Master Thesis

CEO succession: When does the firm's new leader generate more strategic change?

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COLOPHON

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Preface

In front of you, you can find my Master Thesis *'CEO succession: When does the firm's new leader generate more strategic change?'*. Over the last six months, I wrote this Thesis as a completion of my Master Strategic Management at The Radboud University. Two years ago, I started my journey at this university, after completing my bachelor's degree at Avans University of Applied Sciences. I look back on two challenging but exciting years, where I learned many academic skills and improved my understanding regarding management issues. Where I had never performed any statistical analysis one and a half year ago. This master thesis will show the additional knowledge I gained during my time at the Radboud University. I truly enjoyed this journey!

I would like to express my gratitude to dr. Koen F. van den Oever, my Thesis Supervisor, who showed sincere interest in the subject matter and supported me throughout the thesis process with helpful feedback. Secondly, I would like to thank dr. Paul E.M. Ligthart for assessing my Research Proposal and providing several interesting remarks.

Moreover, I wish to thank my parents for granting the possibility to study and for their everlasting encouragement. Finally, I would like to acknowledge the support provided by Valerie Boon during the writing process of my master thesis.

I am proud to present you my Master Thesis. I hope you will enjoy reading it!

Renée van Beek

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Table of Contents

ABSTRACT

Intrigued by solving the puzzle in which situations a CEO succession results in a higher level of strategic change. I proposed that a forced CEO turnover and the level of dissimilarity in demographic characteristics between the prior and the new CEO could potentially explain why one CEO succession results in more strategic change, while the other CEO successions do not. Based on a panel data analysis of the firms ranked on the Standard & Poor's 500 Index, this study confirms the expectation that dissimilarity in specific demographic characteristics can explain why some CEO successions result in a higher level of strategic change. However, I did not find a significant influence of a forced CEO turnover on the level of strategic change. Furthermore, a more sophisticated way to measure a CEO succession implied that prior research might have overestimated the effect of CEO succession on strategic change. I discuss the implications of my findings for research regarding the upper echelons theory, CEO succession and strategic change.

Keywords: upper echelons, CEO succession, strategic change, forced CEO turnover, demographic characteristics, self-selection

1 | INTRODUCTION

A basic premise in strategic management research is that top executives, e.g. Chief Executive Officer (CEO), perform a dominant role in formulating the firm’s strategy (e.g. Hambrick & Mason, 1984; Quigley & Hambrick, 2015; Westphal & Fredrickson, 2001). Following the predominant line of argumentation, higher CEO tenure should be related to more commitment of their paradigms, resulting in slower decision making. In turn, this should lead to ignorance of required strategic change (Hambrick & Fukutomi, 1991), creating a rigid path for a firm (Gilbert, 2005). This part could be broken by changing the firm’s CEO (e.g. Karaevli & Zajac, 2013). Nevertheless, prior strategic management research focused on the relationship between CEO succession, and strategic change showed conflicting results (Fondas & Wiersema, 1997); while some researches focused on specific situations showed that a CEO succession did result in more strategic change (e.g. Barron, Chulkov, & Waddell, 2011; Karaevli & Zajac, 2013), other researches focused on other situations showed the opposite effect (e.g. Boeker, 1997b; Datta, Rajagopalan, & Zhang, 2003; Yokota & Mitsuhashi, 2008).

Remarkably, missing in the current state of research regarding the relationship between CEO succession and strategic change is the situation when the firm's board of directors forces a CEO succession. This is striking because a forced CEO turnover should provide the opportunity for a firm to modify its strategy (Romanelli & Tushman, 1994). A forced CEO turnover is generally viewed as a disruptive change for a firm (Helfat & Bailey, 2005), which often creates an uncertain transition between the prior and the new CEO (Clayton, Hartzell, & Rosenberg, 2005). Hence, a forced CEO turnover can be seen as a sign that the board of directors desires a change in the firm's strategy (Nakauchi & Wiersema, 2015). Consequently, whether the CEO succession is forced by the board could potentially explain why one CEO succession results in more strategic change and the other CEO succession does not.

Moreover, 'while the reason behind CEO turnover is important in CEO succession, the selection of the successor is of equal importance (if not more) because the successor determines the firm's future strategic direction' (Shen & Cannella, 2003, p. 196). However, the current state of research lacks evidence whether dissimilarity in demographic characteristics between the prior and the new CEO has an influence on the level of strategic change after a CEO succession. This is surprising, as prior research concluded that demographic characteristics could determine the cognitive frame of a CEO. In turn, this cognitive frame influences the CEO' strategic decisions (Hambrick, 2007). Therefore, it would be plausible that selecting a CEO who is dissimilar in demographic characteristics would generate more strategic change. Consequentially, in addition to the situation that the board forces the CEO succession, the level of dissimilarity in demographic characteristics could potentially also explain why one CEO succession results in more strategic change, while the other CEO succession does not.

Taken this all together, in this paper, I intend to provide an additional explanation regarding the conflicting results in prior strategic management research on the relationship between CEO succession and strategic change, by uncovering the influence of a forced CEO turnover and the dissimilarity between the prior and the new CEO. Therefore, the research question is: '*To what extent can the conflicting results on the relationship between a CEO succession and a strategic change be explained by a forced CEO turnover or by dissimilarity in demographic characteristics?'*

I will study this research question by performing a quantitative study based on the firms ranked on the Standard & Poor's 500 Index. To measure strategic change, I will employ the entropy measure of diversification (Jacquemin & Berry, 1979). The forced CEO turnover will be measured as an alternation in the CEO position enforced by the board of directors. Besides, the dissimilarity between the prior and the new CEO will be determined by including the difference in age, gender, nationality, and educational background. Hence, prior research might have suffered a methodological problem, as they indicated a CEO succession as a binary variable. This implied that the decision of a firm to execute a CEO succession is ‘either a function of forces external to and out of the control of the firm or is simply the result of random choice’ (Iyengar & Zampelli, 2009, p. 1093). Rather than an organisational decision executed with the outcome implications in mind (Clougherty, Duso, & Muck, 2016). Therefore, I will also account for self-selection on the relationship between CEO succession and strategic change.

By studying the research question, I intend to make the following theoretical contributions. First, I aim to contribute to the upper echelons theory of Hambrick and Mason (1984), by providing more advanced insights into the way a forced CEO turnover influences the relationship between a CEO succession and strategic change. While prior research identified a forced CEO turnover as a CEO succession in which the former CEO left below the age of 65 (Wiersema, 1995). However, subsequent research indicated that incorporating ‘age’ to determine the succession type is be problematic ‘since a CEO’s age is not a direct indicator of the nature of his/her departure’ (Wiersema & Zhang, 2011, p. 1168). Consequentially, the influence of a forced CEO turnover is still unknown. Therefore, this research will incorporate a more advanced way to determine whether the case of a forced CEO turnover can explain why some successions result in a higher level of strategic change, while other CEO successions do not.

In the second place, I intend to contribute to the way demographic characteristics are embedded in the upper echelons theory of Hambrick and Mason (1984). While prior strategic management literature neglected to incorporate dissimilarity in demographic characteristics, or only included the direct effect of CEO’s characteristics on strategic change. They potentially have overestimated the effect of CEO succession on strategic change. As dissimilarity in demographic characteristics possibly explain why one CEO succession results in a higher level of strategic change, while other successions do not generate a higher level.

Finally, I aim to contribute to the literature concerning the relationship between a CEO succession and a strategic change, by incorporating a more sophisticated method to measure a CEO succession. This would potentially introduce an alternative explanation that it is not the CEO succession that generates more strategic change, but an organisational decision to select a CEO succession with the outcome implications (i.e. strategic change) in mind (Clougherty et al., 2016).

In the next section, I will describe the theory and literature related to the research question. Based on this, I will formulate hypotheses and present the conceptual model. Later, I will describe the sample of this study, the data sources, and the analytical methods. Next, I will present the empirical results and conclude with a discussion of the significance of my findings for this study.

2 | LITERATURE REVIEW

2.1 | Upper echelons theory

The upper echelons theory is originally published by Hambrick and Mason (1984). The central premise of the upper echelons theory is that 'executives' experiences, values, and personalities greatly influence their interpretations of the situations they face and, in turn, affect their choices' (Hambrick, 2007, p. 334). The theory contains two interconnected parts. First, executives determine their actions based on personal interpretation of a strategic situation. Second, the personal interpretation of the strategic situation is based on the experience, values, and personalities of an executive (Hambrick & Mason, 1984).

The upper echelons theory is based on the concept of bounded rationality (Cyert & March, 1963). This concept suggests that when situations are uncertain and complex, they are not objectively knowable, alternatively, they are interpretable (Mischel, 1977). Therefore, to understand the behaviour of a firm, the cognitive frames of the firm's top executives need to be considered (Hambrick, 2007). According to the upper echelons theory, top executives' characteristics can be utilized as a valid proxy for the cognitive frames of the executives (Hambrick, 2007). Since the publication of the original theory in 1984, many researchers showed how the characteristics of top executives influence the strategic decisions of a firm (Bromiley & Rau, 2016). This research is mainly divided into two areas.

The first area focused on the psychological and social processes of top executives (Hambrick, 2007). This is often applied to the context of strategic change. Within this context, research suggests that CEOs with a higher level of narcissism have a preference for bold actions, which results in a higher degree of change in the firm's strategy (Chatterjee & Hambrick, 2007). Besides, CEO openness, emotional stability (P. Herrmann & Nadkarni, 2014) and CEO charisma (Wowak, Mannor, Arrfelt, & McNamara, 2016) have a positive effect on strategic change. In addition, CEOs who established a high social status will receive higher levels of flattery and opinion conformity. This will increase their confidence in their strategic judgement and leadership capabilities, which reduce the likelihood that the CEO will generate strategic change (S. H. Park, Westphal, & Stern, 2011). However, the confidence that the CEO can perform a task successfully in combination with intelligence (practical, analytical and creative) of the CEO will increase the likelihood of strategic change (Baum & Bird, 2010).

The second area focused on the demographic profiles of top executives (Hambrick, 2007). Research in the context of strategic change suggests that top executives characterised by a lower age, shorter tenure, higher educational level increase the likelihood for strategic change (Wiersema & Bantel, 1992). More recent studies suggest, for example, that political ideologies of CEOs are often reflected in the actions and priorities of a firm (Chin, Hambrick, & Trevino, 2013). Besides, career diversity is positively related to strategic change, as CEOs with higher diversity prefer 'new' and will process broader mental models, this will guide firms to novel courses (Crossland, Zyung, Hiller, & Hambrick, 2014). Finally, also the origin of a CEO is related to strategic change when the position of the CEO is changed, a new internal CEO brings limited variation to the CEO's position, while a new outsider CEO is assumed to bring new perspectives which yield in strategic change (Friedman & Saul, 1991; Wiersema, 1992).

As the previous example confirmed, the upper echelons theory explained that 'CEOs of differing stripes, including differing values orientations, tend to pursue pathways that suit their personal inclinations' (Chin et al., 2013, p. 219). Hence, CEOs will re-use knowledge retrieved from experience when they make present decisions (Zhang Cyndi & Greve, 2019). Therefore, firms with different CEOs will peruse different strategies.

2.2 | Managerial discretion

After the original publication of the upper echelons theory in 1984, many researchers tested this line of argumentation. Overall, there are two opposing views on the influence of a CEO on the firm's strategy. One view argues that firms are inertial and limited by internal and external pressures (e.g. Hannan & Freeman, 1984). The opposing view suggests that a CEO has considerable influence on what occurs within their firms. In the way that a CEO formulates goals and objectives and executes sequences of activities to accomplish them (Chandler, 1962). In line with the last view, the CEO is the firm's decision maker who has the strategic choice to realise strategic changes and is able to govern in which environmental sphere the firm compete (Child, 1972).

To harmonise the opposing views on the influence of a CEO on the firm's strategy, researchers developed the concept of managerial discretion (Hambrick & Finkelstein, 1987). According to this concept, both views are conditionally valid depending on the managerial discretion, i.e. the latitude of action. Top executives have managerial discretion when there are limited constraints in decision-making and various possibilities available to affect the strategic outcomes of a firm (Hambrick & Abrahamson, 1995; Hambrick & Finkelstein, 1987). When the level of discretion is low, the influence of the CEO is restricted, 'and upper echelons theory will have weak explanatory power. Where discretion is high, managers can significantly shape the organisation, and managerial characteristics will be reflected in organisational outcomes' (Finkelstein & Hambrick, 1990, p. 484).

The literature states that managerial discretion can originate from three factors (Hambrick, 2007). First, the environmental conditions of a firm, this contains elements in the domain (e.g. industry) of a firm. Secondly, managerial discretion originates from the internal organisation. Finally, the characteristics of the top executive himself, as CEO can vary in the degree to which they envision and create multiple courses of activities. (Hambrick & Finkelstein, 1987; Wangrow, Schepker, & Barker, 2015)

2.3 | Changing the CEO to generate strategic change

Prior research stated that some leaders are more open-minded towards strategic change compared to others (Hambrick, Geletkanycz, & Fredrickson, 1993). For example, a CEO with a higher tenure is more likely to be committed to previous courses of actions, generating less strategic change, which creates a rigid path for a firm (Audia, Locke, & Smith, 2000; Gilbert, 2005; Hambrick et al., 1993; Ndofor, Priem, Rathburn, & Dhir, 2009). Prior research explained this behaviour by suggesting that CEOs with a longer organisational tenure will 'have a great deal invested (psychologically and tangibly) in the status quo and often have more to lose than gain from organisational and strategic changes' (Datta et al., 2003, p. 105). Consequently, the CEO might believe that the current strategy of a firm is appropriate (Hambrick et al., 1993; McClelland, Liang, & Barker, 2010), even when the environment demands adaptations (Ndofor et al., 2009). One way to break through the rigid path of a firm is by changing the firm's CEO (e.g. Karaevli & Zajac, 2013; White, Smith, & Barnett, 1997). However, within strategic management, there are opposite views, whether changing the CEO would generate more strategic change.

In line with the cognitive commitment arguments, changing the CEO can be an opportunity to disrupt traditional accepted norms, values, and behaviour (Friedman & Saul, 1991). A new CEO is not expected to experience the difficulties in reverting previous decisions of the predecessor (i.e. the prior CEO) (Hambrick & Fukutomi, 1991) because the successor (i.e. the new CEO) will not experience the need to justify their previous decisions as an incumbent CEO would have (Staw, Sandelands, & Dutton, 1981). In addition, an incumbent CEO is more likely to grow into a psychological commitment for methods and courses of actions that generated success in the past (Datta et al., 2003; Hambrick et al., 1993). This might lead an incumbent CEO to ignore demands for change and to execute only a few initiatives (Hambrick & Fukutomi, 1991; Karaevli & Zajac, 2013; Simsek, 2007). In line with this argumentation, changing the incumbent CEO would generate more strategic change.

Conversely, there are also opposite views within strategic management, considering that changing the CEO will not result in more strategic change. One view is grounded in the path-dependency perspective (e.g. Sydow, Schreyoegg, & Koch, 2009). This perspective includes that the firm's strategic actions of the past will impact the available strategic actions in the future (Sydow et al., 2009). Therefore, the available strategic options of the successor are limited, which would result in less generation of strategic change. This can be explained by the literature on managerial discretion, suggesting that the leeway of a CEO is dependent on the availability of various possibilities to affect the strategic outcomes of a firm.

Taken this all together, the opposing views whether CEO succession will generate more strategic change, are frequently discussed within the strategic management literature. Based on this, I expect, that path of the incumbent CEO will limit the available options for the new CEO to some extent. However, the effect of a new CEO will be more profound. Considering that the new CEO is less committed to the firm's previous decisions and strategies that generated success. Besides, the introduction of a new CEO can disrupt traditional accepted norms, values, and behaviour. Hence, I suggest that changing the firm's CEO does have a positive influence on the generation of strategic change.

Hypothesis 1: Firms in which CEO succession has occurred, will exhibit greater strategic change than those in which no CEO succession has occurred.

2.4 | A CEO succession forced by the board of directors

For the first hypothesis, I discussed 'CEO succession' in the broadest sense, without paying attention to how the CEO succession was originated. The literature on the relation between CEO succession and strategic change suggests that the type of CEO succession might have a different influence on the generation of strategic change. For example, there is substantial evidence on how a new CEO origin (inside versus outside the firm) affects the level of strategic change (Zhang & Rajagopalan, 2010). Yet, the area of forced strategic change is underexplored.

A forced CEO turnover involves a CEO dismissal, a situation where the previous CEO needs to leave the firm against his will. A forced CEO turnover is generally viewed as a disruptive change for a firm (Helfat & Bailey, 2005), which often creates an uncertain transition between the prior and the new CEO (Clayton et al., 2005). In line with the organisational adaptation perspective (Hrebiniak & Joyce, 1985), a CEO will be removed from their job when the firm's strategy does not generate sufficient performance (Denis & Kruse, 2000). According to this perspective, CEO dismissal represents an important adaptation mechanism of a firm when their environment shifts (Wiersema & Bantel, 1993). Therefore, CEO dismissal can be interpreted as an event to realign the firm's strategy with the external environment (Shen & Cho, 2005).

Extant literature suggests that it is the primary goal of a CEO to generate economic returns for the firm's shareholders (Quigley & Hambrick, 2015). Accordingly, a forced CEO turnover is frequently the result of poor firm performance (Salancik & Pfeffer, 1980). This relationship is enhanced by the presence of a separated chief operation officer within the firm (Zhang, 2006), by prior investment in corporate social responsibility by the predecessor (Hubbard, Christensen, & Graffin, 2017), or when the investment analysts publish negative stock recommendations of the firm (Wiersema & Zhang, 2011). However, the CEO's firm-specific knowledge decreases the probability of forced CEO turnover, even when the firm is faced with negative firm performance (Wang, Zhao, & Chen, 2017). In addition, the CEO's social capital and reputation can increase the likelihood that a CEO who is dismissed can regain their CEO position within the firm (Schepker & Barker, 2018).

A CEO dismissal is frequently completed by the firm's board of directors as 'the power to hire, fire and replace executive officers, specifically the CEO, rests with […] its board of directors' (Hilger, Mankel, & Richter, 2013, p. 10). By executing a forced CEO turnover, the board of directors performs its strategic role. This role includes the involvement of the board in the firm's business concept, mission, and strategy, to enhance the competitive position of the firm, thereby maximising the wealth of its shareholders. (Pearce & Zahra, 1992). Therefore, a forced CEO turnover is often imposed by the board of directors as a signal that the board is not satisfied with the firm's strategy and has the desire for a strategic change (Hutzschenreuter, Kleindienst, & Greger, 2012). Consequently, after CEO dismissal, the new CEO receives a mandate to change the firm's strategy (Ballinger & Marcel, 2010; Nakauchi & Wiersema, 2015).

In addition to the strategic role, the board of directors also performs a corporate role. This role includes selecting the new CEO (Pearce & Zahra, 1992). Considering that a forced

CEO turnover is interpreted as an event to realign the firm's strategy with the external environment (Shen & Cho, 2005). The board of directors is expected to select a successor whose competencies and repertoire fit with the external environment in the foreseeable future (Finkelstein, Hambrick, & Cannella, 2009).

