ERASMUS UNIVERSITY ROTTERDAM

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What are the effects of CEO family status on firm performance? Do these effects differ across gender?

Abstract

This paper assesses whether firm performance is affected by the family status of a CEO. That is, whether a CEO is married, divorced, a parent in general, or a parent to multiple children. Additionally, the differences of family status-effects between male and female CEO are tested. The models are tested by using generalized estimating equations. The dataset consists of CEOs of S&P100 firms from 2011 to 2019. The results show that CEO marriage and firm performance measured by ROA are negatively associated to each other. Besides this, there is no proof of life events in the life of a CEO influencing firm performance found. Future research could take on a more short-term approach, focusing on the direct effect of the life event, rather than the long-term approach that was taken in this study.

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1. Introduction

The chief executive officer (CEO) is the highest-ranking person in a firm. The CEO is responsible for the overall performance of a company. Consequently, firm performance is dependent on the decisions of a CEO (Antia et al., 2010). These decisions are, amongst others, influenced by the behaviour of a CEO, which is influenced by the CEO's life events (Bandiera et al., 2020).

Life events are defined as important occasions in a lifespan that can be expected or unexpected (American Psychological Association, 2022). They can be large or small, but they all have an impact on the life of an individual as life events cause personal growth and adaptation (Guzma & Essau, 2011). Research has shown that life events can affect an individual to the extent that they can change one's behavior permanently (Bleidorn et al., 2018). In the life of a CEO, this means that life events can permanently influence their decision-making. This could be of huge impact to a firm; negative or positive. For example, O'Sullivan et al. (2021) show that CEOs who had a traumatic experience in their early-life have an increased focus on corporate social responsibility (CSR) because of the strength and life lessons they gained from it.

The National Center for Health Statistics (2020) show that the number of divorces in the US is almost half as high as the number of marriages. Over the last few decades, the standard life expectation of getting married and having children has changed. Less people are married and more people remain single, partly caused by the increased focus on working instead of building a family. What strikes is that, on average, single people – compared to married ones – tend to be less successful regarding earnings, education and economical independence (The National Center for Health Statistics, 2020). This creates ground to believe that the life event of marriage has a positive influence on individuals.

Reina et al. (2017) tested whether CEOs in the United States (US) experienced negative effects from family-to-work conflicts (FWC) on firm performance.[1] They found that this conflict has a negative impact on firm performance. Neneh (2018) did a similar study on FWC in female-owned firms and Pan and Yeh (2019) looked at FWC for hotel employees. They both found results corresponding with Reina et al. (2017): FWC have a negative impact on firm performance. Where existing research that focuses on FWC takes together all factors that could induce FWC, this paper aims to make a distinction between a number of FWC situations (i.e., marriage, divorce, parenthood) to find out more specifically what this negative

[1] Reina et al. (2017) define FWC as "*the extent to which one's work responsibilities are made more difficult by family responsibilities*". They add: "*FWC can refer to any situation, positive or negative, that distracts a person from his or her job that occurs away from work, such as care for a sick parent, a divorce, the purchase of a home, or the birth of a child.*"

impact enhances or stems from. Additionally, this paper attempts to find out whether these effects differ by gender of the CEO. The research question that is central in this paper is "*What are the effects of CEO family status on firm performance? Do these effects differ across gender?*" In which *family status* relates to three life events regarding family status: marriage, divorce and parenthood.

In this study, we focus on firm performance as CEO behavior is found to be related to firm performance (Bandiera et al., 2020). As stated before, family status can influence work performance and the behavior of an individual. Therefore, this research focuses on life events regarding family status. This paper follows previous research by using firm performance as a measure for how well the CEO is running the firm (Andric et al., 2020; Khan & Vieito, 2013; Zhou, 2012). In the main analysis, firm performance is measured by return on assets (ROA). We later test for the robustness of this measure by using return on equity (ROE) as a proxy for firm performance. The research question will be answered based on data from a sample of the CEOs of S&P100 firms from 2011 to 2019. It will be layered out in four hypotheses, testing the effects of CEO marriage, CEO divorce, CEO parenthood, and whether a CEO has multiple children. Additionally, CEO gender is added in subhypotheses regarding CEO divorce and parenthood.

Whereas most existing research focuses on the effects of family status on general employees' work performance, this paper adds to the existing literature by digging deeper and estimating an effect on CEO-level and their firm performance. The existing body of literature does not discuss the relation between CEO life events and the performance of their firm. An answer to the research question could give insights for policy makers regarding new hires or promotions. Is it important to weigh life events in these decisions? Different firm types could have preferences for employees with different family statuses, which could be incorporated in their hiring policies. Additionally, it could be interesting for firms to focus on the benefits of taking measures after an employee went through a certain life event. For example, extra measures regarding maturity leave and daycare. It is important to note that this research focuses on long-term effects of family status, rather than the direct short-term impact of after an event.

This study finds that marriage has a negative effect on firm performance. A CEO being divorced, a parent, or a parent to multiple children has no relation to firm performance. Gender differences do not have a moderating effect on the relation between firm performance and any of the life events tested in this paper.

The paper is built up as follows: section 2 will discuss the theoretic framework and hypothesis building, section 3 the data and methodology, section 4 the results of the main analysis and robustness checks. Finally, sector 5 will contain the limitations, discussion and conclusion of the paper.

2. Literature review

2.1. Life events

As discussed in the introduction, life events are experiences that have a permanent influence on an individual's personality and behavior. The field of psychology describes two types of life events: positive and negative, also referred to as desirable and undesirable life events. Desirable life events mostly correspond with the American standard measures of success like marriage, family, education, occupation and health. Undesirable life events consist of negative events like death, divorce and jailtime (Holmes & Rahe, 1967).

Vinokur & Selzer (1975) find that there is a positive relation between undesirable life events and stress-related variables that have a negative influence on mental health. This effect does not exist for desirable life events. Negative life events generally weigh heavier on individuals than positive life events do (Berntsen et al., 2011). The authors note that this difference is caused by the immediate response to negative experiences that cause distress, while positive experiences gradually help build identity, life story and a buffer against negative experiences. This is in line with the behavioral economic theory of negativity bias. This bias states that negative experiences weigh heavier on an individual than positive experiences do (Rozin & Royzman, 2001). Sutin et al. (2010) show that individuals experiencing stressful life events generally report lower self-rated health because of it. The authors add that these individuals report no change in the level of psychological distress after a stressful life event if the suspects perceived it as a turning point or lesson learned. When the suspects do not gain any insights from it, the levels of self-reported psychological distress increase as a result of the stressful event. Additionally, Nishikawa et al. (2018) show that beyond the type, also the timing of a life event plays a large role regarding the further life of the individual experiencing it. By this, they mean that negative life events in the early life of an individual generally shape an individual more than if the same event had happened when the individual was at an older age. For example, when someone was bullied in their childhood, they could experience poor well-being in their adulthood because of this negative life event. If the same person had been bullied as an adult instead of in their childhood, the effects would probably have been less severe. Lastly, Ross et al. (1990) consider the effects of family on mental and physical health. Their results show that married people are in better health than single and divorced people and that these effects are found to be stronger for males than for females. The general positive effect of marriage is mainly due to married people having more emotional support and better economic well-being – compared to single and divorced individuals.

The authors also reviewed the effects of parenthood on the health of an individual but found no significant difference between the health of parents and non-parents.

