
Inter_gov					−0.104***
					(−3.771)
ROA	−4.995***	−4.967***	−4.458***	−5.472***	−5.053***
	(−9.573)	(−9.597)	(−8.274)	(−10.021)	(−9.685)
Size	−0.171***	−0.169***	−0.164***	−0.205***	−0.169***
	(−5.418)	(−5.340)	(−5.193)	(−6.112)	(−5.439)
Mtb	−0.021***	−0.022***	−0.018**	−0.024***	−0.020***
	(−2.785)	(−2.922)	(−2.501)	(−3.406)	(−2.636)
Lev	1.134***	1.149***	0.825***	1.037***	1.027***
	(5.549)	(5.676)	(3.926)	(4.805)	(5.159)
PPE	0.789**	0.820***	0.902***	0.622*	0.822***
	(2.488)	(2.594)	(2.838)	(1.780)	(2.622)
Growth	−0.648***	−0.648***	−0.600***	−0.496***	−0.612***
	(−7.355)	(−7.357)	(−6.600)	(−5.473)	(−6.934)
Lnfirmage	0.305***	0.293***	0.305***	0.244**	0.255***
	(3.229)	(3.104)	(3.237)	(2.511)	(2.712)
Tendency	0.656	0.599	0.710*	0.018	0.692*
	(1.631)	(1.491)	(1.750)	(0.046)	(1.737)
Stdret	−4.627***	−4.655***	−4.282***	−5.507***	−4.218***
	(−4.867)	(−4.890)	(−4.520)	(−5.146)	(−4.541)
IO	0.222	0.233	0.373	−0.082	0.234
	(0.881)	(0.925)	(1.587)	(−0.348)	(1.000)
Founder	−0.195	−0.201	−0.158	−0.258	−0.160
	(−1.216)	(−1.266)	(−0.965)	(−1.478)	(−1.009)
Duality	0.034	0.035	0.031	0.076	0.026
	(0.444)	(0.463)	(0.401)	(0.983)	(0.336)
Lntenure	−0.057	−0.056	−0.047	−0.074	−0.054
	(−0.973)	(−0.973)	(−0.790)	(−1.251)	(−0.938)
Lnage	0.567	0.514	0.449	0.642*	0.329
	(1.509)	(1.399)	(1.186)	(1.672)	(0.878)
Male	0.125	0.125	0.125	0.044	0.109
	(0.523)	(0.526)	(0.541)	(0.223)	(0.455)
Education	−0.502***	−0.498***	−0.487***	−0.526***	−0.531***
	(−3.079)	(−3.053)	(−3.039)	(−3.156)	(−3.252)
Consc	0.143	0.137	0.161	0.135	0.117
	(1.067)	(1.023)	(1.189)	(0.985)	(0.871)
Extra	−0.026	−0.038	−0.035	−0.066	−0.058
	(−0.394)	(−0.570)	(−0.519)	(−0.892)	(−0.876)
Emoti	0.196*	0.188*	0.169	0.222*	0.179*
	(1.805)	(1.749)	(1.529)	(1.845)	(1.648)
Openn	−0.132	−0.127	−0.152	−0.135	−0.094
	(−0.948)	(−0.907)	(−1.072)	(−0.961)	(−0.663)
Ownership	−0.224	−0.180	−0.034	−0.899	0.024
	(−0.231)	(−0.184)	(−0.035)	(−0.709)	(0.025)
Constant	−0.837	−1.960	−1.859	−1.241	−1.021
	(−0.468)	(−1.141)	(−1.062)	(−0.687)	(−0.581)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster(firm)	Yes	Yes	Yes	Yes	Yes
N	8405	8405	8210	6856	8157
Adj. R^2	0.2135	0.2181	0.2214	0.2324	0.2203

Note: This table reports the results of the subsample analysis when excluding sample of the first year in CEO's tenure. Column (1) reports the result of baseline regression (*H1*), Columns (2) to (5) are results of estimating moderating effect of product market competition (*H2*), financial distress (*H3*), managerial entrenchment (*H4*), and internal governance (*H5*), respectively. Notably, *HHI* is an inverse measure of product market competition. Detailed variables definitions are presented in Appendix A. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

Table 12
Subsample analysis: excluding sample of the first two years in CEO's tenure.