In the section of managerial discretion, I discussed that the influence of a CEO on the firm's strategy is dependent on the level of latitude of action. Top executives will have managerial discretion when there are limited constraints in decision-making and various possibilities available to affect the strategic outcomes of a firm (Hambrick & Abrahamson, 1995; Hambrick & Finkelstein, 1987). Applying this to the situation of a forced CEO turnover, the new CEO will experience limited constraints on his or her action due to the received mandate for strategic change. Besides, the competencies and repertoire of the new CEO will be realigned to the foreseeable future. Based on this realignment, I assume that the CEO is more likely to observe various possibilities to affect the strategic outcomes of a firm.

Combining these theoretical insides, I assume, that the managerial discretion of the new CEO will be higher after a forced CEO turnover. Consequently, the successor will have a substantial influence on the firm's strategy. Accordingly, I expect that a new CEO will increase the level of strategic change within the firm after a forced CEO turnover.

> *Hypothesis 2: Firms in which forced CEO turnover has occurred, will exhibit greater strategic change, than those in which no forced CEO turnover has occurred.*

2.5 | Selection of a new CEO with dissimilar characteristics

In the previous sections, I implicated that a CEO succession is a possibility to break the inertial path of a firm. Hence, I assumed that the board of directors would select a new CEO with competencies and repertoire aligned with the external environment in the foreseeable future. These statements were in line with the research on the upper echelons theory (Hambrick & Mason, 1984), which often showed that the characteristics of top executives (e.g. CEO) influence the strategic decision of a firm (Bromiley & Rau, 2016). For example, past strategic management research related the characteristics of a CEO to strategic reorientation (Keck & Tushman, 1993), product diversification (Boeker, 1997a) and innovation (Miller & Shamsie, 2001; Wu & Priem, 2005).

Nevertheless, prior research demonstrated that both a predecessor and the board of directors prefer a CEO who is similar in demographic characteristics to themselves (Zajac &

Westphal, 1996). Pfeffer (1997) described this phenomenon as ‘demography has a tendency to perpetuate itself’ (p.99). This tendency can be explained by the recent research of Hutzschenreuter, Kleindienst, and Greger (2015). These researchers stated that when a CEO reaches the end of his or her tenure, the CEO is likely to use this or her power in an attempt to select a predecessor who is comparable in demographic characteristics to themselves, believing that the new CEO will be more likely to continue his or her strategy. This indicates that similarity in demographic characteristics would increase the likelihood to continue the strategy of the former CEO. Formulated the other way around, the similarity in demographic characteristics would decrease the probability for a change in the firm’s strategy.

Prior research showed that the demographic characteristics of a CEO influence the organisational decisions of a firm (Bromiley & Rau, 2016). Hambrick and Mason (1984) stated that demographic characteristics are seen as a valid proxy for the cognitive frame of a CEO. This cognitive frame of a CEO will determine the attentional focus, selective ignorance, and strategic framing of a CEO (Yokota & Mitsuhashi, 2008). Consequentially, to understand the behaviour of a firm, the cognitive frame of a CEO needs to be considered (Hambrick & Mason, 1984). Hence, CEOs with similar cognitive frames will develop similar attitudes, a shared language based on shared experience and comparable choices (Zajac & Westphal, 1996). Therefore, when the cognitive map of the prior and the new CEO are similar, it would be questionable whether a CEO succession leads to a change in the firm's strategy (Sutcliffe & Huber, 1998).

Conversely, Yokota and Mitsuhashi (2008) debated, that a CEO succession is only likely to trigger a change in the strategy for a firm unless the new CEO cognitive map is different from its predecessor. This suggests, that not every CEO will generate strategic change, only a CEO who will approach the strategy formulating process with a different cognitive frame would be more likely to initiate more strategic change. For example, Wiersema (1992) showed that when the successor had a professional career outside the firm, this new CEO will generate more strategic change after CEO succession. This implicates that a difference in the demographic characteristic professional experience would introduce a higher level of strategic change. Moreover, Zajac and Westphal (1996) suggested that ‘change in functional background, age, or educational background (degree type or affiliation) can indicate change in […] attitudes on strategic issues’(p.66).

However, the evidence comparing the former CEO to the new CEO is limited; previous research was primarily focused on the direct effect of demographic characteristics on strategic change. For example, female CEOs tend to be more risk-averse, more controversial, less competitive, and exhibit less risky behaviour in decision-making. Consequently, they would be less likely to initiate strategic change (Croson & Gneezy, 2009). Moreover, the educational level of a CEO is also related to the preference for certain types of strategic initiatives (Hambrick, Cho, & Chen, 1996). Likewise, the nationality of a CEO is also related to a certain level of strategic change (Crossland & Hambrick, 2007).

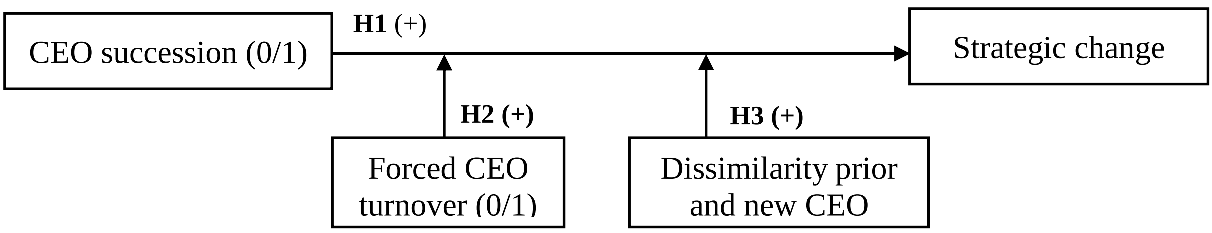
Based on these insights, my central argument is that CEOs who are similar in demographic characteristics (as a proxy of the cognitive frame of a CEO) will be more likely to continue the strategy of their predecessor (i.e., generate less strategic change). Whereas a CEO who is dissimilar in demographic characteristics would generate a higher level of strategic change.

> *Hypothesis 3: Firms which select a new CEO with dissimilar demographic characteristics compared to their predecessor, will exhibit greater strategic change, than those in which a CEO is selected with similar demographic characteristics compared to their predecessor.*

2.6 | Conceptual model

Figure I displayed an in-depth conceptual model based on the literature and the formulated hypotheses. This figure illustrates the relationships of the independent variable CEO succession on the dependent variable strategic change. To answer the research question, I included the influence of a forced CEO turnover and the dissimilarity between the prior and the new CEO. The expected effects and directions are shown between the brackets.

Figure I: Conceptual model



3 | RESEARCH DESIGN

In order to answer the research question, a quantitative study is performed based on secondary data (desk research). This research method was the best approach available to answer my research question, as it provides the opportunity to compare a large number of CEO successions, occurred in multiple firms, over a substantial time frame. Moreover, a quantitative study grants a chance to control for factors that are expected to influence this relationship. Besides, the literature review of Hutzschenreuter et al. (2012) showed that researches on the relationship between leadership change and strategic change were for more than 80 per cent employed by quantitative studies based on secondary data. Furthermore, when I would have applied an interview or survey study as a research method, the reliability of the results would have been questionable. For example, asking a predecessor why they have left the company (to determine whether the CEO succession is forced) might have resulted in socially desirable answers. While databases like Thomson Reuters Eikon (Eikon) and BoardEx provide a substantial amount of data to determine the effect of CEO succession on strategic change.

3.1 | Sample and time frame

The sample for this analysis is based on the firms ranked on the S&P 500. The S&P 500 includes 500 leading companies and covers roughly 80 per cent of the market capitalisation. These 500 companies are regularly used as a benchmark for the state of the economy of the United States of America. Hence, the 500 leading firms cover a large number of industries and are expected to have an established corporate strategy (Bloomberg, 2019). Therefore, the S&P 500 is an appropriate sample to answer my research question regarding CEO succession and strategic change. Hence, this sample is often used in prior CEO succession studies (i.e. Graffin, Boivie, & Carpenter, 2013; Wiersema & Zhang, 2011).

I collected data over the timeframe of 2007 until 2017. To observe the firms over a more extended period, I collected panel data based on firm-year observations. I eliminated all the financial firms (SIC code within the range 60 to 69), as they potentially would have biased my results[1]. Moreover, firms that are ranked on the S&P 500 are consciously selected based on their market capitalisation. Therefore, the sampling method s convenience sampling.

[1] The financial firms are excluded for two reasons. First, the financial statements of financial firms are dissimilar compared to non-financial firms (Dowell, Shackell, & Stuart, 2011), and some of my control variables rely on these data. Second, considering the timeframe of my study, the global financial crisis is included. After this crisis, the government of the United States of American introduced many restriction rules to the financial sector, which were continued until 2018 (Ackerman, 2018). These restrictions were focused on the risk behaviour of financial firms, which potentially would have limited the level of strategic change after a CEO succession.

3.2 | Dependent variable

In this research, *strategic change$_{i,t}$* refers to change on the corporate level for a firm in a specific year, which consist of the decisions about the product and markets in which firms compete (Boeker, 1997b). I operationalised this type of change as the year-on-year change in the segment sales of a firm (Crossland et al., 2014; Wiersema & Bantel, 1992). According to Hutzschenreuter et al. (2012), changes in the segment sales of a firm are likely to reflect a shift in the attentional focus of a CEO. In this research, change in a firm's segment sales is measured by the entropy measure of diversification (Jacquemin & Berry, 1979). Although this is a measure from an economic perspective, it is often applied in many strategic management studies to measure strategic change (e.g. Boeker, 1997b; Crossland et al., 2014; Jensen & Zajac, 2004; Oehmichen, Schrapp, & Wolff, 2017; Wiersema & Bantel, 1993). Besides, this measure 'has been found to have good construct validity relative to other diversification measures' (Hoskisson, Johnson, & Moesel, 1994, p. 1222). The entropy measure is calculated as follows:

$$\sum_{i=1}^{N} P_i \, ln\left(\frac{1}{P_i}\right)$$

In this measure, P_i is the percentages of sales of a firm in the business segment i, N is the number of segments a firm is active. Afterwards, I calculated a percentage of change based on the entropy score of one year earlier. The data for the entropy measure of diversification is collected from the data platform Eikon, based on the ISIN codes of the firms in the sample.

In line with prior strategic management research regarding the CEO succession – strategic change effect which used the diversification measure, the diversification measure is analysed at t = 0 and t + 1 (e.g. Boeker, 1997b). For the reason that the 'influence of a CEO is the highest in their first year, but worsened steadily thereafter' (Henderson, Miller, & Hambrick, 2006, p. 458).

3.3 | Independent variable

Changes in the CEO position$_{i,t}$, typically defined in the literature as the departure from the official position of a CEO (e.g. Barron et al., 2011). This is measured by analysing firm-year combinations, whether the CEO of a firm is changed. This variable coded as follows, for firm *i* at time *t*:

0. When there was no CEO succession
1. Where there was a CEO succession

Forced CEO turnover$_{i,t}$ involves a CEO dismissal, a situation where the previous CEO needs to leave the firm against his will. By combining researches of Shen and Cannella (2002) and Wiersema and Zhang (2011) I categorised several succession situations as a forced CEO turnover (during the data collecting process I also categorised an unforced CEO turnover). The data for this variable is obtained by analysing news articles of The Wall Street Journal by Dow Jones and Reuters by Thomson Reuters. Table 1 shows the distinction in more detail. This variable is coded as follows, for firm *i* at time *t*:

0. When there was no forced CEO turnover
1. When there was a forced CEO turnover

Table 1: Categorisation succession in forced or unforced CEO turnover

Forced CEO turnover	**Unforced CEO turnover**
Openly announced as fired	CEO is introduced as interim CEO
Announced as resigned promptly, and the firm is faced with poor performance	Announced as resigned promptly, but unrelated to performance firm
Utilise 'early retirement' when the firm is faced with poor performance	Predecessor accept the offer for a similar CEO position at another firm
When the predecessor died/ has health issues	Retirement

Dissimilarity$_{i,t}$ showed a resemblance between the former and the new CEO. This is measured by an overall measure of dissimilarity. This included the dissimilarity in gender, age, nationality, and level of education. Table 2 provides an overview of the four variables.

To operationalise dissimilarity across the four demographic characteristics, an overall score is calculated by standardising (standard deviation of one and a mean of 0) each demographic characteristics, summing all four variables together and compute an average score (Datta et al., 2003; Zajac & Westphal, 1996). To determine whether dissimilarity in individual demographic characteristics influenced the level of strategic change, I executed additional analyses to determine the influence of the differences in demographic characteristics separately.

Table 2: Coding scheme dissimilarity between predecessor and successor

Variable	Description	Code	Reference
Gender	Gender of the successor compared to the predecessor	0 = No difference 1 = Difference	(e.g. Pulakos & Wexley, 1983)
Age	The difference in the year of birth	Ratio number	(e.g. Zajac & Westphal, 1996)
Nationality	Nationality of the successor compared to the predecessor	0 = No difference 1 = Difference	(e.g. Hofstede, 2001)
Level of education	Highest level of education completed of the successor compared to the predecessor. (1) Lower than college (2) College degree (3) Bachelor's degree (4) Master's degree (5) PhD	0 = Same level of education (ed.) 1 = Difference of one level of ed. 2 = Difference of two levels of ed. 3 = Difference of three levels of ed. 4 = Difference of four levels of ed.	(e.g. Karaevli & Zajac, 2013)

The data regarding the four demographic variables are mainly collected by BoardEx. Nevertheless, the number of missing values was exceedingly high. Therefore, the researcher collected the missing information by analysing the firm's annual reports, the LinkedIn profiles of the CEOs, publications in The Wall Street Journal and articles from Universities describing the career of their former students.

3.4 | Control variables

First of all, there are composing views whether prior experience with strategic change increased or decreased the likelihood for future strategic change. For example, the research of Kelly and Amburgey (1991) showed that when a firm gained experience with strategic change on the corporate level, the firm is more likely to execute strategic change in the future. However, there are also opposite perspectives, for example, that firms will balance long periods of stability with brief periods of change (Mintzberg, Ahlstrand, & Lampel, 2009). Alternatively, the 'duality view', which suggests that change and stability are fundamentally interdependent for a firm (Farjoun, 2010). Therefore, I incorporated *prior strategic change* as a control variable. This is operationalised as the value of diversification from the year before, in other words, diversification at t-1 (Crossland et al., 2014).

Moreover, I controlled for the *age of the firm* because the firm's age is negatively associated with the probability of change (Kelly & Amburgey, 1991). The data for this control variable is collected by combining the data platforms Eikon and Orbis.

As third, Haveman (1993) argued that there is an inverted U-shape between size and strategic change. Therefore, I included two control variables. First, the *total assets* of a firm are added to control the size of product-driven companies (Crossland et al., 2014). Second, the *number of employees* to control the size of service-driven companies (Zhang & Rajagopalan, 2010). The data platform Eikon obtained the data for this variable.

Furthermore, I controlled for two additional characteristics of a CEO. First of all, the network of a CEO has a positive influence on the level of strategic change of a company (Collins & Clark, 2003; Helfat & Martin, 2015). Therefore, the *size of the CEO's network* is included as a control variable. Secondly, the long-term payment of a CEO is also positively related to strategic change (Carpenter, 2000). Additionally, when a CEO is paid less compared to its peers, the likelihood of strategic change increases (Seo, Gamache, Devers, & Carpenter, 2016). Therefore, I controlled for the *CEO's long term incentive plan* (LTIP) (Crossland et al., 2014). The data for these two control variables are arranged by the data platform BoardEx.

As described in chapter two, the board of directors has a substantial influence on CEO succession and the firm's strategy. Therefore, two variables are included to control for this influence. First, *CEO duality* – 'the practice of a single individual serving as both CEO and board chair' (Krause, Semadeni, & Cannella, 2014, p. 256) is included as a control variable. As CEO succession literature suggests, CEO duality is negatively related to CEO succession (Goyal & Park, 2002). Besides, CEO duality permits firms to make critical decision faster (Dowell et al., 2011). Secondly, I incorporated *board size* as a control variable, as the size of a firm's board is related to a higher level of strategic change (Golden & Zajac, 2001). The data for these two variables are presented by the data platform BoardEx.

Finally, I controlled for firm performance, since poor firm performance is positively related to strategic change, as it can be interpreted as a sign that the current strategy is not fitting with the environmental requirements (Boeker, 1997b). Firm performance is operationalised as the *Return on Assets (ROA)* (Zhang & Rajagopalan, 2010) and *net sales* of a firm (Finkelstein & D'Aveni, 1994). The data platform Eikon provided the data for these three control variables.

3.5 | The data analysis procedure

For the purpose of this research, I performed several regression analyses based on the panel data. This analysis aimed to use the single independent variable to predict the single dependent variable, and test whether this relationship is influenced by a forced CEO turnover and dissimilarity in demographic characteristics (Hair, Black, Babin, & Anderson, 2014). I employed two different types of regression analyses using the data analysis program STATA. I started with fixed effect models. Subsequently, I applied a two-stage least square (2SLS) estimator to account for the presence of self-selection.

Fixed effect model

To test effect hypotheses 1, 2 and 3, I employed a fixed effect model. This is a model which examines group differences in the intercept and provided the opportunity to control for firm and year fixed. A fixed effect model is the preferred model for this analysis based on the Goodness-of-fit measure, the Hausman test and the F-test (H. M. Park, 2009). The results of these tests are shown in Appendix I and II. To answer the research question, I employed a regression model estimating the following equation[2]:

$$STRATEGIC\ CHANGE_{i,t} = \beta_0 + \beta_1 \cdot CEO_{i,t} + \beta_2 \cdot FORCED_{i,t} + \beta_3 \cdot DISSIMILARITY_{i,\ t} + \beta_4 \cdot CV_{i,t-1} + FE_{\ t} + FE_i + \varepsilon_{i,t}$$

In addition to measuring strategic change at t = 0 (time equal to zero), the level of strategic change is also measured as t + 1 (time plus one year). The following formula is employed:

$$STRATEIGIC\ CHANGE_{i,t+1} = \beta_0 + \beta_1 \cdot CEO_{i,t+1} + \beta_2 \cdot FORCED_{i,t+1} + \beta_3 \cdot DISSIMILARITY_{i,\ t} + \beta_4 \cdot CV_{i,t-1} + FE_{\ i} + FE_t + \varepsilon_{i,t}$$

STRATEGIC CHANGE$_{i,t}$ is the level of strategic change of firm *i* at time *t*. CEO$_{i,t}$ showed whether there occurred a change in the CEO position of firm *i* at time *t*. *FORCED$_{i,t}$* displayed whether the change in CEO position of firm *i* at time *t* is forced. *DISSIMILARITY$_{i,t}$* demonstrated the dissimilarity score between the prior and the new CEO of firm *i* at time t. Subsequently, *CV$_{i,t}$* is the vector consisting of all the control variables for firm *i* on time *t-1*. Incorporating the lagged value of all control variables is in line with the researches of Zajac and Westphal (1996), Weng and Lin (2014) and Zhang and Rajagopalan (2010).

[2] The second and third hypotheses are tested in a subsample, consisting of the firm-year combinations in which a CEO succession occurred.