2.2. CEO & firm performance

A report by McKinsey & Company is focused on how a CEO can improve a company (Dewar et al., 2022). They note that a company is not just run by a CEO. The CEO delegates important managerial tasks to C-suite managers and has a board of directors to advise him in his strategic decisions. C-suit managers are, for example, the Chief Financial Officer (CFO) who takes budgeting decisions, the Chief Marketing Officer (CMO) who takes the important marketing decisions and the Chief Operating Officer (COO) oversees the firm's operations (Masterclass, 2021). This paper focuses on S&P100 companies, which are all multinational firms. All firms included in this paper therefore have a C-suite like discussed above. Dewar et al. (2022) find that though many firm decisions are not just made by the CEO, there are ways for a CEO to influence firm performance. The CEO can set a company's vision and stimulate their employees to act in line with it. They should exercise bold moves early to try to outperform competitors and keep active and innovative, rather than sitting still after a move. They need to constantly optimize the firm in their strategy and processes. These findings are in accordance with Nohria et al. (2014) who find that successful CEOs push their companies to greatness through a certain leadership strategy. They create a strategic vision and execute it efficiently, innovate to stay ahead of the market, develop a company culture and act in line with it, and build an efficient company structure that motivates employees to do their job well. CEOs can thus affect firm performance by influencing firm strategy and company structure. Several papers confirm this relation between firm strategy and performance (Parnell and Wright, 1993; Smith et al., 1989; Snow and Hrebiniak, 1980). A well-known theory regarding this phenomenon of executives influencing firm strategy is the Upper Echelons Theory by Hambrick and Mason (1984). This theory states that executives act and make decisions based on their personal interpretations, experiences, values and personality. This means that CEO do not always make their decisions completely objectively – albeit subconsciously.

Firm performance is often measured by return measures. These include ROA, ROE, return on investments (ROI), return on sales (ROS) and sales growth. ROA is the most commonly used measure for firm performance (Blackmore & Nesbitt, 2012; Buallay et al., 2017; DeSarbo, 2005; Fiss, 2011; Jadiyappa et al., 2019). This measure indicates the profitability of the firm. It thus measures the efficiency of the firm, which can be regulated through internal policies and protocols (Saraç et al., 2014). This efficiency can be controlled by the CEO through, for example, strategic vision and company culture – as noted before.

2.3. Gender

In the context of this study, it is interesting to look at the role of gender. The Cherie Blair Foundation for Women (2021) published a report on female stereotyping. They found that gender stereotypes often are already conveyed in girls' childhoods. Additionally, there is a lot of judging in choice of career path based on gender. An important factor playing a role here is the lack of female role models that show young girls the possibilities for their future jobs. These children learn about stereotypes in jobs from a young age. The foundation sent out surveys and the results showed that females feel like they get less business opportunities than their male counterparts do. There thus is still a lot of gender discrimination going on in the business world. That is the reason that – for divorce and parenthood – we will analyze whether their relationships with firm performance differ by CEO gender. Gerber (2009) concludes that differences in (self-perceived) personality traits and the stereotyping between males and females – like the Cherie Blair Foundation (2021) described – are mainly caused by status observations. When people repeatedly observe that males have a higher status than females, a portrait is being sketched that creates stereotypes for males and females. This is also in accordance with the lack of female role models discussed by the Cerie Blair Foundation for Women (2021). The U.S. corporate C-Suite still exists for 75% of males. From 2016 to 2021, this is an increase of 27% of women in the C-suite (McKinsey & Company & LeanIn.org., 2021). The stereotype observation is thus logical as the large majority of leaders in the US is male.

A different branch of research shows the difference in management styles between males and females (Helgesen, 1990; Rosener, 1990; Vinkenburg et al., 2000). Gender-related research shows either of two outcomes. It either proves that females are better leaders because they tend to be better in communication, empathy, listening, negotiation and handling conflicts than men are, or it shows no significant differences between genders (Chow, 2005). Existing research shows no hard evidence that males possess better characteristics to be leaders – though in practice we find the majority of CEOs to be male. So, when focusing on characteristics, females seem to be the better choice for leadership. "Women in the workplace" is an annual report published by LeanIn.Org and McKinsey & Company, based on the female workforce in the US. Their 2021 report shows that, while the female workforce is increasing and an increasing number of females is represented in high functions, women are still underrepresented. This report states that female CEOs work harder to make the workplace a nice and safe place for their employees than their male counterparts (McKinsey & Company & LeanIn.org., 2021). A nice working environment, in turn, improves firm performance (Buhai et al., 2008). These results could mean that women, on average, generate higher firm performance than males, which is in agreement with Khan and

Vieito (2013). The point of view that females are better leaders is also taken on by research that shows females are systematically more risk-averse than their male counterparts (Charness & Gneezy, 2012; Khan & Vieito, 2013). Khan & Vieito (2013) find that firms with female CEOs perform better on average than firms with male CEOs, because of this difference in risk attitude.

This is unlike the findings of Fairlie and Robb (2009), who find that the difference in risk attitude is mainly caused mainly by the lack of work experience and financial capital in female-owned companies (Fairlie & Robb, 2009). The results by Khan and Vieito (2013) are based on a sample from 1992 to 2004, containing data from companies listed on the S&P 1500. Additionally, performance of female-owned companies is generally lower than that of male-owned companies. Jadiyappa et al. (2019), for example, found that female CEOs perform significantly worse than male CEOs, based on a sample of Indian firms from 1999 to 2015. They suspect this effect to be caused by increased agency costs for female CEOs. Adams and Ferreira (2009) add to this that having a board with a large proportion of females on it lowers firm performance. They suspect this relation to be caused by overmonitoring. Adams and Funk (2012) have corresponding findings, namely that females take less risk and they care less about achievement and power than men. These findings could help explain the findings of Fairlie and Robb (2009).

Regarding life events, Sutin et al. (2010) show that females are more likely to report a stressful event than males. They are also more likely to become depressed as a result of an undesirable life event, compared to males (Nazroo et al., 1997). This chance of getting depressed is lower for married people than it is for unmarried people. However, this is only the case when the marital relationship is good. When this is not the case, at the time of a negative life event women are let down by their spouse and therefore the chances of depression are increased. Females show greater dependence on support from others. They thus show to be generally more sensitive towards life events than males are (Edwards et al., 1998). Duxbury et al. (1994) find that females mainly carry the weight of parenthood, and this reflects on work performance. That is, their work performance decreases after they birth a child, as work-life balance gets disrupted (Duxbury et al., 1994).

Because of the possible differences in firm performance between male and female CEOs, the hypotheses in this paper regarding divorce and parenthood are followed by subhypotheses testing for differences across gender. These moderation effects of gender are analyzed to find out whether a significant difference between genders exists related to life events and their influence on firm performance.

2.4. Marriage

The number of people getting married in the US has dropped by eight percentage points since 1990. More people are staying single for a longer time than people used to in the past. Many people decide on just cohabitation rather than marriage, whereas in the past cohabitation was perceived more as a transition phase towards marriage (Geiger & Livingston, 2020; Rank, 1981). The reasons for marriage differ from what they used to be in the past. In the past, people mostly got married to be able to build a family. Unmarried people would feel ashamed and feel inferior towards people that were married (Orr, 1963). Geiger and Livingston (2020) continue that these old-school visions of marriage being something necessary to start building a family have faded. Nowadays, most Americans marry for love. There is also a fair share of people marrying for the legal benefits of it.

The general finding in existing research is that married people, compared to non-married people, report better mental and physical health and greater well-being (Gurin, 1960; Haring-Hidore et al., 1985; Gove 1972; 1973; Williams, 1988). Marriage has a positive effect on the mental and physical health of an individual, because it ensures some kind of steady social contact that singles do not have (House et al., 1988; Jackson & Frame, 2018; de Vaus, 2002). A good mental health, in turn, has a positive effect on work performance (Wright et al., 1993).

