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SCHOOL OF BUSINESS, ECONOMICS AND LAW**

**Who's managing earnings? A personality study of
earnings management**

- Using algorithms to analyze how CEO personality traits engage in earnings management

Master degree project in Accounting and Financial Management

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Abstract

Extensive research explains the underlying reasons to why firms engage in value-destroying and risky earnings management. There is subjectivity involved in these decisions, and to explain why managers engage in earning management differently, recent research has started to go beyond the traditional motives to explain why CEOs manage earnings differently. Postulating that earnings management is a costly and risky activity, we use a sample of firms suspected of managing earnings to analyze CEO personality traits association to earnings management decisions. The Big Five Personality Traits are scored from earnings conference call (ECCs) transcripts using a newly developed open-language machine learning algorithm specifically trained and validated on CEOs. We find long-term focused conscientious CEOs, who often want to avoid accountability for suboptimal outcomes, to manage earnings the most to reach benchmarks and increase both real- and accruals management. Similarly, insecure and risk-averse neurotics want to avoid confrontation causing them to increase real-earnings management, whilst accruals management is regarded as too risky. Risk-seeking extraverted CEOs who are often great rhetorics, and non-conforming open CEOs who are often great visionaries both decrease real-earnings management since it is value-destroying. Thus, we find interesting associations between personality traits and earnings management decisions. We also see potential for further research using personality within accounting and other research domains.

Keywords: Earnings management, Big Five Personality Traits, Chief executive officer

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1. Introduction

Underlying incentives to manage earnings are well researched and have mainly been centered around capital market expectations, earnings benchmarks and contractual arrangements related to reported earnings (Walker, 2013). Recent literature has also started to examine managers' individual characteristics and personality traits influence on discretionary behavior and earnings management. To understand why managers take certain actions for their organizations, subjectivity must be considered (Hambrick, 2007) and in regards to earnings management, the core assumption is that individuality affects risk preferences, which in turn influences accounting choices and earnings quality (Papadopolous, 2018). The risks are not to be confused with illegal activities, rather the risks are the consequences and costs of being caught managing earnings, displeasing the market or destroying future value. It is a risk-reward tradeoff between avoiding short-term market penalties and possibly jeopardizing future value and credibility.

Earnings management is a field that has been given much attention within accounting research (Beneish, 2001; Walker, 2013), constituting the traditional method accruals management and the more recently discovered method real-earnings management (Roychowdhury, 2006). Considering that investors, in essence buy future earnings, its quality is critical for investors and the evaluation of firms, especially in respect to its value and performance. Managerial judgment in financial reporting increases its usability and precision but consequently allows for earnings management (Healy & Wahlen, 1999). In this regard, regulators strive to withhold strong market confidence, minimize manipulations and ensure reliability for disclosures through laws and rules. The Sarbanes Oxley-act introduced in 2002 was such an attempt, which reduced accruals management since it became more scrutinized and riskier to perform. Nonetheless, earnings management still persist and has rather taken a shift towards utilizing more real-earnings management (Cohen et al., 2008), which is more difficult to detect but value-destroying (Graham et al., 2006). The reason for engaging in real-earnings management despite it being costly is not fully understood but seems rooted in the fact that the capital market strongly emphasizes current, short-term reported earnings more than long-term value creation and the markets ability to understand earnings numbers is

distrusted by firms (Walker, 2013). Some managers may still prefer accruals management since it is performed when the results are given and the need to manage earnings are more certain (Gunny, 2010) and a tradeoff between the two methods based on their relative costliness is nowadays documented (Zang, 2012). Bearing this in mind, a tendency to manage earnings in response to market pressure is common despite it being risky and costly (Graham et al., 2005, 2006, 2007; Roychowdhury, 2006; Zang, 2012).

The risk preferences among CEOs are mainly based on their sense of confidence and trust for their own and firm's capabilities (Chatterjee & Hambrick, 2011), possibly explaining why most work within the area of CEO personality traits and earnings management has focused on personality traits biased towards risk-willingness; narcissism (Capalbo et al., 2018; Buchholz et al., 2019) and overconfidence (Schrand & Zechamn, 2012); Hsieh et al., 2014). In regards to the previously mentioned risk-reward tradeoff of earnings management, we believe the differences between CEO personalities to be more comprehensive. Market pressure and a fear of being held accountable for missed earnings benchmarks may cause some individuals to manage earnings. On the contrary, the risks of being caught or destroying future value may be decisive for another person to not engage in earnings management. In addition, previous research has also been constrained by smaller datasets, inaccurate proxies for personality, such as CEO portrait size in the annual report and excessive use of the corporate jet (Buchholz et al., 2019) or the utilization of closed-language natural language processing tools not trained or validated on CEOs (Mairesse, 2007; Capalbo et al., 2018). In this regard, Harrison et al. (2019) developed a more precise tool specifically focused on assessing the personality of CEOs to enable analysis of its effect on firm outcomes.

To our knowledge, no research has yet performed a wider study of personality traits and its effect on earnings management. Hence, this study applies the Big Five Personality Framework (Goldberg, 1990), which is the most merited and commonly accepted taxonomy for understanding personality (Harrison et al., 2019; Soto, 2019). Consisting of *conscientiousness*, *extraversion*, *neuroticism*, *openness to experience* and *agreeableness* it represents personality in a broader sense

and enables an extension to previous literature. We do not seek to replicate prior studies but to explore the Big Five personality traits effects of CEOs on earnings management behaviors in a situation where it could make sense to manage earnings. Specifically, we aim to examine the impact of CEO conscientiousness, extraversion, neuroticism and openness to experience and how these traits influence earnings management decisions and preferences. This research adds a nuance to accounting literature, where the incentives for earnings management is known but how different personality traits are associated with earnings management is unexplored. By highlighting how personality traits affects financial decision-making we contribute to a better understanding of financial rationality and strengthen the evidence indicating that subjectivity influences corporate decision-making. Furthermore, we believe that the empirical evidence is beneficial for regulators and practitioners, since a better understanding of why and how earnings management decisions are made can help regulation become more efficient and make investment decisions more informed.

2. Literature review

2.1 Earnings Management

Accounting standards allow and require the use of managerial judgment in financial reporting. Managers are the experts within their organizational field and are most suitable for choosing accounting policies and methods, meant to enrich disclosures as the information can be argued to become more precise and informative. However, allowing judgment in financial reporting also creates an opportunity to distort and manage earnings. Earnings management can be defined as when managers use their judgmental freedom in financial reporting and when structuring transactions to alter financial reports with the intention to either mislead stakeholders or influence contractual outcomes by not reflecting the underlying performance correctly (Healy & Wahlen, 1999). Until the beginning of the 20th century most literature was focused on accruals management, partly since real-earnings management was identified later on and initially not well understood. Nowadays, the prevalence of real-earnings management is well documented (Graham et al., 2005; Roychowdhury, 2006; Zang, 2012) and earnings management is commonly separated between the two methods.

Accruals management refers to changing accounting methods or estimates in order to alter earnings. That is, accruals management does not change the cash flow of a firm, rather it alters the estimation and timing of it in financial reports. For instance, changing the depreciation method for fixed assets is an action which could be used to bias the reported earnings but not affect the cash-flow of the firm. Accruals management is in part detected and hindered by high-quality auditors, especially after the introduction of the Sarbanes-Oxley act (SOX) in 2002 which aims to protect investors and make corporate disclosures more reliable (Zang, 2012). Real-earnings management refers to strategic decisions aimed to alter reported earnings, for instance structuring operations, investments or financing transactions to affect earnings (Zang, 2012). It could also be performed by cutting discretionary expenditures or through overproduction (Roychowdhury, 2006). On the

contrary to accruals management, it affects the actual business and entails actions which have suboptimal consequences (Zang, 2012).

There is always a risk of earnings management being detected which will cause firms to suffer from a loss in credibility (Libby & Mathieu, 2001), displease the market and it can have significant economic consequences (Papadopolous, 2018). In this regard, Zang (2012) documents that depending on each method's costs and timing firms choose which method to engage in. Accruals management can be costlier to perform because of less accounting flexibility, shorter operating cycles and higher accounting scrutiny, which is caused by regulations like SOX. When these costs are high firms tend to use real-earnings management instead. On the other hand, firms are more likely to manage earnings through accruals when real-earnings management is more costly to perform due to high scrutiny from investors, a less competitive market position or poor financial health (Zang, 2012). Real-earnings management is more difficult to detect but value destroying, as for instance deferring investments or cutting R&D expenses may result in a short-term benefit, but at the cost of not delivering in the long-term (Graham et al., 2006). Earnings management is more likely to occur when firms are right at or just below important earnings benchmarks, such as zero earnings, last year's earnings, as well as analysts and management forecasts (Roychowdhury, 2006; Zang, 2012). Capital markets have a poor ability to both understand earnings completely and to see beyond current period, short-term reported earnings (Walker, 2013), pressuring managers to reach their financial benchmarks. The consequences of missing benchmarks are severe as it may indicate problems within the firm or with poor management, affecting the stock market. In this regard, managers are willing to offset long-term value maximization to reach the benchmarks, which instead builds credibility to the market and helps maintain and increase stock price (Graham et al., 2006). Beyond that, it is poorly understood why firms engage in such costly activities by literature (Walker, 2013). There is also a direct substitutive relationship between the two methods where managers perform accruals management after the fiscal year-end as a top-up method if the outcome of real earnings management which took place during the fiscal year was not enough to reach a financial benchmark (Zang, 2012). Despite accruals management becoming

riskier due to scrutiny, managers often still utilize it since it is performed when the results are given and the need to manage earnings are more certain (Gunny, 2010). Though, accruals management alone entails a risk of not being sufficient as reaching a benchmark may require more earnings management than is possible to conduct at year-end (Roychowdhury, 2006). Bearing this in mind, a tendency to conform to market pressure of delivering and benefit in the short-term seems to be common at the cost of long-term shareholder value (Graham et al., 2005, 2006, 2007; Walker, 2013).