	Dependent variable: *REM*				
	(1)	(2)	(3)	(4)	(5)
Agreeableness	**−0.459*****	**−0.398****	**−0.459*****	**−0.441****	**−0.449****
	(−2.599)	**(−2.284)**	**(−2.593)**	**(−2.250)**	**(−2.563)**
Agreeableness×HHI		**7.729*****			
		(2.933)			
HHI		2.829*			
		(1.771)			
Agreeableness×Distress			**−0.048*****		
			(−2.631)		
Distress			0.033***		
			(3.289)		
Agreeableness×E_index				**0.372****	
				(2.415)	
E_index				0.023	
				(0.447)	
Agreeableness×Inter_gov					**−0.151***
					(−1.838)
Inter_gov					−0.092***
					(−3.074)
ROA	−5.072***	−5.029***	−4.517***	−5.561***	−5.068***
	(−9.166)	(−9.180)	(−7.716)	(−9.828)	(−9.197)
Size	−0.175***	−0.173***	−0.167***	−0.209***	−0.172***
	(−5.292)	(−5.240)	(−5.065)	(−6.006)	(−5.329)
Mtb	−0.019**	−0.020**	−0.015**	−0.023***	−0.019**
	(−2.307)	(−2.486)	(−2.007)	(−2.924)	(−2.378)
Lev	1.045***	1.073***	0.751***	0.963***	0.969***
	(4.863)	(5.054)	(3.413)	(4.290)	(4.617)
PPE	0.791**	0.832**	0.920***	0.689*	0.797**
	(2.308)	(2.433)	(2.668)	(1.822)	(2.373)
Growth	−0.566***	−0.566***	−0.534***	−0.420***	−0.570***
	(−5.755)	(−5.765)	(−5.273)	(−4.198)	(−5.911)
Lnfirmage	0.324***	0.308***	0.324***	0.258**	0.291***
	(3.075)	(2.924)	(3.089)	(2.405)	(2.798)
Tendency	0.832*	0.762*	0.888**	0.127	0.793*
	(1.906)	(1.753)	(2.028)	(0.313)	(1.835)
Stdret	−4.247***	−4.364***	−3.938***	−5.101***	−3.858***
	(−3.999)	(−4.101)	(−3.740)	(−4.390)	(−3.771)
IO	0.224	0.237	0.382	−0.101	0.250
	(0.847)	(0.894)	(1.539)	(−0.414)	(1.012)
Founder	−0.189	−0.198	−0.157	−0.280	−0.157
	(−1.164)	(−1.223)	(−0.944)	(−1.581)	(−0.980)
Duality	0.013	0.016	0.009	0.050	0.006
	(0.154)	(0.197)	(0.104)	(0.604)	(0.078)
Lntenure	−0.062	−0.064	−0.047	−0.074	−0.049
	(−0.823)	(−0.847)	(−0.617)	(−0.984)	(−0.655)
Lnage	0.617	0.547	0.501	0.762*	0.364
	(1.495)	(1.360)	(1.201)	(1.831)	(0.890)
Male	0.158	0.156	0.163	0.094	0.135
	(0.596)	(0.589)	(0.636)	(0.455)	(0.507)
Education	−0.555***	−0.548***	−0.552***	−0.616***	−0.569***
	(−3.179)	(−3.129)	(−3.213)	(−3.472)	(−3.316)
Consc	0.102	0.102	0.124	0.103	0.076
	(0.685)	(0.688)	(0.822)	(0.680)	(0.517)
Extra	−0.052	−0.067	−0.062	−0.109	−0.069
	(−0.704)	(−0.899)	(−0.834)	(−1.332)	(−0.932)
Emoti	0.198*	0.187	0.173	0.229*	0.180
	(1.659)	(1.593)	(1.428)	(1.742)	(1.543)
Openn	−0.085	−0.083	−0.106	−0.078	−0.053
	(−0.549)	(−0.539)	(−0.676)	(−0.511)	(−0.341)
Ownership	−0.375	−0.296	−0.121	−1.195	−0.063
	(−0.360)	(−0.283)	(−0.118)	(−0.910)	(−0.063)
Constant	−0.930	−1.973	−2.034	−1.628	−1.233
	(−0.474)	(−1.054)	(−1.063)	(−0.831)	(−0.643)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster(firm)	Yes	Yes	Yes	Yes	Yes
N	6675	6675	6514	5591	6655
Adj. R^2	0.2084	0.2141	0.2168	0.2331	0.2152