Regarding the life event of marriage, a lot of the previous research has focused on a dataset of American CEOs from 1993 to 2008, generated by Roussanov and Savor (2014). Studies based on this dataset have found that single CEOs take more risk and take on a more aggressive approach than married CEOs. This is especially the case for young CEOs (Hilary et al., 2017; Roussanov & Savor, 2014). Furthermore, research based on the Roussanov and Savor (2014) dataset has found that married CEOs focus more on CSR than unmarried CEOs (Hegde & Mishra, 2019). This would lead to higher firm performance on the long term (Kao et al., 2018). This could mean that married CEOs would achieve higher firm performance on the long term.

Based on the fact that, compared to unmarried individuals, married individuals exhibit greater mental and physical health and well-being, and the fact that well-being improves work performance, we hypothesize that firms with married CEOs have higher performance than firms with CEOs that are not married.

Hypothesis 1: "Firms with married CEOs compared to unmarried CEOs have higher firm performance."

2.5. Divorce

Divorces are becoming increasingly common. Almost half the marriages in the US ends in divorce or separation. An average first marriage lasts only eight years before it ends in divorce. Adults with a low-income, African-Americans and baby boomers are examples of groups that show enlarged levels of divorce in the US. Americans with high incomes and Asian-Americans generally show low levels of divorce. Reasons for divorce could be infidelity, lack of commitment, too many fights or domestic violence (Wilkinson & Finkbeiner, 2022).

Existing literature shows evidence for two contradicting effects of divorce. It either shows that firm performance is resilient to divorce, or it shows that divorce negatively influences the wellbeing of an individual – and thus work performance (Amato, 2010; Hetherington & Kelly, 2002; Lee et al., 2011; Mancini et al., 2011). Sbarra and Coan (2017) take the well-being focus a bit further and focus on personal health effects caused by divorce rather than performance-related effects of divorce. They focus on individual differences between the lives of respondents to find out which of these two outcomes is the most plausible. They show that only a small percentage or divorcees experience low health outcomes as a result of their divorce. Most people are resilient to the effects of divorce. However, they do show an association between divorce and increased risk for negative health outcomes. The reasons behind this increased risk are not clear but may have to do with anxiety and attachment issues. This study by Sbarra and Coan (2017) is relevant to describe because, as previously discussed, work performance is influenced by mental health and wellbeing. Gustavson et al. (2014) show that the response to divorce depends on the quality of the relationship. When the initial relationship was of bad quality, divorcees show increased life satisfaction.

Focusing on firm performance, Zhou (2012) finds that a negative effect of divorce on firm performance exists around the time of divorce, due to the conflicts when the CEO is in the process of divorce. This contradicts the positive effect findings of Gustavson et al. (2014), that often divorce induces an increase in the well-being of an individual due to relief after a stressful period. This paper focuses on whether a CEO is divorced in general, not the actual time of the divorce. Because of this, we take a more long-term approach. Combining this with the findings of Gustavson et al. (2014) – that after a divorce the relief of getting out of the relationship increases human well-being – we expect to see a positive relationship between a CEO being divorced and firm performance. In this study, we distinguish between people that have ever been divorced and people who have never been divorced.

Hypothesis 2A: "Firms with divorced CEOs compared to non-divorced CEOs have higher firm performance"

When looking at differences in gender, women experience more conflicts between them and their former spouse after divorce than men do (Hald et al., 2020). Hald et al. (2020) explain these conflicts as problems with communication, being around each other, and respecting each other. These differences between gender and the experiencing of conflicts is caused by the reasons for divorce. Men mostly relate the conflicts to one factor being their initiation of divorce, whereas women relate the conflicts to multiple factors like mostly infidelity, initiation of divorce and when one of the two – rather than both – has a new partner after the divorce (Hald et al., 2020). Gerstel (1988) finds that women are generally better at rebuilding and maintaining social connections than men are, and therefore women are more likely to engage in a new relationship after their divorce. The previously discussed literature on marriage showed that males generally gain more benefits from a marriage than females do. Because of males losing these benefits after divorce and because women seem to be better at rebuilding their life after divorce, we expect divorced women to report better well-being and thus better performance at work than divorced males (Wright et al., 1993). We therefore hypothesize the following:

Hypothesis 2B: "Being female positively moderates the relationship between divorce and firm performance."

2.6. Having children

Having children can be a life-changing event. A child introduces new responsibilities into the life of a parent. Parents are forced to be patient and must adapt their life to that of their child. Babies need sleep, structure, love and attention. A parent has to keep a strict planning and be aware of their child and their surroundings at all times. Every life decision is taken while considering how it would affect the child (Bright Horizons, 2019).

While nowadays men are participating more in parenthood than they used to in the past, it has been shown that women still mainly take care of the children (Brooks, 2020). Females experience a conflict between spending time on work and spending time on parenthood. Fathers experience this conflict to a lesser degree (Ladge et al., 2015). Ladge et al. (2015) created a dataset by asking fathers about their job satisfaction and how much time they spent with their children on a day. The authors showed that fathers are more satisfied with their work activities when they spend a fair amount of time with their children, instead of only spending their time on working to provide for their family.

Van Scheppingen et al. (2016) and Umberson et al. (2010) both researched the relationship between parenthood and the well-being of an individual. They agree that becoming a parent has a big impact on the life course of an individual. In a review of the literature, Umberson et al. (2010) found that

parents of young children experience higher stress levels and lower well-being than childless individuals. Especially first-time parents are more likely to experience higher levels of stress, anxiety and depression than non-parents are. This is likely to be caused by time and money issues (Brockington, 2004; McLanahan & Adams, 1987). This psychological distress and decrease in wellbeing caused by parenthood are found to be more existent for mothers than it is for fathers (Matthey et al., 2000). Additionally, it is more extant for young individuals than it is for older ones. It thus is not only the parent-to-be status that causes a change, but also the timing of it. Especially teenage parents struggle with their education status, work opportunities and marital stability in their later lives. Distress and decrease in well-being in turn could have a negative effect on parents' work performance. As individuals get older, these negative effects of parenthood on performance are reversed. Childless elderly report lower well-being than elderly with children. Parents of adult children showcase the same stress levels as childless individuals (Umberson et al., 2010).

Where most research focuses on the mother or the parent in general, Kaufman and Uhlenberg (2000) focus on two models in which fathers play a role. Using data from 1992-1993, they distinguish between providing-fathers (traditional) and involved-fathers (modern). In the providing-father model, the father works a lot after having a child to provide for the family. In the involved-father model, the father is largely involved in raising the kid. The authors find opposite results for males and females, with increased employment for fathers over non-fathers and decreased employment for mothers over non-mothers. In the provider or involved point of view, the results show that the providing, traditional, type of father works more hours after a child is born. The involved, modern, father works less hours after a child is born. This research was conducted over 20 years ago, with data that is about 30 years old. These results could now have changed as the traditional male may be less present in modern society compared to 1992. However, nowadays parenthood still has a larger effect on the career of females than it does on the career of males (Geiler & Renneboog, 2015).

Having a child generally decreases parental wellbeing and work performance, (Brockington, 2004; Matthey et al., 2000; McLanahan & Adams, 1987; Van Scheppingen et al., 2016; Umberson et al., 2010). One could expect that the time spent on work decreases when a CEO has to spend time with their children as well. Therefore, the expectation is that firm performance decreases after a CEO has a child. We thus hypothesize the following:

Hypothesis 3A: "Firms with CEOs that have children compared to firms with CEOs that have no children have lower firm performance"

Regarding gender, it is intuitively assumed that women carry a larger weight of parenthood than males do because of natural processes. Women have to carry, birth, and feed the baby in the first stages of parenthood – men have more freedom regarding this situation. This could be an explanation for the previously discussed finding that increased levels of psychological distress and decreased well-being as a result of parenthood are more existant for mothers than it is for fathers (Matthey et al., 2000). Existing research found that mothers, on average, work less hours and are less likely to be employed than fathers and that they have lower wages partly because of this phenomenon (Kaufman & Uhlenberg, 2000; Waldfogel, 1997). Additionally, a common pattern in the past – while decreasing since the 1970's – is that mothers drop out of the labor market. This decrease was especially notable for single mothers and mothers with a degree (Boushey, 2008). Previous literature has shown a positive relation between payment rate and firm performance, which could be explained by performance incentives (Zhou, 2000). This would mean that when payment decreases, firm performance would decrease. Nowadays, compared to the past, females are more focused on their career and more often have a degree. This means that the negative effect of having children on firm performance could have decreased. There is little research to date that focuses specifically on firm performance after a CEO has a child. We hypothesize that the negative relation between parenthood and firm performance is larger for female CEOs than they are for male CEOs, considering the findings of research discussed above (Duxbury et al., 1994; Kaufman & Uhlenberg, 2000; Geiler & Renneboog, 2015).