A large body of research has been focused on understanding incentives and consequences of earnings management (Healy & Wahlen, 1999; Walker, 2013), where the motives mainly concern contractual prespecified targets, either at firm or manager-level, and capital-market incentives (Walker, 2013). Recent research has shown interest in managers' individual characteristics and personality traits, which are influential factors to discretionary behavior, financial reporting and earnings management. These could take the form of both unobservable (e.g. managerial skills and expertise) and observable (gender, age, education, reputation, personality traits) characteristics (Papadopoulos, 2018). In the accounting literature agency theory usually serves as a basis for examining earnings management (Walker, 2013), where the prevailing dilemma is the assumption of an individual's rationality and utility maximization causing the problem to pursue one's own interest at the cost of the principal and shareholders (Jensen, 1986). However, the assumptions in agency theory do not allow for managerial differences in behaviors. The behavioral research on earnings management is instead based on the upper echelons theory, which takes a more individual perspective and highlights how managers are shaped by their experiences, values and personality traits (Hambrick, 2007). The theory is based on bounded rationality where these unobservable and observable values and characteristics shape individuals actions and decision-making processes, in this case CEOs. Hambrick (2007) states that in order to understand why organizations act in certain ways these personal constructs and biases of top executives must be considered. Similarly, it is demonstrated to have an effect on firm outcomes, in particular for our study's interests; disclosures (Bamber & Wang, 2010), financial reporting and accounting practices (Dejong & Ling, 2013). The

underlying assumption in this type of research is that individuality affects risk preferences, which in turn influences accounting choices and earnings quality (Papadopolous, 2018). The risks are not to be confused with illegal activities; earnings manipulation and misrepresentation of economic reality. Rather the risks are the prior stated consequences and costs of being caught managing earnings, displeasing the market or destroying future value. On that basis, managers have discretion within the firm which allows their individual differences and personality traits to affect firm outcomes, including earnings management decisions.

Some observable factors have been studied to a greater extent in the setting of earnings management, for instance age, gender and family situations (Huang & Rose-Green, 2012; Harris et al., 2019; Hilary et al., 2017). Possibly since it is easier to quantify compared to personality traits, which are more complex and reflect all attributes that characterize and are unique for each individual (Mairesse et al., 2007). In the interest of this study, only some research has been conducted on certain personality traits of executives and its effect on earnings management. Schrand and Zechman (2012) finds that overconfident executives are more prone to be optimistic about future performance and manage earnings through accruals. At one point in time past managed earnings must be reversed and if future performance does not improve enough to cover the reversals the likelihood to manage earnings increases. Hsieh et al. (2014) finds that in comparison to before, overconfident CEOs became more likely to manage earnings through accruals after SOX and remained equally likely to engage in real-earnings management. Moreover, Capalbo et al. (2018) and Buchholz et al. (2019) finds CEO narcissism to be positively associated with accrual management. Narcissistic CEOs are coupled to overidentification with their firm and have an extreme will to achieve goals, leading them to manage earnings (Capalbo et al., 2018). A strong self-serving behavior and will to impact the perception of the firm are two other tendencies of narcissists which explains their engagement in accrual management (Buchholz et al., 2019).

2.2 The Big Five Personality Factor Structure

Goldberg (1990) conceptualized The Big Five, a method for clustering the almost infinite individual differences that exist into five main personality traits. Goldberg compiled previous fragmented taxonomy research into one concept by confirming that all possible traits can be broadly represented using the The Big Five Factors (Goldberg, 1990). The Big Five is enabled by the fundamental Lexical Hypothesis which states that the most important differences between individuals are encoded as single linguistic terms, and the more frequently these specific terms are mentioned, the more important they are. The Big Five uses a hierarchy of traits, where the top levels are the following: *Conscientiousness*, *Extraversion*, *Neuroticism*, *Openness to experience* and *agreeableness*. The objective of the framework is not to reduce personality to five traits but to easily represent personality in a broader sense by ranking each individual on a scale for each of the five personality traits (DeYoung, 2015). Higher- and lower-level traits have high correlation, which means that a higher score on a higher-level trait can be made up of different combinations of lower-level traits. A high score on a trait is not always necessarily made up by the same lower-level traits. For instance, conscientious people often, but not always, have lower level traits like self-discipline and organization. Criticism has been directed towards the small number of top-level traits in the model which could lead to a loss of nuances, where other researchers like Cattell (1963) have used greater quantities of top-level traits. However, The Big Five has still become the most widely applied theories when it comes to personality traits (Soto, 2019).

Table 1. Summary of the Big Five personality traits

Source: Mairesse et al., (2007).

Top-level traits	Common lower-level traits
Conscientiousness	Self-disciplined, organized
Extraversion	Sociable, assertive, playful
Neuroticism	Insecure, anxious
Openness to experience	Intellectual, insightful
Agreeable	Friendly, cooperative

2.2.1 Conscientiousness

Conscientiousness relates to the tendencies of being self-controlled, responsible towards others, diligent, orderly and rule abiding (Jackson & Roberts, 2017). Moreover, conscientious individuals tend to be cautious and analytical, causing them to be risk-averse and less willing to innovate (Judge et al., 2009). Conscientious individuals stress the need to follow procedures and policies, act professionally, maintain high standards and conform to laws and norms. As such, these individuals may be regarded as perfectionists, role-models and good, trustable, employees (Hogan & Hogan, 2001). Moreover, being analytical and cautious are inherited characteristics of the conscientious personality trait (Judge et al., 2009), a tendency which relates to a fear of being criticized, shamed or blamed. As a result, avoidance of such situations are vital for conscientious individuals who therefore are likely to conform to established procedures, especially when under stress (Hogan & Hogan, 2001). In addition, their calculated approach and urge to be well-informed results in slower decision making, which could restrict effective usage of resources or result in missed opportunities for aggressive investments in new business opportunities (Judge et al., 2009).

A high level of conscientiousness and their ability to focus on achieving long-term goals instead of short-term gains and gratification contradicts earnings management. Accruals management may be regarded as too risky in terms of being detected and blamed, the accounting principles are also established procedures which a conscientious CEO are likely to conform to. In regards to real-earnings management it could be too value-destroying for a conscientious CEO's long-term focus. On the other hand, conscientious CEOs feel more responsible towards others compared to other traits which increases their perceived negative impact of being blamed for missed benchmarks. In this regard, they could be willing to minimize these risks and market pressure, which makes it easy to fall back on using earnings management which can be seen as rational when close to a benchmark (Graham et al., 2006). Conscientious CEOs have traits which could cause them to both engage in and refrain from earnings management, leading to the following hypothesis.

H1: *CEO conscientiousness is associated with earnings management*

2.2.2 Extraversion

Extraverts are characterized by being outgoing, social and overall gregarious, as well as ambitious, dominant and excitement-seeking. It also involves showing a lot of warmth and compassion towards others, along with prevailing positive emotions. That is, an extraverted CEO is going to show a larger interest in others compared to other dominant traits. Extraversion is also characterized by assertiveness. With tendencies to be bold, aggressive and acting in grandiose ways they like to be the center of attention and can quickly bounce between ideas or subjects. Extraverts also have the tendency to overestimate themselves and seek to dominate others (Judge et al., 2009; Hogan & Hogan., 2001). Taking advice or listening carefully to what is being said within the company can also be rather difficult for extroverts because of their shorter attention spans which can lead to hasty decisions that are poorly built and lack solid information (Beauducel et al., 2006). This can lead to extraverts making rapid strategy changes, acquisitions or perhaps earnings management decisions (Judge et al., 2009). Schrand and Zechman (2012) find evidence that firms with overconfident managers are more likely to be optimistic about future performance

and thereby more prone to engage in accruals management. Further, Hsieh et al. (2014) found that post SOX overconfident managers were found to be more likely to engage in accruals management whilst their engagement in real-earnings management remained equally likely. Harrison et al. (2019) found extraverted CEOs to decrease strategic change (e.g. advertising and R&D intensity) when firms perform poorly, which is one way to boost earnings in the short-term. Taking this into consideration, one proposition is that extraverts offset the risks of earnings management to hopefully benefit from the brushed up earnings. On the other hand, one could reason that extraverts overconfidence and higher risk-taking (Harrison et al., 2020) could lead to lower levels of earnings management compared to other traits because of their ability to disregard short term discrepancies and believing in the future. Their tendencies to be bold, assertive and act in grandiose ways make them less afraid of responding to and coping with backlash than other traits (Bono & Judge, 2004). Considering that real-earnings management is value-destroying it also contradicts their long-term focus. Extroverted CEOs have traits which could cause them to both engage in and refrain from earnings management, leading to the following hypothesis.

H2: CEO extraversion is associated with earnings management

2.2.3 Neuroticism

Neuroticism is characterized by lower emotional stability (McCrae & John, 1992), which often leads to higher levels of anxiety, lower self-esteem and less impulse control (Costa & McCrae, 1995). Neurotics have tendencies to be tense, worried and irritable, their behavior is often experienced as sad, guilt-prone, helpless, weak and vulnerable. Furthermore, neuroticism has a strong negative association and ability to cope with stress (Mohiyeddini, Bauer & Semple, 2015) and is also strongly associated with risk-aversion (Nicholson et al., 2005).