Furthermore, I implemented two Fixed Effects to capture some unobserved heterogeneity. These Fixed Effects removed the time-invariant characteristics, which made it possible to assess the net effect of predictors on the dependent variable. First of all, FE_t are the year Fixed Effects, these are included to control for general trends which affect all the firms in the sample. To test whether year fixed effects are required for this model, I executed the Wald test. For most models, this test provided s significant results. Consequently, the null hypothesis, that all year dummies are jointly equal to zero, is rejected and time fixed effects are added to the model (H. M. Park, 2009). The output of this analysis is shown in Appendix I and II.

Secondly, FE_i were applied to control for the difference within a firm, for example, the firm's culture and industry difference. This is especially important for the fixed effect models, as these models exclude variables which are time invariant. As discussed, this research is based on firms ranked on the S&P 500. This index ranked firms based on their market capitalisation, including many different types of industries. However, by nature, one industry consists of more managerial discretion than the other (Finkelstein et al., 2009; Hambrick & Abrahamson, 1995). By including firm fixed effects, I controlled for the influences of different industries.

Finally, the last section of the equation describes that the standard errors were clustered robust. These types of standard errors were added to the model after executing the Modified Wald Test. This test checks for the presence of group-wise heteroscedasticity in a fixed effect regression model. This test showed significant results (p<.01). Therefore, the null hypothesis is rejected, which suggest that group-wise heteroscedasticity is present in the data. To correct for this issue, clustered robust standard errors by firm ID were introduced to the model (H. M. Park, 2009). The STATA output of this analysis is shown in Appendix I and II.

<u>Accounting for self-selection</u>

The previous section discussed the fixed effect model. Nevertheless, this model does not determine whether a CEO succession is an organisational decision that is selected with the outcome implications in mind (Clougherty et al., 2016), which could potentially be important for the analysis of hypothesis 1. To address this issue, I applied the 2SLS model. In the first stage of this model, the independent variable (i.e. CEO succession) is predicted by the use of instrumental variables. These instrumental variables were expected to not correlate with the dependent variable (i.e. strategic change). After the first stage, a term is calculated and inserted in the second stage of the model. Incorporating a 2SLS model provided the advantage that the 'estimated coefficients in the first stage became easily interpretable' (Clougherty et al., 2016, p. 296).

In line with the research of Hamilton and Nickerson (2003), I distinguished certain instrumental variables to predict a CEO succession. The first instrumental variable included a dummy variable whether the firm's CEO has reached the age of 65 (Quigley & Hambrick, 2012; Wiersema, 1995). The second instrumental variable included the situation that a CEO voluntarily left his position (i.e. an unforced CEO turnover). Finally, the last instrumental variable is an inside succession – the situation when a CEO is succeeded by an individual who is before the succession an employee of the firm (Shen & Cannella, 2002).

After incorporating the instrumental variables in the first stage of the model, the instrument relevance is checked by two steps. First, I analysed the F-statistics which test of the hypothesis 'that the coefficients on the instrument(s) equal to 0 in the structural equation' (Bascle, 2008, p. 296). This is rejected as the significance level is below $p<.01$. Secondly, Stock and Yogo (2005) determined that the F-statistic should report values above the threshold value of 9.08 (p.39). In my analysis, the F-statistic reported a value of 510.93, which is much larger than the threshold value. Based on this, I concluded that the instrumental relevance is sufficient. Consequentially, the first stage of the 2SLS model is checked and showed that all variables were significantly related to the variable CEO succession (all $p <.05$). The output of the first-stage model is shown in Table 3.

Table 3: First stage 2SLS, including three instrumental variables to predict CEO *succession*

CEO succession	**Coef.**	**Std. Err.**	**t**	**P>t**	**[95% Conf.**	**Interval]**
Control variables (t-1)						
Prior Diversification	.0104033	.0193886	0.54	0.592	-.0276196	.0484261
Age firm	-.0100429	.0376626	-0.27	0.790	-.083903	.0638171
Total assets	.0025302	.0144691	0.17	0.861	-.0258452	.0309056
Number of employees	.0068598	.0143987	0.48	0.634	-.0213775	.0350971
Network size	-.0009625	.0003824	-2.52	0.012	-.0017124	-.0002126
LTIP	.0009903	.0014673	0.67	0.500	-.0018873	.0038678
CEO duality	.0194998	.0093607	2.08	0.037	.0011426	.037857
Board size	-.0006972	.001673	-0.42	0.677	-.0039781	.0025838
ROA	-8.20e-06	3.38e-06	-2.42	0.015	-.0000148	-1.57e-06
Unforced CEO turnover	.3774886	.016267	23.21	0.000	.3455874	.4093898
Inside succession	.7273217	.0145206	50.09	0.000	.6988454	.755798
Retirement age	.0250873	.0115619	2.17	0.030	.0024133	.0477614
_cons	.0516191	.3593305	0.14	0.886	-.6530632	.7563013

Note1: Firm and year fixed effects are included in all models.

To check whether the instrumental variables were significantly related to the independent variable (i.e. CEO succession) but not significantly related to the dependent variable (i.e. strategic change) a partial correlation matrix and several single regression analyses were performed. The results regarding showed that the instrumental variables were highly significant related to CEO succession (a p-value below the 0.01) and not statistically significant related to strategic change. Based on this, I concluded that the strength of the instrumental variables is sufficient. The STATA output of the partial correlation matrix is shown in Appendix III, and the several single regression analyses are shown in Appendix IV.

3.6 | Validity

To arrive at useful results, it is particularly important to consider the validity and reliability of the analysis. Validity is defined as 'evidence that a study allows correct inferences about the question it was aimed to answer or that a test measures what it set out to measure conceptually' (Field, 2014, p. 878).

In the first place, validity could be gained when the variables contain proxies measure the correct meaning (i.e. construct validity). To accomplish this, I measured the variables CEO succession and multiple control variables directly. In addition, I adapted proxies used in earlier researches within the field of strategic management. For example, the entropy measure of diversification (Jacquemin & Berry, 1979) is applied in many strategic management studies to measure corporate strategic change (e.g. Boeker, 1997b; Crossland et al., 2014; Jensen & Zajac, 2004; Oehmichen et al., 2017; Wiersema & Bantel, 1993). Hence, this measure 'has been found to have good construct validity relative to other diversification measures' (Hoskisson et al., 1994, p. 1222). Finally, the validity of the dissimilarity measure is questionable because this is not a measure used in prior research. To correct for this validity issue, two additional analyses are executed determining the effect of the four demographic characteristics separately. First of all, I performed a quantitative analysis with the separated demographic characteristics as independent variables. Second, I analysed news articles published in The Wall Street Journal to determine whether I could see a same pattern in practice.

3.7 | Reliability

Besides validity, I considered reliability during this research project. Reliability tests 'whether an instrument can be interpreted consistently across different situations' (Field, 2014, p. 12). Hence, reliability is 'the degree that the observed variable measures the true value' (Hair et al., 2014, p. 8). This is especially important for the dissimilarity between predecessor and successor. Researches using a construct based on several items often a apply a reliability test. However, the items included in this research project did not have to correlate. Consequently, a reliability test is not required. To explain this statement, the following example is provided; gender dissimilarity does not have to correlate with the level of education or the age of a person.

Besides the reliability of the construct, Lincoln and Guba (1985) suggest four criteria to establish confidence in the truth of the findings of this research: credibility, dependability, transferability and confirmability. For this research, the first two evaluation criteria were most applicable. First of all, credibility, this is most questionable for the categorisation of the type of CEO succession, as it involved sensitive business information which is likely to be concealed. As Kaplan and Minton (2012) concluded, CEO successions are often published as voluntary why the CEO is dismissed. Therefore, I compared multiple news articles to decide whether the CEO succession is forced or unforced. Secondly, dependability, to show that the findings are consistent and repeatable, I used proper references to cite to the original writer. In addition, during the data collecting phase, I noted down how and where information was obtained.

3.8 | Research ethics

During all phases of this research project, I applied the principles of the American Psychological Association (APA) and practices of social research mentioned by Babbie (2016). Therefore, I aimed for the highest ethical standards while doing research. This included neither plagiarising or falsifying information (Babbie, 2016). Further, this contained being honest about the limitations of the research, take into account related researches and accepting the responsibilities for my research project (Yin, 2014). Although this research comprised a quantitative research project based on secondary data, I emphasised the importance of the privacy of the CEOs included in this research project. In addition, I made sure that this research project included more perspectives on the same problem, to avoid not discussing certain views. Besides, in the case that I approached people for assistance on this research project, I let them only participate voluntarily.

4 | RESULTS

4.1 | Data analysis

Before conducting the regression analysis, I followed the data examination procedure as described by Hair et al. (2014). This procedure started with an analysis of the missing values.

Based on this analysis, I decided to delete thirteen cases which did not have any valid values on strategic change. Subsequently, I also examined the data for specific outliers. For each variable, I inspected for values with a standard deviation far above the 'threshold value of four' (Hair et al., 2014, p. 65). This resulted in a deletion of values for a maximum of 0.5 per cent of values for each variable. Subsequently, I analysed the normality of the continuous variables. Although deviation from normality is of less impact for sample size above 200. The data for this analysis consisted of such remarkable deviation from the normal distribution that additional analyses were necessary. First of all, I evaluated the mean, median, standard deviation, skewness, kurtosis, histogram, and P-Plot. Based on this, I concluded that all variables were positively skewed, with an extremely high kurtosis. To resolve this concern, I examined a log, square root, square and reciprocal transformation for each variable (Field, 2014). After analysing the results of each data transformation for each variable, I transformed the dependent variables *strategic change, age firm, network size* and *net sales* in a square root. In addition, I squared the variable *ROA firm* and logged the variables *total assets, number of employees* and *LTIP*. For the variables, *dissimilarity* and *board size* were no data transformations necessary. The STATA output interpreted for this analysis is shown in Appendix V.

In total, there were 353 firms included in this analysis, for all continuous variables the means and standard deviations after the data transformations are presented in Table 4. Over the timeframe of 2007 until 2017, there were 347 CEO successions within the sample, 119 were marked as a forced CEO turnover, and 201 were marked as an unforced CEO turnover. Unfortunately, for 27 CEO successions, there were no publications available to determine whether the CEO succession was forced or unforced. A CEO succession took place in 263 firms, only 90 firms did not have a CEO succession within the timeframe of 2007-2017.

Table 4: Descriptive statistics after data transformation

Variable	**Mean**	**SD**	**Min**	**Max**	**N**
Strategic change	1.00202	.1438452	.0850655	2.586658	3061
CEO succession	.0893639	.285305	0	1	3883
Forced CEO turnover	.371875	.4840622	0	1	320
Dissimilarity	-1.98e-09	.5407555	-.8363239	2.13289	339
Prior strategic change	1.00202	.1438452	.0850655	2.586658	3061
Age firm	7.916132	2.734446	1	14.8324	3839
Total assets	16.29736	1.285547	11.6787	20.49733	3873
Number of employees	9.899838	1.437093	4.369448	14.64842	3816
Network size	40.51363	16.80345	4.582576	96.38983	3775
LTIP	8.479194	3.145929	0	13.52843	3649
CEO duality	.4425554	.4967531	0	1	3882
Board size	10.71087	2.084355	5	19	3801
ROA	6314.325	1247.826	.7921	15987.07	3844
Net sales	15.92195	1.45188	0	20.0308	3882

4.2 | Estimating the results

Before conducting the linear regression analysis based on panel data, I computed a partial correlation matrix, which is shown in Table 5. This matrix showed a significant negative relationship between the variables *prior strategic change* and *strategic change n at t = 0* (r. -0.0394, p <.05). This is inconsistent with the analysis of (Mintzberg et al., 2009). For the control variable *age of a firm* the matrix showed a significant positive association with *strategic change at t = 0 and at t + 1* (r = 0.0446, p <.05 & r = 0.0425, p <.05), this is the opposite of the results of Kelly and Amburgey (1991) who concluded that when firms become older they are more likely to show inertial behaviour. In addition, the CEO incentive compensation variable *LTIP* showed as significant positive relationship with *strategic change* at *t + 1* (r = 0.0422, p <.05). This is consistent with literature which indicated this positive relationship (Carpenter, 2000). To close this section, it is remarkable the *ROA of a firm* is according to the correlation matrix not related to *strategic change at t = 0* and *t + 1*, as literature indicated that poor firm performance could be interpreted as a sign that the existing strategy is not fitting the environmental requirements (Boeker, 1997b). Yet, the correlation between *ROA of a firm* and *CEO succession* (r. -0.0310, p <.1) is consistent with the literature, as it points out that poor firm performance will increase the likelihood for a CEO succession (Boeker, 1997b).

Moreover, based on the partial correlation matrix, the presence of collinearity is inspected. After reviewing the results, three variables are indicated for collinearity concerns. First of all, the variables *total assets* and *number of employees* are highly correlated with the variable *net sales* (r. 0.8663, p <.01 & r. 0.7887, p <.01). This issue can be solved by deleting one of the variables from the model. Therefore, the variable *net sales* is deleted from the model. However, also the variables *total assets* and *number of employees* showed a relatively high partial correlation (r. 0.6193, p <.01). However, these two variables were intentionally included to control for different types of firm’s sizes: the variable *total assets* is included to the model to control for product-driven firms, while the variable *number of employees* is included to control for the size of service-driven firms.

4.3 | Hypotheses Tests

In this section, I will test the three hypotheses formulated in the literature review. Table 6 displays the regression results with strategic change at t = 0. The first model consists of a model showing only the control variables. The second model demonstrates the main effect, both in a fixed effect model. In the third model, the main effect is showed after accounting for self-selection. In order to test hypothesis two and three, a subsample is selected consisting of only

Table 5: Partial correlation matrix (for all variables the lagged values is used)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Strategic change (t=0)														
2 Strategic change (t+1)	-.04 **													
3 CEO change	-.02	.02												
4 Forced CEO turnover	.05	.07	.											
5 Dissimilarity	.07	.1	.	.02										
6 Prior strategic change	-.04 **	-.01	-.01	.02	.13 **									
7 Age firm	.04 **	.04 **	.02	-.03	-.1 *	.05 ***								
8 Total assets	.01	.03	.04 **	.12 **	-.11 **	.01	.24 ***							
9 Number employees	.05 **	.06 ***	.02	.1 *	-.08	.06 ***	.26 ***	.62 ***						
10 Network size	.02	.02	.01	.08	.02	.05 **	.1 ***	.41 ***	.26 ***					
11 LTIP	.01	.04 **	.01	.07	-.1 *	.01	.23 ***	.4 ***	.31 ***	.14 ***				
12 CEO duality	.03 *	.02	.02	.05	-.07	.03	.18 ***	.26 ***	.17 ***	.17 ***	.15 ***			
13 Board size	.02	.05 **	.01	.04	-.14 **	.05 ***	.19 ***	.3 ***	.26 ***	.13 ***	.15 ***	.08 ***		
14 ROA	0	0	-.03 *	-.15 ***	.05	.03 *	.01	-.15 ***	.08 ***	-.05 ***	.03 **	-.07 ***	-.07 ***	
15 Net sales	.01	.02	.04 **	.12 **	-.08	.01	.25 ***	.87 ***	.79 ***	.29 ***	.4 ***	.24 ***	.25 ***	.04 **

*Legend: *p<.1, ** p<0.05; *** p<0.01*

situations where a CEO succession occurred. In model four, the effect of a forced CEO turnover on strategic change is tested on this subsample. Likewise, model five shows the effect of dissimilarity in demographic characteristics on strategic change, tested on this subsample of cases where a CEO succession had occurred. Hence, Table 7 shows the results of the regression analysis with strategic change at t + 1, the structure of regression models is identical to Table 6, only the models are numbered 6 until 10.

Starting with the main effect of *CEO succession* on *strategic change* in a fixed effect model (model 2 and 7), a CEO succession does not lead to more strategic change at t = 0 (β = -0.007, p = 0.530). Comparing this to the results of *strategic change at t + 1*, in this timeframe a CEO succession does lead to more strategic change. However, this is not highly significant (β = 0.025, p = 0.070). This provides marginal support for hypothesis 1 for t + 1. In order words, firms in which a CEO succession occurred showed a higher level of strategic change one year after the CEO succession, compared to firms where no CEO succession occurred. However, there is no support found for hypothesis 1 at t = 0.

Conversely, after accounting for the self-selection effects (model 3 and 8), a CEO succession does not have a significant effect on strategic change at t + 1 (β = 0.011, p = 0.324), and also not on strategic change at t = 0 (β = -0.009, p = 0.422). Based on these insights, hypothesis 1 should also be rejected for strategic change at t + 1. In other words, after accounting for the self-selection effects the main effect of CEO succession on strategic change does no longer report a statistically significant effect.

The fourth and ninth model displays the effect of a *forced CEO turnover* on the level of *strategic change.* In both timeframes, it showed, as expected, a positive relationship. However, the results were not significant at both t = 0 (β = 0.070, p = 0.148) and t + 1 (β = 0.035, p = 0.555). Based on this, the second hypothesis is not supported.

Finally, the fifth and tenth model displays the effect of *dissimilarity in demographic characteristics* on *strategic change*. This effect showed opposing results when the two timeframes are compared. The selection of a CEO with a higher dissimilarity score is connected to a lower level of strategic change in the year that the CEO succession took place (β = -0.033, p = 0.089). On the other side, selecting a CEO with a higher dissimilarity score would result in more strategic change one year after the succession (β = 0.069, p = 0.093). Combining these results, the hypothesis that firms which select a new CEO with dissimilar characteristics compared to their predecessor will exhibit more strategic change is marginally supported at t + 1 but is not supported at t = 0.

<u>The conceptual model showing the supported hypotheses</u>

To summarise the section concerning the hypothesis tests, figure 3 shows the conceptual model containing the regression coefficient and p-value for the supported hypothesis.