Note: This table reports the results of the subsample analysis when excluding sample of the first two years in CEO's tenure. Column (1) reports the result of baseline regression (*H1*). Columns (2) to (5) are results of estimating moderating effect of product market competition (*H2*), financial distress (*H3*), managerial entrenchment (*H4*), and internal governance (*H5*), respectively. Notably, *HHI* is an inverse measure of product market competition. Detailed variables definitions are presented in Appendix. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

Table 13
Endogeneity analysis: Controlling possible endogeneity in CEO selection.

	Dependent variable: *REM*				
	(1)	(2)	(3)	(4)	(5)
Agreeableness	**−0.467*** **	**−0.406*** **	**−0.445*** **	**−0.412** **	**−0.457*** **
	(−3.011)	**(−2.631)**	**(−2.829)**	**(−2.322)**	**(−2.950)**
Agreeableness×HHI		**7.147*** **			
		(3.063)			
HHI		1.831			
		(1.428)			
Agreeableness×Distress			**−0.034** **		
			(−2.077)		
Distress			0.032***		
			(3.751)		
Agreeableness×E_index				**0.264*** **	
				(2.622)	
E_index				−0.012	
				(−0.307)	
Agreeableness×Inter_gov					**−0.195*** **
					(−2.998)
Inter_gov					−0.100***
					(−4.031)
ROA	−4.951***	−4.927***	−4.461***	−5.433***	−5.054***
	(−10.263)	(−10.289)	(−8.877)	(−10.413)	(−10.453)
Size	−0.157***	−0.153***	−0.150***	−0.195***	−0.152***
	(−5.262)	(−5.147)	(−4.999)	(−6.092)	(−5.163)
Mtb	−0.028***	−0.028***	−0.024***	−0.028***	−0.027***
	(−3.934)	(−4.038)	(−3.580)	(−4.045)	(−3.753)
Lev	1.199***	1.212***	0.906***	1.088***	1.075***
	(6.266)	(6.399)	(4.489)	(5.213)	(5.745)
PPE	0.770***	0.807***	0.873***	0.598*	0.830***
	(2.597)	(2.736)	(2.944)	(1.812)	(2.833)
Growth	−0.645***	−0.646***	−0.512***	−0.453***	−0.609***
	(−8.254)	(−8.258)	(−6.515)	(−5.437)	(−7.588)
Lnfirmage	0.278***	0.268***	0.286***	0.225**	0.224***
	(3.305)	(3.202)	(3.313)	(2.460)	(2.690)
Tendency	0.455	0.401	0.521	−0.059	0.533
	(1.214)	(1.070)	(1.382)	(−0.151)	(1.430)
Stdret	−5.069***	−5.057***	−4.625***	−5.937***	−4.646***
	(−5.854)	(−5.844)	(−5.343)	(−5.656)	(−5.444)
IO	0.246	0.260	0.371	−0.055	0.253
	(1.091)	(1.154)	(1.541)	(−0.247)	(1.231)
Founder	−0.173	−0.176	−0.125	−0.218	−0.147
	(−1.059)	(−1.088)	(−0.765)	(−1.229)	(−0.918)
Duality	−0.001	−0.003	−0.003	0.048	−0.003
	(−0.014)	(−0.041)	(−0.039)	(0.663)	(−0.047)
Lntenure	−0.069	−0.067	−0.062	−0.078*	−0.077*
	(−1.617)	(−1.577)	(−1.420)	(−1.700)	(−1.809)
Lnage	0.842**	0.794**	0.674*	0.850**	0.651*
	(2.298)	(2.213)	(1.822)	(2.196)	(1.776)
Male	0.068	0.067	0.075	−0.011	0.064
	(0.307)	(0.306)	(0.356)	(−0.058)	(0.284)
Education	−0.477***	−0.472***	−0.472***	−0.515***	−0.502***
	(−3.135)	(−3.105)	(−3.131)	(−3.250)	(−3.294)
Consc	0.151	0.137	0.178	0.167	0.127
	(1.279)	(1.160)	(1.492)	(1.363)	(1.065)
Extra	−0.010	−0.020	−0.020	−0.059	−0.036
	(−0.170)	(−0.337)	(−0.334)	(−0.864)	(−0.594)
Emoti	0.194**	0.187**	0.174*	0.232**	0.177*
	(2.033)	(1.986)	(1.785)	(2.137)	(1.839)
Openn	−0.173	−0.161	−0.204*	−0.195*	−0.142
	(−1.576)	(−1.466)	(−1.834)	(−1.794)	(−1.260)
Ownership	−0.082	−0.049	0.166	−0.750	0.086
	(−0.089)	(−0.053)	(0.182)	(−0.594)	(0.099)
Endogeneity	1.069*	1.066*	0.958*	0.844	1.207**
	(1.822)	(1.789)	(1.665)	(1.255)	(2.072)
Constant	−5.205*	−6.422**	−5.742**	−4.710	−6.096**
	(−1.834)	(−2.211)	(−1.978)	(−1.472)	(−2.100)
Year	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes
Cluster(firm)	Yes	Yes	Yes	Yes	Yes
N	10,212	10,212	9882	7679	9700
Adj. R^2	0.2277	0.2324	0.2311	0.2371	0.2353