From an earnings management perspective we reason the effect of neuroticism to be two-folded. Neurotic CEOs may conform to market pressure and manage earnings to reach important benchmarks. The pressure of not delivering may cause stress, anxiety and trigger impulses to

manage earnings which can be difficult to resist for neurotics (Costa & McCrae, 1995). Their lower levels of self-esteem may also cause a greater stress of how others will perceive them and the company, therefore experiencing a greater perceptual pressure in comparison to other traits. Harrison et al. (2020) find the personality of CEOs to influence stakeholders' perception of the firm, where neurotic CEOs particularly were found to be perceived as more risky despite their low risk willingness, due to higher impulsiveness, irrationality and lower emotional stability which make them unpredictable. Moreover, putting this into a context where a neurotic CEO may be held accountable for managing earnings, stress, anxiety and negative emotions may take over and refrain from engaging in earnings management. Again, the low self-esteem coupled to neurotic people can be assumed to cause a worry of how others will perceive them. In this context the risks of being caught managing earnings and displeasing the market may be regarded as too high. As mentioned, neurotic people are associated with low risk-taking (Nicholson et al., 2005), which should disincentivize earnings management. Neurotic CEOs two-foldness leads to the following hypothesis.

H2: CEO neuroticism is associated with earnings management

2.2.4 Openness to experience

Openness is characterized by being imaginative which often leads to unusual thought processes. It is also characterized by having a broad sense of interests with a bold and often risk seeking attitude (McCrae & Costa 1987). Open individuals have the tendency to be creative, self-aware, resourceful and insightful (John & Srivastava, 1999). In this regard, openness is associated with organizational change (Judge et al., 1999), transformational leadership and an aspirational vision for the future of the organization (Bono & Judge, 2004). Openness leads to a superior ability to focus strategically (Judge et al, 1999). Furthermore, these people are able to challenge common practice and do not feel the need to conform to pressure or norms (Bono & Judge, 2004). CEOs high in openness are often willing to try almost anything to reach organizational success, this tendency can sometimes lead to drastic or hastily taken decisions (Judge & LePine, 2007). That in

conjunction with risk willingness could incentivize an open CEO to manage earnings. On the other hand, open CEOs insightfulness may help them make strategic changes meant to solve the underlying problem causing missed benchmarks instead of trying to reach it by managing earnings. That and their self-awareness may also cause them to understand what is optimal for the company and themselves on a deeper level. In combination with their visionary attributes, they should be able to stick to the vision instead of conforming to a short-term market pressure of reaching a benchmark, thereby not letting short-term fear of being held accountable influence decisions. Open CEOs have traits which could cause them to both engage in and refrain from earnings management, leading to the following hypothesis.

H4: CEO openness is associated with earnings management

3. Method

3.1 Regression design

In this study five regressions were performed, one for each earnings management measure as a dependent variable. These aim to explain how the test variables, the different personality traits, affect earnings management and were estimated as with the following equation:

$$EM_{it} = \beta_1 \text{Conscientiousness}_{it} + \beta_2 \text{Extraversion}_{it} + \beta_3 \text{Neuroticism}_{it} + \beta_4 \text{Openness}_{it} + \beta_5 \text{Controls}_{it} + \varepsilon_{it} \quad (\text{Eq. 1})$$

Where EM_{it} is one of the five different measures on earnings management presented in subsection 3.3 for firm i at time t . The test variables constitute the personality traits described in subsection 2.2 of each CEO: *Conscientiousness*, *extraversion*, *neuroticism* and *openness*. All of the Big Five personality traits have been documented to affect each other (Mairesse et al, 2007) and were therefore included in one single model for each dependent variable. Agreeableness was excluded due to multicollinearity. Controls_{it} is the set of control variables, which are defined in section 3.5 and Appendix 1.

3.2 Personality scoring

The Big Five personality traits were used as test variables in the regression. First, these were extracted from ECC transcripts for each CEO. The basis for categorizing personality traits have for long been the lexical hypothesis, which proposes that the differences among individuals are encoded in their language. The Big Five personality traits have traditionally been categorized by factor analyses and surveys (Mairesse et al., 2007), but with new technology having been developed content analysis and machine learning algorithms have enabled large-scale quantifications and more precise classification of personality traits out of transcribed statements of CEOs (Harrison et al., 2019).

A challenge for more recent research focusing on executives and their personality traits have been the inability to classify personality traits with high validity and reliability (Hambrick, 2007; Harrison et al., 2019). First, there is an inherited shortcoming with using publicly available firm disclosures as a basis for personality scoring, where many are scripted, prepared and the actual author behind it is unknown. In comparison to other types of disclosures ECC transcripts can be regarded as more transparent than other forms of disclosures, where for example CEO letters are scripted beforehand and the CEO may not even be the actual author behind it (Amernic & Craig, 2007). In an earnings conference call, however, we can be certain that it is the CEO speaking. Moreover, earnings conference calls consist of different parts (Safe harbor statement, presentation and discussion, Q&A session) where the Q&A session is the section with the most informative value when classifying personality traits. During this part of the call, analysts are given the opportunity to ask questions which the CEO cannot have prepared answers for, causing a need to improvise and speak freely, which allows their typical language to shine through (Matsumoto et al., 2011). Accordingly, the Q&A section of the ECC transcripts was used to facilitate a reliable classification of personality traits. We removed the prepared introductory presentation of each ECC transcript made by the CEO along with all other transcribed statements of other participants in the call, and kept unprepared statements made by the CEO only. There is also a risk of CEOs being coached for these calls or other media exposure and impression management may be performed (Chandler & Munday, 2020). This could impact their language when answering questions and thus affect the precision of the personality scoring. Though, the questions from analysts are normally direct and unforeseen (Malhotra, 2018), which puts the CEO in a position where the possible biases mentioned above are minimized. Moreover, ECCs are not mandatory and are usually held on a quarterly basis. In order to increase accuracy in our estimation of personality traits we therefore aggregated all statements from the CEO from each ECC held during the year as a representation for the fiscal year. The aggregation also addresses the problems with CEO coaching and impressions management, as with more text the probability of that the CEO speaks their natural language increases.

In response to the caveats of previous research, we use the “Open Language Chief Executive Personality Tool” (OLCPT) developed by Harrison et al. (2019). The tool is specifically trained with the purpose of founding a common ground for future research within CEO personality traits and its effect on corporate outcomes. Based on a subsample of S&P 1500 firms the tool is based on an open-language machine learning algorithm which identifies linguistic features (single words, multi-word phrases and unconventional language) which are compared to a psychometrically validated measure of the same trait (Hill et al., 2019). In other words, OLCPT is not based on a predefined dictionary of words but is instead trained to predict each personality trait by comparing a full body of text to a separate psychometrically validated measure of the same construct. Open-language methods can improve predictions of personality (Park et al., 2015) and OLCPT was similarly found to outperform prior methods in terms of reliability and validity (Harrison et al., 2019). It is also trained specifically on the Q&A section of ECCs which addresses the potential issues with CEOs being prepared for ECCs etc, as it is trained on specific disclosures and uses an open-language method with a richer set of linguistic features. The estimation results from the model are retrieved on a scale ranging from 1 to 7 for each trait, where 7 is the highest and 1 the lowest score possible.

The personality traits influence each other (Goldberg 1990; Harrison et al., 2019) which is logical given their broad definitions. Pairwise correlations are therefore presented in Table 2 to observe their influence on each other in our sample. First, agreeableness is significant at a 1% level and highly correlated to openness (0.78) and neuroticism (-0.705), which may impose multicollinearity to the model (Brooks, 2019). Openness and agreeableness are the personality traits being most evaluative in nature and most difficult to accurately classify using text (Harrison et al., 2019). In this regard, we remove agreeableness from our model, which also is a trait that is not as prominent among the CEOs in our sample (see mean values for personality traits in Table 5). Openness is also correlated to conscientiousness and neuroticism with 0.686 and -0.615 respectively, both significant at the 1% level. Thus, removing openness could bias the results of these other traits and

cannot be removed as long as no multicollinearity issue prevails. The remaining traits are also significantly correlated at the 1% level but at lower levels.

Table 2. Pairwise correlations of the Big Five Personality traits

Variables	Consc	Extra	Neuro	Openn	Agree
Consc	1.000				
Extra	0.380*** (0.000)	1.000			
Neuro	-0.444*** (0.000)	-0.434*** (0.000)	1.000		
Openn	0.686*** (0.000)	0.552*** (0.000)	-0.615*** (0.000)	1.000	
Agree	0.579*** (0.000)	0.569*** (0.000)	-0.705*** (0.000)	0.780*** (0.000)	1.000

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

3.3 Earnings management measure

3.3.1 Real-earnings Management

Our study concerns both real- and accruals management as firms use both methods. Studying only one of them would not capture the overall effect of earnings management, nor lead to definitive conclusions (Zang, 2012). Consistent with prior research, proving its ability to capture real-earnings management (see e.g. Cohen et al., 2008; Ham et al., 2017; Roychowdhury, 2006; Zang, 2012), the three measures: discretionary expenditures, overproduction and sales manipulation, introduced by Roychowdhury (2006) are applied to measure real-earnings management. In contrast to research prior to Roychowdhury (2006), focusing mainly on R&D expenditures, this model offers a broader perspective of real activities taking place to manage earnings, which would have been disregarded if relying on methods from earlier works. In regards to accruals management the modified jones-model were applied, which has been found to provide the most powerful tests of accruals management (Dechow et al., 1995).

Roychowdhury (2006) extended prior literature by adopting a broader method factoring in several ways in which firms can manage earnings through real activities. Accordingly, the following three measures were applied in order to capture real-earnings management.

Sales manipulation concerns offering price discounts or more favorable credit terms, usually for a limited time, in order to temporarily boost sales. Offering price discounts or a lower interest rates are examples, which under the assumption of positive margins translates into an increase of total earnings in the current period as additional sales are recognized. Noteworthy is that the increased sales volumes most likely disappears when the offer ends. This causes the cash inflow per sale to be lower as margins decline and the corresponding production costs to be abnormally high. That is, sales manipulation leads to lower current period CFO and higher production costs in comparison to what is regarded as normal (Roychowdhury, 2006). Following Roychowdhury (2006) we first derive the normal level of CFO by running the cross-sectional regression below for every industry with at least 15 observations and for every year. Industries are defined by each firm's 2-digit SIC-code (Roychowdhury, 2006).

$$\frac{CFO_{it}}{A_{it-1}} = \alpha_0 + \beta \left(\frac{1}{A_{it-1}} \right) + \beta_1 \left(\frac{S_{it}}{A_{it-1}} \right) + \beta_2 \left(\frac{\Delta S_{it}}{A_{it-1}} \right) + \varepsilon_t \quad (\text{Eq. 2})$$

Where CFO is the cash flow from operations at time t, A_{it-1} is the total assets at time t-1, S_{it} is the total sales at time t and ΔS_{it} is the change in sales from time t-1 and t. The residuals are then estimated in order to capture the deviation from normal levels of sales manipulation.