Hypothesis 3B: "Being female negatively moderates the relationship between CEO parenthood and firm performance"

2.7. Multiple children

Whereas one child may be hard to handle, the extra work builds when you have another child. This is also found by Kaufman and Uhlenberg (2000), who find that people with multiple children work less hours. Divicienti et al. (2018) add to this that part-time workers decrease the productivity of a firm.

We combine the finding that parents of multiple children work less hours and therefore are less productive in a firm (Kaufman & Uhlenberg, 2000; Krapf et al., 2017). As a result, we hypothesize that firms with CEOs that have multiple children have lower firm performance than firms with CEOs that have only one child.

Hypothesis 4A: "Firms with a CEO that has multiple children have a lower firm performance than firms with a CEO that has only one child."

Focusing on gender, Krapf et al. (2017) found that having multiple children decreases work productivity for mothers. This effect is less pronounced for fathers than it is for mothers. An interesting note to add is their finding that the direction of this effect turns around when the children are in their teenage years. Having older children actually increases work performance for mothers as mothers often have become very organized, as a result of parenthood. In addition to their study on the influence of parenthood on employment, Kaufman and Uhlenberg (2000) find that having multiple children makes no difference to men, but this differs for women. The more children they have, the significantly less hours mothers spend working. This effect becomes smaller when the children get older. Since their research was done on 1992-1993 data, and since then society has changed with regards to parents working, using more recent data might moderate the relationship that has previously been found, but keeping in mind the natural implications of motherhood, we still expect the direction to remain unchanged. This, in combination with the findings of Matthey et al. (2000) – that mothers experience more distress and decreases in wellbeing than fathers – lays ground for the following hypothesis:

Hypothesis 4B: "Being female negatively moderates the relationship between having multiple children and firm performance."

3. Data and methodology

3.1. Dataset

For this research, a longitudinal dataset of S&P100 firms and their CEOs was created. The dataset is based on a database ranging from 2011 to 2013 created by Lisanne Veter, PhD Student at Erasmus University, to study the effects of CEO life events on firm performance. For our paper, the dataset was broadened by adding data from 2013 to 2019. This new updated dataset modernizes this research, setting it apart from much research that has been done on the Roussanov and Savor (2014) dataset. Firm data was retrieved from Compustat. CEO-specific data was received through various online sources. Multiple sources have been compared for every CEO to verify the information found. Examples of these sources are interviews in business articles or on company websites, Wikipedia and CEO fanbases – as CEOs in the US often have celebrity statuses.

3.1.1. Firm performance

Firm performance is the dependent variable in this paper. As mentioned in section 2.2, firm performance will be measured using ROA, like other authors have done before as well (Buallay et al., 2017; Jadiyappa

et al., 2019). All values of ROA in the dataset are generated using the net income in the year of observation divided by total assets in the year of observation, retrieved from Compustat.

3.1.2. Life events

The life events highlighted in this paper are marriage, divorce, general parenthood and having multiple children. These events are included in the dataset using dummy variables. The variable *CEO married* has value 1 if the CEO is married and value 0 otherwise. *CEO divorced* has the value 1 if the CEO has ever had a divorce and value 0 if they have not. *CEO parenthood* has the value 1 if the CEO has children and value 0 if they have not. Lastly, *Multiple Children* has value 1 if the CEO has 2 or more children and value 0 if they have only one child. Consequently, all observations of CEOs having zero children drop out of models 7 and 8. This paper does not consider stepchildren.

3.1.3. Gender

The variable for *CEO gender* is constructed as a binary variable with value 1 if the CEO is male and value 0 if the CEO is female. This paper does not consider any other genders than male or female.

3.1.4. Control variables

We control for firm characteristics through variables *firm age* (years since establishment) and *firm size* (number of employees in thousands). Focusing on CEO characteristics, we control for *CEO tenure* and *CEO age* using continuous variables. The values of these variables equal the years the individual is active as CEO in the company and the age of the CEO, respectively. Existing research on firm performance has shown that CEO age has a negative effect and CEO tenure a curvilinear effect – first inclining and after some years declining (Eitzen & Yetman, 1972; Zhang, 2010). Lastly, we add year fixed effects by adding dummies for each year, to control for the year of observation.

3.2. Methodology

3.2.1. Research methods

This research will use a generalized estimating equation (GEE) approach created by Liang and Zeger (1986) and Zeger and Liang (1986) – an exention to the generalized linear model (GLM). This model is especially suitable for the analysis of longitudinal data and works well with estimating within-firm covariance structures. The dataset used in this paper consists of repeated evaluations of S&P100 firms and their CEOs. This study uses *year* as the time variable and *firm-ID* as panel variable. The model estimates the average of the population, and from there on provides results that show how much the average response would change when the independent variables increase with one unit. That is, in this paper, how much the

average firm performance would change when a variable regarding life events changes with one unit, ceteris paribus. Another beneficial characteristic of GEE is that it accounts for correlation within subjects and for non-normal distributions. The GEE approach works well with this kind of correlation because the GEE model, in contrast to GLM, does not assume independence of the observations and does not require a balanced dataset (Ballinger, 2004; Homish et al., 2010; Zeger & Liang, 1986).

The hypotheses tested are shown by model in table 1 below. Model 1 only runs the control variables on firm performance, as a baseline for comparison. Model 2 tests hypothesis 1 by adding the binary variable for the marriage status of a CEO to the baseline model. Model 3 tests hypothesis 2 by adding the binary variable for the divorce status of a CEO to the baseline model. Here it is tested whether there is a difference in firm performance between CEOs that ever had a divorce in their lives and CEOs who have not. Then for the interaction effect between divorce and gender, model 4 is added. Model 5 tests hypothesis 3a by adding the binary variable for parenthood to the baseline model. Model 6 tests hypothesis 3b by adding an interaction term between parenthood and CEO gender to model 4. Model 7 tests hypothesis 4a by adding the binary variable for having multiple children to the baseline model. Model 8 tests hypothesis 4b by adding an interaction term between CEO gender and the binary variable of having multiple children to model 7.

A Woolridge test was performed, and the null hypothesis stating there is no first-order autocorrelation could not be rejected (p=0.403). This means that the ROA is not highly dependent on the previous year's ROA and we do not add an autoregressive variable to the model.

Table 1: Model overview

Model	Content
1	Controls only
2	Hypothesis 1: Marriage
3	Hypothesis 2a: Divorce
4	Hypothesis 2b: Divorce x Gender
5	Hypothesis 3a: Parenthood
6	Hypothesis 3b: Parenthood x Gender
7	Hypothesis 4a: Multiple Children
8	Hypothesis 4b: Multiple Children x Gender

3.2.2. Descriptive statistics

Descriptive statistics are shown in table 2 and table 3. The total dataset contains 924 observations. Appendix A, tables A.1 to A.4 show additional descriptive statistics. Table A.1 shows how many CEOs have been divorced for over and under 10 years. Table A.2 shows the division of CEOs in the dataset that have

no children, one child or multiple children. Table A.3 show the division between female and male CEOs that are married and unmarried. Lastly, table A.4 shows the division between female and male CEOs that are divorced and not divorced.