Note: This table reports the second-step results of addressing possible endogeneity in CEO selection. Variable *Endogeneity* is the predicted score of agreeableness using the significant determinants in the first-step regression. We control this variable in our regressions. Column (1) reports the of baseline regression (*H1*), Columns (2) to (5) are results of estimating moderating effect of product market competition (*H2*), financial distress (*H3*), managerial entrenchment (*H4*), and internal governance

(*H5*), respectively. Notably, *HHI* is an inverse measure of product market competition. Variables definitions are presented in Appendix A. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

Table 14
Interaction effects between different personalities.

	Dependent variable: *REM*			
	(1)	(2)	(3)	(4)
Agreeableness	**−0.420*** **	**−0.386** **	**−0.440*** **	**−0.420*** **
	(−2.769)	**(−2.501)**	**(−2.805)**	**(−2.764)**
Agreeableness×Consc	**−0.141** **			
	(−2.031)			
Agreeableness×Extra		**0.306** **		
		(2.568)		
Agreeableness×Emoti			**−0.038**	
			(−0.217)	
Agreeableness×Openn				**−0.102**
				(−0.485)
ROA	−4.905***	−4.937***	−4.907***	−4.905***
	(−10.174)	(−10.265)	(−10.177)	(−10.182)
Size	−0.164***	−0.165***	−0.164***	−0.164***
	(−5.437)	(−5.467)	(−5.409)	(−5.445)
Mtb	−0.027***	−0.027***	−0.027***	−0.027***
	(−3.952)	(−3.973)	(−3.956)	(−3.957)
Lev	1.142***	1.135***	1.142***	1.142***
	(5.950)	(5.930)	(5.945)	(5.949)
PPE	0.718**	0.723**	0.727**	0.724**
	(2.440)	(2.462)	(2.474)	(2.462)
Growth	−0.654***	−0.655***	−0.653***	−0.653***
	(−8.437)	(−8.482)	(−8.422)	(−8.431)
Lnfirmage	0.295***	0.300***	0.296***	0.296***
	(3.466)	(3.526)	(3.472)	(3.479)
Tendency	0.491	0.492	0.491	0.493
	(1.303)	(1.301)	(1.304)	(1.308)
Stdret	−4.938***	−5.041***	−4.940***	−4.958***
	(−5.703)	(−5.826)	(−5.659)	(−5.740)
IO	0.263	0.269	0.266	0.265
	(1.156)	(1.191)	(1.172)	(1.169)
Founder	−0.223	−0.242	−0.223	−0.225
	(−1.391)	(−1.502)	(−1.393)	(−1.401)
Duality	0.028	0.030	0.030	0.029
	(0.393)	(0.418)	(0.415)	(0.411)
Lntenure	−0.043	−0.041	−0.044	−0.044
	(−1.071)	(−1.024)	(−1.091)	(−1.086)
Lnage	0.635*	0.621*	0.635*	0.631*
	(1.865)	(1.824)	(1.858)	(1.854)
Male	0.073	0.052	0.077	0.075
	(0.340)	(0.239)	(0.356)	(0.349)
Education	−0.466***	−0.463***	−0.467***	−0.466***
	(−3.085)	(−3.067)	(−3.086)	(−3.077)
Consc	0.142	0.146	0.147	0.148
	(1.191)	(1.218)	(1.223)	(1.228)
Extra	−0.020	−0.005	−0.021	−0.018
	(−0.326)	(−0.083)	(−0.341)	(−0.302)
Emoti	0.181*	0.188*	0.194*	0.185*
	(1.798)	(1.932)	(1.892)	(1.809)
Openn	−0.143	−0.147	−0.145	−0.147
	(−1.144)	(−1.175)	(−1.160)	(−1.167)
Ownership	−0.119	−0.058	−0.109	−0.100
	(−0.133)	(−0.065)	(−0.121)	(−0.112)
Constant	−2.458	−2.496	−2.523	−2.484
	(−1.540)	(−1.570)	(−1.584)	(−1.550)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Cluster(firm)	Yes	Yes	Yes	Yes
N	10,372	10,372	10,372	10,372
Adj. R^2	0.2257	0.2275	0.2255	0.2256