Overproduction is carried out with the purpose of decreasing the cost of goods sold (COGS) by producing more goods than the expected demand requires. With more inventory the fixed costs are allocated over a larger number of units and are consequently lowered per unit. That is, total costs per unit will decline as long as there is no increase in marginal cost per unit, causing COGS to be lower and the operating margin to increase. Nevertheless, cash flow from operations will be lower than normal since the firm has incurred production and holding costs for goods that will not

be sold during the same period. Following Roychowdhury (2006) we derive the normal level of production cost in accordance through running the regression below cross-sectionally for industries with at least 15 observations and for every year. Industries are defined by each firm's 2-digit SIC-code (Roychowdhury, 2006)

$$\frac{PROD_{it}}{A_{it-1}} = \alpha_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 \left(\frac{S_{it}}{A_{it-1}} \right) + \beta_3 \left(\frac{\Delta S_{it}}{A_{it-1}} \right) + \beta_4 \left(\frac{\Delta S_{it-1}}{A_{it-1}} \right) + \varepsilon_t \quad (\text{Eq. 3})$$

Where $Prod_{it}$ is the COGS plus change in inventory from time t-1 and t. The residuals are then estimated in order to capture the deviation from normal levels of overproduction.

Reduction of discretionary expenditures (DISEXP), such as R&D, advertising and maintenance, causes the reported expenses to be lower and consequently result in increased earnings. Discretionary expenditures are supposed to be expensed in the same period as incurrence, however, if these can be reduced or deferred to a later period current earnings can be increased. Selling, general and administrative costs (SG&A) can also be regarded as discretionary expenses as it usually includes employee training, maintenance and travel which can be used in a similar manner to alter reported earnings. Reducing such expenditures decreases cash outflows and instead results in abnormal cash flows during the same period, where one can observe the deviation from normal levels of DISEXP to measure such manipulations, i.e. the residuals (Roychowdhury, 2006). Again, following Roychowdhury (2006) the normal levels of DISEXP are estimated through the cross-sectional regression below for industries with at least 15 observations and for every year. Industries are defined by each firm's 2-digit SIC-code (Roychowdhury, 2006).

$$\frac{DISEXP_{it}}{A_{it-1}} = \alpha_0 + \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 \left(\frac{S_{it-1}}{A_{it-1}} \right) + \varepsilon_t \quad (\text{Eq. 4})$$

Where $DISEXP_{it}$ is the sum of R&D, advertising and SG&A for firm i at year t. The residuals are then estimated to capture the abnormal level of DISEXP.

Following Zang (2012) the residuals for CFO and DISEXP were then multiplied by -1, such that higher values indicate greater sales manipulation and cuts of discretionary expenditure to increase reported earnings. This also simplifies the interpretation of the regression output where the directions of each coefficient estimates for all dependent variables will imply the same. The two measures DISEXP and PROD were aggregated into one single proxy (REM), representing the total amount of real-earnings management taking place in a firm. CFO is not included in the aggregation since different real earnings management activities impact this in different directions, making its net effect ambiguous (Roychowdhury, 2006; Zang, 2012). For instance, discretionary expenditure cuts decrease cash flow from operations, whereas price discount, channel stuffing and overproduction increases it (Roychowdhury, 2006).

$$REM_{it} = \frac{PROD_{it}}{A_{it-1}} + \frac{DISEXP_{it}}{A_{it-1}} \quad (\text{Eq. 5})$$

3.3.2 Accruals management

The original Jones Model had the problem of estimating discretionary accruals with error when discretion is exercised over revenues. The modified version adjusts for change in revenue for the change in receivables and also makes the assumption that all changes in credit sales during the studied period are a result of earnings management. It is motivated through the reasoning that exercising discretion over the recognition of revenue on credit sales is easier than exercising it on cash sales (Dechow et al., 1995). Following Dechow et al. (1995) we first estimate total accruals for each firm and year by the following formula:

$$TA_{it} = (\Delta \text{Current Assets}_{it} - \Delta \text{Current Liabilities}_{it} - \Delta \text{Cash and cash equivalents}_{it} + \Delta \text{Debt inc. in Current Liabilities}_{it}) - \text{Depreciation \& Amortisation}_{it} \quad (\text{Eq. 6})$$

Second, total accruals are included in the following regression model which we estimate cross-sectionally for each industry and year with at least 15 observations.

$$\frac{\Delta A_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \frac{(\Delta REV_{it} - \Delta REC_{it})}{A_{it-1}} + \alpha_3 \left(\frac{PPE_{it}}{A_{it-1}} \right) + \varepsilon_{it} \quad (\text{Eq. 7})$$

Where ΔREV_{it} is the change in revenue from year t-1 to year t, ΔREC_{it} is the change in accounts receivables for firm i from year t-1 to year t and PPE_{it} is the gross property, plant and equipment for firm i in year t scaled by total assets at t-1. The residuals are then estimated to capture abnormality and are used as the proxy for accruals management.

3.4 Control variables

Consistent with prior research (Roychowdhury, 2006; Zang, 2012) we control for several firm-specific variables which have been found to affect earnings management: *Size*, *market-to-book-value* and *performance*. Size is defined as the natural logarithm of total assets and included as a control variable as it has been shown to affect earnings management, either positively or negatively. Larger firms need to respond to higher expectations and pressure from stakeholders (Pincus & Rajgopal, 2002), which might incentivize earnings management. On the other hand, external pressure also involves stronger external monitoring and higher political costs which should disincentivize earnings management along with stronger governance structures and less information asymmetry being present in larger firms (Meek et al., 2007). Size also controls for systematic variation in the real-earnings management measures along with the next control variable, market-to-book-value (MTB), proxying growth opportunities (Roychowdhury, 2006). MTB is defined as the market value of equity divided by book value of equity and gives an indication of how the firm is expected to grow in the future. In general bad news, such as not reaching an earnings benchmark, is coupled to a negative response on the stock market. For high-growth firms this effect has been shown to be stronger (Skinner & Sloan, 2002). Recall that firms being very close to reaching earnings benchmarks are regarded as suspects (Roychowdhury, 2006; Zang, 2012) and more inclined to engage in earnings management. High-growth firms, having it more difficult to reach earnings targets, are hence more likely to engage in earnings management, especially since they suffer from a consequential stronger effect on the stock market if targets are

missed. Especially firms performing poorly are likely to have incentives to manage earnings upwards (Dechow et al., 1995). Accordingly, we control for return on assets (ROA), a measure on performance which by itself is likely to incentivize earnings management. In addition, it controls for the possibility of the abnormal values, used to calculate the dependent variables, having a measurement error correlated with performance (Roychowdhury, 2006).

The choice of which earnings management method to perform is based on the respective method's costliness, which in turn are affected by its operational and accounting environment (Zang, 2012). In regards to real-earnings management we therefore control for *market share*, *financial health* and *institutional ownership*. Market share and financial health have been found to affect earnings management, larger and more financially healthy firms engage in more real-earnings management. Following Zang (2012) we measure market share as the ratio of a company's sale divided by the total sale of the corresponding industry and year. Industries were in this case identified by its 3-digit SIC-code and financial health were calculated in accordance with the modified version of Altman's Z-score (Zang, 2012). The free float, i.e. the total outstanding shares held by public owners are used as a proxy for institutional ownership. Institutional ownership is expected to affect real-earnings management negatively (Zang, 2012). Concerning accruals management, we control for *Big-8 auditor*, *audit tenure*, *operating cycle* and *net operating assets (NOA)*. Big-8 auditor is a proxy for high-quality auditing which hinders the possibility of managing earnings through accruals. Longer auditor tenure also increases the likelihood of constraining firms to engage in accruals management. We define these variables as indicators, which for the former takes the value of 1 if the company is audited by a big 8 auditor and for the latter if the auditor tenure is above the corresponding industry mean, and zero otherwise. A firm's operating cycle decides the flexibility of managing earnings as accruals can reverse over longer periods and the accounts can be greater. Firms with longer operating cycle therefore use more accruals management and firms with shorter operating cycles therefore use more real-earnings management. See Appendix 1 for calculation of operating cycle. NOA is a proxy for accruals management performed in previous periods which constrains the amount of accruals management possible. Higher NOA should therefore decrease

accrual management and increase real-earnings management. We measure it as a dummy variable which takes the value of 1 if the net operating assets (shareholders equity less cash and short-term investments plus total debt) at the beginning of the year divided by lagged sales are above the median of the corresponding industry and year, and 0 otherwise. Further we include the variable REM in the regression concerning accruals management and accruals management in the real-earnings management equation to control for the tradeoff between the two (Zang, 2012).

Concerning age, older CEOs are associated with higher quality of earnings and are less likely to engage in earnings management (Hang & Rose-Green, 2012). They also tend to invest less in R&D (Chowdhury & Fink, 2017), being a part of real-earnings management. A possible explanation for this might be the horizon problem, claiming that CEOs close to turnover or retirement do not work in the best of long-term shareholder value, rather focus is on short-term benefits to serve their self-interest to maximize wealth. This also incentivizes older CEOs to engage in less conservative accounting prior to retirement or turnover (Chen et al., 2018). In regards to tenure, recently hired CEOs desire to portray a good image and send signals to the market are more likely to engage in earnings management with the purpose of impacting market perceptions (Ali & Zhang, 2015). Managers seem to be conservative in managing earnings at the beginning of employment, but become more likely to manipulate earnings in the next few years to finally reverse to a specific level of earnings management (Hu et al., 2015). This could further be understood by the concept of big-bath accounting, being especially prevalent during CEO turnovers, both in the beginning and end of employment (Nieken & Sliwka, 2015). In this manner, a leaving CEO would prefer to defer earnings until the last period of their terms, whereas a big bath is common to be undertaken by newly appointed executives when the former management is still responsible, and positive earnings shifted forward to later periods (Nieken & Sliwka, 2015). We control for only CEO *tenure* to prevent multicollinearity, because CEO age and tenure have been found to be highly correlated and explain the similar effects (Simsek, 2007).