Table 2 shows a negative correlation between ROA and all four studied life events. This matches the hypothesized outcomes in this paper, except for the effects of marriage. ROA is also negatively correlated with CEO age, as is in accordance with the findings of Cline and Yore (2016). These authors find that CEO age is negatively related to firm performance. There are no alarmingly high correlations found in the dataset.

Furthermore, table 2 shows that over 90% of the CEOs in the sample are married, about 10% divorced, about 83% is a parent, the average CEO has more than one child, and the average CEO tenure is a little over 6 years. Bandiera et al. (2020) find that it takes three years for a CEO to make a difference. This means that the average CEO in this dataset has a long enough tenure to influence the firm performance. The average firm in the sample is over 80 years old, which makes sense for the large cap S&P100 firms it exists of. Even so does the average employee count of 139,500 make sense for these kinds of large firms. Finally, we note that a little over 91% of the CEOs in this dataset is male. All hypotheses regarding gender thus have to be interpreted with caution due to the lack of observations of female CEOs in the dataset. Additionally to this, there are no unmarried female CEOs in the dataset.

Table 3, shows the descriptive statistics of categorical variables. We note that all variables regarding life events are unevenly divided. Only 79 out of the 907 CEOs are unmarried, only 98 out of 799 CEOs are divorced, and only 40 out of 704 CEOs have multiple children instead of just one. We have to keep this in mind while interpreting the results.

Table 2: Descriptive statistics: number of observations, mean, standard deviation, pairwise correlations

Variables	N	Mean	SD	(1)	(2)	(3)	(4)
(1) ROA	917	.069	.080	1.000			
(2) Firm age	924	81.82	52.40	-.147	1.000		
(3) Firm size	909	139.5	239.6	.015	-.015	1.000	
(4) CEO married	907	.913	.282	-.119	.154	.098	1.000
(5) CEO divorced	897	.109	.312	-.028	.043	.042	-.181
(6) CEO parent	880	.825	.380	-.043	.157	.113	.398
(7) Multiple children	704	.943	.232	-.047	-.049	-.046	-.014
(8) CEO gender	924	.916	.278	.035	-.040	-.027	-.095
(9) CEO age	924	57.98	6.747	-.046	.340	-.058	-.040
(10) CEO tenure	924	6.491	7.041	-.018	-.001	.009	.045
(11) Year	924	–	–	.008	-.008	.038	.009

Variables	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) ROA							
(2) Firm age							
(3) Firm size							
(4) CEO married							
(5) CEO divorced	1.000						
(6) CEO parent	.098	1.000					
(7) Multiple children	.076	-.025	1.000				
(8) CEO gender	-.171	.004	-.034	1.000			
(9) CEO age	.110	-.039	.026	.017	1.000		
(10) CEO tenure	.294	.083	.002	.094	.558	1.000	
(11) Year	-.016	.036	.046	.006	.041	.037	1.000

Table 3: Descriptive statistics of categorical variables

	Freq	%		Freq	%
CEO married			CEO Parent		
Unmarried (0)	79	8.71	Not a parent (0)	154	17.50
Married (1)	828	91.29	Parent (1)	726	82.50
Total	907	100.00	Total	880	100.00
CEO divorced			Multiple children		
Not divorced (0)	799	89.07	One child (0)	40	5.68
Divorced (1)	98	10.93	Multiple children (1)	664	94.32
Total	897	100.00	Total	704	100.00

4. Results

The results from the GEE estimation are shown in Table 4 – following the model description as in Table 1. First, in column 1, the baseline results are shown only using the control variables. Then, in column 2, the effects of a CEO being married on firm performance are shown. Column 3 reports the effects of a CEO being divorced on firm performance and column 4 adds an interaction term between CEO divorce and CEO gender to the previous column. Then, after that, the results of CEO parenthood on firm performance are reported in column 5. Column 6 shows the interaction between CEO parenthood and CEO gender. Column 7 reports the effects of a CEO having multiple children on firm performance and column 8 adds the interaction term between having multiple children and CEO gender to this. Finally, column 9 shows the full model. In section 4.1, the results of table 4 are discussed. In section 4.2.1., a robustness test is performed in which firm performance is measured by ROE instead of ROA. As a response to the results found, an additional test was performed using a sample containing observations of only male CEOs. The results of this additional test are discussed in section 4.2.2.

4.1. Main results

4.1.1. Marriage

Column 2 of Table 4 shows the GEE estimation results including control variables and the binary variable for CEO marriage. This model tests hypothesis 1: *"Firms with married CEOs compared to unmarried CEOs have higher firm performance."*. The results show a negative and significant effect of a CEO being married on firm performance ($\beta = -0.022, SE = 0.008, p < 0.01$). Hypothesis 1 is thus rejected. We find the opposite of what was hypothesized. Firms with married CEOs compared to unmarried CEOs have lower firm performance on average. It is important to note that because there are no unmarried female CEOs in the dataset, this outcome is only based on male CEOs.

4.1.2. Divorce

Column 3 shows the results of the GEE estimation testing hypothesis 2a: *"Firms with divorced CEOs compared to non—divorced CEOs have higher firm performance."*. The results in column 3 show insignificant coefficients ($\beta = -0.011, SE = 0.009, p > 0.10$). We therefore cannot assume there is a relation between a CEO being divorced and firm performance. Hypothesis 2a is not supported.

In column 4, the results regarding hypothesis 2b, *"Being female positively moderates the relationship between divorce and firm performance."*, are reported. No significant effect of gender is found on the relationship of CEO divorce on firm performance ($\beta = 0.021, SE = 0.024, p > 0.10$). This means that

there is no evidence showing that being female positively moderates the relationship between divorce and firm performance. Hypothesis 2b is not supported.

4.1.3. Parenthood

Columns 5 shows the results of the estimation testing hypothesis 3a: *"Firms with CEOs that have children compared to firms with CEOs that have no children have lower firm performance."*. This hypothesis is not supported as the results show no significant relation between parenthood and firm performance ($\beta = -0.013, SE = 0.010, p > 0.10$). We thus find no proof of a negative relation between a CEO being a parent and firm performance measured by ROA.

Hypothesis 3B, *"Being female negatively moderates the relationship between CEO parenthood and firm performance.",* is tested in column 6 through the interaction effect between CEO parenthood and CEO gender. The coefficient of the interaction effect between CEO parenthood and CEO gender is not significant ($\beta = -0.041, SE = 0.035, p > 0.10$). This means that there is no proof that being male positively moderates the relationship between CEO parenthood and firm performance. No support is therefore found for hypothesis 3B.

4.1.4. Multiple children

Column 7 shows the results testing hypothesis 4A: "*Firms with a CEO that has multiple children have a lower firm performance than firms with a CEO that has only one child.".* As the coefficient for having multiple children in column 6 is insignificant, this hypothesis is not supported ($\beta = -0.012, SE = 0.011, p > 0.10$). We do not find significant evidence to support the idea that firms with CEOs that have multiple children have a lower firm performance than firms with CEOs that have only one child.

Finally, column 8 shows the results for hypothesis 4B: *"Being female negatively moderates the relationship between having multiple children and firm performance."*. The interaction effect between having multiple children and the CEO being a male is insignificant ($\beta = -0.028, SE = 0.059, p > 0.10$). This means that there is no significant evidence supporting hypothesis 4B.

Table 4: Results of the GEE model with ROA as the dependent variable.