Note: This table reports the estimated result of the interaction effects of four other Big-five personalities on the association between agreeableness personality and REM. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *t*-statistics are shown in parentheses.

critical to their management choices (Lapointe-Antunes et al., 2022).

Lastly, we add to personality-situation interaction literature by integrating perspectives in upper echelons theory and TAT to identify the contingent factors for the impact of CEO agreeableness on REM. Extant studies mostly theorize the significance of situational factors in personality expression (Hambrick, 2007); little is known about which and how factors moderate the impact of CEOs' specific personalities on corporate decisions (Harrison et al., 2019). By examining the moderating effects of multilevel factors on CEO agreeableness, we provide powerful evidence that situation-personality profiles can capture unique manifestations of personality across various situations (Greenbaum et al., 2017).

5.2. Practical implications

Our study provides insights for corporates and regulators in reducing the likelihood of opportunistic managerial behavior. First, the negative relationship between CEO agreeableness and REM implies that using personality as part of the selection criteria for CEO may be a reasonable action for organizations. Appointing highly agreeable CEOs could help maintain a high-quality earnings reporting environment. These CEOs should be more valued for firms under poor financial conditions or intensive market competition because they are not likely to pursue strategies that worsen the firm's competitiveness for self-interest. Firms with agreeable managers should also weaken managerial entrenchment and improve internal governance, thus reducing REM more effectively.

We also offer valuable implications for stakeholders with a preliminary analysis of how a CEO's personality reflected in their verbal information affects firm behavior. We highlight that CEO's communication cues are important channels for stakeholders to gain insight into their underlying psychological traits; these cues may serve as additional information to assist stakeholders in their investment decisions, especially given that CEOs have the motivation to exploit the inherent information asymmetry between them and outside stakeholders to engage in opportunistic but less detectable behaviors (e.g., REM). We encourage stakeholders to incorporate CEOs' unscripted verbal cues into their information sets to evaluate the likelihood of suspicious financial reporting, which may help them make more unbiased investment decisions.

5.3. Limitations and future research

We offer directions for future research. First, the Big Five framework captures five dimensions of personality. Future research should embed other rarely explored personalities, such as CEO conscientiousness and emotional stability, into explorations of the "black box problem" in upper echelons studies. Second, our measure for CEO personality is based on a linguistic algorithm on conference calls. Future research could focus on more advanced models and extract CEOs' psychological characteristics from various communication clues, such as images and videos.

Data availability

Data will be made available on request.

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Appendix A. Variable definition