4. Sample selection

4.1 Sample and data collection

The sample consists of American publicly listed companies and concerns two sets of data: earnings call transcripts and firm-specific financial data to measure earnings management. In order to maximize the volume of text for reliable classification of personality traits of CEOs, we first selected the data based on the availability of ECC transcripts. The transcripts were retrieved from Finnhub, allowing large-scale queries of such data, and the financial data were retrieved from COMPUSTAT. This resulted in 8,991 companies with available ECC transcripts between 2005 and 2020. From the original number of companies there were 2,387 firms where financial data was not available in COMPUSTAT. After lagging certain variables, the original sample yielded 6,610 firms and 83,349 firm-years between 2005 and 2020. Managing earnings is more difficult in certain industries, following Roychowdhury (2006) we therefore excluded firms in regulated industries (SIC codes between 4400 and 5000) as well as banks and financial institutions (SIC codes between 6000 and 6500).

Prior research identifies earnings benchmarks as proxies for when earnings management is likely to occur, including just beating or meeting zero earnings, last year's earnings and analyst forecast consensus (Roychowdhury, 2006; Zang, 2012). This study concerns how certain personality traits affect earnings management decisions. Firms in a setting where earnings management is likely to occur were therefore extracted, meaning that these CEOs are in a position where it could make sense to use earnings management to reach a target. Following Zang (2012) we improved the power of our sample by identifying earnings management suspect firms. Suspect firms were defined as firm-years with ROA between 0 and 0.005, change in basic earnings per share (EPS) before extraordinary items between 0 and 2 cents, as well as, firm-years with actual basic EPS before extraordinary items less the analyst estimate consensus between 0 and 1 cents (Zang, 2012). During the sample period there were 840 firm-years just beating or meeting zero-earnings, 806

just beating or meeting last year's earnings and 1,162 just beating or meeting analyst estimate consensus. After removing duplicates which emerge when a firm-year is suspect based on more than one of the definitions above, the suspect sample amounts to 2,588 firm-years. There were 986 occasions where no ECCs were held and 45 where the CEO was not present or did not talk. As can be observed in table 2, the final sample amounts to 1,577 suspect firm-years.

Table 3. Sample selection

	Firms	Firm-year observations
Original n. of companies (2005-2020)	8,991	134,865
Less companies w. missing data		(73,119)
Less excluded industries		(13,437)
Original sample	5,104	48,309
Identification of suspect firm-years		
Suspect ROA		840
Suspect EPS change from last year		806
Suspect analyst forecast		1,162
Total number of suspects ¹		2,588
No earnings conference calls held		(986)
CEO not present/does not speak (enough)		(45)
Final sample size	1,141	1,557

¹ Firms can be suspect on several measures, resulting in less total number of suspect observations than the aggregation of all measures, 220 firms are suspect on multiple measures.

4.2 Validation of suspect sample

To confirm the validity of the suspect sample we estimate the following regression (Roychowdhury, 2006; Zang, 2012) to compare suspect firm-years to the rest of the sample:

$$EM_{it} = \alpha + \beta_1 \text{Suspects}_{it} + \beta_2 \text{Size}_{it-1} + \beta_3 \text{MTB}_{it-1} + \beta_4 \text{ROA}_{it} + \varepsilon_{it} \quad (\text{Eq. 8})$$

Where the dependent variables are the measures on earnings management. Following Roychowdhury (2006) we include the market to book ratio and ROA. We also include the natural logarithm of total assets. Firm-years close to being suspects can still have incentives to manage earnings and are therefore excluded from the sample in this comparison, to enable a test whether suspect firm-years are significantly distinguishable from non-suspect firms. Following Zang (2012) we therefore define firms that clearly beat or miss all earnings benchmarks by firm-years beating or missing zero earnings with more than 2.5 percent in either direction, as well as, beating or missing last year's earnings or analyst estimate consensus with more than 5 cents. The observations in between suspects and non-suspects are accordingly removed from the sample in this comparison. Consequently, the variable suspects is a dummy variable which takes the value of 1 if the firm-year just beats or meets one of the earnings benchmarks and 0 if it clearly beats or misses all earning benchmarks (Zang, 2012). Table 4 reports the estimation results, where the dummy variable suspects are statistically significant for all earnings management measures. This suggests that suspect firm-years engage in different earnings management methods and that we can use the sample to increase the power of our analysis.

Table 4. Suspect firm validation

VARIABLES	REM	DISEXP	PROD	CFO	AM
Suspects	0.0532*** (0.0121)	0.0686*** (0.00828)	-0.0138** (0.00569)	-0.0442*** (0.00637)	-0.112*** (0.0154)
Size _{t-1}	0.121*** (0.00844)	0.143*** (0.00567)	-0.0122*** (0.00396)	-0.0746*** (0.00437)	-0.0725*** (0.0112)
MTB _{t-1}	-0.000252*** (0.000087)	-0.000188*** (0.000067)	-0.000067* (0.000036)	-0.000120** (0.000053)	-0.0000052 (0.000208)
ROA _t	0.0000015 (0.000001)	0.0000015* (0.0000008)	-0.0000001 (0.0000002)	-0.0000001 (0.0000003)	0.0000004 (0.0000006)
Observations	33,404	33,404	33,404	33,404	33,404
Year FE	YES	YES	YES	YES	YES

Robust standard errors in parentheses (clustered on firm and year)

*** p<0.01, ** p<0.05, * p<0.1

5. Results & Discussion

5.1 Descriptive Statistics

Table 5 presents summary statistics of the variables used in this study. The sample consists of 1,557 suspect firm years between 2005 and 2020, including 1,227 CEOs. In Panel A summary statistics of all variables included in the regression model (personality traits, explanatory variables and controls) are presented. Conscientiousness, extraversion, and openness are the three most prominent traits in the sample, having means of 5.12, 4.71 and 4.69 respectively. Neuroticism and agreeableness have the lowest means of 3.26 and 4.08. It can be observed that extraversion, agreeableness and neuroticism have the highest standard deviation while conscientiousness has the lowest. Neuroticism and agreeableness have the lowest min values while conscientiousness, extraversion and openness have the highest max values, further supporting the implication that these three are the most prominent traits in our sample. These results are comparable to Harrison et al. (2020). The suspect sample has 5 percent of the market shares in their industries on average, indicating that the firms in our sample overall seem to be rather small or that the market is dispersed between many firms in the corresponding industries. The mean market-to-book value is 2.15, indicating that most of the firms have expectations of growth accounted for in share price. The mean ROA is -0.043, indicating that the firms in our sample are not very profitable, which is logical when considering the benchmarks used to identify suspect firms. Moreover, the firms may be regarded as financially healthy as the mean z-score of 2.86 is above the cutoff-points 2.675 and 1.81 as suggested by Altman (2000). The mean free float is 74.4 percent and the mean of NOA dummy of 0.471 indicates that approximately half of the sample has net operating assets above their corresponding industry-year mean. The suspect firms have on average an operating cycle of 139 days, 71.5 percent are audited by a big-8 auditor and approximately 70 percent of the firms have had a relationship with the same audit firm for more than four years (the median length of auditor tenure). REM is the aggregated proxy of DISEXP and PROD and has a mean of 0.052. Since we multiplied discretionary expenditures and CFO by (-1) all of the earnings management

measures can be interpreted similarly; higher values of respective measures indicate more earnings management. DISEXP is the most used real activity to manage earnings and has a positive mean of 0.06. CFO has a positive mean value of 0.002, indicating that it is not overall commonly used in our sample. The corresponding standard deviations for each measure indicates a spread in the data, meaning that there are more and less extreme cases of real-earnings management taking place. The mean values for PROD and accruals management are just below 0, though with a standard deviation and max value indicating a presence of these activities in our sample. As a sign of validity, all measures in *Panel A* and *B* are comparable to Zang (2012).

Panel B presents the summary statistics of earnings call transcripts and each CEOs participation in it. We had no threshold of how much a CEO needed to talk as long as they do talk, since the OLCPT algorithm does not have a length requirement. Explaining the min and max values to have a large range. The mean word count of CEOs is 6325 with a standard deviation of 4586. The mean sentence count of CEOs is 325 with a standard deviation of 229. Panel C presents the industry distribution and illustrates that the majority of our sample operates in the manufacturing and services industry.