ROA	(1) Controls only	(2) Marriage	(3) Divorce	(4) Divorce x CEO gender	(5) Parenthood	(6) Parenthood x CEO gender	(7) Multiple children	(8) Multiple children x CEO gender
CEO gender	0.007	0.010	0.010	0.003	0.007	0.041	0.003	0.026
	(0.013)	(0.011)	(0.011)	(0.013)	(0.013)	(0.032)	(0.011)	(0.061)
CEO married		-0.022***						
		(0.008)						
CEO divorced			-0.011	-0.028				
			(0.009)	(0.022)				
CEO divorced				0.021				
x CEO gender				(0.024)				
CEO parent					-0.013	0.026		
					(0.010)	(0.035)		
CEO parent						-0.041		
x CEO gender						(0.035)		
Multiple children							-0.012	0.015
							(0.011)	(0.058)
Multiple children								-0.028
x CEO gender								(0.059)
Firm age	-0.000**	-0.000*	-0.000*	-0.000*	-0.000***	-0.000**	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm size	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEO age	0.001	-0.000	-0.000	-0.000	0.001	0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO tenure	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.042	0.103***	0.082***	0.092***	0.058	0.027	0.118***	0.091
	(0.035)	(0.029)	(0.028)	(0.031)	(0.037)	(0.045)	(0.036)	(0.064)
Observations	909	892	882	882	866	866	697	697
Number of firms	129	128	128	128	127	127	112	112
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Chi^2	32.50	36.18	30.40	31.11	33.97	35.48	20.16	20.16

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4.2. Robustness tests

4.2.1. Firm performance measure

As a robustness check, ROE is added to the dataset as a different measure for firm performance. The ROE has been used extensively as a proxy for firm performance in existing research (Michaud & Gai, 2009). It compares the firm performance to the performance of both the market and the competition. ROA and ROE both assess the financial performance of a firm. There is, however, a small difference between the two. ROA is determined by dividing the firm's net income by its total assets minus the liabilities. The ROE is determined by dividing the firm's net income by its net assets. ROE thus, in comparison to ROA, does not include debt (Kristiani, 2022). Because of this, ROE often disregards the risks that are involved with high debt (Hagel et al., 2013). Though a firm has a COO – controlling the operational functions – and a CFO– controlling the financial actions – working under the CEO, the CEO does control overall operations. The CEO therefore has bigger impact on operations than it has on finances. ROA specifically focuses on efficiency of the operating management, while ROE focuses more on the efficiency of financial management. Additionally, ROA is a better measure for financial performance than ROE is (Thakur, 2021). These reasons listed above, create ground for choosing ROA in the main analysis and ROE as a robustness check.

To generate ROE, *Net Income* is divided by *Shareholder Equity*. Data for both variables was retrieved from Compustat and ranges from 2011 to 2019. This is the same dataset that was used to calculate values for ROA in the main analysis. ROE is computed through the formula shown in Eq. (1). The variable for ROE contains 894 observations. A Woolridge test was performed and showed no signs of first-order autocorrelation ($p = 0.228$). We therefore do not have to add an autoregressive term.

$$ROE = \frac{Net\ income}{Shareholder\ Equity} \tag{1}$$

The results of this robustness check are shown in Table A.5 of appendix B.

Column 1 shows the controls, in which CEO gender has now become a significant control variable. Using the ROE, we thus find that male CEOs to show a decreased firm performance measured by ROE compared to female CEOs ($\beta = -0.975, SE = 0.449, p < 0.05$). Column 2 shows the results that test hypothesis 1. The binary variable for CEO marriage does not show a significant coefficient, and we thus reject hypothesis 1 ($\beta = -0.507, SE = 0.452, p > 0.10$). This means that when we measure firm performance by ROE, there is no relation found between a CEO being married and firm performance. Column 3 shows the results for hypothesis 2a. Again, no significant coefficients are found ($\beta =$

$0.153, SE = 0.445, p > 0.10$). There is thus no significant association between a CEO being divorced and firm performance measured by ROE. Column 4 adds the interaction effect between a CEO being divorced and their gender. The results show a positive coefficient ($\beta = 2.006, SE = 1.093, p < 0.10$). However, this result is weakly significant – at a 10% level – and we thus cannot base any conclusions on this outcome. This means that we cannot say that being female positively moderates the relationship between divorce and firm performance. Column 5 tests hypothesis 3a: *"Firms with CEOs that have children compared to firms with CEOs that have no children have lower firm performance."*. Significant results are found regarding this hypothesis ($\beta = 0.869\ SE = 0.357, p < 0.05$). These results do, however, not match hypothesis 3a as the opposite effect is found. This would mean that, using ROE as a measure for firm performance, firms with CEOs that have children compared to firms with CEOs that have no children have higher firm performance – the opposite of what was hypothesized. The interaction effect between CEO parenthood and CEO gender is found to be insignificant in column 6 ($\beta = -0.003, \mathrm{SE} = 1.184, p > 0.10$). This means that when using ROE as a measure for firm performance, no support is found for hypothesis 3b. Column 7 shows no significant relation between firm performance measured by ROE and whether a CEO has multiple children rather than only one child. ($\beta = 0.287, SE = 0.638, p > 0.10$). Hypothesis 4a is not supported. Finally, the interaction effect between CEO gender and a CEO having multiple children in column 8 is insignificant ($\beta = -1.647, SE = 2.623, p > 0.10$). This means there is no evidence to support hypothesis 4b.

Neither the main analysis using ROA as a measure for firm performance nor the robustness check using ROE show proof to support any of the hypotheses. The main analysis did find a significant negative association between CEO marriage and firm performance – rather than the hypothesized positive relation. Additionally, the robustness check found a positive association between parenthood and firm performance – also the opposite of what was hypothesized.

4.2.2. Male sample

As discussed, there is a lack of observations of female CEO in the dataset. Additionally, the moderation effect between gender and firm performance measured by ROE was weakly significant. Because of these two reasons, it seemed interesting to find out whether the results would differ if the models were run on a sample containing only observations of male CEOs. However still, we keep in mind that the observations are very unevenly divided between groups, e.g., many more non-divorced male CEOs than divorced CEOs, many more male CEOs with children than male CEOs without children, and many more male CEOs that have multiple children than male CEOs that have only one child. The results of these

tests are shown in appendix B, table A.6. The columns for CEO marriage are left out because there are no unmarried female CEOs in the dataset, meaning the coefficients would remain unchanged when leaving females out of the sample. Columns 1, 2 and 3 show the results for firm performance measured by ROA. Comparing these results to columns 3, 5 and 7 in table 4, the coefficients have barely changed after removing females from the sample. This means that female CEOs barely influence the outcomes and the results are mainly based on male CEOs. Columns 4, 5 and 6 show the results for firm performance measured by ROE. When comparing this to columns 3, 5 and 7 in table A.5, we see a slightly larger change in coefficients. However, the coefficients for parenthood and having multiple children are still not significant. What does stand out is that the coefficient for a CEO having multiple children rather than one child becomes more significant ($\beta = 0.860, SE = 0.296, p < 0.01$).

5. Conclusion and discussion

5.1. Discussion

This paper aimed to find out whether CEO life events could influence the CEO's firm performance. Existing literature mainly focuses on general work performance of employees, rather than that of a CEO specifically. Also, existing literature that focuses on CEO performance in relation to life events, does not specify the different types of events that could affect performance. Moreover, these existing studies that focus on CEO's performance use an outdated dataset, created by Roussanov and Savor (2014). This dataset runs from 1998 to 2008. Since this dataset was created, the business environment has changed immensely, for example, by the extensive use of internet and social media (Knilans, 2019). This paper splits up the life events and aims to find effects of the separate events on firm performance, measured by ROA. It does so by focusing on a more recent dataset, that runs from 2011 to 2019. The results found in this paper could give insights for policy makers regarding the hiring policy of a firm. The research question central in this paper was "*What are the effects of CEO family status on firm performance? Do these effects differ across gender?".* To answer this question, it was split up in multiple hypotheses assessing several life events separately: marriage, divorce, parenthood and being a parent to multiple children.