Name	Definition
REM	A combined measure of standardized abnormal production costs (*R_PROD*), standardized abnormal discretionary expenses (*R_DISEXP*), and standardized abnormal cash flow (*R_CFO*).*REM* = *standardized R_PROD* − *standardized R_DISEXP* − *standardized R_CFO*
R_PROD	Abnormal production costs (positive measurement for real earnings management).
R_DISEXP	Abnormal discretionary expenses (negative measurement for real earnings management).
R_CFO	Abnormal cash flows from operations (negative measurement for real earnings management).
RM_PROD & DISEXP	A combined measure of standardized abnormal production costs and standardized abnormal discretionary.*RM_PROD&DISEXP* = *standardized R_PROD* − *standardized R_DISEXP*
RM_DISEXP & CFO	A combined measure of standardized abnormal production costs and standardized abnormal discretionary.*RM_DISEXP&CFO* = − *standardized R_DISEXP* − *standardized R_CFO*
Agreeableness	CEO agreeableness score calculated based on Mairesse et al. (2007) LIWC approach.
Control Variables:	
ROA	The ratio of earnings before interest and taxes to total assets.
Size	Natural log of firm's market value of equity.
Mtb	The market value of equity over the book value of equity.
Lev	Total liabilities are scaled by total assets.
PPE	The firm's property, plant and equipment scaled by total assets
Growth	Total sales scaled by sales in the previous year, minus one.
Lnfirmage	Natural logarithm of years the firm is entered in the CRSP database dataset.
Tendency	*ROA* for the firm in the year before the CEO's tenure starts.
Stdret	The standard deviation of monthly stock returns during the prior 5 years.
IO	Firms' institutional investors ownership in year *t*.
Founder	Indicator variable equal to one if the CEO is one of the founders of the firm, zero otherwise.
Duality	Indicator variable equal to one if the CEO is also the chairman of the firm, zero otherwise.
Lntenure	Natural log of the number of years the CEO has been in the position.
Lnage	Natural log of the CEO's age in years.
Male	Indicator variable equal to one if the CEO is male, zero otherwise.
Education	Indicator variable equal to one if the CEO obtain Dr. degree, zero otherwise.
Ownership	Common shares owned by the CEO scaled by total shares outstanding.
Consc	CEO conscientiousness score calculated based on Mairesse et al. (2007) LIWC approach.
Extra	CEO extraversion score calculated based on Mairesse et al. (2007) LIWC approach.
Emoti	CEO emotional stability score calculated based on Mairesse et al. (2007) LIWC approach.
Openn	CEO openness score calculated based on Mairesse et al. (2007) LIWC approach.
Cross-sectional Variables:	
Inter_gov	A combined measure of standardized key subordinate executives' decision horizon (*Exec_Horizon*) and standardized compensation ratio of key subordinate executives (*Exec_PayRatio*). *Exec_Horizon* is the average number of years until the age of retirement (assumed to be 65) for the top four executives other than the CEO. *Exec_PayRatio* is the average compensation of top four executives scaled by CEO's annual compensation.
Distress	Altman (1968) *Z*-score multiplied by −1. *Z-score* = *1.2 (Working Capital/Assets)* + *1.4 (Retained Earnings/Assets)* + *3.3 (Net Income/Assets)* + *0.6 (Stock Price* × *Shares Outstanding)* + *0.999 (Sales/Assets)*.
HHI	Herfindahl-Hirschman Index for firms' market share(sale) in an industry for year *t*.
E-index	Aggregate of six entrenchment provisions for a firm in year *t*. Higher *E-index* indicates weaker governance.

Appendix B. The first-step results of endogeneity analysis: determinants of CEO Agreeableness

	Dependent variable: *Agreeableness*
Ante_ROA	−0.069
	(−0.784)
Ante_Size	−0.005
	(−0.649)
Ante_Lnfirmage	−0.003
	(−0.216)
Ante_Revt	0.925
	(1.134)
Ante_Lev	−0.026
	(−0.745)
Comte_Lnage	**−0.175*****
	(−2.668)
Initial	0.014
	(0.747)
Duality	−0.022
	(−1.375)
Ownership	−0.207
	(−1.063)
Constant	4.075***
	(15.219)
Year	Yes
Industry	Yes
Cluster(firm)	Yes
N	10,181
Adj. R^2	0.1228

Note: This table reports the first-step results of addressing possible endogeneity in CEO selection. Following Chatterjee and Hambrick (2007) two-step approach. First, we regress agreeableness on a set of antecedents and contemporaneous variables to obtain the predicted score of agreeableness using the significant determinants. Second, we control this predicted value in our regression. *Ante_ROA*, *Ante_Size*, *Ante_lnfirmage*, *Ante_Revt*, and *Ante_Lev* are *ROA*, firm size, natural logarithm of firm age, firm revenue, and leverage in the year preceding CEO's tenure, respectively. *Initial* and *Duality* are indicators of whether CEO is inside promoted, whether CEO is chairman of the firm, respectively. Ownership is CEO's shareholding ratio. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. *T*-statistics are shown in parentheses.

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