Table 5. Summary statisticsPanel A: *Summary statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
Consc	1557	5.127	0.422	3.749	6.067
Extra	1557	4.729	0.739	2.210	6.224
Neuro	1557	3.281	0.597	1.572	4.807
Openn	1557	4.690	0.530	3.023	5.755
Agree	1557	4.087	0.735	1.602	5.92
REM	1557	0.052	0.527	-2.035	1.837
DISEXP	1557	0.059	0.344	-1.340	1.157
PROD	1557	-0.008	0.229	-0.828	0.754
CFO	1557	0.004	0.218	-0.880	0.989
AM	1557	-0.006	0.167	-0.495	0.872
Auditor tenure	1557	0.702	0.458	0.000	1.000
Floatt-1	1557	74.362	27.885	0.000	99.91
ROA	1557	-0.041	0.246	-1.587	0.219
Marketshare	1557	0.051	0.137	0.000	0.836
NOA dummy	1557	0.471	0.499	0.000	1.000
Operating cyclet-1	1557	139.149	195.698	0.000	1620.179
CEO tenure	1557	2.11	2.278	0.000	10.000

Panel B: Summary statistics of CEO participation in earnings conference calls

Variable	Obs	Mean	Std. Dev.	Min	Median	Max
Words	1557	6325	4586	156	5341	34787
Sentences	1557	325	229	21	273	1714

Panel C: Industry distribution

SIC-code:	Description	Obs	Percent
1-19	Mining and construction	120	7.7%
2-39	Manufacturing	653	41.9%
4-44	Energy, transportation and communication	9	0.6%
5-59	Trade	164	10.5%
65-69	Real Estate & construction	262	16.8%
7-89	Services	349	22.4%
Total		1557	100%

Table 6. Correlation table

Variables	Consc	Extra	Neuro	Openn	Agree	REM	DISEXP	PROD	CFO
Consc	1.000								
Extra	0.358***	1.000							
Neuro	-0.505***	-0.522***	1.000						
Openn	0.697***	0.558***	-0.683***	1.000					
Agree	0.572***	0.591***	-0.755***	0.800***	1.000				
REM	-0.056**	-0.034	0.142***	-0.120***	-0.123***	1.000			
DISEXP	-0.036	0.026	0.099***	-0.074***	-0.079***	0.924***	1.000		
PROD	-0.078***	-0.116***	0.168***	-0.154***	-0.161***	0.835***	0.579***	1.000	
CFO	-0.0042	0.0251	-0.0504**	0.0270	0.0237	0.0362	-0.0892***	0.2377***	1.000
AM	0.0493*	-0.0112	-0.0265	0.0179	0.0463*	-0.0416*	-0.0488*	-0.0325	-0.2567***
CEO Tenure	-0.012	-0.077***	0.001	-0.004	0.007	0.040	0.029	0.053**	0.060**
Size	-0.080***	-0.142***	0.256***	-0.205***	-0.252***	0.151***	0.117***	0.161***	-0.078***
MTB	0.063***	0.086***	-0.098***	0.090***	0.109***	-0.065**	-0.024	-0.080***	-0.080***
Zscore1	0.042*	0.043*	-0.087***	0.043*	0.070***	0.031	0.077***	-0.045*	-0.154***
Big 9	-0.041*	-0.051**	0.074***	-0.073***	-0.076***	0.062**	0.036	0.083***	-0.053**
Auditor tenure	-0.043*	-0.059**	0.023	-0.051**	-0.029	0.062**	0.054**	0.064**	0.030
Float-1	-0.026	-0.093***	0.044*	-0.056**	-0.034	0.029	0.010	0.055**	-0.004
ROA	-0.080***	-0.047*	0.240***	-0.140***	-0.184***	0.205***	0.279***	0.050**	-0.264***
Marketshare	0.011	0.075***	0.005	-0.088***	-0.073***	0.063**	0.036	0.075***	-0.015
NOA_dummy	-0.012	-0.022	0.027	-0.054**	-0.045*	0.087***	0.097***	0.056**	-0.020
Operating cycle-1	-0.035	0.000	-0.014	-0.084***	-0.037	-0.083***	-0.054**	-0.104***	-0.004

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

Variables	AM	CEO Tenure	Size	MTB	Zscore-1	Big 8	Auditor tenure	Float-1	ROA	Marketshare	NOA_dummy	Operating cyclct-1
Consc												
Extra												
Neuro												
Openm												
Agree												
REM												
DISEXPP												
PROD												
CFO												
AM	1.000											
CEO Tenure	-0.059***	1.000										
Size	-0.017	0.036	1.000									
MTB	0.079***	-0.005	0.016	1.000								
Zscore-1	0.091***	0.014	0.035	0.237***	1.000							
Big 9	-0.044*	0.012	0.597***	0.010	0.040	1.000						
Auditor tenure	-0.027	0.299***	0.055**	-0.017	-0.056**	0.000	1.000					
Float-1	-0.059**	0.189***	0.198***	0.014	-0.001	0.148***	0.212***	1.000				
ROA	0.084***	0.024	0.474***	0.094***	0.295***	0.288***	0.010	0.046*	1.000			
Marketshare	-0.010	-0.036	0.286***	-0.013	0.004	0.172***	0.034	0.102***	0.098***	1.000		
NOA_dummy	-0.052**	-0.042*	0.256***	-0.036	-0.048*	0.094***	-0.032	0.003	0.026	-0.056**	1.000	
Operating cyclct-1	0.023	0.058**	0.076***	-0.039	-0.060**	-0.014	0.011	0.030	-0.076***	-0.030	0.160***	1.000

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

5.2 CEO personality traits association with earnings management

Table 7 presents the regression results for each earnings management measure and the aggregated proxy for REM overall on the suspect sample. We hypothesized that CEO conscientiousness is associated with earnings management and the results indicate that this is supported. The coefficient estimates for DISEXP and REM are statistically significant at a 1% level, PROD is significant at 5% and accruals management at 10% respectively, which indicates that a conscientious CEO increases the use of earnings management in a setting when it is likely to occur. Conscientious CEOs tend to have a long term focus, which would disincentivize real-earnings management for these individuals as it is value destroying and harms future performance. They are often orderly, diligent and risk-averse (Jackson & Roberts, 2017; Judge et al., 2009), which contradicts the engagement in earnings management overall. Conscientious CEOs have tendencies to be analytical perfectionists that aim to maintain a high standard, they are also afraid of being criticized and blamed (Hogan & Hogan, 2001). Reporting a loss weighs heavier for a conscientious CEO (Benischke, 2019). In relation to earnings benchmarks, we reason that these tendencies explain their participation in real-earnings management even though it contradicts their long-term focus. Conscientious CEOs are better at turning risk into return (Harrison et al., 2020), which makes us reason that their calculated approach may allow them to utilize real-earnings management to a point which is optimal in terms of both reaching short-term earnings benchmarks and maximizing future value. The use of accruals management highlights an extra strong urge to reach earnings benchmarks to please the market for conscientious CEOs. It is a rather common practice to manage earnings to reach a benchmark at the cost long-term value (Graham et al., 2005) which a conscientious individual can conform to as a response to their tendency to rely on established and accepted procedures.

In regards to our second hypothesis; *H2: CEO extraversion is associated with earnings management*, it can be observed that supporting results were found. Extraversion is statistically significant at a 1% level and has a negative effect on discretionary expenditures, overproduction and the REM proxy. We interpret the consistently negative coefficient estimates of each measure

as a sign of robustness of all real-earnings management measures and conclude that CEO extraversion negatively affects real-earnings management. Recalling that extraverts have a tendency to be overconfident, optimistic about future performance (Schrand & Zechman, 2012) and risk-seekers, we reason that the less usage of REM may be caused by its negative consequences on future performance. Extraverts are often great rhetorics and are likely to dominate earnings conference calls (Harrison et al., 2019), which enables them to disregard the fear of being criticized for missed benchmarks and lets them focus on the long term goal. Whereas the engagement in accruals management proposed by prior studies (Schrand & Zechman, 2012; Hsieh et al., 2014) is logical since it does not affect the cash flow of the firm and is aligned with their risk-willingness. Though, no significant results were found for accruals management or sales manipulation in this study. The negative mean of accruals management in our sample (see table 5), indicating a low presence of such activities, may explain the insignificant results for accruals management. Sales manipulation's insignificance may be explained by the fact that the net effect of sales manipulation (abnormal CFO) is ambiguous (Roychowdhury, 2006).

In regards to our third hypothesis, *H3, CEO neuroticism is associated with earnings management*; it can be observed that it is supported by the results. Neuroticism is statistically significant at a 1% level and has a positive effect on discretionary expenditures and the REM proxy. In regards to accruals management, the coefficient estimate is statistically significant at a 10% level and indicates that neuroticism decreases the use of accruals management. That is, the results illustrate that neurotic CEOs prefer to engage in real-earnings management over accruals management. This stands to reason when considering that real-earnings management is more difficult to detect and less risky to get caught managing than accruals (Roychowdhury, 2006), but does provide a possible solution to the previously hypothesized two-foldedness of stressing about missing an earnings benchmark and the fear of getting caught managing earnings. Even though accruals management is not illegal it is more likely to be detected when scrutinized by for instance auditors than real-earnings management which rather harms the future of the firm (Graham et al., 2006). Further, it could be reasoned that real-earnings management is easier to disguise as strategic when questioned

by stakeholders, for instance lower R&D expenditures could be explained by poor results and liquidity problems, whereas accruals management cannot really be defended. Our results suggest that neurotics offset the value destruction caused by real-earnings management to reach earnings benchmarks and not being criticized. Specifically, neurotic CEOs prefer to use DISEXP which is the most commonly used real-earnings management method (Graham et al., 2005; Zang, 2012), which could suggest that neurotics think that discretionary expenditures are the most difficult to detect.

In regards to our fourth hypothesis, *H4, CEO openness is associated with earnings management*, the results indicate that this is supported, open CEOs use less real-earnings management. Openness is statistically significant at a 1% level and has a negative effect on discretionary expenditures, overproduction and the REM proxy. The higher effect of REM can be explained by it being an aggregation of the other two measures. We interpret the consistently negative coefficient estimates of each real-earnings management measure as a sign of robustness and conclude that CEO openness negatively affects real-earnings management. This is logical when considering the arguments outlined in the hypothesis development (see section 2.2.4) where open CEOs were discussed to be able to disregard common practice and not make decisions based on short-term market pressure, instead they are able to continue being visionary and focus on the future. Given that real-earnings management harms future value, open CEOs would rather make decisions affecting the future of the organization positively instead of trying to alter the present. As opposed to more conscientious CEOs who are long-term oriented but end up using real-earnings management because of their worse ability to disregard short-term market pressures and being held accountable for missing financial targets. There is also an important distinction to be made between long-term focus and being visionary where the latter is more goal-oriented and not necessarily anchored in a strong belief as is the case for a strong vision. This would also imply that it is more difficult to disregard and make decisions which contradicts a strong vision and belief, explaining open CEOs unwillingness to manage earnings. In addition, earnings benchmarks for a specific year or a quarter may not be regarded as a proxy for success, especially not if you manage earnings to

just reach or beat it. Rather it is part of the market's evaluation of firms. In the pursuit of organizational success, open CEOs are insightful and able to understand that it might be better to focus strategically instead of managing earnings, which they are comfortable with.