5.1.1. Marriage

The results have shown that marriage has a negative impact of a CEOs firm performance, measured by ROA. This goes against the findings in existing literature that elaborates on the fact that marriage should increase firm performance due to stability and emotional back-up from one's spouse (Cohen & Haberfeld, 1991; Gurin, 1960). This could be because the research stating that marriage increases well-being is mostly

dated from a time where not being married was something to be ashamed about. At that time, marriage was necessary to retain the population count and it was the social standard to get married (Riviere, 1971). Nowadays, marriage is no longer seen as a necessity (Geiger & Livingston, 2020). The findings do comply with the findings of Hilary et al. (2017) and Roussanov and Savor (2014), discussed in section 2.4.. These authors find that unmarried CEOs tend to take more risk and therefore realize higher firm performance. This side of literature on marriage could explain the results found in this paper.

5.1.2. Divorce

The hypothesis in this study regarding CEO divorce stated that divorced CEOs achieve higher firm performance than CEOs that are not divorced do. This hypothesis is based on the fact that the dataset mainly exists of CEOs that are divorced for over 10 years, in combination with the existing literature by Gustavson et al. (2014) who find that people show increased wellbeing after a divorce. The results from this paper, however, do not show a relationship between CEO divorce and firm performance. This could be caused by the number of observations in the dataset. As shown in Appendix A, table A.4, only about 10% of the observations in our dataset is on a divorced CEO. For this reason, the coefficients must be interpreted with caution. Another explanation for the findings in this study could be that, as the CEOs in the dataset have been divorced for so long, the effect has aged and disappeared.

The second hypothesis regarding CEO divorce proposed the idea that being female positively moderates the relationship between divorce and firm performance. There was no evidence found to support this hypothesis. This could be for the same reasons as discussed above: lack of divorcees in the dataset and an aging of the effect as the divorce has taken place a long time ago. The lack of female divorced CEOs compared to the number of male divorced CEOs could be a problem as well.

Future research could broaden the dataset, creating a more equal division of divorced and non-divorced CEOs. Additionally, more female divorced CEOs could be added to the dataset to find a significant mediation effect of CEO gender. To realize this, however, there need to be more female CEOs in general. Finally, it could focus on the short-term direct impact of the divorce rather than the long-term effect. Maybe then a significant effect could be found.

5.1.3. Parenthood

The first hypothesis regarding parenthood, hypothesis 3a, states that CEOs that have children achieve lower firm performance than CEOs that have no children. The results in the main analysis cannot confirm this expectation. This contradicts the negative relation between firm performance and parenthood that

was found by Brockington (2004), Matthey et al. (2000), McLanahan and Adams (1987), Van Scheppingen et al. (2016) and Umberson et al. (2010) – as discussed in section 2.6. Neither was proof found to support hypothesis 3b; hypothesizing that being male positively moderates the relationship between CEO parenthood and firm performance. This is unlike previous research that has found a negative moderation effect here (Duxbury et al.,1994; Geiler & Renneboog, 2015; Kaufman & Uhlenberg, 2000).

An explanation to the difference in findings between our study and previous studies in existing literature could be provided by Umberson et al. (2010) and Krapf et al. (2017). These authors write that, while the children are still young, parents experience decreased levels of well-being caused by psychological distress. These increased stress levels disappear when the children become older and parents need to worry less. It is expected that most children of CEOs in the dataset is already at an age of adulthood – or close to it – for two reasons. First of all, over 90% of the CEOs in the dataset is aged between 48 and 67 years old. Second, the average age a male becomes a father in the US is 27.5 and the average age a female becomes a mother in the US is 24.6 (Schweizer, 2019). The same problem as was discussed in the CEO divorce section could also be of effect here. Namely that the effect of parenthood on firm performance has aged and is no longer present.

Future research could aim to find out if this is the reason behind finding no relationship between parenthood and firm performance by adding the ages of the CEO's children into the regression. Additionally, taking a more short-term approach to the event of having children could work in this case, as well as in the case of divorces. For example, they could study the firm performance five years prior and five years after a CEO has a child – to study if there are any significant changes visible here.

5.1.4. Multiple children

In the last two hypotheses, we tested whether it affects firm performance when a CEO has multiple children instead of only one. Hypothesis 4a is not supported. We cannot conclude that being a parent to multiple children decreases a CEO's firm performance. These findings are unlike what we expected to find based on the findings in previously discussed literature (Kaufman & Uhlenberg, 2000; Krapf et al., 2017; Zhou, 2002). For the last hypothesis, 4b, the interaction term between having multiple children and CEO gender was tested. The expectation was for females to carry a higher burden having multiple children and thus showcase a stronger decrease in firm performance after having multiple children (Kaufman & Uhlenberg, 2000; Krapf et al., 2017; Matthey et al., 2000). However, we found no indication of a difference in the relation between firm performance and having multiple children instead of only one child caused by gender. This could have to do with the age of the female and thus the age of their children, like discussed

in section 5.1.3.. Another explanation could be that we are looking at CEOs. These people have to run billion-dollar businesses and therefore cannot be distracted by family too much. Additionally, the average CEO earns about $20 million per year, giving them plenty of resources to get a nanny, for example (Liu, 2022). This way they can have children and not let this interfere with their job operations. This could serve as an opportunity for future research to dig deeper into. Future research could for example take in account whether a CEO has a spouse that is a stay-at-home parent or not, and – if they are not – whether they have a nanny at home.

5.1.5. Robustness

The robustness test checks all hypotheses the same way it was discussed in the main analysis. The difference was to use ROE instead of ROA as a measure of firm performance.

The main analysis showed a negative relation between firm performance and whether a CEO is married, compared to an unmarried CEO. The robustness test showed a positive relation between CEO having children and firm performance measured by ROE, compared to non-divorced CEOs. The difference in outcomes could mean that the results are not robust to a change in the measure of firm performance. However, as we cannot draw many conclusions based off the results, this is also hard to say with confidence. A second explanation for this difference in outcomes could be that there is a factor included in either ROA or ROE that is affected by the life events. This factor is probably related to debt as this is the main difference between ROA and ROE. For example, it could be the case that life events change the risk attitude of a CEO and therefore the amount of debt they are willing to let their firm have. Future research could aim to find this out by taking in account risk attitudes.

Regarding the aspect of gender, the results have not shown that gender differences change the relation between life events and firm performance measured by ROE. However, when comparing the main analysis with this test, results for ROE have changed more than results for ROA have. One could therefore believe that observations of female CEOs have a bigger effect on ROE than on ROA. As the main difference between the two measures is that ROE takes in account debt, this could mean there is a difference between male and female CEOs in relation to debt. One explanation for this phenomenon could be the fact that female CEOs tend to take less risk (Adams and Funk, 2012; Charness & Gneezy, 2012; Khan & Vieito, 2013). Future research could dive deeper into this matter.

5.2. Limitations & future research

Though this paper aimed to find an answer to the research question *"What are the effects of CEO family status on firm performance? Do these effects differ across gender?"* as effectively as possible, there have been some difficulties in this research. These limitations are discussed below. The first limitation is the GEE estimation method. Though it is the best method for longitudinal datasets, there are some issues concerning the use of this method. The GEE method is sensitive to outliers and there are difficulties in goodness-of-fit tests (Khajeh-Kazemi et al., 2011). Additionally, the GEE estimator drops out observations for which not all variables are present. For example, if one observation includes values for CEO gender and CEO marriage, but not for CEO divorce; then this whole observation is excluded for a model in which all three variables are added. This is a problem because we could have gained explanatory power from the gender and marriage values – in this case of example. Though we are aware of the limitations of the method, it still is the best one to use for our longitudinal dataset.