Figure 3: Conceptual model after the analysis of the result

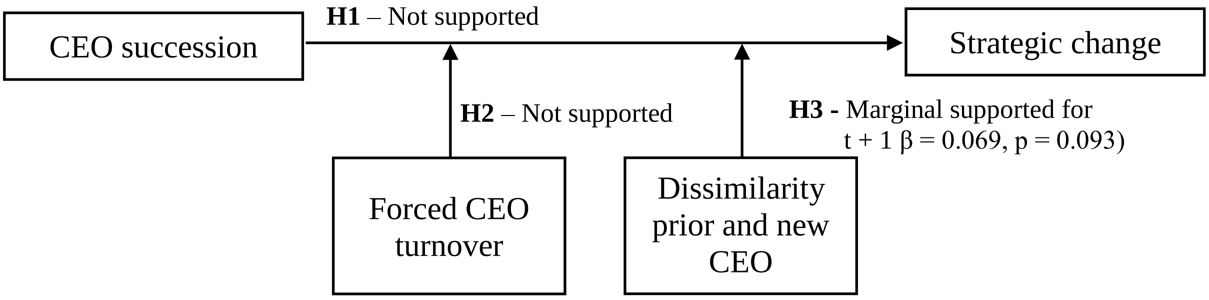


Table 6: Regression analysis – Strategic change at t = 0

Strategic change (t = 0)	**Model 1** **Fixed effect** β/se	**Model 2 (H1)** **Fixed effect** β/se	**Model 3 (H1)** **2SLS** β/se	**Model 4 (H2)** **Fixed effect** β/se	**Model 5 (H3)** **Fixed effect** β/se
CEO succession		*-0.007*	-0.009		
		(0.01135)	(0.01120)		
Forced CEO turnover				0.070	
				(0.04823)	
Dissimilarity					-0.033*
					(0.01904)
Control variables (t-1)					
Prior strategic change	-0.175***	-0.175***	-0.175***	-0.050	-0.096
	(0.03123)	(0.03117)	(0.02286)	(0.09847)	(0.07174)
Age firm	0.059	0.059	0.060	0.316	0.470
	(0.03721)	(0.03692)	(0.04335)	(0.57911)	(0.58181)
Total assets	-0.014	-0.014	-0.005	0.067	-0.010
	(0.01844)	(0.01840)	(0.01765)	(0.05448)	(0.06081)
Number of employees	-0.005	-0.005	-0.014	-0.106*	-0.083
	(0.02200)	(0.02191)	(0.01654)	(0.06269)	(0.06801)
Network size	-0.001	-0.001	-0.001	0.001	0.000
	(0.00053)	(0.00053)	(0.00043)	(0.00123)	(0.00129)
LTIP	-0.003	-0.003	-0.003*	-0.006	-0.009**
	(0.00225)	(0.00224)	(0.00168)	(0.00573)	(0.00421)
CEO duality	0.014	0.014	0.014	0.065	0.057
	(0.01088)	(0.01091)	(0.01078)	(0.05357)	(0.04744)
Board size	0.000	0.000	0.000	-0.022***	-0.021**
	(0.00189)	(0.00190)	(0.00192)	(0.00817)	(0.00882)
ROA	0.000	0.000	0.000	-0.000	-0.000***
	(0.00000)	(0.00000)	(0.00000)	(0.00001)	(0.00001)
_cons	1.023***	1.013***	1.011**	-1.484	(4.72093)
	(0.36487)	(0.36108)	(0.41366)	(4.75108)	(4.06283)
N	2410	2410	2410	214	228
F-test	7.251***	6.924***	124379.54***	13.761***	7.159***
R-square	0.103	0.103	0.103	0.653	0.694
Adjusted R-square	0.096	0.096	0.096	0.619	0.666

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and year fixed effects are included in all models.
Note 3: In model 2, CEO succession is instrumented by the instrumental variables unforced CEO turnover, inside succession, retirement age and all the control variables.

Table 7: Regression analysis – Strategic change at t + 1

Strategic change (t + 1)	**Model 6** **Fixed effect** β/se	**Model 7 (H1)** **Fixed effect** β/se	**Model 8 (H1)** **2SLS** β/se	**Model 9 (H2)** **Fixed effect** β/se	**Model 10 (H3)** **Fixed effect** β/se
CEO succession		0.025*	0.011		
		(0.01366)	(0.01134)		
Forced CEO turnover				0.035	
				(0.05870)	
Dissimilarity					0.069*
					(0.04069)
Strategic change (t-1)					
Prior strategic change	-0.124***	-0.124***	-0.124***	0.322**	0.236**
	(0.02950)	(0.02951)	(0.02254)	(0.14996)	(0.11152)
Age firm	0.040	0.039	0.040	-0.955**	-0.660
	(0.03049)	(0.03124)	(0.04930)	(0.39019)	(0.55007)
Total assets	0.015	0.014	-0.014	0.275***	0.316**
	(0.01819)	(0.01807)	(0.01841)	(0.08367)	(0.12680)
Number of employees	-0.014	-0.015	0.015	0.241***	0.154***
	(0.02655)	(0.02591)	(0.01826)	(0.05903)	(0.03980)
Network size	-0.001*	-0.001*	-0.001*	-0.001	-0.002
	(0.00058)	(0.00058)	(0.00048)	(0.00184)	(0.00134)
LTIP	0.000	0.000	0.000	-0.009	0.003
	(0.00180)	(0.00181)	(0.00179)	(0.01128)	(0.00739)
CEO duality	-0.007	-0.007	-0.007	0.123*	0.053
	(0.01175)	(0.01175)	(0.01152)	(0.07397)	(0.06156)
Board size	0.003*	0.003*	0.003	-0.020	-0.004
	(0.00180)	(0.00180)	(0.00198)	(0.01352)	(0.01610)
ROA	-0.000	-0.000	0.000	-0.000	-0.000
	(0.00000)	(0.00000)	(0.00000)	(0.00003)	(0.00002)
_cons	0.727**	0.767**	0.745	2.267	-0.328
	(0.30773)	(0.31002)	(0.47283)	(3.04812)	(3.37943)
N	2128	2128	2128	194	207
F-test	7.168***	6.794***	116725.95***	23.963***	9.539***
R-square	0.102	0.104	0.104	0.638	0.592
Adjusted R-square	0.094	0.097	0.097	0.601	0.553

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and year fixed effects are included in all models.
Note 3: In model 2, CEO succession is instrumented by the instrumental variables unforced CEO turnover, inside succession, retirement age and all the control variables.

4.4 | Additional analysis - Quantitative

The prior section showed opposing results for the relationship between dissimilarity and strategic change for the two timeframes. While it indicated a significant positive relationship between *dissimilarity* and *strategic change at t + 1*, a negative relationship is found with *strategic change at t = 0*. To interpret these results in more detail, the four demographic characteristics difference are separately included as independent variables in the analysis. The descriptive statistics are shown in Appendix VI.

The output of the additional analysis are shown in Table 8 for strategic change a t = 0 and in Table 9 for t + 1. In both tables, model six until nine shows the coefficients of the demographic characteristic differences separately, the last model (model 10) displays the final fixed effect model. For this additional analysis, all five models provided a sufficient model fit. Yet, the adjusted R-square for the final model is higher compared to the separated tests. Therefore, the final model is used to interpret the results.

First of all, dissimilarity in *age* between the predecessor and the successor. This showed contradictory results, while the difference in age does not show a significant relationship with *strategic change a t = 0* (β = -0.002, p = 0.572). Dissimilarity in age between the predecessor and successor leads to a higher level of *strategic change at t + 1* (β = 0.007, p = 0.033).

Secondly, a CEO succession where the *gender* of the successor is dissimilar to the gender of the predecessor showed opposing effects on strategic change. While gender dissimilarity resulted in a decrease of the level of *strategic change at t = 0* (β = -0.137, p = 0.012), the effect on *strategic change at t = 0* was positive, although not significant (β = 0.104, p = 0.407). This indicates that dissimilarity in gender between the predecessor and successor CEO will result in more strategic change in the year of the succession but not one year after the CEO succession.

Moreover, a change in the *nationality* of a CEO after a CEO succession will not generate more strategic change for a firm. Comparing the situation of no nationality change with a nationality change after a CEO succession, changing the nationality would not result in a statistically significant change in the level of strategic change at both timeframes (β = 0.023, p = 0.690 & β = -0.150, p = 0.176). This suggests that dissimilarity in nationality is not beneficial for the level of strategic change of a firm after a CEO succession.

Focusing on the *education difference* between the predecessor and the successor, this difference showed interesting results. According to the analysis, an education difference of one level would increase the extent of strategic change at t = 0 (β = 0.081, p = 0.036), but result in a decrease at t + 1 (β = -0.099, p = 0.001). Focussing on an education difference of 2 levels, this shows a substantial increase in the level of strategic change at t + 1 (β = 0.274, p = 0.019), while the effect is not statistically significant for strategic change at t = 0 (β = - 0.094, p = 0.105).

Taken this all together, as the composed dissimilarity measure showed a negative relationship with strategic change at t = 0, but a positive relationship with strategic change at t + 1. For t = 0 this negative relationship is also reflected (with statistically significant results) in the dissimilarity in gender. Nevertheless, dissimilarity in education with a difference of one level showed a positive influence on strategic change at t = 0. For strategic change at t + 1, the positive relationship is reflected (with statistically significant results) in the dissimilarity in age and in an education difference of 2 levels. Remarkably, an education difference of one level tends to have a negative influence on strategic change at t + 1. Finally, a dissimilarity in nationality did not show any significant influence on strategic change at both timeframes.

Table 8: Additional analysis – fixed effect model – Strategic change at t = 0

Diversification (t = 0)	**Model 11** β/se	**Model 12** β/se	**Model 13** β/se	**Model 14** β/se	**Model 15** β/se
Age Difference	-0.003				-0.002
	(0.00269)				(0.00276)
Gender Difference		-0.136***			-0.137**
		(0.04522)			(0.05370)
Nationality Difference			-0.064		0.023
			(0.07106)		(0.05720)
Education Difference (1)				0.078**	0.081**
				(0.03744)	(0.03836)
Education Difference (2)				-0.064	-0.094
				(0.05784)	(0.05749)
Control variables (t-1)					
Prior Diversification	-0.134*	-0.067	-0.066	-0.061	-0.065
	(0.07742)	(0.05734)	(0.07557)	(0.07691)	(0.05206)
Age firm	0.280	0.643	0.497	0.823	1.302***
	(0.58137)	(0.50597)	(0.61383)	(0.58168)	(0.49081)
Total assets	0.012	-0.069	0.008	0.004	-0.082
	(0.06210)	(0.05083)	(0.06352)	(0.05972)	(0.05094)
Number of employees	-0.085	-0.091	-0.060	-0.068	-0.084
	(0.06550)	(0.06522)	(0.07393)	(0.05483)	(0.05451)
Network size	0.001	-0.000	0.000	-0.000	-0.001
	(0.00130)	(0.00124)	(0.00114)	(0.00103)	(0.00117)
LTIP	-0.009*	-0.011***	-0.008*	-0.004	-0.007
	(0.00459)	(0.00385)	(0.00431)	(0.00506)	(0.00478)
CEO duality	0.055	0.072	0.069	0.069*	0.066*
	(0.04797)	(0.04382)	(0.04632)	(0.04174)	(0.03523)
Board size	-0.020**	-0.023***	-0.021**	-0.017**	-0.020**
	(0.00863)	(0.00819)	(0.00849)	(0.00759)	(0.00772)
ROA	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
_cons	-0.096	-1.735	-2.202	-4.838	-7.119*
	(4.75113)	(4.10179)	(4.90311)	(4.79520)	(4.12301)
N	228	228	228	228	228
F-test	8.695***	15.050***	7.676***	7.654***	29.767***
R-square	0.696	0.724	0.687	0.730	0.781
Adjusted R-square	0.669	0.699	0.658	0.703	0.757
N	228	228	228	228	228

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and year fixed effects are included in all models.

Table 9: Additional analysis – fixed effect model – Strategic change at t + 1

Diversification (t + 1)	**Model 16**	**Model 17**	**Model 18**	**Model 19**	**Model 20**
	β/se	β/se	β/se	β/se	β/se
Age Difference	0.009**				0.007**
	(0.00374)				(0.00326)
Gender Difference		0.123			0.104
		(0.13727)			(0.12523)
Nationality Difference			0.136		-0.150
			(0.08856)		(0.10994)
Education Difference (1)				-0.090***	-0.099***
				(0.02923)	(0.02971)
Education Difference (2)				0.260***	0.274**
				(0.07511)	(0.11588)
Control variables (t-1)					
Prior Diversification	0.336**	0.212*	0.160	0.123	0.277**
	(0.13349)	(0.10017)	(0.11000)	(0.09124)	(0.11334)
Age firm	-0.422	-0.670	-0.696	-1.405**	-1.492**
	(0.47295)	(0.75972)	(0.49671)	(0.55106)	(0.73432)
Total assets	0.255**	0.331*	0.283**	0.315**	0.346**
	(0.12257)	(0.14576)	(0.11244)	(0.10482)	(0.13718)
Number of employees	0.159***	0.165***	0.106*	0.143***	0.204***
	(0.03423)	(0.03815)	(0.05669)	(0.03392)	(0.05756)
Network size	-0.003*0	-0.001	-0.001	-0.000	-0.001
	(0.00149)	(0.00119)	(0.00135)	(0.00136)	(0.00146)
LTIP	0.003	0.006	0.002	-0.007	-0.005
	(0.00740)	(0.00871)	(0.00786)	(0.00619)	(0.00612)
CEO duality	0.071	0.025	0.011	0.034	0.093
	(0.05834)	(0.05329)	(0.05250)	(0.05833)	(0.06393)
Board size	-0.008	-0.005	-0.002	-0.005	-0.011
	(0.01455)	(0.01585)	(0.01449)	(0.01062)	(0.01137)
ROA	-0.000	0.000	-0.000	0.000	0.000
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
_cons	-1.476	-0.627	1.078	6.157*	5.541
	(3.03363)	(4.61241)	(3.74424)	(3.70342)	(4.42575)
N	207	207	207	207	207
F-test	9.864***	7.166***	8.886***	31.571***	49.730***
R-square	0.607	0.576	0.574	0.675	0.723
Adjusted R-square	0.569	0.535	0.533	0.642	0.689

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and year fixed effects are included in all models.

4.5 | Additional analysis - Qualitative

In the prior section of this research, I performed a quantitative study regarding the four demographic characteristics separately. This section will provide an additional qualitative explanation concerning the effect of dissimilarity in demographic characteristics on the level of strategic change. The companies included in this analysis are ranked on the S&P 500. The *data required for this additional analysis is collected by evaluating news articles published in The Wall Street Journal and studying recorded interviews with CEOs.*

First of all, the CEO succession of Apache Corporation showed that selecting a CEO with an education dissimilarity of one level can result in more strategic change one year after the CEO succession. For example, the new CEO of Apache corporation John Christmann completed his master's degree while Steven Farris only finished his bachelor's degree. Subsequently, four months after the CEO succession, John Christmann presented a plan consisting of substantial *"strategic portfolio repositioning"* (Beilfuss, 2015). However, one year later, mister Christmann introduced a plan to readjust the spending plan due to cash flow problems (Stynes, 2016). This would indicate that dissimilarity in education potentially result in more strategic change directly after the succession event but generate less strategic change one year later. This is in line with my findings in the prior quantitative analysis.

Moreover, at the start of 2017, Xerox Corporation executed a CEO succession. The new CEO, Jeff Jacobson, was dissimilar to his predecessor Ursula Burns in gender but entirely similar in age, nationality, and education level. Subsequently, after one year in this position, Xerox Corporation's investor Carl Icahn performed a public attack on this company, by stating *"The CEO is the most important person in the company. We believe Xerox still has potential, but it will go the way of Kodak if there aren't major changes"* (Benoit & Prang, 2017). This statement of Xerox Corporation's investor indicates that the new CEO did not execute substantial strategic changes in his first year at the CEO position. This is consistent with my findings of the quantitative study, which suggested that dissimilarity in gender will generate less strategic change within the first year after a CEO succession.

Moreover, in 2015, the CEO succession of the high fashion brand Ralph Lauren demonstrated that selecting a CEO with dissimilar characteristics can generate more strategic change. The board of Ralph Lauren selected Stefan Larsson as the new CEO. This new CEO was 35 years younger, from different nationality and received a master's degree in Business Administration while his predecessor only finished high school. One year after the succession event, Larsson introduced a new corporate strategy, including refocussing on the core labels, closing ten per cent of all stores, dismissing eight per cent of the staff, decreasing the production time with six months and eliminating three management layers (Kapner, 2016). This example of Ralph Lauren is coherent with the findings of my previous quantitative analysis, which also suggested that dissimilarity in age and a difference of two levels in education would increase the level of strategic change.

Furthermore, the quantitative analysis showed that dissimilarity in age did not have a significant effect on the level of strategic change in the same year as the CEO succession took place. This finding is consistent with limited strategic change after the CEO succession of the firms Boeing and General Electrics. In both successions, the successor was only dissimilar in age. For example, after the CEO succession of Boeing, the new CEO implemented only a few cultural adjustments and banked the loaded goodwill. There were no indications of a change in the firm's strategy, as the new CEO Dennis Muilenberg stated *"I do not see this as a generational shift, we are confident in the strategy that we have in place and we are going to continue to drive that strategy with pace" (Ostrower, 2015).* Even more apparent, the new CEO of General Electrics was removed from his CEO position only fourteen months after his selection, as the board was concerned about the *"pace of change"* (Stoll, 2018).

Finally, the CEO succession of the Tiffany showed consistent findings with my quantitative study regarding the non-significant influence of dissimilarity in the nationality. For example, in the succession of Tiffany, the predecessor was an American, while the successor was a Frenchman. This resulted in a presentation of the new strategic plan that did not forecast substantial improvements or adjustments for the company. Consequently, Tiffany's board removed the recently selected CEO for the reason that *"it wanted a leader who could deliver results faster"* (Kapner, 2016).

4.6 | Simulation of the results

In the previous sections, I displayed the hypotheses tests. Still, the magnitudes of the presented β-coefficients are hard to interpret. To prevent that my results are only based on statistical significance, risking that I accept results that are not meaningful, I will also estimate whether the coefficients have face validity (Shaver, 2007). Therefore, I compute a fictive firm. At time A, this fictive firm was for 80 per cent active in their main sales segment, and 20 per cent active in their second sales segment. Based on the significant regression coefficients of the prior analysis, I calculated the expected segment sales[3] for this fictive firm at time B. Consequentially, I was able to express the strategic change in percentages. In Table 10, I provide an overview of the expected segment sales based on the significant β-coefficients of the previous section.

[3] I included segment sales because strategic change is operationalised by the entropy measure of diversification.

Table 10: Expected change in strategy based on the significant β-coefficients.

Variable	Time frame	Coefficient	Sales seg. 1	Sales seg. 2	Strategic change in %
Dissimilarity	T = 0	-0.033	81.16%	18.84%	- 1.16%
Dissimilarity	T + 1	0.069	77.35%	22.65%	+ 2.65%
Gender difference	T = 0	-0.137	84.48%	15.52%	- 4.48%
Education dif. (1)	T = 0	0.081	76.85%	23.15%	+ 3.15%
Age difference	T + 1	0.007	79.75%	20.25%	+ 0.25%
Education dif (1)	T + 1	-0.099	83.30%	16.70%	- 3.30%
Education dif (2)	T + 1	0.274	66.5%	33.50%	+ 13.50%

Note 1: Sales seg. 1 and sales seg. 2 display the deviation of the segment sales at time B.
Note 2: At time A, the fictive firm had 80 per cent sales in segment one and 20 per cent in segment two.
Note 3: Following the interpretation of β-coefficients based on the entropy measure of diversification, a negative β-coefficient is equal to a decrease in the level of strategic change (e.g. Boeker, 1997b)

To explain the interpretation of Table 10 in more detail, I will provide an example. Focusing on *strategic change at t = 0*, I found a significant β-coefficient of -0.033 for the dissimilarity measure. For the fictive firm, this would mean an 81.16 per cent sales in their main sales segment and 18.84 per cent in their second sales segment. This simulation showed a decrease in the level of strategic change with 1.16 per cent.

Based on the β-coefficients expressed in more understandable percentages, this section will discuss the magnitude of the β-coefficients to determine their face validity. First of all, a difference in age showed a slight increase of 0.25 per cent of the level of strategic change. In my opinion, this difference is exceedingly small that it can hardly present a shift in the CEO's attentional focus. Therefore, I conclude that a difference in age would be negligible.

Most striking is the influence of a two-level difference in the educational background. This showed an increase of 13.5 per cent in the level of strategic change. Considering that the average sales of the firms included in my sample is $20 billion. A 13.5 per cent change is a shift of $2.7 billion. Therefore, I conclude that the magnitude of the β-coefficient of an educational difference of two-levels is substantial, i.e. the β-coefficient consists of meaningful results.

Besides these two β-coefficients with outstanding small or large effects on the firm's strategy. The other five variables are within the range of |1| and |5| per cent. While this might look small, a 1.16 per cent decrease of dissimilarity on strategic change at t = 0 is still a decrease of $232 million and a 3.15 per cent increase of one-level educational difference is a raise of $630 million. Therefore, I conclude that both dissimilarity measures, the gender difference, and the educational difference of one level are not neglectable and have a substantial influence on the level of strategic change. Although they are less extensive in magnitude compared to a difference of two levels in educational background.

4.7 | Robustness checks

To test whether the results were robust, I executed three additional tests. First of all, I incorporated social and historical attainment discrepancy as alternative control variables for the ROA. Attainment discrepancy is 'the difference between actual and aspired performance' (Arora & Dharwadkar, 2011, p. 137). Historical attainment discrepancy is measured as the relative difference between the ROA of t-2 and t-1. To assess the social attainment discrepancy, I compared the firm's ROA with the average ROA of the industry. A positive score on attainment discrepancy indicates that the actual performance of a firm exceeded the aspired performance, while a negative score implies its converse (Arora & Dharwadkar, 2011). Eikon provided the ROA of the firms. Unfortunately, Fact Sheet provided a high number of missing values for the ROA of an industry. As an alternative, I grouped all firms within the sample based on their Standard Industry Code (SIC) and calculated a ROA for each year.

After including both variables, all models were still highly significant ($p < .01$) and the results of the tests were mainly comparable to the models that incorporated ROA as a control variable. The only difference was that the dissimilarity measure was no longer significant (at $t = 0$, $\beta = -0.032$, $p = 0.125$ and at $t + 1$, $\beta = 0.065$, $p = 0.123$). Nevertheless, the dissimilarity coefficients were still in the same direction as the results shown in Table 6 and 7. Besides, focussing on the four demographic characteristics separately, the results of the robustness check were identical to the results of Table 6 and 7. Appendix VII shows the results of the analysis.

The second robustness check included an alternative coding of the forced CEO turnover variables. In the research design of this study, I described CEO successions as a result of death, sickness, or sexual incidents as a forced CEO turnover. However, this could also be interpreted as an unforced CEO turnover, as the influence of a firm is limited. Therefore, I recoded these CEO successions in an additional category and analysed the results of the fixed effect model. Analysing the results, a forced CEO turnover does not have a significant influence on strategic change at $t = 0$ ($\beta = 0.070$, $p = 0.172$) or at $t + 1$ ($\beta = 0.017$, $p = 0.775$). This is in line with my findings shown in the prior section. Appendix VIII shows the output of this robustness check.

Finally, to confirm the statement that a CEO succession has the highest influence in the first year after the appointment of his function but decreases afterwards, I performed the same regression analysis as earlier with the dependent variables strategic change at t+2. In line with the expectations based on literature, the analysis showed no significant results for strategic change at t+2. This analysis is shown in Appendix IX.

Taken this all together, all three robustness checks show results similar to my prior quantitative analysis. Therefore, I conclude that I do not have an indication to be concerned regarding the robustness of my results.

5 | DISCUSSION

In the introduction of this report, I stated that the basic premise in strategic management research is that top executives, e.g. CEO, perform a dominant role in formulating the firm's strategy (e.g. Hambrick & Mason, 1984; Quigley & Hambrick, 2015; Westphal & Fredrickson, 2001). As a baseline hypothesis, I expected that a new CEO would generate more strategic change. Surprisingly, this research uncovered that the direct effect of CEO succession on strategic change turned non-significant after accounting for self-selection. Hence, to determine whether the situation when the firm's board of directors forces a CEO succession resulted in a higher level of strategic change, I incorporated a more sophisticated way to measure a forced CEO turnover. Contrasting to my expectations, I observed that a forced CEO turnover did not have any significant influence on the level of strategic change. Moreover, I uncovered that dissimilarity in demographic characteristics between the prior and the new CEO had a substantial effect on strategic change. Finally, the additional analysis disclosed that dissimilarity in specific demographic characteristics had a distinctive influence on the level of strategic change. Having summed up the main results of this study, the next section will consist of an in-depth examination of these striking findings.

<u>The effect of a CEO succession</u>

The results of my firm-year analysis provided surprising evidence, while before accounting for self-selection, a CEO succession resulted in a higher level of strategic change one year after the CEO succession. This would imply that a new CEO is less committed to previous firm's decisions and strategies that generated success in the past, consequentially they would be more likely to change the strategy of a firm (Datta et al., 2003; Hambrick et al., 1993).

Nevertheless, after accounting for self-selection, CEO succession did no longer contribute to a higher level of strategic change one year after the CEO succession. Although the upper echelons theory of Hambrick and Mason (1984) argues that the CEO's strategic choices influence the firm's strategy. The results of my analysis implicate that a CEO succession is an organisational decision that is selected with the outcome implications in mind (Clougherty et al., 2016). For example, a CEO often transfers his job for the reason that *"it is the right time* *to leave"* (Ovide, 2008) or *"it is time for a new CEO to step in"* (Verbergt, 2016). Another example is that the board of directors executes a CEO succession to enhance the competitive position of the firm (Pearce & Zahra, 1992). This alternative perspective on the relationship between CEO succession and the level of strategic change is grounded in the endogenous governance theory of Becker (1983). This theory proposes a firm's behaviour, where firms choose their governance structure with specific outcome implications in mind (Becker, 1983; Clougherty et al., 2016). In other words, my results suggest that the CEO succession itself does not generate strategic change. Rather, it implied that a CEO succession is a specific organisational decision with the outcome implications in mind (e.g. that it potentially will break the inertial path of a firm).

<u>The effect of a forced CEO turnover</u>

Since a CEO succession should be seen as the result of an organisational decision that is selected with the desired outcome implications in mind. A plausible consequence would be that a forced CEO turnover would generate more strategic change compared to a voluntary CEO turnover. For the reason that literature suggested that a forced CEO turnover could be seen as a sign that the board is not satisfied with the current strategy and had a desire to change the firm's strategy (Hutzschenreuter et al., 2012). Moreover, the literature stated that the new CEO after the dismissal of the prior CEO often receives a mandate to change the firm's strategy (Ballinger & Marcel, 2010; Nakauchi & Wiersema, 2015). Therefore, a forced CEO turnover is expected to be a situation of high managerial discretion, where the CEO would have a significant influence on the firm's strategy (Hambrick, 2007; Hambrick & Finkelstein, 1987). Remarkably, my study showed that there was no significant relationship between a forced CEO turnover and strategic change.

A potential explanation might be found in the pre-succession phase of a firm (Kristin & Klarner, 2017). In this phase, the firm's board of directors indicates the desired path for a firm and asses the required capabilities for the CEO position to direct this path (William, 1999). This plan will increase the quality of the outcomes of the succession event for a firm (Schepker, Nyberg, Ulrich, & Wright, 2018). Nevertheless, a report of the Conference Board in 2009, focused on the same sample as this research (the S&P 500), revealed that only 34 per cent of the boards included the CEO succession planning frequently on their board meeting and 40 per cent of the boards included this item less than once a year (Tonello, Wilcox, & Eichbaum, 2009). Consequentially, the firm's board of directors often only responds in the case of a leadership crisis, instead of developing a CEO succession planning proactively (Kristin &

Klarner, 2017). Potentially, this can create a trap, for the reason that the identification and preparation of a new CEO often require several years (Schepker et al., 2018).

Combining the evidence from practice with prior research might suggest that as a large group of the S&P 500 firms do not frequently incorporate CEO succession planning on their board meetings. Consequentially, when a firm is faced with an abrupt change in the CEO position, the firm might be compelled to make ad hoc decisions regarding the successor. While a CEO succession without a smooth transition of leadership will result in unfavourable organisational consequences (Marcel Jeremy, Cowen, & Ballinger, 2017). Thus, when a forced CEO turnover is executed, and the board of directors has invested too little in the succession planning in the past. They might not be capable of selecting a new CEO whose competencies and repertoire fit with the external environment in the foreseeable future (Finkelstein et al., 2009). Consequently, the sudden decision to dismiss the former CEO might not result in more strategic change.

<u>The effect of dissimilarity between the predecessor and the successor</u>

Supplementary to why a CEO succession has occurred, my study also emphasised the relevance of comparing the demographic characteristics of a new CEO to its predecessor. As Shen and Cannella (2003) stated ‘while the reason behind CEO turnover is important in CEO succession, the selection of the successor is of equal importance (if not more) because the successor determines the firm’s future strategic direction’ (p. 196). Therefore, my study shows the importance of selecting a new CEO, who is dissimilar in demographic characteristics to the former CEO. In other words, when firms appoint a new CEO, who is not comparable in specific demographic characteristics to the previous CEO, the level of strategic change was significantly different in comparison to the situation when a CEO was selected with similar characteristics. For example, my study shows that choosing a CEO who is dissimilar in gender would generate less strategic change while choosing a CEO with one level difference in the educational background would initiate more strategic change within the year of the CEO succession. On the other side, this education difference would generate less strategic change one year later, while a gap of two levels in education would generate more strategic change within this timeframe. Opposingly, dissimilarity in the nationality did not show a relationship with the level of strategic change. Since the cognitive map is formed by demographic characteristics (Finkelstein et al., 2009), the results of my study confirmed the expectation that overlapping cognitive maps will not result in a higher level of strategic change, and alternatively different cognitive maps will result in a higher level of strategic change (Sutcliffe & Huber, 1998; Yokota & Mitsuhashi, 2008). Taken this all together, my study suggests that specific demographic dissimilarity results in more strategic change in particular timeframes, while dissimilarity in other characteristics decreased the level of strategic change or did not show any influence on the level of strategic change.

5.1 | Theoretical contributions

My study provides three theoretical implications. First, I contribute to the upper echelons theory of Hambrick and Mason (1984) by providing more advanced insights into the way a forced CEO turnover influences the relationship between a CEO succession and strategic change. Prior research incorporated non-routine succession (below the age of 65) as a boundary condition on the relationship between CEO turnover and strategic change. Interpreting a non-routine succession as the departure of the top executives (e.g. CEO) before the normal retirement age, which would disrupt the succession planning and can be instigated by the board as a mandate for change (Wiersema, 1995). Consequentially, Wiersema (1995) indicated that non-routine succession of CEO was related to a higher level of strategic change. Nevertheless, my study builds on the recent argumentation that incorporating 'age' to determine the type of CEO succession can be problematic 'since a CEO's age is not a direct indicator of the nature of his/her departure' (Wiersema & Zhang, 2011, p. 1168). Therefore, the influence of a forced CEO turnover was unknown until now. Which was remarkable, because prior research emphasised that a forced CEO turnover can be seen as an opportunity to realign the firm's strategy with the external environment (Shen & Cho, 2005) and indicated that the nature of succession (i.e. voluntary versus forced) had the potential to influence the level of strategic change (Nakauchi & Wiersema, 2015). After applying a more sophisticated way of measuring a forced CEO turnover, my results were contradictory to the prior research of Wiersema (1995); there was no longer an effect of a forced CEO turnover on the level of strategic change. This emphasize the importance of interpreting the nature of the CEO succession. While a less precise method (i.e. retirement age) indicated a significant effect on strategic change, a more sophisticated view showed the opposite results. Hence, this research enriches our understanding that a way the CEO succession is initiated is important in understanding the conflicting results of CEO succession on strategic change. Besides, this study helped to address the validity issue of measuring a forced CEO turnover.

In the second place, I contribute to the way demographic characteristics are embedded in the upper echelons theory (Hambrick & Mason, 1984). Hence, this study provides a new perspective on the way demographic characteristics can be of added value for the upper echelons theory. Prior research lacked or neglected to include the differences in demographic characteristics in their research design. Only a small number of studies recognised an effect of dissimilarity in characteristics of the predecessor and the successor on outcomes of a firm. These studies focused on dissimilarity in the functional background (Ocasio & Kim, 1999), openness to change (Datta et al., 2003) or risk attitudes (Pol Herrmann & Datta, 2002). Alternatively, researches also included only the direct effect of demographic characteristics. Therefore, prior research might have overestimated the way that a CEO succession will result in a higher level of strategic change. For the reason that my findings show that the dissimilarity in the demographic characteristics can also determine the level of strategic change, by suggesting that dissimilarity in specific demographic characteristics will have a distinctive influence of the level of strategic change. This implicates the importance of not having a single focus on who will be the successor but also comparing this to the predecessor when analysing the outcomes of a firm. Thus, my study contributes to the ongoing debate regarding the upper echelons theory of Hambrick and Mason (1984), by showing that dissimilarity in the demographic characteristics between the predecessor and the successor can influence strategic choices for organisations, rather than having a sole focus on demographic characteristics of the successor.

Finally, I contribute to the literature regarding the relationship between CEO succession and strategic change by introducing an alternative view on this relationship. While prior research mainly supported the view that a CEO succession generates more strategic change (for a comprehensive review see Hutzschenreuter et al., 2012). The results of my analysis suggest that prior strategic management research might have overestimated this relationship for the reason that these researches neglected to account for self-selection. To my best knowledge, this study is one of the first that integrated self-selection in the research design. Consequentially, accounting for self-selection provided an alternative perspective on the relationship, suggesting that a CEO succession is executed with the potential implications for the organisational outcomes, i.e. strategic change, in their mind (Clougherty et al., 2016). This might indicate that the organisational processes before a CEO succession have a considerable influence on the level of strategic change. In these processes, the board of directors will decide to change the CEO in order to generate more strategic change. Therefore, a CEO succession could be interpreted as a mean to generate more strategic change, rather than that the CEO succession itself generates more strategic change. Thus, my framework offers new insights into the way a CEO succession could be interpreted by strategic management literature.

5.2 | Practical implications

In addition to the theoretical implications mentioned in the last part, I defined two managerial (practical) implications based on my study. First of all, my research shows that there is no significant difference between a forced and a voluntary CEO turnover on the level of strategic change. Although a forced CEO turnover is seen as a mechanism to adapt to the firm's strategy to the external environment, it does not generate a significantly higher level of strategic change than a voluntary CEO turnover. Combining this with the evidence that a CEO succession can be seen as an organisational decision selected with the outcome implications in mind. It is essential for the board of directors to realize that forcing a CEO out of a firm, will not necessarily result in a higher level of strategic change, while it is still a disruptive change for a firm (Helfat & Bailey, 2005), and often creates an uncertain transition between the prior and the new CEO (Clayton et al., 2005).

Secondly, the findings of my research project demonstrate the strategic importance of the selection of the firm's new leader. Therefore, the firm's board of directors should carefully decide which individual they appoint as the successor of the CEO position because dissimilarity in specific demographic characteristics has an explicit influence on the level of strategic change. For example, if the board selects a new CEO from a different educational background, this potentially generates more strategic change directly after the appointment. While selecting a CEO which is dissimilar in gender would result in less strategic change directly after the CEO succession. This is especially important as the main effect of my analysis shows that a CEO succession might be interpreted as an organisational decision that is selected with the outcome implications for the firm in mind. Combining these two elements, members of the board of directors should be aware of the effect of dissimilarity in demographic characteristics between the prior and the new CEO. For the reason that dissimilarity can affect the outcome implications of their organisational decision to execute a CEO succession. To put in briefly, the board of directors of a firm should be aware of the influence of dissimilarity in demographic characteristics when they make the organisational decision to succeed the CEO and appoint a new one.

5.3 | Limitations and future research opportunities

Despite that my present study provided thought-provoking results, with relevant implications for academic and practice. This research did also include several limitations. These limitations should be acknowledged and provide opportunities for future research.

First of all, regardless of the fact that I included panel data with time and firm fixed effects in the model. The timeframe of the current study was not extensive enough to incorporate the long-time consequences of a CEO succession on strategic change (i.e. time plus three and further). Due to the limited duration of this research project and the availability of data, it was not possible to extend the timeframe of the study further. Nevertheless, based on the research of Henderson et al. (2006), I expected that a new CEO would generate more strategic change within the CEO succession year, or one year later. As the literature suggested that the influence of a CEO on the strategy is the highest in their first year but worsened steadily afterwards (Henderson et al., 2006). Yet, there is also an alternative view on the time required to measure strategic change, grounded in the literature of Westphal and Fredrickson (2001). These researchers applied a longer period to incorporate strategic change generated by a 'more protracted decision-making process' (Westphal & Fredrickson, 2001, p. 1123). Consequently, in further research, it would be worth studying the long-term consequences of this research design.

Second, in this research, I accounted for self-selection in the main effect. However, this study was unsuccessful in accounting for self-selection effect in a forced CEO turnover and dissimilarity. Although a forced CEO turnover did show a highly insignificant result in the fixed effect model, dissimilarity showed significant results. Therefore, I invested much time to detect instrumental variables which were related to dissimilarity, but uncorrelated with the error term. Unfortunately, this was too challenging within the timeframe of this study. For the reason that potential instrumental variables associated with dissimilarity were generally also related to strategic change. Yet, it would be interesting for future research to determine whether the firm's board of directors intentionally appoints a new CEO with dissimilar characteristics with outcome implications in mind. This would require more research on the antecedents of decision-making of the board of directors on CEO succession, especially the selection process of a new CEO is mostly unknown in literature.

Third, the dissimilarity between a predecessor and a successor was operationalised by four demographic characteristics of a CEO as a proxy to determine his or her cognitive frame (Hambrick, 2007). Therefore, I did not examine directly 'the psychological and social processes that mediate between executives' demography on the one hand and their behaviours on the other' (Hambrick, 2007, p. 335). This is called the black box problem. However, it was not attainable to collect about the psychological and social processes of a CEO within the timeframe of this study. Prior strategic management assumed that exploiting demographic characteristics is a valid solution for this measurement issue (Hambrick, 2007). Therefore, future research should focus on opening the black box problem, rather than exploiting a quantitative study based on secondary data. For example, a study with qualitative interviews would provide meaningful insights regarding the psychological and social processes of the CEO.

Moreover, in addition to the previous limitation, is the validity of the dissimilarity measure is questionable, as this is not a measure used in prior research. In this study, the dissimilarity variable is computed by standardising, summing, and averaging the four demographic characteristics. Consequentially, all four characteristics received the same weight. To correct for this validity issue, an additional analysis is executed including the four demographic characteristics separately. By incorporating this additional analysis, it showed that dissimilarity in specific demographic characteristics results in different levels of strategic change. However, prior research concluded that several demographic characteristics of a new CEO resulted in more or less strategic change. However, these researches did not compare these characteristics to the processor. Therefore, it would be interesting for future research to incorporate more dissimilarity measures, for example, dissimilarity in the leadership style or narcissism. Hence, it would also be valuable for future research to develop a valid measure to determine the difference in demographic characteristics between two individuals, as this is currently lacking. While the results of this study showed that it is relevant for strategic management research.

Fifth, the sample of this study was the S&P 500. This index was selected based on the fit with the research design and the accessibility of information (e.g. data and news articles). Consequently, this study only included massive, powerful, and wealthy firms. Therefore, the results are harder generalizable to smaller, less powerful, and less rich firms. It would be interesting to execute a similar research design on smaller firms to determine whether the results are similar.

Sixth, my study incorporated the entropy measure of diversification to operationalise the level of strategic change of a firm. Although this measure 'has been found to have good construct validity relative to other diversification measures' (Hoskisson et al., 1994, p. 1222). It would also be worth studying other types of strategic change to determine whether the results of my study also hold when strategic change is operationalised from another perspective.

The final limitation concerns the influence of the external environment. While it is acknowledged in the literature that the environmental conditions of a CEO succession influence the relationship between a CEO succession and strategic change. This analysis did not find any significant effect of an environmental jolt (shown in Appendix X). An environmental jolt is the situation of an abrupt and discontinuous change in the firm's external environment (Meyer, Brooks, & Goes, 1990). In my analysis, this jolt was operationalised by the recent global financial crisis but turned out nonsignificant. Nevertheless, Finkelstein et al. (2009) stated that 'when environments shift […] these are conditions in which the succession effect may be profound'. Therefore, it would be worth studying alternative environmental shifts on the relationship between a CEO succession and strategic change.

6 | CONCLUSION

My study provides additional explanation to the conflicting results regarding the relationship between a CEO succession and strategic change, by describing the influence of a forced CEO turnover and dissimilarity in demographic characteristics between the prior and the new CEO. In doing so, I add to the upper echelons theory of Hambrick and Mason (1984). After employing a more sophisticated method to measure a forced CEO turnover, I describe that a forced CEO turnover potentially represents a less important event to generate strategic change than acknowledged in prior literature. Perhaps most striking, I show that including the dissimilarity in demographic characteristics can explain why one CEO succession resulted in a higher level of strategic change, while other successions did not. Hence, I found the remarkable result that after accounting for self-selection effects, a CEO change did no longer result in a higher level of strategic change, which suggests that prior research might have overestimated the effect of CEO succession on strategic change.

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APPENDIX

I | Reasoning why the fixed effect model was preferred

The analysis started with three models a Pooled OLS model, a Random Effect model and a Fixed Effect model (H. M. Park, 2009). In order to determine which model was preferred to test the hypotheses, multiple tests were executed for each model. First of all, the Goodness-of-fit measure was examined to test whether the model fits the data. This measure showed for roughly each model a significant fit (p. <.05). Secondly, to decide whether a fixed or a random effect model was preferred, the Hausman test was performed for each model. This test examines whether the ‘random effects estimate is insignificantly different from the unbiased fixed effect estimate’ (Kennedy, 2008, p.286). For each model, the Hausman test provided a p-value below the significance level of .05. Therefore, the null hypothesis could be rejected, and the fixed effect model was preferred. Subsequently, to examine whether a pooled OLS model would be more appropriate for this analysis, the F-test was executed. This showed for each model a p-value below the significance level of .05. Therefore, the null hypothesis was rejected, and a fixed effect model was more appropriate for the analysis. The STATA output regarding these results of these tests are shown in Appendix II.

II | Test to determine the preferred model

Model: Hypothesis 1 (DV, IV and control variables) – at t =0

Comparison model fit of all three models

Strategic change (t = 0)	Pooled OLS	Random Effect	Fixed Effect
F-test	2.5917694***	41.47***	4.748982***

As all three models are significant, multiple tests are executed to determine the preferred model.

1. Hausman test to choose between a Fixed Effect model or a Random effect model

Null hypothesis: A random effect is more appropriate for this analysis.

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 309.56

Prob>chi2 = 0.0031

As the p-value of the Hausman test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a random effect model.

2. F-test to choose between a Fixed Effect model and a Pooled OLS model.

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

F(294, 2105) = 1.26

Prob > F = 0.0000

As the p-value of the F-test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a pooled OLS model.

3. Breusch and Pagan Lagrangian multiplier test to choose between a Random effect model and a pooled OLS model

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

As the p-value of the Breusch and Pagan Lagrangian multiplier test is above the significance level of .05 the null hypothesis is not rejected. Therefore, a pooled OLS model is preferred above a Random effect model.

Combining the first three tests to determine the preferred model

Based on the first three tests the preferred model for this analysis is the fixed effect model

4. Wald test (Testparm) to test for time-fixed effects.

Null hypothesis: Jointly all year dummy coefficients are equal to zero.

F(9, 294) = 8.05

Prob > F = 0.0000

As the p-value of the Wald test (Testparm) is below the significance level of .05 the null hypothesis is rejected. Therefore, it is required to add time fixed effects to the model.

Model: Hypothesis 1 (DV, IV and control variables) – at t + 1

Comparison model fit of all three models

Strategic change (t + 1)	**Pooled OLS**	**Random Effect**	**Fixed Effect**
F-test	3.3791765***	55.56***	5.1997863***

As all three models are significant, multiple tests are executed to determine the preferred model.

1. Hausman test to choose between a Fixed Effect model or a Random effect model

Null hypothesis: A random effect is more appropriate for this analysis.

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 123.45

Prob>chi2 = 0.0000

As the p-value of the Hausman test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a random effect model.

2. F-test to choose between a Fixed Effect model and a Pooled OLS model.

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

F(288, 1829) = 1.29

Prob > F = 0.0015

As the p-value of the F-test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a pooled OLS model.

3. Breusch and Pagan Lagrangian multiplier test to choose between a Random effect model and a pooled OLS model

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

chibar2(01) = 0.00

Prob > chibar2 = 1.0000

As the p-value of the Breusch and Pagan Lagrangian multiplier test is above the significance level of .05 the null hypothesis is not rejected. Therefore, a pooled OLS model is preferred above a Random effect model.

Combining the first three tests to determine the preferred model

Based on the first three tests the preferred model for this analysis is the fixed effect model

4. Wald test (Testparm) to test for time-fixed effects.

Null hypothesis: Jointly all year dummy coefficients are equal to zero.

F(8, 288) = 1.5e+08

Prob > F = 0.0000

As the p-value of the Wald test (Testparm) is below the significance level of .05 the null hypothesis is rejected. Therefore, it is required to add time fixed effects to the model.

Model: Hypothesis 2 (DV, Forced CEOchange, control variables) – at t = 0

Comparison model fit of all three models

Strategic change (t = 0)	Pooled OLS	Random Effect	Fixed Effect
F-test	1.6586194*	29.96**	3.1982507***

As both the random effect and the fixed effect models are significant at a p-value of .05.

1. Hausman test to choose between a Fixed Effect model or a Random effect model
Null hypothesis: A random effect is more appropriate for this analysis.

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 23.56

Prob>chi2 = 0.0051

As the p-value of the Hausman test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a random effect model.

2. F-test to choose between a Fixed Effect model and a Pooled OLS model.

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

F (175, 28) = 2.51

Prob > F = 0.0027

As the p-value of the F-test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a pooled OLS model.

3. Breusch and Pagan Lagrangian multiplier test to choose between a Random effect model and a pooled OLS model

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

chibar2(01) = 0.24

Prob > chibar2 = 0.3105

As the p-value of the Breusch and Pagan Lagrangian multiplier test is above the significance level of .05 the null hypothesis is not rejected. Therefore, a pooled OLS model is preferred above a Random effect model.

Combining the first three tests to determine the preferred model

Based on the first three tests the preferred model for this analysis is the fixed effect model

4. Wald test (Testparm) to test for time-fixed effects.

Null hypothesis: Jointly all year dummy coefficients are equal to zero.

F(9, 294) = 8.06
Prob > F = 0.1231

As the p-value of the Wald test (Testparm) is above the significance level of .05 the null hypothesis is not rejected. Therefore, it is not required to add time fixed effects to the model.

Model: Hypothesis 2 (DV, Forced CEOchange, control variables) – at t + 1

Comparison model fit of all three models

Strategic change (t + 1)	Pooled OLS	Random Effect	Fixed Effect
F-test	1.4181071	20.35	9.2523827***

As only the fixed effect models is significant at a p-value of .05, this is the preferred model for this analysis. Therefore, I will check whether adding time fixed effects is required.

4. Wald test (Testparm) to test for time-fixed effects.

Null hypothesis: Jointly all year dummy coefficients are equal to zero.

F(8, 161) = 2.95
Prob > F = 0.0042

As the p-value of the Wald test (Testparm) is below the significance level of .05 the null hypothesis is rejected. Therefore, it is required to add time fixed effects to the model.

Model: Hypothesis 3 (DV, Similarities CEOchange, control variables)

Comparison model fit of all three models

Strategic change (t = 0)	Pooled OLS	Random Effect	Fixed Effect
F-test	1.8980978**	34.07***	2.736088***

As all three models are significant, multiple tests are executed to determine the preferred model.

1. Hausman test to choose between a Fixed Effect model or a Random effect model

Null hypothesis: A random effect is more appropriate for this analysis.

chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 12.02

Prob>chi2 = 0.2124

As the p-value of the Hausman test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a random effect model.

2. F-test to choose between a Fixed Effect model and a Pooled OLS model.

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

F(183, 31) = 2.06

Prob > F = 0.0097

As the p-value of the F-test is below the significance level of .05 the null hypothesis is rejected. Therefore, a fixed effect model is preferred above a pooled OLS model.

3. Breusch and Pagan Lagrangian multiplier test to choose between a Random effect model and a pooled OLS model

Null hypothesis: A pooled OLS model is more appropriate for this analysis.

chibar2(01) = 0.21

Prob > chibar2 = 0.3251

As the p-value of the Breusch and Pagan Lagrangian multiplier test is above the significance level of .05 the null hypothesis is not rejected. Therefore, a pooled OLS model is preferred above a Random effect model.

Combining the first three tests to determine the preferred model

Based on the first three tests the preferred model for this analysis is the fixed effect model

4. Wald test (Testparm) to test for time-fixed effects.

Null hypothesis: Jointly all year dummy coefficients are equal to zero.

F(9, 183) = 3.64
Prob > F = 0.0003

As the p-value of the Wald test (Testparm) is below the significance level of .05 the null hypothesis is rejected. Therefore, it is required to add time fixed effects to the model.

Model: Hypothesis 3 (DV, Similarities CEOchange, control variables)

Comparison model fit of all three models

Strategic change (t + 1)	Pooled OLS	Random Effect	Fixed Effect
F-test	1.3967845	22.70	3.6703896***

As only the fixed effect models is significant at a p-value of .05, this is the preferred model for this analysis. Therefore, I will check whether adding time fixed effects is required.

4. Wald test (Testparm) to test for time-fixed effects.

Null hypothesis: Jointly all year dummy coefficients are equal to zero.

F(8, 168) = 4.18
Prob > F = 0.0001

As the p-value of the Wald test (Testparm) is below the significance level of .05 the null hypothesis is rejected. Therefore, it is required to add time fixed effects to the model.

III | Partial correlation matrix - Instrumental variables

	1	2	3	4	5
1. Strategic change (t = 0)					
2. Strategic change (t+1)	-0.0394**				
3. CEO succession					
4. Forced CEO turnover	-0.0353*		0.7458***		
5. Inside succession			0.8621***	0.6729***	
6. Retirement age			0.1778***	0.2097***	0.1706***

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Only printed when the p-value was below .1

IV | Regressions - Instrumental variables with IV & DV

To determine whether the instrumental variables were significant related to CEO succession

DV: CEO succession	***Instrument 1*** β/se	***Instrument 2*** β/se	***Instrument 3*** β/se
Unforced CEO turnover	0.982***		
	(0.00575)		
Inside succession		0.982***	
		(0.00506)	
Retirement age			0.373***
			(0.03639)
Control variables (t-1)			
Prior Diversification	-0.040	0.039	0.007
	(0.02804)	(0.02366)	(0.04629)
Age firm	-0.025	-0.004	0.050
	(0.02522)	(0.02612)	(0.07173)
Total assets	0.020	0.006	-0.001
	(0.02370)	(0.01674)	(0.03349)
Number of employees	0.019	0.004	0.069 *
	(0.02250)	(0.02030)	(0.04105)
Network size	-0.000	-0.001	-0.000
	(0.00084)	(0.00068)	(0.00107)
LTIP	0.002	-0.001	-0.009**
	(0.00218)	(0.00132)	(0.00421)
CEO duality	0.017	0.014	0.010
	(0.01291)	(0.01249)	(0.02182)
Board size	0.001	-0.001	-0.002
	(0.00275)	(0.00176)	(0.00371)
ROA	-0.000	0.000**	-0.000
	(0.00001)	(0.00000)	(0.00001)
_cons	-0.228	0.013	-0.894
	(0.40228)	(0.33932)	(0.76166)
N	2.458	2.458	2.458
F-test	2145.86***	3858.03***	8.172***
R-square	0.631	0.784	0.101
Adjusted R-square	0.628	0.783	0.094

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Firm and time fixed effects are included in all models.

To determine whether the instrumental variables were not significant related to strategic change.

	DV: strategic change (t = 0)	***DV: strategic change (t + 1)***
	β/se	β/se
Unforced CEO turnover	-0.006	0.021
	(0.01937)	(0.01803)
Inside succession	-0.000	-0.006
	(0.01844)	(0.01754)
Retirement age	-0.016	0.005
	(0.01314)	(0.01518)
Control variables (t-1)		
Prior Diversification	-0.174***	-0.125***
	(0.03119)	(0.02952)
Age firm	0.059	0.040
	(0.03650)	(0.03104)
Total assets	-0.013	0.015
	(0.01847)	(0.01804)
Number of employees	-0.005	-0.014
	(0.02181)	(0.02618)
Network size	-0.001	-0.001*
	(0.00052)	(0.00058)
LTIP	-0.003	0.000
	(0.00224)	(0.00180)
CEO duality	0.014	-0.007
	(0.01076)	(0.01170)
Board size	0.000	0.003*
	(0.00189)	(0.00181)
ROA	0.000	-0.000
	(0.00000)	(0.00000)
_cons	1.002***	0.742**
	(0.35858)	(0.31149)
N	2.410	2.128
F-test	6.622***	6.299***
R-square	0.103	0.103
Adjusted R-square	0.096	0.094

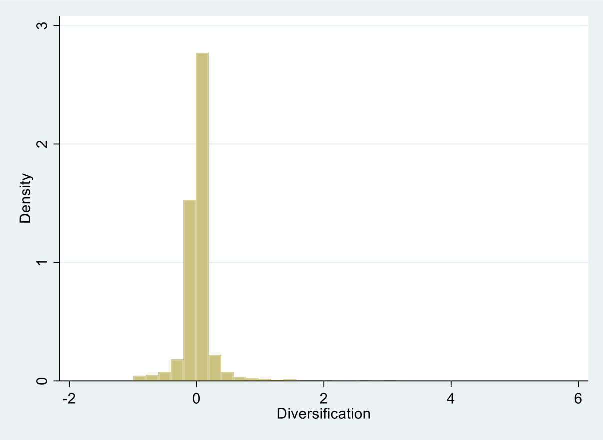
*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Firm and time fixed effects are included in all models.

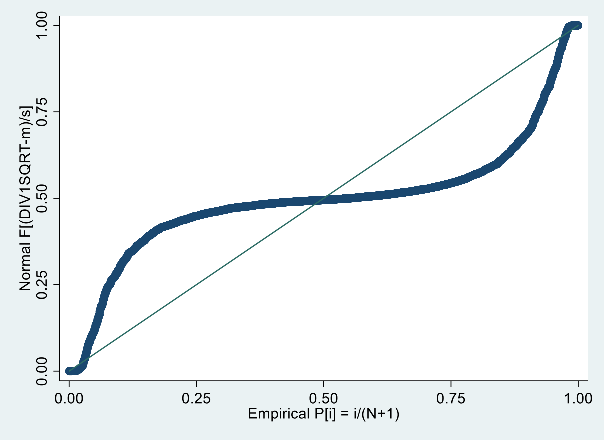
V | Transformations variables included in the analysis

Variable name: Strategic change

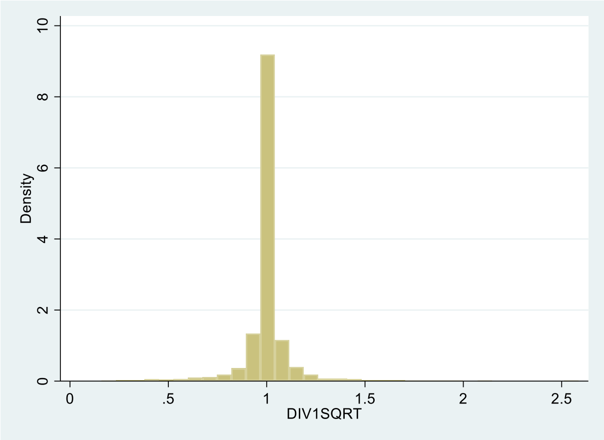
	Variable	LOG	SQRT	SR	INV
mean	.0247289	-.0186232	1.00202	1.165646	1.147903
p50	.0004069	.0004068	1.000203	1.000814	.9995933
sd	.3400217	.3233648	.1438452	1.625912	2.69767
min	-.9927639	-4.928667	.0850655	.0000524	.149459
max	5.690797	1.900733	2.586658	44.76677	138.1952
skewness	6.616605	-3.737975	1.738435	16.4754	44.1145
kurtosis	82.72078	43.98596	28.52118	357.0393	2192.096
N	3061	3061	3061	3061	3061

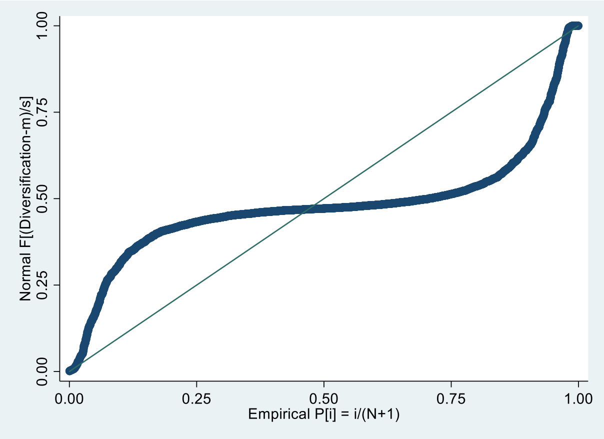
Before transformations





After transformations

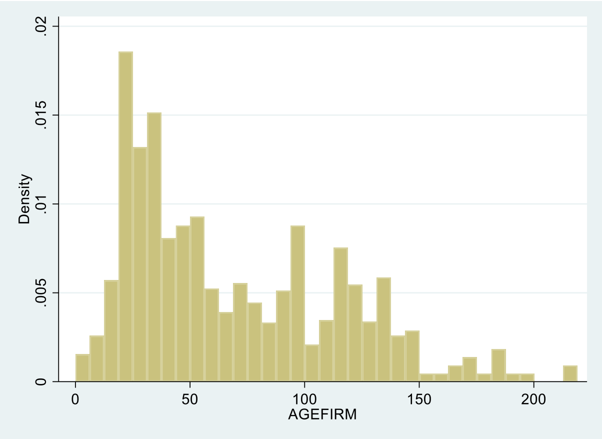


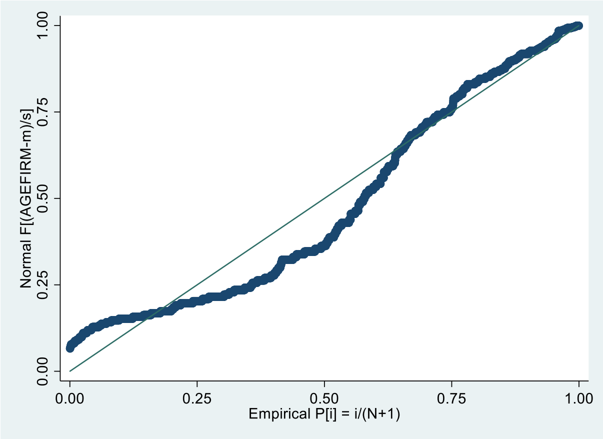


Variable name: Age firm

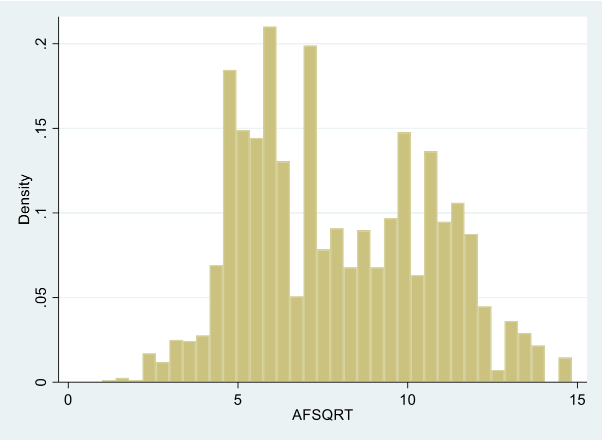
	Variable	LOG	SQRT	SR	INV
mean	69.1404	4.008735	7.916132	7025.533	.0249821
p50	53	3.988984	7.348469	2916	.0185185
sd	45.8956	.741259	2.734446	8394.259	.0344333
min	0	0	1	1	.0045455
max	219	5.393628	14.8324	48400	1
skewness	.7758705	-.500117	.261662	1.83278	14.66702
kurtosis	2.796948	3.267979	2.123309	6.862382	362.2476
N	3839	3839	3839	3839	3839

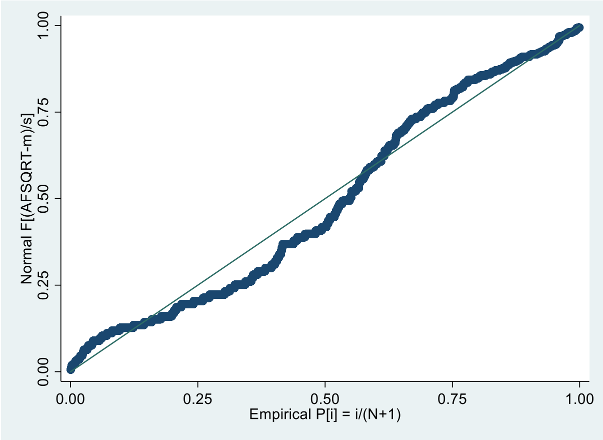
Before transformations:





After transformations:

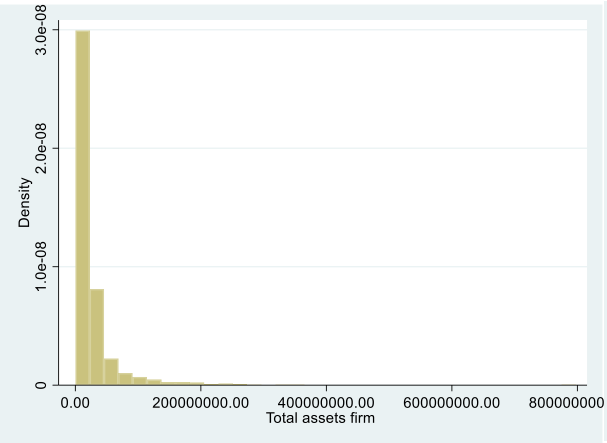


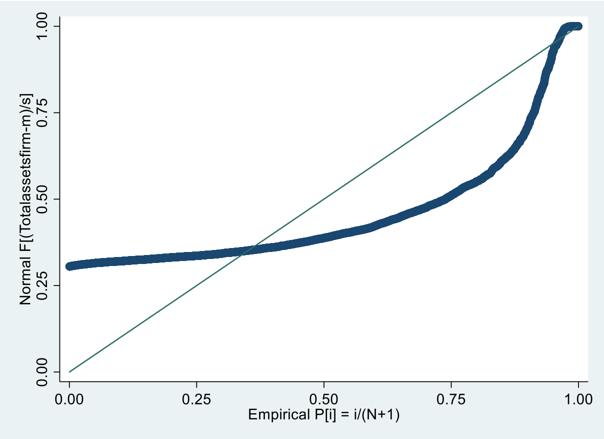


Variable name: Total assets

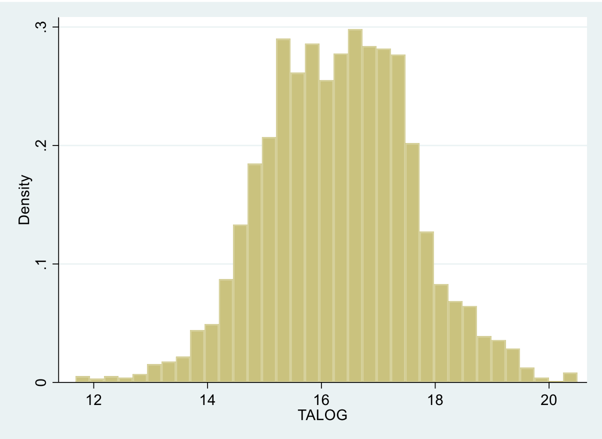
	Variable	LOG	SQRT	SR	INV
mean	2.75e+07	16.29736	4244.444	3.64e+15	1.96e-07
p50	1.22e+07	16.31342	3477.783	1.46e+14	8.23e-08
sd	5.38e+07	1.285547	3070.687	2.70e+16	4.57e-07
min	118031	11.6787	0	0	1.25e-09
max	7.98e+08	20.49733	28244.8	6.36e+17	8.47e-06
skewness	6.861622	-.0016005	2.404203	17.52311	9.739921
kurtosis	73.43521	3.1623	12.54004	356.7384	132.7927
N	3873	3873	3883	3883	3873

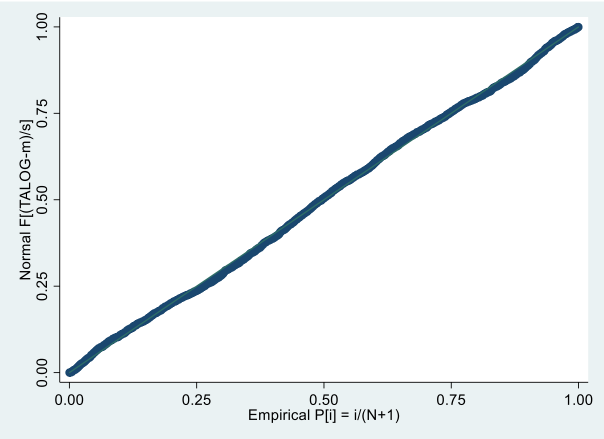
Before transformations:





After transformations:

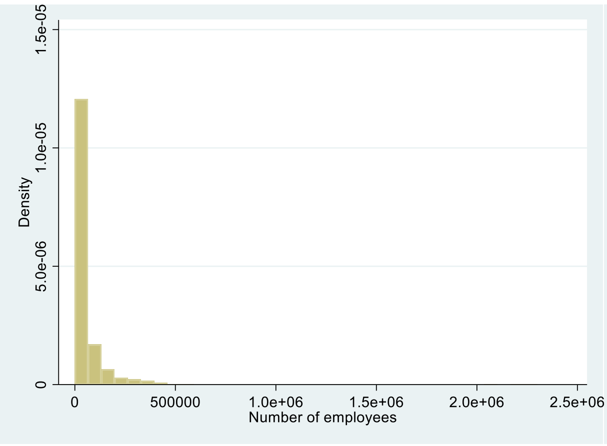


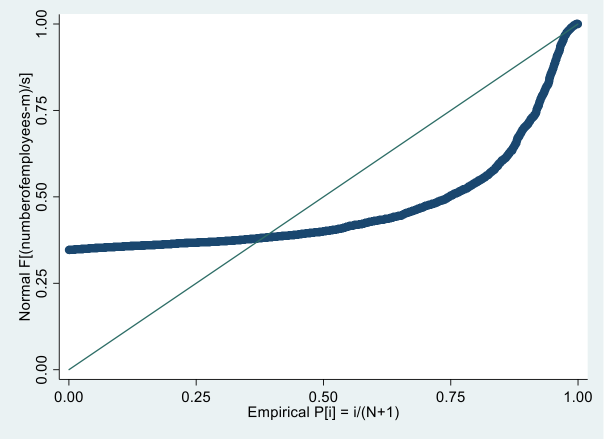


Variable name: Number of employees

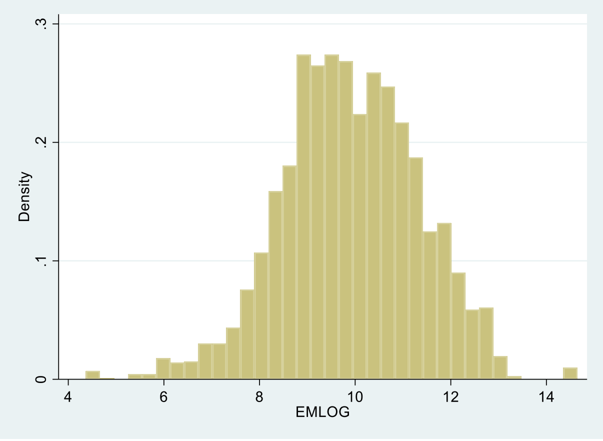
	Variable	LOG	SQRT	SR	INV
mean	53632.16	9.899838	181.3493	2.13e+10	.0001662
p50	19258.5	9.865708	138.775	3.71e+08	.0000519
sd	135684.4	1.437093	144.0486	2.59e+11	.0006474
min	79	4.369448	8.888194	6241	4.35e-07
max	2300000	14.64842	1516.575	5.29e+12	.0126582
skewness	11.72597	-.1688463	3.050322	18.44852	14.12802
kurtosis	180.0195	3.329408	22.06556	346.0594	243.5373
N	3816	3816	3816	3816	3816

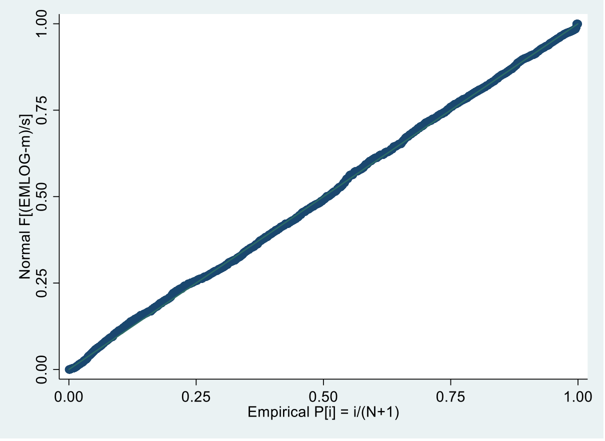
Before transformations:





After transformations:

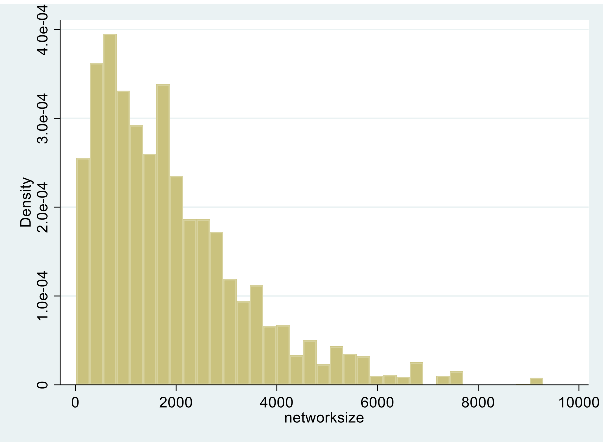


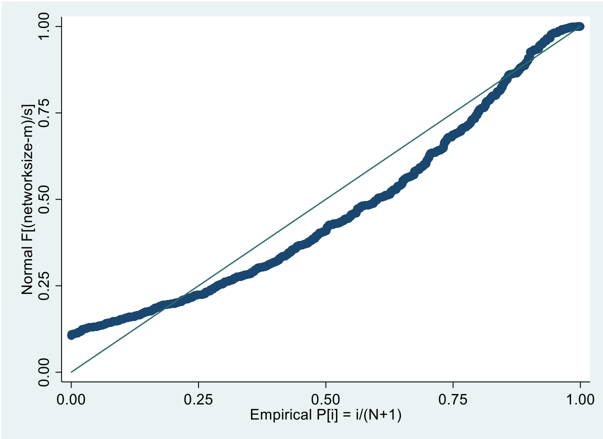


Variable name: Network size

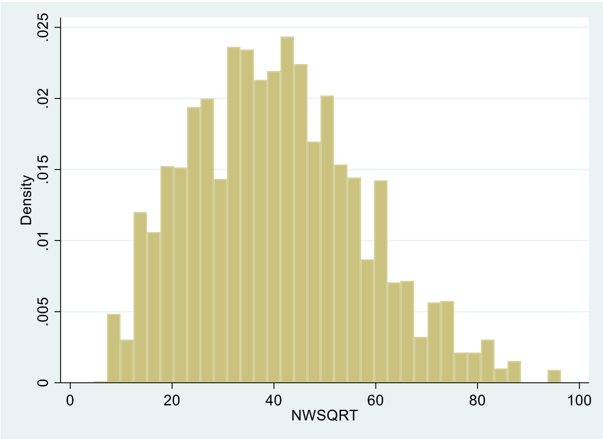
	Variable	LOG	SQRT	SR	INV
mean	1923.636	7.206563	40.51363	6015531	.001546
p50	1574	7.361375	39.67367	2477476	1.25e-07
sd	1521.765	.9383025	16.80345	9735254	.0392887
min	21	3.044523	4.582576	441	2.00e-09
max	9291	9.136802	96.38983	8.63e+07	1
skewness	1.389094	-.7423266	.411138	3.460285	25.37719
kurtosis	5.259471	3.518538	2.830671	19.44972	645.0015
N	3775	3775	3775	3775	3882

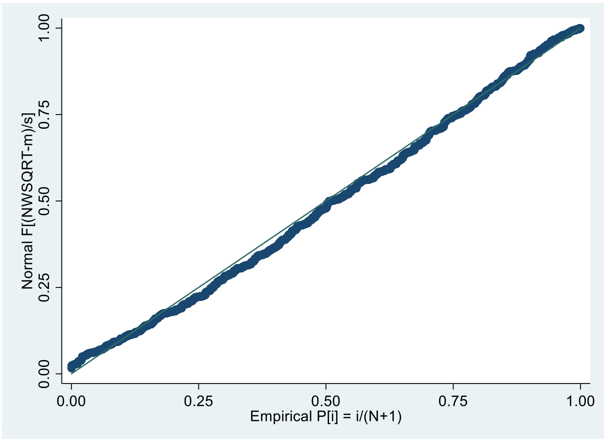
Before transformations:





After transformations:

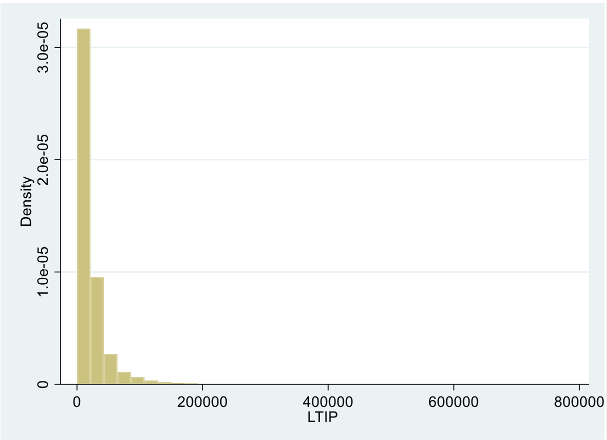


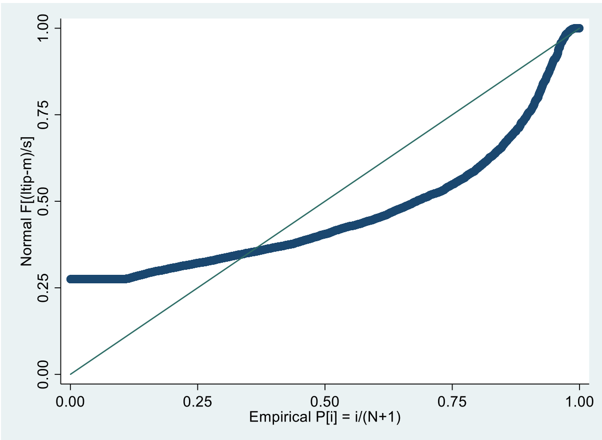


Variable name: LTIP

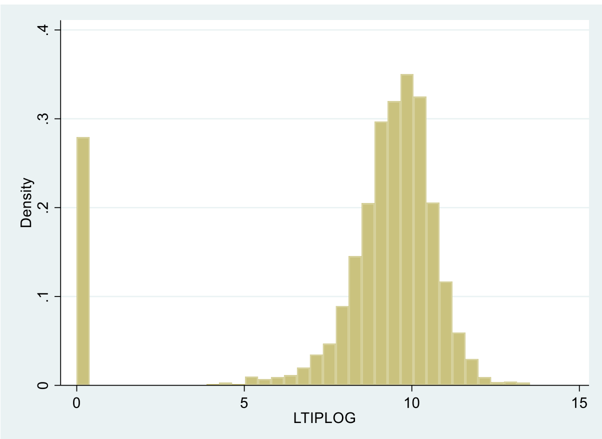
	Variable	LOG	SQRT	SR	INV
mean	21464.66	8.479194	120.4091	1.75e+09	.1081539
p50	12845	9.460788	113.3402	1.65e+08	.0000778
sd	35906.23	3.145929	83.48193	1.49e+10	.3103296
min	0	0	1	1	1.33e-06
max	750448	13.52843	866.2846	5.63e+11	1
skewness	8.245554	-1.996761	1.563401	23.83064	2.526328
kurtosis	113.9058	5.8255	10.20682	709.1801	7.382388
N	3649	3649	3649	3649	3649

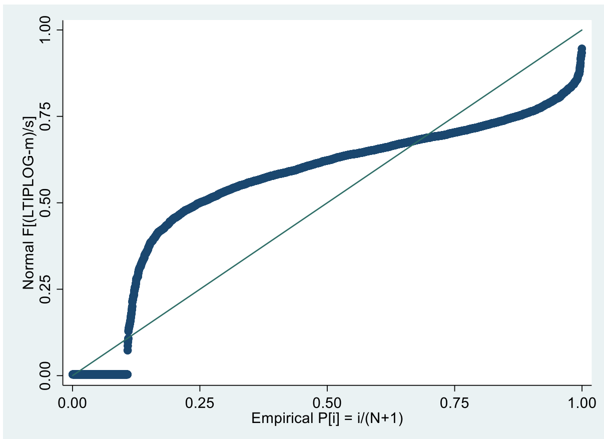
Before transformations:





After transformation:

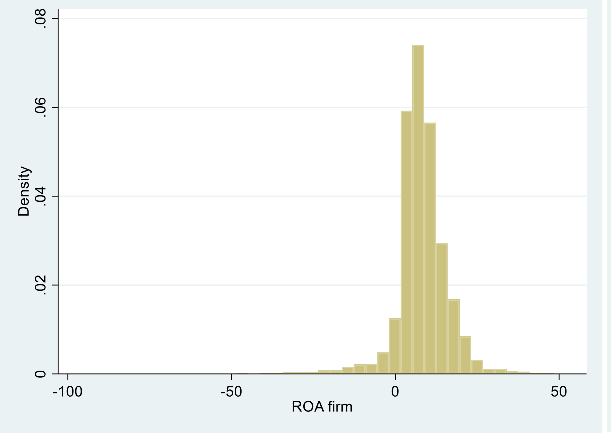


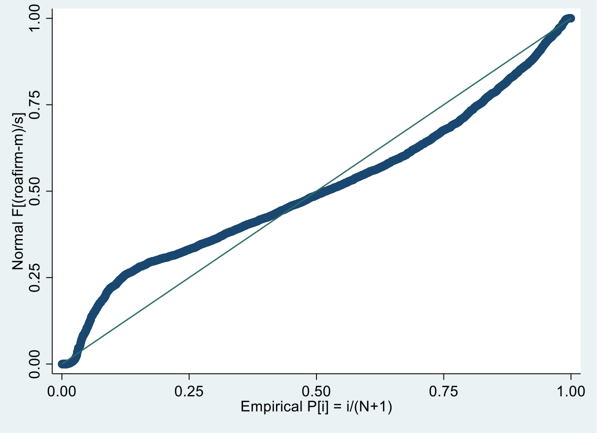


Variable name: ROA firm

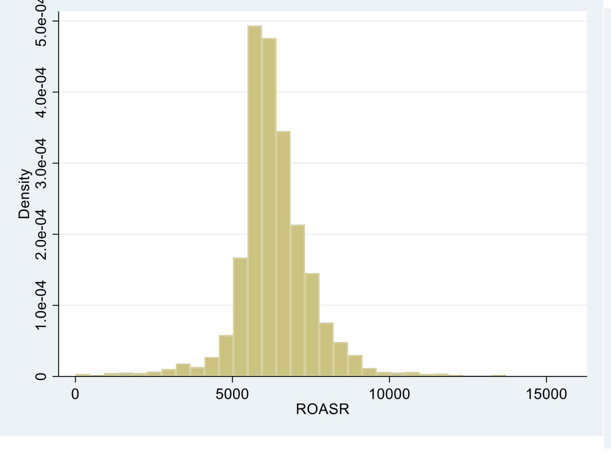
	Variable	LOG	SQRT	SR	INV
mean	8.024022	4.362013	8.874696	6314.325	.0131738
p50	7.785	4.366723	8.876091	6207.076	.0126928
sd	8.339479	.1470192	.513677	1247.826	.0182191
min	-70.11	-.1165338	.9433981	.7921	.0079089
max	55.44	4.839768	11.24455	15987.07	1.123595
skewness	-1.353514	-11.04668	-3.364902	.4171363	59.0648
kurtosis	15.05282	268.5994	38.45604	9.370198	3592.496
N	3844	3844	3844	3844	3844

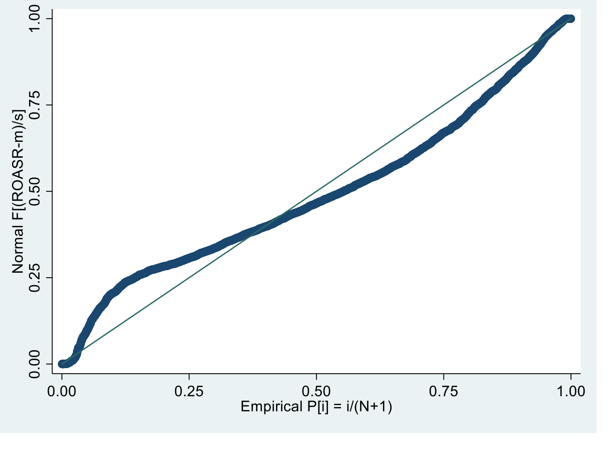
Before transformation:





After transformation:

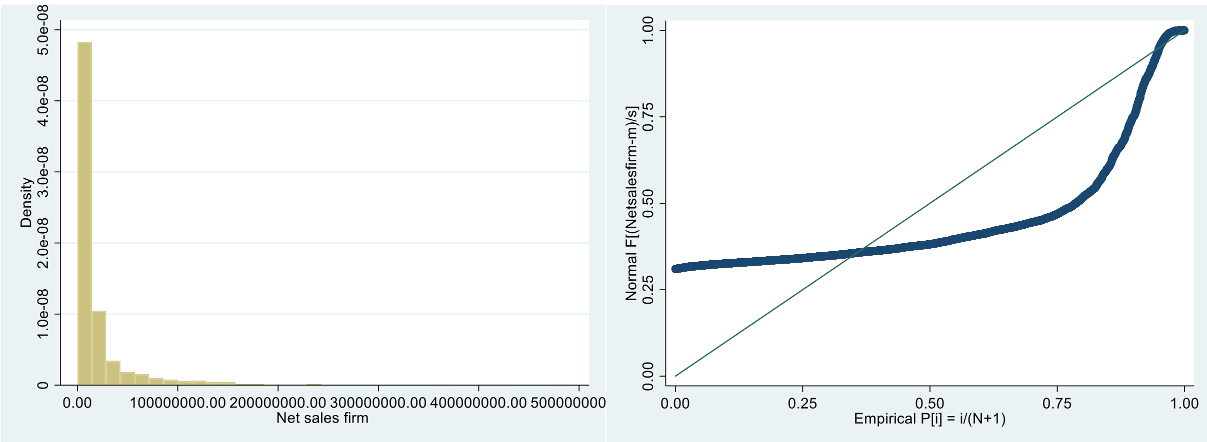




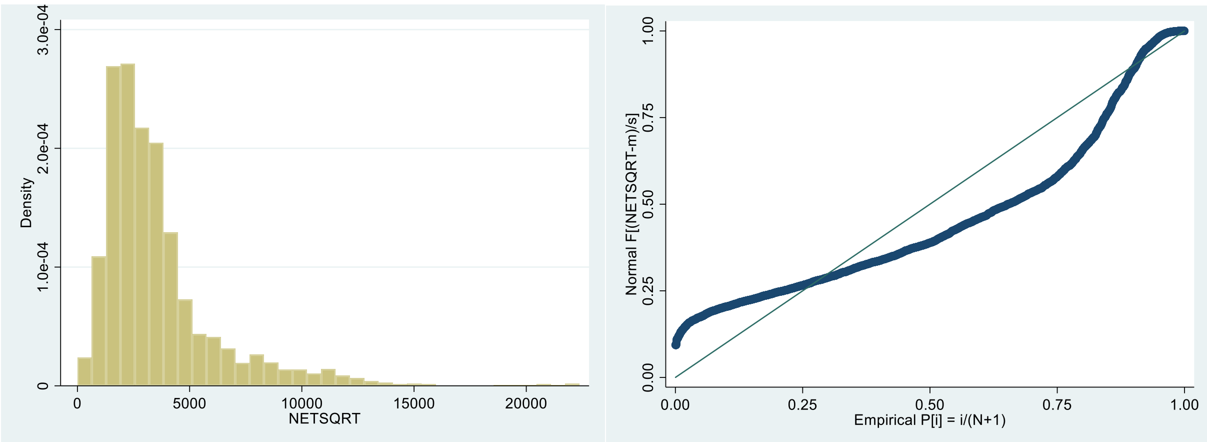
Variable: Net sales

	Variable	LOG	SQRT	SR	INV
mean	2.05e+07	15.92195	3603.492	2.12e+15	.001546
p50	8015000	15.89683	2831.078	6.42e+13	1.25e-07
sd	4.13e+07	1.45188	2734.142	1.37e+16	.0392887
min	0	0	1	1	2.00e-09
max	5.00e+08	20.0308	22368.35	2.50e+17	1
skewness	5.953835	-2.022434	2.446428	13.04339	25.37719
kurtosis	52.3831	25.01519	11.67805	194.0789	645.0015
N	3882	3882	3882	3882	3882

Before transformation:



After transformation:



VI | Descriptive statistics demographic characteristics

Variable	Mean	SD	Min	Max	N
Age Difference	5.73292	8.575221	0	35	339
Gender Difference	.2665021	.0766962	0	1	339
Nationality Difference	.4136953	.2182891	0	1	339
Education Difference	.5962097	.6165192	0	2	339

VII | Robustness check – Alternative ROA measures

Strategic change (t = 0)	**Model 1** *Fixed effect* β/se	**Model 2 (H1)** *Fixed effect* β/se	**Model 3 (H1)** *2LSL* β/se	**Model 4 (H2)** *Fixed effect* β/se	**Model 5 (H3)** *Fixed effect* β/se
CEO succession		-0.007	-0.009		
		(0.01138)	(0.01124)		
Forced CEO turnover				0.069	
				(0.05262)	
Dissimilarity					-0.032
					(0.02042)
Control variables (t-1)					
Prior strategic change	-0.176***	-0.176***	-0.176	0.001	-0.087
	(0.03137)	(0.03130)	(0.02223)	(0.09702)	(0.08345)
Age firm	0.060	0.060	0.060	0.369	0.523
	(0.03754)	(0.03726)	(0.04383)	(0.56208)	(0.55016)
Total assets	-0.015	-0.015	-0.005	0.077	-0.002
	(0.01868)	(0.01865)	(0.01683)	(0.05479)	(0.06485)
Number of employees	-0.006	-0.005	-.0.015	-0.113	-0.086
	(0.02240)	(0.02231)	(0.0166)	(0.06950)	(0.07227)
Network size	-0.001	-0.001	-0.001	0.001	-0.000
	(0.00053)	(0.00053)	(0.00044)	(0.00133)	(0.00141)
LTIP	-0.003	-0.003	-0.003	-0.006	-0.011**
	(0.00222)	(0.00221)	(0.00169)	(0.00629)	(0.00498)
CEO duality	0.014	0.015	0.015	0.084	0.085
	(0.01093)	(0.01096)	(0.01082)	(0.05892)	(0.05916)
Board size	0.000	0.000	0.000	-0.023***	-0.022**
	(0.00189)	(0.00189)	(0.00193)	(0.00847)	(0.00932)
ROA difference industry	-0.000	-0.000	0.000	-0.001	-0.006***
	(0.00069)	(0.00069)	(0.00060)	(0.00165)	(0.00158)
ROA goal	0.001	0.001	0.001	-0.000	-0.001
	(0.00092)	(0.00092)	(0.00118)	(0.00136)	(0.00109)
_cons	1.045***	1.036***	1.033	-2.125	-2.189
	(0.36118)	(0.35742)	(0.41427)	-461.580	-446.129
N	2.397	2.397	2.397	213	227
F	7.371***	7.097***	123460.91***	11.873***	5.837***
r2	0.103	0.103	0.103	0.658	0.685
r2_a	0.096	0.096	0.096	0.623	0.654

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and time fixed effects are included in all models.

Strategic change (t + 1)	**Model 1**	**Model 2 (H1)**	**Model 3 (H1)**	**Model 4 (H2)**	**Model 5 (H3)**
	β/se	β/se	β/se	β/se	β/se
	OLS	OLS	L2SL	OLS	OLS
CEO succession		0.025*			
		(0.01372)			
Forced CEO turnover			0.011	0.041	
			(0.011409)	(0.06315)	
Dissimilarity					0.065
					(0.04217)
Control variables (t-1)					
Prior strategic change	-0.124***	-0.124***	-.0124***	0.246	0.236**
	(0.02955)	(0.02954)	(0.02261)	(0.23532)	(0.11874)
Age firm	0.040	0.039	0.039	-0.897*	-0.591
	(0.03040)	(0.03114)	(0.04976)	(0.52328)	(0.59234)
Total assets	0.016	0.014	0.015	0.261***	0.301**
	(0.01844)	(0.01832)	(0.01847)	(0.08582)	(0.12402)
Number of employees	-0.014	-0.015	-0.015	0.240***	0.161***
	(0.02708)	(0.02645)	(0.01870)	(0.06501)	(0.03913)
Network size	-0.001*	-0.001*	0.015*	-0.001	-0.002
	(0.00058)	(0.00058)	(0.00049)	(0.00181)	(0.00148)
LTIP	0.000	0.000	-0.001	-0.008	0.005
	(0.00182)	(0.00183)	(0.00180)	(0.01183)	(0.00731)
CEO duality	-0.007	-0.007	-0.007	0.105	0.045
	(0.01180)	(0.01180)	(0.01159)	(0.07207)	(0.06352)
Board size	0.003*	0.003*	0.003	-0.017	-0.005
	(0.00181)	(0.00182)	(0.00200)	(0.01483)	(0.01581)
ROA Difference industry	-0.001*	-0.001	-0.001*	-0.003	0.000
	(0.00057)	(0.00057)	(0.00063)	(0.00390)	(0.00270)
ROA Goal	0.001	0.001	0.001	-0.001	-0.003
	(0.00066)	(0.00065)	(0.00119)	(0.00341)	(0.00238)
_cons	0.690**	0.732**	0.709	1.849	-0.741
	(0.30677)	(0.30884)	(0.47348)	-451.911	-400.544
N	2117	2117		193	206
F-test	6.716***	6.384***		6665.16***	11.280***
R-square	0.101	0.104		0.636	0.607
Adjusted R-square	0.094	0.096		0.596	0.567

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and time fixed effects are included in all models.

VIII | Robustness check: Alternative forced CEO turnover

	DV: Strategic change (t = 0)	***DV: Strategic change (t + 1)***
	β/se	β/se
Forced CEO turnover	0.070	0.017
	(0.05098)	(0.05984)
Other reasons	0.065	-0.276**
	(0.11614)	(0.13793)
Control variables (t-1)		
Prior Diversification	-0.050	0.324**
	(0.09876)	(0.13696)
Age firm	0.319	-0.710 *
	(0.58721)	(0.41879)
Total assets	0.068	0.311***
	(0.05905)	(0.08484)
Number of employees	-0.106	0.213***
	(0.06802)	(0.05305)
Network size	0.001	-0.001
	(0.00124)	(0.00169)
LTIP	-0.006	0.001
	(0.00742)	(0.01186)
CEO duality	0.065	0.080
	(0.05611)	(0.07704)
Board size	-0.022**	-0.006
	(0.01034)	(0.00977)
ROA	-0.000	-0.000
	(0.00001)	(0.00002)
_cons	-1.517	-0.332
	-484.395	-299.227
N	214	194
F-test	25.869***	53.955***
R-square	0.653	0.710
Adjusted R-square	0.617	0.679

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and time fixed effects are included in all models.
Note 3: The reference category is an unforced CEO turnover

IX | Robustness check – Strategic change timeframe

	Model 1	Model 2 (H1)	Model 3 (H1)	Model 4 (H2)	Model 5 (H3)
	Fixed effect	Fixed effect	2SLS	Fixed effect	Fixed effect
	β/se	β/se	β/se	β/se	β/se
Strategic change (t + 1)					
CEO succession		0.003	0.005		
		(0.01069)	(.01279)		
Forced CEO turnover				-0.080	
				(0.06369)	
Dissimilarity					-0.060
					(0.03051)
Control variables (t-1)					
Prior strategic change	-0.095**	-0.095**	-0.095***	0.461*	0.446***
	(0.03383)	(0.03384)	(0.02726)	(0.22294)	(0.10133)
Age firm	0.070*	0.069*	0.069	1.293*	1.061
	(0.03100)	(0.03087)	(0.06124)	(0.62555)	(0.73559)
Total assets	0.004	0.004	0.004	0.241**	0.056
	(0.02515)	(0.02515)	(0.02229)	(0.08169)	(0.14475)
Number of employees	-0.005	-0.005	-0.005	-0.069	-0.015
	(0.03533)	(0.03535)	(0.2199)	(0.04198)	(0.05073)
Network size	-0.000	-0.000	-0.000	-0.001	0.001
	(0.00057)	(0.00057)	(0.00060)	(0.00133)	(0.00179)
LTIP	0.002	0.002	0.002	0.009	0.007
	(0.00210)	(0.00210)	(0.00110)	(0.00598)	(0.00811)
CEO duality	0.005	0.005	0.005	0.129*	0.140
	(0.01003)	(0.01010)	(0.01315)	(0.06142)	(0.09451)
Board size	0.002	0.002	0.002	-0.009	0.007
	(0.00172)	(0.00172)	(0.00215)	(0.00942)	(0.01134)
ROA	-0.000*	-0.000*	-0.000	-0.000	-0.000**
	(0.00000)	(0.00000)	(0.00000)	(0.00003)	(0.00003)
_cons	0.525	0.531	0.533	-13.392*	-8.893
	(0.34984)	(0.34736)	(0.59330)	(6.37256)	(7.85431)
N	1856	1856	1856	164	173
F-test	5.348***	5.029***	100000***	34516129***	.
R-square	0.095	0.095	0.0955	0.760	0.710
Adjusted R-square	0.088	0.087	0.087	0.732	0.678

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and time fixed effects are included in all models.

X | Effect: Environmental Jolt

	DV: Strataegic change (t = 0)	***DV: Strataegic change (t + 1)***
	β/se	β/se
CEO succession * Jolt	-0.007	0.008
	(0.01513)	(0.01669)
Control variables (t-1)		
Prior Diversification	-0.168***	-0.141***
	(0.04709)	(0.04525)
Age firm	0.066	-0.018
	(0.11808)	(0.07324)
Total assets	0.001	0.061
	(0.04123)	(0.04365)
Number of employees	-0.015	-0.138**
	(0.05027)	(0.05824)
Network size	-0.001	-0.003**
	(0.00153)	(0.00117)
LTIP	-0.005*	-0.003
	(0.00331)	(0.00269)
CEO duality	0.015	-0.017
	(0.01936)	(0.01450)
Board size	-0.001	-0.001
	(0.00236)	(0.00225)
ROA	0.000	-0.000
	(0.00001)	(0.00001)
_cons	0.819	2.330***
	(1.16532)	0.062
N	1207	1195
F-test	3.137***	2.330***
R-square	0.047	0.062
Adjusted R-square	0.036	0.051

*Legend: * p<.1; ** p<0.05; *** p<0.01*
Note 1: Cluster robust standard errors between the brackets.
Note 2: Firm and year fixed effects are included in all models.