Table 7. Regression results

In table 7 all 5 OLS regression models with five different measures on earnings management are presented, for a complete description of test and control variables see section 3.2.2 *Test variables* and 3.2.3 *Control variables*. For all models fixed effects for year and industry are included. Following Zang (2012) we winsorized at the top and bottom 1%. Standard errors are clustered on firm and year. As robustness checks the same regressions were run without openness, mitigating the multicollinearity problem but yielding the same results (See Appendix 2). The mean VIF-value was 3.42, indicating no multicollinearity present in the model. A Logit model with each earnings management measure as a dummy variable that equal 1 if the measure is above the corresponding mean and 0 otherwise was estimated with all four traits and yielded similar results (See Appendix 3).

VARIABLES	(1) REM	(2) DISEXP	(3) PROD	(4) CFO	(5) AM
Consc	0.162*** (0.0518)	0.0985*** (0.0311)	0.0515** (0.0233)	-0.000330 (0.0202)	0.0326* (0.0169)
Neuro	0.0880*** (0.0250)	0.0670*** (0.0155)	0.0197 (0.0124)	-0.0201 (0.0125)	-0.0223** (0.00908)
extra	-0.0615** (0.0256)	-0.0327** (0.0157)	-0.0287** (0.0123)	0.00235 (0.0129)	-0.00419 (0.00942)
Openn	-0.306*** (0.0502)	-0.187*** (0.0309)	-0.105*** (0.0230)	-0.0128 (0.0230)	0.00466 (0.0179)
Size	0.0231** (0.0101)	0.00423 (0.00640)	0.0180*** (0.00457)	0.00861* (0.00449)	-0.00240 (0.00347)
MTB	-0.00506 (0.00331)	-0.00230 (0.00206)	-0.00159 (0.00122)	-0.000493 (0.00136)	0.00130 (0.000928)
Zscore _{t-1}	-0.000945 (0.00277)	-0.000691 (0.00177)	-0.000489 (0.00125)	-0.00184 (0.00141)	0.000994 (0.00110)
Big 8	-0.0297 (0.0350)	-0.0290 (0.0209)	-0.00191 (0.0162)	-0.0126 (0.0138)	-0.0165 (0.0122)
Auditor tenure	0.0545 (0.0407)	0.0378 (0.0265)	0.0199 (0.0175)	-0.000798 (0.0170)	-0.0121 (0.0146)
Float _{t-1}	0.000553 (0.000462)	0.000426 (0.000296)	0.000160 (0.000219)	-6.11e-06 (0.000217)	-0.000319* (0.000186)
ROA	0.294** (0.127)	0.375*** (0.0879)	-0.0773 (0.0530)	-0.239*** (0.0717)	0.0829** (0.0388)
Marketshare	0.241** (0.123)	0.133** (0.0590)	0.0763 (0.0608)	-0.0370 (0.0542)	-0.00967 (0.0312)
NOA_dummy	0.0436* (0.0254)	0.0409*** (0.0158)	0.00464 (0.0121)	-0.0239** (0.0111)	-0.0132 (0.00934)
Operating Cycle _{t-1}	-0.000189*** (0.000053)	-0.000032 (0.000031)	-0.000148*** (0.000032)	-0.000002 (0.00003)	0.000031 (0.000035)
CEO tenure	0.00222 (0.00536)	-0.00119 (0.00329)	0.00378 (0.00245)	0.00561** (0.00228)	-0.00416** (0.00192)
AM	0.0110 (0.146)	-0.0198 (0.0959)	0.0119 (0.0653)	-0.288*** (0.0738)	
REM					0.00132 (0.0177)
Observations	1,557	1,557	1,557	1,557	1,557
R-squared	0.231	0.328	0.134	0.171	0.072
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES

Robust standard errors in parentheses (clustered on Firm and Year)

*** p < 0.01, ** p < 0.05, * p < 0.1

6. Conclusion

Reliable and valid financial information is critical for the financial market and outside stakeholders. Earnings management is a prominent issue within accounting research, the dilemma has been that managers are the experts of their field and are the most suitable to use their judgment to report their firms financial status in the most accurate way. When judgment is allowed in financial reporting it increases its usability and precision, but it also creates opportunities for misconduct. Market pressure and financial benchmarks are the main factors driving earnings management decisions. In recent years, the academic interest for subjectiveness of executives has grown as an explanation contributing to understanding decision-making on a deeper level. This study analyses CEOs of firms in a situation where earnings management is likely to occur and possibly rationally motivated to reach financial benchmarks, with a focus on how *conscientiousness, extraversion, neuroticism and openness* impact earnings management decisions.

By utilizing algorithms 1277 CEOs personality traits were classified from earnings conference calls transcripts of 1557 firm-years. To our knowledge, we are the first to test multiple personality traits of CEOs' effect on earnings management and thereby extend previous literature focusing on single specific lower-level traits. Our results highlight that CEO conscientiousness increases earnings management the most, in terms of both accruals and real activities. Neuroticism increases real-earnings management but decreases accruals management. CEO extraversion and openness decreases real-earnings management. Conscientious CEOs are better at planning long term, but like neurotics they still use earning management to avoid being held accountable and confronted for missed benchmarks. The high risk of accruals management in combination with risk-aversion of neurotics decreases accruals management. Extraverted and open CEOs are less afraid of missed benchmarks and have a better ability to stick to the vision for the firm and disregard short-term gains, thereby not jeopardizing future value through real-earnings management. Open CEOs are

better at organizational change and therefore prefer fundamental strategy changes to fix underlying problems instead of managing earnings to meet benchmarks.

Lastly, we have extended previous literature by adding a personality perspective as explanation to why firms manage earnings. Contributing to the understanding and highlighting the importance of the subjective part of economic rationality. The findings may work as a foundation for further research but are also of importance to market participants, stakeholders overall and regulators. A question in recent earnings management literature is why firms engage in real-earnings management at the cost of future value. One explanation is market pressure of reaching earnings benchmarks, where we add another explanatory nuance of how personality affects these decisions. It may also help investors and stakeholders in their evaluation of firms and trust for earnings numbers and CEOs. Since regulators strive to withhold strong market confidence, minimize manipulations and ensure reliability for disclosures through laws and rules (Cohen et al., 2008), our research contributes by helping regulators understand underlying drivers of CEOs earnings management decisions.

6.1 Suggestions for further research

We found significant indications that all personality traits affect earnings management differently, some CEOs prefer real-earnings management over accrual management and others seem to either engage in all or none earnings management methods. This shed light on how personality impacts managing earnings decisions and what method is preferred. We therefore suggest further research to replicate our study in different contexts, for instance in another geographical location or particular industries. It would also be interesting to replicate our study in a larger sample or random sample where no earnings management suspect firms have been identified. Perhaps this may lead to less significant results, but could extend the results of our study.

As mentioned in section 3.6 CEOs are often compensated based on accounting numbers (Walker, 2013). It would therefore be interesting to develop a method for identifying suspect firms being

close to reaching CEO benefiting benchmarks. This is tightly coupled to CEO self-serving incentives of, for instance, gaining a bonus. Adding this nuance to a similar study is appealing since it would bring another perspective on how personality traits are associated with earnings management decisions. Are CEO personality traits a determinant factor to manage earnings to reach private financial thresholds? The same reasoning as in our paper may be outlined, where managing earnings for private benefits may invoke even higher risks of losing one's job etc (Walker, 2013). However, to our knowledge there is no method for identifying CEOs that manage earnings to reach a personally advantageous benchmark.

The Big Five Personality Traits are, as mentioned, broadly defined and incorporate several lower-level traits. It would therefore be interesting to explore which of the lower-level traits that drives earnings management more specifically. We rely on the assumption that it mainly is the risk preferences which explains the association between personality traits and earnings management decisions, but this could be quantified and tested in future studies. For instance, neurotics are risk-averse and extroverts risk-seekers, if one is able to significantly test risk preferences towards earnings management this would add a dimension to literature and strengthen our and similar studies reasoning and results.

Another appealing proposal for further research is to classify personality traits among top management teams rather than one specific executive, the CEO in our case. Large organizations are led by multiple people and analyzing them all together is likely to yield stronger explanations to organizational outcomes (Hambrick, 2007). Other executives and top managers are usually attending ECCs and could be scored with OLCPT or similar algorithms. Moreover, a discussion can be made regarding who has the most influence on earnings management, CEOs or CFOs. Literature points to that both work to protect their areas of responsibility, i.e. CEOs prefer accruals management and could even restrict the preference of CFOs to engage in real-earnings management. However, after SOX the preference of CEOs is leaning more towards real-earnings management (Baker, Lopez, Raitenga & Ruch, 2019). Yet, accruals management is still present

and it would be interesting to examine the impact of CFO personality traits on earnings management as well, either alone or together with CEOs and other executives in top management teams. However, the limiting factor is the sufficiency of statements from CFOs that can be found. The availability of CEO statements in earnings calls transcripts is much higher.

Lastly, earnings management is only one out of many firm outcomes which may be impacted by personality traits. There is yet much to explore both within accounting literature and other research domains. An example is the application within M&A by Gillmert & Persson (2019), who analyze conscientiousness effect on M&A outcomes. Another interesting application could be within Private Equity since success in this industry is largely attributable to management teams. Personality traits can provide a great deal of information, especially when classifying whole teams to help predict which teams are going to perform reliably. A seminal research area would therefore be to test personality traits towards successful private equity companies.