The second limitation concerns the lack of female CEOs in the dataset. Though it does reflect the distribution of male-female CEOs in the real world, the sample is too small to gain significant effects that have real explanatory power from the models. We therefore must be careful interpreting interaction effects between life events and gender. Future research could therefore take a larger sample which contains more female CEOs. This could for example be a European sample, or a larger set of American firms like the S&P1500.

An additional limitation to this lack of females in the dataset is that there were no unmarried female CEOs in the dataset, making it impossible to test the interaction effect between CEO gender and marriage on firm performance. Future research could aim to find some results here when data about unmarried female CEOs becomes available. Existing literature shows that Americans think of a man to be a good husband when he can financially provide for his family. This perception is less present for women on being a good wife. Gurin (1960) finds that married men tend to be happier than married women. This research is dated, as strict gender roles are less pronounced nowadays, but the research showed that the reason for the difference is that females felt their roles in the household to be restricting and frustrating. Gove (1972) agrees with the idea that – when looking at general happiness and well-being – marriage is generally more advantageous for males than for females but still both genders rank above non-married people. Cohen and Haberfeld (1991) relate the increased performance related to marriage for professional males to motivation, advice and emotional support that their wives give. This, added to the literature

stating that men get more advantages from marriage than women, lays ground to hypothesize that for the relationship between CEO marriage and firm performance, a difference between gender exists.

Third, it is a limitation that the quality of marriage is unknown. Edwards et al. (1998) found that the effect of marriage differs when the marriage is successful or not, e.g., are the people happy in their marriage? The same difference in effects would arguably be the case for divorce. When a person deals with an acrimonious divorce, the effects will be larger than when the divorce was amical. That is, more negative effects after an acrimonious divorce and less negative effects after amical divorce. Future research could, for example, work with a survey among CEOs. They could aim to find out whether their marriage is happy through a HOPIT model. This is a model based on surveys that also controls for reporting heterogeneity, e.g., it considers differences in perceptions.

A final limitation is in the variable for CEO gender. Though research generally only distinguishes the two genders "male" and "female", a more modern way of thinking approaches gender as a spectrum (McGuire et al., 2020). Though this is not a major limitation, it is something to keep in mind. During the data collection there have been no encounters with CEO of different genders than male or female, but it is a way of thinking that will most likely change in the future. It could therefore serve as an opportunity for future research to take in account the spectrum of genders rather than a binary "male" or "female". This could be realized through a survey among CEOs, asking them what they identify as – rather than what their gender is.

Regarding future research, it could be interesting to find out whether the CEOs spouse is working or a stay-at-home parent. This could also influence the stability of the home base and raising of the children. Finally, it could be interesting to test whether CEOs in same-sex marriages show different results.

5.3. Conclusion

This study attempted to find an answer to the research question *"What are the effects of CEO family status on firm performance? Do these effects differ across gender?"*. We find that CEO marriage and firm performance are negatively related. We do not find any relations between firm performance measured by ROA and CEO divorce, parenthood and having multiple children. The robustness check showed that when firm performance is measured by ROE, a positive relation between firm performance and parenthood exists. For the second part of the question, regarding gender, we found no proof that gender moderates the relation between life events and firm performance. We do have to interpret these results cautiously as the number of female CEOs in the dataset is low. Regarding policy implications based on this research,

it could be smart to consider the family status of an employee and take steps to avoid decrease of performance that may be caused by life events related to them. For example, for hiring policy, it is interesting that the analyses showed no negative relations to parenthood. Additionally, as this paper has a long-term approach, it could be interesting to note that negative effects of life events– as found in previous studies – might not last too long as they are not found in this study. Because of this, policy makers could stabilize firm performance by offering solutions to people going through life events with negative influences. If they get help, they will recover faster and damage to firm performance could be minimalized. Examples of this could be providing daycare or organizing support groups.

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Appendix A: elaboration on variables

Table A.1: CEO divorce years

	Freq	Percentage
Divorced for under 10 years	21	27.27
Divorced for over 10 years	56	72.73
Total	77	100.00

Table A.2: CEO number of kids

Number of kids	Freq	Percentage
0	154	17.95
1	38	4.43
Multiple	666	75.62
Total	858	100

Table A.3: CEO gender and marriage status

CEO Marriage CEO Gender	Unmarried (0)	Married (1)	Total
Female (0)	0	78	78
Male (1)	79	750	829
Total	79	828	907

Table A.4: CEO gender and divorce status

CEO Divorce CEO Gender	Not Divorced (0)	Divorced (1)	Total
Female (0)	56	22	78
Male (1)	743	76	819
Total	799	98	897

Appendix B: Robustness tests

Table A.5: Results of the GEE model with ROE as the dependent variable.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ROE	Controls only	Marriage	Divorce	Divorce x CEO gender	Parenthood	Parenthood x CEO gender	Multiple children	Multiple children x CEO gender
CEO gender	-0.975**	-1.002**	-0.926**	-1.384***	-0.983**	-0980	-1.028**	0.554
	(0.449)	(0.457)	(0.464)	(0.518)	(0.452)	(1.075)	(0.516)	(2.571)
CEO married		-0.507						
		(0.452)						
CEO divorced			0.153	-1.442				
			(0.445)	(0.973)				
CEO divorced				2.006*				
x CEO gender				(1.093)				
CEO parent					0.869**	0.899		
					(0.357)	(1.122)		
CEO parent						-0.003		
x CEO gender						(1.184)		
Multiple children							0.287	1.831
							(0.638)	(2.541)
Multiple children								-1.647
x CEO gender								(2.623)
Firm age	-0.003	-0.003	-0.003	-0.003	-0.005*	-0.005*	-0.000	-0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Firm size	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO age	-0.010	-0.014	-0.014	-0.016	0.002	0.002	-0.011	-0.012
	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)	(0.024)	(0.027)	(0.027)
CEO tenure	-0.007	-0.005	-0.009	-0.012	-0.018	-0.018	0.003	0.003
	(0.022)	(0.022)	(0.022)	(0.022)	(0.023)	(0.023)	(0.025)	(0.025)
Constant	2.382*	3.073**	2.604*	3.154**	1.198	1.195	2.058	0.602
	(1.343)	(1.437)	(1.378)	(1.400)	(1.457)	(1.615)	(1.645)	(2.837)
Observations	887	870	860	860	845	845	683	683
Number of firms	125	124	124	124	123	123	110	110
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Chi^2	12.25	13.10	11.97	15.62	18.62	18.62	9.81	10.21

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix B: Male CEO sample

Table A.6.: Results of the GEE models using a sample containing only observations of male CEOs.

	ROA			ROE		
	(1)	(2)	(3)	(4)	(5)	(6)
	Divorce	Parenthood	Multiple children	Divorce	Parenthood	Multiple children
CEO divorce	-0.007			0.591		
	(0.010)			(0.388)		
Parenthood		-0.014			0.860***	
		(0.010)			(0.296)	
Multiple children			-0.011			0.129
			(0.012)			(0.456)
Firm age	-0.000*	-0.000**	-0.000	-0.002	-0.003	0.002
	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.002)
Firm size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEO age	-0.000	0.000	-0.001	-0.018	0.001	-0.014
	(0.001)	(0.001)	(0.001)	(0.019)	(0.019)	(0.019)
CEO tenure	0.001	0.001	0.001	-0.023	-0.027	-0.007
	(0.001)	(0.001)	(0.001)	(0.018)	(0.018)	(0.018)
Constant	0.102***	0.075**	0.125***	1.945*	0.357	1.319
	(0.029)	(0.038)	(0.033)	(1.037)	(1.111)	(1.100)
Observations	804	788	634	784	769	622
Number of firms	121	120	106	118	117	105
Year FE	YES	YES	YES	YES	YES	YES
Chi^2	22.78	29.21	16.80	10.39	16.25	8.46