6.2 Limitations

Our relatively large sample size, the range of years this study concerns and time-limit complicated the retrieval of some data. Marginal tax rates were only available for a small number of firms and years. There is neither a proper way of calculating it accurately and was therefore not included. In regards to CEO-specific data gender and board duality it was not retrievable and also not included. The results regarding gender are dispersed, where female executives both have been found to partake less (Peni & Vähämaa, 2010) and more in earnings management (Harris et al., 2019). In regards to board duality, it has been documented that when a CEO also is a member of the board the likelihood of earnings management increases (Davidson et al., 2004 & Sarkar et al., 2008). These variables could have been included and perhaps increased the R^2 slightly, but in regards to coefficient estimates and significance levels we strongly believe these variables would have had a negligible impact. In addition, the reasoning behind gender's influence on earnings management is that risk preferences may differ, something which is accounted for in the personality of a person.

Two other limitations to our study are related to the identification of the sample. In addition to the three definitions of suspect firms used in our study, Zang (2012) also identifies firms just meeting or beating management's forecast as suspect firm-years. Due to limited data access and time constraints this could not be included and could mean that some significant observations were left out. Though, the impact would probably have been negligible in terms of the power of our results. Moreover, despite these measures of identification being well documented in research and validated in section 3.5 there are other situations where earnings management is more likely to occur. For instance, CEOs are often compensated based on accounting numbers, which should incentivize earnings management through private benefits (Walker, 2013), at least when being close to reaching such a target. That is other observations which could have been incorporated to further increase the power of our analysis.

As discussed in the methodology, we believe that we have used the most suitable type of disclosures, ECCs, and part of it, the Q&A section, which should mitigate the issue of scripted and prepared statements of the CEO. The language is freely spoken and should reflect the personality traits of each CEO. Nevertheless, we acknowledge that CEOs are likely to be trained for such exposures and impression management (Chandler & Munday, 2020) may be performed which could cause their personality traits to be concealed. This may impose measurement errors and serves as a limitation to the method used. We are unable to determine how much this impacts the accuracy of our personality predictions. In part, OLCPT mitigates this issue since it is an open-language machine-learning algorithm accounting for a comprehensive amount of linguistic features (Harrison et al., 2019) which improves predictions (Park et al., 2015). Further research could investigate this more by comparing personality predictions of scripted and prepared statements to the unscripted parts of an earnings conference call. A last limitation is that we chose not to include firm-level fixed effects since we have a majority of observations only occurring once in the sample.

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Appendix

Appendix 1. Summary of control variables

If not stated otherwise, data is collected from WRDS compustat.

<u>Control variables</u>	<u>Definitions</u>
Size	Natural logarithm of total assets
Market-to-book value	The ratio of market value of equity and total common equity
Performance	Return on assets, measured as net income divided by total assets
Market share	The ratio of sales of each firm divided by total sales of its industry. A finer definition of industries were used based on each firm's first 3 digits of their SIC-code.
Financial health	Modified Altman's Z-score (Zang, 2012), calculated as:: $0.3 \frac{NI_t}{TA_t} + 1 \frac{Sales_t}{TA_t} + 1.4 \frac{Retained\ earnings_t}{TA_t} + 1.2 \frac{Working\ capital_t}{TA_t} + 0.6 \frac{Market\ capitalization_t}{Total\ liabilities_t}$
Big-8 auditor	A dummy variable which takes the value of 1 if the firm is audited by a big-8 auditor and a value 0 otherwise

Auditor tenure	A dummy variable which takes the value of 1 if the auditor tenure for a firm is above the sample median 5 and 0 otherwise
Net operating assets	Shareholders equity less cash and short-term investments plus total debt. A dummy variable which takes the value of 1 if $\frac{NOA_{t-1}}{Sales_{t-1}}$ are larger than the industry median the same year
Operating cycle	<p>The average time cash takes to produce goods and receive the payment for it, calculated as:</p> $\left(\frac{AR_t + AR_{t-1}}{Sales/360}\right) + \left(\frac{INV_t + INV_{t-1}}{COGS/360}\right)$ <p>(Dechow, 1994)</p>
CEO tenure	CEO tenure was calculated through the number of consecutive years as CEO from the ECC transcripts.

Appendix 2. Robustness check, regression without Openness

VARIABLES	(1) REM	(2) DISEXP	(3) PROD	(4) CFO	(5) AM
Consc	-0.0504 (0.0328)	-0.0309 (0.0193)	-0.0212 (0.0159)	-0.00921 (0.0149)	0.0358*** (0.0112)
Neuro	0.135*** (0.0253)	0.0953*** (0.0159)	0.0356*** (0.0126)	-0.0181 (0.0124)	-0.0229** (0.00928)
Extra	-0.114*** (0.0253)	-0.0644*** (0.0155)	-0.0466*** (0.0119)	0.000176 (0.0119)	-0.00345 (0.00905)
Size	0.0219** (0.0102)	0.00349 (0.00647)	0.0175*** (0.00460)	0.00855* (0.00449)	-0.00237 (0.00347)
MTB	-0.00545* (0.00330)	-0.00254 (0.00206)	-0.00172 (0.00122)	-0.000510 (0.00136)	0.00130 (0.000928)
Zscore _{t-1}	-0.00107 (0.00283)	-0.000768 (0.00181)	-0.000532 (0.00125)	-0.00185 (0.00141)	0.000995 (0.00110)
Big 8	-0.0374 (0.0356)	-0.0337 (0.0213)	-0.00453 (0.0163)	-0.0129 (0.0138)	-0.0164 (0.0121)
Auditor Tenure	0.0617 (0.0412)	0.0422 (0.0268)	0.0223 (0.0176)	-0.000497 (0.0170)	-0.0122 (0.0146)
Float _{t-1}	0.000370 (0.000469)	0.000314 (0.000301)	9.78e-05 (0.000220)	-1.38e-05 (0.000218)	-0.000316* (0.000186)
ROA	0.333*** (0.127)	0.398*** (0.0879)	-0.0638 (0.0521)	-0.238*** (0.0708)	0.0825** (0.0389)
Marketshare	0.313** (0.128)	0.177*** (0.0630)	0.101 (0.0626)	-0.0340 (0.0545)	-0.0106 (0.0316)
NOA dummy	0.0556** (0.0259)	0.0483*** (0.0162)	0.00878 (0.0122)	-0.0234** (0.0111)	-0.0133 (0.00937)
Operating Cycle _{t-1}	-0.000128** (5.12e-05)	5.92e-06 (3.07e-05)	-0.000127*** (3.17e-05)	1.10e-06 (2.82e-05)	3.03e-05 (3.47e-05)
CEO tenure	0.00264 (0.00549)	-0.000934 (0.00337)	0.00392 (0.00246)	0.00563** (0.00229)	-0.00417** (0.00192)
AM	0.00730 (0.147)	-0.0220 (0.0963)	0.0106 (0.0653)	-0.288*** (0.0737)	
REM					0.000854 (0.0171)
Observations	1,557	1,557	1,557	1,557	1,557
R-squared	0.206	0.307	0.118	0.171	0.072
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES

Appendix 3. Robustness check, logit model

VARIABLES	(1) REM	(2) DISEXP	(3) PROD	(4) CFO	(5) AM
Consc	0.182 (0.218)	-0.179 (0.248)	0.563** (0.223)	0.0934 (0.205)	0.242 (0.200)
Neuro	0.616*** (0.131)	0.444*** (0.146)	0.372*** (0.127)	-0.230* (0.124)	-0.00606 (0.114)
Extra	-0.367*** (0.121)	-0.172 (0.150)	-0.357*** (0.135)	0.0471 (0.118)	0.0254 (0.109)
Openn	-0.712*** (0.220)	-1.003*** (0.259)	-0.923*** (0.226)	-0.196 (0.210)	-0.0871 (0.202)
Size	0.144*** (0.0448)	0.109** (0.0511)	0.157*** (0.0449)	0.0478 (0.0407)	-0.0688* (0.0410)
MTB	-0.0176 (0.0115)	-0.0106 (0.0117)	-0.00452 (0.00923)	0.0110 (0.00922)	0.0129 (0.00906)
Zscore _{t-1}	-0.00406 (0.00847)	0.00167 (0.00942)	-0.0140 (0.00903)	-0.0193** (0.00927)	0.0241*** (0.00808)
Big8	0.0727 (0.168)	-0.347* (0.188)	0.0544 (0.167)	-0.0836 (0.158)	-0.0636 (0.157)
Auditor tenure	0.317* (0.171)	0.261 (0.209)	0.106 (0.172)	-0.180 (0.164)	-0.0673 (0.157)
Float _{t-1}	0.00160 (0.00243)	-0.00132 (0.00285)	-0.00133 (0.00238)	-2.29e-05 (0.00221)	-0.000176 (0.00218)
ROA	0.0705 (0.320)	0.883** (0.394)	-0.937*** (0.343)	-2.209*** (0.654)	0.591** (0.282)
Marketshare	-0.591 (0.532)	0.314 (0.530)	-0.419 (0.531)	-0.596 (0.572)	0.458 (0.552)
NOA dummy	0.262** (0.129)	0.384** (0.149)	0.403*** (0.132)	-0.317** (0.124)	0.0245 (0.121)
Operating Cycle _{t-1}	-0.00105*** (0.000299)	-0.00100* (0.000514)	-0.00134*** (0.000306)	0.00113*** (0.000298)	0.000217 (0.000336)
CEO tenure	0.0176 (0.0295)	-0.0252 (0.0320)	0.0232 (0.0302)	0.0222 (0.0258)	-0.0352 (0.0271)
AM	0.232 (0.402)	-0.322 (0.464)	0.0953 (0.386)	-0.748* (0.387)	
REM					-0.00510 (0.121)
Observations	1,533	1,491	1,536	1,545	1,540
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES