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Performance of German Family Firms During the Global Financial Crisis

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Abstract

Research on family firm performance has led to inconclusive results which is why scholars called for a differentiated consideration of family firms during exogenous shocks, where costs and benefits of the inherent ownership structure are assumed to be magnified. Following these calls, I use the Global Financial Crisis of 2007 – 2009 as a unique natural experiment where firms have been moved out of their equilibrium while ownership structure maintained constant in the near term. I differentiate between true family firms and lone founder firms and hypothesize that the firm performance of both ownership structures during the Global Financial Crisis is higher than for non-family firms. In a study of 178 firms listed in the German Prime Standard, I found that lone founder ownership was significantly associated with higher firm performance during the GFC, while showing no differences in performance during the period of stable economic conditions prior to the crisis. For true family ownership, in contrast, the results suggest a general tendency of superior performance during the steady-state pre-crisis period, but it could not be established that these firms outperformed other firms during the GFC. Analogously, I found that the presence of a family CEO in true family firms is beneficial for firm performance during stable economic conditions, but the advantageousness seems to vanish in times of severe financial distress.

Keywords: Family firm; ownership; governance; performance; crisis.

1. Introduction

Family firms represent the most dominant economic force worldwide, accounting for approximately 90% of all companies in the world (Aldrich & Cliff, 2003; La Porta, Lopez-de Silanes, & Shleifer, 1999). Family ownership is predominant in countries located in Continental Europe, Middle East, or Asia (Minichilli, Brogi, & Calabrò, 2016), but also plays a pivotal role in the United States, where family firms constitute 70 percent of all publicly listed firms (Sirmon & Hitt, 2003) and one third of the companies listed in the S&P 500 (Anderson & Reeb, 2003). This dominance might explain why scholars have devoted much attention to understanding the characteristics as well as consequential benefits and costs of family ownership in the last two decades (e.g. Anderson, Duru, & Reeb, 2009; Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007; Maseda, Iturralde, Aparicio, Boulkeroua, & Cooper, 2019; Villalonga & Amit, 2006).

Within academic literature on family firms, a growing body of research has focused on the impact of family ownership on firm performance. However, findings on corporate performance of family firms so far have been inconclusive: On the on hand, researchers argued that family ownership is harmful for firm performance as the families might pursue private benefits of control at the expense of minority shareholders (Anderson & Reeb, 2003), the availability of financial and social resources may be restricted (Poletti-Hughes & Williams, 2019), and conflicts between economic and non-economic goals of the family might arise (Gómez-Mejía et al., 2007). On the other hand, firm performance might be enhanced due to reduced conflicts between ownership and management (Andres, 2008), the commitment to lead the firm as stewards in a collectivistic way (Chu, 2011), unique strategic resources (Allouche, Amann, Jaussaud, & Kurashina, 2008), and the benefit from long-term orientation (Gentry, Dibrell, & Kim, 2016) as well as unique values and norms of the family (Andres, 2008). In order to better disentangle the impact of ownership on firm performance, various researchers argued that the consideration of overall economic activity, specifically an economic downturn, will enrich corporate governance research and provide further insights into the ownership-performance relationship (e.g. Lins, Volpin, & Wagner, 2013; Minichilli et al., 2016; Saleh, Halili, Zeitun, & Salim, 2017;

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Zhou, Wang, & He, 2012). Specifically, they argued that, during an economic crisis, firms are moved out of their equilibrium while ownership structure maintains constant at least in the short-term. Thereby, an exogenous shock such as an economic crisis serves as a natural experiment where costs and benefits of the ownership structure are magnified. Therefore, this differentiated perspective might provide new insights, contributing to the long-lasting discussion as to whether certain ownership structures have an enhancing impact on firm performance.

In a study of 178 firms listed in the German Prime Standard, I analyzed how ownership structures affected firm performance during the Global Financial Crisis of 2007- 2009. I substantiate my hypotheses with prior academic research and argumentation referring to the agency theory, stewardship theory, resource based view, as well as the concept of socio-emotional wealth. Furthermore, I contribute to the debate of heterogeneity that has gained increasing attention in recent family firm literature (e.g. Arosa, Iturralde, & Maseda, 2010; Block, Jaskiewicz, & Miller, 2011; Maseda et al., 2019) by incorporating a differentiated perspective on how large the stake held by the family is, how actively the family is involved in the management of the firm, and whether the firm is owned and managed by a lone founder rather than by descendants or multiple family members of the founder. The results indicate that lone founder firms, where the firms' founders are large shareholders of the firm, do not exhibit superior effects during the steady-state pre-crisis period but seem to outperform during crisis, in times where the firms faced serious threats due to macroeconomic developments. In contrast, true family firms, where multiple members of the same family are large shareholders of the firm, show a superior performance during overall stable economic conditions but do not exhibit significant performance differences during the global economic crisis. Furthermore, while the presence of a family CEO in true family firms is observed to be beneficiary during stable economic conditions, the competitive advantage of a family CEO seemed to vanish during the GFC.

This thesis is structured as follows. In section 2, I provide a theoretical background of extant literature on firm performance of family firms and develop my hypotheses. Thereafter, section 3 describes the sample and how the data has been retrieved, explains the independent, dependent, and control variables, and finally describes the statistical model used to test the hypotheses. In section 4, the results of the statistical regression are outlined. Moreover, robustness tests and further empirical analyses are presented in this section. The findings are discussed in detail in section 5. In this section, I also outline implications for theory and practice as well as limitations and fruitful avenues for future research. In section 6, the thesis will be concluded.

2. Theoretical Background and Hypothesis Development

This section provides an overview of prior academic research on the performance of family firms in general and during difficult times such as the Global Financial Crisis. Thereafter, three hypotheses will be derived by suggesting how specific ownership structures influence firm performance. In order to disentangle the complex of multiple studies and observations proposing different, even contrasting results, heterogeneity regarding ownership, management involvement, as well as generational stage will be taken into account. This section proceeds as follows: First, an overview of existing academic research studying the effect of family firm ownership on firm performance will be outlined and the underlying argumentation referring to different academic theories and concepts will be analyzed. Furthermore, heterogeneity among family firms and its effect on firm performance will be introduced in this chapter. Second, the Global Financial Crisis will be introduced and hypotheses on how family firms have performed during such an economic downturn will be developed.

2.1. Family Ownership and Firm Performance

The impact of family firm ownership has been studied extensively in numerous studies (Astrachan & Zellweger, 2008). However, despite the multitude of academic research during the last three decades, it has remained a controversial topic as results from studies all over the world produced different and even contrasting results with regard to the question as to whether family firms show superior performance than other types of firms (Martínez, Stöhr, & Quiroga, 2007). Referring to widely accepted academic theories and concepts such as *Agency Theory, Stewardship Theory, the Resource Based View (RBV), or the concept of Socio-emotional Wealth (SEW)*, this section seeks to provide a comprehensive overview of extant literature and a profound understanding of the mechanisms underlying the ownership-performance relationship.

2.1.1. Family Ownership and Negative Firm Performance

Several studies have provided evidence suggesting that family ownership affects firm performance negatively. Morck, Stangeland, and Yeung (2000) analyzed the financial performance of large Canadian family firms over a period of five years between 1984 and 1989 and found that family ownership is associated with poor financial performance when compared to widely held firms. Achmad, Rusmin, Neilson, and Tower (2009) also found that family firms show significantly lower performance than non-family firms by examining large listed Indonesian firms. Also Hamadi (2010) found that the presence of a first largest shareholder, specifically when it is a family organized as a voting block, has a significant negative effect on firm performance. In his study, Hamadi (2010) analyzed data of 147 Belgian listed firms covering a five-year-period between 1991 and 1996. In the remainder of this section, I will outline the underlying argumentation of why family ownership might affect firm performance negatively. Specifically, I will outline arguments related to agency theory, RBV, as well as the concept of SEW.

In publicly listed firms, ownership and control are usually separated, giving rise to conflicts between owners and managers running the company (Fama & Jensen, 1983; Jensen

& Meckling, 1976). This situation, where dispersed shareholders (principals) have to delegate control over a company to managers (agents) is also called type 1 principal-agent problem. This problem might be mitigated by concentrated ownership where the firm is managed and owned by the same shareholders and thus interests between principals and agents are aligned (Maseda et al., 2019). However, the presence of a large, block-holding family might give rise to a different conflict providing a possible explanation for the weaker performance of family firms: According to the agency theory influenced by Fama and Jensen (1983), a concentration of ownership might result in conflicts between the majority shareholders and minority shareholders, constituting the so called type 2 principal-principal problem. According to Shleifer and Vishny (1997), this type of agency conflict in some countries is more pronounced compared to the type 1 principal-agent problem. The next two paragraphs therefore outline in more depth how family owners might try to maximize their personal utility at the expense of firm performance, resulting in a disadvantageous shareholder structure compared to widely held firms with a dispersed ownership structure (Anderson & Reeb, 2003).

First, scholars argued that the combination of ownership and control allows family firms that hold a large stake in the company to exchange firm profits for private benefits (Anderson & Reeb, 2003; Shleifer & Vishny, 1997) and thereby expropriate minority investors (Faccio, Lang, & Young, 2001). For example, family owners might draw scarce resources away from firms' profitable projects in order to consume such resources privately (Demsetz, 1983). An expropriation of firm wealth might occur by families paying out excessive compensation, special dividends, or by related party transactions that turn out to be unfavorable not only for the firm but especially for other shareholders (Anderson & Reeb, 2003) and sometimes even for employees and creditors (Johnson, LaPorta, Lopez-de Silanes, & Shleifer, 2000).

Second, rather than pursuing the enhancement of shareholder value, family shareholders might strive for other achievements such as technological innovation or growth (Anderson & Reeb, 2003). Pursuing their own goals, family owners might also take sub-optimal investment decisions which are not in the best interest of other shareholders (Andres, 2008). Thereby, corporate performance of publicly listed firms, that is often measured as investors' return, might result to be lower.

Apart from arguments related to the agency theory, scholars refer to the RBV when trying to understand why family firms might show a weaker performance than their non-family counterparts. According to Barney (1991), every individual firm possesses heterogeneous resources and therefore can pursue different strategies to capitalize on its unique resources and build a sustained competitive advantage over other firms that have a different resource mix. Barney (2001) defines resources of a firm as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (p.101). As advantageous as these resources can be, it also means that firms that do not have access to resources to the same extent as their competitors might have a strategic disadvantage and therefore under perform when compared to their peers. The next two paragraphs will outline how family firms suffer from a scarcity of specific resources whereas non-family firms might not face such constraints.

First, with regard to financial capital, family firms suffer from limited access to financing which might result in inferior performance. On the one hand, equity financing might entail a dilution of control which the family, that might be emotionally tied to the firm, wants to avoid (Amihud, Lev, & Travlos, 1990; Faccio & Masulis, 2005; Ward, 2004). On the other hand, also debt financing is unattractive for family firms as they wish to preserve a balance sheet with a healthy leverage ratio and want to assure the firm's survival in the long-term (Dreux, 1990). High debt would increase the firm's vulnerability or bankruptcy risk which family owners again want to avoid as families often have the majority of their wealth invested in the firm (Anderson & Reeb, 2003) and therefore seek to minimize the business risk of their family firm (La Porta et al., 1999). Furthermore, higher vulnerability risk due to a high share of debt capital is avoided by family firms as often the firm employs other family members (Poletti-Hughes & Williams, 2019), the family well being of future generations might be at stake (Schulze, Lubatkin, & Dino, 2002), and the reputation following excessive borrowing might be compromised (Bartholomeusz & Tanewski, 2006).

Second, with regard to social capital, Anderson and Reeb (2003) argued that families often select top management positions exclusively from their relatives and therefore limit the pool of capable and qualified talent to a small number of people. This restriction of talent might then potentially lead to a competitive disadvantage and therefore inferior performance when compared to other firms. The reasoning behind that resource restricting action is that families want to provide employment opportunities for family members that might not find a similarly prestigious position (Poletti-Hughes & Williams, 2019) and because of the emotional pleasure families or founders experience when seeing their offspring managing the firm they established (Andres, 2008). The impact of family involvement in management on performance will be further examined in section 2.1.3 *Family Firm Heterogeneity and Firm Performance.*

A third concept that helps to better understand why family firms under perform compared to their non-family counterparts is the concept of SEW. According to the concept of SEW, the family is emotionally connected with the firm and actively seeks to maintain control and ownership driven by economic but also non-economic criteria such as the preservation of family identity and authority or the provision of employment opportunities for family members (Gómez-Mejía et al., 2007). This emotional attachment to the firm might result in a deterioration of firm performance, as it will be outlined in the following paragraph.

In general, Chu (2009) argued that in family firms there exist two distinct institutions that might not be compatible in every aspect and therefore restrain efficient operations in the firm: On the one hand, what today would be referred to as dimensions of SEW, the family institution reflects social ties, personal trust and assurance of care and nurturance of all the members belonging to the family. On the other hand, the business institution aims at economic rationality, effectiveness and efficiency. According to Chu (2009), the underlying set of values and norms of the two institutions are fundamentally different which is why financial performance, the single most important goal of the business institution, is lower compared to non-family firms where the family institution does not exist. For example, Allouche et al. (2008) argued that altruism among members of a family might potentially lead to lower firm performance and harm shareholder value. The family owning the firm refuses to dismiss managers who are family members but not capable of running the firm (Gomez-Mejia, Nunez-Nickel, & Gutierrez, 2001). This behavior might, for the moment, maintain peace within the family but will harm firm performance and ultimately shareholder value in the long term. A very famous illustration of SEW is the example of Spanish oil mills introduced by Gómez-Mejía et al. (2007). A few decades ago, these oil mills were primarily owned by entrepreneurial families. Gradually, the mills were offered membership of a cooperative. This membership would have mitigated financial risk and volatility, but it also would have resulted in a loss of family control and thus in a loss of SEW. Many Family businesses decided against joining the cooperative, attaching greater importance to independence and in return accepting financial performance hazards.

To summarize, the negative performance of family firms documented by several scholars could be explained by the private benefits of control (agency theory), the limited availability of financial and social resources (RBV), and the conflict of economic and non-economic goals between the family institution and the business institution (concept of SEW).

2.1.2. Family Ownership and Positive Firm Performance

Contrasting to the studies reviewed above, there exists a multitude of academic research suggesting that family ownership is positively associated with firm performance. One of the most cited articles analyzing family firm performance is the study by Anderson and Reeb (2003). Analyzing 403 publicly listed firms in the S&P 500, Anderson and Reeb (2003) concluded that, overall, family firms performed better than firms with different ownership structures. Similar results have been found by other scholars examining family firm performance in the United States (e.g. Anderson et al., 2009; Block et al., 2011; Chrisman, Chua, Kellermanns, & Chang, 2007). Furthermore, researchers found evidence of the superior performance of family firms all over the world: Allouche et al. (2008) found that Japanese listed family firms outperform their non-family counterparts. Andres (2008) provided evidence suggesting that German family firms not only are superior performer compared to widely held firms but also compared to all other types of firms with a large blockholder. Ben-Amar, Francoeur, Hafsi, and Labelle (2013) found a significant positive impact of family ownership on performance when studying family and non-family firms in Canada. Other scholars found a positive association between family firms and performance in Sweden (Bjuggren & Palmberg, 2010), Chile (Bonilla, Sepulveda, & Carvajal, 2010; Martínez et al., 2007), Taiwan (Chu, 2009, 2011), China (Ding & Zhang, 2008), or Spain (Maseda et al., 2019) Again, the underlying arguments that possibly explain these results will be outlined in the following, referring to agency theory, stewardship theory, RBV, as well as the concept of SEW.

The agency theory has been introduced earlier already. Whereas family firms might be prone to principal-principal conflicts, scholars argued that the combination of ownership and management, as it is often the case for family businesses, might be beneficial for firm performance (e.g. Anderson & Reeb, 2003). In 2013, van Essen, van Oosterhout, and Heugens stated that family blockholding can be seen as a remedy to agency problems. The following paragraphs will substantiate this argument in more detail and with the help of some specific examples.

First, when ownership and management are concentrated, owner-manager conflicts most likely fail to arise and therefore managerial entrenchment and expropriation can be avoided (Andres, 2008; Chu, 2009): In a situation where ownership and management are separated, managers could act in their own interest instead of the shareholders' interest. Managers could invest a company's resources in projects that are valuable for themselves even though there might be better investment alternatives that would maximize shareholder value (Shleifer & Vishny, 1989). For example, managers might engage in acquisitions that are harmful to shareholder value but potentially lead to an increase of the manager's salary due to the increase in the size of the firm (Gorton, Kahl, & Rosen, 2005). In family firms, where ownership and management often are combined, the monitoring of managers counteracts such opportunistic behavior (Van Essen, van Oosterhout, & Heugens, 2013). Chu (2009) argued that, since the objectives of owners and managers are aligned and the owning family not only controls the firm but is also the residual claimant of profits to be distributed, family firms might be an ideal form of organization.

Second, concentrated ownership reduces transaction costs and even creates economies of scale. For example, family ownership might be beneficial as large blockholders can develop specific capabilities to monitor a firm which other, more dispersed blockholders cannot (Ryan & Schneider, 2002). This is one of several examples showing that the presence of family blockholders can successfully reduce transaction costs (Black, 1990). Chu (2009), for instance, stated that one specific requirement of control is information and information does come at a price. In family firms, he argued, family shareholders have access to superior information and better knowledge of the business which facilitates control and reduces transaction costs. One example of such superior information is the general notion that family members get in contact with and learn about the business from early childhood on (Kets de Vries, M., 1993).

It should be noted that, although the agency theory is widely accepted, well researched, and often referred to in academic family business literature, it is not completely undisputed. Chu (2011) argued that stewardship theory has been gaining more and more attention among family firm research more recently and is offering a different perspective on situational behavior that might even be contrary to agency theory. According to the stewardship theory, managers do not intrinsically follow their own interest at the expense of shareholders but place a higher value on responsible management of the firm (Davis, Schoorman, & Donaldson, 1997). According to Chu (2011), family firm managers then act as stewards, rather than agents of the firm and maximize their utility by collectivistic, pro-organizational behavior instead of self-serving, opportunistic behavior. He argued that a reasoning related to the agency theory and hence the explanation of performance differences therefore should be read with caution and that a potential superiority of family firms might rather originate from the commitment of stewards to manage the family firm than from redundant monitoring and governance mechanisms.

Scholars also substantiated the better performance of family firms referring to the RBV. Regarding social capital, researchers argued that family owners have experience and specific knowledge that is more likely to be passed on within generations of the family and therefore have a competitive advantage compared to firms with other shareholder structures (Andres, 2008). Allouche et al. (2008) argued that there is a special, intricate connection between the family and the business which induces organizational efficiency: Strategic resources are generated by the network of interactions between the productive activities of the business and the family. These strategic resources themselves can constitute a source of competitive advantage (Arrègle, Durand, & Véry, 2004). Specifically, the presence of family shareholders in the firm might be an intangible resource that enables the company to build long-term relations with various types of stakeholders such as employees, suppliers, customers, or banks (Chu, 2009).

With regard to technological resources, Zahra (2005) found that family-owned firms are widely recognized as a major source of entrepreneurial activities and technological innovation, showing a better ability to combine intangible and tangible resources to ensure innovativeness. It, therefore, is not only the availability of strategic resources but also the right use and ability to transform them into output. **?** found that family firms transform innovation input into innovation output with a higher conversion rate than other firms and, ultimately, show a higher innovation output compared to their non-family counterparts.

With regard to financial resources, it has been argued earlier in this paper that the limited access to capital through debt financing is a disadvantage and therefore affects performance negatively. Other scholars, however, argued differently: Allouche et al. (2008) concluded that the limited access to debt capital is positively associated with firm performance as financial risk and therefore the risk to lose control and face bankruptcy is reduced. Furthermore, Anderson, Mansi, and Reeb (2002) argued, contrary to the belief of restricted access to debt capital, that family firms have even facilitated access to debt financing as they enjoy a lower cost of debt. According to their study, family ownership constitutes an organizational structure that better protects the interests of creditors and bondholders. Therefore, family firms tend to have an ownership-specific advantage over other firms that might be manifested in superior firm performance.

Scholars also refer to the concept of SEW when trying to understand the positive impact of family ownership on firm performance. First, family firms are often characterized as having a long-term orientation and transgenerational intention where the business is seen as an asset that is going to be passed on to later generations and therefore the family inheritance is preserved (e.g. Allouche et al., 2008; Chu, 2009; Gentry et al., 2016). One potential effect of long-term orientation is the implementation of optimal investment policies in the long run (Stein, 1989). Firms with a longer investment horizon experience less managerial opportunism and do suffer less from short term pressures to boost current earnings (Stein, 1989). The efficient investment decisions of family firms are therefore assumed to be value enhancing (Andres, 2008). Furthermore, Allouche et al. (2008) argued that the long-term orientation of family firms induces families to attach greater importance to quality. Moreover, the long-term nature of family firms allows them to develop long-lasting ties and networks with other stakeholders (Anderson & Reeb, 2003).

Second, family shareholders share a certain set of values with the business institution which in return might enhance firm performance (Andres, 2008). With their set of values and norms, families create a social construction of trust, loyalty and altruism (Allouche et al., 2008). As a result, the family firm creates a favorable working environment resulting in lower employee turnover and might therefore enhance firm performance (Andres, 2008). Furthermore, the trust and loyalty is not only limited to the firm itself but also enriches relationships to other stakeholders, thereby the family realizes possible gains as they credibly commit to implicit contracts and agreements (Andres, 2008). Moreover, the desire to preserve the norms and values of the family institution and the business institution is accompanied by a reputational concern. Anderson and Reeb (2003) argued that the family's reputation is able to create long-term economic consequences for the company whereas firms with other shareholder structures might attach greater importance to the short-term performance.

To summarize, the positive performance of family firms documented by several scholars could be explained by reduced conflicts between ownership and management (agency theory), the commitment to lead the firm in a collectivistic way (stewardship theory), unique strategic resources (RBV), and the benefit from long-term orientation and unique values and norms of the family (concept of SEW).

To complete the literature analysis on the association between family ownership and firm performance, two important points need to be made. First, it should be noted that a number of scholars could not identify performance differences between family firms and firms with other shareholder types: Analyzing non-financial Spanish listed companies during the period from 2003 to 2008,Sacristan-Navarro, Gomez-Anson, and Cabeza-Garcia (2011a) could not find any evidence that any type of ownership consistently and significantly impacts firm performance either positively or negatively. Other researchers came to similar conclusions analyzing data of family firms in Italy (Sciascia & Mazzola, 2008), India (Singal & Singal, 2011), and France (Sirmon, Arregle, Hitt, & Webb, 2008).

Second, the debate of heterogeneity within family firms has gained increasing attention in recent academic literature (e.g. Arosa et al., 2010; Block et al., 2011; Maseda et al., 2019; Perrini & Rossi, 2008; Zhou et al., 2012). Researchers have documented several dimensions of family firm heterogeneity that should be considered when examining family businesses qualitatively or quantitatively. Therefore, in the following, an entire section of this thesis will be devoted to this topic.

2.1.3. Family Firm Heterogeneity and Firm Performance

This section helps to better understand the underlying mechanisms of family firms by disentangling family firm status further. In the following, three aspects of heterogeneity are outlined in more detail. First, considering the magnitude of equity ownership helps to differentiate between low stakes of family ownership and situations where families own large shares of a firm. Second, family involvement in the management of the firm will be considered by analyzing how performance is affected when one or more family members are present on the management board. Finally, considering the generational stage, lone founder firms are differentiated from true family firms, where either several members of the family are active as shareholders or in the management of the firm or where one or more descendants of the founder own or manage the firm.

Miller, Le Breton-Miller, and Lester (2010) argued that ownership is a matter of degree and families that hold a large number of shares thus might behave differently than families possessing only a few voting rights. Reviewing extant literature, it turned out that some researchers found evidence suggesting that the relationship between family ownership and performance is indeed dependent on the magnitude of ownership: Anderson and Reeb (2003) found that first, with increasing family ownership, performance of S&P 500 firms increases but at around 31% family ownership, the inflection point of maximum performance, performance starts to decrease with increasing family ownership. They therefore suggested a non-linear relationship between performance and family ownership. If plotted in a graph, with firm performance on the y-axis and family ownership on the x-axis, the relationship would look like an inverted U shape. Analyzing a panel of 217 Polish companies, also Kowalewski, Talavera, and Stetsyuk (2010) found an inverted U-shaped relationship between family ownership and performance. Furthermore, in a meta-analysis based on a total sample of 748,569 firm year observations that have been derived from 162 studies covering 23 European countries, Van Essen et al. (2013) provided evidence suggesting that the relationship between ownership and firm performance has a form of an inverted U-shape. Moreover, De Massis, Kotlar, Campopiano, and Cassia (2013) again found that the impact of family ownership on firm performance is dependent on the magnitude of ownership and suggested a U-shaped relationship between family ownership dispersion and firm performance.

Those researchers suggesting a non-linear, U-shaped relationship between family ownership and firm performance, substantiated their findings with arguments from the agency theory that have been already introduced. Specifically, at a lower level of ownership, a positive alignment between the interests of shareholders and managers (reduced Type 1 principal-agent conflict) results in enhanced firm performance. With an increasing stake of ownership, however, minority shareholder expropriation through private benefits of control (Type 2 principal-principal conflict) might lead to a deterioration of firm performance again (e.g. Maseda et al., 2019; Van Essen et al., 2013). In short, the non-linear relationship between family ownership and performance is explained by the existence of two competing arguments from the agency theory that affect performance in its strongest form at different levels of family ownership.

Besides family ownership, great importance has been attached in recent academic research to the involvement of the family in the management of the firm. The presence of family CEOs and family members in the board of management is a widely recognized family firm characteristic (e.g. Anderson & Reeb, 2003) and implies active family management (Denis & Denis, 1994). By being a CEO or holding another top management position, a family member can impact the strategic direction of a firm (Pieper, Klein, & Jaskiewicz, 2008). Especially the position of a family CEO is worth analyzing in more detail as the CEO of the firm is generally considered the most powerful and important actor of the organization, having overall responsibility for the conduct and performance of the business (e.g. Minichilli, Corbetta, & MacMillan, 2010).

Several scholars suggested that firms, where family members are involved in the management of the firm, performed better than their non-family counterparts. Anderson and Reeb (2003) found that the profitability of a firm is enhanced when a family member holds the CEO position. Andres (2008) found that German family firms perform better if the family is actively involved in the firm, either in the supervisory or executive board. Other researchers found similar results analyzing data of family firms in Sweden (Bjuggren & Palmberg, 2010), Taiwan (Chu, 2011), Poland (Kowalewski et al., 2010), Italy (Minichilli et al., 2010), and Spain (Sacristan-Navarro et al., 2011a). The next four paragraphs will outline the underlying argumentation of these findings.

Scholars motivated the positive effect of family management referring to the same theories and concepts outlined earlier in this section. First, from an agency theory point of view, the family can more easily align their interests with the interest of the company (Anderson & Reeb, 2003). Also, because families often have the majority of their wealth invested in the firm, family CEOs show particular concern over the business and monitor its development (McConaughy, Walker, Henderson, & Mishra, 1998). Miller and Le Breton-Miller (2006) found that the presence of a family CEO is manifested in fewer short-sighted acquisitions, less downsizing actions, and a more long-term nature of capital expenditures and R&D expenses, suggesting that family CEOs focus more on long-term competitiveness and hence increase sustainable performance.

Second, scholars attributed the positive performance impact of family management to the fact that family executives often act as a steward of the organization (e.g. Chu, 2011). They therefore consider the firm as an extension of their well-being and maximize their utility achieving organizational objectives (Davis et al., 1997). The continuing prosperity of the firm is of such importance that they less likely follow self-serving objectives, thereby enhancing firm performance (Chu, 2011).

Third, referring to the RBV, scholars argued that a family CEO might bring specific knowledge, skills and attributes to the firm which again results in enhanced firm performance. Dyer (2006) argued that the understanding of the complexities of the business often has been gained in early years of the life and experiences from family members have been shared to younger generations, resulting in the development of human and social capital from which the organization can benefit. Because family CEOs are well acquainted with the firm, its established networks, and its corporate strategy (Chung, Lubatkin, Rogers, & Owers, 1987), CEO candidates within the family promote stability and profound expertise (Amran, 2012).

Finally, researchers also argued that family firms where family members are involved in the management of the firm do perform better due to the existence of SEW. Because family CEOs have an intention to pass over the firm to the next generation, they are more interested in the survival of the business (Sciascia & Mazzola, 2008). This might result in value maximizing investment behavior (Stein, 1989). Furthermore, family CEOs have a particular incentive to achieve high firm performance as the reputation of the entire family might be severely damaged and conflicts among the family shareholders might arise (Arrègle, Hitt, Sirmon, & Very, 2007). Moreover, family CEOs do often show an altruistic behavior that creates an atmosphere of trust and loyalty which in turn has a positive impact on firm performance (e.g. Minichilli et al., 2010).

However, research on the effect of family members involved in the firm's management on firm performance so far has been inconclusive. First, some scholars could not find any significant effect suggesting that the presence of a family CEO influences firm performance in either way (e.g. Block et al., 2011; Miller, Le Breton-Miller, Lester, & Cannella, 2007). Second, a growing amount of literature suggests that the relationship between the involvement of the family in the firm and firm performance is not linear and might be dependent on other factors. Maseda et al. (2019) found an S-shaped relationship between family ownership of board members and firm performance suggesting that the family's involvement in management might lead to a convergence of interests between family members and a strengthening of ties between the family and the business. Perrini and Rossi (2008) found that family management only affects firm performance positively when family ownership is low. In the case of high family ownership, the controlling family members might use their executive positions to extract private benefits and expropriate minority shareholders. Also De Massis et al. (2013) argued that family involvement only has a positive impact on firm performance when family ownership is moderate. Third, other researchers found even a negative relationship between family firm involvement and firm performance (e.g. Giovannini, 2010; Sciascia & Mazzola, 2008; Sindhuja, 2009; Wong, Chang, & Chen, 2010). The arguments substantiating a negative relationship between family involvement in management and firm performance will be outlined in the following two paragraphs.

First, from an agency point of view, family CEOs might pursue different objectives than those that would be value-maximizing for the shareholders. Family CEOs might use the firm's resources to the benefit of their families and thereby expropriate other shareholders (Block et al., 2011). Furthermore, family members present in the management often seek additional forms of compensation such as immaterial rewards or even reduce their efforts (Lubatkin, Schulze, Ling, & Dino, 2005) since they are not likely to be dismissed from their position for incompetent behavior (Block et al., 2011).

Second, families often restrict the occupation of top management positions to family members (e.g. Anderson & Reeb, 2003). In doing so, they can provide high-paying jobs to their offspring and gain utility in seeing their successors managing the business they established (Sacristan-Navarro et al., 2011a). However, family CEOs might not be as capable and talented as outside, professional CEOs (Schulze et al., 2002). Such behavior might also cause resentment by other, non-family executives (Gomez-Mejia et al., 2001). De Massis et al. (2013) argued that outside managers are beneficial for an organization as they bring business-specific knowledge and have better access to outside information and resources. Moreover, outside managers could be beneficial as they not only prevent negative practices of the family such as the extraction of private benefits but also could mitigate risks originating from family firms, for instance by mediating family disputes. In short, restricting the talent pool and forgoing possible benefits from outside managers might explain the negative relationship between firm performance and family involvement in management.

Besides the magnitude of ownership and the involvement of the family in the management of the firm, scholars also argued that the generation of family owning or managing the business impacts firm performance. Reviewing many family firm definitions in extant academic literature from all around the world, Miller et al. (2007) noticed that many studies consider firms, in which there is involvement of only a lone founder, but no other family member, as a family firm, making it impossible to differentiate effects on performance that might originate from the individual structure of the firm. Only few researchers included lone founder firm as a separate shareholder structure in their analyses which is why research on the effect of lone founder ownership on firm performance is still tentative and not as numerous and fruitful compared with classical family business research. However, this differentiation is of major importance as approximately one-third of all family firms worldwide are managed by one or multiple founders, while the remaining two-thirds are managed by the descendants of the founding family (La Porta et al., 1999).

When analyzing data of 896 US-American companies between 1996 and 2000, Miller et al. (2007) found that only lone founder firms, companies where an individual is one of the founders of the firm with no other involvement of family members, outperform firms with other shareholder structures. The results of their study did not suggest performance difference between family firms, where more than one family member is involved, and firms with other types of ownership structures. Similarly, Villalonga and Amit (2006) provided evidence suggesting that family ownership only creates value if there is a founder CEO or if the founder serves as chairman of the board of directors with an external CEO in place. Barontini and Caprio (2006) found that the operating performance and market valuation of 675 European firms were higher if the firms were controlled by their founders. The result of the study by Anderson and Reeb (2003) indicated that the market performance of family firms was only better in case of the presence of a founder CEO or a professional, external CEO. The reasoning between the significant performance effect of a founder firm will be outlined in the following paragraphs.

First, researchers argued that lone founder firms show a different behavior because of their social context. The important stakeholders surrounding a lone founder firm are a diverse group of investors, venture capitalists, employees, customers, partners, and others (Donaldson & Preston, 1995) which all have primarily economic interests and demand high growth in return for their investments in an emerging company (Miller, Le Breton-Miller, & Lester, 2011). Greve, Hitt, Ireland, Camp, and Sexton (2003) argued that these stakeholders exert pressure on the lone founders aiming at the exploitation of economic opportunities, enhancement of customer service, successful positioning in the market, or out performance of competition. When addressing these pressures, the founders assume an entrepreneurial, individualistic role where the firm can be seen as an extension of the entrepreneurs themselves (Miller et al., 2011). Furthermore, lone founders might play an entrepreneurial role because they compare themselves with and see similarities to other entrepreneurs. Because of this entrepreneurial, growth-oriented role, the performance of lone founder firms is often associated with a typical strategy of growth characterized by innovation, expansion, and long-term investment (Miller et al., 2011).

Second, Morck (1988) argued that founder CEOs bring expertise and skills to the firm that enhance the value of the business. For example, founder CEOs are assumed to more likely possess technical and market expertise and a more organization specific knowledge (Fahlenbrach, 2009). Also Andres (2008) argued that the special influence and value-adding skills of founders result in enhanced performance of the firm. Moreover, founders might also benefit from experience of success and failure of previous entrepreneurial activities and based on that incorporate the learnings into the management of their businesses (Cope, 2011).

Third, researchers referred to the concept of SEW when trying to explain the founder effect on firm performance (e.g. Miller et al., 2011). Since the social approval and self image of the founder often is tied to the success of the business, the founder has an incentive to make capital investments that benefit the firm and maximize shareholder value (Kirzner, 1979) thereby enhancing firm performance. However, researchers also assumed less conflicts between the pursuit of economic goals of the firms and of non-economic goals of the family: Because lone founders do suffer less from succession issues and disputes within a family, firm performance is less likely to be weakened by family firm specific conflicts of interest (Miller et al., 2007).

To summarize, this section demonstrated how family firms differ within each other and how the distinct facets of a family firm affect firm performance differently. It is building on the preceding sections about the relationship between family ownership and firm performance primarily referring to arguments related to agency theory, stewardship theory, RBV, or the concept of SEW. The complexity of the relation between family ownership and firm performance has been outlined and the multitude of effects examined by researchers has been tried to disentangle. The last section demonstrated that, when analyzing the impact of family ownership on the performance of a firm, it should be taken into account how large the stake held by the family is (magnitude of ownership), how actively the family shapes the management of the firm (family involvement through board membership) and whether the firm is owned and managed by a lone founder rather than descendants or multiple family members of the founder (generational stage of family firms).

In order to consider the generational stage of the family business, for the remainder of this thesis, I differentiate between *Lone Founder Firms and True Family Firms* as their different social contexts may induce distinct behaviors which in turn might affect firm performance differently. In order to avoid any possible misunderstanding, true family firm(s) will be abbreviated by 'TFF' and lone founder firm(s) by 'LFF' respectively. Since there exists a multitude of definitions of a family firm in prior academic literature, finding a consensus on an exact definition is difficult (Miller et al., 2007). For the shareholder categorization within the course of this analysis, I follow the definition of Miller et al. (2007) who suggested that a TFF is "one in which multiple members of the same family are involved as major owners or managers, either contemporaneously or over time" (p. 836). Furthermore, LFF were defined as "those in which an individual is one of the company's founders with no other family members involved, and is also an insider (officer or director) or a large owner" (Miller et al., 2007, p. 837). Following this logic, if family members are present in the company alongside the active founders, the firm is categorized as a true family firm.

2.2. Family Firm Performance during the Global Financial Crisis 2007 – 2009

2.2.1. Global Financial Crisis and Firm Performance in Germany

Minichilli et al. (2016) argued that the analysis of family firm-specific characteristics influencing the company's performance is subject to several contingencies such as the definition of TFF or LFF ownership as well as the selection of performance measures. In order to ensure the consideration of these contingencies, various robustness tests will be performed later in this thesis (see section *4.3 Robustness*). Besides these rather methodical elements, researchers also indicated that the time period considered in the analysis might play an important role (e.g. Miller et al., 2007). Therefore, recent academic research on TFF and LFF behavior has called for a more detailed consideration of potential contingencies such as the stage of national development and the financial situation of the economical context the firm is participating in (Minichilli et al., 2016).

Various researchers argued that the consideration of overall economic activity, specifically an economic downturn, will enrich corporate governance research that focusses on behavior of firms with specific ownership types: Lins et al. (2013) described a financial crisis as a natural experiment that moves firms out of their equilibrium while the ownership structure remains unchanged at least temporarily. Therefore, they further argued, it can be better observed how investors adjust their expectations of firm performance with distinct types of ownership structures. Saleh et al. (2017) noted that the consideration of a situation of financial distress is beneficial as it has direct implications for the decision-making process, which, in turn, is a function of corporate ownership structure. More specifically, Minichilli et al. (2016) argued that firms, when confronted with an economic downturn, show a more explorative attitude and hence fundamental decisions that directly affect firm performance, such as R&D investment, M&A activity or expansion strategies, can be observed. Summarizing the above mentioned argumentation, Van Essen, Strike, Carney, and Sapp (2015) described the crisis situation as magnifying both negative and beneficial characteristics of a TFF and LFF due to the fact that firms have been moved out of their equilibrium. Following these calls for a consideration of situational behavior, in this thesis, the performance of TFF and LFF shall be analyzed in the light of the Global Financial Crisis (GFC) of 2007 – 2009.

The GFC originated from a bubble in US-American real estate prices that was caused by loose monetary policy and global imbalances (F. Allen & Carletti, 2010). The availability of funds and the cheap credit contributed to the bubble and other factors such as high leverages in the banking sector, weak regulatory frameworks, and subprime mortgages exacerbated the effects of the bubble, resulting in a national financial crisis (F. Allen & Carletti, 2010). At that point in time, although the financial sector being under tremendous pressure, the real economy was not much affected. However, on September 15, 2008, the collapse of the American investment bank Lehman Brothers signaled international markets that there is serious concern about credit risk in the financial sector, resulting in investors re-assessing risk and withdrawing from markets (F. Allen & Carletti, 2010). The concern about the financial standing of banks and other institutions quickly spread all over the world and disrupted economic activity, resulting in negative firm performance and investor returns (Saleh et al., 2017). The velocity and magnitude of the global spreading were unseen, as never before a crisis of this extent had occurred in the context of well-advanced globalization and a complex financial system (Breitenfellner & Wagner, 2010). Moreover, massive risk-taking by financial institutions such as Lehman Brothers magnified the impact of the GFC (F. Allen & Carletti, 2010). Aboura and Wagner (2016) argued that uncertainty and volatility has a strong negative effect on asset prices and therefore the GFC led to sharp declines in equity prices, severely affecting the global economy. Some scholars argued that the impact on world trade and industrial manufacturing even exceeded the corresponding effect of the Great Depression in 1929, although it should be noted the comparability with that economic downturn is limited due to data availability and data quality as well as the completely different reactions of monetary and fiscal policymakers (Fonseca, 2011). In case of the GFC, it took massive bail-outs of banks and other palliative fiscal and monetary policies to prevent the global financial system from collapsing completely (Breitenfellner & Wagner, 2010).

In Germany, the economic system was deeply hit by the GFC. In 2008, the annual economic growth rate fell to 1.1% and in 2009 it even became negative, at -5.6% (The World Bank Group, 2019). Figure 1 shows the development of the Prime All Share Index over time from 2004 to 2018. The Prime All Share Index tracks the performance of the entire German Prime Standard segment. The German Prime Standard is a market segment of the Frankfurt Stock Exchange where the sample firms of this analysis are listed. In January 2004, the closing price was 1,515.27 and from there on the index continuously increased until the end of 2007 up to 200% of its base value in 2004. In 2008, the index began to decrease first slowly and then from mid-September 2008 on dropped drastically. The Prime All Share Index reached its lowest point in March 2009, where its value was 87% (1,325.13 pts.) compared to the base in January 2004. Thereafter, the economy slowly started to recover (Lins et al., 2013) and increased steadily until mid-2018 to a level of 347% compared to the initial base. In recent months, economic development has decreased due to political conflicts destabilizing business activity all over the world (International Monetary Fund, 2019). Figure 2 provides a more detailed view on the development of the Prime All Share Index during the GFC in order to understand the macro-economic circumstances the firms inherent in the sample of this analysis had to face. The impact of the collapse of the investment bank Lehman Brothers on September 15, 2008, can be clearly seen. From mid-September 2008 to early March 2009, the Prime All Share Index dropped drastically by 43% from 2,340.05 pts. on the day before the Lehman bankruptcy to 1,325.13 pts. on March 6, 2009. After reaching this nadir, the German economy slowly started to recover as a result of the massively expansionary and fiscal policies (Funk, 2012). However, Figure 1 shows that, even 18 months after the bankruptcy of Lehman Brothers, the German Prime Standard was not able to recover to a pre-crisis level. Unemployment maintained on a higher level and indebtedness increased considerably in the aftermath of the GFC (Funk, 2012)

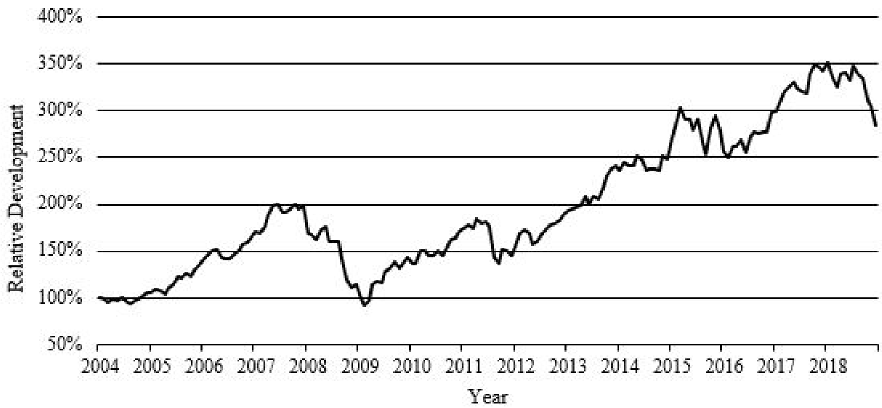
2.2.2. Firm Performance of TFF during the GFC

Academic research on how TFF coped with the GFC has led to inconclusive and even contradictory results (e.g. Arrondo-García, Fernández-Méndez, & Menéndez-Requejo, 2016). Using a large data sample of 8,500 firms from 35 countries, Lins et al. (2013) found that TFF under performed significantly during the GFC compared to firms with other shareholder structures. Specifically, buy and hold crisis period returns during this time in their study were 1.4 percentage points lower than for firms with a dispersed shareholder structure and even 3.3 percentage points lower than for firms with a controlling non-family blockholder. Lins et al. (2013) showed empirically that TFF also cut investment more relative to other firms and further suggested that these investment cuts are negatively associated with performance. Specifically, they found that TFF reduced their capital expenditures to assets ratio by 0.52 percentage points compared to other firms. Those firms in the sample that cut investment more were found to have greater stock price declines than other firms.

Researchers have referred to the agency theory when trying to explain the supposedly inferior performance of TFF during the GFC. Lins et al. (2013) argued that the GFC magnified the inherent conflict of interest between the family and outside shareholders. For example, in light of an economic recession, the survival of the family's economic interests is of greater importance and hence private benefits of control have become more costly to minority shareholders. Saleh et al. (2017) argued that the extreme volatility on global capital markets created panic among family shareholders because they often do not possess sufficiently diversified investment portfolios but rather have their wealth invested in the firm. The protection of the family's interest on the expense of other shareholders has been discussed comprehensively in the previous chapters of this thesis and the fact that these survival-oriented actions are especially predominant in times of crisis has been subject to extensive academic research, referring to it as the "tunneling" of resources out of the firm (e.g. Van Essen et al., 2015).

Other scholars, in contrast, provided evidence suggesting that TFF performed better than other firms during the GFC. Analyzing the entire population of industrial, listed TFF in Italy, Minichilli et al. (2016) found that TFF consistently and significantly outperformed other firms during the GFC. Specifically, they found that TFF did not show a significant performance difference to other firms during a ten-year-period from 2002 to 2012. During the GFC however, Minichilli et al. (2016) found that TFF achieved higher ROE and ROA than other Italian firms. Saleh et al. (2017) examined the financial performance (ROA and ROE) of 677 Australian firms during the GFC and found that TFF performed significantly better than firms with other shareholder structures. Analyzing a large data sample of 2,949 firms across 27 European countries, Van Essen et al. (2015) found that TFF significantly outperformed during the crisis but showed no significant differences to other firms during a period of stable growth (2004 – 2006). In their study, they used cumulative market-adjusted stock return as an indicator of market performance. Moreover, Van Essen et al. (2015) found that TFF are less likely to reduce their workforce or cut wages during both pre-crisis and crisis periods. Amann and Jaussaud (2012) provided evidence suggesting that TFF in Japan showed stronger resilience during the GFC, recovered faster and exhibited higher performance compared to firms with other shareholder structures. In their study, Amann and Jaussaud (2012) formed 98 carefully selected pairs of one Japanese TFF and one Japanese non-TFF and compared ROE, ROA, ROI, and net income of the respective firms. As outlined in the following two paragraphs, researchers have primarily referred to the concept of SEW and the RBV when trying to explain the supposedly superior performance of TFF during the GFC.

With regard to the concept of SEW, scholars argued that, during a crisis, family shareholders will reduce their emphasis on exploiting the family's SEW advantages and rather focus on short-term financial performance (e.g. Berrone, Cruz, & Gomez-Mejia, 2012). In more detail, prior academic research has suggested that under stable economic conditions, TFF prioritize SEW over pure economic rationality (Gómez-Mejía et al., 2007). However, Gomez-Mejia, Cruz, Berrone, and de Castro (2011) argued that with increasing external hazards, family shareholders more likely make strategic decisions resulting in a deterioration of SEW for the benefit of financial performance. Similarly, Patel and Chrisman (2014) found that TFF minimize risks and avoid aggressive investing in times where performance meets or exceeds aspirations but also accept more risks than other firms in situations where performance is below aspirations. The willingness to accept greater risks and make strategic choices might also be fueled by the emotional attachment and effective commitment of the family, management, employees, or other stakeholders to the firm (Berrone et al., 2012). Minichilli et al. (2016) argued that the emotional at-



Source: Thomson Reuters Eikon

Figure 1: Development of the Prime All Share Index 2004 – 2018

Source: Thomson Reuters Eikon

Figure 2: Development of the Prime All Share Index 2004 – 2018

tachment and the resulting extraordinary commitment helps firms to withstand external threats as all forces are concentrated to rescue the firm during the economic downturn and the controlling family will capitalize on their ability to make a fast decision. Furthermore, researchers argued that the long-term orientation of TFF is beneficial especially in times of financial distress. For instance, greater cooperation and implicit contracts with stakeholders favors the continuance of the firm (Van Essen et al., 2015).

Scholars also referred to the RBV when trying to explain the greater resilience of TFF during a crisis. On the one hand, the controlling family might be willing to prop up the TFF by injecting private financial resources in order to assure the long-term survival of the firm (Villalonga & Amit, 2010). Apart from their private assets, family shareholders might also provide financing via other firms under their control in order to maintain employment levels despite declines in market demand or competitiveness (Lins et al., 2013). On the other hand, family shareholders might enjoy privileged access to capital during periods of economic downturns compared to other firms (Minichilli et al., 2016). Crespí-Cladera and Martín-Oliver (2015) found that TFF have facilitated access to debt financing during crises as they more effectively build long-lasting and trusting relationships with business partners like financers.

To summarize, scholars consider the GFC as a natural experiment where inherent benefits and disadvantages of TFF ownership are magnified and hence contribute a further perspective to the long-lasting academic debate as to whether TFF outperform other firms or not. Although Lins et al. (2013) provided evidence indicating lower firm performance of TFF during the GFC, those results suggesting a positive association between TFF ownership and firm performance are predominant and have been substantiated referring to renown academic theories and concepts. To my knowledge, no academic study published in a relevant journal has considered the firm performance of TFF in Germany during the GFC. Therefore, following researchers that formulated similar hypotheses for different geographic settings (Amann & Jaussaud, 2012; Minichilli et al., 2016; Saleh et al., 2017), I hypothesize that during the GFC, TFF in Germany show a significantly higher financial performance than non-family firms.

> Hypothesis 1a: During the GFC, TFF ownership of firms listed in the German Prime Standard is associated with higher firm performance compared to firms with other shareholder structures.

2.2.3. Firm Performance of LFF during the GFC

The role of LFF has not been subject to academic research to the same extent as the role of TFF during periods of financial downturns (Zhou et al., 2012). Arrondo-García et al. (2016) examined a sample of 6,315 Spanish firms and found that firm performance during the GFC varied within the heterogeneous pool of family firms dependent on the generational stage of the firm. Specifically, first-generation firms exhibited higher growth, but increased their debt ratios and showed lower ROE compared to multi-generational family firms. Although not specifically analyzing LFF, the underlying theory explaining the behavior of first-generation family firms might be analogous to that of LFF. Studying non-financial firms in the S&P 500 during the GFC, Zhou et al. (2012) found that, while family firms, in general, outperformed other firms, especially LFF, a subgroup of family firms, contributed to the superior performance. Specifically, Zhou et al. (2012) suggested that the Operating Return on Assets (OROA) of LFF did not drop at all during the GFC compared to a pre-crisis level whereas the OROA of TFF declined by 14%, contributing to the relative outperformance of LFF. Moreover, their results revealed that LFF invested significantly less and had better access to debt financing during the GFC. The following two paragraphs will provide an overview of the underlying argumentation substantiating the findings suggested by researchers.

On the one hand, Arrondo-García et al. (2016) argued that younger firms have restricted access to resources and might not be able to ensure the survival of the firm during the crisis with the help of investments to the same extent than multi-generational TFF do. Furthermore, in their perspective, the emotional attachment and inexperience of founders result in an excessive commitment and risk-taking that ultimately is supposed to lead to inferior firm performance compared to TFF that exist for at least two generations. In such TFF, according to Arrondo-García et al. (2016), financial goals are increasingly important, especially during times of financial hardship, as the wealth of several family members is at stake. Moreover, Arrondo-García et al. (2016) expected LFF to have a disadvantage when entering a crisis as ownership is more concentrated and hence the founder's wealth is less likely to be diversified.

On the other hand, researchers argued that, on the contrary, the actions of TFF are impacted by greater emotional attachment and encumbered governance whereas LFF are free from kinship ties and therefore can make strategic decision faster and more efficiently, which is especially important during times of financial distress (Miller et al., 2007; Zhou et al., 2012). Furthermore, Zhou et al. (2012) argued that the focus on the lone founders in LFF plays a pivotal role in differentiating them from TFF and therefore firm performance might be enhanced. Specifically, LFF are free from owner-manager conflicts or conflicts among shareholders such as in TFF where disputes between family members might arise (Eddleston & Kellermanns, 2007; Villalonga & Amit, 2010).

To summarize, the literature on the impact of LFF ownership on firm performance during crises is scarce and inconclusive. To my knowledge, no study published in relevant journals has examined the performance of LFF during crisis within the German jurisdiction. After reviewing literature on LFF performance in general as well as during crisis periods, I hypothesize, based on the insights in literature and following the conjecture of Zhou et al. (2012), that, during the GFC, LFF in Germany show a significantly higher financial performance than other firms.

> Hypothesis 1b: During the GFC, LFF ownership of firms listed in the German Prime Standard is associated with higher firm performance compared to firms with other shareholder structures.

2.2.4. The Role of the Family CEO during the GFC

Although family management in general being subject regularly in prior academic literature, the role of family involvement in the management of the firm during a crisis has been analyzed by researchers only scarcely. In their study of 219 Italian firms, Minichilli et al. (2016) analyzed the interaction of ownership concentration and the presence of a family CEO in TFF. Interestingly, they found that while during periods of economic stability a TFF with a family CEO performs better if the family holds a large share of the firm, during a crisis this result is reversed. Specifically, they found that the ROA of Italian TFF during the GFC was higher when a family CEO was present and family ownership was not concentrated, thus the family was not a very large blockholder of the firm.

Minichilli et al. (2016) argued that governance mechanisms are optimized typically for steady-state conditions and during contingencies such as the GFC the expenses of given governance decisions might exceed their benefits. While having a family CEO in TFF might be beneficial during stable economic conditions due to the alignment of interests between management and owners (Anderson & Reeb, 2003), the CEO's behavior as a steward of the organization (Davis et al., 1997), the CEO's specific knowledge and skills (Dyer, 2006), or their emotional attachment and transgenerational intention (Sciascia & Mazzola, 2008), family CEOs might take advantage of the resource distribution during times of financial distress (Minichilli et al., 2016). Especially because their wealth is often tied to the firm, the concentration of ownership and management might induce family CEOs during a crisis to extract capital out of the firm and thus ensure the survival of the family's wealth (Minichilli et al., 2016). As discussed earlier in this thesis, such behavior for the benefit of the family is at the expense of other, non-family shareholders and finally results in weaker firm performance. As the private benefits of control might be especially high during economic downturns, the cost of family involvement in the management might outweigh the advantages in these times.

To summarize, the impact on family involvement during crises on firm performance has not gained much attention in academic research yet. Although believed to be beneficial during times of stable economic conditions, I hypothesize, in line with Minichilli et al. (2016), that the costs of a governance mechanism entailing concentrated ownership and management outweigh the benefits during the GFC.

> Hypothesis 2: During the GFC, the presence of a family CEO in TFF listed in the German Prime Standard is associated with lower firm performance compared to the performance of TFF with an external CEO.

It should be noted that, with regard to LFF, extant academic literature most often has not differentiated within LFF regarding founder management or external management as the CEO position in an LFF is most often held by one of the founders. In my sample, as it can be seen in section 3.4 Independent Variable, in 15 out of 32 LFF, one of the founders was present as CEO. Therefore, a differentiated analysis within LFF will not lead to statistically relevant results. In fact, the LFF founder variable was omitted by the software used in the regression model due to multicollinearity. As a consequence, for the remainder of this thesis only the presence of a family CEO will be analyzed while the presence of a founder CEO or external CEO in a founder firm will be neglected.

3. Methodology

This section describes the composition of the sample used for the regression, the retrieval of data as well as the dependent, independent, and control variables. Furthermore, the analytical approach will be outlined.

3.1. Sample

My sample consisted of large German firms listed in the 'Prime Standard' at the Frankfurt Stock Exchange. The German market is selected because here a high number of family shareholders can be found (Fiss & Zajac, 2004). Furthermore, 85% of the German listed firms have at least one blockholder possessing voting rights of more than 25% (Andres, 2008). Therefore, Germany might be a suitable environment to explore the performance of family TFF and LFF. Moreover, the focus on only one specific market increases the comparability between the firms and their actions as for example the jurisdiction and legislative framework is the same. Prime Standard is the largest market segment with the highest transparency standards of the Frankfurt Stock Exchange. A listing in the Prime Standard is a requirement for the admission to one of Deutsche Börse's selection indices, such as DAX, MDAX, TecDAX, or SDAX (Deutsche Börse Group, 2019). In 2018, 319 Prime Standard instruments were included in this market segment. I received the initial dataset containing the firms listed in the Prime Standard from the WHU Chair of Family Business that before had reduced the sample to a total number of 279 individual companies: First, 17 prime standard instruments have been excluded as they constituted only preferred shares of companies that have listed both their ordinary and their preferred shares in the Prime Standard. Furthermore, 23 companies have been excluded within the process of data collection and processing due to data incompleteness or data corruption. Out of these 279 firms, 101 had their IPO after 2005 and therefore could not be considered in the analysis that compared firm performance during and prior to the GFC.

The final data set for the main hypothesis therefore contains 178 firms. The primary industries of the sample firms span nine different one-digit SIC codes including but not limited to services, manufacturing, real estate, wholesale trade, mining, agriculture or transportation. Table 1 summarizes the distribution of the sample firms according to the nine SIC codes. 50.6% of the firms in my sample are classified as manufacturers (SIC codes 2 and 3). The second-largest segment is services (27.1%) followed by Transportation & Public Utilities (7.9%). Figure 3 shows the age distribution of the firms present in my sample at the year-end of 2007, shortly before the crisis period. Although the majority of the firms (59.6%) have been founded less than 50 years ago, it is striking that some firms in the sample are several centuries old and thus might look back on many generations of firm history. The oldest firms in my sample were the pharmaceutical company Merck KGaA (founded 1668), followed by ceramics manufacturer Villeroy & Boch AG (1748), and Koenig & Bauer AG, manufacturer of printing presses (1817). Table 2 shows that the average age of the sample firm was 64.5 years with a median of 40 years.

With regard to the size of the sample firms at the respective period (2007), Table 2 shows that, while the average firm had a market capitalization of 5.21bn € ,the median market capitalization was only 0.32bn € . This calls for a deeper analysis, which is why Figure 4 plots the market capitalization of all sample firms. It can be clearly seen that there are few very large firms dominating the segment in terms of firm size. In total, the aggregated market capitalization of the 178 selected firms amounts to 928.14bn € . Thereof, the five largest firms by market capitalization constituted 39.5% alone. In 2007, the largest firms in my sample by market capitalization were E.ON SE (91.97bn €) and Daimler AG (88.15bn €), whereas KPS AG (7.06m €) and SThilo Wenig&T AG (8.61m €) marked the lower end of the ranking by firm size.

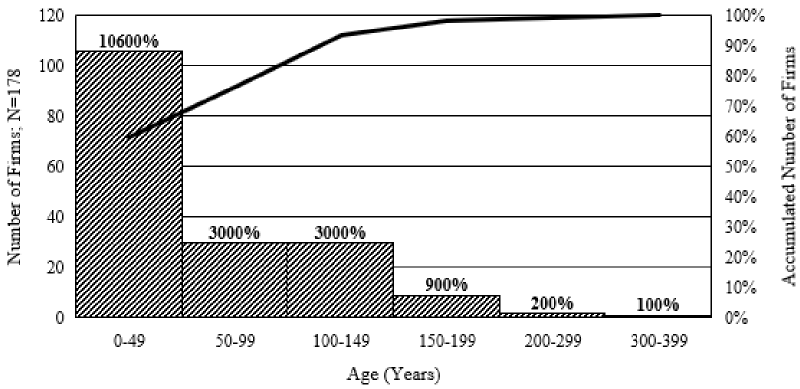
3.2. Data

The data compiled was obtained from multiple sources. All data collected covers the years 2003 – 2018. The list of the

Table 1: Sample Firm Industry Classification

Industry	SIC-Code	Number of Firms	Percentage Share
Agriculture, Forestry and Fishing	0	1	0.6%
Construction and Mining	1	6	3.4%
Manufacturing (I)	2	23	12.9%
Manufacturing (II)	3	67	37.6%
Transportation & Public Utilities	4	14	7.9%
Wholesale and Retail Trade	5	10	5.6%
Finance, Insurance, Real Estate	6	7	3.9%
Services (I)	7	40	22.5%
Services (II)	8	10	5.6%

Source: NAICS Association, Own Calculation



Source: Own Calculation

Figure 3: Age Distribution among Sample Firms

Table 2: Sample Firm Descriptive Statistics

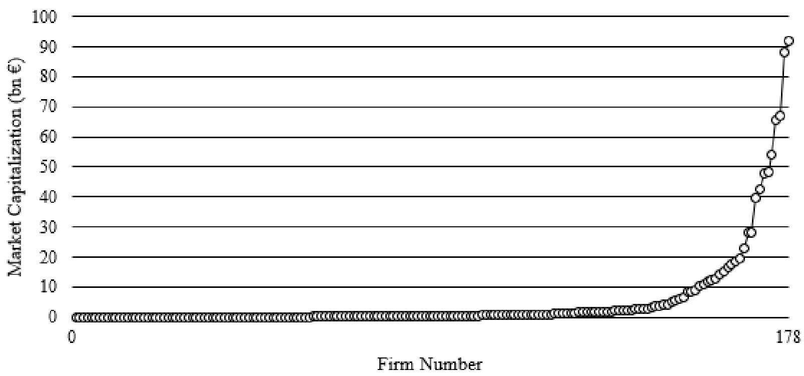
	N	Mean	25th pcl.	Median	75th pcl.	SD
Age	178	64.51	25.25	40.00	95.00	53.72
Market Capitalization (bn €)	178	5.21	0.08	0.32	1.93	14.26
Debt-to-Equity Ratio	178	56.58	16.32	43.04	83.49	153.28
Current Ratio	178	2.69	1.23	1.62	2.43	5.63
CF-to-Sales Ratio	178	-20.40	5.38	9.67	14.04	280.75

Source: Own Calculation

319 companies in the German Prime Standard was issued by Deutsche Börse Group (2019), the operator and owner of the Frankfurt Stock Exchange. Financial data of the firms in the sample such as return ratios, market capitalization, or other key financials was obtained by Thomson Reuters Eikon. An initial categorization of the shareholder structure of the firms has been provided to me by the WHU Chair of Family Business. The shareholder structure has been categorized with the help of the Amadeus database, which is a database of comparable financial and business information on Europe's largest 520,000 public and private companies by Bureau van Dijk / Moody's Analytics (Bureau van Dijk, 2019). The obtained data was manually checked for errors and, if necessary, completed using information from the companies' websites and annual reports. A more detailed description of the shareholder categorization can be found in section 3.4 *independent Variables*. CEO and founder information, as well as missing data, have been collected manually.

3.3. Dependent Variable

In order to test my hypotheses, a primary measure indicating firm performance has to be selected. Several researchers analyzing effects on firm performance found that their results



Source: Own Calculation

Figure 4: Distribution of Market Capitalization (2007)

were highly sensitive to the choice of the performance measure (e.g. Block et al., 2011). Therefore, it is important to first gain a deeper understanding of the different dimensions of performance measurement in order to determine which metrics are beneficial with regard to the analyses conducted in this thesis.

"Organizational performance is the ultimate dependent variable of interest for researchers concerned with just about any area of management" (Richard, Devinney, Yip, & Johnson, 2009, p. 719). In an extensive study reviewing every single article in in the *Strategic Management Journal, the Academy of Management Journal, Administrative Science Quarterly, Journal of International Business Studies, and the Journal of Management* of the last three years, Richard et al. (2009) found that in 29% of all articles organizational performance was included as a dependent, independent, or control variable. The performance measures in these articles ranged from profitability ratios, such as ROE, to broad subjective perceptions of performance, such as reputation, or specific outcomes determining success, like firm survival.

Although subjective performance measures like self-reports and Likert survey responses might provide a deeper understanding of how performance is achieved in individual organizations, in this quantitative thesis, objective measures of performance characterized by higher data availability and firm comparability shall be selected. Researchers generally categorize objective performance measures into three categories: Accounting measures, financial market measures, and mixed accounting and financial market measures (Richard et al., 2009).

Accounting measures are the most common means of determining firm performance (Richard et al., 2009). Due to the publication requirement of firm financials, data is readily available and can be collected in great quantities with the help of financial data service providers. Leading accounting measures that quantify firm performance are Return on Assets (ROA), Return on Equity (ROE), Return on Investment (ROI) or Return on Invested Capital (ROIC) but also sales growth, margins, or market share are often analyzed by researchers (Richard et al., 2009). However, scholars must be aware that accounting measures might be distorted by distinct accounting standards, human error, or deception. Richard et al. (2009) argued that the rules specified in accounting standards are not always corresponding to the actual underlying logic of firm performance. Moreover, accounting performance measures are rather backward-looking, focusing on historic activity more than on future performance (Keats, 1988).

The greatest strength of financial market measures, in contrast, is that these performance measures are forward-looking and consider expected future success and cash flows (Fisher & McGowan, 1983). Apart from expectations about the future, financial market-based measures also integrate intangible assets more effectively than accounting measures do (Richard et al., 2009). Therefore, financial market measures might more precisely depict the performance of an organization with core assets that might not be capitalized in its financials standards due to accounting regulations. Leading financial market measures are Earnings-per-share (EPS), Price-to-earnings ratio (P/E ratio), or total shareholder return (Richard et al., 2009). However, financial market measures also have limitations. Generally, share price movement is not only impacted by the actual performance of an organization but also reflects macroeconomic financial market volatility, momentum, or irrational investor's decisions such as herding behavior (Richard et al., 2009). Furthermore, financial market measures evaluate the organization as a whole and therefore the choice of such measures might not be appropriate when examining the performance impact of strategic decisions regarding individual products or business units.

Apart from pure accounting or financial market measures, there also exist mixed accounting and financial market measures. Richard et al. (2009). argued that such measures might constitute a good compromise as they balance the organization's risks, which are often not considered in accounting measures, against operational performance matters, that might not be reflected in financial market measures. One of the earliest and very popular hybrid measures is Tobin's q. It is the ratio of the market value of firm assets and its replacement cost (Tobin, 1969). In practice, because the estimation of the replacement value of a firm's assets is difficult, researchers calculate the ratio by dividing the market value of a firm's equity and liabilities by its corresponding book values. Other examples of mixed accounting and financial market measures are Altman's Z-Score predicting the probability of a firm's bankruptcy using accounting and stock market metrics (Altman, 1968) or the Economic value added (EVA) introduced by Stern, Stewart, and Chew (1995) adjusting accounting profits for the cost of capital.

To summarize, firm performance is not at all one-dimensional and the selection of the suitable performance measure is highly critical. According to Richard et al. (2009), in literature there can be observed three common practices by scholars that are spoilt for choice between the extant multitude of performance measures: First, a single measure is chosen based on a belief, supported by theory and evidence, that the relationship of this measure with firm performance exactly serves to analyze the underlying research question. Second, researchers decrease the significance of the choice of individual measures by testing the same independent variables with a set of different performance measures, thus testing different dependent variables. Third, scholars might aggregate several dependent variables to one proposition of a firm's performance comprising several performance dimensions.

For the purpose of this thesis, I chose to focus on the most suitable performance measure first and then also consider other measures during robustness tests, thereby combining the first and second approach outlined by Richard et al. (2009). Specifically, firm performance in the main regression analysis will be depicted by total shareholder return, constituting a financial market based performance measure. Later, the same independent variables will be tested using alternative performance measures, including accounting measures and mixed accounting and financial market measures. A more detailed description of these measures can be found in section *4.3 Robustness*

For the evaluation of the companies' performance, I followed other family firm researches (e.g. Miller et al., 2011) by using the total return for shareholders. In their study analyzing the prevalence of firm performance measures in strategy, economics, and finance literature, Richard et al. (2009) concluded that financial market measures are most often used and, above all, shareholder return is the single most preferred instrument representing an organization's performance.

The benefit of the total shareholder return is that it considers not only capital gains realized by stock price movements but also takes into account dividend pay-outs. In other words, it accounts for two categories of return: Dividends or distributions as well as capital appreciation representing the change in the market price of an asset. Specifically, the Thomson Reuters Total Return Index shows a "theoretical growth in value of a share holding over a specified period, assuming that dividends are re-invested to purchase additional units of an equity or unit trust at the closing price applicable on the ex-dividend date" (Aalto University School of Business, 2019, p. 8). Specifically, the return index (RI) is constructed as follows:

$$RI_t = RI_{t-1^*} \frac{P_t}{P_{t-1}} \tag{1}$$

except when t = ex-date of the dividend payment D_t then:

$$RI_t = RI_{t-1^*} \frac{P_t + D_t}{P_{t-1}} \tag{2}$$

Where
RI_t = return index on day t
$RI_{(t-1)}$ = return index on the previous day
P_t = price on the ex-dividend date
$P_{(t-1)}$ = price on the previous day
D_t = d dividend payment associated with ex-dividend date t

Where available, gross dividends are used and tax as well as re-investment charges are ignored. The price index and hence the return index is determined using adjusted closing prices. In case of new issues, return indices are initially based on annualized dividend until exact data on the actual payment of the first dividend becomes available.

The total return is accumulated over a time period from September 14, 2008, the day before the collapse of the investment bank Lehman Brothers until March 6, 2009, when the German Prime All Share Index reached rock bottom, as explained in section *2.2.1 Global Financial Crisis and Firm Performance.* I hereby use a timeframe that is very similar to that of other researchers examining effects on firm performance during the GFC (e.g. Lins et al., 2013). However, some researchers used different time spans in their analysis when examining the effect on performance during the GFC. For example, Van Essen et al. (2015) argued that the crisis period should include the beginnings of the real estate bubble in the US and therefore determined the period to be analyzed from 2007 to 2009. In order to consider such contingencies, I conducted my regression analysis using an alternative crisis period window. A more detailed description of this contingent analysis can be found in section *4.3 Robustness*.

In order to compare my results with a control period before the GFC, I determined the control window to cover the years 2005 – 2007, a period where there was little if any indication that a financial crisis with global extent was looming on the horizon (Lins et al., 2013). This control window hence does not overlap with either my crisis period from September 14, 2008, until March 6, 2009, or the crisis period used by other researchers, for instance, Van Essen et al. (2015) , who determined the crisis window to be 2007 – 2009.

Table 3 shows the accumulated shareholder return of the sample firms both during the crisis window and the control window prior to the crisis. The impact of the GFC can be clearly noted: Accumulated over the two-year period between January 1, 2005, and December 31, 2006, the shareholder return was on average 69.9%, demonstrating high economic growth. Some firms showed exceptional developments, for example, shareholders of the Capital Stage AG (nowadays Encavis AG) more than tripled their investments over two years, with a shareholder return of 366%. Only 13 out of 178 firms exhibited negative accumulated shareholder returns. During the crisis window, however, the shareholder return of all but 16 firms was negative. On average, shareholders lost 44.0% of their investments during a period of not even six months. The standard deviation during the crisis window was much lower compared to the control window, indicating that while firms showed very different performance behaviors during stable times, the economic downturn hit them rather equally. This is also suggested by the closer percentiles compared to those before the crisis.

3.4. Independent Variables

In order to test the hypotheses, family firm ownership has to be assessed. The shareholder structure provided by the WHU Chair of Family Business was determined as follows: Major shareholders that own at least 3% of the company's shares were manually categorized into families, state, financial institutions, private equity firms, other firms, and other individuals. In order to differentiate between TFF and LFF, I extended this shareholder structure by separating founders from other individuals who are not founders. In case families or lone founders held shares not only as a person but also through investment companies and other affiliated companies, these stakes were attributed to the respective family or individual in order to identify and label the ultimate shareholder. As a result, the owners of a firm were categorized into seven groups. In addition, the portion of shares in the hands of public investors holding less than 3% of voting rights was categorized as free float. It should be noted that the total percentage of ownership according to Amadeus sometimes exceeded 100% primarily due to ownership changes throughout the year or minor database errors.

In this study, voting rights, thus the percentage of shares held by an investor, determine the ownership of a firm. Throughout prevailing academic literature, most of the quantitative studies incorporating family ownership use a dummy variable based on a specific threshold of equity ownership or voting rights held by the family (e.g. Andres, 2008; Kowalewski et al., 2010; Sacristan-Navarro et al., 2011a; Villalonga & Amit, 2006). With regard to family ownership, Miller et al. (2010), for instance, argued that ownership is, of course, a matter of degree as the more shares are owned by a family, the more there is at stake and hence certain behaviors like for example the tendency towards acquisition changes. However, it is quite difficult to determine a particular threshold: While many studies use a threshold of 25% family ownership (e.g. Andres, 2008; Kowalewski et al., 2010) it is difficult to argue that for instance firms with 24% family ownership are fundamentally different than firms with 26% family ownership. Therefore, in alignment with other studies (e.g. Anderson & Reeb, 2003; Chu, 2009; Hamadi, 2010; Sciascia & Mazzola, 2008). I use ownership as a continuous variable in my main regression analysis. Nevertheless, in section *4.3 Robustness*, the regression analysis is repeated using dummy variables with various thresholds for ownership.

As already discussed in section *2.1.3 Family Firm Heterogeneity and Firm Performance*, TFF and LFF in this analysis are defined following Miller et al. (2007). The independent variable *TFF* therefore describes the percentage of voting rights (common shares) held by multiple members of the same family as of the end of the financial year 2007. The independent variable LFF describes the percentage of voting rights (common shares) held by the company's founder(s) with no other family members involved as of the end of the financial year 2007, respectively. Table 6 at the end of this section summarizes all variables and also provides a more detailed explanation of the variables concerning the ownership types state, financial institutions, private equity firms, other firms, and other individuals. Table 4 shows the distribution of ownership among the 178 sample firms according to the categorization introduced above. On average, 16.5% percent of all voting rights of the sample firms are in the hands of a family and 5.2% are owned by founders with no other family member involved. However, the averages are across all firms within the sample and therefore a differentiated perspective on only those firm including particular ownership types is required in order to permit qualitative assessments of the magnitude of ownership. Out of the 178 sample firms, 64 are classified as having TFF-shareholders. On average, these family shareholders hold 45.8% of voting rights, almost half of the companies' shares. Furthermore, 32 firms are classified as having LFF-shareholders where the founders, on average, possess 28.8% of voting rights. With regard to the other ownership types, it can be noted that more than half of the sample firms (93) have financial institutions as shareholders and on average the financial institutions hold 24.1% of voting rights. PE shareholders only hold 15.1% voting rights on average and state-ownership is the least common among the sample firms (present in 11 out of 178 firms). It should be noted that the sum of firms where a specific ownership type is present (373) by far exceeds the number of sample firms (178) as in most of the firms, multiple shareholder types are present. In order to incorporate family management into the regression analysis, the independent variable *Family - CEO* shall be introduced. The importance of including family management has been discussed extensively during the literature review. Therefore, it comes as no surprise that a multitude of researchers included family involvement as an independent variable into the analysis (e.g. Anderson et al., 2009; Andres, 2008; Minichilli et al., 2016; Sacristan-Navarro et al., 2011a; Sacristan-Navarro, Gomez-Anson, & Cabeza-Garcia, 2011b). Since the CEO is considered the most important powerful decision-maker in a company (Minichilli et al., 2010), I follow other researchers and include the family CEO as an independent variable in my regression model (e.g. Minichilli et al., 2016; Sirmon et al., 2008). Specifically, *FamilyxFamily - CEO* is designed as an interaction term where a dummy variable that is one, if

Table 3: Accumulated Shareholder Return of Sample Firms

	N	Mean	25th pcl.	Median	75th pcl.	SD
Accumulated Pre-Crisis Return 01.01.2005 – 31.12.2006	178	69.9%	36.7%	60.8%	89.0%	0.63
Accumulated Crisis Return 14.09.2008 – 06.03.2009	178	-44.0%	-61.0%	-41.2%	-22.6%	0.38

Source: Own Calculation

Table 4: Ownership Distribution among Sample Firms

	N	TFF	LFF	Other Individual	Financial Institution	PE	State	Other
Average % of equity ownership across all firms	178	16.5%	5.2%	3.5%	12.6%	3.7%	1.6%	10.9%
Number of firms where ownership type is present	178	64	32	47	93	44	11	82
Average % of equity ownership among firms with respective ownership type	n/a	45.8%	28.8%	13.2%	24.1%	15.1%	25.1%	23.6%

Source: Own Calculation

the CEO is a member of the family shareholders, and zero otherwise, is multiplied with the continuous variable TFF representing the percentage of voting rights held by the family. Correspondingly, the term *FamilyxExternal_CEO* represents the families' voting rights of a TFF where no family CEO, but an outside manager holds the CEO position.

As explained earlier, no differentiation with regard to the management involvement of founders in LFF is made as this will not lead to statistically relevant results. In fact, the LFF founder variable was omitted by the software used in the regression model due to multicollinearity.

Table 5 shows the presence of family and founder CEOs in the firms. Specifically, while around one third (34.4%) of all TFF have a family CEO, almost in half of the LFF (46.9%), one founder holds the CEO position. It is also interesting to note that when a family CEO is present, the average percentage of voting rights is higher than with an external CEO. This might be due to the fact that in large firms, equity ownership is more dispersed and external, professional CEOs are more common. It is especially notable that when there is no LFF CEO, the average percentage of voting rights by the founders is only 16.7%, compared to 42.5% ownership when an LFF CEO is present.

3.5. Control Variables

This study argues that family ownership affects firm performance. It therefore is important to ensure that the analysis takes other factors influencing firm performance into account. Consistent with previous studies on family firm performance (e.g. Lins et al., 2013; Minichilli et al., 2016; Van Essen et al., 2015), I therefore control for industry affiliation, past performance, firm age, firm size, leverage, and liquidity. Furthermore, I include ownership types other than TFF and LFF into the regression.

Other ownership types. In order to separate the effect originating from family or founder ownership and to better understand how ownership structure in general affects firm performance, I included the following ownership types in the regression. *Other-Individual* describe shareholders or their holdings which are controlled by a maximum of two non-relative individuals. *Financial-Institution* are banks, venture capital funds, insurance firms, mutual or pension funds, other funds or holding companies. Private equity firms (PE) are firms that exclusively engage in private equity activities. Also professionally-managed family offices are classified as PE as they are assumed to have a similar nature as classical PE firms (Estrodt, 2003). State describes government-controlled blockholders. Other describes all other shareholder types (except for free float), for instance foundations, cooperatives, anonymous investors or employees.

Industry affiliation (SIC). I expect that firms belonging to particular industries might show a different performance during a crisis than firms in other industries. In order to control for this industry effects, I grouped the companies in the sample using the first digit of the Standard Industrial Classification (SIC) code. The regression analysis therefore considers the following industries as control variables: Agriculture, Forestry and Fishing, Construction and Mining, Manufacturing, Transportation & Public Utilities, Wholesale and Retail Trade, Finance, Insurance and Real Estate, and Services.

Past performance (Pre-Crisis-Return). I expect that the

Table 5: Family Involvement in the Management of Sample Firms

	N	TFF	LFF
Number of firms where ownership type is present	178	64	32
Number of firms where ownership type is present and family member (founder) is CEO	178	22	15
Percentage of TFF (LFF) with presence of family CEO (founder CEO)	178	34.4%	46.9%
Average % of equity ownership by family (founder) with presence of family CEO (founder CEO)	178	48.7%	42.5%
Average % of equity ownership by family (founder) with external CEO	179	44.2%	16.7%

Source: Own Calculation

mere fact that firms that have performed better in the past might also lead to better performance during the regression period. In order to isolate that effect, I include the company's pre-crisis total return for shareholders between 2005 and 2007 in the main regression.

Firm age (ln-IPO). I expect that older firms perform better, as they tend to have greater management expertise, higher cash reserves, and might even have survived a crisis in the past. Especially after the first listing at the stock exchange, access to capital and supervision by shareholders due to transparency requirements is higher. Therefore, I include the natural logarithm of the firms' age since their IPO, the difference between the year of the IPO and the respective year of the regression period. The natural logarithm is used in order to improve the model fit by altering the scale of skewed variables, such as firm age and firm size.

Firm size (ln-Cap). I expect that larger firms might tend to perform better, especially during a crisis, because of greater management expertise or higher cash reserves. Smaller firms might lack the management expertise required to navigate a company through such challenging times. Therefore, I use the natural logarithm of the market capitalization in order to control for the firm size.

Leverage (DE_Ratio). I expect that higher leverage affects firm performance negatively as it tends to magnify profits in good times but also magnifies losses in bad times like the GFC (?). A firm that borrows heavily bears a higher risk of default compared with a less-leveraged firm due to high interest rates constituting fixed costs or the inability to raise additional capital due to the higher risk of over-indebtedness (Castanias, 1983). Leverage in this study is evaluated with the help of the debt-to-equity ratio, calculated by dividing a company's total liabilities by its shareholder equity.

Liquidity (Current_Ratio). I expect that firms with higher liquidity reserves perform better during a crisis as those firms with liquidity shortage lack the financial resourced to repay creditors and therefore might result in a situation of default. Liquidity is evaluated with the current ratio, calculated by dividing a firm's current assets by its current liabilities. The current ratio therefore measures a company's ability to repay short-term liabilities with the available short-term resources on hand.

Cash flow generation (CF_Sales_Ratio). I expect that firms that have a greater ability to generate cash out of its sales perform better during a crisis as they can generate more cash for each money unit earned than other firms with a lower cash flow generation ability. The ability to translate sales into cash is evaluated by the cash flow-to-sales ratio, calculated by dividing a company's funds from operations by its net sales.

3.6. Analytical Approach

All regressions have been performed in StataSE 16 by Stata corp. For the main regression, I chose a multiple linear regression model using generalized least squares in order to estimate coefficients. The regression results will be interpreted using significance levels of 1%, 5%, and 10%. Deviating, non-linear regression models or models with different dependent variables used for robustness tests are described in detail in section 4.3 Robustness.
The following formula depicts the main regression analysis:

$$y_i = \beta_0 + \beta_1 X_i + \cdots + \beta_1 X_n + \epsilon_i$$

Where y_i = Dependent variable
β_0 = Population Y intercept
β_1 = Population slope coefficients
$X_i \cdots X_n$ = Independent variables and control variables
ϵ_i = Random error term

Generally, it should be noted that the independent and control variables have been lagged by one period (year-end 2007) in order to ensure that they describe the pre-crisis status. Thereby, I avoid that variables are already influenced by the crisis period. For example, the debt-to-equity ratio serving as the leverage control variable is considered for the year 2007 and therefore cannot be a consequence of heavy borrowing during the crises period. Table 6 summarizes the variables that have been used in the main regression analysis as well as their purpose, the variable type and the respective definition.

4. Analyses and Results

This section summarizes the empirical findings of the analyses performed in this thesis. The significant outcomes will be outlined, and it will be resolved whether the hypotheses

Table 6: Variable Definitions

Variable	Variable Purpose	Variable Type	Definition
Crisis_Return	Dependent	Continuous	Accumulated total return for shareholders between September 14, 2008, and March 6, 2009
TFF	Independent	Continuous	Percentage of voting rights (common shares) held by multiple members of the same family as of the end of the financial year 2007
LFF	Independent	Continuous	Percentage of voting rights (common shares) held by the company's founder(s) with no other family members involved as of the end of the financial year 2007
FamilyxFamily_CEO	Independent	Interaction Term	Percentage of voting rights (common shares) held by multiple members of the same family multiplied with one if the CEO is a family member as of the end of the financial year 2007 as of the end of the financial year 2007
FamilyxExternal_CEO	Independent	Interaction Term	Percentage of voting rights (common shares) held by multiple members of the same family multiplied with one if the CEO is no member of the owning family as of the end of the financial year 2007 as of the end of the financial year 2007
Other_Individual	Independent	Continuous	Percentage of voting rights (common shares) held by individual investors with no other family members involved as of the end of the financial year 2007
Financial_Institution	Independent	Continuous	Percentage of voting rights (common shares) held by banks, venture capital funds, insurance firms, mutual or pension funds, other funds, or holding companies as of the end of the financial year 2007
PE	Independent	Continuous	Percentage of voting rights (common shares) held by PE firms (incl. family professionally managed family offices) that exclusively engage in private equity activities as of the end of the financial year 2007.
State	Independent	Continuous	Percentage of voting rights (common shares) held by the government / state-controlled blockholders as of the end of the financial year 2007
Other	Independent	Continuous	Percentage of voting rights (common shares) held by all other types of shareholders (except free float), i.e. foundations, cooperatives, anonymous investors, management, or employees as of the end of the financial year 2007
Pre_Crisis_Return	Control	Continuous	Accumulated total return for shareholders between 2007 and 2009
1-digit SIC codes	Control	Categorical	Standard Industrial Classification (SIC) Code of the firm's industry
ln_IPO	Control	Continuous	Natural logarithm of the firms' age since their IPO as of the end of the financial year 2007
ln_Cap	Control	Continuous	Natural logarithm of the firms' market capitalization as of the end of the financial year 2007
DE_Ratio	Control	Continuous	Debt-to-Equity ratio as of the end of the financial year 2007
Current_Ratio	Control	Continuous	Current ratio (current assets / current liabilities) as of the end of the financial year 2007
CF_Sales_Ratio	Control	Continuous	Cash flow-to-sales ratio (funds from operations / net sales) as of the end of the financial year 2007

Source: Miller et al. (2007), Own Compilation can be supported or not. The section is structured as follows: First, descriptive statistics including means, standard deviations, and correlations among the variables are presented. Thereafter, the main regression results will be outlined in order to conclude whether the hypotheses derived throughout this thesis can be supported. Finally, several robustness tests increase the quality of research by testing resistance to variable definitions, choice of dependent variables, determination of the crisis window, or selection of the analytical approach. Finally, further empirical analyses related to decisions about personnel, capital structure, and capital expenditures provide further insights into the behavior of TFF and LFF during the GFC.

4.1. Descriptive Results

Table 7 summarizes the empirical correlations among the dependent, independent, and control variables, including means and standard deviations and excluding interaction terms. The dependent variable, Crisis_Return, shows a significant positive correlation with LFF (p<0.05), but not with TFF. Furthermore, Other_Individual ($p < 0.05$) correlates positively with accumulated total shareholder return during the GFC. Performance during the control window prior to the crisis is positively correlated with Financial_Institution ($p < 0.01$) and Current_Ratio ($p < 0.01$). Furthermore, there is a slight negative correlation between CF_Sales_Ratio and Pre_Crisis_Return. It is also noteworthy that LFF ownership is negatively associated with firm size (*ln_Cap*, $p < 0.01$) and firm age (*ln_IPO*, $p < 0.01$) which is intuitive as the founders are still present and therefore the firms cannot be as old as multigenerational TFF and often are smaller due to the relatively early stage of business. TFF ownership, analogously, is positively associated with firm age ($p < 0.1$).

4.2. Main Regression Results

Table 8 shows the regression results for the first regression. Hypotheses 1a and 1b are tested in Model 2, where total shareholder return is accumulated during the crisis period from September 14, 2008, until March 6, 2009. Model 1 performs the same analysis, only that the total shareholder return is accumulated over the period 2005 – 2007. Furthermore, pre-crisis return is introduced as a control variable in Model 2 in order to test whether the performance is impacted by prior performance.

The first independent variable, TFF does not seem to have any significant effect on firm performance during the crisis ($p > 0.1$). Therefore, the results do not support hypothesis 1a. Interestingly, there is a significant effect of TFF ownership on firm performance during the control window prior to the GFC ($p < 0.1, \beta = 0.302$). The positive coefficient implies that TFF ownership is positively associated with total shareholder return, suggesting that TFF exhibit superior performance during a period of stable economic conditions.

The second independent variable, LFF, is significant during the crisis period ($p < 0.05, \beta = 0.425$). The positive coefficient implies that LFF ownership is positively associated with total shareholder return, suggesting that LFF exhibit superior performance during a period of financial distress. Therefore, the results do support hypothesis 1b. During the pre-crisis period 2005 – 2007, no significant performance effect relating to LFF ownership can be observed ($p > 0.1$).

With regard to other categories of firms analyzed in this study, only a few ownership types show significant effects, and when they do, then only for one of the periods examined. First, and most notable, state ownership is positively and highly significantly associated with firm performance during crisis ($p < 0.01, \beta = 1.323$). This result might indicate that investors had higher expectations for firms where the government was a large shareholder as these firms might benefit from preferential treatment with regard to financial bailouts by the government. Second, also firms where other individuals like single investors were major shareholders showed superior performance during the GFC ($p < 0.1, \beta = 0.624$). Third, ownership by financial institutions is positively associated with performance in the control window prior to the crisis ($p < 0.05, \beta = 0.573$). During the GFC, however, having financial institutions as shareholders had no significant effect on firm performance.

Although I expected firms belonging to different industries to behave differently, almost no significant associations between industry group membership and firm performance can be observed. With regard to other control variables, age does not seem to be significant for firm performance, either ($p > 0.1$). Firm size is only significant during the control window prior to the GFC ($p < 0.1, \beta = 0.0518$). The Debt-to-Equity ratio, not significant before crisis, is negatively associated with performance during the GFC ($p < 0.1, \beta = -0.000315$), suggesting that a higher indebtedness resulted in inferior performance during the crisis. The current ratio exhibits a positive significant effect on firm performance both during ($p < 0.1, \beta = 0.00993$) and before the crisis ($p < 0.01, \beta = 0.0412$). The Cash-flow-to-sales ratio, in contrast, is not significant with regard to firm performance during neither period.

The strength of the relationship between the model and the dependent variable is expressed by the R-squared. The R-squared is the percentage of the dependent variable variation that is explained by the linear regression model and therefore is always between zero and one. The R-squared value of the model during the crisis and before the crisis is 0.234 and 0.284, respectively. This suggests, that 23.4% (28.4%) of the variance of accumulated total shareholder return during (before) the crisis can be explained by the model. The R-squared adjusted penalizes the analysis as additional variables that do not enhance the explanatory power of the model are included in the model. The lower R-squared adjusted during both periods indicates that the inclusion of some of the control variables did not improve overall fit of the model.

Table 9 shows the second regression analysis. The dependent variable and the regression model are identical, but in this setting, the independent variable TFF is replaced by two interaction terms where the effect of family ownership

Table 7: Correlation Matrix

	Mean	SD	1	2	3	4	5	6
1. Crisis_Return	-0.44	0.38	1.0000					
2. Pre_Crisis_Return	0.70	0.63	0.0038	1.0000				
3. TFF	0.16	0.27	0.0070	0.0275	1.0000			
4. LFF	0.05	0.15	.1518**	0.0562	-0.2109***	1.0000		
5. Other_Individual	0.03	0.08	0.1542**	-0.0633	-0.1099	0.0281	1.0000	
6. Financial_Institution	0.13	0.20	-0.0244	0.2828***	-0.1652**	-0.1608**	-0.0610	1.0000
7. PE	0.04	0.11	0.0063	-0.0889	-0.0180	-0.0963	-0.0069	-0.0520
8. State	0.02	0.08	0.0916	-0.0133	-0.0995	-0.0688	-0.0296	-0.0687
9. Other	0.11	0.22	0.0304	-0.0491	-0.1442*	-0.0848	-0.0822	0.0108
10. ln_IPO	2.42	0.59	-0.0700	-0.0402	0.1395*	-0.2646***	-0.1083	0.0159
11. ln_Cap	13.08	2.21	-0.1206	-0.0057	0.0794	-0.2930***	-0.1340*	0.0324
12. DE_Ratio	56.58	153.72	-0.1111	-0.0511	-0.0476	-0.0482	0.0008	0.0220
13. Current_Ratio	2.69	5.64	0.0888	0.3827***	-0.0776	0.0372	0.0699	0.2164***
14. CF_Sales_Ratio	-20.40	284.54	-0.1228	-0.1392*	0.0684	0.0129	-0.0633	-0.0426

	7	8	9	10	11	12	13	14
1. Crisis_Return								
2. Pre_Crisis_Return								
3. TFF								
4. LFF								
5. Other_Individual								
6. Financial_Institution								
7. PE	1.0000							
8. State	-0.0445	1.0000						
9. Other	-0.0611	0.0231	1.0000					
10. ln_IPO	-0.0287	-0.0341	-0.0041	1.0000				
11. ln_Cap	-0.1301*	0.2382***	0.1081	0.5098***	1.0000			
12. DE_Ratio	0.1549**	0.1482**	0.0457	0.0162	0.1830**	1.0000		
13. Current_Ratio	-0.0647	-0.0558	-0.0589	-0.0979	-0.1925**	-0.0712	1.0000	
14. CF_Sales_Ratio	-0.0008	0.0238	0.0404	0.0686	0.1074	0.0416	-0.2039***	1.0000

Source: Own calculation. ***p<0.01, **p<0.05, *p<0.1.

on firm performance is conditioned on whether the firm is managed by a family CEO or an external CEO. With regard to all other variables except FamilyxFamily_CEO and FamilyxExternalCEO, the regression results are naturally almost identical to the first regression.

The independent variable FamilyxFamily_CEO, hence the share of family ownership in case a family member holds the CEO position, is not significant during the crisis period ($p > 0.1$). Therefore, hypothesis 2 cannot be supported. However, the results suggest that there is a significant relationship between the presence of a family CEO and the accumulated shareholder return in the years 2005 – 2007, prior to the GFC ($p < 0.1, \beta = 0.501$). The positive coefficient implies that family management is beneficial for firm performance during periods of stable economic conditions.

The analogous independent variable FamilyxFamily_CEO, hence the share of family ownership in case the CEO position is held by an external manager, is not significant in either period ($p > 0.1$) and thus the presence of an external CEO seems to have no impact on total shareholder return.

The coefficient of determination, R-squared, and also the R-squared adjusted are slightly higher than in the first regression analysis, suggesting that the differentiation within TFF helped to increase the explanatory power of the model.

4.3. Robustness

In this section, several robustness tests will be performed. It shall be analyzed whether the results are influenced by specific variable definitions or analytical methods. Therefore, the regression analysis is repeated using alternative performance measures, alternative blockholder definitions, an alternative crisis period window, as well as an alternative analytical approach.

4.3.1. Alternative Firm Performance Measures

In their meta-study, Block et al. (2011) found that the results of studies examining family firm performance were highly sensitive to the choice of the performance measure.

Table 8: Regression Results TFF and LFF

DV: Accumulated total shareholder return VARIABLES	(1) Pre-Crisis	(2) Crisis
TFF	0.302*	0.137
	(0.178)	(0.113)
LFF	0.463	0.425**
	(0.333)	(0.210)
Other_Individual	-0.314	0.624*
	(0.558)	(0.350)
Financial_Institution	0.573**	0.122
	(0.241)	(0.154)
PE	-0.0732	0.173
	(0.398)	(0.249)
State	0.345	1.323***
	(0.638)	(0.400)
Other	-0.0978	0.0195
	(0.207)	(0.130)
Pre_Crisis_Return		-0.0477
		(0.0500)
group(SIC) = 2	0.359	-0.341
	(0.625)	(0.392)
group(SIC) = 3	0.145	-0.392
	(0.589)	(0.369)
group(SIC) = 4	0.243	-0.484
	(0.582)	(0.365)
group(SIC) = 5	0.130	-0.687*
	(0.613)	(0.384)
group(SIC) = 6	0.206	-0.325
	(0.607)	(0.380)
group(SIC) = 7	0.887	-0.402
	(0.627)	(0.396)
group(SIC) = 8	0.443	-0.185
	(0.590)	(0.370)
group(SIC) = 9	0.123	-0.126
	(0.619)	(0.388)
ln_IPO	-0.0477	0.0448
	(0.0921)	(0.0577)
ln_Cap	0.0518*	0.00529
	(0.0272)	(0.0172)
DE_Ratio	-0.000209	-0.000315*
	(0.000293)	(0.000184)
Current_Ratio	0.0412***	0.00993*
	(0.00848)	(0.00570)
CF_Sales_Ratio	-0.000247	-6.11e-05
	(0.000170)	(0.000107)
Constant	-0.380	-0.324
	(0.687)	(0.431)
Observations	178	178
R-squared	0.284	0.234
R-squared adjusted	0.192	0.131

Source: Own Calculation
Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Regression Results Family CEO

DV: Accumulated total shareholder return VARIABLES	(1) Pre_Crisis_CEO	(2) Crisis_CEO
FamilyxFamily_CEO	0.501*	0.269
	(0.258)	(0.164)
FamilyxExternalCEO	0.192	0.0662
	(0.206)	(0.129)
LFF	0.483	0.440**
	(0.333)	(0.210)
Other_Individual	-0.298	0.633*
	(0.558)	(0.350)
Financial_Institution	0.573**	0.124
	(0.241)	(0.153)
PE	-0.0393	0.194
	(0.399)	(0.250)
State	0.328	1.313***
	(0.638)	(0.400)
Other	-0.105	0.0141
	(0.207)	(0.130)
Pre_Crisis_Return		-0.0525
		(0.0501)
group(SIC) = 2	0.454	-0.277
	(0.631)	(0.396)
group(SIC) = 3	0.237	-0.331
	(0.595)	(0.373)
group(SIC) = 4	0.347	-0.415
	(0.590)	(0.370)
group(SIC) = 5	0.226	-0.624
	(0.619)	(0.388)
group(SIC) = 6	0.277	-0.277
	(0.611)	(0.383)
group(SIC) = 7	0.993	-0.328
	(0.635)	(0.401)
group(SIC) = 8	0.536	-0.123
	(0.596)	(0.374)
group(SIC) = 9	0.222	-0.0601
	(0.626)	(0.392)
ln_IPO	-0.0503	0.0429
	(0.0921)	(0.0577)
ln_Cap	0.0561**	0.00831
	(0.0275)	(0.0174)
DE_Ratio	-0.000217	-0.000321*
	(0.000293)	(0.000184)
Current_Ratio	0.0414***	0.0103*
	(0.00848)	(0.00570)
CF_Sales_Ratio	-0.000248	-6.27e-05
	(0.000170)	(0.000107)
Constant	-0.528	-0.423
	(0.701)	(0.440)
Observations	178	178
R-squared	0.289	0.240
R-squared adjusted	0.193	0.132

Source: Own Calculation. Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

In section *3.3 Dependent Variable*, the categorization of performance measures into accounting measures, financial market measures and mixed accounting and financial market measures according to Richard et al. (2009) has been introduced. In order to test the robustness of the main result, where the financial market-based performance measure total shareholder return was used, the following Table 10 shows a regression using popular accounting measures as well as mixed accounting and financial market measures.

One major disadvantage of accounting measures, and therefore also of mixed measures, is that they cannot be observed on a daily basis like financial measures but rather are reported at least on an annual basis. Therefore, it is impossible to measure performance over the exact crisis period that has been used for the main regression. Because accounting measures are rather backward-looking (Keats, 1988), for the purpose of this analysis, the accounting performance measures are the sum of the year-end reported measures by Reuters Eikon of the years 2008 and 2009. Thereby, the crisis period as defined in the main regression is included. In order to compare the results against stable economic conditions before the GFC, I also aggregated the same dependent variables over the years 2005 and 2006.

Please note that Table 10 shows shortened regression results. For improved visualization, some control variables that have not been significant like the industry groups or past performance are not displayed. For a full regression table, including all variables, please refer to Appendix 1. I tested the different ownership types against four alternative performance measures both during and before the GFC.

ROE has been computed as the net income before extraordinary items for the fiscal year divided by the same period average total equity and is expressed as a percentage. Surprisingly, no single ownership type has a significant effect on ROE. Furthermore, the goodness-of-fit measure R-squared during the crisis is relatively low *(0.125)* and the R-squared adjusted close to zero *(0.007)*, suggesting that the overall model does not explain much of the ROE's variance and the choice of variables might not be optimal for this analysis. To conclude, neither hypothesis 1a nor hypothesis 1b can be supported.

Examining ROA, in contrast, reveals interesting results. ROA represents the return on assets after taxes. It is calculated as net income before extraordinary items for the fiscal year divided by the average total assets for the same period and is expressed as a percentage. Interestingly, TFF ownership is significant both before ($p < 0.01, \beta = 18.05$) and during the crisis ($p < 0.1, \beta = 12.59$). The indication of this result is twofold. First, although only significant at a 10% level, TFF seem to have performed superior in terms of ROA compared to other firms during the GFC. This supports hypothesis 1a. Second, TFF generally seem to perform better than other firms during the period of stable economic conditions prior to the GFC. LFF ownership is not significant and therefore seems to have no effect on firm performance neither before nor during the crisis. Therefore, hypothesis 1b cannot be supported. Another interesting result is that PE ownership is negatively associated with ROA performance on a 1% significance level ($p < 0.01, \beta = -49.08$). Overall, the R-squared during the crisis is relatively high *(0.466)* and also the R-squared adjusted *(0.395)* indicates that the relationship between the dependent variable and the model is quite good.

Also the analysis of the ROIC reveals significant results with regard to the effect of ownership types. ROIC is calculated as income after tax for the fiscal year divided by the same period average total long-term capital and is expressed as a percentage. Total long-term capital represents the sum of total equity, total long-term debt, deferred income tax and total other liabilities. When measuring performance with the ROIC, TFF ownership is only significant in the period prior to the GFC ($p < 0.05, \beta = 28.17$), but not during the crisis itself. LFF ownership is not significant and therefore seems to have no effect on firm performance neither before nor during the crisis. Therefore, neither hypothesis 1a nor hypothesis 1b can be supported. Similar to ROA performance, PE ownership has a significantly negative effect on the firm's ROIC ($p < 0.01, \beta = -1,481$). Again, R-squared *(0.440)* and R-squared adjusted *(0.365)* suggest a good model fit.

The fourth alternative performance measure is a mixed accounting and financial market-based measure, Tobin's q. It is the ratio of the market value of firm assets and its replacement cost (Tobin, 1969). Because the estimation of the replacement value of a firm's assets is difficult, I calculated the ratio by dividing the market value of a firm's assets by its corresponding book values. Specifically, I follow the approach of Chung and Pruitt (1994) who simplified the calculation of Tobin's q by dividing the sum of the market value of equity, hence the market capitalization, at the end of the year and the book value of debt by the book value of total assets. The market-to-book value is considered a useful measure of firm performance as the valuation of the firm is determined by market participants who evaluate the firms and their prospects (Villalonga & Amit, 2006).

Neither TFF nor LFF ownership has a significant effect on the firms' Tobin's q during the GFC, providing no support for hypotheses 1a and 1b. It should be noted, however, that TFF ownership is positively associated with firm performance ($p < 0.1, \beta = 1.673$) when examining the effect during the control window 2005 – 2007 where economic conditions were stable. Interestingly, firm age since the IPO had a significant negative effect both prior and during the GFC. Overall, the R-squared during the crisis is highest *(0.489)* compared with all other performance measures and also the R-squared adjusted (0.420) indicates that the relationship between the dependent variable and the model is quite good.

Table 11 shows the same dependent variables. However, this time the independent variable TFF is separated into FamilyxFamily_CEO and FamilyxExternalCEO, analogously to the main regression. Regardless of the performance measure, family CEO presence was not significant during the crisis and therefore no effect on firm performance can be suggested by the results. Therefore, hypothesis 2 cannot be supported. However, in the period 2005 – 2007, prior to the

Table 10: Robustness – Regression (shortened) including Alternative Performance Measures

VARIABLES	(1a) Pre-Crisis ROE	(1b) Crisis ROE	(2a) Pre-Crisis ROA	(2b) Crisis ROA	(3a) Pre-Crisis ROIC	(3b) Crisis ROIC	(4a) Pre-Crisis TobinsQ	(4b) Crisis TobinsQ
TFF	57.70	50.03	18.05***	12.59*	28.17**	26.32	1.673*	0.327
	(35.79)	(35.94)	(6.767)	(6.739)	(12.75)	(68.90)	(0.921)	(0.451)
LFF	12.19	0.444	7.327	-3.485	16.44	-104.7	2.321	1.062
	(66.72)	(66.81)	(12.62)	(12.53)	(23.76)	(128.1)	(1.717)	(0.838)
Other_Individual	53.02	60.98	13.25	11.46	-4.723	127.2	3.226	0.0286
	(111.9)	(111.5)	(21.16)	(20.91)	(39.86)	(213.7)	(2.879)	(1.398)
Financial_Institution	13.31	-1.239	2.022	-6.364	-0.125	28.11	0.665	-0.125
	(48.30)	(48.92)	(9.132)	(9.173)	(17.20)	(93.78)	(1.243)	(0.613)
PE	79.61	81.47	3.728	-49.08***	23.51	-1,481***	-0.986	1.353
	(79.87)	(79.49)	(15.10)	(14.90)	(28.44)	(152.4)	(2.055)	(0.997)
State	-21.93	-30.68	-7.683	-4.074	-15.81	17.42	-3.493	-1.375
	(128.0)	(127.5)	(24.20)	(23.91)	(45.59)	(244.4)	(3.293)	(1.598)
Other	41.62	44.10	7.702	8.698	19.62	-2.895	0.0652	-0.419
	(41.46)	(41.29)	(7.839)	(7.742)	(14.77)	(79.15)	(1.067)	(0.518)
ln_IPO	-11.65	-10.44	0.997	2.170	-2.025	30.50	-1.122**	-0.682**
	(18.46)	(18.39)	(3.491)	(3.448)	(6.576)	(35.26)	(0.475)	(0.231)
ln_Cap	12.92**	11.61**	2.000*	1.921*	5.569***	3.066	0.335**	0.212***
	(5.460)	(5.495)	(1.032)	(1.030)	(1.944)	(10.53)	(0.140)	(0.0689)
DE_Ratio	-0.0129	-0.00762	-0.00771	-0.0157	-0.0195	-0.166	-0.00150	-0.000793
	(0.0588)	(0.0587)	(0.0111)	(0.0110)	(0.0210)	(0.112)	(0.00151)	(0.000735)
Current_Ratio	3.171*	2.125	1.787***	-0.377	2.147***	-2.410	-0.0113	-0.0182
	(1.701)	(1.815)	(0.322)	(0.340)	(0.606)	(3.480)	(0.0438)	(0.0228)
CF_Sales_Ratio	0.0282	0.0344	0.0268***	0.0489***	0.0290**	0.0491	-0.00327***	-0.00440***
	(0.0340)	(0.0341)	(0.00644)	(0.00639)	(0.0121)	(0.0654)	(0.000876)	(0.000428)
Constant	-164.4	-154.7	-33.41	-24.56	-73.72	9.363	1.293	2.766
	(137.8)	(137.3)	(26.05)	(25.74)	(49.08)	(263.1)	(3.545)	(1.721)
Observations	178	178	178	178	178	178	178	178
R-squared	0.111	0.125	0.296	0.466	0.211	0.440	0.183	0.489
R-squared adjusted	-0.003	0.007	0.207	0.395	0.111	0.365	0.079	0.420

Source: Own Calculation; Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

GFC, the presence of a family CEO has a significant positive impact when performance is measured by ROA ($p < 0.01, \beta = 26.32$) or ROIC ($p < 0.05, \beta = 37.91$). The presence of an external CEO, that is not part of the owning family, has a positive, but only slightly significant effect on ROA performance both prior ($p < 0.1, \beta = 13.48$) and during ($p < 0.1, \beta = 13.27$) the GFC. There seems to be no significant relationship between the presence of an external CEO and other firm performance measures.

4.3.2. Alternative TFF and LFF Definitions

Researchers argued that despite the existence of wide-ranging family business literature, finding a consensus on the exact definition of a TFF or LFF is difficult (Miller et al., 2007). In many studies, TFF or LFF status is defined by the circumstance that the voting rights or equity held by the owning family or owning founders exceed a particular threshold. However, there has been no conclusive opinion in academic research about how high exactly such a threshold should be. Reviewing studies from family business literature, I found that researchers used a variety of different thresholds ranging from 5% (M. P. Allen & Panian, 1982; Miller et al., 2010) to 10% (Sacristan-Navarro et al., 2011b) to 20% (Arosa et al., 2010; Faccio & Lang, 2002) to 25% (Andres, 2008; Kowalewski et al., 2010) to 33% (Barth, Gulbrandsen, & Schønea, 2005) to 50% (Ang, Cole, & Lin, 2000; Wong et al., 2010) to 51% (Barontini & Caprio, 2006).

In order to test whether my regression analysis is robust to the independent variable definition, I follow a similar approach as mentioned above and create dummy variables for all ownership types that are one, if the voting rights or equity held by the owning family or owning founders exceed the respective threshold and zero, otherwise. By performing the same regression but with several different thresholds, I want to ensure to obtain results that can be traced back to the ownership structure independent from the respective thresholds themselves.

Specifically, I tested the effect of ownership structure on accumulated total shareholder return during and before the GFC using thresholds of 25%, 30%, and 50%. In the first model, family or founder shareholder must hold at least half of all voting rights of the firm, hence are by all means the single largest shareholder in the firm and always have the absolute majority in the firm. In my sample, 32 TFF and six LFF fulfill this criterion. The dummy variable for TFF is not significant neither before nor during the GFC. The LFF dummy, however, is significant with a positive coefficient in the period prior to the crisis ($p < 0.05, \beta = 0.589$), indicating that LFF, where the founders hold 50% of voting rights, performed better than firms with other types of blockholders

Table 11: Robustness – Regression (shortened) including Alternative Performance Measures and Family CEO

VARIABLES	(1a) Pre-Crisis ROE	(1b) Crisis ROE	(2a) Pre-Crisis ROA	(2b) Crisis ROA	(3a) Pre-Crisis ROIC	(3b) Crisis ROIC	(4a) Pre-Crisis TobinsQ	(4b) Crisis TobinsQ
FamilyxFamily_CEO	78.96	66.53	26.32***	11.31	37.91**	-28.39	2.187	0.891
	(51.90)	(52.29)	(9.780)	(9.809)	(18.47)	(100.1)	(1.335)	(0.653)
FamilyxExternalCEO	45.94	41.18	13.48*	13.27*	22.78	55.65	1.388	0.0250
	(41.43)	(41.37)	(7.808)	(7.760)	(14.75)	(79.20)	(1.066)	(0.517)
LFF	14.31	2.340	8.148	-3.632	17.41	-111.0	2.372	1.127
	(66.97)	(67.12)	(12.62)	(12.59)	(23.84)	(128.5)	(1.723)	(0.838)
Other_Individual	54.65	62.04	13.89	11.38	-3.975	123.7	3.265	0.0650
	(112.2)	(111.8)	(21.14)	(20.98)	(39.93)	(214.1)	(2.887)	(1.396)
Financial_Institution	13.24	-0.956	1.993	-6.386	-0.160	27.17	0.663	-0.115
	(48.40)	(49.05)	(9.121)	(9.203)	(17.23)	(93.92)	(1.245)	(0.613)
PE	83.22	84.20	5.134	-49.29***	25.16	-1,490***	-0.899	1.446
	(80.29)	(79.94)	(15.13)	(15.00)	(28.58)	(153.1)	(2.066)	(0.998)
State	-23.75	-31.87	-8.391	-3.981	-16.64	21.38	-3.537	-1.415
	(128.3)	(127.9)	(24.18)	(23.99)	(45.67)	(244.8)	(3.302)	(1.597)
Other	40.81	43.42	7.387	8.751	19.25	-0.643	0.0456	-0.442
	(41.57)	(41.42)	(7.835)	(7.772)	(14.80)	(79.31)	(1.070)	(0.517)
ln_IPO	-11.93	-10.68	0.891	2.188	-2.150	31.29	-1.128**	-0.690***
	(18.51)	(18.45)	(3.488)	(3.461)	(6.588)	(35.32)	(0.476)	(0.230)
ln_Cap	13.38**	11.99**	2.177**	1.892*	5.777***	1.809	0.346**	0.225***
	(5.530)	(5.578)	(1.042)	(1.046)	(1.968)	(10.68)	(0.142)	(0.0697)
DE_Ratio	-0.0137	-0.00836	-0.00802	-0.0157	-0.0199	-0.163	-0.00152	-0.000818
	(0.0590)	(0.0588)	(0.0111)	(0.0110)	(0.0210)	(0.113)	(0.00152)	(0.000735)
Current_Ratio	3.198*	2.171	1.798***	-0.380	2.159***	-2.561	-0.0106	-0.0166
	(1.705)	(1.823)	(0.321)	(0.342)	(0.607)	(3.491)	(0.0439)	(0.0228)
CF_Sales_Ratio	0.0281	0.0342	0.0267***	0.0489***	0.0290**	0.0497	-0.00327***	-0.00441***
	(0.0341)	(0.0342)	(0.00643)	(0.00641)	(0.0121)	(0.0655)	(0.000878)	(0.000427)
Constant	-180.1	-167.1	-39.55	-23.60	-80.96	50.32	0.910	2.344
	(140.9)	(140.5)	(26.55)	(26.36)	(50.14)	(269.0)	(3.625)	(1.755)
Observations	178	178	178	178	178	178	178	178
R-squared	0.113	0.126	0.302	0.466	0.214	0.442	0.184	0.493
R-squared adjusted	-0.0069	0.002	0.209	0.391	0.108	0.363	0.074	0.421

Source: Own Calculation
Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

holding 50% of voting rights in that period.

According to the German Securities Acquisition and Takeover Act, control is defined as the holding of at least 30% of the voting rights of a company (§291$W_p\bar{U}G$). The threshold of 30% was chosen because in many cases the majority of the voting rights represented are already attained in a general meeting, where not all shareholders are present. I therefore tested the impact on firm performance in the second model under the condition that the family or founder shareholders must hold at least 30% of all voting rights of the firm. In my sample, 46 TFF and 13 LFF fulfill this criterion. The dummy variable for TFF is not significant neither before nor during the GFC. The LFF dummy, however, is significant with a positive coefficient during the crisis ($p < 0.1, \beta = 0.217$), indicating that LFF, where the founders hold 30% of voting rights or more, performed better than firms with other types of blockholders holding at least 30% of voting rights during the GFC.

Finally, I repeated the same analysis using a threshold of 25%. According to the European Commission (2019), "Listed companies meet the definition of family enterprise if the person who established or acquired the firm (share capital) or their families or descendants possess 25 per cent of the decision-making rights mandated by their share capital" (p.1). This time, 50 TFF and 16 LFF of my sample fulfill this criterion. Using this threshold, both TFF ($p < 0.1, \beta = 0.117$) and LFF ($p < 0.1, \beta = 0.118$) are significant and seem to have a positive impact during the GFC. However, prior to the crisis, TFF or LFF did not perform differently than firms with other types of blockholders holding at least 25% of voting rights prior to the crisis. This result would support hypothesis 1a and 1b as it emphasized the superior performance of TFF and LFF during the GFC.

To summarize, choosing different thresholds defining the independent variables led to different results. Although there is a tendency that TFF and LFF might outperform other firms in some economic conditions and dependent on specific variable definitions, no conclusive observations across the different models can be made. As explained earlier, this approach has some important limitations. For instance, it is difficult to argue that for example firms with 24% family ownership are

Table 12: Robustness – Regression including Alternative Independent Variable Definitions

DV: Total shareholder return VARIABLES	(1a) Pre_Crisis 50%	(1b) Crisis 50%	(2a) Pre_Crisis 30%	(2b) Crisis 30%	(3a) Pre_Crisis 25%	(3b) Crisis 25%
TFF_Dummy	0.161	0.0120	0.0810	0.0816	0.151	0.117*
	(0.118)	(0.0771)	(0.110)	(0.0684)	(0.107)	(0.0680)
LFF_Dummy	0.589**	0.191	0.00663	0.217*	-0.0349	0.180*
	(0.246)	(0.164)	(0.183)	(0.114)	(0.171)	(0.108)
Other_Individual_Dummy	-0.403	0.329	0.00337	0.331*	-0.294	0.248
	(0.414)	(0.271)	(0.306)	(0.191)	(0.250)	(0.159)
Financial_Institution_Dummy	0.341**	0.0240	0.141	0.0493	0.0928	0.0650
	(0.172)	(0.113)	(0.136)	(0.0853)	(0.132)	(0.0832)
PE_Dummy	-0.180	-0.0309	0.188	0.0483	0.220	0.0692
	(0.339)	(0.221)	(0.305)	(0.191)	(0.237)	(0.150)
State_Dummy	0.121	0.449	-0.255	0.481**	0.188	0.413**
	(0.437)	(0.285)	(0.362)	(0.226)	(0.306)	(0.193)
Other_Dummy	-0.0320	0.00249	-0.00123	0.0182	-0.116	0.00686
	(0.177)	(0.116)	(0.138)	(0.0862)	(0.126)	(0.0796)
Pre_Crisis_Return		-0.0428		-0.0307		-0.0395
		(0.0520)		(0.0497)		(0.0503)
group(SIC) = 2	0.270	-0.401	0.369	-0.315	0.486	-0.296
	(0.615)	(0.401)	(0.641)	(0.400)	(0.635)	(0.401)
group(SIC) = 3	0.101	-0.421	0.166	-0.375	0.244	-0.368
	(0.585)	(0.381)	(0.603)	(0.376)	(0.596)	(0.376)
group(SIC) = 4	0.188	-0.507	0.253	-0.451	0.330	-0.442
	(0.576)	(0.376)	(0.597)	(0.372)	(0.590)	(0.372)
group(SIC) = 5	0.0887	-0.583	0.253	-0.586	0.267	-0.565
	(0.603)	(0.393)	(0.630)	(0.393)	(0.621)	(0.392)
group(SIC) = 6	0.117	-0.310	0.180	-0.291	0.267	-0.279
	(0.602)	(0.392)	(0.620)	(0.387)	(0.613)	(0.387)
group(SIC) = 7	0.894	-0.447	0.979	-0.398	1.104*	-0.389
	(0.614)	(0.403)	(0.640)	(0.402)	(0.636)	(0.405)
group(SIC) = 8	0.356	-0.200	0.464	-0.151	0.555	-0.143
	(0.585)	(0.382)	(0.606)	(0.378)	(0.599)	(0.379)
group(SIC) = 9	0.0678	-0.190	0.0772	-0.102	0.240	-0.0766
	(0.611)	(0.398)	(0.635)	(0.396)	(0.629)	(0.397)
ln_IPO	-0.0456	0.0337	-0.0694	0.0469	-0.0588	0.0377
	(0.0912)	(0.0595)	(0.0946)	(0.0590)	(0.0928)	(0.0586)
ln_Cap	0.0573**	0.00209	0.0550**	0.00107	0.0508*	0.00348
	(0.0262)	(0.0174)	(0.0276)	(0.0174)	(0.0276)	(0.0176)
DE_Ratio	-0.000222	-0.000245	-0.000233	-0.000316*	-0.000313	-0.000309
	(0.000288)	(0.000188)	(0.000299)	(0.000187)	(0.000298)	(0.000189)
Current_Ratio	0.0401***	0.00843	0.0427***	0.00936	0.0437***	0.00982*
	(0.00845)	(0.00589)	(0.00860)	(0.00577)	(0.00851)	(0.00580)
CF_Sales_Ratio	-0.000268	-8.30e-05	-0.000262	-7.82e-05	-0.000231	-8.10e-05
	(0.000170)	(0.000111)	(0.000174)	(0.000109)	(0.000173)	(0.000110)
Constant	-0.333	-0.153	-0.306	-0.275	-0.357	-0.308
	(0.669)	(0.436)	(0.695)	(0.434)	(0.691)	(0.436)
Observations	178	178	178	178	178	178
R-squared	0.294	0.182	0.252	0.208	0.269	0.207
R-squared adjusted	0.204	0.072	0.157	0.102	0.175	0.100

Source: Own Calculation
Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

fundamentally different than firms with 26% family ownership. Nevertheless, I further tested the impact of the presence of a family CEO using dummy variables (see Appendix 3 for the regression table). However, the results reveal that neither the presence of a family CEO nor the presence of an external CEO has a significant impact on performance during the GFC in any of the three models.

More interestingly, I also tested the impact on ownership defined with the help of dummy variables on firm performance using alternative measures of firm performance (see Appendix 4 for regression table). Whereas LFF ownership is not significant in any of the models including ROA, ROIC, and s q as a performance measure, TFF ownership is significant when measuring performance with ROA across all three thresholds. The positive coefficient indicates that TFF ownership positively affects the firm's ROA, regardless whether TFF are defined using a threshold of 50% ($p < 0.1, \beta = 8.378$), 30% ($p < 0.1, \beta = 7.717$), or 25% ($p < 0.1, \beta = 8.008$). TFF ownership computed with a dummy variable is not significant when performance is measured by ROIC or Tobin's q.

4.3.3. Alternative Crisis Window

In their study of 2,949 firms across 27 European countries, Van Essen et al. (2015) argued that the crisis period should include the beginnings of the real estate bubble in the US and therefore determined the period to be analyzed from 2007 to 2009. Following the original approach with accumulated total shareholder return as the performance measure and the percentage of voting rights held by the family or founders as a continuous, independent variable, I repeat my analysis using an alternative crisis window covering the period January 1, 2007, until December 31, 2009. The results are compared against the original analysis where shareholder returns were accumulated over the period starting September 14, 2008, until March 6, 2009

Table 13 shows the regression results. The first model shows the impact of the seven different ownership types while the second model further differentiates between TFF with a family CEO and TFF with an external CEO. The regression results of the models are very similar. TFF ownership is not significant neither during the original crisis window nor during the alternative crisis window. LFF ownership, in contrast, is significant in both approaches. The positive coefficient indicates that LFF ownership is associated with a higher firm performance from September 14, 2008, until March 6, 2009 ($p < 0.1, \beta = 0.403$) as well as in the period January 1, 2007, until December 31, 2009 ($p < 0.1, \beta = 0.631$).

Differentiating between TFF with family CEOs and TFF with external CEOs does not lead to any significant results, regardless of the period used in the analysis. Interestingly, the significance level of LFF ownership in the regression using the original period is higher ($p < 0.05, \beta = 0.440$) than when using the alternative crisis window ($p < 0.1, \beta = 0.652$). Overall, the R-squared and R-squared adjusted in both models are lower when examining the ownership performance relationship during an alternative time period. To conclude, the results suggest that the findings are robust to the alternative crisis period definition and the model using the original definition of the GFC timeframe shows a higher fit.

4.3.4. Alternative Analytical Approach

Several researchers provided evidence suggesting that the relationship between family ownership and firm performance might not be linear. Specifically, some scholars found that the relationship can be best described by an inverted U-shape (e.g. Anderson & Reeb, 2003; Kowalewski et al., 2010; Van Essen et al., 2013). More recently, also Maseda et al. (2019) found that there seems to be an inverted U-shaped relationship between family board members' ownership and firm performance. I therefore analyzed the impact of TFF and LFF ownership on accumulated total shareholder return during the GFC using an alternative, non-linear regression model.

Table 14 shows the results of a quadratic regression. The quadratic regression fits a non-linear model to the data although some consider it to be a special case of linear multiple regression because it is linear as a statistical estimation problem. Specifically, the following formula depicts the quadratic regression analysis:

$$y_i \beta_0 + \beta_1 X_i \beta_2 X_2 i + \cdots + \beta_1 X_n + \beta_2 X^2 n + \epsilon_i$$

Where
y_i = Dependent variable
β_0 = Population Y intercept
$\beta_1 \cdots \beta_n$ = Population slope coefficients
$X_i \cdots X_n$ = Independent variables and control variables
ϵ_i = Random error term
Model 1 again shows the regression results of firm performance during the GFC for the different ownership types whereas model 2 further differentiates between family CEOs and external CEOs. While a significant t-test of the quadratic term might indicate a quadratic relationship, considering the significance level of a quadratic term is not sufficient to interpret the results. I therefore performed a joint test of the linear and quadratic coefficients of the independent variables (Table 15). The p-values in both models are always greater than 0.1 except for the ownership type state. However, in that case, a quadratic distribution cannot be assumed since the effect of the quadratic coefficient is not significant.

Overall, the results do not suggest that the relationship between firm performance and accumulated total shareholder return during the GFC is quadratic. Therefore, the conjecture of researchers finding a U-shape or inverted U-shape relationship between ownership and performance cannot be supported.

4.4. Further Empirical Analyses

In the light of the inconclusive regression results, I conducted further, additional empirical analyses to better understand the behaviors of family and non-family firms during the GFC that consequentially might evoke performance differences when compared to other firms. Following other researchers that examined the behavior of TFF and LFF during

Table 13: Robustness – Regression including Alternative Crisis Window

DV: Total shareholder return VARIABLES	(1a) 09/08 – 03/09	(1b) 2007 – 2009	(2a) 09/08 – 03/09	(2b) 2007 – 2009
TFF	0.122	-0.0731		
	(0.112)	(0.183)		
FamilyxFamily_CEO			0.269	0.107
			(0.164)	(0.265)
FamilyxExternalCEO			0.0662	-0.170
			(0.129)	(0.210)
LFF	0.403*	0.631*	0.440**	0.652*
	(0.208)	(0.339)	(0.210)	(0.340)
Other_Individual	0.639*	-0.265	0.633*	-0.254
	(0.349)	(0.566)	(0.350)	(0.567)
Financial_Institution	0.0948	-0.00929	0.124	-0.00619
	(0.151)	(0.249)	(0.153)	(0.249)
PE	0.176	-0.606	0.194	-0.576
	(0.249)	(0.404)	(0.250)	(0.405)
State	1.306***	0.472	1.313***	0.459
	(0.400)	(0.648)	(0.400)	(0.648)
Other	0.0241	-0.259	0.0141	-0.266
	(0.129)	(0.210)	(0.130)	(0.210)
Pre_Crisis_Return		-0.0237	-0.0525	-0.0302
		(0.0809)	(0.0501)	(0.0812)
group(SIC) = 2	-0.358	-0.0103	-0.277	0.0774
	(0.391)	(0.634)	(0.396)	(0.641)
group(SIC) = 3	-0.399	-0.712	-0.331	-0.629
	(0.369)	(0.597)	(0.373)	(0.604)
group(SIC) = 4	-0.496	-0.814	-0.415	-0.720
	(0.365)	(0.590)	(0.370)	(0.599)
group(SIC) = 5	-0.693*	-0.965	-0.624	-0.878
	(0.384)	(0.622)	(0.388)	(0.629)
group(SIC) = 6	-0.335	-0.668	-0.277	-0.603
	(0.380)	(0.616)	(0.383)	(0.620)
group(SIC) = 7	-0.444	-0.847	-0.328	-0.746
	(0.393)	(0.640)	(0.401)	(0.649)
group(SIC) = 8	-0.207	-0.558	-0.123	-0.472
	(0.370)	(0.599)	(0.374)	(0.607)
group(SIC) = 9	-0.132	-0.758	-0.0601	-0.668
	(0.388)	(0.628)	(0.392)	(0.635)
ln_IPO	0.0471	-0.0746	0.0429	-0.0772
	(0.0577)	(0.0934)	(0.0577)	(0.0935)
ln_Cap	0.00281	0.0308	0.00831	0.0350
	(0.0170)	(0.0279)	(0.0174)	(0.0283)
DE_Ratio	-0.000305*	-0.000569*	-0.000321*	-0.000577*
	(0.000184)	(0.000298)	(0.000184)	(0.000298)
Current_Ratio	0.00797	-0.000362	0.0103*	0.000138
	(0.00531)	(0.00922)	(0.00570)	(0.00924)
CF_Sales_Ratio	-4.93e-05	-9.36e-06	-6.27e-05	-1.16e-05
	(0.000106)	(0.000173)	(0.000107)	(0.000173)
Constant	-0.306	0.751	-0.423	0.616
	(0.430)	(0.697)	(0.440)	(0.712)
Observations	178	178	178	178
R-squared	0.230	0.173	0.240	0.177
R-squared adjusted	0.131	0.061	0.132	0.061

Table 14: Robustness – Quadratic Regression

DV: Total shareholder return VARIABLES	(1) Quadratic	(2) Quadratic_CEO
TFF	0.370	
	(0.306)	
c.TFF#c.TFF	-0.314	
	(0.369)	
FamilyxFamily_CEO		0.305
		(0.416)
c.FamilyxFamily_CEO#c.FamilyxFamily_CEO		-0.0354
		(0.482)
FamilyxExternal_CEO		0.668
		(0.418)
c.FamilyxExternal_CEO#c.FamilyxExternal_CEO		-0.851
		(0.554)
LFF	0.439	0.468
	(0.615)	(0.616)
c.LFF#c.LFF	-0.0182	-0.0367
	(0.913)	(0.912)
Other_Individual	0.0664	0.127
	(0.870)	(0.869)
c.Other_Individual#c.Other_Individual	1.527	1.410
	(2.240)	(2.236)
Financial_Institution	-0.0307	-0.0532
	(0.423)	(0.422)
c.Financial_Institution#c.Financial_Institution	0.203	0.224
	(0.597)	(0.596)
PE	0.216	0.280
	(0.582)	(0.585)
c.PE#c.PE	-0.0594	-0.122
	(0.743)	(0.744)
State	2.438**	2.248**
	(1.068)	(1.073)
c.State#c.State	-2.005	-1.752
	(1.773)	(1.776)
Other	-0.202	-0.235
	(0.284)	(0.285)
c.Other#c.Other	0.248	0.280
	(0.266)	(0.267)
group(SIC) = 2	-0.297	-0.265
	(0.401)	(0.408)
group(SIC) = 3	-0.354	-0.339
	(0.379)	(0.387)
group(SIC) = 4	-0.472	-0.437
	(0.373)	(0.381)
group(SIC) = 5	-0.634	-0.593
	(0.395)	(0.402)
group(SIC) = 6	-0.292	-0.283
	(0.390)	(0.395)
group(SIC) = 7	-0.400	-0.366
	(0.402)	(0.411)

(Continued)

Table 14—continued

group(SIC) = 8	-0.177	-0.153
	(0.378)	(0.385)
group(SIC) = 9	-0.0850	-0.0606
	(0.397)	(0.405)
ln_IPO	0.0530	0.0480
	(0.0588)	(0.0587)
ln_Cap	-0.00339	0.000355
	(0.0182)	(0.0184)
DE_Ratio	-0.000298	-0.000281
	(0.000188)	(0.000188)
Current_Ratio	0.00762	0.00761
	(0.00550)	(0.00549)
CF_Sales_Ratio	-6.05e-05	-6.51e-05
	(0.000110)	(0.000110)
Constant	-0.268	-0.337
	(0.445)	(0.458)
Observations	178	178
R-squared	0.247	0.260
R-squared adjusted	0.111	0.115

Source: Own Calculatio
Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15: Joint F-test of the Linear and Quadratic Coefficients

Variables tested		F-Statistic F (2,150)	P-Value
Model 1	TFF	0.98	0.3770
	LFF	2.00	0.1394
	Other_Individual	1.67	0.1911
	Financial_Institution	0.28	0.7562
	PE	0.24	0.7882
	State	5.91	0.0034
	Other	0.46	0.6307
Model 2	Family CEO	1.39	0.2522
	External CEO	1.28	0.2812
	LFF	2.16	0.1195
	Other_Individual	1.74	0.1795
	Financial_Institution	0.26	0.7734
	PE	0.30	0.7391
	State	5.32	0.0059
	Other	0.57	0.5642

Source: Own Calculation

severe crises (e.g. Lins et al., 2013; Van Essen et al., 2015), I analyzed the firms' decisions with regard to their personnel, capital structure, and investments. It should be noted that at this point there will be no comprehensive hypothesis development, but results are presented rather shortly, giving additional information with regard to the decision making of TFF and LFF during the GFC and therefore might provide possible areas for future analyses outside the scope of this thesis.

Studying 2,949 companies across 27 European countries, Van Essen et al. (2015) found that TFF show a lower propensity to cut wages or downsize their workforce in both crisis and pre-crisis conditions. They argued that TFF more likely consider the interests of their employees and are under less pressure from outside investors to cut wages or decrease workforce. Analogous to Van Essen et al. (2015), I analyzed personnel-related alterations of German TFF and LFF during the GFC. Specifically, I examined both changes in the workforce and in salaries. Δ *Workforce* is a dependent variable calculated as the percentage change of the workforce between 2007 and 2009. Workforce is the reported number of both full and part-time employees of the company. Δ *Salaries* represents the percentage change in wages paid to the employees by the firm. It includes but is not restricted to salaries, employee benefits such as health insurance, and contributions to pension plans.

Table 16 shows the variable descriptions. Despite the crisis, on average both the number of employees *(+7.3%)* as well as the amount of salaries paid *(+13.9%)* increased. While the 25^{th} percentile shows that some firms decreased workforce *(-5.8%)* and wages *(-3.0%)*, the positive median indicates that at least half of the firms showed positive growth rates in both number of employees and salaries and benefits paid to them. Overall, the standard deviation is rather low, and the mean is in between the median and the 75^{th} percentile for both variables. It should be noted that the change in salaries paid to the workforce is partly caused by the change in the workforce.

The regression results are presented in Table 17. The impact of ownership on the change in workforce and salary payments is tested in models 1a and 1b respectively. In the model, that is analogous to the main regression but with a different dependent variable, neither TFF nor LFF are significant with regard to the employee-related decisions. Moreover, no other ownership type seems to be significantly associated with a change in the number of workforce or the amount of salaries paid to the employees. Interestingly, past performance is the variable with the highest significance. A high total shareholder return over the years 2005 and 2006 is positively associated with workforce change ($p < 0.01, \beta = 0.084$) and salary payment change ($p < 0.01, \beta = 0.124$). Furthermore, age since IPO is negatively associated with workforce ($p < 0.05, \beta = -0.0798$) and salary change ($p < 0.1, \beta = -0.078$).

Next, financing decisions with regard to the borrowing of capital shall be analyzed. Lins et al. (2013) assumed different propensities of TFF with regard to cash financing decisions but could not find significant results. Nevertheless, I performed an analysis of financing decisions within the frame of German listed firms. Table 16 shows the characteristics of the variables Δ *Long-Term Debt and* Δ *Short-Term Debt. Specifically*, Δ Long-Term Debt is the change of the firm's long-term debt between the years 2007 and 2009. Long-term debt comprises all interest-bearing financial obligations, excluding amounts due within one year. It is shown net of premium or discount. While the median firm did not increase or decrease its long-term debt *(+/- 0.0)*, the very high mean *(+828.6%)* shows that very few firms increased their debt excessively. This is also reflected in the high standard deviation. The variable Δ Short-Term Debt shows a similar and even more pronounced statistic: The median firm did not increase or decrease its short-term debt *(+/- 0.0)*, but the average firm increased its short-term debt significantly *(+1919.7%)*. The rather modest increase of the 75^{th} percentile *(+54.3%)* shows that again very few firms increased their short-term debt quite significantly. Short-term debt represents that portion of debt payable within one year including current portion of long-term debt and sinking fund requirements of preferred stock.

The change in capital structure is represented in models 2a and 2b in the regression table. Similarly to the results regarding the firms' workforce, neither TFF nor LFF ownership is significant. Furthermore, other ownership structures do not show significant results with the except of state ownership, which is significantly associated with long-term debt ($p < 0.1, \beta = -187.4$). The negative coefficient implies that with increasing state ownership, firms are less likely to exhibit strong borrowing of long-term capital during the GFC when compared with other firms. Furthermore, a higher current ratio is positively associated with an increase in short-term debt ($p < 0.01, \beta = 8.769$).

Finally, also the investment decisions of TFF and LFF will be analyzed. Lins et al. (2013) found that TFF cut investments more than other firms. They argued, that for TFF the survival of the family's wealth is of major importance and therefore owning families extract capital at the expense of prospective investment projects of the firm. Specifically, I analyze the change in the capital expenditure to total asset ratio from 2007 to 2009. Capital expenditures represent the funds used to purchase fixed assets with the except of acquisitions. It includes but is not restricted to investments in property, plant, and equipment. The amount of capital expenditures is then divided by the total assets of the firm. By using ratios, the comparability between firms is increased. Table 16 shows that Δ *Capex-Asset-Ratio* on average increased significantly between 2007 and 2009 *(+475.9%)*. However, the median change is negative *(-22.9%)* suggesting that at least half of the firms in the sample decreased their capex-to-asset ratio. The fact that the mean is well above the 75^{th} percentile (+11.6%) again is an indication that few firms increased their capital expenditure-to-asset ratio quite extensively during the GFC.

The regression results again do not reveal a significant effect of TFF or LFF ownership in model 3. With regard to other ownership types, only financial institution ownership is significant ($p < 0.05, \beta = 21.16$). The positive coefficient implies that higher ownership of financial institutions results in a stronger increase in the capex-to-asset ratio. The high R-squared *(0.878)* and R-squared adjusted *(0.861)*, indicating a good model fit, is quite notable. For completeness, the analysis again is repeated in Appendix 5 differentiating between family CEOs and non-family CEOs. However, the differentiation does not lead to any significant effect other than those presented in the previous paragraphs.

Table 16: Further Analyses - Variable Descriptions

Variable	N	Mean	25th pcl.	Median	75th pcl.	SD
Δ Workforce	178	7.3%	-5.8%	4.8%	15.5%	0.24
Δ Salaries	178	13.9%	-3.0%	8.7%	22.8%	0.30
Δ Long-Term Debt	178	828.6%	-20.0%	0.0%	51.9%	87.97
Δ Short-Term Debt	178	1919.7%	-44.0%	0.0%	54.3%	187.14
Δ Capex-Asset-Ratio	178	475.9%	-57.5%	-22.9%	11.6%	58.06

Source: Own Calculation

5. Discussion

Analyzing German publicly listed firms during the GFC as a unique exogenous contingency, the aim of this study was to better understand the frequently assumed supremacy of TFF and LFF over other ownership types (e.g. Allouche et al., 2008; Ben-Amar et al., 2013; Chrisman et al., 2007; Maseda et al., 2019; Miller et al., 2011).

In this section, the results of my study will be interpreted with regard to the hypotheses derived as well as with reference to extant academic literature. Thereafter, theoretical and practical implications of the findings will be discussed. Finally, limitations of this study as well as fruitful avenues for future research will be outlined.

5.1. Interpretation of Results

In my first hypothesis (1a), I expected TFF ownership to be associated with higher firm performance during the GFC, analogous to findings of previous research covering sample firms located in other jurisdictions (Amann & Jaussaud, 2012; Minichilli et al., 2016; Saleh et al., 2017; Van Essen et al., 2015). I argued that TFF might reduce their emphasis on SEW objectives for the benefit of financial performance and even inject private capital, provide financing through other family firms, and have easier access to debt, all of which increases the performance of the firm. The results provide only weak support for hypothesis 1a: There is no significant effect in the main regression model. However, TFF ownership results in superior performance when firm performance is measured with the accounting measure ROA and when TFF ownership is constructed as a dummy variable with a threshold of 25% voting rights that have to be possessed by the owning family.

Interestingly, the results reveal an even stronger positive effect on firm performance during the pre-crisis period 2005 – 2007. TFF ownership is significantly and positively associated with accumulated total shareholder return in the main regression analysis but is also significant when measuring firm performance with ROA, ROIC, or Tobin's q. These results suggest that there seems to be a general tendency of outperformance of TFF ownership during stable economic conditions. Therefore, the findings are similar to those of other researchers who argued that TFF generally show higher firm performance when compared to other ownership types (e.g. Anderson & Reeb, 2003; Block et al., 2011; Miller et al., 2011). The positive performance effect of TFF, according to academic literature, most probably originates from reduced conflicts between ownership and management (agency theory), the commitment to lead the firm in a collectivistic way (stewardship theory), unique strategic resources (RBV), as well as the benefit from long-term orientation and unique values and norms of the family (concept of SEW).

With regard to LFF, I hypothesized that also LFF ownership led to higher firm performance during the GFC (hypothesis 1b), because LFF are free from kinship ties and therefore can make strategic decisions faster and more efficiently during times of financial distress. Furthermore, LFF are less likely subject to owner-manager conflicts or conflicts among owners such as in TFF, where disputes between family members might arise. The performance of LFF during the GFC has scarcely been examined in prior academic research, only Zhou et al. (2012) published a study in a renown academic journal and derived the same hypothesis. For the greater part, the results provide support for hypothesis 1b: LFF ownership is significant in the main regression, thereby indicating that accumulated total shareholder return during the GFC was higher when compared to other ownership types. The results are significant when determining LFF status with the help of dummy variables that were one if the founders held 25% or 30%, respectively. Only when measuring performance with alternative accounting measures and mixed accounting and financial market measures, LFF ownership is not significant.

In contrast to the impact of TFF ownership, the positive effect of LFF ownership on firm performance was almost exclusively during the crisis period. Only in one specific case, where LFF status was determined using a 50% voting rights dummy, LFF ownership is significant and has a positive effect on firm performance. In the main regression and all other robustness tests, LFF ownership is not significant. Therefore, the general notion suggesting that LFF ownership always influences firm performance positively due to their social context emphasizing financial performance, expertise and skills as well as independence from family disputes and other SEW objectives could not be supported. While other researchers found supremacy of LFF in general during stable economic conditions (e.g. Anderson & Reeb, 2003; Barontini & Caprio, 2006; Miller et al., 2007; Villalonga & Amit, 2006), this study does not provide similar evidence with regard to publicly listed firms in Germany but emphasizes the importance of a differentiated perspective incorporating the GFC

Table 17: Further Analyses – Regression Results

VARIABLES	(1a) Δ Workforce	(1b) Δ Salaries	(2a) Δ Long-Term Debt	(2b) Δ Short-Term Debt	(3) Δ Capex-Asset Ratio
TFF	-0.0256	-0.0209	1.156	-58.43	5.597
	(0.0714)	(0.0898)	(27.69)	(57.88)	(6.866)
LFF	0.0875	-0.0371	13.58	16.41	-17.96
	(0.133)	(0.167)	(51.48)	(107.6)	(12.76)
Other_Individual	-0.0117	0.177	-56.74	25.30	25.17
	(0.221)	(0.278)	(85.91)	(179.5)	(21.30)
Financial_Institution	-0.0972	-0.134	59.54	-52.09	21.16**
	(0.0972)	(0.122)	(37.70)	(78.79)	(9.347)
PE	-0.00695	-0.0828	88.44	-38.33	22.71
	(0.158)	(0.199)	(61.25)	(128.0)	(15.19)
State	-0.320	-0.416	-187.4*	51.13	-6.655
	(0.253)	(0.318)	(98.25)	(205.3)	(24.36)
Other	-0.00211	0.0602	29.95	-11.30	1.858
	(0.0820)	(0.103)	(31.82)	(66.49)	(7.888)
Pre_Crisis_Return	0.0840***	0.124***	-8.369	-29.69	0.847
	(0.0316)	(0.0398)	(12.27)	(25.65)	(3.043)
group(SIC) = 2	-0.0184	0.0326	-2.753	-9.835	10.92
	(0.248)	(0.312)	(96.17)	(201.0)	(23.84)
group(SIC) = 3	-0.229	-0.253	-2.639	-8.112	5.823
	(0.234)	(0.294)	(90.59)	(189.3)	(22.46)
group(SIC) = 4	-0.247	-0.244	1.480	-12.26	5.416
	(0.231)	(0.290)	(89.58)	(187.2)	(22.21)
group(SIC) = 5	-0.259	-0.213	116.7	-45.49	21.09
	(0.243)	(0.306)	(94.31)	(197.1)	(23.38)
group(SIC) = 6	-0.260	-0.315	6.395	227.0	-6.326
	(0.241)	(0.303)	(93.41)	(195.2)	(23.16)
group(SIC) = 7	-0.252	-0.182	-7.951	-2.402	-16.00
	(0.250)	(0.315)	(97.10)	(202.9)	(24.08)
group(SIC) = 8	-0.0883	-0.0628	-1.501	-17.41	16.98
	(0.234)	(0.295)	(90.94)	(190.1)	(22.55)
group(SIC) = 9	-0.181	-0.144	-4.397	-32.78	0.417
	(0.245)	(0.309)	(95.20)	(199.0)	(23.60)
ln_IPO	-0.0798**	-0.0781*	-8.133	-10.60	2.289
	(0.0365)	(0.0459)	(14.17)	(29.62)	(3.514)
ln_Cap	0.00972	0.00577	0.692	-2.563	1.965*
	(0.0109)	(0.0137)	(4.235)	(8.850)	(1.050)
DE_Ratio	-0.000101	1.09e-05	-0.0454	-0.00529	0.00501
	(0.000117)	(0.000147)	(0.0452)	(0.0945)	(0.0112)
Current_Ratio	-0.00490	-0.000577	-1.630	8.769***	9.687***
	(0.00361)	(0.00453)	(1.399)	(2.924)	(0.347)
CF_Sales_Ratio	1.58e-05	6.15e-05	-0.00894	0.0295	0.0363***
	(6.77e-05)	(8.52e-05)	(0.0263)	(0.0549)	(0.00651)
Constant	0.316	0.375	12.73	95.45	-64.83**
	(0.273)	(0.343)	(105.8)	(221.1)	(26.22)
Observations	178	178	178	178	178
R-squared	0.229	0.213	0.134	0.164	0.878
R-squared adjusted	0.125	0.107	0.018	0.052	0.861

Source: Own Calculation
Note: Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

as a contingent event into the analysis.

In a third analysis, I differentiated further between TFF where a family member holds the CEO position and TFF where an external, outside CEO manages the firm. I expected that having a family CEO unfolds as disadvantageous during the GFC because the managers might extract capital out of the firm and thus ensure the survival of the family's wealth. Therefore, analogous to Minichilli et al. (2016), I assumed firm performance to be lower. The results, however, do not support hypothesis 2: The presence of a family CEO is not significant in any of the regression models during the GFC. Thus, there is no indication that firm performance during the crisis was influenced positively or negatively by the involvement of the family in the firm. Similarly, the interaction term representing an external CEO in TFF is not significant in any of the models except when performance is measured with ROA, where the presence of an outside manager has a weak but positive effect on firm performance during the crisis.

However, the results indicate that during the period of stable economic conditions, the presence of a family CEO significantly impacted firm performance positively: Family CEO presence is significant in the main regression as well as when using alternative performance measures ROA and ROIC. The results thereby are aligned with evidence suggested by other researchers (e.g. Anderson & Reeb, 2003; Andres, 2008; Chu, 2011; Kowalewski et al., 2010; Minichilli et al., 2010) who argued that family CEOs contribute to the superior performance of TFF due to the alignment of interests between management and owners, the CEOs' behavior as a steward of the organization, the CEOs' specific knowledge and skills, or their emotional attachment and transgenerational intention.

To summarize, the results indicate a general superior performance of TFF ownership over other ownership types that is more pronounced during overall stable economic conditions and generally is not magnified during situations of financial distress such as the GFC. LFF ownership, in contrast, does not exhibit superior effects during the steady-state period but seems to be beneficial in times where firms face serious threats due to macroeconomic developments. Analyzing family management led to results suggesting a reverse effect: While beneficiary during stable economic conditions, the competitive advantage from a family CEO seemed to vanish during the GFC.

5.2. Implications for Theory

I contribute to the family business literature by analyzing theoretically and empirically the performance of German publicly listed firms during and prior to the GFC. Specifically, my study has a number of potential theoretical implications. First, I contribute to the longstanding and inconclusive discussion of whether family firms exhibit superior firm performance compared to their non-family counterparts (Block et al., 2011). Maseda et al. (2019) argued that the effects of corporate ownership and governance on firm behavior were "some of the most debated issues in business and management literature" (p. 285). Although significance levels varied across models the family ownership variables TFF and LFF were only significant in some of the models, each of the significant coefficients had a positive sign. This indicates a general tendency of the superior performance of family ownership irrespective of performance measurement or variable definitions in the model. For other ownership structures, in contrast, the results did not provide sufficient evidence suggesting a significant and robust impact of ownership on firm performance. Adopting a purely agency-theoretical perspective, one could argue that the benefit of concentrated ownership and management through, for instance, reduced principal-agency conflicts exceed the costs often associated with such ownership structures, in particular the extraction of resources for the benefit of the family shareholders and on the expense of other investors. It remains questionable, however, whether the well-adopted agency theory is sufficient to explain the superior performance. The literature review delineated further academic theories and concepts such as the stewardship theory, RBV, and the concept of SEW. While it is very difficult to attribute the financial market and accounting based outcome of an organization to a specific component of these academic theories and concepts, this study in general supports the notion that the outlined mechanisms collectively result in superior performance and outweigh potential disadvantages of TFF or LFF.

Second, I contribute to the narrative of an external hazard as a contingency that moderates the impact of ownership on firm performance by analyzing the sample firms during and prior to the GFC. The implications of my study, however, are twofold. On the one hand, I could not establish that TFF ownership resulted in exceptional superior or inferior performance during the GFC when compared to a period of stable economic conditions prior to the GFC. Scholars, in contrast, suggested that with increasing external hazard, the balance between families' non-economic and economic objectives during stable economic conditions (Berrone et al., 2012; Gómez-Mejía et al., 2007) is challenged and family shareholders prioritize the financial survival of the TFF, thereby showing an explorative attitude characterized by enhanced risk-taking and ultimately higher firm performance (Minichilli et al., 2016). This study rather suggests that TFF are significantly different from other firms and exhibit higher performance during steady-state periods but during crisis suffer similarly to other firms and cannot capitalize on the advantages originating from TFF-specific characteristics during such times of financial distress. Moreover, it should be noted that the further empirical analyses conducted in section 4.4 support this proposition: Analyzing employee-related as well as financing and investment decisions, this study does not provide any significant indication that TFF have behaved differently during the GFC than firms with other ownership structures.

On the other hand, the GFC indeed seems to be a contingency that moderates the impact of LFF ownership on firm performance. This result is of special interest as LFF ownership and its association with firm performance during times of financial distress has been subject in academic literature only to a very limited degree. Accordingly, extant literature does not provide a comprehensive overview of underlying theories explaining the superior performance of LFF ownership during crisis. From an agency-theoretical perspective, LFF are very similar to TFF in that regard that ownership and management are often concentrated. However, the differences among these two ownership types may lie in the fact that principal-principal conflicts might arise more frequently in TFF where several family members are shareholders of the firm while in LFF there is mostly one founder or a very low number of founders holding voting rights in the firm and hence the company is less apt to such conflicts. From a SEW perspective, it might be the independence from non-economic obligations and higher perceived freedom to take risks and fully concentrate on the performance of the firm that helps LFF to outperform other companies during the GFC. To summarize, the narrative of an exogenous shock serving as a natural experiment that moves firms out of their equilibrium and hence magnifies costs and benefits of ownership structures can only partially be supported.

The third contribution is to the increasingly debated topic of heterogeneity among family firms (e.g. Berrone et al., 2012). I considered three different dimensions of heterogeneity in my analysis. Firstly, by differentiating between TFF and LFF ownership, I considered the generational stage of the family firms, and the results confirm that the two ownership types affect firm performance differently. Especially the social context of founders and the existence of non-economic utility that is increasingly important in multi-generational TFF result in different corporate decision making. Differentiating between the two ownership structures helps to disentangle how the different academic theories influence the behavior of the heterogenetic family business landscape and has been gained high attraction in literature (e.g. Barontini & Caprio, 2006; Miller et al., 2007).

Furthermore, regarding heterogeneity, I considered the magnitude of ownership, thus the stake held by the family or founder, by defining ownership as a continuous variable and testing also a non-linear regression model. Because the significance of variables and the corresponding coefficients differ, it can be assumed that the magnitude of ownership indeed is an important factor to consider when examining family firms. Furthermore, I tested different dummy variables representing various equity stakes held by the family or founders. It is reasonable to assume that the outlined mechanisms and their respective academic theories are impacting firm performance differently depending on the stake of ownership. For instance, I would expect that the desire to preserve the SEW might be present even with low family ownership and increases rather moderately with larger ownership stakes. The elements of agency theory, however, are heavily dependent on the level of ownership. A family with many voting rights can use its powerful blockholder position whereas a family in a minority shareholder position cannot and moreover might be more prone to other governance issues such as owner-manager conflicts. These conclusions are in line with family business researchers who argued that the ownership-performance relationship is not linear but dependent on the degree of ownership (e.g. Anderson & Reeb, 2003; Kowalewski et al., 2010; Maseda et al., 2019).

Moreover, family involvement through board membership is another dimension of heterogeneity considered in this study. Although not pronounced during the GFC, this study showed that there is a positive impact of strategic leaders belonging to the family that enhances firm performance. The role of a family CEO has been extensively discussed in academic literature and scholars argued that although the family managers might tend to abuse their situation and pursue family-related goals on the expense of firm performance, the advantageousness of having a family CEO outweighs the costs (e.g. Andres, 2008; Kowalewski et al., 2010). Again, it is difficult to determine how exactly family management affects firm performance but, considering different academic theories the positive effect might be due to a family CEO who has fewer incentives to act opportunistically (agency theory), or sometimes even maximizes his own utility by seeing the firm strive (stewardship theory), while capitalizing on specific skills and knowledge (RBV), and being attached emotionally to the organization with the intention to preserve it over a long period of time and potentially hand it over to the next generation (concept of SEW).

The fourth contribution of this study is the validity of the SEW as an appropriate perspective to better understand the behavior of families and founders. The previous paragraphs already indicated that the concept of SEW plays a pivotal role in understanding why TFF or LFF ownership is different from other ownership types. The SEW perspective is based on behavioral agency theory and obtained its name within the frame of a study of Spanish oil mills by Gómez-Mejía et al. (2007). It has gained increasing attraction in recent family business research (Minichilli et al., 2016). The evidence suggested in this study reconnects with the recent advancement of the SEW concept distinguishing between restricted and extended SEW priorities. While restricted SEW priorities are family-centric and often counteract the interests of non-family stakeholders in the long run, extended SEW priorities go beyond the family and are characterized as advocating stewardship, sustainability, or multi-stakeholder advancement (Miller & Le Breton-Miller, 2014). For instance, while the extended SEW approach might help to better understand the superior performance of TFF with family management, the differentiation shows that the argumentation substantiating the superior performance of LFF refers to the absence of restricted SEW priorities. In short, the objectives relating to the SEW have been further divided in order to better understand the mechanisms that lead to different firm behaviors.

To summarize, the conjecture that ownership structures affect firm performance in particular during financial crises, magnifying ownership-specific costs and benefits, cannot be supported unanimously. On the one hand, this study contributes to one of the most debated issues in family business research as the results indicate a general superior performance of TFF during periods of stable economic activity. On the other hand, the macroeconomic environment of a firm seems to matter in case of LFF ownership as these firms show superior performance compared to other firms during crises but do not stand out from the sample in a period of stable economic conditions prior to the GFC. The diverging results confirm the need of a differentiated perspective regarding the heterogeneous landscape of family firms and, finally, different dimensions of the SEW concept have been found helpful to understand the underlying mechanisms impacting firm behavior, further promoting the concept on its way to becoming an established academic theory.

5.3. Implications for Practice

This study examining the performance of firms with different ownership types during and prior to the GFC offers several practical implications. First, investors and bondholders gain a deeper understanding of how ownership structures affect firm performance. Generally, investors can assume that TFF tend to have higher returns when compared to other firms and therefore investors could concentrate their investment on firms with family shareholders. The supposition that the positive effect on firm performance is even magnified when a family member holds the top management position of the firm could also be considered in their investment decision. During periods of economic downturns, such as the GFC, having invested in TFF does not turn out to be unsuccessful but the empirical results showed that in these times LFF ownership is more likely to be beneficial for firm performance and should therefore be in the focus of equity investing.

Second, financial institutions and rating agencies can incorporate the findings into the credit risk assessment of TFF and LFF. While TFF ownership, contrary to the belief of some researchers arguing that the family shareholders harm the firm by extracting resources (e.g. Anderson et al., 2009), does not exhibit any negative performance effect during the crisis, it proved even beneficial in general, during stable economic conditions, and TFF could therefore be considered as more creditworthy than firms with other shareholder types. In addition, financial institutions and rating agencies should value the long-term orientation (Anderson & Reeb, 2003), aversion with regard to their bankruptcy risk (Poletti-Hughes & Williams, 2017), and willingness to inject private capital to the firm in times of financial distress (Villalonga & Amit, 2010). With regard to LFF, although granting credits to the relatively young firms during economic downturns might impose risks, financial institutions and rating agencies should consider that these firms tend to outperform other organizations in particular during crises, and banks or other institutions therefore can adjust their credit risk assessment accordingly.

Third, members of the shareholding family gain a deeper understanding of the advantageousness of having a family CEO, especially during periods of stable economic conditions. Families should meet calls for widely diffused, outsider-dominated governance systems (Minichilli et al., 2016) with caution and acknowledge that the unique skill set, emotional attachment, and attitude as the steward of the organization might evolve to higher firm performance and to a sustained competitive advantage in the long term. However, no conclusion can be drawn that having a family member as CEO during a global recession turns out to be beneficial for the firm.

Finally, policymakers could recognize the strengths and performance superiority of TFF and LFF and their contribution to the national economy. Although it should be argued with caution if policymakers shall privilege particular ownership structures over others, it might be beneficial for the economy to support the development of TFF and LFF, for instance by creating awareness about the importance of such ownership structures in the corporate environment. Furthermore, the development of LFF could be supported especially during crises to even further foster the positive effect on performance, offsetting partially the negative effect of a global recession.

5.4. Limitations

This study has some important limitations. First, the firms of my sample were all listed in the German Prime Standard. Therefore, the findings might not be transferable or only partially transferable to a very small or mid-sized German family firm. Among my sample firms are some of the largest corporations in Germany and due to their legal form, they have to follow rules and laws that might restrict family influence and involvement when compared with smaller firms. For example, a listed legal entity ("AG") is required to have a supervisory board partly consisting of employee representatives (§96$AktG$). The mere size of these companies implies a corresponding organizational behavior typical for large firms that due to the complexity limits the influence of individual shareholders. However, it should be noted that an empirical study of smaller firms and their behavior is very difficult to perform as smaller firms do not have to comply to publication and disclosure requirements to the same extent as large firms do. For this reason, most of the studies analyzed in the theoretical background section of this thesis examined performance of publicly listed family and non-family firms (e.g. Anderson & Reeb, 2003; Andres, 2008; Bjuggren & Palmberg, 2010; Bonilla et al., 2010; Kowalewski et al., 2010; Martínez et al., 2007; Sacristan-Navarro et al., 2011a, 2011b).

Second, it should be noted that the German market analyzed in my study includes a high number of TFF (Fiss & Zajac, 2004) and is often characterized as an economy heavily dependent of family firms, which is why comparability among geographies and the transferability of results for example to Anglo-Saxon countries might be limited. Furthermore, regulatory peculiarities of the German jurisdiction such as the employees' rights of participation in the supervisory board mentioned in the previous paragraph might distort results and limit the transferability of findings to firms in other jurisdictions

Third, family involvement in the management in this study is determined only by the presence of a CEO who at the same time is a member of the owning family. Although this approach might be appropriate as the CEO is the single most important and influential person in the organization (Minichilli et al., 2010), the owning family might influence the management of the firm in other forms (Berrone et al., 2012). For instance, family members might exert pressure over the management of the firms through other positions in the company such as board memberships or division management positions. Furthermore, the family influence might be manifested in the membership or even chairmanship of the supervisory board, overseeing management actions and appointing the board members running the organization.

5.5. Avenues for Future Research

The analysis that has been conducted throughout this thesis provides several avenues for future research. First, studies should be performed also for small and medium-sized firms in order to decrease the effect of large firm size on corporate behavior as mentioned earlier. Because it might be difficult to collect data for empirical analyses, it could be revealing to choose a qualitative research approach. In general, the benefit of a qualitative analysis is that it provides deeper insights into the underlying mechanisms and drivers of firm performance with regard to the different ownership types. Thereby, it would complement and enhance the existing quantitative research.

Second, researchers should consider similar studies with firms in a different geographical or organizational context. For instance, companies in Anglo-Saxon countries might behave differently than companies in the German market that is especially characterized by the influence families have on the business. In order to increase the explanatory power of findings that might be distorted by the peculiarities of national jurisdictions, future research should consider extending the results to cross-national evidence.

Third, further research on heterogeneity among the ownership structure, management structure, as well as the generational stage of family firms should be intensified. Especially in the context of the longstanding debate whether family firms perform better than other firms, the differentiation of TFFs and LFFs has been incorporated in only few studies before. However, after finding partial support for my first set of hypotheses, I believe that it is important to make this distinction because these different types of ownership structures tend to elicit distinct organizational behavior as the impact on firm performance was found to be different. Besides the integration of heterogeneity aspects with regard to the ownership structure, further research on the involvement of family members and founders not only as CEO but also as board members or supervisory board members could help identify how families and founders influence the strategic decision making process in an organization, therefore covering a broader spectrum of family involvement.

Finally, future research on the validity of using an economic shock as an experiment, where firms are moved out of their equilibrium and ownership effects intensify because adjustments of the ownership structure occur with a certain delay, is necessary. My results could only partially support this conjecture and, in case of TFF ownership, rather indicate an effect of ownership on firm performance in general, independent from the macroeconomic condition. It cannot unanimously concluded that the effect for LFF ownership during crisis observed in this study is causally linked to the economic downturn which is why primarily qualitative research should examine the influence of a crisis on LFF as well as the resulting organizational behavior.

6. Conclusion

The aim of this study was to better understand the frequently assumed supremacy of TFF and LFF ownership over other ownership types by using the GFC as a unique exogenous contingency, where firms are moved out of there equilibrium while ownership structures stay constant at least in the short-term and, therefore, costs and benefits of the ownership structure are assumed to be magnified.

Introducing arguments from the agency theory, stewardship theory, RBV, as well as the concept of SEW, I hypothesized that TFF and LFF ownership is associated with superior performance during the GFC when compared to firms with other ownership structures. The results of the analysis covering 178 firms listed in the German Prime Standard indicated a general superior performance of TFF ownership over other ownership types that was more pronounced during overall stable economic conditions but was not observed during situations of financial distress such as the GFC. LFF ownership, in contrast, did not exhibit superior effects during the steady-state pre-crisis period but seemed to be beneficial in times where firms faced serious threats due to macroeconomic developments. Furthermore, I hypothesized that the presence of a family CEO in TFF is associated with lower firm performance compared to TFF with an external CEO. However, the results did not support this hypothesis: While beneficiary during stable economic conditions, the competitive advantage of a family CEO seemed to vanish during the GFC.

To conclude, the conjecture that ownership structures affect firm performance in particular during severe economic crises, magnifying ownership-specific costs and benefits, cannot be supported unanimously. However, contributing to the increasing academic discussion of family firm heterogeneity, the results of this thesis confirm the need of a differentiated perspective on how large the stake held by the family is (magnitude of ownership), how actively the family shapes the management of the firm (family involvement through board membership), and whether the firm is owned and managed by a lone founder or by descendants or multiple family members of the founder (generational stage of family firms).

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Coping with Sales Pressure – A Literature-based Analysis of Strategies for Coping with Stress in Sales

Coping with Sales Pressure – Eine literaturbasierte Analyse von Strategien zur Stressbewältigung im Vertrieb

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Abstract

Although the stress level of employees has increased by 20% in recent years, the topic of stress receives little attention in marketing and sales research. Based on Lazarus' Transactional Stress Model, this paper identifies causes and consequences of stress in sales and examines the effectiveness of different coping strategies for stress. Results show that role conflict and ambiguity cause stress. Stress has negative effects on job satisfaction, performance, and commitment of a salesperson. In terms of coping with stress, problem-focused coping strategies are more suitable than emotion-focused strategies because they help to actively control stressful situations. The results offer managers two options to avoid the consequences of stress: Addressing causes and fostering characteristics that increase the use of problem-focused coping strategies, such as an employee's self-efficacy expectancy. Future research should examine additional factors influencing coping strategy choice, such as work environment, and effects of this choice on mental and physical health.

Zusammenfassung

Obwohl das Stresslevel von Arbeitnehmern in den letzten Jahren um 20% angestiegen ist, findet das Thema Stress in der Marketing- und Vertriebsforschung nur wenig Beachtung. Basierend auf dem Transaktionalen Stressmodell von Lazarus identifiziert diese Arbeit Auslöser und Folgen von Stress im Vertrieb und untersucht die Effektivität verschiedener Stressbewältigungsstrategien. Die Ergebnisse zeigen, dass Rollenkonflikt und -mehrdeutigkeit Stress auslösen. Stress hat negative Auswirkungen auf Jobzufriedenheit, Leistung und Commitment eines Vertriebsmitarbeiters. Hinsichtlich der Stressbewältigung eignen sich problemorientierte Bewältigungsstrategien besser als emotionsorientierte Strategien, da diese helfen, Stresssituationen aktiv zu kontrollieren. Die Ergebnisse bieten Managern zwei Stellhebel, um Folgen von Stress zu vermeiden: Auslöser bekämpfen und Eigenschaften fördern, die die Nutzung problemorientierter Bewältigungsstrategien erhöhen, wie z.B. die Selbstwirksamkeitserwartung eines Mitarbeiters. Zukünftige Forschung sollte untersuchen, wie sich weitere Einflussfaktoren auf die Wahl der Bewältigungsstrategie, wie z.B. das Arbeitsumfeld, und diese Wahl auf die mentale und physische Gesundheit auswirken.

Keywords: Stress; Coping; Sales.

1. Relevanz und Gang der Arbeit

Die Anforderungen in der Arbeitswelt sind in den vergangenen Jahren stetig angestiegen. Anspruchsvollere Tätigkeiten, technische Entwicklung und das Streben der Unternehmen nach Gewinnmaximierung führen vermehrt zu psychologischen Anspannungen und Stress von Arbeitnehmern.

Laut einer Studie des Korn Ferry Institutes ist das Stresslevel von Arbeitnehmern in den letzten 30 Jahren um 20% angestiegen. Dabei gaben 76% der Befragten an, dass Stress negative Auswirkungen auf die persönlichen Beziehungen hat und 16% haben stressbedingt den Arbeitgeber gewechselt

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(Korn Ferry Institute, 2018).

Stress am Arbeitsplatz kann zu gesundheitlichen Problemen der Mitarbeiter, wie beispielsweise Kopf- und Rückenschmerzen bis hin zu Überforderung und Burnout führen (vgl. Gillespie, Walsh, Winefields, Dua & Stough, 2001, S 53-72). Zudem beeinflusst Stress die Jobzufriedenheit und Leistung eines Arbeitnehmers negativ (vgl. Goolsby, 1992, S. 155-164).

Ein spezielles Arbeitsgebiet, das im Folgenden untersucht werden soll, ist der Vertrieb. Situationen, denen Vertriebsmitarbeiter ausgesetzt sind, sind oft breit gefächert und werden durch viele Faktoren beeinflusst. Kundenerwartungen werden immer höher, Produkte komplexer und durch die Globalisierung gibt es einen immer größeren Wettbewerb. Deshalb benötigen Vertriebsmitarbeiter heute ein breiteres Wissen, müssen schneller reagieren sowie den Service und das Produkt vermehrt an dem Kunden ausrichten (vgl. Strutton & Lumpkin, 1993, S. 71-82).

Diese Entwicklung übt einen hohen Druck auf Vertriebsmitarbeiter aus, der bei ihnen Stress erzeugen kann. Dieses kann wiederum zu hohen Fluktuationszahlen in den Unternehmen führen (vgl. Jones, Steven, Andris & Barton, 2005, S. 105-111). Wenn Vertriebsmitarbeiter das Unternehmen verlassen, können diesem erhebliche Kosten entstehen, da sie neue Mitarbeiter finden, einstellen und schulen müssen (vgl. Dubinsky, Dougherty & Wunder, 1990, S. 121-133). Deshalb ist es für die Profitabilität des Unternehmens wichtig, zu verstehen, wie man die Fluktuationsabsichten der Vertriebsmitarbeiter minimieren kann (vgl. Lewin & Sager, 2010, S. 355-370).

Vertriebsmitarbeiter können dem Stress, den sie erfahren, nicht aus dem Weg gehen, da sie aktiv Kontakt zu Kunden und ihrem Vertriebsleiter aufrechterhalten müssen, um ihre beruflichen Ziele zu erreichen (vgl. Sager & Wilson, 1995, S. 51-63). Um dennoch negative Auswirkungen von Stress zu vermeiden, ist es wichtig zu untersuchen, wie Vertriebsmitarbeiter mit Stress umgehen können. Dabei wird sich auf die Frage konzentriert, welche Bewältigungsstrategien Vertriebsmitarbeitern dabei helfen können, ihren stressigen Arbeitsalltag zu meistern. Dafür ist es zunächst wichtig zu verstehen, wie Stress entsteht, und wie dieser Stress aufgrund verschiedener Bewertungen unterschiedlich bewältigt werden kann. Dieses wird anhand des Transaktionalen Stressmodells nach Lazarus in Kapitel 2 erklärt.

In dieser Arbeit werden zwei sich beeinflussende Themenfelder untersucht: Zuerst das Themenfeld „Stress im Vertrieb“. Hier wird zunächst darauf eingegangen, welche Auslöser es für Stress im Vertriebskontext gibt und welche Folgen Stress hat. Dabei sind Folgen für den Vertriebsmitarbeiter einerseits und für das Unternehmen andererseits zu betrachten. Das zweite Themenfeld dieser Arbeit beschäftigt sich damit, wie Vertriebsmitarbeiter diesen Stress bewältigen können. Dabei wird auf verschiedene Bewältigungsstrategien eingegangen und im Anschluss daran erläutert, welche Einflussfaktoren es auf die Wahl der Bewältigungsstrategie gibt und welche Auswirkung die Wahl auf den Vertriebsmitarbeiter und das Unternehmen hat. Den Abschluss der Arbeit stellen Implikationen für Forschung und Praxis dar.

2. Erklärungsmodell zur Entstehung von Stress

Stress wird als Beziehung zwischen einer Person und ihrer Umwelt verstanden, die von der Person als Strapazierung oder Überschreitung ihrer Ressourcen und als Gefährdung des Wohlbefindens bewertet wird (vgl. Folkman, 1984, S. 839-852).

Es existieren verschiedene Ansätze, um die Entstehung von Stress zu erklären. Ein Erklärungsansatz ist dabei das Transaktionale Stressmodell von Lazarus. Diese Theorie heißt transaktional, da sie bei der Erklärung von Stress einen Zusammenhang zwischen Mensch und Umwelt darstellt (vgl. Lazarus & Folkman, 1987, S. 141-169).

Lazarus und Folkman (1984) sind der Auffassung, dass nicht die Reize oder die Situation an sich eine Stressreaktion auslöst, sondern die Bewertung derer durch den Einzelnen (vgl. Lazarus & Folkman, 1984, S.31). Dieses Konzept ist wichtig, um zu verstehen, dass Menschen unterschiedlich auf Stress reagieren, da sie ihn bei vergleichbaren Reizen unterschiedlich bewerten.

Aufgrund dieser Bewertung gibt es auch Unterschiede, wie sie Stress bewältigen (vgl. Lazarus & Folkman, 1984, S. 35-36). Dieser Prozess ist oben in Abbildung 1 dargestellt.

Menschen bewerten das, was ihnen passiert von dem Standpunkt aus, ob es signifikant für ihr Wohlbefinden ist oder nicht. Dieser Prozess wird Bewertung (appraisal) genannt (vgl. Lazarus & Folkman, 1987, S. 141-169). Die Bewertung einer Situation umfasst zunächst zwei Phasen: Die Primäre Bewertung (primary appraisal) und die Sekundäre Bewertung (secondary appraisal) (vgl. Lazarus & Folkman, 1987, S. 141-169).

Die Primäre Bewertung beschäftigt sich mit der motivalen Relevanz des Geschehens, also damit, ob etwas wichtig für das Wohlbefinden ist (vgl. Lazarus & Folkman, 1987, S. 141-169). Ein Individuum kann eine Situation auf drei Arten primär bewerten: Irrelevant, positiv oder stressend (vgl. Lazarus & Folkman, 1984, S. 32). Eine Bewertung der Situation als irrelevant bedeutet, dass ein Ereignis keine Auswirkung auf das Wohlbefinden einer Person hat. Somit ist keine Reaktion erforderlich (vgl. Lazarus & Folkman, 1984, S. 32). Positive Bewertungen treten auf, wenn eine Person das Ergebnis als positiv auslegt, es somit das Wohlbefinden fördert oder verspricht, dies zu tun. Als Reaktion dieser Bewertung treten Emotionen wie Freude, Liebe oder Glück auf (vgl. Lazarus & Folkman, 1984, S. 32).

Eine Bewertung der Situation als stressig führt zu den weiteren folgenden drei Abstufungen der Bewertung: Als Schädigung (harm) wird eine Situation eingestuft, wenn der Schaden bereits eingetreten ist, als Bedrohung (threat), wenn der Schaden erwartet wird und als Herausforderung (challenge), wenn eine Möglichkeit der Überwindung gesehen wird (vgl. Lazarus & Folkman, 1987, S. 141-169). Alle drei Kategorien der Bewertung des stressigen Ereignisses beinhalten eine negative Bewertung des gegenwärtigen oder

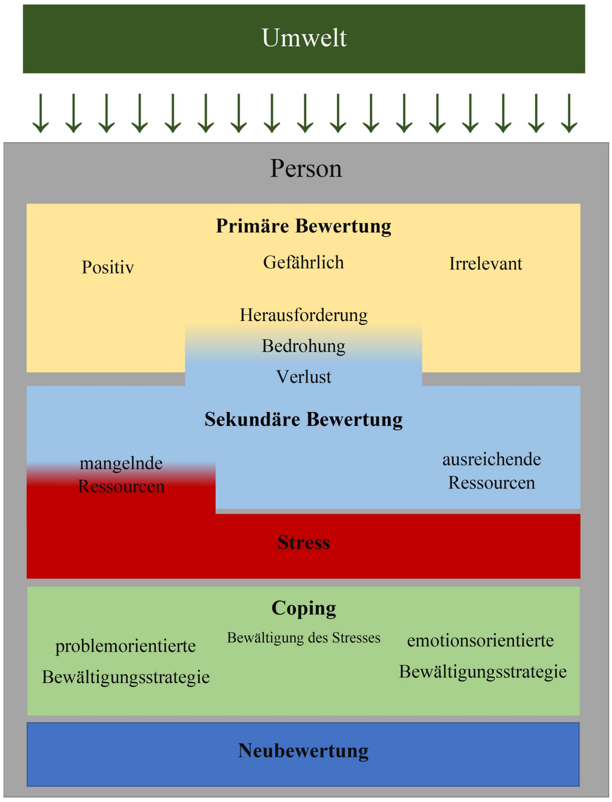

Abbildung 1: Transaktionales Stressmodell nach Lazarus in Anlehnung an Philipp Guttmann

zukünftigen Wohlbefindens. Eine Einschätzung der Situation als negativ kann Gefühle wie Wut, Ekel, Enttäuschung oder Traurigkeit hervorrufen (vgl. Folkman & Lazarus, 1985, S. 150-170).

Wenn eine Situation als stressend bewertet wird, kommt es zu einer weiteren Beurteilung, was getan werden kann, um diese stressige Situation zu bewältigen (vgl. Lazarus & Folkman, 1984, S. 33). Diese Bewertung wird Sekundäre Bewertung (second appraisal) genannt. Sie beinhaltet die Bewertung, ob man die erforderlichen Ressourcen, also die persönlichen Kompetenzen oder Handlungsmöglichkeiten hat, um eine Situation zu bewältigen. Wenn die Ressourcen in einer stressenden Situation als mangelhaft bewertet werden, kommt es zu einer Stressreaktion (vgl. Lazarus & Folkman, 1987, S. 141-169).

Als Reaktion auf eine Stressbewertung wird eine Bewältigungsstrategie entworfen, inwiefern man den Stress, der das Wohlbefinden gefährdet, bewältigen kann (vgl. Lazarus & Folkman, 1984, S. 35-36; Lazarus & Folkman, 1987, S. 141-169). Unter Bewältigung werden kognitive und verhaltensbezogene Anstrengungen verstanden, um externe und interne Anforderungen und Konflikte zwischen ihnen zu meistern, zu tolerieren oder zu reduzieren. Diese Bewältigungsbemühungen erfüllen zwei Hauptfunktionen: Die Steuerung oder Veränderung der Beziehung zwischen Mensch und Umwelt als Stressquelle, und die Regulierung stressiger Emotionen (vgl. Folkman & Lazarus, 1980, S. 219-239). Dabei lassen sich zwei grundlegende Strategien finden: Die problemorientierte und die emotionsorientierte Bewältigungsstrategie. Auf diese wird in Kapitel 4 genauer eingegangen.

Bewertung und Bewältigung stehen in einem Zusammenhang. Denn eine Bewertung ist auch davon abhängig, wie viel Kontrolle jemand über die Ergebnisse ausüben kann, also welche Bewältigungsoptionen es gibt. Wenn es eine Gefahr für ein schädliches Ergebnis gibt, aber man zuversichtlich ist, dass dies durch Bewältigung verhindert werden kann, wird die Bedrohung als nicht vorhanden und minimal eingestuft (vgl. Lazarus & Folkman, 1987, S. 141-169). Zudem beeinflussen sich Beurteilung und Bewältigung in einer stressigen Situation kontinuierlich. Eine Bewertung der Situation als schädlich, bedrohlich oder herausfordernd stimuliert beispielsweise Bewältigungsstrategien, die die Beziehung zwischen Menschen und Umwelt verändern. Die veränderte Beziehung führt zu einer Neubewertung, die wiederum weitere Bewältigungsmaßnahmen erforderlich macht. Somit bedingen sich Bewertung und Bewältigung gegenseitig (vgl. Folkman & Lazarus, 1980, S. 219-239). Die Neubewertung (Reappraisal) stellt die dritte Phase der Bewertung dar. Sie bezieht sich auf die veränderte Bewertung aufgrund neuer Informationen von der Umwelt (vgl. Lazarus & Folkman, 1984, S. 38).

Bei der Erklärung, wie Stress entsteht, gehören Bewertung und Bewältigung zu den wichtigsten Faktoren. Im weiteren Verlauf wird untersucht, welche Situationen bei Vertriebsmitarbeitern im speziellen Stress auslösen können.

3. Stress im Vertrieb

Stress, den Mitarbeiter im Vertrieb erfahren, kann oft viele verschiedene Ursachen haben und weitreichende Folgen mit sich bringen. Der Vertriebsmitarbeiter nimmt im Unternehmen eine besondere Rolle ein, denn durch seine Verkaufstätigkeit und den Kundenkontakt ist er direkt am Unternehmenserfolg beteiligt. Daher ist es wichtig zu beleuchten, in welcher Form diese Position Stress auslöst.

Dabei wird Jobstress eines Vertriebsmitarbeiters als einen negativen emotionalen Zustand definiert, der sich daraus ergibt, dass sich der gegenwärtig wahrgenommene Zustand von dem gewünschten unterscheidet und der Mitarbeiter diesen Unterschied als wichtig erachtet (vgl. Edwards, 1992, S. 238-274). Diese Diskrepanz kann beispielsweise durch zu geringe Verkaufszahlen oder die Unzufriedenheit der Kunden entstehen.

3.1. Auslöser des Stresses im Vertrieb

Im Vertrieb gibt es weitreichende Auslöser für Stress. Es gibt unterschiedliche Faktoren, die in der Ausübung des Berufs von Bedeutung sind. Zu diesen gehören zum Beispiel Zeitdruck, Leistungsdruck und viele Arbeitsstunden, aus denen Überforderung und Stress resultieren kann (vgl. Broadbridge, 2002, S. 173-183). Des Weiteren kann die Rolle, die ein Vertriebsmitarbeiter im Unternehmen einnimmt, ebenfalls Stress auslösen.

Rollenstress entspricht spezifischen aufgabenbezogenen und umweltbezogenen Rollenwahrnehmungen des Vertriebsmitarbeiters (vgl. Sager, 1994, S. 74-84). Die Rolle ist definiert durch einen Prozess, der drei Schritte umfasst. Zuerst werden dem Rolleninhaber die von den Mitgliedern festgelegten Erwartungen und Anforderungen über geeignete Rollenverhaltensweisen, zusammen mit dem Druck auf die Konformität mit diesen Anforderungen, mitgeteilt (vgl. Walker, Churchill & Ford, 1975, S. 32-39). Die Rolle des Vertriebsmitarbeiters wird durch verschiedene Personen in verwandten Positionen beeinflusst, sowohl innerhalb und außerhalb des Unternehmens. Dazu gehören zum Beispiel der unmittelbare Vorgesetzte des Vertriebsmitarbeiters, Arbeitskollegen oder Kunden. Sie alle werden versuchen, das Verhalten des Vertriebsmitarbeiters nach eigenen Wünschen und Zielen zu verändern (vgl. Walker et al., 1975, S. 32-39).

Der zweite Teil des Definitionsprozesses der Rolle betrifft die empfangene Rolle. Sie beinhaltet die Wahrnehmung des Inhabers über die Rollenerwartungen und den Druck, der von den Mitgliedern seiner Rolle geschickt werden, und daraus resultierende Vorstellung, wie seine Rolle sein sollte. Zu diesem Zeitpunkt treten der Rollenkonflikt und die Rollenmehrdeutigkeit auf (vgl. Walker et al., 1975, S. 32-39). Der letzte Schritt im Prozess der Rollendefinition ist der der Umwandlung von Rollenwahrnehmungen in Rollenverhaltensweisen des Vertriebsmitarbeiters (vgl. Walker et al., 1975, S. 32-39).

Der Rollenkonflikt lässt sich definieren als den Grad der Unvereinbarkeit der mit der Rolle verbundenen Erwartungen (vgl. Singh, Goolsby & Rhoads, 1994, S. 558-569). Dagegen beschreibt Rollenmehrdeutigkeit den Grad, in dem klare Informationen über die mit einer Rolle verbundenen Erwartungen, Methoden zur Erfüllung der Rollenerwartungen oder die Folgen der Rollenleistung fehlen (vgl. Singh et al., 1994, S. 558-569). Rollenmehrdeutigkeit und Rollenkonflikt gehören zu den wichtigsten Auslösern von Stress (vgl. Sager, 1994, S. 74-84). Diese beiden Auslöser von Stress stehen ebenfalls in Zusammenhang. So lässt sich finden, dass die Rollenmehrdeutigkeit den Rollenkonflikt erhöht (vgl Babakus, Cravens & Moncrief, 1999, S. 58-70). Dabei erhöht der Rollenkonflikt den Jobstress mehr als die Rollenmehrdeutigkeit, aber die Rollenmehrdeutigkeit hat einen indirekten Einfluss auf den Stress, indem sie wiederum den Rollenkonflikt erhöht (vgl. Moncrief, Babakus, Cravens & Johnston, 1997, S. 786-798).

Als einen weiteren Auslöser von Stress lässt sich die Rollenüberlastung nennen. Diese tritt auf, wenn Individuen das Gefühl haben, dass sie nicht genug Zeit haben, ihre Aufgaben zu erledigen (vgl. Dubinsky et al., 1990, S. 121-133). Rollenüberlastung existiert auch, wenn die Rollenerwartungen viel größer sind als die Fähigkeiten und Motivation eine Aufgabe zu erledigen (vgl. Singh et al., 1994, S. 558-569). Dieser Auslöser nimmt im Gegensatz zu den anderen beiden allerdings nur eine untergeordnete Rolle ein, da er in der Literatur nur selten untersucht wird.

Der Grund, weshalb ein Vertriebsmitarbeiter ein hohes Level an Rollenkonflikt und Rollenmehrdeutigkeit erfährt, liegt an der besonderen Position, die er im Unternehmen einnimmt. Er befindet sich in einer Boundary-Spanning-Position (vgl. Walker et al., 1975, S. 32-39). Boundarys repräsentieren unsichtbare Barrieren, die ein Vertriebsmitarbeiter durchdringen muss, um Kommunikationsengpässe oder andere Probleme richtig zu handhaben, die zu einer Verringerung des Umsatzes führen können. Boundary-Spanners sind Personen, die an der Grenze einer Organisation tätig sind und Aufgaben ausführen, die die Organisation mit Elementen außerhalb der Organisation in Verbindung bringen (vgl. Lysonski & Johnson, 1983, S. 8-21). Vertriebsmitarbeiter müssen sowohl Kundenerwartungen als auch Unternehmenszielen gerecht werden und somit Druck von innerhalb und außerhalb des Unternehmens aushalten (vgl. Goolsby, 1992, S. 155-164).

Rollenstress von Vertriebsmitarbeitern kann aus verschiedenen Faktoren resultieren: Wenn sie scheitern einen Verkauf zu tätigen, es gegensätzliche Forderungen des Kunden und Unternehmens gibt, oder das Unternehmen unerreichbare Ziele wie Marktanteile und Gewinne gleichzeitig steigern möchte. Wenn die Vertriebsmitarbeiter feststellen, dass sie unzureichende Ressourcen zur Verfügung haben, um die aufgabenspezifischen Ziele erreichen zu können, beginnen sie sich „emotional ausgelaugt“ zu fühlen (vgl. Lewin & Sager, 2008, S. 233-246).

Aufgrund dieser verschiedenen Anforderungen ist der Job eines Vertriebsmitarbeiters sehr komplex. Jobkomplexität im Vertriebskontext lässt sich nach Schmitz und Ganesan (2014) als das Ausmaß definieren, in dem eine Aufgabe eine große Anzahl und Vielfalt von Elementen in den Umgebungen von Konsumenten- und Unternehmensumwelt umfasst, die der Verkäufer berücksichtigen muss, um seine Jobaufgaben effektiv auszuführen (vgl. Schmitz & Ganesan, 2014, S. 59-77). Kundenkomplexität lässt sich insofern beschreiben, dass Vertriebsmitarbeiter auf eine Vielzahl von Kundenbedürfnissen und der Belegschaft reagieren müssen (vgl. Schmitz & Ganesan, 2014, S. 59-77). Unternehmenskomplexität tritt auf, wenn Vertriebsmitarbeiter auf eine Vielzahl von Personen und Richtlinien in ihren eigenen Organisationen bei der Ausführung ihres Jobs reagieren müssen (vgl. Schmitz & Ganesan, 2014, S. 59-77). Vertriebsmitarbeiter sind oft in einer Situation, in der sie mehreren Leuten gerecht werden müssen, die widersprüchliche Ziele verfolgen. Als Beispiel dafür sind zum Beispiel verschiedene Vorstellungen hinsichtlich der Preisgestaltung mehrerer Abteilungen zu nennen (vgl. Lysonski & Johnson, 1983, S. 8-21). Auch Kundenwünsche, die nicht umsetzbar oder vereinbar mit Unternehmenszielen sind, können Stress bei Vertriebsmitarbeitern auslösen. Kundenkomplexität und Unternehmenskomplexität erhöhen den Rollenkonflikt der Vertriebsmitarbeiter, zudem erhöht die Unternehmenskomplexität die Rollenmehrdeutigkeit (vgl. Schmitz & Ganesan, 2014, S. 59-77).

Vertriebsmitarbeiter können dem Stress, den sie erfahren, nicht aus dem Weg gehen. Trotz dieses Druckes, den sie sowohl von Kunden als auch dem Unternehmen erfahren, müssen die Verkäufer regelmäßig den Kontakt zu Vertriebsleitern und Kunden aufrechterhalten, um die Ziele im Job zu erreichen. Deshalb müssen sich Vertriebsmitarbeiter aktiv in stressige Situationen begeben (vgl. Sager & Wilson, 1995, S. 51-63). Dies kann weitreichende Folgen mit sich bringen, auf die im Nachfolgenden eingegangen wird.

3.2. Folgen von Stress

Es lässt sich in der Literatur finden, dass die Stressfaktoren der Rolle eines Vertriebsmitarbeiters negative Auswirkungen auf die Jobzufriedenheit, die Leistung und das Commitment für das Unternehmen haben. Zudem erhöhen sie Nervosität und Fluktuationsabsichten (vgl. Singh, 1998, S. 69-86).

Die Rollenmehrdeutigkeit übt einen stark negativen Einfluss auf die Leistung eines Vertriebsmitarbeiters aus. Unklarheiten über die Aufgaben im Vertrieb und wie diese erledigt werden sollen, schmälern die Leistungsfähigkeit eines Mitarbeiters (vgl. Behrman & Perreault, 1984, S. 9-21). Erstaunlicherweise hat der Rollenkonflikt einen positiven Einfluss auf die Leistung des Mitarbeiters. Dies lässt sich insofern interpretieren, dass einige Aspekte des Rollenkonflikts grundlegend für die Leistung des Verkaufsberufs sein können, selbst wenn hoher Rollenkonflikt negative Auswirkungen mit sich bringt (vgl. Behrman & Perreault, 1984, S. 9-21). Diese These stützen auch Schmitz und Ganesan (2014) mit ihrem Ergebnis, dass Rollenkonflikt und Arbeitsaufwand positiv in Zusammenhang stehen. Gemäßigte Niveaus von Rollenkonflikten scheinen positive Motivationseffekte zu haben (vgl. Schmitz & Ganesan, 2014, S. 59-77).

Dagegen senken die Rollenmehrdeutigkeit und auch der Rollenkonflikt die Jobzufriedenheit (vgl. Behrman & Perreault, 1984, S. 9-21; Brown & Peterson, 1993, S. 63-77; Lysonski & Johnson, 1983, S. 8-21).

Jobzufriedenheit ist positiv, denn sie reduziert den Stress auf der Arbeit und erhöht so das Wohlbefinden des Vertriebsmitarbeiters (vgl. Sager, 1994, S. 74-84). Zudem haben Mitarbeiter, die zufrieden mit ihrem Job sind, geringere Fluktuationsabsichten (vgl. Dubinsky et al., 1990, S. 121-133). Jobzufriedenheit wirkt ebenfalls positiv, indem sie das organisationale Commitment erhöht (vgl. Brown & Peterson, 1993, S. 63-77). Die Stressfaktoren der Rolle senken im Gegensatz dazu das organisationale Commitment (vgl. Singh, 1998, S. 69-86). Dieses führt wiederum zu erhöhten Fluktuationsabsichten (vgl. Jones, Lawrence, Deva & James, 2007, S. 663-671). Somit beeinflusst Stress die Absicht, das Unternehmen zu verlassen, indirekt (vgl. Sager, 1994, S. 74-84).

Jones et al. (2007) untersuchten die Auswirkung der Rollenüberlastung als weiteren Stressfaktor der Rolle. Die Ergebnisse ihrer Studie implizieren, dass auch die Rollenüberlastung einen negativen Einfluss auf die Jobzufriedenheit und das organisationale Commitment hat (vgl. Jones et al., 2007, S. 663-671). Da Mitarbeiter, die zufrieden mit ihrem Job sind, geringere Fluktuationsabsichten haben, sollte die Rollenüberlastung verhindert werden (vgl. Dubinsky et al., 1990, S. 121-133).

Die Rollenmehrdeutigkeit, der Rollenkonflikt und die Rollenüberlastung haben ebenfalls einen direkten negativen Einfluss auf die Fluktuationsabsichten eines Vertriebsmitarbeiters (vgl. Lysonski & Johnson, 1983, S. 8-21; Jones et al., 2007, S. 663-671). Dieser direkte Effekt bedeutet, dass Unsicherheiten über Anforderungen der Rolle ein wichtiger Faktor dafür sind das Unternehmen zu verlassen (vgl. Brown & Peterson, 1993, S. 63-77). Zudem erhöhen der Rollenkonflikt und die Rollenmehrdeutigkeit arbeitsbezogene Anspannung (vgl. Lysonski & Johnson, 1983, S. 8-21). Diese Anspannung führt ebenfalls zu einem erhöhten Wunsch, das Unternehmen zu verlassen (vgl. Singh, 1998, S. 69-86).

Die Kosten, die entstehen, wenn ein Vertriebsmitarbeiter das Unternehmen verlässt, können erheblich sein. Dazu zählen auf der einen Seite greifbare Kosten, wie beispielsweise Rekrutierungs-, Einstellungs- und Schulungskosten. Andere sind weniger greifbar, können aber dramatische Auswirkungen auf ein Unternehmen haben. Dazu zählen Kosten für entgangene Umsätze und Gewinne, die sich beispielsweise daraus ergeben können, dass der Mehrwert der Kunden durch den Abgang des Vertriebsmitarbeiters verringert wurde und die Stelle durch einen neuen Mitarbeiter nicht adäquat ersetzt werden kann (vgl. Dubinsky et al., 1990, S. 121-133).

Als persönliche Folge von Stress ist die emotionale Erschöpfung zu nennen. Diese ist gekennzeichnet durch mangelnde Energie und ein Gefühl, dass der emotionale „Speicher" des Individuums leer ist (vgl. Babakus et al., 1999, S. 58-70). Es kann in sehr anspruchsvollen, kundenorientierten Situationen auftreten, wie in jenen, in denen sich Vertriebsmitarbeiter befinden. Ein häufiges Symptom emotionaler Erschöpfung ist die Angst, zur Arbeit zu gehen (vgl. Babakus et al., 1999, S. 58-70). Wenn sich der Rollenkonflikt und die Rollenmehrdeutigkeit eines Vertriebsmitarbeiters erhöht, führt dies zu einer verstärkten emotionalen Erschöpfung (vgl. Boyd, Lewin & Sager, 2009, S. 798-805). Diese emotionale Erschöpfung hat wiederum Auswirkungen auf die Arbeit: Sie hat geringere Jobzufriedenheit und Commitment für das Unternehmen zur Folge. Diese beiden Faktoren fördern, wie bereits erörtert, Fluktuationsabsichten (vgl. Babakus et al., 1999, S. 58-70). Als Konsequenzen von emotionaler Erschöpfung gehören auch verhaltensbezogenen Ergebnisse, wie verminderte Leistung eines Mitarbeiters (vgl. Babakus et al., 1999, S. 58-70).

Folgen von Stress gehen über den Arbeitskontext hinaus. Denn Jobstress hat ebenfalls einen negativen Einfluss auf die Gesundheit eines Menschen. Die mentale Gesundheit eines Vertriebsmitarbeiters wird dadurch beeinträchtigt, dass der Rollenstress die Jobzufriedenheit mindert und die emotionale Erschöpfung fördert. Wenn ein Mitarbeiter auf der Arbeit mentalen Stress erfährt, der die Gesundheit beeinträchtigt, wirkt sich dies auch auf die allgemeine mentale Gesundheit aus (vgl. Kelloway & Barling, 1991, S. 291-304).

In einer Studie berichteten Mitarbeiter, dass der derzeitige berufliche Stress zu einer Reihe physischer und psychischer Gesundheitsprobleme, sowie zu einer Belastung der familiären und persönlichen Beziehungen geführt habe. Drei Viertel der befragten Mitarbeiter gaben an, als Folge von arbeitsbedingtem Stress an gesundheitlichen Schäden zu leiden. Zu diesen gesundheitlichen Symptomen gehören beispielsweise Kopfschmerzen, Schlafstörungen und körperliche Müdigkeit, aber auch Herzprobleme und Hauterkrankungen. Des Weiteren wirke sich der arbeitsbedingte Stress psychisch auf sie aus, indem dieser Angstgefühle, Depressionen, Burnout und Frustration gegenüber dem Management fördert (vgl. Gillespie et al., 2001, S. 53-72).

Wie erläutert, kann Stress weitreichende Folgen haben. Er beeinflusst nicht nur die Jobzufriedenheit und Leistung des Mitarbeiters, sondern erhöht ebenfalls Fluktuationsabsichten und beeinträchtigt die Gesundheit eines Vertriebsmitarbeiters. Um diese Folgen zu vermeiden kann das Unternehmen Einfluss auf das Arbeitsumfeld nehmen. Jobcharakteristika, wie beispielsweise Autonomie und Feedback, erhöhen die Jobzufriedenheit und die Leistung von Vertriebsmitarbeitern. Sie wirken dem Stress somit entgegen (vgl. Singh, 1998, S. 69-86). Zudem können diese Faktoren die Rollenmehrdeutigkeit senken und haben damit einen direkten Einfluss auf Stress (vgl. Singh, 1993, S. 11-31). Diese Charakteristika können somit bereits beeinflussen, welche Folgen der Stress im Unternehmen mit sich bringt. In weiteren Studien könnte eine wichtige Forschungsfrage sein, welche Einflussfaktoren es noch gibt. Auf der anderen Seite können Mitarbeiter Stress selbst bewältigen, um diese negativen Folgen zu vermeiden. Coping gilt als wichtiger Faktor, um mit stressigen Situationen umgehen zu können. Darauf wird im folgenden Abschnitt eingegangen.

4. Bewältigungsstrategien von Vertriebsmitarbeitern

Bewältigung oder auch Coping lässt sich definieren als die Anstrengung einer Person, die psychologischen Anforderungen einer Situation zu bewältigen, die die Ressourcen der Person belastet (vgl. Folkman, Lazarus, Gruen & Delongis, 1986, S. 992-1003).

In der Literatur gibt es zwei weithin anerkannte Funktionen. Dazu zählt zum einen die Bewältigung des Problems, das den Stress verursacht und zum anderen die Steuerung von Emotionen (vgl. Folkman & Lazarus, 1985, S. 150-170). Coping ist unabhängig von seinem Ausgang definiert, ob es hilft Stress zu vermindern oder nicht (vgl. Folkman, 1984, S. 839-852). Folkman & Lazarus beschreiben Coping als Vermittler zwischen dem täglichen Stress und dem psychologischen, physischen und sozialen Wohlbefinden (vgl. Folkman & Lazarus, 1980, S. 219-239). Dabei impliziert Stress eine gestörte Beziehung von Mensch und Umwelt, welches Coping verändern soll (vgl. Folkman & Lazarus, 1985, S. 150-170).

Die Bedeutung der Bewältigung von Stress ist sehr groß, denn das Scheitern von Vertriebsmitarbeitern, ihren arbeitsbedingten Stress zu reduzieren, ist einer der Hauptgründe, das Unternehmen zu verlassen (vgl. Lewin & Sager, 2008, S. 233-246; Srivastava & Sager, 1999, S. 47 57).

Wie in Abbildung 2 dargestellt, soll Coping den Vertriebsmitarbeitern helfen, den Stress, den sie im Unternehmen erfahren, besser bewältigen zu können. Mithilfe der Bewältigung sollen negative Folgen von Stress vermieden werden. Es gibt verschiedene Einflussfaktoren auf die Wahl der Bewältigungsstrategie, die wiederum Auswirkungen mit sich bringt.

In der Literatur lassen sich allgemein zwei Bewältigungsstrategien finden. Es wird zwischen problemorientierten und emotionsorientierten Bewältigungsstrategien unterschieden.

Problemorientierte Bewältigungsstrategien beinhalten das Verändern der Stress verursachenden Beziehung zwischen Mensch und Umwelt und Anstrengungen zur Überwindung des Problems, das den Stress auslöst (vgl. Folkman & Lazarus, 1985, S. 150-170, Folkman et al., 1986, S. 571-579).

Situationen, die bei einem Vertriebsmitarbeiter Stress auslösen können, sind beispielsweise solche, in denen die Mitarbeiter scheitern, das Produkt einem Kunden zu verkaufen oder der Kunde unzufrieden mit der Verkaufspräsentation ist.

Problemorientierte Bewältigungsstrategien können auf der einen Seite aggressive Versuche beinhalten die Situation zu ändern, indem z.B. beim Kunden versucht wird, Entscheidungsdruck für den Kauf eines Produktes aufzubauen. Auf der anderen Seite können diese aber auch ruhig und rational sein und gezielte Anstrengungen zur Überwindung des den Stress verursachenden Problems beinhalten (vgl. Strutton & Lumpkin, 1993, S. 71-82).

Zu problemorientierten Bewältigungsstrategien zählen zum Beispiel gerichtetes Problemlösen und reine Problemkonzentration, die Taktiken beinhalten, wie man am besten den arbeitsbezogenen Stressfaktor bewältigen kann. Ihre Verwendung impliziert, dass die Vertriebsmitarbeiter andere Informationen und Aufgaben beiseitelegen und vermeiden, um sich stärker auf die Bedrohung oder Herausforderung konzentrieren zu können (vgl. Strutton & Lumpkin, 1994, S. 28-37). Als Beispiel für reine Problemkonzentration lässt sich nennen, dass Vertriebsmitarbeiter sich aktiv in Verkaufs-

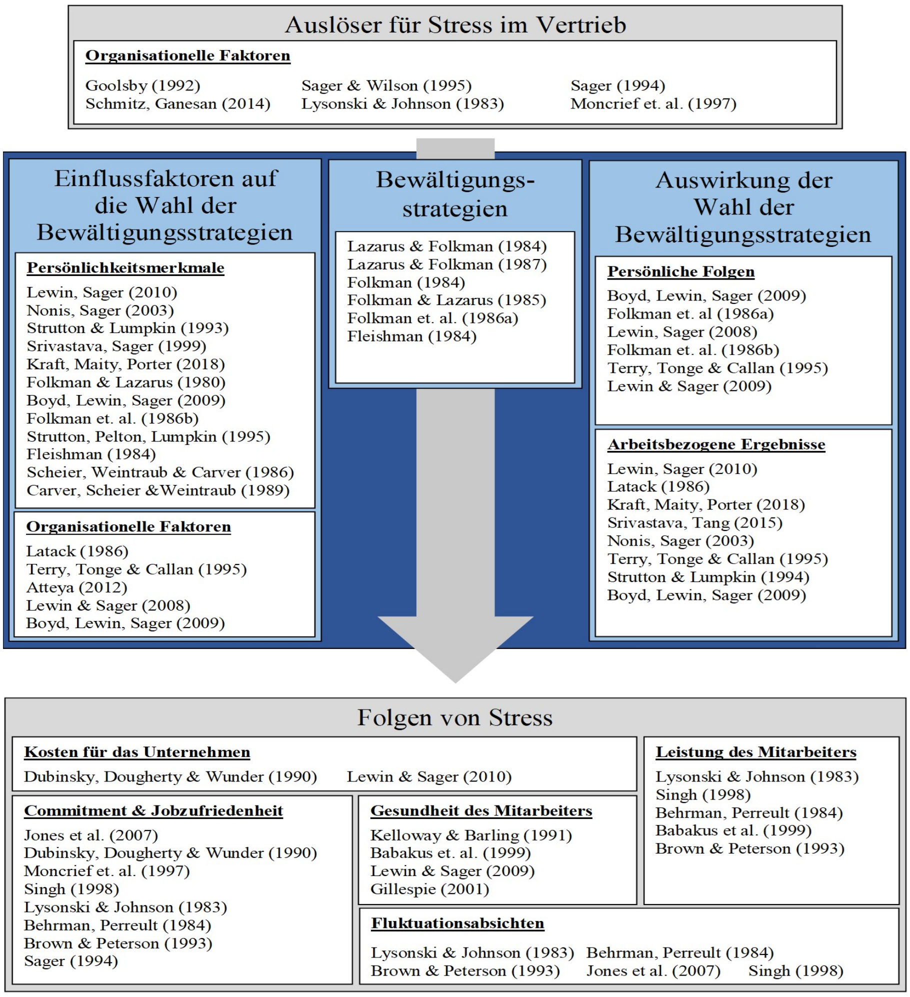

Abbildung 2: Eigene Darstellung des Literaturüberblicks

situationen begeben und Kundenkontakt suchen. Damit versuchen sie das Problem, einen Verkauf nicht abschließen zu können, zu überwinden und Verkaufsstrategien zu verbessern.

Als weitere wichtige problemorientierte Bewältigungsstrategie ist die positive Neuinterpretation zu nennen. Diese beinhaltet, dass die Vertriebsmitarbeiter vergangene Situationen analysieren und dadurch versuchen aus Vergangenem zu lernen (vgl. Strutton & Lumpkin, 1994, S. 28-37). So können sie beispielsweise analysieren, welche Dinge in der letzten Verkaufspräsentation schlecht waren, um zukünftig ihren Anforderungen besser gerecht zu werden.

Vertriebsmitarbeiter bedienen sich ebenfalls der Selbstkontrolle als problemorientierte Bewältigungsstrategie, indem sie sich auf ihre Stärken konzentrieren und durch eigenes aktives Handeln die Situation bewältigen können (vgl. Strutton & Lumpkin, 1994, S. 28-37). Die Fokussierung auf erlernte Verkaufsstrategien und zwischenmenschliche Fähigkeiten kann dabei helfen, eine Verkaufspräsentation erfolgreich abschließen zu können.

Emotionsorientierte Bewältigungsstrategien dagegen zielen eher auf das Regulieren stressiger Emotionen ab (vgl. Folkman et al., 1986, S. 571-579). Sie beinhalten Taktiken zur Distanzierung oder Flucht vor der stressigen Situation, können aber auch das Streben nach einem positiven sozialen Umfeld beinhalten, das Unterstützung mit sich bringen soll (vgl. Folkman & Lazarus, 1985, S. 150-170; Strutton & Lumpkin, 1994, S. 28-37). Emotionsorientierte Bewältigungsstrategien wirken eher als Neuinterpretation oder Neudefinierung einer problematischen Situation, um ihr aus dem Weg zu gehen, anstatt durch aktives Angehen das Problem zu lösen (vgl. Fleishman, 1984, S. 229-244). Negatives Vermeiden und Distanzieren umfassen beide Bewältigungsaktivitäten, die den Vertriebsmitarbeiter von einer ernsthaften Betrachtung der Arbeitsaufgabe oder des Ziels ablenkt. Diese Strategien umfassen Aktivitäten, wie z.B. Tagträumen und Ablenken von eigentlichen Arbeitsaufgaben, die erledigt werden müssen (vgl. Strutton & Lumpkin, 1994, S. 28-37). Mitarbeiter versuchen Stress zu vermindern, indem sie Kunden aus dem Weg gehen und Verkaufspräsentationen meiden.

Somit lässt sich festhalten, dass sich problemorientierte- und emotionsorientierte Bewältigungsstrategien qualitativ in ihrer Art unterscheiden, wie sie Kontrolle über eine stressige Situation gewinnen. Emotionsorientierte Bewältigungsstrategien führen zur Kontrolle belastender Emotionen durch Ändern der Bedeutung eines Ergebnisses. Problemorientierte Bewältigungsstrategien werden genutzt, um die Stresssituation aktiv zu kontrollieren durch Problemlösen, Entscheidungsfindung oder direktes Handeln (vgl. Folkman, 1984, S. 839-852).

Allgemein gilt, je größer die Belastung durch Stress ist, desto größer ist die Häufigkeit, in der Bewältigungsstrategien verwendet werden (vgl. Fleishman, 1984, S. 229-244). Beide Bewältigungsstrategien können gemeinsam in derselben stressigen Situation auftreten (vgl. Strutton & Lumpkin, 1993, S. 71-82). Folkman und Lazarus (1980) kamen in ihrer Studie zu dem Ergebnis, dass die Befragten in 98% der stressigen Situationen Bewältigungsstrategien nutzten, dazu gehörten sowohl problemorientierte als auch emotionsorientierte Bewältigungsstrategien (vgl. Folkman & Lazarus, 1980, S. 219-239). Dabei dominiert jedoch die Nutzung einer der beiden Bewältigungsstrategien und meistens haben Menschen generell einen relativ stabilen Bewältigungsstil für die stressige Situation, der sie begegnen (vgl. Carver, Scheier & Weintaub, 1989, S. 267-283; Srivastava & Sager, 1999, S. 47-57).

In der Literatur sind weitere Bewältigungsstrategien zu finden, die jedoch in geringerem Umfang erörtert werden. Dazu gehört die zeitorientierte Bewältigungsstrategie, die beschreibt, dass Vertriebsmitarbeiter Stress erheblich durch bessere Einteilung ihrer Zeit minimieren können (vgl. Kraft, Maity & Porter, 2018, S. 347-359). Zudem gibt es in der Forschung begriffliche Unterscheidungen zwischen verschiedenen Bewältigungsstrategien. So wird ebenfalls problemorientierte Bewältigungsstrategien als aktives Coping und emotionsorientierte Bewältigungsstrategien als vermeidendes Coping bezeichnet (vgl. Srivastava & Tang, 2015, S. 525-542).

Da die Untersuchung von problemorientierten und emotionsorientierten Bewältigungsstrategien in der Literatur überwiegt, konzentrieren sich die Betrachtungen im weiteren Verlauf der Arbeit auf diese beiden Strategien.

4.1. Einflussfaktoren auf die Wahl der Bewältigungsstrategien

Die Wahl der Bewältigungsstrategie hängt von verschiedenen Einflussfaktoren ab. Dazu gehören auf der einen Seite persönliche Charaktereigenschaften der Vertriebsmitarbeiter, auf der anderen Seite organisationale Einflussfaktoren des Unternehmens.

4.1.1. Persönliche Charaktereigenschaften

Vertriebsmitarbeiter, die ihre Ressourcen als ausreichend bewerten, um Stressfaktoren der Rolle zu bewältigen, werden die Überzeugung haben, dass sie die Kontrolle über eine Situation haben und den Stressfaktor als herausfordernd und positiv wahrnehmen (vgl. Kraft et al., 2018, S. 347-359). Somit können persönliche Charaktereigenschaften beeinflussen, wie eine stressige Situation bewältigt wird.

Die Tatsache, ob ein Vertriebsmitarbeiter optimistisch oder pessimistisch eingestellt ist, beeinflusst die Wahl der Bewältigungsstrategie. Optimismus beschreibt hierbei die Tendenz, das bestmögliche Ergebnis zu erwarten (vgl. Strutton & Lumpkin, 1993, S. 71-82). Strutton und Lumpkin (1993) fanden in ihrer Studie heraus, dass optimistische Verkaufsmitarbeiter eher problemorientierte Bewältigungsstrategien nutzen (vgl. Strutton & Lumpkin, 1993, S. 71-82). Als Beispiele dazu sind gerichtetes Problemlösen und positive Neuinterpretation zu nennen. Optimisten nutzen in stressigen Verkaufssituationen eine sorgfältige, erfahrungsbasierte Analyse und verstärken ihre Bemühungen, den Stressfaktor zu beseitigen (Nutzen von gerichtetem Problemlösen). Optimistische Verkäufer neigen auch häufiger dazu, sich anzupassen und sich selbst zum besseren umzugestalten als Folge der stressigen Situation (Gebrauch der positiven Neuinterpretation) (vgl. Strutton & Lumpkin, 1993, S. 71-82). Sie werden sich mental nicht von dem Problem loslösen und distanzieren, sondern versuchen es zurückhaltend und selbstkontrolliert zu lösen (vgl. Carver et al., 1989, S. 267-283; Strutton & Lumpkin, 1993, S. 71-82).

Pessimistische Vertriebsmitarbeiter dagegen nutzen eher emotionsorientierte Bewältigungsstrategien (vgl. Nonis & Sager, 2003, S. 139-150). Dazu gehört beispielsweise die Suche nach sozialer Unterstützung (vgl. Strutton & Lumpkin, 1993, S. 71-82). Pessimisten konzentrieren sich auf ihre Gefühle und Emotionen. Sie tendieren dazu, Bewältigungsstrategien zu nutzen, die eine Abkehr von Zielen und die Flucht vor bestimmten Situationen beinhaltet (vgl. Carver et al., 1989, S. 267-283; Scheier, Weintraub & Carver, 1986, S. 1257-1264). Diese Flucht vor stressigen Situationen kann sich negativ auf die Leistung und Position im Unternehmen auswirken (vgl. Strutton & Lumpkin, 1993, S. 71-82).

Ein weiterer persönlicher Einflussfaktor ist die Selbstwirksamkeitserwartung eines Mitarbeiters. Diese lässt sich definieren als Erwartung eines Menschen, die Fähigkeiten für die erforderlichen Verhaltensweisen zu haben, um wünschenswerte Ergebnisse zu erzielen (vgl. Strutton & Lumpkin, 1994, S. 28-37). Im Vertriebskontext bedeutet dies, dass Verkäufer mit hoher Selbstwirksamkeit eine größere Fähigkeit haben, Erwartungen der Kunden zu verstehen, zu priorisieren und zu formulieren, als Verkäufer mit geringerer Selbstwirksamkeit (vgl. Schmitz & Ganesan, 2014, S. 59-77). Ein hohes Maß an Selbstwirksamkeit weist darauf hin, dass die Mitarbeiter der Ansicht sind, dass sie das Potenzial haben, Arbeitsaufgaben auszuführen und mit Stressfaktoren besser umzugehen als diejenigen mit geringerer Selbstwirksamkeit (vgl. Jex, Bliese, Buzzel & Primeau, 2001 S. 401-409). Menschen mit hoher Selbstwirksamkeitserwartung nutzen eher problemorientierte Bewältigungsstrategien und weniger emotionsorientierte Bewältigungsstrategien. Verkäufer, die selbstsicher in ihren Fähigkeiten sind, sehen sich selbst dazu in der Lage, berufliche Widrigkeiten durch persönliche Überwindung zu bewältigen (vgl. Lewin & Sager, 2010, S. 355-370; Boyd et al., 2009, S. 197-211; Srivastava & Sager, 1999, S. 47-57). Vertriebsmitarbeiter mit hoher Selbstwirksamkeitserwartung haben wenig Motivation arbeitsbedingte Stresssituationen mit Hilfe von emotionsorientierten Bewältigungsstrategien zu bewältigen. Diese Vertriebsmitarbeiter sind von ihren Fähigkeiten überzeugt und betrachten eine Flucht vor der stressigen Situation als Hindernis, um ihre gewünschten Ergebnisse zu erzielen (vgl. Lewin & Sager, 2010, S. 355-370). Dagegen werden Menschen, die an sich selbst zweifeln, eher auf emotionsorientierte Bewältigungsstrategien zurückgreifen (vgl. Fleishman, 1984, S. 229-244).

Die Kontrollüberzeugung eines Menschen zählt zu einem weiteren Einflussfaktor auf die Wahl der Bewältigungsstrategie. Menschen haben entweder eine externe oder interne Kontrollüberzeugung (vgl. Rotter, 1966, S. 1-28). Wenn Individuen eine externe Kontrollüberzeugung haben, glauben sie, dass das Ergebnis durch Glück, Zufall, Schicksal oder anderen externen Faktoren begründet ist. Interne Kontrollüberzeugung beschreibt die Auffassung eines Individuums, dass das Ergebnis auf das eigene Verhalten oder persönliche Charaktereigenschaften zurückzuführen ist (vgl. Rotter, 1966, S 1-28).Vertriebsmitarbeiter mit einer externen Kontrollüberzeugung greifen eher auf emotionsorientierte Bewältigungsstrategien zurück (vgl. Lewin & Sager, 2010, S. 355-370). Wenn sie eine interne Kontrollüberzeugung besitzen, nutzen sie eher problemorientierte Bewältigungsstrategien (vgl. Nonis & Sager, 2003, S. 139-150, Srivastava & Sager, 1999, S. 47-57). Es zeigt sich, dass Mitarbeiter mit einer internen Kontrollorientierung weniger vor einer stressigen Situation flüchten, als die Mitarbeiter, die eine externe Kontrollüberzeugung haben (vgl. Terry, Tonge & Callan, 1995, S. 1-24).

Dazu passen die Ergebnisse der Untersuchungen von Strutton, Pelton und Lumpkin (1995). In ihrer Studie untersuchten sie den Einfluss von Selbstbestimmung auf die Wahl der Bewältigungsstrategie. Menschen, die eine Orientierung zur Selbstbestimmung haben, neigen dazu, sich in neue Situationen zu stürzen und sich diese zu eigen zu machen. Gefühle der Selbstbestimmung ermöglichen es Vertriebsmitarbeitern, dem Stress mit der Überzeugung zu begegnen, ihn kontrollieren zu können. Sie bedienen sich problemorientierten Bewältigungsstrategien, wie Selbstkontrolle und gerichtetem Problemlösen (vgl. Strutton et al., 1995, S. 132-140). Menschen, die eine externe Kontrollüberzeugung haben, fühlen sich eher machtlos und von anderen bestimmt. Als Folge davon nutzen sie eher emotionsorientierte Bewältigungsstrategien, wie beispielsweise Vermeidung (vgl. Strutton et al., 1995, S. 132-140).

Individuen wählen generell eine Bewältigungsstrategie in der Annahme, dass sie eine Situation ändern können oder nicht (vgl. Boyd et al., 2009, S. 197-211). Halten Vertriebsmitarbeiter ihre angestrebten Ziele für erreichbar, setzen sie mit größerer Wahrscheinlichkeit ihre Anstrengungen und Ressourcen ein, um Hindernisse für ihre gewünschten Ziele aktiv zu beseitigen, selbst wenn dies schwierig ist (vgl. Strutton & Lumpkin, 1993, S. 71-82). Optimistische Verkäufer sind der Meinung, dass ein bestimmtes Ziel erreichbar ist. Folglich werden sie eher problemorientierte Bewältigung verwenden (vgl. Strutton & Lumpkin, 1993, S. 71-82). Menschen nutzen eher problemorientierte Bewältigungsstrategien, wie beispielsweise gerichtetes Problemlösen, wenn sie der Auffassung sind, dass Situationen veränderbar sind. Emotionsorientierte Bewältigungsstrategien, zu denen Distanzierung oder Vermeidung und Flucht gehören, werden gewählt, wenn Menschen wenig Möglichkeiten sehen das Ergebnis zu verändern (vgl. Folkman et al., 1986, S. 992-1003). Auch Mitarbeiter mit einer internen Kontrollüberzeugung haben eher die Überzeugung, dass eine stressige Situation kontrollierbar ist. Sie nutzen daher weniger die Strategie, vor einer stressigen Situation zu flüchten (vgl. Terry et al., 1995, S. 1-24).

Wie in Kapitel 2 beschrieben, ist die Bewertung (appraisal) von großer Bedeutung und wird als kritische Determinante des Bewältigungsprozesses betrachtet. Menschen setzen eher emotionsorientierte Bewältigungsstrategien ein in Situationen, die wenig Möglichkeiten für eine vorteilhafte Veränderung bietet und die sie als bedrohlich oder schädlich bewerten. Auf der anderen Seite verwenden Menschen problemorientierte Bewältigungsstrategien in Situationen, die sie als veränderbar bewerten (vgl. Folkman & Lazarus, 1980, S. 219-239).

Auch das Geschlecht kann ein Einflussfaktor auf die Wahl der Bewältigungsstrategie sein. So lässt sich in der Literatur finden, dass Frauen eher dazu tendieren, emotionsorientierte Bewältigungsstrategien zu nutzen, während Männer dieses nicht tun. Es zeigt sich, dass Frauen eine größere Tendenz dazu haben, sich Wunder oder reizvolle und ideale Ergebnisse vorzustellen und mehr Zeit mit Tagträumen verbringen als Männer. Allerdings wird angenommen, dass diese Aktivitäten keinen Stress vermindern (vgl. Srivastava & Tang, 2015, S. 525-542).

4.1.2. Organisationale Faktoren

Organisationale Faktoren können ebenfalls beeinflussen, ob sich ein Individuum für problemorientierte oder emotionsorientierte Bewältigungsstrategien entscheidet. Zu diesen Einflussfaktoren gehören beispielsweise der Rollenkonflikt und die Rollenmehrdeutigkeit, die zu wichtigen Auslösern von Stress zählen.

Es lässt sich in der Literatur finden, dass Vertriebsmitarbeiter, die ein hohes Level an Rollenkonflikt erfahren, eher auf emotionsorientierte Bewältigungsstrategien zurückgreifen, um den Stress zu bewältigen. Sie greifen dabei sehr selten auf problemorientierte Bewältigungsstrategien zurück (vgl. Boyd et al., 2009, S. 197-211).

Auch die Rollenmehrdeutigkeit hat Auswirkung darauf, welche Methoden zur Bewältigung von Stress gewählt werden. Emotionsorientierte Bewältigungsstrategien werden gewählt, wenn es problematisch ist, mit der Rollenmehrdeutigkeit umzugehen und effektiv problemorientierte Bewältigungsstrategien anwenden zu können (vgl. Atteya, 2012, S. 30-51). Wenn ein Vertriebsmitarbeiter hohe Rollenmehrdeutigkeit erfährt, nutzt er weniger Strategien eine Situation aktiv zu kontrollieren (vgl. Latack, 1986, S. 377-385). Wenn die Rolle dagegen klar definiert ist, nutzen Vertriebsmitarbeiter problemorientierte Bewältigungsstrategien (vgl. Boyd et al., 2009, S. 197-211).

Auch das berufliche Umfeld kann die Wahl der Bewältigungsstrategie beeinflussen. Als Beispiel lässt sich der Vertriebsleiter nennen, der der Vorgesetzte eines Vertriebsmitarbeiters ist. Lewin und Sager (2008) zeigen in ihrer Studie, dass positive Unterstützung des Vertriebsleiters die Nutzung von problemorientierten Bewältigungsstrategien erhöht. Zudem zeigen die Ergebnisse der Studie, dass problemorientierte Bewältigungsstrategien dabei helfen, dass sich der Vertriebsmitarbeiter durch den Vorgesetzten emotional unterstützt fühlt (vgl. Lewin & Sager, 2008, S. 233-246).

Darüber hinaus ist die Jobzufriedenheit ein Einflussfaktor. Mitarbeiter, die mit ihrem Job unzufrieden sind, tendieren eher dazu, sich auf eine emotionsorientierte Bewältigungsstrategie zu verlassen, indem sie vor einer Situation flüchten (vgl. Terry et al., 1995, S. 1-24).

4.2. Auswirkung der Wahl der Bewältigungsstrategien

Aus Sicht des Unternehmens ist die generelle Bewältigungsstrategie, die ein Mitarbeiter nutzt, mehr oder weniger wünschenswert. Vertriebsmitarbeiter, die emotionsorientierte Bewältigungsstrategien nutzen, würden eher Handlungen unternehmen, um sich von dem Stress zu distanzieren. Wenn diese von Unternehmens- und Vertriebszielen differieren, ist diese Wahl der Bewältigungsstrategie aus Sicht des Unternehmens nicht wünschenswert (vgl. Strutton et al., 1995, S. 132-140). Aufgeben oder Loslösen von Unternehmenszielen würde generell das Wohlergehen der Organisation und die beruflichen Perspektiven des Einzelnen beeinträchtigen (vgl. Strutton et al., 1995, S. 132-140). Demgegenüber zielt die problemorientierte Bewältigung von Vertriebsaktivitäten direkt darauf ab, die Quelle der Belastung zu behandeln und vertritt so besser organisatorische und individuelle Interessen (vgl. Strutton & Lumpkin, 1993, S. 71-82).

Stress hat einen negativen Einfluss auf die Gesundheit eines Menschen, indem er das psychologische Wohlbefinden mindert. Problemorientierte Bewältigungsstrategien wirken dem entgegen, indem sie psychologische Symptome vermindern (vgl. Folkman et al., 1986, S. 992-1003; Terry et al., 1995, S. 1-24). Die Entscheidung für emotionsorientierte Bewältigungsstrategien, wie z.B. die Flucht vor einer stressigen Situation, verschlechtert das psychologische Wohlbefinden eines Vertriebsmitarbeiters (vgl. Terry et al., 1995, S. 1-24).

Stress beeinflusst die Gesundheit eines Menschen ebenfalls negativ, indem er emotionale Erschöpfung fördert. Es lässt sich zeigen, dass problemorientierte Bewältigungsstrategien Gefühle emotionaler Erschöpfung vermindern, im Gegensatz dazu fördern emotionsorientierte Bewältigungsstrategien die emotionale Erschöpfung eines Vertriebsmitarbeiters (vgl. Lewin & Sager, 2008, S. 233-246). Das Ergebnis, dass emotionsorientierte Bewältigungsstrategien und emotionale Erschöpfung in einem positiven Zusammenhang stehen, suggeriert, dass emotionsorientierte Bewältigungsstrategien zur Bewältigung arbeitsbedingter Stressfaktoren weitgehend uneffektiv und potenziell schädlich sind (vgl. Lewin & Sager, 2008, S. 233-246).

Zudem beeinflusst das Nutzen problemorientierter Bewältigungsstrategien den negativen Einfluss der Rollenmehrdeutigkeit und des Rollenkonflikts auf die emotionale Erschöpfung. Problemorientierte Bewältigungsstrategien können die negativen Folgen der Stressfaktoren der Rolle nicht nur vermindern, sondern komplett vermeiden (vgl. Boyd et al., 2009, S. 798-805). Wenn Vertriebsmitarbeiter allerdings auf emotionsorientierte Bewältigungsstrategien zurückgreifen, wenn sie Rollenkonflikt erfahren, führt das zu erhöhter emotionaler Erschöpfung des Mitarbeiters (vgl. Boyd et al., 2009, S. 798-805).

Bei Vertriebsmitarbeitern wird die Verwendung von emotionsorientierten Bewältigungsstrategien zu einer Abwärtsspirale führen. Das Verkaufsumfeld erfordert zunehmend einen kooperativen Beziehungsansatz, um Lösungen für Kundenprobleme zu entwickeln. Die Gefühle der emotionalen Erschöpfung werden durch das Nutzen der emotionsorientierten Bewältigungsstrategien weiter zunehmen und die Produktivität der Verkäufer verringern. Dies führt dazu, dass sich die negativen Gefühle noch verstärken, was die Leistung des Vertriebsmitarbeiters weiter verschlechtert. Im Gegensatz dazu wirken sich problemorientierte Bewältigungsstrategien positiv auf die Leistung des Vertriebsmitarbeiters aus. Sie fördern die Fähigkeit der Verkäufer, mit Kunden zusammenzuarbeiten und Lösungen zu entwickeln, um die Bedürfnisse der Kunden zu befriedigen (vgl. Lewin & Sager, 2008, S. 233-246).

Die Verkaufspräsentation eines Vertriebsmitarbeiters lässt sich teilweise durch die Wahl der generellen Bewältigungsstrategie beeinflussen. So zeigen Strutton und Lumpkin (1994), dass die Nutzung von problemorientierten Bewältigungsstrategien, wie positive Neuinterpretation und gerichtetes Problemlösen, einen positiven Einfluss auf die Wirksamkeit der Verkaufspräsentation des Vertriebsmitarbeiters hat. Das Nutzen von emotionsorientierten Bewältigungsstrategien, wie die Flucht vor einer stressigen Situation, sowie Vermeidung und Distanzierung, beeinflussen die Wirksamkeit der Verkaufspräsentation negativ (vgl. Strutton & Lumpkin, 1994, S. 28-37). Die Leistung eines Vertriebsmitarbeiters hängt somit von der Wahl der Bewältigungsstrategie ab.

Zudem erhöht die Nutzung von problemorientierte Bewältigungsstrategien die Jobzufriedenheit (vgl. Kraft et al., 2018, S. 347-359). Sie stehen in positivem Zusammenhang mit organisationalem Commitment und verringern Fluktuationsabsichten des Vertriebsmitarbeiters (vgl. Lewin & Sager, 2010, S. 355-370; Srivastava & Tang, 2015, S. 525-542).

Emotionsorientierte Bewältigungsstrategien, wie beispielsweise die Flucht vor einer stressigen Situation, senken die Jobzufriedenheit (vgl. Terry et al., 1995, S. 1-24). Das organisationale Commitment eines Mitarbeiters wird durch emotionsorientierte Bewältigungsstrategien vermindert, zudem erhöhen sie die Fluktuationsabsichten (vgl. Lewin & Sager, 2010, S. 355-370; Srivastava & Tang, 2015, S. 525-542).

Die beiden generellen Bewältigungsstrategien stehen ebenfalls in Zusammenhang. Wenn Vertriebsmitarbeiter emotionsorientierte Bewältigungsstrategien verwenden, um stressige Situation zu vermeiden, kann dies gleichzeitig die Verwendung problemorientierter Bewältigungsstrategien behindern (vgl. Folkman & Lazarus, 1985, S. 150-170). Zudem nutzen Menschen, die problemorientierte Bewältigungsstrategien zur Reduzierung von Stress wählen, keine emotionsorientierten Bewältigungsstrategien, die die stressige Situation leugnen oder ignorieren (vgl. Fleishman, 1984, S. 229-244).

Problemorientierte Bewältigungsstrategien gehen mit positiver Neuinterpretation einher. Dies reflektiert auf der einen Seite, dass positive Neuinterpretation eine mögliche problemorientierte Strategie zu Bewältigung von Stress ist. Auf der anderen Seite lässt sich dadurch ableiten, dass Menschen, die problemorientierte Bewältigungsstrategien nutzen, eine Situation im Nachhinein positiv Neubewerten (vgl. Folkman et al., 1986, S. 992-1003). Wie in Kapitel 2 beschrieben, hat diese positive Neubewertung positive Auswirkungen auf die weitere Bewältigung des Stresses, den ein Vertriebsmitarbeiter erfährt.

Abbildung 3 stellt dar, dass die Wahl der Bewältigungsstrategie sowohl durch persönliche Charaktereigenschaften als auch organisationale Einflussfaktoren beeinflusst wird.

Es ist festzuhalten, dass indirekt die persönlichen Charaktereigenschaften eines Vertriebsmitarbeiters und organisationale Faktoren des Unternehmens die Umstände beeinflussen, inwieweit der Mitarbeiter den Stress gut bewältigen kann und welche Folgen dieser Stress hat. Beispielsweise erhöht die Nutzung von emotionsorientierten Bewältigungsstrategien als Reaktion auf hohen Rollenkonflikt und als Tendenz externer Kontrollüberzeugung das Level an emotionaler Erschöpfung. Die Verwendung von problemorientierten Bewältigungsstrategien als Reaktion auf die Klarheit über Arbeitsaufgaben und hohe Selbstwirksamkeitserwartungen senkt das Level an emotionaler Erschöpfung (vgl. Boyd et al., 2009, S. 197-211).

Die Wahl der Bewältigungsstrategie hat erhebliche Auswirkungen auf den Vertriebsmitarbeiter selbst, aber auch auf das Unternehmen. Problemorientierte Bewältigungsstrategien sind emotionsorientierten Bewältigungsstrategien gegenüber von Vorteil. Sie steigern die Leistung, das Commitment und die Jobzufriedenheit eines Vertriebsmitarbeiters. Zudem begünstigen sie das psychologische Wohlbefinden. Das Nutzen von emotionsorientierten Bewältigungsstrategien bedeutet für das Unternehmen eine Abkehr von gemeinsamen Zielen, weshalb die Verwendung problemorientierter Bewältigungsstrategien gestärkt werden sollte.

5. Implikationen für Forschung und Praxis

Stress ist ein sehr komplexes Themenfeld. Im Vertriebskontext lässt sich zeigen, dass Vertriebsmitarbeiter durch ihre Boundary-Spanning-Position, in der sie zwischen dem Unternehmen auf der einen und den Kundenanforderungen auf der anderen Seite vermitteln, ein hohes Ausmaß an Stress erfahren. Als wichtigster Auslöser von Stress lässt sich der Rollenstress eines Vertriebsmitarbeiters nennen. Dazu gehören vor allem die Rollenmehrdeutigkeit und der Rollenkonflikt. Diese haben negative Auswirkungen auf den Mitarbeiter selbst, indem sie emotionale Erschöpfung fördern, und negative Auswirkungen auf das Unternehmen, da sie Jobzufriedenheit mindern und zu Fluktuationsabsichten führen. Im Vertrieb lässt sich dieser Stress aufgrund der besonderen Position der Mitarbeiter kaum mindern, er führt zu hohen Fluktuationszahlen in den Unternehmen. Somit ist es bedeutsam herauszustellen, inwiefern die Vertriebsmitarbeiter den Stress bewältigen können. Grundlage dazu bietet das Transaktionale Stressmodell von Lazarus. Dieses bietet einen Ansatz zum Verständnis, warum Menschen unterschiedlich auf Stress reagieren, indem es die zwei wichtigen Komponenten des Stressprozesses aufzeigt: Die Bewertung und die Bewältigung. Die Reaktion auf eine stressige Situation hängt von der Bewertung dieser ab. Bewertung und Bewältigung bedingen sich gegenseitig und sorgen im Zusammenspiel dafür, inwiefern Stress bewältigt werden kann.

Die Literatur zeigt zwei generelle Bewältigungsstrategien: Die problemorientierte Bewältigungsstrategie, die beinhaltet, wie man aktiv ein Problem lösen kann, dem der Stress zugrunde liegt. Die zweite Strategie ist die emotionsorientierte Bewältigungsstrategien, die die Regulierung stressiger Emotionen und Distanzierung von dem Problem beinhaltet. In der Literatur lassen sich ebenfalls verschiedene Einflussfaktoren auf die Wahl der Bewältigungsstrategie finden. So zeigt sich, dass optimistische Vertriebsmitarbeiter und die, die eine hohe Selbstwirksamkeitserwartung und interne Kontrollüberzeugung haben, eher auf problemorientierte Bewältigungsstrategien zurückgreifen. Wichtig ist die Überzeugung, ob man eine Situation verändern kann. Wenn man die Auffassung hat, eine Situation nicht mehr ändern zu können, greift man eher auf emotionsorientierte Bewältigungsstrategien zurück. Studien haben gezeigt, dass problemorientierte Bewältigungsstrategien zu präferieren sind, da sie beispielsweise einen positiven Einfluss auf die Leistung haben und Mitarbeiter sich mit emotionsorientierten Bewältigungsstrategien eher von Unternehmenszielen distanzieren. Emotionsorientierte Bewältigungsstrategien gelten im Gegensatz zu problemorientierten Bewältigungsstrategien als unwirksam, stressige Situationen bewältigen zu können. Deshalb ist es wichtig, inwiefern man das Nutzen von problemorientierten Bewältigungsstrategien verstärken kann.

In der Literatur lässt sich finden, dass der Rollenkonflikt und auch die Rollenmehrdeutigkeit zu den wichtigsten Auslösern von Stress zählen. Zudem zeigt sich, dass der Rollenkonflikt die Nutzung von emotionsorientierten Bewältigungsstrategien verstärkt. Um das Nutzen von problemorientierten Bewältigungsstrategien zu fördern, sollte das Unternehmen den Rollenkonflikt mindern und die Rolle klarer erscheinen lassen (vgl. Boyd et al., 2009, S. 197-211). Erfolgreiche Verkaufsmentoren als Vorbilder und die Zuweisung von anfänglichen Arbeitsaufgaben, die die Erfolgswahrscheinlichkeit erhöhen, können zu mehr Klarheit der Rolle und letztendlich zu einer stärkeren Abhängigkeit von problemorientierten Bewältigungsstrategien führen (vgl. Lewin & Sager, 2010, S. 355-370).

Persönliche Charaktereigenschaften von Vertriebsmitarbeitern sind wichtig (vgl. Strutton et al., 1995, S. 132-140). Für Unternehmen ist es auf der einen Seite von Bedeutung, die richtigen Menschen als Vertriebsmitarbeiter einzustellen. Dies könnten sie beispielsweise durch einen Zettel- und

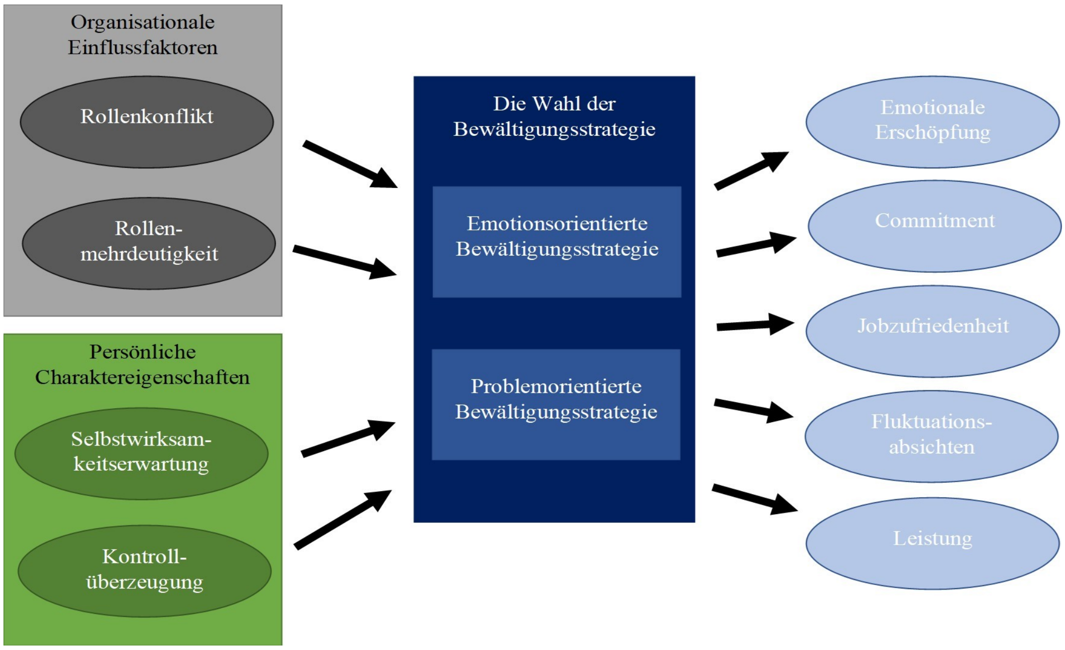

Abbildung 3: Die Wahl der Bewältigungsstrategie in Anlehnung an (Boyd et al., 2009)

Papier-Test herausfinden, indem sie gezielte psychologische Fragen zu Verhaltensweisen einer Person in bestimmten Situationen erfragen (vgl. Strutton et al., 1995, S. 132-140). Durch diese gezielten Fragen können persönliche Charaktereigenschaften der Bewerber erkannt werden, wie z.B. die Selbstwirksamkeitserwartung oder auch die Kontrollüberzeugung (vgl. Strutton et al., 1995, S. 132-140).

Auf der anderen Seite ist es bedeutsam, dass Mitarbeiter aktiv ihre Eigenschaften fördern, die in der Verkaufssituation hilfreich sein können. Die Selbstwirksamkeitserwartung zeigt sich als wichtige Charaktereigenschaft für die Wahl der Bewältigungsstrategie. Neu eingestellten Vertriebsmitarbeitern könnte eine anfängliche Aufgabenzuteilung und eine daraus resultierende erhöhte Erfolgswahrscheinlichkeit helfen, die Selbstwirksamkeitserwartung zu steigern (vgl. Lewin & Sager, 2010, S. 355-370). Des Weiteren kann die Selbstwirksamkeitserwartung der Vertriebsmitarbeiter durch Trainingsmaßnahmen gestärkt werden, indem Verkaufstechniken verbessert werden und ein breiteres Fachwissen über Produkte sowie Dienstleistungen vermittelt wird (vgl. Boyd et al., 2009, S. 197 211). Zudem können zwischenmenschliche Fähigkeiten gestärkt werden, die dabei helfen sollen, besser auf Kundenwünsche eingehen zu können. Dies kann ein wichtiger Schritt zur Verbesserung des Selbstvertrauens eines Vertriebsmitarbeiters darstellen.

Trainieren der Selbstwirksamkeitserwartung und ein erhöhtes Selbstvertrauen kann eine wichtige Ausgangsbasis dafür sein, dass Vertriebsmitarbeiter optimistischer sind (vgl. Strutton & Lumpkin, 1993, S. 71-82). Dies ist, wie im vorherigen Kapitel gezeigt, eine wichtige Eigenschaft für die Wahl von problemorientierten Bewältigungsstrategien.

Strategien zur Förderung der internen Kontrollüberzeugung kann ein Gespräch zwischen dem Vertriebsleiter und Vertriebsmitarbeiter darstellen. In diesem wird gemeinsam beurteilt, was der jeweilige Vertriebsmitarbeiter erwartet, was er leistet, was im Gegenzug von ihm erwartet wird und welche Ressourcen dem Mitarbeiter bei der Erfüllung seiner Aufgaben zur Verfügung stehen (vgl. Lewin & Sager, 2010, S. 355-370). Feedback und Trainingsmaßnahmen können Vertriebsmitarbeiter dazu ermutigen, Verantwortung sowohl für Erfolge als auch Misserfolge zu übernehmen, die interne Kontrollüberzeugung wird dadurch gestärkt (vgl. Boyd et al., 2009, S. 197-211).

Zudem können gezielt problemorientierte Bewältigungsmaßnahmen geschult werden, sodass sich Vertriebsmitarbeiter in einer stressigen Situation eher darauf konzentrieren werden, das Problem gezielt zu überwinden, anstatt sich auf Emotionen zu konzentrieren (vgl. Strutton & Lumpkin, 1993, S. 71-82).

In zukünftigen Studien kann es wichtig sein, herauszufinden, inwiefern die spezifische Situation, in der sich ein Vertriebsmitarbeiter befindet, die Wahl der Bewältigungsstrategie beeinflusst (vgl. Strutton & Lumpkin, 1993, S. 71-82). Dieses Verständnis ist wichtig, um Situationen vermeiden zu können, in denen Vertriebsmitarbeiter nur die Möglichkeit sehen, emotionsorientierte Bewältigungsstrategien zu nutzen.

Eine weitere wichtige Komponente, die Auswirkung auf die Wahl der Bewältigungsstrategie, so auch auf die Leistungsfähigkeit des Vertriebsmitarbeiters und den Erfolg des Unternehmens hat, könnte das Umfeld der Arbeit sein. Studien könnten untersuchen, inwiefern Kollegen und das Betriebsklima den Vertriebsmitarbeiter beeinflussen, aktiv das Problem, das den Stress begründet, anzugehen oder sich von Emotionen leiten zu lassen.

Zukünftige Forschung sollte sich damit befassen, welche Auswirkungen die unterschiedlichen Bewältigungsstrategien auf die mentale und physische Gesundheit eines Vertriebsmitarbeiters hat. Forschung dazu existiert nur in geringem Maße und bezieht sich nicht auf den Vertriebskontext. Zudem könnte untersucht werden, inwiefern sich die Wahl der Bewältigungsstrategie auf den Umsatz des Unternehmens auswirkt (vgl. Strutton & Lumpkin, 1993, S. 71-82).

In der Forschung wurden vor allem der Rollenkonflikt und die Rollenmehrdeutigkeit als Auslöser von Stress im Vertriebskontext genannt. Die Forschung zeigt, inwiefern diese beiden Stressfaktoren zu negativen Auswirkungen führen, indem sie beispielsweise die Jobzufriedenheit eines Vertriebsmitarbeiters vermindern oder die emotionale Erschöpfung fördern, was schlussendlich zu Fluktuationsabsichten eines Vertriebsmitarbeiters führt. In der Zukunft wäre es ebenfalls interessant zu beleuchten, ob es noch andere Stressfaktoren gibt und welche Auswirkungen diese Faktoren haben. Dabei lässt sich zum Beispiel Verdienstunsicherheit aufgrund von Provisionszahlungen nennen.

Diese Arbeit zeigt, dass das Thema Stress im Vertrieb sehr relevant ist und die Bewältigungsstrategien ein zentraler Aspekt für den Umgang mit Stress darstellen. Weitere Forschung ist wichtig, um die Stresssituationen von Vertriebsmitarbeitern noch besser verstehen und die Nutzung der Bewältigungsstrategien optimieren zu können.

Literaturtabelle			
Autor(en) / Jahr	**Titel**	**Journal**	**Zentrale Ergebnisse**
Atteya, Nermine Magdy (2012)	Role Stress Measure, Methods of Coping with Stress, and Job Performance: An Exploratory Study	Journal of Organizational Psychology	Die Rollenmehrdeutigkeit hat einen negativen Einfluss auf die Jobleistung. Wenn die Rollenmehrdeutigkeit höher ist, nutzen Menschen eher emotionsorientierte Bewältigungsstrategien.
Babakus, Emin; Cravens, David W.; Moncrief, William C. (1999)	The Role of Emotional Exhaustion in Sales Force Attitude and Behavior Relationships	Journal of the Academy of Marketing Science	Rollenmehrdeutigkeit erhöht den Rollenkonflikt. Rollenmehrdeutigkeit und Rollenkonflikt erhöhen die emotionale Erschöpfung. Emotionale Erschöpfung hat negative Auswirkungen auf die Jobzufriedenheit, die Leistung und das organisationales Commitment. Eine verminderte Jobzufriedenheit und vermindertes Commitment führen zu erhöhten Fluktuationsabsichten. Die Rollenmehrdeutigkeit mindert die Leistung, der Rollenkonflikt erhöht sie.
Behrman, Douglas N.; Perreault, William D. Jr. (1984)	A Role Stress Model of the Performance and Satisfaction of Industrial Salespersons	Journal of Marketing	Die Rollenmehrdeutigkeit steht in negativem Zusammenhang mit Jobzufriedenheit und Leistung. Der Rollenkonflikt vermindert die Jobzufriedenheit, steht aber in positivem Zusammenhang mit der Leistung.
Boyd, Nancy G.; Lewin, Jeffrey E.; Sager, Jeffrey K. (2009)	A Model of Stress and Coping and their Influence on Individual and Organizational Outcomes	Journal of Vocational Behavior	Problemorientierte Bewältigungsstrategien sind effektiv, um Rollenstress zu bewältigen, indem sie den Einfluss von Rollenstress auf emotionale Erschöpfung mindern. Die Selbstwirksamkeitserwartung hat einen positiven Einfluss auf das Nutzen problemorientierter Bewältigungsstrategie. Eine externe Kontrollüberzeugung geht mit Nutzung emotionsorientierter Bewältigungsstrategien einher.
Brown, Steven P.; Peterson, Robert A. (1993)	Antecedents and Consequences of Salesperson Job Satisfaction: Meta-Analysis and Assessment of Causal Effects	Journal of Marketing Research	Der Rollenkonflikt vermindert das organisationale Commitment. Die Rollenmehrdeutigkeit hat einen direkten negativen Einfluss auf Fluktuationsabsichten. Beide Stressfaktoren haben den größten negativen Einfluss auf die Jobzufriedenheit. Die Rollenmehrdeutigkeit vermindert die Leistung.
Carver, Charles; Scheier, Michael F.; Weintraub, Jagdish Kumari (1989)	Assessing Coping Strategies: A Theoretically Based Approach	Journal of Personality and Social Psychology	Aktives Bewältigen steht in positivem Zusammenhang mit Optimismus, dem Gefühl, generell fähig zu sein, die Situation zu verändern, Selbstachtung und Widerstandsfähigkeit. Aktives Bewältigen vermindert Angst vor negativen Ergebnissen. Positive Neuinterpretation geht ebenfalls positiv mit Optimismus und der Überzeugung einher, Kontrolle über eine Situation zu haben, Fokussieren auf Emotionen und mentale Loslösung dagegen negativ.

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Autor(en) / Jahr	Titel	Journal	Zentrale Ergebnisse
Dubinsky, Alan J.; Dougherty, Thomas W.; Wunder, R. Stephen (1990)	Influence of role stress on turnover of sales personnel and sales managers	International Journal of Research in Marketing	Die Rollenmehrdeutigkeit, der Rollenkonflikt und die Rollenüberlastung vermindern Jobzufriedenheit. Die Jobzufriedenheit hat einen negativen Einfluss darauf, kündigen zu wollen. Dies steht positiv in Zusammenhang mit Fluktuationsabsichten. Um Fluktuationsabsichten zu mindern, sollte man die Rollenmehrdeutigkeit, den Rollenkonflikt und die Rollenüberlastung mindern.
Fleishman, Susan (1984)	Personality Characteristics and Coping Patterns	Journal of Health and Social Behavior	In jedem Rollenbereich (Arbeit, Finanzen, Eltern, Ehe) stehen die Bewältigungsstrategien nicht stark in Zusammenhang. Es lässt sich aber beispielsweise finden, dass problemorientierte Bewältigungsstrategien nicht zusammen mit Verleugnung oder Ignorieren der Situation genutzt werden. Persönliche Charaktereigenschaften, wie z.B. Selbstachtung oder Selbstverleugnung haben Einfluss auf die Wahl der Bewältigungsstrategie. Beispielsweise nutzen Menschen mit Selbstleugnung eher emotionsorientierte Bewältigungsstrategien.
Folkman, Susan (1984)	Personal Control and Stress and Coping Processes: A Theoretical Analysis	Journal of Personality and Social Psychology	Es gibt zwei generelle Bewältigungsstrategien: problemorientiert und emotionsorientiert, die sich qualitativ voneinander unterscheiden. Generelle Kontrollüberzeugungen und der Grad, indem jemand Kontrolle über eine Situation hat, können sich auf die Art der Bewertung und Bewältigung auswirken. Zudem kann die Kontrollüberzeugung durch die Stresssituation beeinflusst werden. Dies sollte in Studien untersucht werden.
Folkman, Susan; Lazarus, Richard S.; Dunkel-Schetter, Christine; Delongis, Anita; Gruen, Rand J. (1986)	Dynamics of a Stressful Encounter: Cognitive Appraisal, Coping and Encounter Outcomes	Journal of Personality and Social Psychology	Bewältigung ist abhängig davon, wie eine stressige Situation bewertet wird. Befriedigende Ergebnisse gab es bei Nutzung von gerichtetem Problemlösen und positiver Neubewertung, unbefriedigende Ergebnisse bei Nutzung von Distanzierung oder konfrontativer Bewältigung. Problemorientierte Bewältigungsstrategien werden gewählt, wenn eine Situation als kontrollierbar bewertet wird, emotionsorientierte Bewältigungsstrategien, wenn keine Möglichkeit gesehen wird, das Ergebnis zu verändern.
Folkman, Susan; Lazarus, Richard S.; Gruen, Rand J.; Delongis, Anita (1986)	Appraisal, Coping, Health Status, and Psychological Symptoms	Journal of Personality and Social Psychology	Je mehr für das Individuum auf dem Spiel steht und je mehr es Bewältigungsstrategien nutzt, desto schlechter war der Gesundheitszustand. Bewertung und Bewältigung haben eine Beziehung zu psychologischen Symptomen. Direktes Problemlösen als problemorientierte Bewältigungsstrategie vermindert psychologische Symptome, konfrontatives Bewältigen erhöht sie.

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Autor(en) / Jahr	Titel	Journal	Zentrale Ergebnisse
Folkman, Susan; Lazarus, Richard S. (1980)	An Analysis of Coping in a Middle-Aged Community Sample	Journal of Health and Social Behavior	Der Bewältigungsprozess umfasst sowohl problemorientierte als auch emotionsorientierte Bewältigungsstrategien. Im Arbeitskontext wurden mehr problemorientierte Bewältigungsstrategien genutzt, emotionsorientierte eher im Bezug auf die Gesundheit. Bewältigungsstrategien werden auf Grundlage der Bewertung gewählt. In Situationen, die als Bedrohung oder Schädigung bewertet werden, werden eher emotionsorientierte Bewältigungsstrategien genutzt. In Situationen, die als veränderbar bewertet werden, werden eher problemorientierte Bewältigungsstrategien genutzt.
Folkman, Susan; Lazarus, Richard S. (1985)	If It Changes It Must Be A Process: Study of Emotion and Coping During Three Stages of a College Examination	Journal of Personality and Social Psychology	Menschen bewältigen Stress in einem komplexen Prozess, in dem sie problem- und emotionsorientierte Bewältigungsstrategien nutzen. In jeder Phase einer stressigen Begegnung gibt es erhebliche individuelle Unterschiede in der Emotion, die im Großen und Ganzen individuelle Unterschiede in der kognitiven Einschätzung und Bewältigung widerspiegeln.
Jones, Eli; Chonko, Lawrance; Rangarajan, Deva; Roberts, James (2007)	The role of overload on job attitudes, turnover intentions and salesperson performance	Journal of Business Research	Die Rollenüberlastung hat einen negativen Einfluss auf die Jobzufriedenheit und das organisationale Commitment. Die Rollenüberlastung führt zu Fluktuationsabsichten. Die Jobzufriedenheit und das Commitment vermindern Fluktuationsabsichten.
Kelloway, E. Kevin; Barling, Julian (1991)	Job characteristics, role stress and mental health	Journal of Occupational Psychology	Allgemeine mentale Gesundheit ist abhängig von arbeitsbezogener mentaler Gesundheit, wie z.B. emotionaler Erschöpfung, Jobzufriedenheit und Depersonalisierung. Der Rollenkonflikt und die Rollenmehrdeutigkeit beeinflussen emotionale Erschöpfung, Jobzufriedenheit und Depersonalisierung, die wiederum die allgemeine mentale Gesundheit beeinflussen.
Kraft, Frederic B.; Maity, Devdeep; Porter, Stephen (2018)	The Salesperson Wellness Lifestyle, Coping with Stress and the Reduction of Turnover	Journal of Business & Industrial Marketing	Die Ressourcen, die durch einen Wellness-Lebensstil bereitgestellt werden, verbessern die Fähigkeit problemorientierte und zeitorientierte Bewältigungsstrategien benutzen zu können
Janina C. Latack (1986)	Coping With Job Stress: Measures and Future Directions for Scale Development	Journal of Applied Psychology	In Situationen mit hoher Rollenmehrdeutigkeit nutzen Individuen weniger Kontrollstrategien. Soziale Unterstützung geht eher mit einer Kontrollstrategie als einer Fluchtstrategie einher. Eine Kontrollstrategie ist negativ in Zusammenhang mit Angst und Fluktuationsabsichten und positiv mit Jobzufriedenheit. Die Fluchtstrategie steht in positivem Zusammenhang mit psychosomatischen Symptomen.

(Continued)

Autor(en) / Jahr	Titel	Journal	Zentrale Ergebnisse
Lewin, Jeffrey E.; Sager, Jeffrey K. (2009)	An investigation of the influence of coping resources in salespersons' emotional exhaustion	Industrial Marketing Management	Ein höheres Level an Rollenkonflikt und Rollenmehrdeutigkeit führt zu einem höheren Level an emotionaler Erschöpfung. Die Nutzung problemorientierter Bewältigungsstrategien verringert den negativen Einfluss des Rollenkonflikts und der Rollenmehrdeutigkeit auf die emotionale Erschöpfung. Emotionsorientierte Bewältigungsstrategien erhöhen den negativen Einfluss des Rollenkonflikts auf die emotionale Erschöpfung, senken allerdings den Einfluss der Rollenmehrdeutigkeit auf die emotionale Erschöpfung.
Lewin, Jeffrey E.; Sager, Jeffrey K. (2008)	Salesperson Burnout: A Test of the Coping-Mediational Model of Social Support	Journal of Personal Selling & Sales Management	Die Unterstützung von Vertriebsleitern fördert die Nutzung von problemorientierten Bewältigungsstrategien, was die emotionale Erschöpfung von Vertriebsmitarbeitern senkt.
Lewin, Jeffrey E.; Sager, Jeffrey K. (2010)	The Influence of Personal Characteristics and Coping Strategies on Salespersons' Turnover Intentions	Journal of Personal Selling & Sales Management	Die Selbstwirksamkeitserwartung kombiniert mit problemorientierten Bewältigungsstrategien reduziert Fluktuationsabsichten. Eine externe Kontrollüberzeugung kombiniert mit emotionsorientierten Bewältigungsstrategien erhöht Fluktuationsabsichten von Vertriebsmitarbeitern.
Lysonski, Steven J.; Johnson, Eugene M. (1983)	The Sales Manager As a Boundary Spanner: A Role Theory Analysis	Journal of Personal Selling & Sales Management	Der Rollenkonflikt und die Rollenmehrdeutigkeit stehen im Zusammenhang mit geringer Jobzufriedenheit, hoher arbeitsbezogener Anspannung, geringer wahrgenommener Leistung und Fluktuationsabsichten.
Moncrief, William C.; Babakus, Emin; Cravens, David C.; Johnston, Mark (1997)	Examining the antecedents and consequences of salesperson job stress	European Journal of Marketing	Der Rollenkonflikt hat einen stärkeren Einfluss auf Jobstress, die Rollenmehrdeutigkeit wirkt jedoch indirekt, indem sie den Rollenkonflikt erhöht. Weniger Jobstress führt zu höherer Jobzufriedenheit und höherem Commitment. Diese beiden Faktoren vermindern Fluktuationsabsichten.
Nonis, Sarath A.; Sager, Jeffrey K. (2003)	Coping Strategy Profiles Used By Salespeople: Their Relationships With Personal Characteristics and Work Outcomes	Journal of Personal Selling & Sales Management	Vertriebsmitarbeiter lassen sich in vier Profile einteilen, im Bezug auf ihre Nutzung von problemorientierten, emotionsorientierten Bewältigungsstrategien und wie sie Zeit einteilen. Ein hoher Grad an problemorientierten Bewältigungsstrategien, ein geringer Grad an emotionsorientierten Bewältigungsstrategien und bessere Zeiteinteilung charakterisiert Vertriebsmitarbeiter, welche Stress gut bewältigen.

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Autor(en) / Jahr	Titel	Journal	Zentrale Ergebnisse
Sager, Jeffrey K. (1994)	A Structural Model Depicting Salespeople's Job Stress	Journal of the Academy of Marketing Science	Jobzufriedenheit mindert Jobstress und Fluktuationsabsichten. Jobstress führt zu erhöhten Fluktuationsabsichten, indem er organisationales Commitment vermindert. Jobzufriedenheit erhöht organisationales Commitment.
Sager, Jeffrey K.; Wilson, Phillip H. (1995)	Clarification of the Meaning of Job Stress in the Context of Sales Force Research	Journal of Personal Selling & Sales Management	Vertriebsmitarbeiter erfahren in ihrer Boundary-Spanning Position Stress. Sie haben oft wenig Kenntnisse über Rollenpartner, vor allem den Kunden und den Vertriebsleiter und müssen sich dem beidseitigen Druck widersetzen. Vertriebsmitarbeiter müssen den Stress aktiv suchen, um Kontakt zu Kunden aufrechtzuerhalten und Ziele im Job zu erreichen.
Scheier, Michael F. Weintraub, JagdishKumari; Carver, Charles S. (1986)	Coping With Stress: Divergent Strategies of Optimists and Pessimists	Journal of Personality and Social Psychology	Optimisten nutzen eher problemorientierte Bewältigungsstrategien. Optimismus wird mit positiver Neuinterpretation in Verbindung gebracht. Pessimisten tendieren dazu sich auf ihre Gefühle zu konzentrieren und diese herauszulassen.
Schmitz, Christian; Ganesan, Shankar (2014)	Managing Customer and Organizational Complexity in Sales Organizations	Journal of Marketing	Kunden- und Unternehmenskomplexität erhöhen den Rollenkonflikt, Kundenkomplexität die Rollenmehrdeutigkeit. Der Rollenkonflikt und die Rollenmehrdeutigkeit vermindern die Jobzufriedenheit. Die Rollenmehrdeutigkeit steht im negativen Zusammenhang mit Anstrengungen im Job.
Singh, Jagdip (1998)	Striking a balance in Boundary-Spanning Positions: An Investigation of Some Unconventional Influences of Role Stressors and Job Characteristics on Job Outcomes of Salespeople	Journal of Marketing	Stressfaktoren der Rolle haben einen negativen Einfluss auf die Jobzufriedenheit, die Leistung und das Commitment. Sie haben einen positiven Einfluss auf Anspannung und Fluktuationsabsichten. Anspannung führt zu erhöhten Fluktuationsabsichten; Leistung, Commitment und Jobzufriedenheit zu verminderten Fluktuationsabsichten. Der Rollenkonflikt erhöht die Fluktuationsabsicht. Jobcharakteristika, wie Autonomie, Feedback, Partizipation und Abwechslung der Aufgaben haben einen positiven Einfluss auf Leistung, Commitment und einen negativen Einfluss auf Anspannung und Fluktuationsabsichten.
Srivastava, Rajesh; Sager, Jeffrey K. (1999)	Influence of Personal Characteristics on Salespeople's Coping Style	Journal of Personal Selling & Sales Management	Problemorientierte Bewältigungsstrategien stehen in Zusammenhang mit persönlichen Charaktereigenschaften, wie der internen Kontrollüberzeugung und der Selbstwirksamkeitserwartung.

(Continued)

Autor(en) / Jahr	Titel	Journal	Zentrale Ergebnisse
Srivastava, Rajesh; Tang, Thomas Li-Ping (2015)	Coping Intelligence: Coping Strategies and Organizational Commitment Among Boundary Spanning Employees	Journal of Business Ethics	Problemorientierte Bewältigungsstrategien führen zu höherem organisationalem Commitment, emotionsorientierte Bewältigungsstrategien zu geringerem Commitment.
Strutton, David; Pelton, Lou E.; Lumpkin, James R. (1995)	Personality Characteristics and Salespeople's Choice of Coping Strategys	Journal of the Academy of Marketing Science	Vertriebsmitarbeiter, welche es eher mögen, herausgefordert zu werden, selbstbestimmt sind und mehr involviert sind, nutzen eher problemorientierte Bewältigungsstrategien. Vertriebsmitarbeiter, welche Veränderungen nicht mögen und stressige Situationen als unkontrollierbar bewerten, vermeiden solche Situationen.
Strutton, David; Lumpkin, James R. (1994)	Problem- and Emotion-Focused Coping Dimensions and Sales Presentation Effectiveness	Journal of the Academy of Marketing Science	Problemorientierte Bewältigungsstrategien führen zu höherer Effektivität der Verkaufspräsentation, emotionsorientierte Bewältigungsstrategien zu geringerer Effektivität.
Strutton, David; Lumpkin, James R. (1993)	The Relationship Between Optimism and Coping Styles of Salespeople	Journal of Personal Selling & Sales Management	Optimistische Vertriebsmitarbeiter nutzen eher problemorientierte Bewältigungsstrategien, pessimistische Vertriebsmitarbeiter eher emotionsorientierte Bewältigungsstrategien.
Terry, Deborah J.; Tonge, Linda, Callan, Victor J. (1995)	Employee Adjustment to Stress: The Role of Coping Resources, Situal Factors, and Coping Responses	Anxiety, Stress, and Coping	Problemorientierte Bewältigungsstrategien haben einen positiven Einfluss auf das psychologische Wohlbefinden, vor allem wenn eine Situation kontrollierbar ist. Emotionsorientierte Bewältigungsstrategien haben einen negativen Einfluss. Problemorientierten Bewältigungsstrategien erhöhen die Jobzufriedenheit, emotionsorientierte vermindern sie. Mitarbeiter mit externer Kontrollüberzeugung nutzen öfter emotionsorientierte Bewältigungsstrategien.

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The Power of Personality Traits in Allocation Decision-Making: A Secondary Analysis of a Laboratory Experiment

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Abstract

Individual differences have been addressed by many authors in social sciences, however personality has been neglected. The purpose of this thesis is to investigate the role of personality in social decision-making situations. Prior researches on the role of personality either focused on how personality influences social and economic preferences or on the link between personality and influence in social decision-making. The present thesis intends to combine these two aspects with the help of a secondary analysis of a bargaining experiment. To test personality, the Five Factor Model was included and social preferences were measured with the help of social value orientation. The findings show that two personality dimensions (Agreeableness and Conscientiousness) indicate social preferences and four personality dimensions (Agreeableness, Extraversion, Neuroticism, and Conscientiousness) influence the ability to use structural power. Furthermore, it has been found that the link of personality and bargaining behavior is moderated by social preferences. The findings of the present thesis provide various theoretical and empirical implications for personality psychology, human resource management, and organizational behavior.

Keywords: Social decision-making; fairness; personality; Five Factor Model; social value orientation.

1. Introduction

1.1. Forward to the topic

> "How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render his happiness necessary to him, though he derives nothing from it except the pleasure of seeing it" (Smith, 1976, p. 9).

Contrary to the thought of Adam Smith, traditional economic assumption of self-interest predicts that people aim for as high payoff for them as possible and do not care about others' payoff. Nevertheless, this assumption is not supported by empirical data; experimental results show that individuals do not act (completely) selfish but are ready to be fair and distribute goods in a more or less equal way. For example, in his meta-study about the dictator game, Engel (2011) found that dictators offer on average 30% of the pie. But what motivates individuals to care about others' payoff? Why are some people willing to give up some of their own payoff and act in a fair way? Why do others prefer maximizing their own payoff? A growing interest in the interface between economics and psychology, both on the theoretical and empirical level, is noticeable to answer these questions (Zhao & Smillie, 2015). Individual differences, such as risk-aversion, time preference or altruism have been measured and used by economists and are included in economic models. Nonetheless, personality traits are still neglected (Borghans, Duckworth, Heckman, & Ter Weel, 2008), although they differ from the above-mentioned parameters in terms of being provably stable during adulthood and are not situationally determined (McCrae & John, 1992). According to Borghans et al. (2008), the origin and stability of personality traits are better understood and more extensively studied than the parameters used by economists and hence, they support the use of personality traits.

Greenberg and Baron (2008, p. 141) defined individual differences as "the ways in people differ from one another". Furthermore, individuals differ in their preferred approach to solve a problem (Huitt, 1992). Economic preferences, temper, and personality are all considered individual differences and play a role in problem solving and decision-making. Many of these decision-making situations happen in social context, where social interactions cannot be avoided

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(Sanfey, 2007). According to Hutzinger (2014), not every individual has the same influence of decision outcomes; some of them are more influential than others. The ability to influence social decision-making situations can be also categorized as individual difference.

Lately, the role of personality has gained popularity in economic psychology, management studies and experimental economics (McCannon & Stevens, 2017). Studies state that measuring personality types helps explaining and predicting the outcomes of bargaining (Barry & Friedman, 1998; Boone, De Brabander, & Van Witteloostuijn, 1999; McCannon & Stevens, 2017). Rustichini, DeYoung, Anderson, and Burks (2012) showed that personality traits predict not only the outcomes of decision-making situations in laboratories but also the real-world socioeconomic outcomes. Moreover, they found that personality traits are more suitable for prediction of e.g. credit score or job persistence than economic preferences. Thus, personality traits should not be neglected but rather seen as useful tools for better understanding decision-making situations.

1.2. Purpose and relevance of the thesis

It is commonly recognized that personality matters in social decision-making. However, questions still arise about the exact impact of personality and personality traits. In current literature, two distinct directions regarding the role of personality are markable: 1) personality influences economic and social preferences (e.g. Boyce, Czajkowski, & Hanley, 2019; Hilbig, Glöckner, & Zettler, 2014; Koole, Jager, van den Berg, Vlek, & Hofstee, 2001) and 2) personality has an impact on negotiation process and outcome (e.g. Barry & Friedman, 1998; McCannon & Stevens, 2017). In my thesis, I intend to combine these two aspects of the role of personality and so, the primary research question is formulated as following:

> How and to what extent do personality traits influence allocation decisions in networks (depending on power)?

In order to answer this research question, I conduct a secondary analysis of a laboratory bargaining experiment, and personality will be included as explanatory variable. According to Zhao and Smillie (2015) bargaining games are suitable for exposing basic social preferences. In previous laboratory experiments where the link between personality traits and decision-making outcomes was examined, economic games were played with two people (e.g. Barry & Friedman, 1998; Brandstätter & Königstein, 2001; McCannon & Stevens, 2017). However, in my thesis I focus on networks of three people and the design also enables to take the role of power into consideration. Hence, my aim is to better understand how different personality traits influence social preferences and the use of structural power for achieving their preferred outcome.

As stated in Greenberg and Baron (2008), working groups have gained more popularity in every types of organizations. People in working groups often have to reach an agreement or make a common decision, however they individually differ in their preferences and abilities. Researches show that personality relates to job and team performance and thus, it should be not neglected in management studies either (Greenberg & Baron, 2008). The experimental design suits for simulating negotiation about scarce resources among people where one party has more power (principal). Thus, the thesis can provide useful insights also for human resources management.

After this Introduction, which presents the background and the relevance of the topic, the thesis is organized as following: Chapter 2 provides a comprehensive overview of theories, concepts, and empirical findings related to individual differences in social decision-making focusing on the role of personality. The research model and the hypotheses are presented in Chapter 3. Chapter 4 summarizes the research design and method. Additionally, a short review of the sample is given. The testing and detailed analysis of the data (with tables) are presented in Chapter 5. In Chapter 6 the results of the data analysis are discussed in depth, complemented with some criticism. Finally, Chapter 7 concludes the main findings of the thesis. Besides, theoretical and practical significance and implication of the thesis is discussed. Ultimately, the limitations of the study are noted.

2. Literature review

2.1. Social decision-making

Huitt (1992, p. 34) defines decision making as "a selection process where one of two or more possible solutions in chosen to reach a desired goal." Predicting the outcome of decisions-making situations is never easy due to the involved uncertainty. This uncertainty derives from the adapting behavior (people fit their behavior to the changing social environment) and from regarding what consequences these decisions have on others (Lee, 2008). Furthermore, not every individual has the ability to influence the outcome of the group decisions equally. By manipulating and misrepresenting information, people can achieve higher influence on group outcomes (Steinel & De Dreu, 2004). This chapter offers a literature overview starting with different theories of social decision-making and then focuses on individual differences in economics, psychology, and negotiation studies. Finally, the role of personality is discussed in depth and the Five Factor Model is presented.

2.1.1. Social impact theory

As a human being, we cannot be completely and perfectly independent from other human beings. We may fear some people, or admire others. Our everyday life is influenced by people around us. Latané (1981) calls this *social impact,* and concretely defines it as "changes in psychological states and subjective feelings, motives and emotions, cognitions and beliefs, values and behavior, that occur in an individual, human or animal, as a result of the real, implied, or imagined presence or action of other individuals" (Latané, 1981, p. 343).

Moreover, he provides a general theory of social impact: he identified three key variables: *strength, immediacy*, and the *number of sources*. Strength is the sum of factors (such as age, status, power) that determine how influential the source is. Under immediacy we understand the distance in space/time and the possible intervening factors. Finally, the number of sources gives the number of people involved. Three principles, based on the three key variables, shade the theory in more details; Principle 1 (*Social Forces*) says that social impact (I) is equal with the multiplicative function of the three variables. Principle 2 (*The Psychosocial Law*) declares that the first person makes greater impact than the hundredth, so a marginally decreasing effect exists. Finally, according to Principle 3 (*Multiplication Versus Division of Impact*), not only the multiplicative function of sources, but also the multiplicative function of targets has effect on the impact (Latané, 1981).

Sedikides and Jackson (1990) empirically tested the validity of Social Impact Theory. A field experiment was conducted in the Bronx Zoo, where an experimenter was dressed either as a zoo keeper or in casual dress (and thus, it is possible to control for strength since a zoo keeper has more authority and power), who asked visitors not to lean on the railing. Moreover, the size of the groups of visitors was varied (control variable for number of sources). Immediacy was also included since the behavior of visitors was measured immediately after the message and then later. Sedikides and Jackson (1990) found that people followed the rule better if it came from someone dressed as a zoo keeper, acted properly immediately after the message, and finally, fewer people in smaller groups leaned on the railing than in bigger groups. These empirical results partially support Social Impact Theory since evidence for the more complex predictions of the theory were not found (Sedikides & Jackson, 1990).

2.1.2. Social decision scheme theory

The general theory of social decision scheme proposed by Davis (1973) fundamentally addresses the following question: How do individual preferences aggregate and end in a group response (Stasser, 1999). Group decisions are characterized by the diversity in preferences among the involved people and how these diverse preferences will be recognized and included in the group outcome (Davis, 1973). Under social decision scheme Davis (1973) understands a decision rule, which rule guides the social decision-making process. Many existing groups work with formal social decision schemes, e.g. different voting rules like majority wins, other groups aim to reach consensus instead of voting rules (Davis, 1973). Davis (1973) theory works as a general group decision-making model. First, r randomly selected group members form individual preferences for a set of n mutually exclusive and exhaustive alternatives $A_1, A_2, \ldots, A_n$ (Davis, 1973). These individual preferences can be expressed by a probability distribution $p_1, p_2, \ldots, p_n$ across the alternatives (Davis, 1973). Because of the complexity of social processes such as influence, dominance, equity, etc., "group decisions are treated probabilistically" (Davis, 1973, p. 101). With other words, even when the individual preference is known, this preference will be chosen by the group only with some probability (Davis, 1973). Social decision scheme can be described as a social norm, which transforms interactions towards a group decision. Davis (1973) differentiated between social decision schemes such as "majority", "plurality', or "equiprobability". The rule of majority dictates that the majority in individual preference will determine the group response, equiprobability means that every individual preference has the same probability to be selected (Davis, 1973). It is possible to use social decision-making schemes combined (Davis, 1973).

In his original theory, Davis (1973) does not regard intermember differences; individual influence is not taken into account (every member is equally able to influence the group decision), and group members are pictured as indistinguishable and interchangeable (Kirchler & Davis, 1986). Since this initial approach could not explain every aspect of group processes and outcomes (Davis, 1973), Kirchler and Davis (1986) proposed seeing group members as distinguishable. This new approach made it possible to consider individual differences such as personality or expertise (Bonner, 2000). Moreover, not every group member influences group outcome in the same way; some of them are more influential than others (Hutzinger, 2014). Including individual ability to influence others is not the only development of the original theory: Hinsz (1999) extended the model for continuous decisions such as quantities.

2.2. Individual differences in social decision-making

People can differ in many different ways from temper to learning style. However, in social decision-making two types of individual differences are salient: social influence and social preference. As proposed by Latané (1981), not every source is equally influential. The differences in individual influence define how well people can enforce their will (based on their preferences) in groups. Regarding social preferences, as mentioned in the Introduction, based on the traditional economic theory, a self-maximizing behavior is expected (which, in this case would mean that the player in power position demands a very high payoff for him) but empirical results (e.g. Andreoni, Brown, & Vesterlund, 2002; Kahneman, Knetsch, & Thaler, 1986) do not support that people only want to maximize their profit and do not care about fairness; on the contrary, people not only want to be treated and treating others fairly but are ready to resist unfair firms, even if it costs some money. According to Rabin (1993), if the intention of an action is nice then the action itself is considered fair. On the other hand, a hostile intention is perceived as an unfair action (Rabin, 1993). Moreover, Rabin proposed the theory of reciprocity in 1993, which claims the people tend to reward fair intentions and punish unfair intentions. Fehr and Fischbacher (2002) also denies that motivation is based on only maximizing own profit and highlight the importance of social preferences in economics. Social preferences mean that people "are not solely motivated by material self-interest, but also care positively or negatively for the material payoffs of relevant reference agents" (Fehr & Fischbacher, 2002, C1). Fehr and Schmidt (1999, p. 819) modeled fairness "as self-centered inequality aversion". Under inequality aversion we understand that individuals willingly give up some of their own payoff in order to create a more equal distribution of goods since they dislike an unequal distribution (Fehr & Schmidt, 1999). However, inequality aversion can derive from egoistic intention "if people do not care per se about inequality that exists among other people but are only interested in the fairness of their own material payoff relative to the payoff of others" (Fehr & Schmidt, 1999, p. 819). Of course, altruistic behavior can be observed not only in laboratory experiments but also in real life; people donate money to charity projects, help their neighbor or old people. Rabin (1993) defines altruism as caring about the well-being of others.

2.2.1. Individual differences in economics

Social preferences are usually measured in economic games (Kainz, 2013) with the help of game theory, which is a widely used tool in different disciplines to model, among others, social decision-making situations (Camerer, 2003; Zhao & Smillie, 2015). Under economic games we understand decision-making tasks which illustrate strategic situations (Camerer, 2003; Zhao & Smillie, 2015). Economic games have clearly demonstrated that people do not act as the so-called *homo oeconomicus;* the overall rational and completely self-interested agent with perfect information. This neoclassical economic approach expects free riding and maximizing own profit. One of the most famous economic experiments is the dictator game by Güth, Schmittberger, and Schwarze (1982), which game was a pioneer in terms of contradicting the theory of exclusively self-interest man (Fehr & Schmidt, 2006). Later on, by conducting other experiments (such as Dictator Game, Gift Exchange Game or Trust Game) more and more evidence was found for the existence of *other-regarding preferences.* Other-regarding preferences mean that one's utility function counts not only on his own payoff, but also on other people's payoff (Fehr & Schmidt, 2006). Fehr and Schmidt (2006) identified three models of other-regarding preference: social preferences, interdependent preferences, and intention-based reciprocity. First, models of social preferences are based on the assumption the one's utility function depends on other's payoff in his reference group (Fehr & Schmidt, 2006). Taking social preferences into account, agents are considered rational and thus, traditional utility and game theory is applicable (Fehr & Schmidt, 2006). Models of interdependent preferences assume that people also care about the type of their partner; an originally altruistic player adapts to his selfish player and also starts acting in a self-maximizing way (Fehr & Schmidt, 2006). Finally, intention-based reciprocity models include the *intention* of players. Intention differs for the type of the player (altruistic or egoistic); intention can be kind or hostile (Fehr & Schmidt, 2006). Including intention results in more than one equilibrium and thus, the framework of psychological game theory is necessary (Fehr & Schmidt, 2006).

People do not always act in the same way. An altruistic person, who stays altruistic towards to other altruistic individuals, can become hostile towards to hostile individuals since fairness "allows" to hurt someone who does not act nicely (Rabin, 1993). Moreover, there exist evidences that people exploit their bargaining power in competitive market but not in bilateral bargaining situations (Fehr & Schmidt, 1999; Kainz, 2013) and thus, fairness is situation-dependent. Furthermore, the intention behind fairness is often ambiguous. Van Dijk, De Cremer, and Handgraaf (2004) examined the difference between self-centered and altruistic fairness and found that proself individuals often strategically use fairness in order to maximize their own payoff.

Concluded, other-regarding preferences do not explain every single aspects of social decision-making outcome. As De Dreu and Gross (2019, p. 214) write; "people systematically differ in how they self-select into, perceive, and act in particular situations". The main difference between economics and psychological approach is that psychologists focus on individual behavior and differences, meanwhile economists examine group outcomes (Kainz, 2013). As Kainz (2013, p. 32) states in his doctoral dissertation, "psychology in indispensable in order to understand economic behavior since it helps describing and explaining the behavior of the individual". Recently, use of psychology in economic in economic models has become more and more popular. Boyce et al. (2019, p. 82) commented that "simple measures of personality can help to explain economic values and choices in a systematic way". They also argued that personality can be seen as standard socio-economics variables e.g. income or education (Boyce et al., 2019).

2.2.2. Individual differences in psychology

In social psychology, fairness is closely related to altruistic, helping, and pro-social behavior, when people rather cooperate than compete (Kainz, 2013). Social psychologists provide various explanations why people go beyond self-interest: *beliefs* about others' behavior, *relationship characteristics* (e.g. trust), *social norms*, and *social value orientations* (Kainz, 2013). Out of these explanations social value orientations can be categorized as individual difference and thus, it will be discussed in depth.

Psychologists measure individual differences in social motives with the help of the scale *Social Value Orientation* (Kainz, 2013). According to Bogaert, Boone, and Declerck (2008), people systematically differ in social preferences (self-regarding versus other-regarding preferences), and differences in social motives affect valuing cooperation and cooperating behavior. Social value orientation theory enroots in the interdependence theory of Kelley and Thibaut (n.d.). In this theory, situations are examined where the outcome partially or completely depends on the action of others (Kelley & Thibaut, n.d.). The framework of SVO classifies people into types based on their social motives (Schwaninger, Neuhofer, & Kittel, 2019). In 1968, Messick and McClintock proposed three categories: prosocial (individuals care about maximizing own and others' outcome), individualistic (maximizing own outcome), and competitive (maximizing the relative difference between outcome for self and other). As stated by Bogaert et al. (2008), the category *prosocial* is sometimes divided into two sub-categories: altruistic (maximizing outcome for other) and reciprocal cooperators (only cooperate when cooperation is also returned). According to Messick and McClintock (1968), SVO is seen as a trait, which demonstrates how people vary in what they believe fair or unfair. Considering SVO as a trait means that it remains stable (Bogaert et al., 2008; Van Dijk et al., 2004), however it depends on situation and persons (Kainz, 2013). As Kainz (2013) summarized Yamagishi's findings (1995), even egoistic people cooperate if they trust others and consider the consequences of non-cooperation in the long term.

In the literature, it is commonly recognized that SVO has explanatory power on cooperative strategies, choices, and motives (Bogaert et al., 2008). According to Bogaert et al. (2008), SVO only defines the general willingness to cooperate or not to cooperate but the actual behavior is mediated by many contextual factors, such as trustworthiness. Therefore, SVO resembles to personality traits in term of not being independent from situational context.

2.2.3. Individual differences in negotiation approach

Study on negotiation is interdisciplinary and it has been strongly influenced among others by game theory and later by social psychology (L. L. Thompson, Wang, & Gunia, 2010). Negotiations occur very often both in private and business life (Kainz, 2013). When people cannot achieve their goals without cooperating with others, it is called negotiation (L. L. Thompson et al., 2010). According to L. Thompson (1990) negotiation has five characteristics: 1) negotiators are aware of an interest conflict; 2) they are able to communicate; 3) compromises are available; 4) sending offers and counteroffers is possible; 5) outcome is only determined if it was accepted by all parties. Negotiation situations can be divided into two categories based on how resources are handled; integrative and distributive bargaining (L. Thompson, 1990). The main difference between them is, that "integrative bargaining situations are non-zero-sum encounters in which there is the possibility for joint gain from the negotiation" Barry and Friedman (1998, p. 348), while in the case of distributive bargaining a fixed amount of resources must be distributed among the negotiators (Barry & Friedman, 1998). Distributive bargaining (with other words zero-sum or fixed pie) is characterized by players having a *reservation value*, which defines the smallest value one party is willing to accept Barry and Friedman (1998). Regarding the motivation of bargainers, Pruitt and Rubin (1986) proposed the so-called dual concern model, which means that bargainers are motivated by concerning their own outcome and by concerning the outcome of other parties in the negotiation (Van Dijk et al., 2004). This theory is based on two opposite motives; fairness and self-interest (Van Dijk et al., 2004). How much an individual is concerned with his own versus others' outcome varies from individual to individual.

Conventional wisdom suggests that some people naturally have better abilities to negotiate than others and are more successful. Hence, individual differences such as gender, personality, intelligence, etc. have been examined also in negotiation studies. These researches present ambiguous result; lots of them emphasize that individual differences play an important role in bargaining (e.g. Barry & Friedman, 1998; Elfenbein, Curhan, Eisenkraft, Shirako, & Baccaro, 2008; Falcão, Saraiva, Santos, & e Cunha, 2018; McCannon & Stevens, 2017), others argue that individual differences do not predict consistent prediction of bargaining behavior (e.g. L. Thompson, 1990). After many years of inconsistent results, Elfenbein (2015) conducted a meta-analysis and concluded that individual differences are indeed important predictors in negotiations and should not be neglected in future researches. Elfenbein (2015) found that the performance of negotiators stayed consequently the same from one encounter to the next, and thus, individual differences do matter.

The role of power must be mentioned in negotiation studies. Power is defined as the ability to influence other people; hence power is never an absolute value: someone's individual power can be only interpreted as a relation to another person's individual power (Anderson & Thompson, 2004). Power in negotiations can derive from different origins; Anderson and Thompson (2004) distinguish between different sources of power, such as authoritative power or when the powerful individual is in the position to hurt the other party.

2.3. The role of personality

There are some individuals who are more egoistic and others are more altruistic, some people are ready to cheat meanwhile others stay honest. It indicates introducing further explanatory factors; a plausible chose is personality. But what is personality at all? Defining personality is not an easy task; researchers from different schools have provided different definitions during the years. Cattell, who represents the trait-based approach, defines personality as "that which permits a prediction of what a person will do in a given situation" (Cattell, 1950, p. 2). The definition of behaviorist (another school in personality psychology) provides a rather spare interpretation and focuses on the behavior itself (Cloninger, 2009). Finally, the school of personological trait approach takes both personality traits and the integration of the whole person into consideration (Cloninger, 2009). The current state of art interprets personality as a "resulting pattern of habitual behaviors, cognitions, emotional patters" deriving from environmental and biological factors" (Cloninger, 2009, p. 5).

The idea of including personality as an explaining variable in economic and bargaining games is not new. Brandstätter and Königstein (2001, p. 67) stated: "... it is worthwhile to take basic personality dimensions into account if one tries to explain economic behavior in experimental games". The role of personality appears on two different levels: on the one hand, personality influences economic choices (Boyce et al., 2019), on the other hand, Barry and Friedman (1998) also emphasize the relevance of personality in order to better understand negotiation processes and outcomes. It is important to notice that personality traits cannot be considered independent from the economic environment, such as size of quantity, first-mover advantage or asymmetrical information (McCannon & Stevens, 2017). Measuring and including personality has the advantage that personality remains stable during adultness and psychologist already recognized as an effective predictor of behavior (Boyce et al., 2019). Moreover, measuring personality can be conducted in a simple way by using well-established surveys (Boyce et al., 2019).

On the level of economic and social preferences, many researches have proven that personality matters. Boone et al. (1999) concluded that personality of players in Prisoner's Dilemma clearly matters. Moreover, time preferences are affected by intelligence (which is part of the Openness dimension), and Neuroticism is related to risk preferences (Rustichini et al., 2012). Boyce et al. (2019) found that personality also shapes preferences toward status quo and sensitivity to cost. Furthermore, personality influences social relationships (Asendorpf & Wilpers, 1998) and political voting behavior (Schoen & Schumann, 2007). Hilbig et al. (2014) found that personality also indicates social preferences, such as prosocial behavior. Dohmen, Falk, Huffman, and Sunde (2008) likewise found that personality has an impact on social preferences, more concretely on trust and reciprocity. Oda et al. (2014) discovered that personality traits play a role in altruistic behavior in real life.

In negotiation studies, the influence of personality is also supported (Barry & Friedman, 1998; Elfenbein et al., 2008; McCannon & Stevens, 2017). Boyce et al. (2019, p. 201) found a "multidimensional relationship between personality and situational variables". According to McCannon and Stevens (2017, p. 1166), "personality traits of individuals contribute to the ability to predict bargaining outcome". Taking personality into account can help organizations to perform better in negotiation situation (McCannon & Stevens, 2017). Hence, personality characteristics are useful to include in frameworks (McCannon & Stevens, 2017). Deuling, Denissen, Van Zalk, Meeus, and Van Aken (2011) noticed that personality has an impact on individual influence on group decisions. However, is must be highlighted that personality itself does not define individual influence and other factors (e.g. cognitive ability, power) also play an important role (Deuling et al., 2011).

2.3.1. Big Five

One of the most widely used tool for personality measurement is the trait-based Five Factor Model from McCrae and Costa (1989). In this model, five basic dimensions have been discovered and are labeled as; Agreeableness, Extraversion, Neuroticism, Conscientiousness, and Openness. These five dimensions are now considered as a general taxonomy of personality dimensions (John, Naumann, & Soto, 2008). Every one of the dimensions stands for a continuum on which personality can be categorized (Hutzinger, 2014). Neuroticism, for example, represents a scale from being anxious, insecure, and nervous (people high in Neuroticism) to being stable and calm (people low in Neuroticism) (John et al., 2008). Nevertheless, it is important to mention that the Big Five model does not explain the sources of the five dimensions but provides a description of personality (Rustichini et al., 2012).

As McCrae (2009, p. 148) stated, the structure of the model "arises because the traits co-vary" and a consensus among researchers was achieved that these five factors suit well to cover the co-variation of most personality traits. Hence, by using the Five Factor Model it is possible to avoid overlooking important traits (McCrae, 2009). According to Zhao and Smillie (2015, p. 279), "the five broad domains of personality capture the basic structure of personality". There exists a hierarchical structure of personality traits related to Big Five; it means that each domain of the Big Five contains of various facet-level traits and every one of the domains can be divided into two separate but correlated aspects, and these aspects help predicting outcomes (Rustichini et al., 2012). Zhao and Smillie (2015) state that the aspects and facets have strong descriptive and predictive power of behavior.

Originally, psychologists applied the so-called *lexical approach* for studying personality (John et al., 2008). Using dictionaries, descriptors of people were studied and categorized. The Five Factor Model also derives from clustering descriptors and thus, the dimensions are related to various adjectives (John et al., 2008). Figure 1 illustrates which adjectives are mostly related to the five dimensions (based on John et al., 2008).

Agreeableness

Agreeableness is characterized by caring of other's feeling and needs (Zhao & Smillie, 2015). Moreover, people high in Agreeableness are predicted to be flexible, good-natured, tolerant and cooperative (Barrick & Mount, 1991). They appreciate harmony with other people around them and maintaining good relationship is important to the (De Dreu & Gross, 2019). Low level of Agreeableness can lead to conflicts between group members (Kramer, Bhave, & Johnson, 2014) and they tend to act unfriendly, uncooperative (De Dreu & Gross, 2019), and suspicious (Schoen & Schumann, 2007). Agreeableness is divided into Compassion and Politeness (Rustichini et al., 2012). Moreover, lower-level facets of Agreeableness contain altruism, modesty, tender-mindedness, compliance, straightforwardness, and trust (Zhao & Smillie, 2015).

Extraversion

Extraversion is related being talkative, sociable and outgoing (Barrick & Mount, 1991; Zhao & Smillie, 2015) and predicts success in sales and management jobs (John et al., 2008). Extraverted people get their energy from external activities/situations, enjoy being around others (De Dreu & Gross, 2019), and tend to be more active in group discussions (Littlepage, Schmidt, Whisler, & Frost, 1995). Furthermore, groups of solely extraverted people perform better at brain-

	Agreeableness	Extraversion	Neuroticism	Conscientiousness	Openness
High	sympathetic kind appreciative	talkative assertive active	tense anxious nervous	organized thorough planful	wide interests imaginative intelligent
Low	cold unfriendly quarrelsome	quiet reserved shy	stable calm contented	careless disorderly frivolous	commonplace simple shallow

Figure 1: Adjectives related to Big Five Dimensions

storming tasks (Kramer et al., 2014). According to Deuling et al. (2011), Extraversion positively relates to leadership effectiveness. Extraversion moderates the amount of time spending in social interactions and size of the peer networks (Asendorpf & Wilpers, 1998). Koole et al. (2001) found the Extraversion negatively relates to cooperation. Barry and Friedman (1998) found that Extraversion is both an asset and a liability depending the type of the negotiation. The opposite of Extraversion is Introversion, which is characterized by being reserved, cautious, and even shy (Roccas, Sagiv, Schwartz, & Knafo, 2002). The two aspects of Extraversion are Assertiveness and Enthusiasm, where Assertiveness reflects leadership, drive, and dominance and Enthusiasm reflects positive emotions and sociability (Rustichini et al., 2012).

Neuroticism

Neuroticism reflects a tendency to be anxious and easily frustrated (Kramer et al., 2014). Neuroticism is often referred as emotional instability (De Dreu & Gross, 2019) and decreases the willingness of taking risk (Rustichini et al., 2012). People with high score on Neuroticism are more likely to suffer in various psychiatric diseases (McCrae & John, 1992). Consistent differences between men and women have been shown; females achieve higher score on Neuroticism and Agreeableness than men (Deary, 2009). Generally, highly neurotic people have a stronger desire to maintain the status quo and are more loss-averse (Boyce et al., 2019). Hutzinger (2014) and Deuling et al. (2011) independently from each other found that Neuroticism negatively affects individual influence on outcomes of group decisions.

Conscientiousness

Conscientiousness is connected to being responsible, reliable (Kramer et al., 2014), organized, and resourceful (Schoen & Schumann, 2007). Low level of Conscientiousness indicates lazy, immature, and impatient behavior (Schoen & Schumann, 2007). It displays how people are able to "control, regulate, and direct their impulses" (De Dreu & Gross, 2019, p. 217). High Conscientiousness predicts good health outcomes, longevity, and higher academic grade-point averages (John et al., 2008). Moreover, it is a useful tool to predict job performance, both in individual and in group settings (Barry and Stewart, 1997). Conscientiousness is not an "intrinsically interpersonal" trait (McCrae & Costa, 1989, p. 586), but being highly conscientious predicts frequent social contact to family members under young adults (Asendorpf & Wilpers, 1998). It may come from sense of duty and because conscientious people are less like to be distracted by new relationships (Asendorpf & Wilpers, 1998). The aspects of Conscientiousness are identified as Orderliness and Industriousness (Rustichini et al., 2012).

Openness

Openness shows tolerance of diversity (Schoen & Schumann, 2007), intellectual curiosity, and vivid phantasy (Zhao & Smillie, 2015). Highly open individuals have a tendency to hold unconventional beliefs, be creative, and acknowledge arts and beauty (De Dreu & Gross, 2019). On the other hand, low level of openness indicates conventional, insensitive, and down-to-earth behavior (Roccas et al., 2002). Openness has been conceptualized into Intellect and Openness and "reflects the ability and tendency to seek, detect, comprehend, and utilize patterns of information, both sensory and abstract" (Rustichini et al., 2012, p. 3).

2.3.2. Other personality taxonomies

Although the Big Five personality test is the most used personal taxonomy, it has faced with critiques and researchers proposed other personality taxonomies too. Here, two other taxonomies are shortly presented, which also gained popularity among researchers in negotiation studies and economics.

Just like the Five Factor Model, the HEXACO model is also based on lexical approach (Zhao & Smillie, 2015). Additionally, a sixth factor (*Honesty-Humility*) was added to the original five factors (Hilbig et al., 2014). According to Ashton and Lee (2007, p. 156) "Honesty-Humility represents the tendency to be fair and genuine in dealing with others, in the sense of cooperating with others even when one might exploit them without suffering retaliation." The dimension Honesty-Humility is related to being sincere, honest, modest, and fair-minded (Ashton & Lee, 2007). Some of the characteristics of Honesty-Humility is part of the Agreeableness dimension in Five Factor Model (Hilbig et al., 2014). However, the HEXACO Agreeableness differs from the Five Factor Model Agreeableness: the HEXACO Agreeableness relates to tolerance and forgiveness rather than fairness (Ashton & Lee, 2007). FFM Agreeableness is a broader concept of prosocial behavior than HEXACO Agreeableness (Zhao & Smillie, 2015). Some researchers argue that Honesty-Humility suits better to predict giving behavior in dictator game than Five Factor Model Agreeableness (Hilbig et al., 2014). Extraversion, Conscientiousness, and Openness are similar factors in both taxonomies (Ashton & Lee, 2007). The Five Factor Model dimension, Neuroticism is called Emotionality in the HEXACO model and slightly differs from Neuroticism (Ashton & Lee, 2007). However, both concepts can help understanding how individuals behave in mixed-motive social interactions (Zhao & Smillie, 2015).

The Myers-Briggs Type Indicator, which is based on Jung's theory, was proposed by Myers, McCaulley, Quenk, and Hammer (1998) and focuses on four preference dimensions: 1) introversion- extraversion dimension (orientation of energy: inner or outer world), 2) perceiving-judging dimension (attitude towards outer world), (3) feeling-thinking dimension (judgment), and 4) sensing-intuition dimension (perception). The first dimension displays how much an individual demonstrate interest in inner or outer world (McCannon & Stevens, 2017). The second dimension represents the difference in the preferred way in decision making: by judgement or by seeking additional information and perceiving (McCannon & Stevens, 2017). The third dimension is dedicated to the preference whether a person relies on thinking or feeling when making a decision (McCannon & Stevens, 2017). The fourth dimension shows whether the perceiving is done through senses or intuition (McCannon & Stevens, 2017). MBTI gained popularity mainly in the United States of America and is widely used is consultancy (Furnham, 1996; Swope, Cadigan, Schmitt, & Shupp, 2008). McCannon and Stevens (2017, p. 1169) argued that "MBTI tools focus on the components of the decision process which makes them especially appropriate for studying game theoretic choice." Furnham (1996) examined the relationship between the Five Factor Model and the MBTI instrument and found the following correlations: Agreeableness correlates with the feeling-thinking dimension, Extraversion strongly correlates with the extraversion-introversion dimension, Conscientiousness correlates both with the thinking-feeling and the judging-perceiving dimension, Openness correlates with all of the four dimensions, and Neuroticism does not correlate with any of the dimensions in the MBTI instrument.

3. Research model, research question and hypotheses

The aim of my thesis is to examine the role of personality in social decision-making situation; more concretely, in distributive bargaining situation. In the literature, it is recognized that personality matters but there is no unity on *how* exactly it matters. On the one hand, personality traits influence perceived fairness; some people act egoistic, others behave fairly. On the other hand, personality also shapes individuals' ability to successfully achieve his will in negotiation. Hence, humans obtain a pre-negotiation preference based on their fairness attitude. According to the current state of the literature, it is acknowledged that personality has an impact on social preferences. Furthermore, it is also commonly recognized that not every individual is equally influential. Therefore, not every individual is capable to push through his pre-negotiation social preference and use structural power. Based on these findings, I propose the following research model: 1) personality as independent variable influences bargaining behavior (dependent variable) and how well an individual can push through his will, 2) personality (IV) also affects social preferences and 3) social preferences have an impact on bargaining behavior and thus, function as mediator. This research model is a combination of two, so far, distinct research paths: the relationship between personality and social preferences and the relationship between personality and bargaining behavior. In my thesis, I focus on different personality traits from the Five Factory Model and on what impact these five factors have on bargaining behavior and social preferences.

3.1. Research question

In relation to the above notion, the primary research question is the following:

- How and to what extent do personality traits influence allocation decisions in networks (depending on power)?

Moreover, I intend to answer the following sub-questions:

- Which personality traits influence social preferences?
- Is there any connection between personality traits and the tendency for using power position? Of course, by using power position I do not mean maximizing own pay-off. Some individuals prefer equal distribution and can use their power for this purpose.
- Are some personality types influenced more by time pressure? Is it visible when taking a look at the outcomes? Some people may make worse decision under pressure and cannot enforce their will.
- Who are the "tough negotiators"? By tough negotiator I mean those, who send extreme first offers in order to use first-mover advantage.

After answering all these questions, I expect to obtain an overview of the topic and additionally, unfold some hidden interdependencies. Combining the two aspects of the role of personality may provide additional and new insight about mixed-motive social decision-making situations.

3.2. Hypotheses

Agreeableness and Extraversion are the two most significant dimensions to interpersonal behavior (Zhao & Smillie, 2015), which means that highly altruistic and extravert individuals care a lot about social relationships. Intuitively,

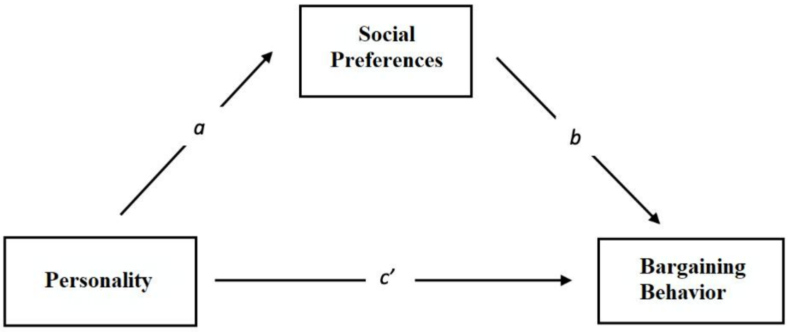

Figure 2: Research model

Agreeableness seems to be the most relevant factor for bargaining outcomes. Empirical evidences also support the Agreeableness is linked to prosocial and altruistic behavior (Baumert, Schlösser & Schmitt, 2014). Roccas et al. (2002) linked altruism with conformity values and argued that highly agreeable people do not want to violate norms. According to Zhao and Smillie (2015), Agreeableness is linked to sending equal offers. Barry and Friedman (1998) found that Agreeableness is a liability in distributive bargaining situations since highly agreeable humans lack the necessary pursuit of self-interest. Moreover, individuals with high score on the Agreeableness scale are more likely to be anchored by extreme first offers (Barry & Friedman, 1998). Regarding the research model it is expected that Agreeableness influences both social preferences and bargaining behavior.

- **H1:** *Highly agreeable individuals tend to use their structural power to achieve an equal bargaining outcome.*

Extraversion is related to being assertive (Rustichini et al., 2012), and extraverts have higher influence on group outcome than introverts (Hutzinger, 2014). Thus, a more active participation from extraverts is expected. This active and information sharing behavior can be advantageous in integrative but not in distributive bargaining situations (Barry & Friedman, 1998). According to Sharma, Bottom, and Elfenbein (2013), extraverts tend to reveal more information about their preferences, which can be disadvantageous. Moreover, it is expected that extraverted people tend to fell for anchoring because "anchoring is more likely to occur when bargainers are highly concerned with the development and maintenance of social ties" (Barry & Friedman, 1998, p. 347). In the literature, there is no evidence that Extraversion affects social preferences, so only an impact of bargaining behavior is expected.

- **H2:** *Extraverts are more likely to send first offers than introverts.*

The other three traits (Conscientiousness, Neuroticism, Openness) are not directly linked with interpersonal behavior, but they influence social decision makings on the periphery and their effects depend on the setting (Zhao & Smillie, 2015). As mentioned earlier, Neuroticism relates to risk attitude (Rustichini et al., 2012), but there is no evidence that it also relates to fairness. Based on the current literature, Neuroticism does not predict social preferences. Elfenbein (2015) argued that the traits themselves do not directly influence bargaining performance, but rather they determine how negotiators feel. At the end, how well the negotiators feel will define performance (Elfenbein, 2015). It is expected that highly neurotic people will suffer under time pressure and thus, will perform more poorly and will not be able to enforce their will despite the power position.

- **H3:** *Highly neurotic individuals earn less than lowly neurotic individuals.*

Highly conscientious individuals like order and prefer avoiding uncertainty (Schoen & Schumann, 2007). With other words, a certain level of norm conformity is expected and thus, people who score high on Conscientiousness will not demand a high amount for themselves. Rather, they adapt to social norms, even when being in power position. Also, highly conscientious individuals are able to plan ahead and this pre-negotiation planning and analysis benefits them (Barry & Friedman, 1998), they will not use their power in a self-maximizing way. Previous findings about Conscientiousness only refer to influence on bargaining behavior but not on social preferences.

- **H4:** *Highly conscientious individuals tend to use structural power to achieve a more equal distribution.*

High Openness predicts great flexibility and divergent thinking, which can be beneficial mostly in integrative situations (Sharma et al., 2013). Oda et al. (2014) found that Openness predicts altruistic behavior towards strangers without expecting reciprocity. Some papers also discovered cooperative behavior of highly open people (Zhao & Smillie, 2015). Boyce et al. (2019) concluded that those who scored high on Openness deviate more easily from the status quo.

- **H5:** *Highly open individuals are more likely to include the third network member than less open individuals.*

4. Design & methods

4.1. Research properties

As mentioned in the Introduction, this thesis is a secondary analysis, which means that the experiment was originally designed to answer another research question. However, the design enables to examine the role of personality depending on power since a personality test was included in the questionnaire. Secondary analysis means using secondary data. Hox and Boeije (2005, p. 593) define secondary data as "data originally collected for a different purpose and reused for another research question." Using secondary data has the following advantages; it is less costly and time-consuming that collecting primary data (Hox & Boeije, 2005). Nevertheless, since the data was originally collected for a different purpose, secondary data is not always optimal and does not perfectly fit to the new research question (Hox & Boeije, 2005). As pointed out earlier, a laboratory experiment was conducted to obtain the primary data (Schwaninger et al., 2019). Experiments allow strong control over the design, the procedure, and the whole situation (Falk & Heckman, 2009; Hox & Boeije, 2005). Thus, casual interpretation of results is permitted, which leads to strong internal validity (Hox & Boeije, 2005). Moreover, the level of control provided by laboratory experiments is hard to reproduce in natural occurring settings (Falk & Heckman, 2009). Nonetheless, laboratory experiments create artificial environment and thus, generalizability of laboratory experiments is not always the most persuasive (Hox & Boeije, 2005).

4.2. Design

A two factorial design was created, where a between-subject design was applied regarding the network structure and a within-subject design was applied regarding the exchange mode (Schwaninger et al., 2019).

As figure 3 shows, subjects negotiated in three-nodes networks. Two different power structure was designed: *triangle* and *three-line network* (Schwaninger et al., 2019). In *triangle* network, all three subjects are connected with each other, which results in an equal structural power distribution. *Three-line network* means that there is one central subject and two on the periphery. The central subject has structural advantage since the two peripheral subjects have to compete with each other in order to agree with the central subject (Schwaninger et al., 2019). Networks are negatively connected; thus, each subject is allowed to exchange with no more than one subject at a time (Schwaninger et al., 2019). As a result, one subject in a three-node network is excluded from the exchange. In *exclusive exchange*, also an exclusion from any payoff is implied (Schwaninger et al., 2019), which means that the excluded party will receive zero payoff. However, in *inclusive exchange*, the third party *can* be included (Schwaninger et al., 2019). With other words, the exchanging dyads have the possibility to allocate some payoff to the third subject, who does not participate in the exchange.

The experiment was conducted at the Vienna Center for Experimental Economics in April 2016 and March 2018 (Schwaninger et al., 2019) and was programmed in zTree (Fischbacher, 2007). Participants were recruited with the help of ORSEE (Greiner, 2004). Upon arrival, subjects were randomly assigned to their cubicles in the laboratory and stayed anonymous during the whole session (Schwaninger et al., 2019).

First, subjects completed an SVO slider task, which was served as a proxy for fairness preferences (Schwaninger et al., 2019). SVO slider task was incentivized and ordered an SVO score to each subject and based on this score, subject could be categorized (i.e. prosocial or proself) (Schwaninger et al., 2019). After completing the first part (SVO and risk aversion measurement), participants were assigned either to a *three-line* or a *triangle network* depending on the treatment, which stayed constant during the whole session and varied between subjects (Schwaninger et al., 2019). According to the restrictions of structure and exchange mode, subjects had to allocate 24 points within the networks of three and played 10 rounds (Schwaninger et al., 2019). As mentioned earlier, the network structure determined whether someone in the network had structural power, and the exchange mode imposed if the excluded party was allowed to receive some share (*inclusive treatment* if yes, *exclusive treatment* if no). Both *inclusive* and *exclusive treatment* were played five consecutive times (thus, within-subjects design), and half of the time the experiment started with *inclusive treatment,* and in the other half of the session *exclusive treatment* came first (Schwaninger et al., 2019). In every round, agreements must have been achieved in three minutes, otherwise every member within the network would have got zero points (Schwaninger et al., 2019). At the end, one round of ten was randomly selected to be relevant for pay-off.

At the end of the experiment, subjects completed the Big Five 30 item personality inventory (Schwaninger et al., 2019). This short scale contains 15 items and was developed as part of the SOEP and is based on the Big Five Inventory by John, Donahue, and Kentle (1991) (Schupp & Gerlitz, 2008). Every personality factor was represented by three questions on a scale from one to seven, where one meaning "does not apply at all" and seven meaning "does apply fully". Participants also filled out a socio-demographic survey and finally, they were paid in Euros individually in private by labor assistants (Schwaninger et al., 2019). For a more detailed description of the experiment see Schwaninger et al. (2019).

4.3. Sample

Overall, 12 sessions with 27 subjects were run and a total of 324 individuals participated (Schwaninger et al., 2019).

Triangle treatment: 162 subjects (50%) participated in the triangle treatment and 67 (41,36%) were male and 95 (58,64%) female. The mean of the age was 22,96 (∼23) years, the youngest participant 18 and the oldest 40 years

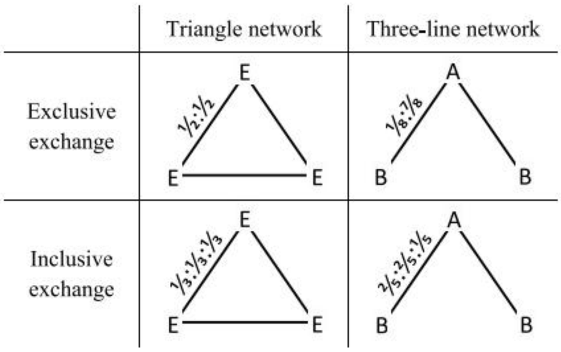

Figure 3: Two-factorial design (Schwaninger et al., 2019)

old. 93% of the subjects were younger than 30 years old. 28 subjects studied natural sciences (17,28%), 11 (6,79%) medical sciences, 25 (15,43%) business or economics, 19 (11,73%) technical studies, 32 (19,75%) human sciences, 45 (27,78%) social sciences, and 2 (1,23%) did not give any field of study. 115 (70,99%) subjects were from German-speaking countries (Austria, Germany, Switzerland) and 47 (29,01%) from non-German-speaking countries. Even participants from non-German-speaking countries stated that they have good German knowledge and with the help of control questions, it was verified that subjects understood the instructions.

Three-line treatment: 162 subjects (50%) participated in the three-line treatment and 69 (42,59%) were male and 93 (57,41%) female. The mean of the age was 24,35 years, the youngest participant 18 and the oldest 57 years old. 92% of the subjects were younger than 30 years old. 17 subjects studied natural sciences (10,49%), 10 (6,17%) medical sciences, 20 (12,35%) business or economics, 24 (14,81%) technical studies, 45 (27,78%) human sciences, 44 (27,16%) social sciences, and 2 (1,23%) did not give any field of study. 114 (70,37%) subjects were from German-speaking countries (Austria, Germany, Switzerland) and 48 (29,63%) from non-German-speaking countries. Comparing the two samples, no remarkable difference regarding gender, age, field of study, and origin is showed. Hence, the potential differences between the treatments derive from the design, and treatment effects can be analyzed.

5. Analysis of results

5.1. Descriptive statistics of the input variables

In this part, descriptive statistics of input variables and results are presented. Table 1 displays the descriptive statistics of the SVO slider task.

Egoistic and competitive individuals both aim to maximize their own output and in this bargaining situation maximizing own output automatically means reducing others' outcome, so they will be treated as one group since differentiation would not provide additional explanation. Hence, SVO type will be dichotomy variable: prosocial or proself (Van Dijk et al. (2004) used the term proself for combining egoistic and competitive categories). Also, only two subjects classified as Competitive, which is too law to make significant differences. In Table 2, the reliability of the Big Five constructs is shown.

Although the applied scale is widely used by researchers in social psychology, economics, and sociology, it is important to check the validity and reliability of the scale. Validity demonstrates if the scale measures what it is supposed to measure. However, reliability is a prerequisite of validity and measures the consistency of an instrument. Cronbach's Alpha is the most widely used tool to measure reliability and generally, a Cronbach's Alpha higher than 0.70 is accepted as reliable (Schupp & Gerlitz, 2008). Nevertheless, it is important to notice that Cronbach's Alpha strongly depends on the number of items and the traditional limit ($\alpha > .70$) is determined for scales with many items (Schupp & Gerlitz, 2008). The Cronbach's Alphas presented here closely corresponds to the values in the inventory of Schupp and Gerlitz (2008). In the case of Agreeableness, Extraversion, and Conscientiousness only a slightly higher Cronbach's Alpha can be achieved by deleting any item of the three. By deleting any item of the construct Neuroticism and Openness, Cronbach's Alpha would slightly decrease. Thus, all of fifteen items were kept and Table 3 presents the descriptive statistics of the Big Five factors.

Each of the dimensions has a maximum score of seven and it was calculated as following: the score of the three questions belonging to each dimension was added (maximum is 21) and then divided by three. According to Vangel (1996), coefficient of variation is calculated as the standard deviation divided by the mean and shows variability. Each of the five dimensions demonstrate a considerable variability. Table 4 shows the correlations between the five dimensions.

The five dimensions show quite weak correlation and the sample demonstrates similar results to previous researches (Kanning, 2009). In my thesis, p-value $<.05$ will be categorized as statistically significant if not stated otherwise.

5.2. Descriptive statistics of the output variables

In this subchapter, descriptive statistics of bargaining results are presented. Table 5 shows the remaining number of

Table 1: Descriptive statistics: SVO

SVO type	Frequency	Percentage
Altruistic	0	0%
Prosocial	149	45.99%
Egoistic	173	53.40%
Competitive	2	0.62%

Table 2: Reliability Big Five

Dimension	**Number of items**	**Cronbach's Alpha**
Agreeableness	3	0.48
Extraversion	3	0.73
Neuroticism	3	0.69
Conscientiousness	3	0.62
Openness	3	0.59

Table 3: Descriptive statistics: Big Five Dimensions

Dimension	**Mean**	**SD**	**Min**	**Max**	**CV**
Agreeableness	5.31	1.01	2	7	.191
Extraversion	4.81	1.23	1.67	7	.256
Neuroticism	4.34	1.30	1	7	.298
Conscientiousness	5.17	1.15	1	7	.222
Openness	5.16	1.13	2.33	7	.219

Table 4: Big Five Dimensions Correlation

$***$ p < .01; $**$ p < .05; $*$ p < .10. (2-tailed)

	AGR	**EXT**	**NEU**	**CON**	**OPE**
Agreeableness	1				
Extraversion	0.060	1			
Neuroticism	−0.038	−0.224$***$	1		
Conscientiousness	0.198$***$	0.194$***$	0.0046	1	
Openness	0.143$***$	0.240$***$	−0.012	0.199$***$	1

Table 5: Number of observations by treatments

	Triangle	**Three-line**	$\sum$
Exclusive	267/267	270/270	537/537
Inclusive	263/264	267/268	530/532
$\sum$	530/531	537/538	

observations and whether an agreement was reached within the given time.

6 observations were dropped because two offers were accepted in indistinguishable time within a network, which resulted in an incorrect output file. Further, in five cases, a subject accepted an offer with zero point dedicated to him. Since it is not beyond the bounds of possibility that a mistake happened, these five observations were also excluded from the sample. Table 6 presents the proportions of equal and unequal outcomes by mode of exchange and treatment.

Table 7 presents the mean of the final profit distributions by treatment and mode of exchange. Generally, powerful subjects earned significantly more than weak subjects (Wilcoxon test, $p < .01$). In exclusive treatment, powerful subjects achieved significantly more than 12 points (Wilcoxon test, $p < .01$) and in inclusive treatment, indi-

Table 6: Proportions of equal and unequal outcomes

	Exclusive exchange		Inclusive exchange	
	Triangle	Three-line	Triangle	Three-line
Even two-way split (12-12-0)	.79	.46	.47	.25
Even three-way split (8-8-8)	–	-	.24	.28
Uneven two-way split	.21	.54	.15	.25
Uneven three-way split	–	–	.14	.22
Two-way split	1	1	.62	.50
Three-way split	–	–	.38	.50

Table 7: Mean of profit distributions by treatment and mode of exchange

	Triangle	Three-line	
		Powerful	Weak
Exclusive	8	13.485	5.257
Inclusive	7.970	11.648	6.090

viduals in power position earned significantly more than 8 points (Wilcoxon test, $p < .01$). Between the two modes of exchange, the difference is rather moderate and not statistically significant.

5.3. Pre-negotiations assumptions

In order to discover the relationship between the five personality dimensions and pre-negotiation preferences, a logistic regression was carried out. Table 8 summarizes the results.

Out of the five dimensions, only Agreeableness and Conscientiousness have statistically significant impact on SVO type. The coefficient of Agreeableness says that while holding the other four dimensions constant, for one-unit increase in Agreeableness a .297 *decrease* in the log odds of SVO type is expected. In the case of Conscientiousness, for a one-unit increase in Conscientiousness a 0.376 *increase* in the log odds of SVO type is expected, while the other four dimensions stay at a fixed value. Thus, if a subject is more agreeable then the odds of being egoistic are decreasing (with other words: the odds of being prosocial are increasing) and if a subject is more conscientious then the odds of being egoistic are increasing.

5.4. Assumptions of bargaining situations

In this section, the following aspects of bargaining will be analyzed: first offers, including the third party, and negotiation outcomes. Altogether, 7653 offers were sent during the 12 sessions and 2654 qualified as first offer. An offer counts as first offer if it is the first sent offer between a dyad in one period. For example, Player 1 sent an offer to Player 2 – qualifies as a first offer, the offer Player 2 sent back to Player 1 in the same period does not count as a first offer, but a counteroffer. However, if Player 1 send an offer to Player 3 in the same period, it qualifies as a first offer. Furthermore, it is distinguished between even and uneven first offers. Uneven first offers are supposed to represent extreme first offers, which could cause anchoring. Next, it will be analyzed if the third party was included in the allocation or not (of course only if the mode of exchange was inclusive). During the 12 sessions, half of the subjects started with exclusive mode of exchange and the other half with inclusive mode of exchange. Thus, it is possible to control for status quo bias. Samuelson and Zeckhauser (1988) showed that individuals disproportionally prefer to maintain the current state (status quo). With other words, individuals prefer to obtain what they have compared to what they could have and personality influences how strong an individual's preferences is for maintaining the status quo (Boyce et al., 2019). If exclusive mode of exchanged is played first, the default value is defined by allocation is dyads and presumably, some people find it hard to deviate from the status quo, which would explain why the third party is not included. In order to discover of the possible impact of status quo bias, a Chi-squared test was conducted with a result of a $X^2 = 37.4895$ and a p-value of .000. Hence, the null hypothesis, which says that including the third network member is independent of which mode of exchange is implemented first, is rejected. Thus, it is concluded that the order of exchange mode cannot be neglected. Ultimately, the final allocations will be evaluated. First, the results of the triangle treatment (without powerful subject) are presented.

Table 8: Logistic regression: SVO – Big Five

	Coefficient	p-value (2-tailed)
SVO type (0 if prosocial, 1 if egoistic)		
Agreeableness	−.297	.012
Extraversion	−.061	.536
Neuroticism	−.058	.525
Conscientiousness	.376	.000
Openness	−.097	.367

Table 9: Logistic regression: First offer – Big Five (triangle)

	Coefficient	p-value (2-tailed)
first offer (0 = if no, 1 = if yes)		
Agreeableness	.017	.632
Extraversion	.029	.326
Neuroticism	−.016	.535
Conscientiousness	.057	.051
Openness	−.023	.439

5.4.1. Bargaining without powerful subject (triangle treatment)

Table 9 presents the results of a logistic regression of sending first offers in the triangle treatment. None of the five dimensions have statistically significant effect on sending first offers in triangle treatment. Thus, **H2** is not supported by this treatment, since extraverts tend not to send more first offers than introverts. Moreover, with equal power distribution no personality dimensions influence the tendency for sending first offers. Table 10 shows the results of the equal first offer in triangle treatment.

Openness is the only dimension that has statistically significant impact on sending equal first offers in triangle treatment. Keeping the other four dimensions constant, for a one-unit increase in Openness a 0.256 increase in the log odds of sending equal first offer is expected. Although this was not hypothesized, sending equal first offers fits well to the theory, which says that highly open individuals show altruistic tendencies toward strangers. Furthermore, unequal offers are divided in two categories: 1) unequal for own benefit 2) unequal for other's benefit. The outcome of a logistic regression of sending unequal first offer for the own or other's benefit is displayed in Table 11.

As before, only Openness has statistically significant impact on sending unequal first offers. Highly open individuals are more likely to send altruistic first offers, which benefit others since for a one-unit increase in Openness, a 1.138 decrease in the log odds of sending unequal first offers of own benefit is expected. Table 12 demonstrates the result of a logistic regression of including the third party in triangle treatment if subjects faced with inclusive mode of exchange first. In this case, no status quo bias can occur since subjects initially are allowed to involve the third player in the allocation (only first offers were considered, so anchoring effects are excluded).

Agreeableness, Neuroticism, and Openness show statistically significant impact on including the party in triangle treatment. In the case of Agreeableness (Neuroticism), for unit-increase, an increase of .588 (.313) in the log odds is expected, which indicates a positive relationship; highly agreeable and neurotic subjects tend to include the third player in triangle treatment when inclusive mode of exchange is played in the first five rounds. Openness, on the other hand, has a negative effect on including the third in the allocation, which implies that highly open individuals rather not include the third player. Hence, **H5** is not supported. Table 13 demonstrates the same analysis but in those cases, where subjects could not include the third player of the network in the first five rounds and so, status quo bias could occur.

Every dimension has statistically significant effect, apart from Agreeableness and Openness, on including the third party in triangle treatment when no status quo bias can occur. Since Openness does not have a statistically significant effect on including the third player in the first offer, **H5** is not supported in triangle treatment when starting with exclusive mode of exchange. Highly extraverted, neurotic, and conscientious subjects are more likely not to include the third player and agree in a two-way split in their first offer.

For analyzing the outcomes, five new dummy variables were created: for each of five dimensions subjects were categorized either high or low. If a subject scored more than the mean of the sample in a given dimension he was categorized as high, and if less than as low in that given dimension. Student's t-test was carried out for each personality factor, but

Table 10: Logistic regression: Equal first offer – Big Five (triangle)

	Coefficient	**p-value (2-tailed)**
Equal first offer (0=if no, 1=if yes)		
Agreeableness	−.008	.916
Extraversion	−.004	.948
Neuroticism	.042	.503
Conscientiousness	−.057	.405
Openness	.256	.000

Table 11: Logistic regression: Unequal first offer – Big Five (triangle)

	Coefficient	**p-value (2-tailed)**
Unequal first offer (0=if other's benefit, 1=if own benefit)		
Agreeableness	−.367	.221
Extraversion	−.427	.100
Neuroticism	.281	.176
Conscientiousness	.083	.753
Openness	−1.138	.000

Table 12: Logistic regression: Including third, no SQB – Big Five (triangle)

	Coefficient	**p-value (2-tailed)**
Including the third, no SQB (0=if no, 1=if yes)		
Agreeableness	.588	.000
Extraversion	−.076	.352
Neuroticism	.313	.000
Conscientiousness	−.159	.101
Openness	−.446	.000

Table 13: Logistic regression: Including third, SQB – Big Five (triangle)

	Coefficient	**p-value (2-tailed)**
Including the third, SQB (0=if no, 1=if yes)		
Agreeableness	.133	.260
Extraversion	−.402	.011
Neuroticism	−.366	.003
Conscientiousness	−.329	.013
Openness	.142	.200

only the significant ones are presented here. Table 14 shows the results of Student's t-test of extraversion in the triangle treatment with exclusive mode of exchange.

The result shows that introverted subjects earn more than one point less than extraverted subjects and this difference is statistically significant. Thus, it is assumed that extraverted people are better at negotiating and can achieve higher outcome for themselves. No statistically significant differences were observed in the case of the other four personality dimensions in triangle treatment with exclusive mode of exchange. Table 15 presents the result of Student's t-test of Neuroticism in triangle treatment with inclusive mode of exchange.

Highly neurotic individuals earn less than lowly neurotic individuals. It is important to note that it is only significant if the chosen $\alpha = 0.10$ is. Hence, there is only weak evi-

Table 14: Student's t-test: Payoff-Extraversion (triangle, exclusive)

	Mean	Alternative hypotheses	p-value
Introverted	7.322	Ha_1: diff < 0	.0046
Extraverted	8.57	Ha_2: diff != 0	.0091
Difference	−1.248	Ha_3: diff > 0	0.995

Table 15: Student's t-test: Payoff-Neuroticism (triangle, inclusive)

	Mean	Alternative hypotheses	p-value
Low on Neuroticism	8.233	Ha_1: diff < 0	.9283
High on Neuroticism	7.616	Ha_2: diff != 0	.1433
Difference	0.6168	Ha_3: diff > 0	0.0717

dence against the null hypothesis in favor of the alternative hypothesis. However, I included this test statistic since it fits to the literature and supports **H3**, and no other personality dimensions show statistically significant difference.

5.4.2. Bargaining with powerful subject (three-line treatment)

Table 16 presents the results of a logistic regression between sending first offer and the five personality dimensions in three-line treatment for powerful subject.

Three factors have statistically significant impact on sending first offers (Extraversion, Neuroticism, Conscientiousness). For one-unit increase in Extraversion and Neuroticism, a decrease of 0.157 and .108 in the log odds of sending the first offer is expected. Thus, highly extraverted and neurotic subjects in power position rather not send the first offer. This contradicts **H2,** which is not supported in any treatment. On the other hand, for one-unit increase in Conscientiousness, 0.160 increases in the log odds is expected, hence, highly conscious individuals have a tendency to send the first offer. Table 17 presents the same analysis, but for weak subjects.

Openness is the only dimension that has statistically significant impact on sending first offers from a weak position. The relationship is negative; thus, highly open individuals do not have a tendency for sending first offer from a weak position. **H2** is not supported by the data in this treatment either. Table 18 demonstrates the logistic regression of sending even first offers in three-line treatment by powerful subjects.

Extraversion and Neuroticism have a statistically significant impact on sending even first offers from power position. For a one-unit increase in Extraversion (Neuroticism), 0.351 (0.320) decrease of the log odds of sending even first offers are expected. Hence, highly extraverted and neurotic people have a tendency to send uneven first offers. Table 19 presents the same analysis but for weak subjects.

Only Extraversion has statistically significant impact on sending even first offers from a weak position. It is predicted that extraverted subjects have a tendency to send unequal first offers even from weak position. Just like in triangle treatment, it was differentiated between unequal first offers for own or other's benefit. Only three subjects sent a first offer which benefits others from a powerful position and statistically no significant results are not displayed in table, so Table 20 shows the results of the same analysis for subjects in weak position.

Statistically significant impact on sending unequal first offers from a weak position is only shown by Agreeableness. For one-unit increase in the scale of Agreeableness, a .413 decrease in the log odds of sending first offers of own benefit is expected and thus, highly Agreeable people demonstrate an altruistic behavior; if they send an unequal first offer, it is rather unequal for others' benefit rather than favoring themselves. Table 21 demonstrates the result of a logistic regression of including the third party in three-line treatment from power position if subjects faced with inclusive mode of exchange first (no status quo bias).

Statistically significant impact is shown by two dimensions: Extraversion and Neuroticism. Both have negative effect (since for a one-unit increase in the personality dimension, decrease in the log odds is expected), which means that highly extraverted and neurotic individuals in powerful position are less like to include the third party, even when no status quo bias could occur. The same analysis was carried out for weak subjects without statistically significant effect, so the results are not presented here. Furthermore, a logistic regression of including the third party in three-line treatment from power position if subjects faced with exclusive mode of exchange first (status quo bias) was conducted but no significant results were shown. Finally, the same analysis was carried out from weak position (Table 22).

Conscientiousness and Openness (only if $\alpha = .10$) have statistically significant impact on including the third party from a weak position if inclusive mode of exchange is played in the last five rounds. Both highly conscious and highly open subjects rather include the third, therefore, **H5** is partly supported.

Table 16: Logistic regression: First offer – Big Five (three-line, powerful)

	Coefficient	**p-value (2-tailed)**
first offer (0= if no, 1 = if yes)		
Agreeableness	.021	.765
Extraversion	−.157	.003
Neuroticism	−.108	.017
Conscientiousness	.160	.018
Openness	−.056	.406

Table 17: Logistic regression: First offer – Big Five (three-line, weak)

	Coefficient	**p-value (2-tailed)**
first offer (0= if no, 1 = if yes)		
Agreeableness	.028	.552
Extraversion	−.060	.151
Neuroticism	.007	.862
Conscientiousness	.026	.572
Openness	−.178	.000

Table 18: Logistic regression: Even first offer – Big Five (three-line, powerful)

	Coefficient	**p-value (2-tailed)**
even first offer (0= if no, 1 = if yes)		
Agreeableness	−.057	.684
Extraversion	−.351	.001
Neuroticism	−.320	.000
Conscientiousness	−.086	.458
Openness	−.007	.959

Table 19: Logistic regression: Even first offer – Big Five (three-line, weak)

	Coefficient	**p-value (2-tailed)**
even first offer (0= if no, 1 = if yes)		
Agreeableness	−.005	.951
Extraversion	−.222	.003
Neuroticism	.073	.276
Conscientiousness	.002	.981
Openness	.087	.268

Ultimately, Student's t-test was carried out for each of the five personality dimensions, in order to see whether personality factors cause significant difference in the final outcomes (of course, it was differentiated between mode of exchange and position when calculating the averages). Only the statistically significant results are presented. Table 23 presents the result of Student's t-test of Neuroticism in three-line treatment with exclusive mode of exchange in power position.

Student's t-test demonstrates a significant difference in earning of highly and lowly neurotic subjects in power position with exclusive mode of exchange. Less neurotic subjects earn almost with one point more than highly neurotic subjects. Consequently, people low on Neuroticism can better use their structural power in exclusive mode of exchange and thus, **H3** is supported. No significant difference was found for any other personality dimensions. The same test was

Table 20: Logistic regression: Unequal first offer – Big Five (three-line, weak)

	Coefficient	**p-value (2-tailed)**
Unequal first offer (0=if other's benefit, 1=if own benefit)		
Agreeableness	−.413	.008
Extraversion	−.046	.738
Neuroticism	.042	.696
Conscientiousness	.238	.143
Openness	−.177	.112

Table 21: Logistic regression: Including third, no SQB – Big Five (three-line, powerful)

	Coefficient	**p-value (2-tailed)**
Including the third, no SQB (0=if no, 1=if yes)		
Agreeableness	.103	.735
Extraversion	−.663	.031
Neuroticism	−.738	.000
Conscientiousness	−.084	.696
Openness	−.101	.710

Table 22: Logistic regression: Including third, SQB – Big Five (three-line, weak)

	Coefficient	**p-value (2-tailed)**
Including the third, no SQB (0=if no, 1=if yes)		
Agreeableness	−.262	.166
Extraversion	.242	.188
Neuroticism	.222	.211
Conscientiousness	.690	.003
Openness	.333	.073

Table 23: Student's t-test: Payoff-Neuroticism (three-line, exclusive, power)

	Mean	**Alternative hypotheses**	**p-value**
Low on Neuroticism	13.92	Ha_1: diff $<$ 0	.9850
High on Neuroticism	12.99	Ha_2: diff != 0	.0299
Difference	0.93	Ha_3: diff $>$ 0	.0150

conducted for subjects in weak position in exclusive mode of exchange, but again; no statistically significant results were found. Further, inclusive mode of exchange was tested too. Table 24 demonstrate the results of Student's t-test of Conscientiousness in three-line treatment with inclusive mode of exchange in power position.

Student's t-test reveals statistically significant difference between the mean earnings of highly and lowly conscious individuals in power position with inclusive mode of exchange. Less conscious individuals earn 1.403 points more than more conscious subjects. Hence, highly conscious individuals use their power for a more equal distribution and thus, **H4** is supported. Finally, the same analysis was carried out for weak subjects, but no significant difference was found for weak subjects in inclusive mode of exchange.

Table 24: Student's t-test: Payoff-Conscientiousness (three-line, inclusive, power)

	Mean	**Alternative hypotheses**	
Low on Conscientiousness	12.342	Ha_1: diff < 0	.9926
High on Conscientiousness	10.939	Ha_2: diff != 0	.0148
Difference	1.403	Ha_3: diff > 0	.0074

5.4.3. The mediating role of social preferences

In order to discover the mediating role of social preferences proposed in the research model the same tests and regressions were conducted as before, but controlled for SVO type. In order to control whether personality predicts social preferences, a logistic regression was conducted (Table 25).

Table 25 reveals that two dimensions (Agreeableness and Conscientiousness) have statistically significant impact on the SVO type and thus, it is concluded that personality predicts social preferences. The effect of the two statistically significant dimensions is contrary: for one unit increase in Agreeableness (Conscientiousness), .297 (.376) decrease (increase) in the log odds is expected. Hence, Agreeableness predicts prosocial preferences and Conscientiousness anticipates egoistic social preferences. Results revealed that SVO type has no statistically significant impact on sending first offers or sending (un)equal first offers. However, regardless of the treatment and the possible status quo bias, SVO type significantly influence including the third player. Table 26 presents the results of the logistic regression of including the third in the triangle treatment with no SQB.

The logistic regression reveals that prosocial individuals are more likely to include the third network member. Comparing this table to Table 12 (which presents the same logistic regression without SVO type), the three statistically significant dimensions remained significant, but their coefficients slightly decreased. Furthermore, the Pseudo R^2 slightly increased (from 0.0836 to 0.0949) in this regression compared to the previous one. The Pseudo R^2 indicates which model predicts better the outcome and the higher the R^2 the better the model's prediction power. Table 27 presents the same analysis but starting with exclusive mode of exchange.

Comparing the results to Table 13, it is shown that Extraversion lost its significance and the Pseudo R^2 increased (from 0.0733 to 0.1955). As expected, egoistic individuals are less likely to include the third party in the allocation when the sessions started with exclusive mode of exchange than prosocial individuals. Thus, prosocial individuals do not have strong preferences for maintaining the status quo. The same analysis was carried out for the three-line treatment both for powerful and weak position. Table 28 demonstrates the results of the logistic regression of including the third network member from a powerful position with no possible SQB.

As before, the Pseudo R^2 increased from 0.1582 to 0.2163, compared to the model without SVO type (Table 21). The log odds of Neuroticism decreased in the model with SVO type compared to the model with SVO type. The same analysis was conducted for weak subjects but no statistically significant impact was found. Finally, the logistic regression was carried out when the session started with exclusive mode of exchange. Statistically significant effect was found only for subjects in weak position but no for subjects in powerful position and the results are presented in Table 29.

Compared to the model without including the SVO type (Table 22) an increase in the Pseudo R^2 is revealed from 0.1216 to 0.1765. In each case, SVO type is the most powerful predictor for including the third player in the allocation. Regardless of the treatment and mode of exchange, prosocial individuals are more likely to include the third than egoistic ones.

5.5. Summary

Table 30 is devoted to summarize which hypotheses are supported by the data.

6. Discussion

In this chapter, the results are discussed in context of the existing economics and social psychology literature on personality. First, a general overview of the role of personality in bargaining situations is provided then each of the five personality dimensions and their relationship with social preferences are discussed in depth.

6.1. General Discussion

Summarized, there are clear signs that personality influences social preferences and bargaining behavior but the results are rather inconsistent. Two personality dimensions (Agreeableness and Conscientiousness) indicate social preferences, four personality dimensions (Agreeableness, Extraversion, Neuroticism, and Conscientiousness) influence the ability to use structural power. The relationship between Openness and including the third is almost fully mediated by SVO types. The role of SVO types in including the third party fits well to the findings of Schwaninger et al. (2019) who found that social value orientation has explanatory power on the outcome only in inclusive mode of exchange.

A possible explanation for the ambiguous results is that personality expression varies on computer (Blumer & Döring,

Table 25: Logistic regression: SVO – Big Five

	Coefficient	**p-value (2-tailed)**
SVO (0=prosocial, 1=egoistic)		
Agreeableness	−.297	.012
Extraversion	−.062	.536
Neuroticism	−.059	.525
Conscientiousness	.376	.000
Openness	−.097	.367

Table 26: Logistic regression: Including the third, no SQB – Big Five+SVO (triangle)

	Coefficient	**p-value (2-tailed)**
Including the third, no SQB (0=if no, 1=if yes)		
Agreeableness	.548	.000
Extraversion	−.064	.435
Neuroticism	.348	.000
Conscientiousness	−.137	.153
Openness	−.427	.000
SVO type	−.546	.004

Table 27: Logistic regression: Including the third, SQB – Big Five+SVO (triangle)

	Coefficient	**p-value (2-tailed)**
Including the third, no SQB (0=if no, 1=if yes)		
Agreeableness	−.091	.493
Extraversion	−.264	.135
Neuroticism	−.401	.003
Conscientiousness	−.405	.006
Openness	.204	.108
SVO type	−1.936	.000

Table 28: Logistic regression: Including the third, no SQB – Big Five+SVO (three-line, powerful)

	Coefficient	**p-value (2-tailed)**
Including the third, no SQB (0=if no, 1=if yes)		
Agreeableness	.302	.348
Extraversion	−.709	.031
Neuroticism	−.538	.005
Conscientiousness	−.189	.437
Openness	.283	.354
SVO type	−1.831	.005

2012). It is important to emphasize that not *personality* itself varies, which is stable by definition, but the *expression* of personality. According to Stritzke, Nguyen, and Durkin (2004), shyness (which is part of the Extraversion scale) is expressed weaker in online settings. With other words, introverted individuals become more sociable if the communication happens on computer (Blumer & Döring, 2012). Not only introverts benefit from an online, anonym setting; research of Rice and Markey (2009) states that highly neurotic individuals feel less anxious communicating on computers than face-to-face.

Furthermore, taking personal values in consideration

Table 29: Logistic regression: Including the third, SQB – Big Five+SVO (three-line, weak)

	Coefficient	p-value (2-tailed)
Including the third, no SQB (0=if no, 1=if yes)		
Agreeableness	−.319	.093
Extraversion	.203	.279
Neuroticism	.195	.294
Conscientiousness	.774	.001
Openness	.098	.629
SVO type	−1.362	.002

Table 30: Summary

Hypothesis	Finding
H1*: Highly agreeable individuals tend to use their structural power to achieve an equal bargaining outcome.*	not supported
H2: *Extraverts are more likely to send first offers than introverts.*	not supported
H3: *Highly neurotic individuals earn less than lowly neurotic individuals.*	supported
H4: *Highly conscientious individuals tend to use their structural power to achieve a more equal distribution.*	supported
H5: *Highly open individuals are more likely to include the third network member than less open individuals.*	partly supported

provides deeper understanding of behavior. According to Schwartz (2012), values represent desirable and abstract goals, which motivate actions. Schwartz (2012) proposed ten types of values each expressing a motivational goal. Just like traits, values also show relative stability during time (Roccas et al., 2002). Furthermore, Roccas et al. (2002) linked the values to personality traits saying that they mutually influence each other. Since "values serve as ideals or oughts and hence guides for self-regulation", people aim to adapt their behavior according to their values (Roccas et al., 2002, p. 791). Basic values seem to play a crucial role in case of Conscientiousness, so it will be discussed in details under 6.2.4.

6.2. Personality dimensions

6.2.1. Agreeableness

Literature predicted altruistic attitude of highly agreeable people (Zhao & Smillie, 2015), which is supported by data and Agreeableness predicts prosocial social value orientation. Becker, Deckers, Dohmen, Falk, and Kosse (2012) also found that Agreeableness predicts altruistic preferences. Moreover, highly agreeable individuals show a tendency to include the third player in the allocation. However, the outcomes of bargaining situations do no support **H1** and there is no statistically significant difference between the profit distributions of highly and lowly agreeable people. Thus, it is concluded that highly agreeable individuals cannot use their structural power to achieve an even distribution. Even though they have a preference for equal outcomes, they rather go with the flow and accept others' offers. The findings of this thesis match well to the discovery of Barry and Friedman (1998); Agreeableness appears to be a liability in distributive bargaining situations. Highly agreeable individuals are at risk for not enforcing their own will and accepting an outcome, which is not so favorable for them. People high on Agreeableness try to avoid conflicts since inter-personal relationships are very important to them (De Dreu & Gross, 2019) and as a result, a people-pleasing attitude is observable and they give up their own interest. Another possible explanation for the inconsistent results derives from the findings of Hilbig et al. (2014): Honesty-Humility dimension (see Chapter 2.3.2) has stronger explanatory power on prosocial behavior than Agreeableness.

6.2.2. Extraversion

Extraversion does not predict any pre-negotiation preferences. Furthermore, there is no sign that extraverted are more active and initiative than introverted and so, **H2** is not supported by the data. Just like Agreeableness, Extraversion also directly relates to interpersonal relationships but contrary to Agreeableness, cooperative behavior of extraverted people is often driven by the expectation of reciprocity and not by altruism (Zhao & Smillie, 2015). Although Extraversions does not indicate tendency for sending first offers, it does predict the likeliness of sending unequal first offers favoring themselves. Moreover, Extraversion decreases the willingness of including the third party in the allocation. Hence, highly extraverted individuals can be categorized as tough negotiator, who try to achieve an agreement in the dyad and thus, reach a high payoff for them. These findings match well to the results of Koole et al. (2001), who noted a negative relationship between Extraversion and cooperation. Since extraverted people earned significantly more in triangle treatment with exclusive mode of exchange than introverted, it is concluded that extraverts utilize their assertiveness successfully in bargaining situations and Extraversion affects bargaining behavior. As mentioned in the General Discussion, Extraversion is one of the most sensitive dimensions in terms of its online expression and thus, it is possible that the difference between extraverts and introverts was less notable during a laboratory experiment on computers.

6.2.3. Neuroticism

In the case of Neuroticism, no pre-negotiation preferences are anticipated. As hypothesized, highly neurotic individuals earn significantly less than subjects who scored less on the scale of Neuroticism, so **H3** is supported. However, highly neurotic individuals apply tough negotiation styles; they are more likely to send uneven first offers and do not want to include the third party in inclusive mode of exchange. These signs suggest a rather self-maximizing preference, but based on the lower payoff, it is concluded that highly neurotic people are unable to use structural power. Ma (2005) stated that highly neurotic individuals are prone to find conflicts threating and decide to rather avoid them. Avoiding conflicts could result in lower payoff since highly neurotic individuals rather accept offers than demand higher payoff for themselves. According to Sharma et al. (2013, p. 303), highly neurotic “negotiator may struggle to engage the task and their relationship partners”, which potentially leads to disadvantages in outcome.

6.2.4. Conscientiousness

Conscientiousness predicts egoistic social value orientation. Moreover, signs of initiation are shown, which fits well to the careful and planning behavior predicted by literature. Based on the egoistic preferences and careful preparation, it was expected that highly conscientious individuals are able to use their structural power and achieve higher outcome for themselves. However, results show that highly conscientious people earn less in power position than lowly conscientious individuals and do not send unequal first offers benefitting them, which means that **H4** is supported. Summarized, it is concluded that highly conscientious individuals respect the norms so much that they behave against their preferences. A possible explanation of this behavior derives from the link between personality traits and personal values. Roccas et al. (2002) found that Conscientiousness positively, strongly, and significantly relates with *achievement* and *conformity* values. Schwartz (2012, p. 5) determines the demonstrating goal of achievement values as “personal success through demonstrating competence according to social standards”. Achievement values belong to individual values and hence, they potentially explain egoistic social preferences. On the other hand, “conformity values emphasize self-restraint in everyday interaction” Schwartz (2012, p. 6), which potentially lead to retain egoistic preferences and balance the behavior of highly conscientious individuals. According to Schwartz (2012), the promoted cooperative behavior by conformity values is motivated by avoiding negative outcome for self and not by internalized motives.

6.2.5. Openness

In case of Openness, the results are highly inconsistent. **H5** is partially supported because in some treatment and mode of exchange highly open people are more likely to include the third network member than less open individuals. However, in other treatment and mode of exchange highly open humans are less likely to include the third party. Furthermore, Openness partially predicts altruistic behavior, but it is not consistent. Regarding including the network member, it is plausible to say that SVO types explain whether someone decides to include the third or not and thus, Openness has no significant explanatory power on including the third. In addition, Openness positively and significantly correlates with every dimension besides Neuroticism (Table 3), which potentially also weakens the explanatory power of Openness.

7. Conclusion

The ultimate goal of the present Master’s thesis was to shed light on the role of personality in social decision-making situations. It was intended to combine two already existing but distinct approaches: how personality influences social preferences and the impact of personality on individual influence in bargaining situations. Hence, the major scientific contribution of this thesis is how the link between personality traits and bargaining behavior is mediated by social preferences. In this Chapter, theoretical and practical significance of the thesis in along with the limitations of the study and future research direction are discussed.

7.1. Theoretical and practical significance

The findings of the present study extents current literature at least in two ways; first, contrary to previous researches about the role of personality and bargaining behavior in economic games where dyads were studied, in this case, the focus was on triads and behavior in networks of three were analyzed. Networks of three created a competition between subjects to be in the agreeing dyad, which presumably affected bargaining process and provided additional information about individual influence. The second scientific contribution of the thesis is the combination of the two, above mentioned aspects and the proposition of the research model (Fig. 2), where social preferences mediate the relationship between personality and bargaining behavior. Complementary evidences to Dohmen et al. (2008) and Hilbig et al. (2014) are provided, who also found that personality traits have an impact on social preferences. Moreover, this thesis supports that personality influences negotiation process and outcome, which was proposed by Barry and Friedman (1998), McCannon and Stevens (2017), and Elfenbein

(2015). However, to the best of my knowledge, no other scientific research has examined the impact of personality on social preferences and bargaining behavior at the same time. Thus, the present study contributes to the scientific literature by revealing the mediating role of social preferences.

In addition to the presented contribution to the scientific literature, the current study also provides significant implications for human resources management and organizational behavior. Personality already has been linked to job performance (Barrick & Mount, 1991) and to personnel selection (Rothstein & Goffin, 2006). Based on the findings of the present thesis, it is supported that managers and human resource professionals should consider personality at selecting personnel. For example, highly conscientious individuals seem to be a better choice for time-sensitive job than highly neurotic individuals, who suffer from time pressure. Moreover, highly neurotic people seem not to be able to use structural power, which indicates that selecting lowly neurotic people for a management position would be more beneficial. As it has been pointed out earlier, self-managed working groups have become more and more popular (Greenberg & Baron, 2008). Individual influence plays a crucial role both in self-managed working groups where members do not differ in terms of power position. It is expected that extraverted individuals will be more influential than introverts and thus, it is important to monitor that introverts also have the possibility to use their knowledge in group decisions. However, extraverts and highly conscientious individuals suit better for distributive negotiation situation than highly agreeable or neurotic people.

7.2. Limitations and future research

Even though the thesis provides many important theoretical and empirical suggestions and implications, the limitation of the study must be noted too.

As it has been already pointed out, the expression of personality is influenced by the communication channel. Rice and Markey (2009) found that Neuroticism is strongly affected by whether the communication happen face-to-face or via computer. Additionally, a second dimension – Extraversion – has been shown to be influenced by the mode of communication; when the communication happens via computers, the difference between extraverts and introverts is less salient (Blumer & Döring, 2012). Therefore, it is expected that communicating face-to-face would result in a relatively more active participation and stronger influence of extraverts compared to introverts.

Furthermore, it is expected that the Honesty-Humility dimension of the HEXACO model would explain what the FFM Agreeableness was not able to. Based on previous researches (Hilbig et al., 2014), applying the HEXACO model shows more consistent results regarding altruism and thus, further research using HEXACO is supported.

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The Attitude-Behavior Gap – Drivers and Barriers of Sustainable Consumption

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Abstract

Individuals' consumption behavior plays a key role on the path to a sustainable future. Understanding what influences the decision to act in a sustainable manner is therefore crucial. The aim of this thesis is to provide a structured overview of the current state of academic literature on the drivers and barriers of sustainable consumption and to discuss the related phenomenon of the attitude-behavior gap. The identified influencing factors can be broadly divided into two categories: individual-related determinants and environmental determinants. The former includes socio-demographics, personal characteristics and value orientation, non-cognitive factors (habits and emotions) and cognitive factors like knowledge. The environmental determinants comprise product-, service-, or behavior-related factors (such as stereotypes towards sustainable products), corporate activities (e.g., communication efforts), social influence as well as structural conditions like the available infrastructure. From the diversity of influencing factors and their interplay, it becomes clear that to promote sustainable behavior or to close the attitude-behavior gap, a holistic approach is needed that combines different instruments and is adapted to the specific type of consumer behavior.

Keywords: Sustainable consumption; attitude-behavior gap; sustainable choices; sustainable consumer behavior.

1. Introduction

With adolescents around the globe demonstrating for a sustainable future and businesses increasingly embracing the idea of sustainable economic activities,[1] it is undeniable that sustainability has evolved from a niche topic into a mainstream one.[2] The consumption behavior of individuals plays a key role in enabling a sustainable future for the world.[3] This is manifested in the United Nations' 2030 Agenda for Sustainable Development with Goal Number 12 being "Responsible Consumption and Production".[4] In Germany, social justice as well as environment and climate protection rank in second and third place among the most important problems the country currently faces. However, only 19% of respondents think that enough is done for environmental and climate protection by German citizens.[5] This indicates a discrepancy between people's attitudes toward sustainable practices and the extent to which they actually act on them. This phenomenon is also frequently observed in the academic literature and is one of the few unambiguous insights concerning sustainable consumer behavior.[6] Generally, this topic has received increasing and considerable coverage in academic publications across various fields of research.[7] Nevertheless, there is a lack of understanding regarding the factors shaping sustainable consumer behavior, and researchers repeatedly comment on the need for clarity and further research.[8]

Therefore, this thesis aims to structure and discuss facilitators as well as obstacles of sustainable consumption identified in the literature to date and thereby give the reader an overview of the current state of scientific knowledge on this subject. This will be achieved through a systematic literature review. The thesis is structured as follows: Firstly, sustainable consumption, as well as the attitude-behavior gap, will be conceptualized, and reasons for the gap will be outlined.

[1] Cf. Bové et al. (2017), p.1; British Broadcasting Corporation (2019), p.1.

[2] Cf. Carrington, Neville, and Whitwell (2010), p.40; Mittelstaedt, Shultz, Kilbourne, and Peterson (2014), p.260.

[3] Cf. Sanne (2002), p.273; Tanner, Wölfing, and Kast (2003), p.883.

[4] Cf. United Nations (2019).

[5] Cf. Rubik et al. (2019), p.16f..

[6] Cf. Caruana, Carrington, and Chatzidakis (2016), p.215.

[7] Cf. Liu, Qu, Lei, and Jia (2017), p.427.

[8] see, for example Chatzidakis, Kastanakis, and Stathopoulou (2016), p.95; Abdulrazak and Quoquab (2018), p.16.

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Subsequently, relevant theories for understanding consumer behavior in the context of sustainability will be discussed. This is followed by a synopsis of the drivers and barriers of sustainable consumption. Finally, implications for the effective promotion of sustainable consumerism will be derived, and future directions for research will be suggested.

2. Conceptual foundation

2.1. Defining sustainable consumption

The concept of sustainable consumption is traced to the action plan for sustainable development adopted in 1992 by the United Nations' Rio Earth Summit (Agenda 21).[9] Since no definition of the term was included therein, 'sustainable consumption' was first defined by the Oslo Symposium two years later. As this definition was not a scientific one, it was heavily criticized in the academic field.[10] Hence, several attempts were made to provide a more accurate and comprehensive characterization of the term, leading to a lack of clarity within the academic literature due to a myriad of available definitions.[11] A selection of these as well as related concepts can be found in the appendix[12] (Appendix A). What becomes evident from these definitions is that conceptualizations of sustainable consumption should (a) capture the entire consumption cycle, (b) take into account ecological as well as social issues, (c) consider the well-being of the global population and (d) take a long-term perspective. With this in mind, the present thesis views sustainable consumption as the selection, acquisition, use and disposal of products and services that considers not only the consumer's own needs and wants, but also those of the current and future population in both an ecological and social respect.[13]

It is thus a very broad and multidimensional concept, which contains a range of different behaviors with varying levels of consumer commitment. It comprises, for instance, low-commitment acts such as buying fair-trade products but also actions that require deeper commitment like the reduction of the consumption level in general.[14] The practice of reduced consumption also represents the difference between the terms 'sustainable consumption' and 'consumption of sustainable products', as the latter merely refers to consuming products with positive social and/or environmental attributes,[15] omitting the act of not consuming at all.

Ethical consumption is often used as a synonym for sustainable consumption,[16] although it denotes consumption activities that are influenced by the consumer's ethical concerns.[17] It, therefore, differs from the aforementioned conceptualization of sustainable consumption, which does not necessarily have to be morally motivated. The purchase of environmentally friendly alternatives for reasons of superior taste or look can be classified as sustainable without being considered ethical.[18] Ethical consumption is commonly used to refer to problems with workers' rights, animal welfare or fair trade, but it includes environmental issues as well.[19]

Further similar and overlapping concepts can be found in the literature. These include 'green consumption' (inconsistent definitions exist in the literature, either referring to ecological issues only[20] or including social aspects too[21]), 'pro-environmental consumption or behavior' (concerned with effects on the natural and built world only[22]), as well as 'responsible consumption' (varying definitions throughout the literature with different widths of associated activities[23]). As this thesis views sustainable consumption as an encompassing and holistic construct, the just mentioned concepts all fall under this definition.

The cube model of sustainable consumption behavior by Geiger et al. (2017) is a framework that reflects the multifaceted nature of sustainable consumption. In addition to the already discussed aspects of (a) ecological as well as socioeconomic impact and (b) different consumption phases, it highlights (c) the various areas of consumption in people's lives (e.g. food, housing, mobility) and (d) the impact of chosen behaviors (from low to high).[24] Although sustainable behavior comes down to its impact in the end, one cannot expect people to always be aware of the factual effect their consumption choices have. For the assessment of sustainability in consumption acts, the underlying pro-ecological or prosocial intention of the consumer therefore often counts. This is called an intent-orientated approach and it stands in contrast to the impact-orientated approach, which is concerned with the social and ecological consequences of the action at stake.[25] Both methods should ideally be combined for the promotion of sustainable consumption, meaning that in particular motives for consumer behaviors that have the highest sustainability impact should be identified and encouraged.[26]

2.2. The attitude-behavior gap

As previously mentioned, an issue that often arises during the exploration of sustainable consumption is a phenomenon that stems from social psychology and is called

[9] Cf. United Nations (2018), p.18.
[10] Cf. Geiger, FIscher, and Schrader (2017), p.20.
[11] Cf. Peattie (2010), p.197.
[12] The Appendix can be found on `https://jums.academy`.
[13] Cf. Vermeir and Verbeke (2006), p.170* (this is only the secondary source as the primary source is in Dutch); Di Giulio, Fischer, Schäfer, and Blättel-Mink (2014), p.54; Geiger et al. (2017), p.20.
[14] Cf. Prothero et al. (2011), p.32; Dermody, Hanmer-Lloyd, Koenig-Lewis, and Zhao (2015), p.1473; Scott and Weaver (2018), p.291.
[15] Cf. Luchs, Naylor, Irwin, and Raghunathan (2010), p.18.
[16] Cf. Luchs et al. (2010), p.18.
[17] Cf. Cooper-Martin and Holbrook (1993), p.113; Kushwah, Dhir, and Sagar (2019), p.3.
[18] Cf. Strubel (2017), p.11.
[19] Cf. Shaw and Shiu (2002), p. 286.
[20] Cf. Tanner et al. (2003), p. 885.
[21] Cf. Moisander (2007), p.405.
[22] Cf. Kollmuss and Afyeman (2002), p.240.
[23] Cf. Valor and Carrero (2014), p.1110f.; Gupta and Agrawal (2018), p.524.
[24] Cf. Geiger et al. (2017), p.20ff..
[25] Cf. Fischer, Michelsen, Birgit, and Di Giulio (2012), p.73f..
[26] Cf. Geiger et al. (2017), p.19.

"attitude-behavior gap".[27] Several synonyms and very similar concepts exist in the literature, such as 'ethical purchasing gap'[28], 'ethical consumption paradox'[29], 'values-action gap'[30], 'words/deeds inconsistency'[31] or even '30:3 syndrome' (attributed to a study which found that 30% of people claim to be motivated to buy ethically featured products, but these only account for 3% of the market share[32]). The following section gives a more detailed outline in terms of definition and causes of this widely documented[33] matter.

2.2.1. Defining the attitude-behavior gap

Ajzen (1991) defines the attitude toward a behavior as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (p. 188). In the simplest terms, it represents how a person feels or thinks about a certain behavior, for instance about buying groceries in zero waste shops. It should be clarified that 'attitude toward a behavior' refers to a specific attitude, which are to be distinguished from general ones, such as one's attitude toward waste avoidance at large.[34] The conceptualization of attitudes usually contains both cognitive (rational considerations like cost and benefit) and affective (experienced feelings) elements.[35] The related concept of values, by contrast, is more basic. Values often underlie attitudes, which are linked more closely to specific objects or situations.[36] Beliefs are another concept related to attitudes. They refer to the information (the knowledge) a person has about an object, issue or person.[37]

An interesting and at this point noteworthy model is the one of dual attitudes by Wilson, Lindsey, and Schooler (2000). It proposes that people can hold two attitudes about the same object simultaneously, one implicit and the other explicit. While implicit attitudes are automatically activated and thus often not recognized, explicit ones are under conscious control as they require cognitive effort. The cognitive capacity to retrieve the explicit attitude determines whether or not the implicit attitude gets overridden.[38] This differentiation will be relevant for a later discussion.

For now, it is important to note that attitudes can be changed or altered relatively easy by new information or by both internal and external circumstances,[39] which already indicates that once-voiced attitudes are not always in accordance with future actions. This discrepancy is what the attitude-behavior gap is about. It refers to the inconsistency between a person's attitude and their actual behavior, and it has been identified by several authors in the context of sustainable consumption.[40]

In this context, it is important to distinguish between attitudes and intentions, the latter of which is defined as "instructions that people give to themselves to behave in certain ways" (Triandis, 1980, p. 203). They are conceptualized as people's motivations or decisions to perform a particular action. Representative responses have the form "I intend / plan to do behavior x" or "I will do behavior x".[41] Most models in the field of sustainable consumer behavior are based on the following core cognitive progression: Beliefs inform attitudes, these attitudes lead to intentions, and intentions, in turn, determine behavior. According to this framework, there may be a gap between attitude and intention as well as between intention and behavior that contribute to the overall discrepancy between what consumers express via attitudes and what they end up doing.[42]

2.2.2. Causes for the attitude-behavior gap

Four major grounds for the attitude-behavior gap can be determined from the literature. These are briefly specified hereinafter.

Deficiency of research methods

The first reason for the gap can be attributed to the applied study designs, which can result in several biases and other problems, such as inadequate data collection or errors made by informants in the prediction of their behavior. Apart from biases that are associated with decontextualization of the respondents and sample selection toward more sustainable consumers,[43] the most prominent bias is the social desirability bias, where respondents feel social pressure to provide socially acceptable answers.[44] Consequently, consumers tend to overstate their socially and ecologically responsible attitudes. This is especially true for self-reported survey instruments.[45] These are predominantly used in studies on sustainable consumption, with only a few researchers observing actual behavior.[46] It was found that when self-reported rather than actual behavior was assessed, lower attitude-behavior correlations were obtained.[47] A solution to this issue was recently suggested: Implicit attitudes should serve as an additional measure since they are more robust to external stimuli and therefore also immune to the social desirability bias.[48]

[27]Cf. Lapiere (1934), p.230ff..
[28]Cf. Nicholls and Lee (2006), p.369.
[29]Cf. Carrington, Zwick, and Neville (2016), p.21.
[30]Cf. Ertz, Karakas, and Sarigöllü (2016), p.3971.
[31]Cf. Newholm and Shaw (2007), p.257.
[32]Cf. Cowe and Williams (2000), p.5.
[33]Cf. Carrington et al. (2010), p.141.
[34]Cf. Ajzen and Fishbein (2005), p.173f..
[35]Cf. Newhouse (1990), p.26; Ajzen (2011), p.1116.
[36]Cf. Homer and Kahle (1988), p.638.
[37]Cf. Petty and Cacioppo (1996), p.7.
[38]Cf. Wilson et al. (2000), p.104ff..
[39]Cf. Ajzen and Fishbein (2005), p.177; Schwarz (2007), p.642.
[40]E.g. Cf. Roberts (1996b), p.80; Boulstridge and Carrigan (2000), p.355; Carrigan and Attalla (2001), p364; Chatzidakis, Hibbert, and Smith (2007), p.89.
[41]Cf. Sheeran (2002), p.2.
[42]Cf. Carrington et al. (2010), p.142.
[43]Cf. Auger and Devinney (2007), p.363ff..
[44]Cf. Carrington et al. (2010), p.143.
[45]Cf. Chung and Monroe (2003), p.296ff..
[46]Cf. Davies, Lee, and Ahonkhai (2012), p. 38; see exceptions like Buttlar, Latz, and Walther (2017), p.155.
[47]Cf. Hines, Hungerford, and Tomera (1987), p.4.
[48]Cf. Govind, Singh, Garg, and D'Silva (2019), p. 1198.

Another problem that can lead to discrepancies in the attitude-behavior relation is the unequal scope of measurement of attitudes and actions, as demonstrated by the following exemplary questions: "Do you care about the environment?" and "Do you recycle?", whereby the scope of the question referring to attitude is not as specific as the one about the behavior.[49] Furthermore, as the measurement of attitudes and the execution of the discussed behavior are temporally separated, consumers tend to make mistakes in their predictions of future behavior (e.g. due to unavailability of the sustainable product at the time of actual purchase) or in their recollection of past behavior.[50]

Misleading monistic view of morality and personal goals

The second reasoning is not as well-explored in the literature as the social desirability bias, but it is, in a distant sense, also related to the just-mentioned insufficient capture of a person's attitudes. The core issues here are the multiple fragmented and competing identities of consumers.[51] Consumption choices are outcomes of balancing several potentially conflicting demands and desires. Thus, failure to engage in a sustainable consumption act does not necessarily mean that the consumer has incorrectly stated their attitude toward sustainable consumption. Instead, not all moral demands were considered, including the most decisive one that has overruled the attitude toward consuming sustainably. While a mother, for instance, may care for the environment, the duty of care for her child might outrank her environmentally conscious motivations.[52] The problem of duty conflicts is also reflected in the conceptualization of consumer choices as personal projects by Valor and Carrero (2014). According to this view, the gap is attributable to conflicts between different personal projects a consumer has, roles he or she plays and the influence of significant others.[53] This stresses the importance of holistically viewing all of a consumer's moral attitudes and the interactions between them.[54]

Rationalization strategies

Thirdly, rationalization strategies used by consumers to reduce feelings of remorse when past consumption choices contradict their attitudes may also contribute to the attitude-behavior gap.[55] Chatzidakis et al. (2007) revealed different before- or after-the-purchase justifications, labeled as "neutralization techniques" and describing mechanisms that consumers use to validate actions in violation of their attitudes. These encompass (a) denial of responsibility (e.g. lack of available information), (b) appeal to higher loyalties (e.g. financial constraints or inferiority of product), (c) denial of injury or of benefit (i.e. actions allegedly make little difference) and (d) condemning the condemners (referring to the unsustainable actions of others).[56] Additional authors extended these findings and discovered further justifications.[57] A table summarizing and explaining these can be found in the Appendix B. Justification strategies facilitate the gap by helping consumers minimize or even eliminate cognitive dissonance that usually arises from behaving against one's attitude. Neutralization techniques not only moderate the relationship between attitudes and behaviors but are also a determinant that can directly and negatively influence sustainable behaviors.[58]

The plethora of influencing factors

Lastly, a parallel and partly overlapping line of research took a modelling approach and identified potential variables that have a negative effect on behavior and therefore inhibit the translation of pro-environmental and pro-social attitude into actual actions.[59] These variables comprise both individual-related as well as circumstantial factors and change during different phases of the consumption cycle.[60] Since they not only explain the gap between attitude and behavior in particular but also represent obstructive factors of sustainable consumption more broadly, they are discussed as part of the overview of determinants in chapter four.

3. Theoretical foundation

To deeply understand sustainable consumer behavior, not only an awareness of reasons for the distance between attitudes and actions but also a knowledge of how behavior is generally formed is required. There are three classical socio-cognitive behavioral theories originally applied in other fields that have dominated the research agenda of sustainable consumption.[61] Their core statements are described and critically appraised below.

3.1. Theory of Reasoned Action and Theory of Planned Behavior

Ajzen and Fishbein (1980) Theory of Reasoned Action (TRA) revolutionized the comprehension of the link between attitude and behavior by introducing the mediating role of intention.[62] It proposes that behavior is directly determined by an intention to perform the behavior and that this behavioral intention is, in turn, a function of subjective norms (the perceived social pressure of relevant others) and attitude

[49] Cf. Newhouse (1990), p.28; Kollmuss and Afyeman (2002), p.242.
[50] Cf. Carrington et al. (2010), p.141.
[51] Cf. Szmigin, Carrigan, and McEachern (2009), p.229; Heath, O'Malley, Heath, and Story (2016), p.246.
[52] Cf. Heath et al. (2016), p.246.
[53] Cf. Valor and Carrero (2014), p.1119.
[54] Cf. Heath et al. (2016), p.246.
[55] Cf. Chatzidakis et al. (2007), p.89; McDonald, Oates, Thyne, Timmis, and Carlile (2015), p.1504f.; Gruber and Schlegelmilch (2014), p.39.
[56] Cf. Chatzidakis et al. (2007), p.89ff..
[57] Cf. D'Astous and Legendre (2009), p.264; Eckhardt, Belk, and Devinney (2010), p.430ff.; Gruber and Schlegelmilch (2014), p.40f.; McDonald et al. (2015), p.1512ff..
[58] Cf. Chatzidakis et al. (2007), p.95ff.
[59] Cf. Caruana et al. (2016), p.215.
[60] Cf. Mühlthaler and Rademacher. uwf UmweltWirtschaftsForum (2017), p.191.
[61] Cf. Chatzidakis et al. (2016), p.95.
[62] Cf. Hassan, Shiu, and Shaw (2016), p.220.

toward the behavior.[63] In order to account for circumstantial limitations, i.e. when the individual lacks complete volitional control over the behavior, an otherwise identical theory was introduced under the name 'Theory of Planned Behavior' (TPB) which added a further antecedent of behavioral intention, namely Perceived Behavioral Control (PBC).[64] PBC represents the individual's "perceived ease or difficulty of performing the behavior" (Ajzen, 1991, p.188). It is deemed to reflect both the individual's anticipated impediments and past experiences. Not only does it indirectly influence behavior through its effect on intention, but it also has a direct influence on behavior in case it is a reliable predictor of objective behavioral control.[65] The three antecedents of behavioral intentions are underwritten by different kinds of salient beliefs held by consumers as demonstrated in the graphical representation of the TPB below:

As figure 1 illustrates, underlying behavioral, normative and control beliefs (further defined in the graphic) affect the antecedents of intention and can, in turn, vary as a function of a broad spectrum of different background factors.[67] In terms of control beliefs, it might be worth mentioning what perceived self-efficacy and controllability mean. Both are seen as lower-order constructs to PBC. While the former captures a person's belief about their capability to execute a desired action, controllability refers to the extent to which performing the behavior is up to the actor.[68]

Overall, behavior is viewed as a result of weighting costs and benefits (captured in the attitudes) as well as perceived social influence (social norms) and the difficulty of the action. Hence, the TPB regards individuals as utility-maximizing agents, acting rationally and consciously for their own good.[69] Many studies have tested whether the assumptions of TRA and TPB hold true. The results regarding the explanatory power vary significantly, from a mere R2 of 0.0036 for recycling behavior[70] up to 0.84 for voting on a law that ensures a high reuse or recycling rate of bottles[71].[72] Possible reasons for this may be the variation in either the operationalization of the variables or in the types of behaviors the studies tried to explain. Consequently, the two theories were frequently criticized by researchers of sustainable consumer behavior. The presumably most prominent point of criticism is the lack of attention given to understanding normative, affective and habitual dimensions of people's behavior[73] and to contextual factors.[74]

3.2. Norm Activation Theory

As sustainable consumption means acting on behalf of collective beneficial outcomes in the long run, it is unlikely only a rational decision as suggested by the TPB.[75] Thus, pro-social motives might also play a role, which are covered by the Model of Norm Activation (NAM) by Schwartz (1977).[76] Norm activation describes a process in which individuals construct self-expectations with regard to pro-social behavior.[77] According to this less widespread theory, personal norms, conceptualized as "feelings of moral obligation, not as intentions" (Schwartz, 1977, p.227) are the only direct determinants of altruistic actions, such as sustainable consumption practices. Personal norms, in turn, are created by two personality trait activators, namely the awareness of the consequences of performing or not performing a behavior as well as the ascription of responsibility to oneself. Groot and Steg (2009) provided strong empirical evidence that the NAM is a mediator model. According to this conceptualization, a person must be aware of the consequences of a behavior before feeling responsible for it,[78] as shown in figure 2 below.

Studies show empirical support for the NAM,[80] and a meta-analysis revealed that integrating the NAM and TPB is useful, thereby suggesting that sustainable consumption behavior is probably best understood as a mixture of self-interest and pro-social motivations.[81]

3.3. Deficiencies of the TRA, the TPB and the NAM

The abovementioned theories have three shortcomings in common. For one thing, they do not explicitly or sufficiently take into account emotions. For another thing, they do not make allowance for unconscious or habitual actions (for a discussion of their influence see chapter 4.1.3).[82] Lastly, situational factors that intervene during the transition of intentions into actual behavior (see chapter 4.2) are not considered.[83] An attempt to overcome some of these insufficiencies has been made by Guagnano, Stern, and Dietz (1995) in their ABC model, which proposes behavior (B) is an interactive product of attitudinal variables (A) and contextual factors (C). It thus takes both and individual's self-factors and external components into account, such as institutional context and social influence,[84] but it still omits the influence of habits on behavior. Triandis (1977) Theory of Interpersonal Behavior (TIB) is a model that does not suffer from this limitation. According to the TIB, intention – as in the TRA and

63 Cf. Ajzen and Fishbein (1980), p.6.
64 Cf. Ajzen (1991), p.182.
65 Cf. Ajzen (1991), p.188; Bamberg and Möser (2007), p.16.
66 Own illustration based on Ajzen and Fishbein (2005), p. 194ff.
67 Cf. Ajzen and Fishbein (2005), p. 194.
68 Cf. Ajzen (2002), p.672.
69 Cf. Ajzen (1991), p.191ff.; Bamberg and Möser (2007), p.16.
70 Cf. Davies, Foxall, and Pallister (2002), p.70.
71 Cf. Gill, Crosby, and Taylor (1986), p.547.
72 Cf. Hassan et al. (2016), p.224.
73 Cf. Shaw, Shiu, Hassan, Bekin, and Hogg (2007), p.33.
74 Cf. Sutton (1998), p.1335; Carrington et al. (2010), p.148.

75 Cf. van Dam (2016), p.30.
76 Cf. Bamberg and Möser (2007), p.15.
77 Cf. Schwartz (1977), p.223.
78 Cf. Groot and Steg (2009), p. 443.
79 Own illustration based on Schwartz (1977), p.223 and Groot and Steg (2009), p.443.
80 Cf. Harland, Staats, and Wilke (2007), p.328; Onwezen, Antonides, and Bartels (2013), p.149.
81 Cf. Bamberg and Möser (2007), p.21.
82 Cf. Ajzen and FIshbein (2000), p.3ff.; J. Davies et al. (2002), p.98.; Conner, Godin, Sheeran, and Germain (2013), p.264.
83 Cf. Carrington et al. (2010), p.142.
84 Cf. Guagnano et al. (1995), p.701ff..

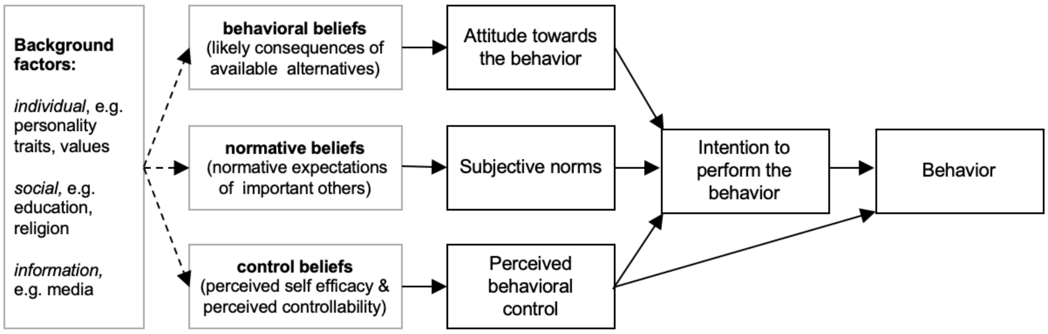

Figure 1: Antecedents of behavior as originally conceptualized in the TPB[66]

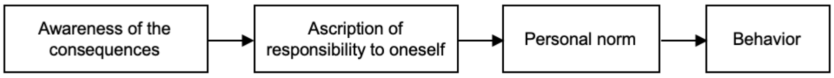

Figure 2: Antecedents of behavior according to the NAM[79]

TPB – is the immediate antecedent of behavior. Critically, habits also mediate behavior, and hence it allows for unconsciousness factors to guide behavior as well. Additionally, the TIB explicitly incorporates the purely emotional factor of "affect", which forms intention together with social factors and attitude.[85] Nevertheless, these two theories are rarely used in the literature on sustainable consumer behavior, which is why they are not discussed in detail here.

What becomes certain from the discussion above, however, is that understanding the behavior of individuals in the field of sustainability is a complex and multifaceted issue, which is influenced by a wide variety of factors. This can be ascribed to the functional and hedonic nature of sustainability and the nuanced and emotional experiences of individuals when dealing with it.[86]

4. Drivers and barriers of sustainable consumption

The following compilation of the academic literature dealing with barriers and drivers of sustainable consumer acts is intended to bring more clarity into this complex topic. The review of the status quo of research was carried out as follows: Synonyms for 'sustainable consumption' and 'attitude-behavior gap' were determined and entered in the search engine of the databases of EBSCOhost and ScienceDirect. Filters concerning the article type and language helped to narrow down the results, whose abstracts were subsequently screened to identify papers that explored individual leisure behavior and discovered drivers or barriers thereof. An additional selection criterion applied was the quality of the article, measured by the ranking of the journal where it was published, which is further elaborated within Appendix F. While reading the filtered articles, a literature table, which can be found in the appendix (Appendices F and G), was created and the bibliographies were screened for additional useful articles. In the end, the results of 118 papers have been incorporated into the overview of determining factors below. The purchasing phase of the consumption cycle lies in the focus of these articles, with buying groceries being a particularly dominant theme.[87] The post-purchase behavior recycling has also received considerable coverage in the literature, with less attention given to behaviors like reduced consumption and its various practices such as repurposing, which describes using a product for something for which it was not initially intended.[88] Further statistics on the key characteristics of the reviewed literature can be found in the appendix (Appendices C, D and E).

The determinants found in the literature review were broadly subdivided into individual-related factors and environmental factors. Within each of these two categories, related determining factors were grouped. No differentiation was made between drivers and barriers in the listing because in the majority of cases, one factor represents both a facilitator and an obstacle, depending on the nature of the manifestation or whether the factor is absent or present (e.g. a consumer's control orientation is a facilitator if he or she has an internal locus of control, whereas it is an inhibitor in case of an external one). Following the written description below, a graphical illustration of the determinants is presented.

[85] Cf. Triandis (1977), page is missing as the source could not be found. Information is therefore assembled from different articles citing Triandis (1977), e.g. Ozaki (2011), p.3.

[86] Cf. Dolan (2002), p.174f.; Schaefer and Crane (2005), p.85.

[87] Cf. Chatzidakis et al. (2016), p.96.

[88] Cf. Tilikidou and Delistavrou (2008), p.61; Scott and Weaver (2018), p. 291.

4.1. Individual-related factors

This category comprises variables that positively or negatively affect consumers' decision-making and behavior from within. They are strongly dependent on the individual but may not be completely detached from external influences.

4.1.1. Socio-demographics

Studies exploring the socio-demographic characteristics of sustainable consumers examined variables like age, income level, educational level, gender, and religiosity, and they provided mixed results.[89] A meta-analysis on responsible environmental behavior found the following correlations between variable and behavior which reflect results of later studies as well: (a) educational level: 0.185, (b) income: 0.162, (c) age: -0.151 and (d) gender: 0.075. For the last two variables, the standard deviation was larger than the correlation itself, indicating a tenuous relationship.[90] Due to the generally inconsistent and thus inconclusive results demographic variables provide, they are said to be of very limited help in understanding the adoption of sustainable practices.[91] Moreover, differences in gender, for instance, were attributed to the underlying personality traits which are typically observed in women vs. men.[92] Consequently, research focused on understanding intrapersonal factors,[93] and the same approach is taken in this thesis. Socio-demographical factors further cannot be changed by promotion measures, which is another reason why they are not elaborated at this point.

4.1.2. Personal characteristics and value orientation

This cluster discusses the character traits and the personal value orientation of consumers, which are two closely interrelated factors and are mostly developed in the early years or are even innate. They do not specifically relate to sustainability but represent the general basic disposition of a person. It follows from this that such determinants are not easily changed by either the individuals themselves or external influences like marketing efforts. However, they are still viewed as important antecedents of a person's decision to act in a sustainable manner[94] and in some cases also as a driver of the translation of attitudes regarding sustainability into behavior, which is why they are discussed below.

Regarding influencing personal characteristics, the following were identified as relevant by researchers:

- Altruism, i.e. active concern for the welfare of others, has a significant positive influence on sustainable consumer behavior.[95] Moreover, altruistic personal values were found to contribute to feelings of guilt after a consumer has opted for the non-sustainable choice,[96] thereby they might indirectly drive sustainable consumption (see section 4.1.3).
- Commitment to one's beliefs in general also increases the likelihood that the consumer follows through on their beliefs regarding sustainability.[97]
- Emotional intelligence also facilitates consuming sustainably as it moderates the effect of environmental engagement on behavior.[98]
- An individual's locus of control, the perception of whether one has the ability to bring about change through their behavior instead of attributing change to chance or powerful others (such as the government) is seen as a driver when the individual has an internal locus of control and viewed as a barrier in case of an external locus of control.[99]
- Long-term orientation was found to positively influence attitudes toward sustainable acts.[100] This might be explained by the fact that sustainability issues involve a long-time horizon, which is, in turn, generally viewed as an inhibitor to the adoption of sustainable practices.[101]
- A person's openness and affinity for new ideas proved to be an essential factor in understanding how attitudes are causally related to sustainable consumer behavior.[102]
- Self-discipline is a trait demonstrated by sustainable consumers in qualitative studies, as it allows them, for instance, to resist the temptation to buy cheap but unsustainable products.[103]

Besides personality traits, the related value orientations and their influence on sustainable consumer behavior have been examined by several researchers and proved to be positively or negatively related to behavior.[104] One of the concordant results of these studies is that egoistic values, also

[89] Cf. Davies et al. (2002), p.84; Rowlands, Scott, and Parker (2003), p.44; Pelsmacker, Janssens, Sterckx, and Mielants (2005), p.522; Grønhøj and Ölander (2007), p.218;Tilikidou and Delistavrou (2008), p.66; Doran (2009), p.559f.; Bateman and Valentine (2010), p.393; Graafland (2017), p.121; Park and Lin (2018), p.5.

[90] Cf. Hines et al. (1987), p.5f..

[91] Cf. Diamantopoulos, Schlegelmilch, Sinkovics, and Bohlen (2003), p.477

[92] Cf. Brough, Wilkie, Jingjing, Isaac, and Gal (2016), p.568.

[93] Cf. Buerke, Straatmann, Lin-Hi, and Müller (2016), p.965.

[94] Cf. E.g. Barbarossa and Pelsmacker (2016), p.229.

[95] Cf. Straughan (1999), p.568; Rowlands et al. (2003), p.45; Pepper, Jackson, and Uzzell (2009), p.133; Song and Kim (2018), p.1162ff..

[96] Cf. Antonetti and Maklan (2014b) p.723.

[97] Cf. Maxwell-Smith, Conway, Wright, and Olson (2018), p.851.

[98] Cf. Kadic-Maglajlic, Arslanagic-Kalajdzic, Micevski, Dlacic, and Zabkar (2019), p.8.

[99] Cf. Hines et al. (1987), p.5; McCarty and Shrum (2001), p.101; Tilikidou and Delistavrou (2008), p.69; Yang and Weber (2019), p.63.

[100] Cf. Leonidou, Leonidou, and Kvasova (2010), p.1337.

[101] Cf. Zaval, Markowitz, and Weber (2015), p.235.

[102] Cf. Grob (1995), p.215; Englis and Phillips (2013), p. 169; Song and Kim (2018), p.1169.

[103] Cf. Shaw, Grehan, Shiu, Hassan, and Thomson (2005), p.194; Johnstone and Tan (2015), p. 316.

[104] See, for instance, Stern and Dietz (1994), p.65ff.; Poortinga, Steg, and Vlek (2004), p.87f..

called self-enhancement or power values, show an inverse relationship to pro-environmental and pro-social attitudes and behaviors. This is because they trigger actions that only take into account oneself and not the others,[105] which stands in contrast with the positive influencing trait altruism. Universalism values also emphasize prosocial concern and are proven to have a favorable influence on sustainable consumer behavior.[106] Interestingly, a study revealed that the predominance of universalism values as opposed to benevolence values, which, however, are similar to universalism values since they are both focused on supporting others, distinguish loyal fair trade consumers from those who buy fair trade only intermittently. This is because universalism values concern all people, whereas benevolence values focus on a person's own group, the so-called in-group.[107] It was concluded that an overriding sense of responsibility to one's in-group prevents some consumers from buying pro-social products as this includes sharing resources with members of one's out-group, for example farmers in remote regions of the world.[108] Other findings in the field of values state that consumers who hold traditional values (e.g. being humble or not having extreme ideas or feelings) have a higher tendency to buy sustainable products than power seekers.[109] Environmentally responsible consumption is also more likely to be shown by consumers holding generativity values (the belief that one's current behavior has consequences for future generations).[110] Furthermore, while materialism is viewed as negatively impacting sustainable consumption in Western countries, the influence for Chinese people is positive, indicating different meanings of materialism between countries and thus cultural differences in sustainable consumer behavior.[111] Other cultural values such as collectivism, which is predominant in Asian countries, showed positive relations to responsible consumption.[112] This is because individuals valuing collectivism are more likely to subordinate their own interests in pursuit of group interests, which might be necessary for sustainable consumer acts.[113] This finding supports the notion that there are differences in sustainable consumer behavior between individuals of disparate cultures.

Related to values is the more concrete concept of personal norms or moral obligations, defined above. Even though it was found by one study that personal norms play no significant role in predicting green food purchases,[114] it is generally seen as an important driver for sustainable behavior,[115] as demonstrated by its key role in the NAM as well.[116] In some cases, consumers even integrate environmental motives into their self-identity, thereby enhancing sustainable consumption behavior[117] since this integration mediates the relationship between values and behavior.[118] However, the aspiration to maintain a positive self-perception can result in the negative effect of self-defensive behaviors such as denigrating others who act more sustainably.[119]

In order to complete the discussion on values, it can be stated that the so-called "consumerism paradigm", which has established in most cultures and thus peoples' values, is another factor that is holding people back from consuming in a sustainable manner. This is due to the paradigm's underlying assumptions that more consumption makes happier, that perpetual growth is what people should strive for and that humans have the right to exploit natural resources.[120] Since consumption is mainly a cultural process and results from norms rather than needs, scientists concluded that a cultural shift to a low consumption paradigm is necessary.[121] This also indicates that individuals are influenced by others in their behavior, as elaborated in section 4.2.3.

4.1.3. Non-cognitive factors

The next cluster has something in common with the preceding one, which is that associated factors cannot easily be changed by marketing measures. Non-cognitive factors are characterized by the fact that consumers are not consciously aware of them and thus are not fully in control of the effects they bring about. Although their contribution is, as aforementioned, underrepresented in the TRA, TPB and NAM,[122] they are of great relevance to actual sustainable consumer behavior, as shown hereinafter.

Emotions

Generally, both positive and negative emotions can not only be an outcome of but also a generator or inhibitor of sustainable behavior.[123] To begin with, it was found that emotional affinity or proximity toward nature enhances the tendency to act pro-environmentally.[124] This feeling is strengthened by past and present experiences in natural environments.[125] From this it can be inferred that the increasing urbanization and the related decrease of time spent in nature may aggravate sustainable behaviors in the future.[126]

[105]Cf. Urien and Kilbourne (2011), p.71.
[106]Cf. Thøgersen and Olander (2002), p.623; Shaw et al. (2005), p.196; Doran (2009), p.559; Thøgersen and Zhou (2012), p.327; Eberhart and Naderer (2017), p.1165.
[107]Cf. Doran (2009), p.559.
[108]Cf. Doran (2010), p.536.
[109]Cf. Vermeir and Verbeke (2008), p.549.
[110]Cf. Urien and Kilbourne (2011), p.69f..
[111]Cf. Dermody et al. (2015), p. 1487.
[112]Cf. Chan (2001), p.404; Leonidou et al. (2010), p.1335.
[113]Cf. Chan (2001), p.392.
[114]Cf. Tanner et al. (2003), p.891.
[115]Cf. Hunecke, Blöbaum, Matthies, and Hoeger (2001), p.844; Davies et al. (2002), p.93; Harland et al. (2007), p.332; Barbarossa and Pelsmacker (2016), p.243.
[116]Cf. Schwartz (1977), p.223.
[117]Cf. Barbarossa and Pelsmacker (2016), p.238; Carfora et al. (2019), p.7.
[118]Cf. Dermody et al. (2015), p.1489.
[119]Cf. Zane and Irwin and Walker Reczek (2015), p.346f..
[120]Cf. Assadourian (2010), p. 189.
[121]Cf. Dolan (2002), p.172ff.; Lorenzoni, Nicholson-Cole, and Whitmarsh (2007), p.456.
[122]Cf. Russell, Young, Unsworth, and Robinson (2017), p.108.
[123]Cf. Gregory-Smith, Smith, and Winklhofer (2013), p.1203.
[124]Cf. Kals, Schumacher, and Montada (1999), p.197; Chan (2001), p.403; Kunchamboo, Lee, and Brace-Govan (2017), p.131.
[125]Cf. Kals et al. (1999), p.193.
[126]Assumption also based on Johnstone and Tan (2015), p.317.

More general negative emotions, such as anger or guilt, are associated with greater intentions to engage in sustainable consumption. However, this intention does not translate into behavior, as results of a survey studying food waste behavior revealed. Participants who experienced more negative emotion when thinking about food waste ended up wasting more food although they intended differently.[127] The same is true for positive anticipated emotions like pride or excitement. A study in the field of saving electricity found that positive anticipated emotions boosted intentions, which did not result in actual saving behavior. It was suggested that this could be grounded in the fact that individuals may think that they can save electricity in the future, which makes not saving in the present forgivable.[128] A second possible explanation is that individuals may want to avoid having to think about the negative situation (like wasting food) and therefore make no effort to change it.[129]

The first explanation already indicates that emotions may play a role in the application of the aforementioned rationalization techniques which are used by consumers after having engaged in a behavior that is not in line with their attitude.[130] Antonetti and Maklan (2014) show that feelings of guilt and pride have an impact on the use of neutralization techniques and the consumer's perceptions of agency and thereby regulate sustainable consumption. More specifically, experiencing guilt and pride forces consumers to recognize the causal link between their own actions and certain sustainability outcomes. As a consequence, their ability to neutralize their sense of personal responsibility decreases, leading to an increased sense of effectiveness in turn and thus to a positive relationship between guilt/pride and intentions to engage in sustainable consumer behavior.[131] Nevertheless, Gregory-Smith et al. (2013) argued that the cognitive dissonance that is usually accompanied by emotions of guilt and regret is relieved by specific strategies (e.g. promising oneself to act differently next time), thereby reducing or even ruining the suggested positive effect of such emotions on future behavior. They additionally found, however, that the experience of positive post-decision emotions like pride or happiness, which arise when the consumer made a choice in line with their beliefs, will reinforce such sustainable decisions in the future.[132]

Furthermore, the meta-analysis of Bamberg and Möser (2007) revealed that feelings of guilt are a significant predictor of the personal moral norm, the immediate determinant of behavior in the NAM.[133] Others found that anticipated emotions form the underlying mechanism through which personal norms guide behavior. They motivate individuals to behave in accordance with their moral standards in order to not only avoid negative emotions, but also to aim for positive ones.[134] This contradicts the finding mentioned above that did not find this enhancing effect of positive anticipated emotions on behavior.[135] The reason why guilt and pride are regarded by some as motivational is because they initiate a process of self-evaluation, i.e. a comparison between the actions of the actual self and those of the 'ideal' self or of the self that others want to see.[136]

Lastly, guilt influences the perception of the ease of performing an action as well as its outcomes. If an individual anticipates stronger feelings of guilt when not acting in a sustainable manner, they tend to view engaging in the sustainable alternative as easier and associate more positive personal consequences with opting for this option.[137]

Habits

The second non-cognitive determinant are habits, which were, to recall, just like emotions proposed to affect behavior in the TIB.[138] They may also be viewed as influences on a person's controllability and thus their PBC, an important determinant of behavior in the TPB.[139] Habits are defined as "relatively stable behavioral patterns" (Verplanken, Aarts, Knippenberg, & Knippenberg, 1994, p. 287) that are executed without deliberate considerations, which means that an automatic response guides them.[140] This requires less cognitive effort than what would be required for conscious reasoning.[141] Hence, habitual behavior may involve selective attention, leading consumers to concentrate on information that confirms their choices and disregard what is not in line with their habits.[142] Since habits tend to be mechanically prompted by contextual and environmental factors, they hinder consumers to switch to an alternative behavior,[143] simply put because they forget that they intended to act differently.[144] Habits were found to play a greater role for low-involvement decisions as consumers tend to put less cognitive effort in such decisions and are thus more vulnerable to acting automatically.[145] This can have both a negative and a positive effect, depending on whether the habit at issue is a sustainable one. The inhibiting role of habit on sustainable consumption was observed in several studies.[146] Nevertheless, if the established habit is a sustainable one, habitual

[127] Cf. Russell et al. (2017), p.111.
[128] Cf. Wang, Lin, and Li (2018), p.177.
[129] Cf. Russell et al. (2017), p.12.
[130] Cf. Chatzidakis et al. (2007), p.97; Bray, Johns, and Kilburn (2011), p.603.
[131] Cf. Antonetti and Maklan (2014b), p.129.
[132] Cf. Gregory-Smith et al. (2013), p.1214f.
[133] Cf. Bamberg and Möser (2007), p. 21.
[134] Cf. Onwezen et al. (2013), 150f..
[135] Cf. Wang et al. (2018), p.177.
[136] Cf. Gregory-Smith et al. (2013), p.1203.
[137] Cf. Bamberg and Möser (2007), p.21.
[138] Cf. Triandis (1977), page is missing for the reason explained above.
[139] Cf. Carrington et al. (2010), p.146.
[140] Cf. Verplanken et al. (1994), p.287.
[141] Cf. Welsch and Kühling (2009), p.173.
[142] Cf. Steg and Vlek (2009), p.312.
[143] Cf. Verplanken and Wood (2006), p.93.
[144] Cf. Carrington et al. (2010), p.144; Yeow, Dean, and Tucker (2014), p.97.
[145] Cf. J. Davies et al. (2002), p.70; Tarkiainen and Sundqvist (2009), p.858f; Young, Hwang, McDonald, and Oates (2010), p.26; Torma, Aschemann-Witzel, and Thøgersen (2018), p.143.
[146] Cf. Thøgersen (1994), p. 259; Jansson, Marell, and Nordlund (2010), p.365; Young et al. (2010), p.26; Bray et al. (2011), p.601; Wiederhold and Martinez (2018), p.425; Hiller and Woodall (2019), p.902.

behavior is beneficial since a once formed habit supports future sustainable actions.[147] The difficulty here, however, is the time required to establish new habits or change old ones.[148]

Besides habits, mere past experiences with a sustainable action were also found to increase the likelihood of executing it again.[149] Research even suggested that sustainable behavior in one area has the potential to leak into other areas.[150] This means that individuals who perform one type of sustainable behavior are more likely to engage in another type as well.[151] This so-called 'spillover-effect' is found to be only of moderate size and contingent on how closely the behaviors are associated in a consumer's mind.[152] For instance, low-involvement consumption practices were not found to spillover to high-involvement behaviors.[153] Habit is expected to be a reason for this limited effect as it decreases the likelihood that behaving sustainably in one area makes the consumer reflect on their behaviors in other domains.[154] Another line of reasoning is provided by Phipps et al. (2013), who suggest that a licensing effect, which was observed in studies conducted in similar fields, could occur in sustainable consumption too. This effect describes a phenomenon where individuals who consume sustainably do the opposite later on as they treat the previous sustainable behavior as an excuse.[155] One study already points to such an effect as they identified a few negative cross-lagged effects between buying organic food and recycling. This can be viewed as an indicator that the performance of a sustainable action reduces the propensity to behave sustainably in other areas.[156]

However, there are two techniques to limit the negative power of habits and turn them into drivers for sustainable consumption. Firstly, habits can be changed by small triggers at the point of behavior implementation. For instance, a sign which reads a request to only use one paper towel to dry one's hands lead to a significant reduction in towel use among participants of a study.[157] Nevertheless, it was also observed that when participants are faced with threatening prospects about the future and personal fallout thereof, they fall back into their environmentally harmful habits, even when these are in fact normatively inconsistent.[158] This already gives an indication that how a message is framed plays an important role, which will be discussed as part of chapter 4.2.2. Secondly, the formation of implementation intentions by the consumer, i.e. an if-then plan that describes when, where and how their intentions will be realized as actual behavior,[159] can help individuals to change their habits to more sustainable ones.[160] In case of purchasing responsibly, for instance, forming plans helps not only to limit the influence of habitually buying non-sustainable products but also to resist spontaneous purchases.[161]

Both emotions and habits are powerful in guiding consumers' behaviors and also contribute to the attitude-behavior gap.[162] It was found that the attitude-behavior link is stronger when habits are weak or absent[163] and that emotions can override expressed attitudes.[164]

4.1.4. Cognitive factors

In contrast to the previous cluster, this one comprises factors that involve intellectual activity of the consumer.

Awareness, knowledge and concern

Although a study showed that subjects who were aware of the consequences their behavior has acted more responsibly,[165] most researchers are in agreement that only a small part of sustainable behavior can be directly linked to awareness.[166]

A concept closely tied to and difficult to clearly distinguish from awareness is environmental knowledge. In some cases, it has been conceptualized as a subcategory of environmental awareness.[167] While some studies showed a positive relation between knowledge and sustainable actions,[168] others came to the conclusion that knowledge only plays a minor role.[169] This inconsistency might be attributed to the different operationalizations and interpretations of knowledge in the context of sustainable consumption. It either covers knowing definitions, causes or consequences of environmental and social problems (factual knowledge) or being familiar with how to take action on them (action-related knowledge or task-specific knowledge).[170] In contrast to factual knowledge, action-related knowledge is more likely to have an impact on behavior.[171] It refers, for instance, to the ability to distinguish sustainable products from the less environmentally friendly ones. This was found to be a driving factor of responsible purchasing,[172] whereas a lack of this ability rep-

[147] Cf. Welsch and Kühling (2009), p.173; Russell et al. (2017), p.12; Wang et al. (2018), p.177.
[148] Cf. Thøgersen (1994), p.159; Verplanken and Wood (2006), p.100.
[149] Cf. Vassallo, Scalvedi, and Saba (2016), p.430; Carfora et al. (2019), p.6.
[150] Cf. Thøgersen and Ölander (2003), p.234.
[151] Thøgersen and Ölander (2003), p.234; Tilikidou and Delistavrou (2008), p.72; Barbarossa and Pelsmacker (2016), p.241; Romani, Grappi, and Bagozzi (2016), p.262.
[152] Cf. Thøgersen and Ölander (2003), p.234.
[153] Cf. Moraes, Carrigan, Bosangit, Ferreira, and McGrath (2017), p.531.
[154] Cf. Thøgersen and Ölander (2003), p.234.
[155] Cf. Phipps et al. (2013), p.1229.
[156] Cf. Thøgersen and Ölander (2003), p.234.
[157] Cf. Buttlar et al. (2017), p.156.
[158] Cf. Buttlar et al. (2017), p.159.
[159] Cf. Gollwitzer and Sheeran (2006), p.82.
[160] Cf. Carrington, Neville, and Whitwell (2014), p.2764; Grimmer, Kilburn, and Miles (2016), p.1585.
[161] Cf. Carrington et al. (2014), p.2764.
[162] Cf. Gregory-Smith et al. (2013), p.1202; Carfora et al. (2019), p.6.
[163] Cf. Verplanken et al. (1994), p.296; Carfora et al. (2019), p.6.
[164] Cf. Gregory-Smith et al. (2013), p.1202.
[165] Cf. Buerke et al. (2016), p.979.
[166] Cf. Kollmuss and Afyeman (2002), p.250.
[167] Cf. Grob (1995), p.209; Kollmuss and Afyeman (2002), p.248.
[168] Cf. Hines et al. (1987), p.3; Tanner et al. (2003), p.893; Mostafa (2007), p.460.
[169] Cf. Grob (1995), p.215, Vainio and Paloniemi (2014), p.25.
[170] Cf. Hines et al. (1987), p.3; Tanner et al. (2003), p.886.
[171] Cf. Tanner et al. (2003), p.886.
[172] Cf. Shaw and Clarke (1999), p.115; Pelsmacker and Janssens (2007), p.374; D'Astous and Legendre (2009), p.263; Young et al. (2010), p.29; Moraes et al. (2017), p.535.

resented an inhibitor.[173] A study on the reasons for never buying green products showed that 70% of respondents lack understanding of the scope of green products and their characteristics and do not buy them as a consequence.[174] Hence, the dearth of knowledge about how to perform a particular sustainable behavior or what the most sustainable action in which to engage in is, represents an important barrier to its adoption.[175] However, this is a problem that can, in some cases, not simply be solved by the acquisition of more information. Longo et al. (2019) revealed the contrasting and paradoxical role knowledge plays in sustainable consumption. They discovered that having great knowledge can also be a source of dilemma, tension and paralysis and can thus disempower consumers in their choice to consume sustainably. For example, combining both social and environmental principles in one single purchasing option can be challenging since there exist trade-offs between these two dimensions (e.g. fair-trade wine from a distant country vs. a non-fair-trade one from a local vineyard). Moreover, knowledge can contribute to feeling inescapably trapped in unsustainable practices, which may cause tension for the individual.[176] This finding also indicates that the dysfunctional nature of consumer knowledge may partly be a result of the impacts caused by information overload and complexity common in the present times.[177]

There is one last interesting discovery concerning consumers' knowledge. Information on the sustainability of products or services is sometimes willfully ignored in order to avoid negative emotions when making unethical consumption decisions. A study found that respondents who cared about the underlying ethical issue were the least likely to request and use environmental attribute information when they made their purchase decisions so that they can justify their unethical purchase by defensively claiming ignorance.[178]

A concept that shares commonalities with awareness and knowledge is concern, whereby the most important distinguishing factor is said to be the association of concern to emotions. While environmental knowledge is more about the cold facts of environmental problems, environmental concern brings about feelings of personal involvement and thus marks a step forward from merely being aware.[179] Although the two constructs are distinct from one another and people can be concerned with issues they have incomplete or no knowledge about,[180] they are positively correlated.[181] In terms of environmental concern being a driver for sustainable behavior, studies delivered mixed results, with some claiming it is an important driver,[182] while others did not see concern translating into behavior.[183] Inconsistent findings may be grounded in the different interpretations of the term and measurement scales used. Environmental concern is not simply ranging from low to high but is a multi-dimensional construct (concern for the self, other people or the biosphere), and it can either refer to a specific issue or to the environment in general.[184] As mentioned above in terms of general and specific attitudes, the specificity of the concern also determines its influence. It should be viewed as an important indirect rather than a direct driver of specific behavior.[185] It was argued that there are variables mediating the relationship between concern and behavior (e.g. perceived marketplace influence, see below), indicating that concern may be a necessary but not a sufficient requirement for engagement in sustainable consumption.[186]

Sense of personal responsibility

Another factor that drives sustainable consumption acts is a heightened sense of personal responsibility for environmental or social problems.[187] This is also reflected by the NAT as it views the denial of responsibility as restricting the emergence of personal norms that guide behavior.[188] The inhibiting role of denial of responsibility on behavior was empirically found to be true by researchers.[189] One argument for not feeling personally responsible is the reliance on institutions to take care of such issues (see also Appendix B).[190]

Perceived Consumer Effectiveness (PCE)

A concept very similar to the above mentioned locus of control is a consumer's perceived effectiveness (or efficacy) of consumption decisions, which is domain-specific and refers to the context of consumerism in particular.[191] It describes to what degree a consumer believes that their personal efforts can have an impact on the environment,[192] and it is similar to the concept of self-efficacy (SE). The same set of beliefs

173Cf. Shaw and Clarke (1999), p.155; Bray et al. (2011), p.602; Papaoikonomou, Tyan, and Ginieis (2011), p.83; Lin and Chang (2012), p.16; Gabler, Butler, and Adams (2013), p.168; Gleim, SMith, Andrews, and Cronin (2013), p.57; Eberhart and Naderer (2017), p.1163.

174Cf. Lin and Chang (2012), p.16.

175Cf. Thøgersen (1994), p.145; Tanner et al. (2003), p.893; Longo, Shankar, and Nuttall (2019), p.762.

176Cf. Shaw and Clarke (1999), p.113; Longo et al. (2019), p.769ff..

177Cf. Carrigan and Attalla (2001), p.573; Bray et al. (2011), p.602; Longo et al. (2019), p.762.

178Cf. Ehrich and Irwin (2005), p.175f.

179Cf. Vainio and Paloniemi (2014), p.25.

180Cf. Pagiaslis and Krontalis (2014), p.346.

181Cf. Chai, Bradley, Lo, and Reser (2015), p.101.

182Cf. Kilbourne and Pickett (2008), p.891; Mobley, Vagias, and Deward (2010), p.436; Lin and Chang (2012), p.15; Pagiaslis and Krontalis (2014), p.345; Vainio and Paloniemi (2014), p.25.

183Cf. Alwitt and Pitts (1996), p.60; Roberts (1996b), p.82; Mainieri, Barnett, Valdero, Unipan, and Oskamp (1997), p.200; Straughan (1999), p.570; Dermody et al. (2015), p.1485.

184Cf. Schultz, Nolan, Cialdini, Goldstein, and Griskevicius (2007), p.397.

185Cf. Alwitt and Pitts (1996), p.60; Bamberg (2003), p.21.

186Cf. Leary, Vann, Mittelstaedt, Murphy, and Sherry (2014), p.1596.

187Cf. Tilikidou and Delistavrou (2008), p.72; Luchs, Phipps, and Hill (2015), p.1455.

188Cf. Schwartz (1977), p.230.

189Cf. Blake (1999), p.266; Lorenzoni et al. (2007), p.452.

190Cf. Eckhardt et al. (2010), p.431.

191Cf. Hines et al. (1987), p.4f.; Ellen, Wiener, and Cobb-Walgren (1991), p.103.

192Cf. Park and Lin (2018), p.2.

is measured in this context by some researchers,[193] although SE is more concerned with the ability to perform a task rather than influencing the underlying outcome.[194] As intuition suggests, PCE/SE promotes sustainable consumption, or its absence inhibits it, a phenomenon that has been empirically proven by numerous researchers.[195] Furthermore, PCE is enhanced by guilt and pride as discussed above.[196]

PCE is not to be confused with PBC, although not all studies make a clear distinction between these two.[197] As PBC is one of the key components of the TPB, it has proven to be an important driver of sustainable behavior or a barrier in case of its absence by numerous studies.[198]

Another concept related to agency and thus similar in nature to PCE is the perceived marketplace influence, defined as the belief that the own sustainable actions actively influence the marketplace behavior of other consumers and organizations. The belief in marketplace influence was revealed to play a crucial role in transforming a consumer's environmental concern into actual actions, as mentioned above.[199]

Perceived lack of urgency and advantageousness

The last factor is not of the same level of concreteness as the ones mentioned above, but it can still be a reason why consumers do not act in a sustainable manner. The elusive nature of sustainability can lead to the unfavorable perception that sustainable actions are not urgent or advantageous. The consequences of sustainable behavior lie in the future and are uncertain, abstract and difficult for the consumers to grasp.[200] Furthermore, these consequences may merely be indirect, which promotes doubts about the effectiveness and thus negatively influences the implementation of behavior.[201] What also contributes to the inability to realize the necessity of sustainability is that consumers have not experienced the negative consequences of unsustainable actions first-hand.[202] An exploratory study found that when individuals were personally affected by an environmental problem, they were more likely to change their behavior in a more sustainable direction. The same was true when current news forced informants to contemplate about a negative issue, indicating that they were thereby reminded of the urgency to act.[203] The role of personal affectedness on behavior was confirmed by a quantitative study, where the subjects behaved more environmentally friendly when they were emotionally affected by the damage to the environment.[204]

4.2. Environmental factors

The second major category describes external forces from the environment of the consumer that have an influence on their sustainable consumption behaviors in either a positive or negative respect. The three behavioral theories explained above do not include such contextual factors sufficiently. The construct of PBC, as included in the TPB, merely captures the individuals' perceptions of contextual factors.[205] The identified environmental factors can be divided into four clusters: product, service or behavior-related factors, corporate activities, social influence and structural conditions. All are subsequently discussed.

4.2.1. Product, service or behavior-related factors

This cluster includes determinants that stem from the sustainable product or service per se or the implementation of a particular sustainable behavior, which is why they do not apply to every sustainable consumption act.

Cost of consumption

Price is a factor that is particularly present when purchasing sustainable products or services and is proving to be a controversial issue. While consumers commonly state that the higher prices of sustainable products or services inhibit their consumption,[206] some studies showed that it is not a barrier.[207] Thus, it was argued that price is not an obstacle per se, but it arises as one when consumers are financially constrained[208] or if they are particularly price sensitive.[209] This was proven by a qualitative study, which found that consumers experiencing economic difficulties more frequently mention price as a barrier.[210] This indicates an intersection of the environmental factor price with the individual's perception about whether the higher price for a sustainable product or service is justified or not. The perception of consumers about the economic profitability of sustainable products was shown to be disadvantageous. Some consumer assume that sustainable products are generally more expensive than 'regular' ones and therefore infer that they will not be able to afford them, even when this is, in fact, not always true.[211] Others do not take into account future cost savings

[193] Cf. Rice (2006), p.375; Hanss and Böhm (2013), p.55.
[194] Cf. Bandura (1977), p.193.
[195] Cf. Webster (1975), p.195; Roberts (1996a), p.224; Straughan (1999), p.570; Rowlands et al. (2003), p.45; Webb, Mohr, and Harris (2008), p.97; Gupta and Ogden (2009),p.386; Gabler et al. (2013), p.165; Lin and Hsu (2015), p.336; Wiederhold and Martinez (2018), p.426; Joshi and Rahman (2019), p.241.
[196] Cf. Antonetti and Maklan (2014), p.129.
[197] See, for example Gabler et al. (2013), p.161.
[198] Cf. Bamberg and Möser (2007), p.20.
[199] Cf. Leary et al. (2014), p.1597.
[200] Cf. McCarty and Shrum (2001), p.93; Spence, Poortinga, and Pidgeon (2012), p.7ff.; Trudel (2018), p.88.
[201] Cf. Eberhart and Naderer (2017), p.1163.
[202] Cf. Ozaki (2011), p.13; Johnstone and Tan (2015), p.320; Eberhart and Naderer (2017), p.1162.
[203] Cf. Bray et al. (2011), p.601f..
[204] Cf. Grob (1995), p.215.
[205] Cf. Steg and Vlek (2009), p.312.
[206] Cf. Carrigan and Attalla (2001), p.569; Hunecke et al. (2001), p.845; Bray et al. (2011), p.601; Ozaki (2011), p.11; Öberseder, Schlegelmilch, and Gruber (2011), p.455; Papaoikonomou et al. (2011), p.84; Gleim et al. (2013), p.52; Han, Seo, and Ko (2017), p.165; Papista, Chrysochou, Krystallis, and Dimitriadis (2018), p.108; Wiederhold and Martinez (2018);
[207] Cf. Thøgersen (1994), p.159; Tanner et al. (2003), p.893; Lin and Chang (2012), p.17.
[208] Cf. Cherrier, Szuba, and Özçağlar Toulouse (2012), p.13; Valor and Carrero (2014), p.1115.
[209] Cf. Gleim et al. (2013), p.52; Janssen (2018), p.26.
[210] Cf. Valor and Carrero (2014), p.1115.
[211] Cf. Öberseder et al. (2011), p.455.

that sustainable products with an initially higher price provide.[212] A reason for this unfavorable perception is that in some consumers' minds, ethics and business are two separate dimensions and they therefore assume that sustainable practices must involve higher costs.[213]

Besides the monetary costs, there are other resources a person has to spend on the consumption, such as the time and effort needed throughout the whole consumption cycle. The higher amount of effort needed to engage in the sustainable behavior and the inconvenience this entails is naturally a barrier to its adoption.[214] Again, it depends not only on the objective costs of engaging in the behavior but also the perception of the individual's personal inconvenience involved.[215] Other decisive factors are the amount of time engaging in a sustainable behavior requires and how much time an individual has at one's disposal.[216] It was shown that a lack of discretionary time prevents consumers from developing preferences that are in line with their underlying environmental concerns, and an increase in discretionary time enhances sustainable consumption behaviors and also reduces the attitude-behavior gap.[217]

A less researched topic is the cost involved in changing from one product, service or behavior to another one, so-called switching costs, such as search effort or performance risk.[218] While one study on this topic found no significant effect of switching costs on customer value,[219] another one revealed that the inconvenience of switching to a green energy tariff and uncertainty about its performance is a barrier to its adoption.[220]

While cost of consumption is often mentioned in the reviewed literature, hardly any benefits connected to the sustainability of consumption occur. The exception to this is the enjoyment consumers find in repurposing products.[221]

Performance, stereotypes and image

The issue with the quality of sustainable products and services varies among different categories and is very intricate. Firstly, despite a few respondents commenting on the better quality of sustainable products, for instance in terms of naturalness and healthiness of organic food or clothing,[222] others stated perceptions of lesser quality,[223] e.g. with regard to the design of clothing[224] or effectiveness of cleaning products.[225]

The latter might be explained by the following finding: Sustainable products are associated with gentleness-related attributes by consumers, while less sustainable alternatives are associated with strength-related attributes.[226] This effect of gentleness works against perceptions of effectiveness and competence, and as a consequence, sustainability is found to be unfavorable when consumers are looking for strength-related products (i.e., where benefits such as power and durability are in the foreground, like for cleaning products). In contrast, when gentle attributes (e.g. baby shampoo) are searched for, consumers prefer sustainable products. This shows that the product category, or more precisely the related degree to which strength is valued in a given category, determines if negative product quality impressions are triggered and thus whether the sustainability of the product is seen as advantageous or not.[227] An implicitly or explicitly held negative perception decreases the likelihood of purchasing sustainable products.[228] It also results in an increase of the amount of sustainable product used to gain a desired result, for instance to make something clean.[229] While one study found that environmentally conscious consumers are more likely to display this usage pattern,[230] another one showed that increased interest in sustainability can reduce the negative perception of a sustainable product, albeit the implicit negative associations remain.[231] Moreover, this study observed that consumers are more likely to opt for the conventional instead of the sustainable option in case of impulse choices or in case the consumers are unobserved.[232] This supports the prior discussed finding that low-involvement or habitual behavior is more prone to unsustainability and indicates that the visibility of actions might have an influence (see also below). Interestingly, even the presence of very fundamental human needs, such as hunger, were found to affect stereotypical perceptions of sustainable products in a negative way. Food deprivation unconsciously alters the implicit associations concerning sustainability, i.e. the products' gentleness, and consequently leads to less sustainable purchase decisions.[233]

As with the previously stated assumption that sustainability comes with higher costs, consumers were also found to have the impression that sustainability must be compensated by inferiority in other dimensions such as the product's quality, especially when companies deliberately consider sustain-

[212]Cf. Gleim et al. (2013), p.46.
[213]Cf. Davies et al. (2012), p.45.
[214]Cf. Carrigan and Attalla (2001), p.570; McCarty and Shrum (2001), p.101; Tilikidou and Delistavrou (2008), p.69; Young et al. (2010), p.26; Gleim et al. (2013), p.48; Barbarossa and Pelsmacker (2016), p.240; Johnstone and Tan (2015), p.316; Papista et al. (2018), p.108.
[215]Cf. Barbarossa and Pelsmacker (2016), p.239.
[216]Cf. Carrigan and Attalla (2001), p.573; Tanner et al. (2003), p.893; Young et al. (2010), p.25.
[217]Cf. Chai et al. (2015), p.105.
[218]Cf. Papista et al. (2018), p.108.
[219]Cf. Papista et al. (2018), p.108.
[220]Cf. Ozaki (2011), p.9ff..
[221]Scott and Weaver (2018), p.303.
[222]Cf. Bray et al. (2011), p.602; Thøgersen and Zhou (2012), p.327; Janssen (2018), p.26.
[223]Cf. Bray et al. (2011), p.602; Lin and Chang (2012), p.133; Newman, Gorlin, and Dhar (2014), p.834; Eberhart and Naderer (2017), p.1163; Han et al. (2017), p.165; Wiederhold and Martinez (2018), p.424; Kushwah et al. (2019), p.10.
[224]Cf. Wiederhold and Martinez (2018), p.426.
[225]Cf. Lin and Chang (2012), p.133.
[226]Cf. Luchs et al. (2010), p.21.
[227]Cf. Luchs et al. (2010), p.22ff..
[228]Cf. Mai, Hoffmann, Lasarov, and Buhs (2019), p.672.
[229]Cf. Lin and Chang (2012), p.132.
[230]Cf. Lin and Chang (2012), p.132.
[231]Cf. Mai et al. (2019), p.669.
[232]Cf. Mai et al. (2019), p.671.
[233]Cf. Hoffmann, Mai, Lasarov, Krause, and Schmidt (2019), p.100f.

ability aspects in their products in order to enhance them.[234] Once again, this highlights the intersection of external stimuli and the perceptions of the individual.

Apart from the stereotype that sustainable products are less strong and effective, there also exists the stereotype that being environmentally friendly is unmanly.[235] This often keeps men from buying sustainable products as they want to preserve their gender identity.[236] In addition, it was recognized that users of responsible brands are perceived as stereotypically warm, which diminishes feelings of envy and weakens the desire to emulate such consumers.[237] Another study discovered that consumers generally have an unfavorable perception of sustainable consumers, also called social-stigma, which prevents consumers from engaging in such behaviors.[238] This points to the importance of social influence, further discussed below. However, as with almost all determinants so far, this one does not come without contradictions: With regard to organic food, Kushwah et al. (2019) could not find evidence for an image barrier.[239]

4.2.2. Corporate activities

While companies or institutions cannot eliminate the information overload, whose negative effect on knowledge is discussed above, they can influence how and what information they present. This is particularly important as deficient credibility was also discovered to hinder sustainable consumption.[240] However, providing credible information in an adequate amount is not a simple task. Sustainability claims and other communication on this subject, for example about a company's social responsibility, are generally approached with mistrust and skepticism.[241] This influences how consumers perceive and judge sustainable offerings and thus also their behavior.[242] Trustworthy and clear information was found as a driver for sustainable consumption and can, for example, be provided via labels. This helps to reduce the cognitive effort of a consumer's decision[243] and was found to be especially effective for low-involvement decisions where consumers are less motivated to carefully evaluate information. A sustainable appeal can then act as a prominent and easily accessible trigger to opt for the sustainable product.[244] Indeed, a more complete, easily interpretable and standardized label was observed to promote eco-friendly consumption.[245] This applies at least to the purchase of groceries, as consumers were found to use their personal networks as a source of information for higher-involvement decisions.[246] Furthermore, it was observed that the European government and non-governmental organizations like Greenpeace are the most trusted issuers of such labels. This shows that effective communication requires collaboration between companies and institutions.[247] Apart from this, technology and more specifically green mobile apps proved to be another method for consumers to acquire information and thereby foster sustainable purchasing.[248]

Generally, research showed that a company's communication efforts can alter consumers' behaviors in a more sustainable direction. An exemplary measure to be mentioned is that of a retailer which presented standard food waste reduction messages to its consumers via different conventional communication channels (e.g. social media and in-store demonstrations) and thereby decreased the consumers' food waste.[249] Companies should, however, be careful in their message framing as this has an effect on the consumers' reaction and in turn the behavior. While negatively framed messages are more effective than positively framed ones due to the shame it elicits in consumers,[250] too assertively phrased messages can have a negative impact on consumers' behavior, depending on the importance the message recipient attaches to the behavior at stake.[251]

Besides the fact that companies can be enablers of sustainable consumer behavior, they can also represent a reason why an individual does not consume in a sustainable manner. This is the case when brand loyalty to an unsustainable company prevents a consumer from switching to a sustainable alternative.[252] In case of small electrical appliances, for instance, it was found that the brand is given priority over sustainability criteria.[253] However, the power that companies possess in this context may offer an opportunity, as individuals might consume in a more sustainable manner if a company to which they are loyal eliminates unsustainable products and services from their assortment.

4.2.3. Social influence

Much of consumption decisions are not made in isolation but also take into account the needs, desires and expectations of others, such as family members, friends, community members and even the general public.[254] How this variety of actors can impact a person's behavior is explained below.

For one thing, there is the influence on an interpersonal level that comes from close persons like family and friends.[255]

[234] Cf. Newman et al. (2014), p.834.
[235] Cf. Shang and Peloza (2015), p.140; Brough et al. (2016), p.579.
[236] Cf. Brough et al. (2016), p.579.
[237] Cf. Antonetti and Maklan (2016), p.797.
[238] Cf. Johnstone and Tan (2015), p.319f..
[239] Cf. Kushwah et al. (2019), p.11.
[240] Cf. Papaoikonomou et al. (2011), p.83.; Pelsmacker and Janssens (2007), p.374; Antonetti and Maklan (2014b), p.729.
[241] Cf. Bray et al. (2011), p.603; Öberseder et al. (2011), p.456; Gleim et al. (2013), p.47; Rettie, Burchell, and Banham (2014), p.13; Johnstone and Hooper (2016), p. 824.
[242] Cf. Pelsmacker and Janssens (2007), p.364; Bray et al. (2011), p.603; Öberseder et al. (2011), p.457.
[243] Cf. Young et al. (2010), p.26f..
[244] Cf. Rahman (2018), p.402.
[245] Cf. Vlaeminck, Jiang, and Vranken (2014), p.187f..
[246] Cf. McDonald, Oates, Thyne, Alevizou, and McMorland (2009), p.143.
[247] Cf. Pelsmacker et al. (2005), p.524.
[248] Cf. Perera, Auger, and Klein (2018), p.850.
[249] Cf. Young, Russell, Robinson, and Chintakayala (2018), p.11ff..
[250] Cf. Amatulli, De Angelis, Peluso, Soscia, and Guido (2019), p.1125.
[251] Cf. Kronrod, Grinstein, and Wathieu (2012), p.100.
[252] Cf. Bray et al. (2011), p.605; Papaoikonomou et al. (2011), p.80; Gleim et al. (2013), p.48.
[253] Cf. McDonald et al. (2009), p.140.
[254] Cf. Cherrier et al. (2012), p.28; Gleim et al. (2013), p.46.
[255] Cf. Trudel (2018), p.91.

The most common theme in the literature relating thereto seems to be the phenomenon of subordinating one's own sustainable intentions to the opinions or wishes of family and friends. Essentially, interacting with people that do not share one's sustainable principles and might not even show understanding for them represented an inhibitor to the pursuit of one's sustainable practices in several studies.[256] Examples of this include buying unsustainable products because one's partner enjoys them, one's children refuse to consume alternatives, or flying to a family gathering one is expected to join.[257] As already described in paragraph 2.2.2, the difference in the wishes and attitudes of close others and of one's self can contribute to the gap between attitude and behavior. However, significant others can also be a driver of sustainable consumption,[258] for instance in case of adolescents, who are found to be more inclined to act pro-environmentally when their parents visibly do so.[259]

For another thing, unrelated others, not necessarily belonging to one's group affiliation, can have an impact on a consumer's behavior.[260] This mostly takes the form of social norms, which are "unwritten rules developed through shared interactions of a social group that govern social behavior" (Trudel, 2018, p.91). Studies have demonstrated the usefulness of social norms to affect behavior across several different domains, including reusing towels in hotels[261], composting[262], reducing household energy consumption[263] and purchasing sustainable food[264]. Social norm was also shown to have an impact on attitude and PCB, as it is used by consumers for judgements of how easy and advantageous the performance of a specific action would be.[265] While research collectively shows the persuasive power of social norms, it is of importance to note that the success depends on what type of and how social norm is applied. The first type are descriptive norms, which describe what most people do in a situation. The second type are injunctive norms, which characterize what others think one should be doing, indicating which behaviors commonly receive approval or disapproval.[266] It is best to align these two types,[267] demonstrated by the results of the following study, which tested the effect of normative appeals on household energy reduction: The messages sent differed depending on whether the household's energy consumption was above or below average. While providing above-average households with descriptive norm information led to a decrease of consumption, the same descriptive norm information increased consumption in below-average households. However, adding an injunctive norm conveying approval of their low energy consumption eliminated this negative effect.[268] Furthermore, it was found that the effectiveness of descriptive norms also depends on the reference group mentioned in the appeal sent. It works best to refer to the norms of the consumer's local setting and circumstances. e.g. individuals that stayed in the specific hotel room before the consumer's own stay.[269] A third factor that possibly influences how strong social norm affects a consumers' behavior is whether the action at issue is visible to others and whether it is in the individual's hands only, such as saving energy or wasting food at home.[270]

Another observation worth mentioning in connection with social influence is the process of social normalization and how it shapes consumer's behavior. Rettie et al. (2014) discovered that consumers' perception of what a 'normal' behavior is influences its adoption. Consumers are reluctant to behave in a way that is not considered as 'normal' and, conversely, are more likely to engage in activities that are deemed mainstream. This contributes to understanding why some unsustainable behaviors are difficult to change: they are taken for granted and are not questioned due to the perception that they are just 'normal' and part of modern life, such as driving a car.[271]

Apart from the influence caused by family, friends or unrelated others, there is a third way by which other people can affect somebody else's sustainable behavior, this time a positive one only. Research found that online communities of likeminded consumers can reinforce sustainable consumption, especially due to informational benefits (e.g. provision of answers to common questions or sharing of practical tips and ideas on sustainable consumption).[272] From this it can be deduced that influencers who promote sustainability could drive sustainable consumer behavior in a similar vein.

4.2.4. Structural conditions

The final cluster addresses determinants over which neither the individual companies nor the consumer alone can exert influence because they deal with public policy, infrastructure and today's lifestyle. Collective action and collaboration between different stakeholders are necessary to make changes to these barriers and turn them into drivers.

It was argued that structural issues are creating a dependence on unsustainable consumption practices. It is suggested that several factors contribute toward this lock-in, including living and working conditions as well as public policy.[273] Thus, governments are responsible for part of the external circumstances that restrict a consumer's freedom of

[256] Cf. Papaoikonomou et al. (2011), p.84; Szmigin et al. (2009), p.228; Cherrier et al. (2012), p.19; Johnstone and Tan (2015), p.318; McDonald et al. (2015), p.1513.
[257] Cf. Szmigin et al. (2009), p.228; Cherrier et al. (2012), p.19; Papaoikonomou et al. (2011), p.85.
[258] Cf. Yeow et al. (2014), p.91.
[259] Cf. Grønhøj and Thøgersen (2012), p.299.
[260] Cf. Trudel (2018), p.91.
[261] Cf. Goldstein, Cialdini, and Griskevicius (2008), p.479.
[262] Cf. White and Simpson (2013), p.78.
[263] Cf. Schultz et al. (2007), p.432; Ozaki (2011), p.12.
[264] Cf. Gleim et al. (2013), p.53; Vermeir and Verbeke (2006), p.187.
[265] Cf. Bamberg and Möser (2007), p .22.
[266] Cf. Cialdini (2003), p.105.
[267] Cf. Cialdini (2003), p.105.
[268] Cf. Schultz et al. (2007), p.432.
[269] Cf. Goldstein et al. (2008), p. 479.
[270] Cf. Russell et al. (2017), p.108f.; Wang et al. (2018), p.178.
[271] Cf. Rettie et al. (2014), p.12ff..
[272] Cf. Gummerus, Liljander, and Sihlman (2017), p.459f..
[273] Cf. Sanne (2002), p.273; Prothero et al. (2011), p.33; Banbury, Stinerock, and Subrahmanyan (2012), p.503; Di Giulio et al. (2014), p.48.

choice and action. Among them are the availability and quality of public transportation, accessibility of recycling facilities and the presence and affordability of sustainable products and services.[274] An empirical case study, for example, showed that the introduction of new recycling policies which included economic incentives had a powerful positive effect on the recycling rates of the inhabitants of the city being researched.[275] Furthermore, the lack of available sustainable alternatives was often mentioned in the literature as discouraging sustainable behavior and, conversely, the availability of sustainable products and services was mentioned as encouraging it.[276] This barrier might increasingly vanish, at least with regard to sustainable groceries and clothing, as they are becoming more widely and easily available in current times.[277] What is indeed regarded as an obstacle are living and working circumstances that limit the time and scope for engaging in sustainable behaviors.[278] The growing urbanization, for instance, may lead to longer commutes to work, which in turn results in people using their cars more intensively.[279]

4.3. Conceptual model and additional remarks

The above described variety of influencing factors, their interconnectedness and the different consumption behaviors that can be classified as sustainable contribute to the difficulty of developing a model that incorporates all possible factors.[280] However, figure 3 depicts the main categories of the factors that could be derived from the literature. For ease of presentation, possible interplays between determinants are not shown.

The numerous factors that have a bearing on the consumer's eventual behavior act at different stages in the process from values or beliefs to behavior.[282] After reviewing the different determinants as well as the mutual influence they have on the implementation of behavior,[283] it becomes comprehensible why consumers with positive attitudes toward sustainable actions do not always follow through and an attitude-behavior gap emerges. In addition to the determinants identified in the reviewed empirical studies, it sometimes might even be a small, momentary factor at the point of behavior implementation that inhibits or facilitates the translation of sustainable intentions into behavior.[284] Such interferences in the choice context have so far been discussed theoretically in the context of sustainable purchasing and include temporary external factors, such as the physical surrounding in a store (e.g. product placement or promotions) or the social surrounding (e.g. interaction with salespeople or presence of a shopping companion) as well as internal factors like a consumer's mood.[285]

Besides this, what is holding one person back from acting in a sustainable manner may not be an obstacle for another. Equally, a consumer's preference for sustainable behaviors varies across time and situations. A consumer that acted in a sustainable manner once might not do so another day or when it comes to another behavior.[286] This irregularity was also shown to depend on the product category and the associated involvement of the consumer and purchase frequency. The literature on these differences, however, is scarce to date.[287] Apart from the ones already indicated above, there are some differences with regard to, for instance, the likelihood to resist consumption of a product (renunciation of fridge or washing machine is not considered viable while doing without meat is comparatively common)[288], purchase criteria used (prestige or self-image are additional criteria for luxury products)[289] or social influence (the effect is smaller on low-involvement behavior)[290]. This highlights again that sustainable consumption needs to be viewed in a differentiated way.

Finally, drivers and barriers of sustainable consumption are in some cases also viewed or conceptualized as determinants of the gap between attitude and sustainable consumption behavior,[291] as suggested in chapter 2.2.2 above. Hence, figure 4 below not only gives a more detailed outline of the identified drivers and barriers but also marks which of them is said to contribute to the gap in the reviewed articles, denoted by a red (green) background in case the determinant increases (reduces) the attitude-behavior gap.

5. Implications and future research

As the previous chapter makes clear, there exists no ultimate way to promote a sustainable behavior or to close the attitude-behavior gap due to the variety and otherness

[274] Cf. Thøgersen (2005), p.145; Press and Arnould (2009), p.105; Barr (2007), p.467; Steg and Vlek (2009), p.312; Johnstone and Hooper (2016), p.846f..
[275] Cf. Viscusi, Huber, and Bell (2011), p.70.
[276] Cf. Shaw and Clarke (1999), p.115; Hira and Ferrie (2006), p.109; Vermeir and Verbeke (2008), p.547; Papaoikonomou et al. (2011), p.84; Davies et al. (2012), p.46; Gleim et al. (2013), p.48; Grimmer et al. (2016), p.1585; Lundblad and Davies (2016), p.157; Moraes et al. (2017), p.535.
[277] Cf. Bray et al. (2011), p.604; Lundblad and Davies (2016), p.157.
[278] Cf. Sanne (2002), p.277ff.; Chai et al. (2015), p.105.
[279] Cf. Sanne (2002), p.277.
[280] Cf. Hines et al. (1987), p.6; Kollmuss and Afyeman (2002), p.239.
[281] Own illustration on the basis of the determinants identified in the reviewed literature.
[282] Cf. Papaoikonomou et al. (2011), p. 86; C. Janssen and Vanhamme (2015), p.778.
[283] Cf. Lin and Hsu (2015), p.327.
[284] Cf. Carrington et al. (2010), p.147.
[285] Cf. Carrington et al. (2010), p.152ff..
[286] Cf. Roberts and Bacon (1997), p.81; Papaoikonomou et al. (2011), p.79; McDonald et al. (2009), p.141; Szmigin et al. (2009), p.229.
[287] Cf. Jansson et al. (2010), p.358; McDonald et al. (2009), p.143; Welsch and Kühling (2009), p.173; Prothero et al. (2011), p.33; Davies et al. (2012), p.37; Rahman (2018), p.400; Trudel (2018), p.93.
[288] Cf. McDonald et al. (2009), p.142.
[289] Cf. Davies et al. (2012), p.47.
[290] Cf. Shaw and Shiu (2003), p.1492; Pelsmacker and Janssens (2007), p.364.
[291] See, for instance, Wiederhold and Martinez (2018), p.424.
[292] Own illustration on the basis of the determinants identified in the reviewed literature.

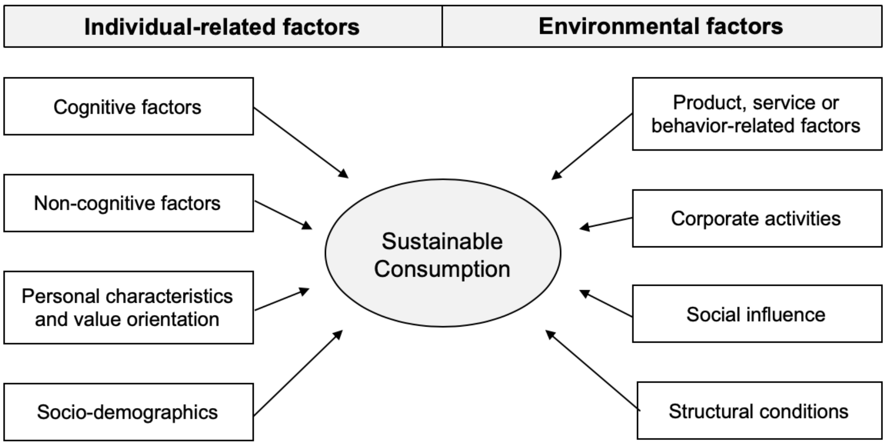

Figure 3: The main factors that have an impact on sustainable consumption[281]

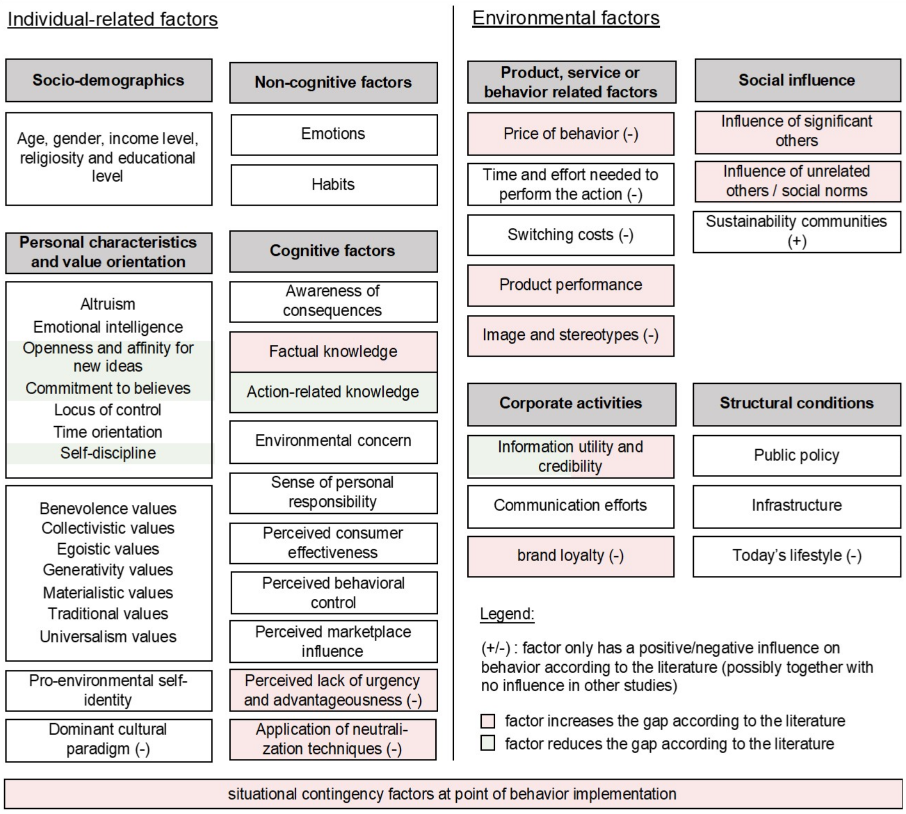

Figure 4: More detailed representation of the drivers and barriers of sustainable consumption as well as factors influencing the attitude-behavior gap [292]

of factors that have an impact. Thus, a combination of different instruments adapted to the specific type of consumption act is required.[293] Generally, a mixture of informational strategies, i.e. altering individual-related factors like perceptions or knowledge and structural strategies aimed at changing the external circumstances in which choices are made is useful.[294] Informational strategies include but are not limited to social support and role models, since solely informing consumers was found not to be effective.[295] This was also demonstrated above by the knowledge dilemma and the great influence that social norms proved to have. Structural strategies like increasing the quality of the public transportation system enhance individual opportunities to act sustainably and make this behavior more attractive. It also indirectly

[293] Cf. Di Giulio et al. (2014), p.56.
[294] Cf. Thøgersen (1994), p.159; Steg and Vlek (2009), p.313.
[295] Cf. Abrahamse, Steg, Vleg, and Rothengatter (2005), p.281; Steg and Vlek (2009), p.313.

impacts individual-related factors in that it makes, for instance, an individual's attitude toward a specific sustainable behavior more favorable.[296] Equally, marketers of sustainable products or services should tailor their strategy to their respective offering.[297] Thus, an important step is to assess the factors that inhibit or drive the adoption of the product or service at stake.[298] The determinants identified above provide a good overview of possible factors. For instance, when promoting a sustainable product where strength attributes are important, the effectiveness should clearly and credibly be highlighted to counteract negative stereotypes.[299] Besides appropriate labels, in-store demonstrations can be helpful to meet consumer's information needs in this respect and also to assist consumers in distinguishing sustainable products from unsustainable ones – an important aforementioned barrier.

Moreover, the literature review revealed several avenues for future research. Firstly, as research so far has focused on low-involvement behaviors (e.g. buying sustainable groceries),[300] there is a scarcity of articles dealing with high-involvement and infrequent behaviors (e.g. installing solar panels). However, these are of great importance as they also have a large impact on the environment.[301] More work on this and comparisons between low and high involvement decisions as well as utilitarian and hedonic products and services is needed. Secondly, since the focus of researchers has lied on the purchasing phase of the consumption cycle or the act of recycling,[302] behaviors in other stages of the consumption cycle or anti-consumption and associated phenomena such as voluntary simplicity or re-usage have been rarely studied so far.[303] Reduced consumption might be of special interest as such behavior is difficult to encourage[304] and can presumably make a major contribution to the world's sustainable development. Thirdly, the articles published so far almost exclusively examine purchasing products and not the utilization of services. The latter might therefore be another interesting area for future research. Furthermore, cross-country comparisons are rare,[305] which is why culture and other local differences particularities[306] is another suggested direction for future research. In addition to this, there exists little research on the role of purchase situations and momentary factors in general that might have an influence on the consumer's behavior.[307] Finally yet importantly, future research might consider methods such as ethnography and actual data rather than the current primarily used instrument of self-reporting, which is prone to widening the attitude-behavior gap.[308]

6. Conclusion

The investigation of the drivers and barriers shows that sustainable consumption is complex, multi-faceted and depends on the consumer's circumstances[309] – both the physical and social ones.[310] Thus, for predicting and promoting such behavior an integrated approach is required and the consideration of different variables or measures respectively is necessary.[311] With regard to the growing popularity of sustainability in people's everyday lives, as demonstrated by the Fridays for Future movement or the recent obligation for large businesses to disclose a sustainability report[312], it can be assumed that the reasons why an individual consumes sustainably are exposed to changes in the future. While new reasons might emerge, others are omitted. It may be, for example, that the prevailing perception of consuming sustainably shifts from not normal and unfavorable[313] to trendy and worth aspiring for. Another reasonable presumption is that sustainable acts will be incentivized by governments or new sustainable business models will simply be the better alternative for consumers. This highlights that businesses can play a crucial role in the consumption patterns of individuals, which gives them the opportunity to change these. An essential step to influencing consumers is understanding them. The present thesis will hopefully make a small contribution to this end.

[296] Cf. Steg and Vlek (2009), p.313.
[297] Cf. Rahman (2018), p.411.
[298] Cf. Abrahamse et al. (2005), p.283.
[299] Cf. Lin and Chang (2012), p.133.
[300] Cf. Jansson et al. (2010), p358; Prothero et al. (2011), p.33; Rahman (2018), p.400.
[301] Cf. Trudel (2018), p.93.
[302] Cf. Tilikidou and Delistavrou (2008), p.61.
[303] Cf. Prothero et al. (2011), p.32.
[304] Cf. Barr (2007), p.470.
[305] Cf. Newholm and Shaw (2007), p.264; an exception is Bucic, Harris, and Arli (2012), p.113.
[306] Cf. Bucic et al. (2012), p.129.
[307] Cf. Carrington et al. (2010), p.155; Grimmer et al. (2016), p.1583.
[308] Cf. Janssen (2018), p.20; Govind et al. (2019), p.1198.
[309] Cf. Nair and Little (2016), p.181f.
[310] Cf. Carrington et al. (2010), p.147.
[311] Cf. Ertz et al. (2016), p.3974.
[312] Cf. European Commission (2014), p.4
[313] Cf. Rettie et al. (2014), p.9; Johnstone and Tan (2015), p.319.

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Job Crafting as Means to Live out One's Calling: An Examination of NPO Employees

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Abstract

Employees increasingly search for jobs in which they can pursue their preferences and interests – more precisely, their callings. Those pursuing their callings are assumed to be more satisfied with their job and to perform better. To provide more insight into this topic, this study examines the relationship between perceiving a calling and job satisfaction by actively pursuing the calling. However, it has not yet been extensively analyzed how employees can convert the perception of a calling at work into actually living it out. This question can possibly be explained by the emerging phenomenon called job crafting. Employees engaging in job crafting techniques might change their work environment in order to be able to live out their calling. Therefore, this study investigated the role of job crafting as moderator in the relationship between perceiving a calling and living a calling as well as in the relationship between living a calling and job satisfaction. The model was tested in a context of nonprofit organizations using a sample of 300 employees and a cross-sectional study design. Data was collected with an online survey for a period of three weeks and analyzed with IBM SPSS PROCESS by means of OLS regression analysis. Living a calling was found to be a full mediator in the relationship between perceiving a calling and job satisfaction. The variables scope of action, employment relationship, and gender are also significantly related to job satisfaction. Against expectations, job crafting does not show any of the two moderating effects but was found to be a partial mediator in the relationship between perceiving a calling and living a calling.

Keywords: Calling; job crafting; job satisfaction; nonprofit organizations.

1. Introduction

1.1. Problem

Nowadays, people expect more from their work than mere financial rewards - they are searching for meaningful work where they are allowed to pursue their personal interests and preferences (Rosso, Dekas, & Wrzesniewski, 2010). According to Wrzesniewski (2003), employees who seek meaning and purpose at work and who weigh monetary outcomes less, consider work as a *calling*. Calling is understood as "an approach to work that reflects seeking a sense of overall purpose and meaning and is used to help others or to contribute to the common good, motivated by an external summons" (Duffy, Dik, Douglass, England, & Velez, 2018, p. 426). While the motivation by an external summons refers to religious callings provided by God, this study focuses on secular callings which emerge within an individual and do not result from divine advice (Bunderson & Thompson, 2009; Dik & Duffy, 2007; Hall & Chandler, 2005; Horvath, 2015; Steger, Pickering, Shin, & Dik, 2010).

Aligned with the presented definition, a secular calling or meaningful work can be seen in either an act of social contribution or simply in the execution of a specific task an individual enjoys performing. Employees of nonprofit organizations (NPOs) are assumed to have a sense of secular calling for social contribution because the organizations they work for already follow a social purpose. However, a high number of tasks to be done in NPOs are administrative tasks, as in for-profit companies, which individuals might not enjoy to perform and which do not immediately satisfy employees' aspiration to help others (Berg, Grant, & Johnson, 2010a). Therefore, it cannot be said with certainty that the mere social purpose of a nonprofit organization completely fulfills their employees' calling. This will be subject of the subsequent analyses.

Pursuing a calling has positive outcomes for individuals and organizations. Besides merely the personal enjoyment of individuals, pursuing a calling also contributes to the achievement of the overall organizational goals. Therefore,

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previous studies evaluated the relationship between callings and outcomes such as work commitment and job satisfaction (Chen, May, Schwoerer, & Augelli, 2017; Choi, Cho, Jung, & Sohn, 2017; Duffy, Allan, & Bott, 2012a), which in turn increase job performance (Kim, Shin, Vough, Hewlin, & Vandenberghe, 2018). Knowing about this positive relationship, pursuing a calling at work may positively affect both employee well-being and organizational performance (Choi et al., 2017; Judge, Locke, Durham, & Kluger, 1998; Kim et al., 2018).

Drawing on the positive consequences of pursuing a calling at work, this study aims to examine whether employees in NPOs do actually live out their calling. Moreover, it is worth analyzing whether employees actively change their work environment to facilitate the living of their calling. So far, it has not been sufficiently determined whether employees design or restructure their jobs in order to live out their calling at work. This may be influenced by a recently emerged phenomenon called job crafting. Job crafting can be defined as "self-initiated change behaviors that employees engage in with the aim to align their jobs with their own preferences, motives, and passions" (Tims, Bakker, & Derks, 2012, p. 173). Thus, it is assumed that employees of NPOs see job crafting as an opportunity to design their job according to their personal preferences and passions which foster the living of their calling.

1.2. Objective

Until now, most research has analyzed respondents who already live their calling and was therefore focused on the examination of the outcomes resulting from living a calling (Choi et al., 2017; Kim et al., 2018). Research on the predictors of living a calling is rather scarce. For that reason, this study analyzes whether employees in organizations adapt their behavior at work to move from the perception of a calling to its living. This relationship is part of a theoretical framework on calling developed by Duffy et al. (2018) (WTC, Appendix 1) which requires further empirical examination. The step from perceiving a calling to living a calling at work might be reached through redesigning a job. Employees who perceive a calling feel an intuition to adapt their work environment so that they can finally live out their perceived calling. Such influencing of the work environment by an employee is called job crafting (Tims et al., 2012).

Most research has so far focused on the detection of concrete job crafting techniques which can be applied at work (Berg et al., 2010a; Wrzesniewski & Dutton, 2001). However, job crafting has not yet been exhaustively associated with possible outcomes. Only Tims, Bakker, and Derks (2015) examined the relationship between job crafting and job performance. Therefore, the indirect influence of job crafting on job satisfaction is investigated in this study. The relationship is tested using a sample of NPO employees. It is assumed that employees of NPOs choose this workplace because of their wish to make a social impact. They may even accept lower wages than employees in for-profit organizations do (Benz, 2005). Although callings and job crafting techniques were analyzed in different occupations and activity fields, NPOs have not yet been fully represented within this scope of research.

To sum up, two research gaps are addressed. First, research about the process of how employees transcend from perceiving a calling to living a calling at work is complemented. This is assumed to happen through employees' engagement in job crafting techniques and the adaption of their work environment. Second, job satisfaction is proposed as another outcome variable of job crafting. Moreover, research on calling and job crafting is broadened with the analysis of NPOs. To fill these two gaps and using the interesting sample of NPOs in the realm of callings and job crafting, the following research question is proposed: *In how far does job crafting influence the relationship between calling and job satisfaction in NPOs?* A cross-sectional study design is used to answer this question.

1.3. Procedure

Including this chapter, the present work is comprised of six chapters. In the second chapter, the combination of latest research with psychological theories lays the foundation for the development of the research hypotheses. The current research state of the concepts of calling, job crafting, and job satisfaction are introduced. Moreover, calling and job crafting are presented with glance to relevant psychological theories explaining the origin of human motivation. While calling is justified through the self-determination theory by Deci and Ryan (1985), job crafting is put in context of a traditional job design theory by Hackman and Oldham (1976). The hypotheses and the overall research model are developed in this chapter and determine further decisions regarding methodology introduced in the succeeding chapter.

Based on the background of relevant research and theory, chapter 3 covers the methodological aspects of the work. The research model is tested with a sample of NPO employees using a cross-sectional study design. Moreover, the data collection procedure is explained introducing the overall structure of the online questionnaire as well as the measures of the model variables in detail. On preparing the actual analysis, the data cleaning procedure and preliminary analyses are explained. The data analysis procedure is realized with the statistical software IBM SPSS. Each of the four subsections of this chapter is required to derive the inclusion criteria of the study, the final calculations and the results.

The methodology is followed by a display of results in chapter 4. The aim of this chapter is to outline the results of the statistical analysis with the SPSS macro PROCESS. First, the mediation effect of living a calling is analyzed. Second, the two moderation effects of job crafting are tested. Last, the complete moderated mediation model is examined. The chapter provides an outlook on the regression coefficients and other relevant values.

The results displayed in the previous chapter are discussed in chapter 5. They are interpreted and classified in line with the research state and psychological theories introduced in chapter 2. Derived from the findings, the practical relevance for NPOs with regard to human resource strategies is evaluated. The chapter closes with a statement about the limitations of the presented study. Derived from those limitations, future research avenues are presented to drive research on calling and job crafting forward. The work closes with a summary of the most important aspects in chapter 6.

2. Theoretical-conceptual foundations

2.1. Calling and self-determination theory

Wrzesniewski (2003) distinguishes three work orientations which are helpful in understanding an employee's intention and motivation at work. Firstly, there are employees who regard work as a *job*. This reflects an employee's orientation toward monetary and material rewards. Secondly, work can be seen as *career* which describes an employee's wish for personal achievement and influence in the organization. Lastly, work can be used to fulfill a personal *calling*. Employees with such a work orientation strive to find a job where they can follow their personal interests and have the opportunity to make a social impact. Whereas work as a job reflects the traditional work orientation, employees increasingly search for work as a calling. The fulfillment of personal interests is becoming more important than it was in the past (Berg et al., 2010a). This explains the new and rising research on calling (Steger et al., 2010).

Research on calling initially started with the examination of religious callings. Religious callings can be understood as "a higher power [which] calls people to use their talents in service of others through their work lives" (Steger et al., 2010, p. 82). The higher power refers to the calling by God who provides people with an orientation for their choice of work. Such religious callings or job recommendations from God are mostly related to social jobs for the sake of needy people. Opposed to religious callings, recent research mainly focuses on a secular understanding of callings. The secular perspective on callings refers to an internal call from within an individual in contrast to the external call by God who provides divine advice. This approach concentrates more on meaning and purpose coming from inside an individual (Esteves & Lopes, 2016; Rosso et al., 2010). Thus, the work choice would be determined by an individual's personal inclination. The understanding of callings in this work complies with the secular perspective (Bunderson & Thompson, 2009; Steger et al., 2010).

Besides the studies on people with religious callings (Neubert & Halbesleben, 2015), callings have been evaluated more broadly in different occupations and activity fields. Musicians (Dobrow, 2013), animal care holders (Bunderson & Thompson, 2009; Schabram & Maitlis, 2017), touring circuses (Beadle, 2013), teachers (Rawat & Nadavulakere, 2015) or for-profit organizations (Chen et al., 2017; Hirschi, 2012) were subjects of analysis. However, until now, there is no consistent definition of a calling. Dobrow (2013) and Hirschi (2010) define calling as a personal passion and one's purpose in life. Elangovan, Pinder, and McLean (2010) emphasize the aspect of social impact to support needy people. Others bring in a third component which describes the origin of a calling as internal or external call - the call from God (Bunderson & Thompson, 2009; Duffy et al., 2018). Although their definitions of calling differ from one another, their general understanding is similar. The majority of the researchers analyzed the actual living out of one's calling when they assess the phenomenon.

In contrast to the majority of researchers, Duffy et al. (2018) distinguish between perceiving a calling and living a calling in their calling framework (WCT, Appendix 1). While the former describes the mere detection of one's calling, the latter refers to the real action of living it out at work. Their differentiation is useful since the mere detection of a calling would not automatically imply that employees are able to live it. It is necessary to perceive a first impulse before individuals can search for jobs where they can pursue their calling. Thus, the living of a calling is guided by the initial perception of it, which determines the hypothesis that perceiving a calling predicts living a calling:

> ***Hypothesis 1 (H1):*** *Perceiving a calling is positively related to living a calling.*

The concept of calling can be better understood when looking at self-determination theory (SDT, Appendix 2). SDT by Deci and Ryan (1985) examines human motivation and behavior. It distinguishes between intrinsic motivation, extrinsic motivation, and amotivation. Intrinsic motivation is defined as "doing an activity for the inherent satisfaction of the activity itself" (Ryan & Deci, 2000, p. 71) and having freedom of choice (autonomy) about one's behavior. Extrinsic motivation describes the "performance of an activity in order to attain some separable outcome" (Ryan & Deci, 2000, p. 71) such as rewards or feedback. Those two kinds of motivation reflect to what extent the regulation of the demanded behavior has been internalized by an individual. Extrinsic motivation is subdivided into four stages of regulation whereby the last stage signifies the highest degree of internalization and thus is very close to intrinsic motivation. Those two motivational processes stand opposed to amotivation whereby people do not feel any motivation at all (Gagné & Deci, 2005).

Whereas employees with amotivation might not feel any sense of calling, intrinsically motivated employees are more likely to perceive a calling. Intrinsically motivated people show real "interest and enjoyment of the task" (Gagné & Deci, 2005, p. 336) which lays the foundation of what they will perceive as a calling. Thus, employees who pursue a calling hold intrinsic motivation due to the fact that they identify with their job very strongly. Moreover, employees with intrinsic motivation perceive challenges at work as rather positive and less stressful since they find meaning in their work regardless of the actual tasks to be done. Kuvaas (2008) also found that intrinsic motivation results in higher job performance of an individual. The same relationship was attributed to calling when Kim et al. (2018) found calling to be related to in-role performance. Therefore, the connection between calling or intrinsic motivation to performance is very close.

In addition to the motivational and behavioral processes described above, SDT proposes three innate psychological needs of people which must be satisfied to guarantee motivation. Unsatisfied needs would have negative effects on motivation and well-being of people. For that reason, people's behavior is guided and determined by the need for competence, need for autonomy, and need for relatedness (Gagné & Deci, 2005). The need for competence reflects people's desire to be able to manage specific tasks. The need for autonomy refers to people's wish for self-determination or freedom of choice which fosters intrinsic motivation. The need for relatedness describes the human desire for interaction with other people. Although those needs are innate and born, they can be developed over time through feedback of the social environment. Thus, the strength of each need is different for individuals, but they need to be fulfilled in the respective amount to foster motivation and mental health. Those three distinct needs are especially important with regard to the application of job crafting in chapter 2.3.

2.2. Job satisfaction

Previous research found that individuals with a calling are more pleased with their overall career and more satisfied with their specific job (Chen et al., 2017; Duffy, Allan, Autin, & Douglass, 2014; Neubert & Halbesleben, 2015; Peterson, Park, Hall, & Seligman, 2009). The satisfaction with one's job is defined as "a pleasurable or positive emotional state resulting from an appraisal of one's job or job experiences" (Locke, 1976, p. 1300). This pleasurable emotional state can be reached when individuals perceive a calling at work. This view in turn has positive effects on job and life satisfaction (Dobrow & Tosti-Kharas, 2011; Duffy et al., 2012a) which leads to the following hypothesis:

> ***Hypothesis 2 (H2):*** *Perceiving a calling is positively related to job satisfaction.*

The mere perception of a calling cannot result in the total amount of job satisfaction but is fostered by the actual living of the calling where employees are able to pursue their interests and desires. Duffy et al. (2014) examined living a calling and job satisfaction over three periods of time. They tested the relationship between living a calling and job satisfaction finding that it is a reciprocal one. Living a calling can have positive effects on people's health, gives meaning to their work and, as a consequence, makes them more satisfied with their work (Elangovan et al., 2010). Thus, being able to live out a calling might have a stronger effect on job satisfaction than the mere perception of a calling. The following hypothesis is developed to test whether the living of it is an indispensable mediator in the relationship between perceiving a calling and job satisfaction:

> ***Hypothesis 3 (H3):*** *Living a calling mediates the positive relationship between perceiving a calling and job satisfaction.*

Job satisfaction does not only have positive consequences for employees' mental health but also for organizational outcomes. Satisfied employees seem to be good performers. Thus, living a calling is assumed to lead to job satisfaction and job satisfaction is assumed to lead to higher performance (Judge, Bono, Thoresen, & Patton, 2001). Kim et al. (2018) found a similar relationship where callings led to higher organizational commitment which in turn increased in-role performance. Consequently, the increase of job satisfaction and job performance initiated by employees living their callings via diverse mediators has positive effects on organizations.

2.3. Job crafting and job design theory

Referring to the most essential statement of the previous chapter, living a calling has positive consequences for both employees and organizations. On the one hand, employees perceive their work as more meaningful and fulfilling which may increase their job satisfaction Chen et al. (2017). On the other hand, organizations benefit from satisfied and committed employees who are good performers (Judge et al., 2001; Kim et al., 2018). Based on this background knowledge, it is interesting to analyze how employees arrive exactly at the living of their calling at work. It is assumed that employees try to change their work environment according to personal interests and preferences which results in the fulfillment of their overall calling (Deci & Ryan, 1985; Hackman & Oldham, 1976).

Employees who alter their work environment engage in an activity called job crafting. Job crafting can be defined as "self-initiated change behaviors that employees engage in with the aim to align their jobs with their own preferences, motives, and passions" (Tims et al., 2012, p. 173). Aligned with this definition, job crafting is different from traditional job design theories with regard to the initiator of changes in the work environment. While changes were initiated by managers in job design theories (top-down), employees themselves are the initiators of changes in the job crafting literature (bottom-up). Thus, a switch from top-town management to bottom-up activity is noticeable and job crafting techniques constitute a valuable complement to job design theories (Berg, Dutton, & Wrzesniewski, 2013; Hackman & Oldham, 1976; Tims et al., 2012).

Job design theories are concerned with organizing and structuring jobs in favor of both employees and organizations. They strive to understand which job characteristics lead to specific work-related outcomes such as job satisfaction or job performance. Hackman and Oldham (1976) combine aspects of motivation with those of structuring a job and propose the job characteristics model (Appendix 3). According to the model, there are five core job characteristics (called job dimensions) inducing three critical psychological states which finally lead to four personal and work-related outcomes. The five job characteristics are skill variety, task identity, task significance, autonomy, and feedback. Each of them contributes to the motivating potential of a job. Consequently, the more the job characteristics are met, the more motivated employees are at their job. This leads to the respective psychological state and results in one or more of the following outcomes: work motivation, performance, satisfaction, and low absenteeism and turnover which are also examined in the calling and job crafting literature (Choi et al., 2017; Judge et al., 1998; Kim et al., 2018). The five job characteristics can be interpreted as possible influencing factors on general job settings and the work environment. Therefore, with the use of job crafting, employees actively structure and modify the characteristics of their job which increases their motivation.

There are different techniques to craft a job or modify the work environment. Wrzesniewski and Dutton (2001) were among the first authors to propose a framework on how the work environment can be changed by an employee. They differentiate the following three techniques of job crafting: changing task, relational, and cognitive boundaries at work. Changing task boundaries refers to the number, scope, and type of tasks done at work which are changed by employees. Changing relational boundaries comprises the quality and number of interactions with others at work which will be adapted. Changing cognitive task boundaries describes how employees regard the job - viewing it either as a set of discrete work tasks or as an integrated whole.

The desire and motivation to engage in one of the three job crafting techniques stem from the basic psychological needs introduced with the SDT. The three needs for autonomy, relatedness, and competence are universal and therefore meaningful to every person (Deci & Ryan, 1985). Nevertheless, the assigned weight to each of the needs can vary from time to time and from person to person - and so the engagement in job crafting varies too. People with a high need for relatedness are likely to engage in relational crafting to satisfy their desire for interaction and social belonging. Therefore, it can be also understood as a need for connection and interaction with others. People with a high need for competence will actively undertake task crafting techniques to broaden their knowledge and skills. They try to increase their competence for a job in order to master different situations occurring at work. Lastly, people with a high need for autonomy strive to act independently and being responsible for their decisions. The fulfillment of the other two needs also partially depend on the provision of autonomy. A low degree of autonomy at a job does not allow for adaptions in the work environment to fulfill the need for relatedness and competence (Bindl, Unsworth, Gibson, & Stride, 2019). These needs must be satisfied to guarantee intrinsic motivation of employees which fosters their fulfillment of their calling.

The three job crafting techniques described above were further developed by Berg et al. (2010a) who propose three techniques to craft a job and two techniques to craft leisure time. Their first two categories, task emphasizing and job expanding, are similar to task crafting. Task emphasizing refers to either changing the assigned task or giving more energy, time, or attention on the assigned tasks. Job expanding means that the assigned tasks are supplemented by additional tasks which help to pursue a calling. Their third job crafting technique is role reframing which describes the alteration of a job in order to meet a social purpose necessary to fulfill one's calling. This goes along with relational crafting. Additionally, the authors present two forms of leisure crafting which are not relevant up to now.

With the described job crafting techniques in mind, employees may become the creators of meaningful jobs on their own. Each of these techniques supports aligning the work environment with one's personal perception of a calling. Since perceiving a calling does not necessarily imply that employees have the opportunity to live it out, job crafting might be a means "for those who 'fell into' a job that does not match their perceived calling" (Duffy et al., 2018, p. 429). Consequently, job crafting is tested to strengthen the relationship between perceiving a calling and living a calling which leads to the next hypothesis:

> ***Hypothesis 4 (H4):*** *Job crafting moderates the positive relationship between perceiving a calling and living a calling such that the relationship is stronger when people engage in job crafting techniques.*

Various studies propose that living a calling at work increases job satisfaction (Chen et al., 2017; Choi et al., 2017; Duffy et al., 2012a). The extent to which a calling is fulfilled can vary among employees and over time. Dobrow (2013) found that "callings can cover the continuum from weak to strong" (p. 433), and thus the intensities of callings are distinct. It might result that the better a calling is fulfilled in an occupation, the higher the job satisfaction will be. Therefore, employees try to fulfill their calling as much as possible through engaging in job crafting. The more they engage in job crafting, the more likely they completely fulfill their calling and the higher their job satisfaction will be.

> ***Hypothesis 5 (H5):*** *Job crafting moderates the positive relationship between living a calling and job satisfaction such that the relationship is stronger when people engage in job crafting techniques.*

Derived from hypotheses 1–5, the last hypothesis and the research model (Figure 1) are proposed:

> ***Hypothesis 6 (H6):*** *Job crafting moderates the mediated relationship between perceiving a calling and job satisfaction through living a calling such that the relationship is stronger when job crafting opportunities are given.*

3. Methodology

3.1. Sample

The influence of job crafting on the relationship between calling and job satisfaction was analyzed with a sample of

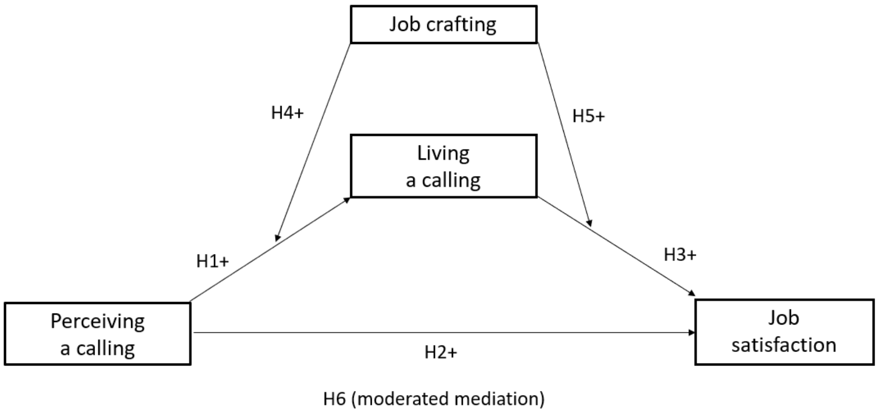


Figure 1: Hypothesized research model (Source: Own illustration based on Hayes, 2018)

nonprofit organizations. NPOs are characterized by their employees' wish for social contribution (Helmig, Ingerfurth, & Pinz, 2014). Because the desire for social contribution is also a very important aspect of calling, it is assumed that employees working in NPOs have a sense of calling. The sense of calling of NPO employees may explain why they are willing to accept lower salaries than employees of private firms (Benz, 2005). However, most tasks to be done in NPOs are administrative tasks where employees might not directly see their social impact. Therefore, it is assumed that they engage in job crafting to fulfill their need for social contribution. This is tested with the present study.

The online survey was addressed to paid employees of associations, foundations, social or public enterprises who were permanently employed and worked full-time, part-time or on a 450-euro tax base. While employees from small and huge organizations were interesting for this study, those from private firms and NPO volunteers were not relevant for the purpose of this study. Initial concerns that it would be difficult to reach permanent employees opposed to volunteers did not transpire. There was a participation rate of employees with permanent contracts because volunteers usually have no email address.

According to g-power analysis, 194 respondents from NPOs were required to adequately test the hypotheses. The sample size was calculated with an online tool developed by researcher from the Heinrich Heine university in Düsseldorf (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007). The statistical test was selected with regard to the future linear multiple regression analysis. Moreover, a rather small effect size of .08, an α error probability of .05, and a power of .95 were assumed. The analysis was run with two predictors because perceiving a calling and living a calling are both antecedents of job satisfaction. Due to the fact that seven control variables were included in the study, the final sample size needed to exceed the 194 cases what was met with the cleaned data set of 300 cases after only three weeks. The composition of the cases is explained in the subsequent section.

Around two-thirds of the participants were female ($N = 209$) and one-third was male ($N = 91$). The age ranged from 18 years to 66 years with an average age of 42 years. 48% of the participating employees worked in associations ($N = 143$), followed by employees working in social enterprises (31%, $N = 92$), foundations (14%, $N = 41$), public enterprises and others (8%, $N = 24$). Employees of NPOs had worked in their organization for an average of 9 years. Most of the respondents were full-time employed (57%, $N = 172$), many were part-time employed (38%, $N = 113$) and only a few belonged to the categories intern, working students, and marginal part-time work (5%, $N = 15$). The sample was well-educated with 82% having a university degree ($N = 245$). The respondents had an average scope of action of 5.6 on a 7-point Likert scale (Appendix 4).

3.2. Data collection and survey design

Online survey research was chosen to test the hypotheses. Cross-sectional data was collected because the various NPOs were observed at the same point in time (Bell, Bryman, & Harley, 2019; Fowler, 2014). Snowball sampling, a non-random sampling technique, was applied to reach as many members of the population as possible. This technique is used for hard-to-reach populations or minority populations (Handcock & Gile, 2011; Heckathorn, 2011). In total, 270 employees from 74 NPOs located all over Germany were contacted via email to increase representativeness of the study by excluding location factors. In large organizations, several people of different departments were contacted. A maximum number of 12 employees was contacted in each organization in order to reduce dominance of an organization. Moreover, associations, foundations, and social enterprises were contacted in equal numbers. 12 employees confirmed that they have spread the survey in their organization. Due to the fact that the initially contacted person holds a gatekeeper position to the final sample, very heterogeneous organizations were contacted.

The study was pretested by fifteen people who were friends and family as well as researchers from university. All of them gave constructive feedback on structure or clarity of the questionnaire and helped to develop an understandable and methodologically clear study to avoid data collection errors due to difficult questioning or faulty construction of the questionnaire (Bell et al., 2019). Some corrections regarding the explanations of the calling scale, the ordering of the two calling scales, and a change of the job crafting scale from Tims et al. (2012) to Bindl et al. (2019) were undertaken.

As mentioned above, the data collection procedure led to an adjusted data set of 300 cases which provided answers to the following two sections of the questionnaire (Appendix 5). The first section of the questionnaire comprised 21 items of the four scales of perceiving a calling, living a calling, job satisfaction, and job crafting. The scales were translated from English into German using Brislin's (1970) method of back-translation. Following this method, a young woman who studied English language and literature translated the English items into German. Afterwards, a British man who is a German translator and has lived in Germany for 55 years retranslated the German items back into English comparing its meaning to the original one. The small discrepancies between the retranslation and the original items were discussed by him and his wife, an American who is a German teacher and has lived in Germany for 35 years.

The job satisfaction scale was chosen to be the first presented scale in the self-completion questionnaire because it could be answered intuitively thus sustaining the motivation of the respondents. After that, the brief calling scale asking about employees' perception of a calling was presented. The participants were provided with a short definition of calling which referred to the two calling aspects of passion and social contribution (Dobrow, 2013; Duffy et al., 2018; Elangovan et al., 2010). This scale was followed by the living a calling scale to emphasize the distinction to the first calling scale. The two job crafting subscales closed the first section of the questionnaire. Subsequently, the validated scales from previous studies are described (Appendix 6).

Perceiving a calling. Perceiving a calling or the detection of one's calling, was measured with the Brief Calling Scale (BCS) by Dik, Eldridge, Steger, and Duffy (2012). The two items from the Presence subscale were used to assess the independent variable. Whereas the original scale was answered on a 5-point Likert scale, a 7-point Likert scale was used in this study to increase variance and facilitate data analysis. The scale ranked from *1) strongly disagree* to *7) strongly agree*. The items were worded as followed: "I have a calling to a particular kind of work" and "I have a good understanding of my calling as it applies to my career." Cronbach's Alpha of the BCS was $\alpha = .79$. Since Cronbach's alpha should lie between .70 and .95. both studies proved internal reliability of the BCS (Taber, 2018; Tavakol & Dennick, 2011).

Living a calling. According to the Living Calling Scale (LCS) developed by Duffy et al. (2012a), living a calling was assessed with six items to examine whether employees can really live out their calling at work. The items were also rated on a 7-point Likert scale ranging from *1) strongly disagree* to *7) strongly agree*. Example items were "I am currently working in a job that closely aligns with my calling" and "I am consistently living out my calling." Proving internal reliability of the LCS, Cronbach's Alpha was $\alpha = .85$ in the original study.

Job satisfaction. Brayfield and Rothe (1951) initially developed a Job Satisfaction Scale (JSS) with 19 items (0-18) to assess "how people feel about different jobs" (p. 309). Later, Judge et al. (1998) reduced the extensive scale and chose a small number of five items to investigate job satisfaction in their study. All items were answered on a 7-point Likert scale ranging from *1) strongly disagree* to *7) strongly agree,* whereby the third and fourth item were reverse scored. Here are two example items: "I find real enjoyment in my work" and "Each day of work seems like it will never end" (reverse scored). The five-item scale JSS was reliable with Cronbach's Alpha being $\alpha = .88$. Moreover, the scale was used in the study by Duffy, Bott, Allan, Torrey, and Dik (2012b) who also found $\alpha = .88$.

Job crafting. So far, research on job crafting was mainly qualitative. Thus, there are only a few different scales available. Tims et al. (2012) developed a job crafting scale with respect to job demands and job resources. Slemp and Vella-Brodrick (2013), Bindl et al. (2019) and Bruning and Campion (2018) accepted some of Tims' et al.'s (2012) items but rather focused on the differentiation of relationship, task, and cognitive job crafting (Wrzesniewski & Dutton, 2001). Taking into account the content and length of all subscales as well as their transferability to a 7-point Likert scale, the job crafting scale created and tested by Bindl et al. (2019) was chosen to test the hypotheses of this study. More concrete, the two subscales promotion-oriented relationship crafting ($\alpha = .86 - .92$) and promotion-oriented task crafting ($\alpha = .87 - .90$) with four items each were taken. Example items for each subscale are "I actively sought to meet new people at work" and "I added complexity to my tasks by changing their structure or sequence." Originally, the items were answered on a 5-point Likert scale and later were converted into a 7-point Likert scale for the purpose of this study.

The scales were subjected to four exploratory factor analyses and tests for validity and reliability (Table 1) in order to probe data fit (Hair, Babin, Anderson, & Black, 2014). They were tested for reliability again because the values of Cronbach's alpha are sample-dependent and cannot be converted from one study to another (Taber, 2018; Tavakol & Dennick, 2011). Factor analysis of the job satisfaction scale revealed the reverse scored item number four to correlate lower with the common factor than the others do. It has still been maintained because only items close to zero need to be removed from a scale (Tavakol & Dennick, 2011). Moreover, factor analysis showed that the job crafting scale load on two different factors which correspond to the two subscales relational job crafting and task job crafting with cross-loadings smaller than .50 (Bortz & Schuster, 2010). Since Cronbach's alpha was acceptable for the combined job crafting scale including eight items, the complete scale was used for analysis. The validity checks with the Kaiser-Meyer-Olkin measure were also acceptable. Perceiving a calling was the only exception with a value of .50 which is rather low according to Kaiser (1974). Table 1 shows that all scales could be summarized and converted into a mean variable for further analyses.

The second section of the questionnaire covered sociodemographic data and control variables because participants tend to be more open at the end of a survey (Bell et al., 2019). The subsequent sociodemographic data and controls were collected: age, gender, education (Bindl et al., 2019; Duffy, Douglass, Gensmer, England, & Kim, 2019), employment relationship (Kim et al., 2018), duration of employment (Bindl et al., 2019), autonomy of job design reflected as scope of action (Berg, Wrzesniewski, & Dutton, 2010b), and type of organization. Employment status constitutes an important control variable with regard to the outcome variable job satisfaction ensuring the distinction between volunteers and permanent employees. The scale was only developed for permanent employees who perceive their job differently than volunteers. Moreover, the duration of employment might provide employees with more autonomy to design their jobs which expands their scope of action. Because the provision of autonomy is required to apply job crafting techniques, scope of action was taken as another control variable. Last, it was important to control for the type of organization to delete respondents who worked for private companies as opposed to nonprofit organizations. On the penultimate page (11), the participants were asked to copy the survey link and forward it to their colleagues in order to support the snowball sampling technique. The high response rate after only three weeks might be a tribute to this strategy.

3.3. Data cleaning and preliminary analyses

The data was cleaned in several steps using the statistical software IBM SPSS Version 26. Initially, the relevant pages for analysis were identified. In total, the questionnaire consisted of eleven pages whereby page 11 was only set up to support snowball sampling by providing a hint to distribute the survey further. Therefore, questionnaires with page 10 being the last completed page were still relevant for analysis and did not yield missing data. This led to 356 questionnaires finishing page 10. All the respondents agreed on data protection ($N = 356$) and only four people failed the attention check and were removed ($N = 352$). Open text boxes in the categories of type of organization and employment relationship were assigned to existing categories. *Others* was added as a new answer category for type of organization comprising religious institutions and welfare organizations. Respondents who stated to work free of charge, namely voluntarily, in their NPO (employment relationship) were removed from the sample because the job satisfaction scale was developed for permanent employees ($N = 340$). Employees working in a private company (type of organization) and not in a NPO were also deleted ($N = 328$). Respondents with a scope of action lower than 3 on a 7-point Likert scale were also removed from the sample because it is assumed that people with a low scope of action would not be able to engage in job crafting activities even if they wanted to ($N = 316$). All cases with missing values were deleted since SPSS PROCESS does not include cases with missing values into analysis ($N = 307$). Moreover, the reverse scored items of the job satisfaction scale were checked for plausibility. Cases where the replies to the two reverse scored items were exactly the opposite of the other three replies were deleted ($N = 306$). In contrast, cases where the replies to the two reverse scored items were different but the other three replies showed high volatility were kept. After that, the mean of the perceiving a calling scale was sorted and all cases with means of 1 were deleted because it is assumed that people who do not perceive a calling cannot live it out ($N = 300$). This led to a final sample size of 300 cases.

This final data set needed to be prepared for further analyses by computing several new variables. First, a mean variable for each of the scales was created. The results of factor, validity, and reliability analyses presented in the last chapter, allowed for this computation. In total, six mean variables were created for perceiving a calling, living a calling, job satisfaction, job crafting, relational job crafting, and task job crafting. In order to control and understand the PROCESS outputs in greater depth, mean-centered variables as well as the required interaction terms to analyze moderation effects were computed manually outside of PROCESS which were used for regression analyses in regular SPSS. Second, the variable age was computed by taking the difference between the current year and the birth year. Year 2019 was taken as the current year because it was mid-January when the data was cleaned. Finally, the control variables - so-called covariates in PROCESS - type of organization, education, employment relation, gender, and action scope were transformed into indicator codes using 0 and 1 for two groups. This was necessary because “multicategorical covariates should be represented with an appropriate categorical coding system with codes constructed outside of PROCESS if they are to be used as covariates” (Hayes, 2018, p. 560).

As a necessary condition for carrying out regression analyses, the final data was tested for normal distribution. The results of the Shapiro-Wilk test did not indicate normal distribution for any of the relevant variables. Therefore, bootstrapping samples were drawn to run the regression analyses. Bootstrapping is “an approach to validating a multivariate model by drawing a large number of subsamples and estimating models for each subsample” (Hair et al., 2014, p. 22). Based on the coefficients of these subsamples, the distribution is estimated, and regression analysis can be conducted. In addition, boxplots were conducted to test the variables for outliers. The detected outliers were not removed for two reasons. First, the outlier values of ordinal and nominal scales are possible answers defined by given categories. Because each of these categories is valid, there are no extreme values within given categories and outliers do not need to be excluded from analysis (Riani, Torti, & Zani, 2012). Second, bootstrapping not only compensates for irregular distributions but also for outliers. Single cases do not have much weight in a procedure where a high amount of subsamples is used to estimate the distribution (Rana, Midi, & Imon, 2012).

Table 1: Summary of the scale reliabilities and factor loadings (Source: Own illustration based on the SPSS output)

The reliability values display Cronbach's alpha. The validity values display the Kaiser-Meyer-Olkin measure.

Construct	Number of Items	Reliability	Validity	Factor loadings
Perceiving a calling	2	$\alpha = .80$	.50	1
Living a calling	6	$\alpha = .92$	.90	1
Job satisfaction	5	$\alpha = .80$	.80	1
Job crafting	8	$\alpha = .83$	.82	2
Relational crafting	1-4	$\alpha = .85$	-	1
Task crafting	5-8	$\alpha = .81$	-	1

For these two reasons, not much weight was attributed to outliers.

In order to control for all relevant aspects necessary for this study, a final number of seven covariates as well as the three variables perceiving a calling, living a calling, and job crafting were considered as predictors of job satisfaction. This is a rather high number of antecedents which impacts the final explained variance of job satisfaction. A higher number of predictors leads to a higher explained variance and consequently increases the accuracy of a model. However, it also bears the risk to distort the results if multicollinearity of the various variables is given (Hair et al., 2014). Therefore, some tests for multicollinearity were conducted to test whether the variables perceiving a calling, living a calling, and job crafting show multicollinearity. With *tolerance* values bigger than .20, and *VIF* values smaller than 5, multicollinearity is not given for any combination of the variables (Hair, Ringle, & Sarstedt, 2011; Ringle, Sarstedt, Mitchell, & Gudergan, 2018) (Appendix 7). Consequently, the interpretation of results does not rely on multicollinearity.

3.4. Data analysis

Following the preliminary analyses, linear regression analysis was carried out to analyze the data. The proposed hypotheses were tested with the statistical software IBM SPSS Version 26, applying the macro PROCESS 3.4.1 developed by Hayes (2018). SPSS PROCESS was an adequate statistical software to test the research model because it provides a user-friendly application area and various choices of predefined research models. It is a regression-based approach which allows calculations of conditional processes combining mediators and moderators in a model. In order to better follow the required steps of analyses, the research model is transmitted into a statistical diagram with its various paths mapped in Figure 2.

The statistical diagram shows that there are two consequent variables in the model - Living a calling and job satisfaction. These two consequent variables define the following two equations of the linear regression analysis (Hayes, Montoya, & Rockwood, 2017):

$$\mathrm{LC} = i_{\mathrm{LC}} + a_1\mathrm{PC} + a_2\mathrm{JC} + a_3\mathrm{PCxJC} + e_{\mathrm{LC}}$$
$$\mathrm{JS} = i_{\mathrm{JS}} + c'\mathrm{PC} + b_1\mathrm{LC} + b_2\mathrm{JC} + b_3\mathrm{LCxJC} + e_{\mathrm{JS}}.$$

The SPSS macro PROCESS estimates the equations separately calculating OLS regressions. The research model of this study with one mediation and two moderation effects is described by the model number 58 in PROCESS (Appendix 8). The path coefficients of the two equations presented above were calculated with this model. Thus, hypotheses 1, 3, 4, 5, and 6 were answered by testing this model. Perceiving a calling was the independent variable in the model (X), job satisfaction was the dependent variable (Y), living a calling was the mediator (M), and job crafting was inserted as the moderator (W).

The variables required for the interaction terms to test the moderation effects (perceiving a calling, living a calling, and job crafting) were mean-centered because mean-centered variables allow the interpretation of an equation even when moderating effects are not proven (Cohen, Cohen, West, & Aiken, 2003). In addition, settings like a bias-corrected 95% confidence interval and 5000 bootstrap samples were selected. Moreover, the options to generate a code for visualizing interactions, pairwise contrasts of indirect effects, and a test for X by M interactions were conducted. Last, the values of the moderator job crafting ranged from low (−1SD) to high (+1SD) around the mean. The analysis was oriented on papers dealing with moderated mediation (Bindl et al., 2019; Duffy et al., 2012b; Hirschi, 2012). Etkin and Sela (2016) and Kim et al. (2018) were especially relevant because they also used the SPSS macro PROCESS.

In addition, the results of moderated mediation model (model 58) calculated in PROCESS were examined for plausibility by calculating the mediation and moderation effects independently using model 1 and 4 in PROCESS (Appendix 8). Model 1 was used to test the two moderation effects described in hypotheses 4 and 5. It was first calculated with perceiving a calling as independent variable, living a calling as dependent variable and job crafting as moderator. Second, model 1 was tested with living a calling as independent variable, job satisfaction as dependent variable and job crafting as moderator. Hence, the two moderation effects were calculated separately using model 1. Afterwards, model 4 was used to test hypothesis 3, the mediating effect of living a calling in the relationship between perceiving a calling and job satisfaction disregarding the moderation effects. Those indirect effects calculated with model 1 and 4 in PROCESS

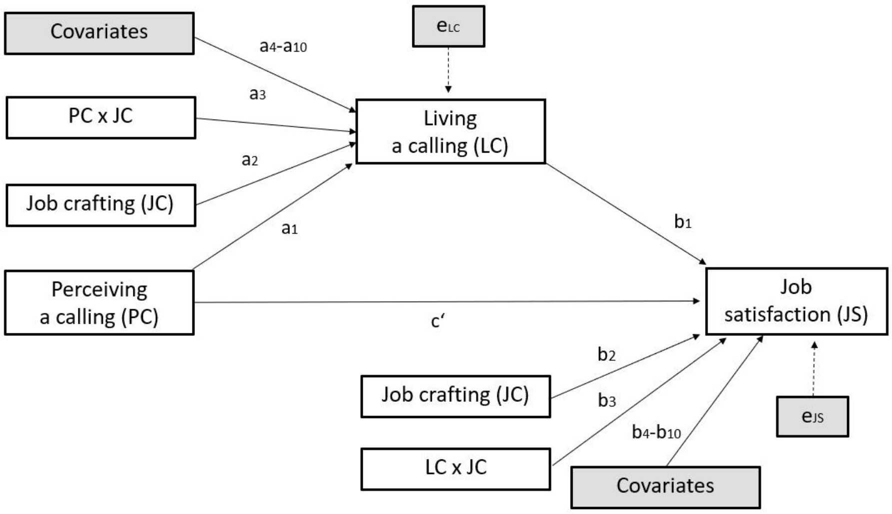


Figure 2: Statistical diagram of research model (Source: Own illustration based on Hayes, 2018)

were also computed manually without bootstrapping to validate the underlying calculations. The results can be found in the digital Appendix and will not be presented in the next chapter because they did not yield different effects.

Hypothesis 2, assuming a direct positive effect from perceiving a calling to job satisfaction, was the only one which could not be calculated with model 58 in PROCESS. The results of the direct effect in model 58 already depend on existing mediation and moderation effects and thus cannot be interpreted independently. Therefore, hypothesis 2 was tested by means of a linear regression analysis conducted in SPSS with job satisfaction as dependent variable and perceiving a calling as independent variable. It was the only effect calculated without PROCESS. These distinct steps of analysis are summarized in Table 2.

To test the robustness of the results, three sensitivity analyses were conducted (Appendix 9). Two of them were used to test the robustness of the model by changing the input variable job crafting. In the previous analysis, the combined job crafting scale including both subscales - relational and task job crafting - was used. In the course of the sensitivity analyses, the influence of the two subscales on the overall results of the regression analysis was tested because the subscales of job crafting load on two different factors which is displayed in Table 1. This approach was chosen to investigate possible differences between the mechanisms of job crafting. Moreover, a possible mediation effect of job crafting was examined. The results of the data analysis are displayed in the following chapter.

4. Display of results

4.1. Living a calling as mediator

Table 3 provides an overview of the means, standard deviations, and correlations for the various study variables. Except for a Pearson correlation of two metric variables, all other correlations are Spearman correlations.

The simple intercorrelations prove a statistically significant relationship between perceiving a calling and living a calling ($r = .67$, $p < .01$) as well as between living a calling and job satisfaction ($r = .59$, $p < .01$). Job crafting is a positive correlate of perceiving a calling ($r = .35$, $p < .01$), living a calling ($r = .35$, $p < .01$), and job satisfaction ($r = .30$, $p < .01$). Moreover, employment relation and job crafting are found to positively correlate ($r = .17$, $p < .01$), although not very strongly (Cohen, 1988).

Subsequently, Table 4 displays the regression coefficients, standard errors, and t-values of Model A and B. It also provides an overview of the results of hypotheses testing.

According to hypothesis 1, there is a positive relationship between perceiving a calling and living a calling. The hierarchical regression analysis proved this relationship to be highly significant ($B = .48$, $t = 12.18$, $p < .001$, CI [.40;.55]). Hypothesis 2 stated the positive direct effect of perceiving a calling to job satisfaction. This relationship was found to be significant in the SPSS analysis ($B = .26$, $t = 8.03$, $p < .001$, CI [.18;.33]) confirming hypothesis 2 with $R^2 = .18$. Hypothesis 3 predicted a mediated relationship between perceiving a calling and job satisfaction via living a calling. Besides perceiving a calling, living a calling is also positively related to job satisfaction ($B = .39$, $t = 8.75$, $p < .001$, CI [.30;.47]). With the addition of living a calling to the regression analysis, the direct effect of perceiving a calling to job satisfaction becomes insignificant. This is a clear indicator for a mediation. The absence of the direct relationship after the addition of living a calling as explanatory mechanism is an indicator for an indirect-only mediation (Zhao, Lynch, & Chen, 2010). The bootstrapping procedure confirmed the mediated relationship with the bootstrapping confidence interval for the indirect effect. On all three levels of job crafting - low (−1 *SD*), medium (*M*), high (+1 *SD*) -, the bootstrapping lower and upper limit were positive, meaning that the confidence interval does not contain zero and

Table 2: Overview of analyzed models (Source: Own illustration)

The model numbers presented in this table should not be confused with those discussed in connection with SPSS PROCESS. Therefore, they are numbered alphabetically. Model A is calculated without PROCESS.

Model number	Analysis	Hypothesis tested	
Model A	Direct effect	Direct effect	H2+
Model B	Moderated mediation	Mediation effect of living a calling	H1+, H3+
		Moderation effect of job crafting	H4+, H5+, H6+
Model C	Sensitivity	Moderation effect of relational crafting	H4+, H5+, H6+
Model D	Sensitivity	Moderation effect of task crafting	H4+, H5+, H6+
Model E	Sensitivity	Mediation effect of job crafting	None

Table 3: Means, standard deviations and correlations (Source: Own illustration based on the SPSS output)

N = 300. Spearman correlations. *M*: Mean, *SD*: Standard deviation. Organization: 1 = associations & foundations, 0 = social & public enterprises. Education: 1 = University degree, 0 = No university degree. Employment relation: 1 = full-time, 0 = part-time. Gender: 1 = female, 0 = male. Action scope: 1 = high action scope, 0 = low action scope. $^{**}p < .01$.

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1 Age	41.55	12.38										
2 Membership	9.05	9.41	.70** (Pearson)									
3 Organization	0.61	0.49	.14	−.04								
4 Education	0.82	0.39	−.07	−.01	−.04							
5 Empl. Relation	0.57	0.50	.08	.17**	.08	.06						
6 Gender	0.70	0.46	− .15	−.13	.04	.03	−.29**					
7 Action scope	0.60	0.49	−.01	−.02	−.15**	.05	.05	−.03				
8 Perceiving	4.92	1.25	.03	.03	−.06	−.06	.10	.02	.22**			
9 Living	5.01	1.05	.12	.11	−.09	−.13	.14	−.02	.30**	.67**		
10 Satisfaction	5.95	0.76	.06	.03	−.10	−.15**	−.08	.18**	.33**	.39**	.59**	
11 Job crafting	4.98	0.90	.04	− .05	−.04	−.05	.17**	.03	.16**	.35**	.35**	.30**

thus offering support for a mediation effect (CI *M* [.13;.24]).

4.2. Job crafting as moderator

The hypotheses 4 and 5 predicted two distinct moderation effects of job crafting. Both of them were analyzed using the complete job crafting scale (model B). In a first step, the moderating effect of job crafting on the relationship between perceiving a calling and living a calling was analyzed, as stated in hypothesis 4. The interaction term of perceiving a calling and job crafting on living a calling did not show significant results ($B = .03$, $t = .76$, NS (not significant), CI [−.05;.11]). Thus, contrary to expectations, the relationship of perceiving a calling to living a calling was not conditional upon the degree of job crafting. In a second step, hypothesis 5 was tested by examining the role of job crafting on the relationship between living a calling and job satisfaction. The regression analysis did not yield significant results for the interaction of living a calling and job crafting either ($B = -.01$, $t = -.43$, NS, CI [−.08;.05]). Not aligned with the initial expectation, the relationship of living a calling to job satisfaction was also not dependent on the degree of job crafting. Consequently, both hypothesized moderating effects are rejected as shown in the subsequent figures. The interaction effects were plotted at high (1 *SD* above the mean), medium (*M*), and low (1 *SD* below the mean) levels of job crafting with the red middle line being the mean.

As the previous figures and the regression coefficients show, the two sensitivity analyses revealed similar results regarding the moderation effects (Figure 3). The exact regression coefficients for the two moderators relational and task job crafting are displayed below in Table 5 and Table 6.

Although there was a significant effect of relational job crafting on living a calling ($B = .14$, $t = 2.94$, $p < .05$, CI [.05;.23]), the interaction term of perceiving a calling and relational job crafting was not a significant predictor of living a calling, thus rejecting hypothesis 4 ($B = .05$, $t = 1.50$, NS, CI [−.02;.11]). Furthermore, the interaction term of perceiving a calling and task job crafting on living a calling was not significant, thus not supporting hypothesis 4. ($B = -.00$, $t = -.03$, NS, CI [−.07;.06]). All three confidence intervals for indirect effects included zero. Thus, the relationship of perceiving a calling to living a calling was not con-

Table 4: OLS regression model results for the moderated mediation model (Model A and B) (Source: Own illustration based on the SPSS PROCESS output)

$N = 300$. B = unstandardized regression coefficients; SE = standard error; CV = covariates; * $p - .05$; ** $p < .01$; *** $p < .001$. Crafting = combined job crafting scale (8 Items). Model A in the table displays a linear regression analysis to verify the direct effect of path c which was created outside of PROCESS. Model B displays the PROCESS output of the moderated mediation. c' displays the direct effect when the mediation was already proven. Organization: 1 = associations & foundations, 0 = social & public enterprises. Education: 1 = University degree, 0 = No university degree. Employment relation: 1 = full-time, 0 = part-time. Gender: 1 = female, 0 = male. Action scope: 1 = high action scope, 0 = low action scope.

	Consequent								
	Living a calling (M)				Job satisfaction(Y)				
Antecedent	Path	*B*	*SE*	*t*	Path	*B*	*SE*	*t*	Hyp.
Model A									
Constant						4.70***	.22	29.03	
Perceiving (X)					c	.26***	.04	8.03	H2 ✔
R^2								.18	
Model B									
Age	a_4	.00	.01	.70	b_4	.00	.00	.15	
Membership	a_5	.00	.01	.45	b_5	.00	.01	.23	
Organization	a_6	− .06	.10	− .61	b_6	.01	.07	.16	
Education	a_7	− .24*	.12	− 2.01	b_7	− .14	.09	− 1.55	
Employment	a_8	.08	.10	.80	b_8	− .15*	.07	− 2.09	
Gender	a_9	.03	.10	.24	b_9	.24**	.08	3.09	
Action scope	a_{10}	.30**	.10	3.16	b_{10}	.25***	.07	3.41	
Constant	i_{LC}	− .20	.25	− .80	i_{JS}	5.80***	.19	30.44	
Perceiving (X)	a_1	.48***	.04	12.18	c'	.01	.04	.31	H1 ✔
Job crafting (W)	a_2	.14**	.05	2.62	b_2	.06	.04	1.48	
X x W	a_3	.03	.04	.76					H4 ✘
Living (M)					b_1	.39***	.04	8.75	H3 ✔
M x W					b_3	− .01	.03	− .43	H5 ✘
R^2				.48				.45	H6 ✘
R^2 without CV				.45				.38	

ditional upon the degree of relational job crafting and task job crafting. The interaction term between living a calling and relational crafting on job satisfaction was not significant ($B = -.02$, $t = -.77$, NS, CI [−.08;.04]) leading to the rejection of hypothesis 5. The interaction term between living a calling and task crafting on job satisfaction did not show significant results either ($B = -.00$, $t = -.02$, NS, CI [−.05;.05]), thus failing to provide support for hypothesis 5. Consequently, the relationship between living a calling and job satisfaction was found to be neither conditional on the degree of relational job crafting nor on the degree of task job crafting (Table 5 and 6).

Moreover, as the correlation table shows, job crafting is significantly correlated to perceiving a calling and living a calling, but it does not show a moderation effect in further analysis. Hence, job crafting was tested for a possible mediation role in this relationship. Results of the mediation analysis revealed perceiving a calling to significantly relate to the assumed mediator job crafting ($B = .25$, $t = 6.52$, $p < .001$, CI [.18;.33]) as well as to the assumed outcome variable living a calling ($B = .50$, $t = 12.98$, $p < .001$, CI [.43;.58]). In addition, the relationship between job crafting and living a calling ($B = .17$, $t = 3.13$, $p < .01$, CI [.06;.28]) is found to be significant. The result that both the direct effect and the indirect effect are significant with the inclusion of job crafting as mediator offers support for a complementary mediation (Zhao et al., 2010). Consequently, job crafting seems to partially mediate the relationship between perceiving a calling and living a calling as displayed in Table 7.

The revealed relationship between the variables perceiving a calling, job crafting, and living a calling is furthermore displayed in the figure 4.

4.3. Moderated mediation model

In sum, previous results confirmed the existence of a direct effect between perceiving a calling and job satisfaction as well as of the mediation role of living a calling, thus lending support to hypotheses 1, 2 and 3. Moreover, both moderation effects are not found to be significant leading to the rejection of hypotheses 4 and 5. Therefore, hypothesis 6 predicting a moderated mediation is rejected too. However, job crafting was found to partially mediate the relationship between perceiving a calling and living a calling.

Besides these main constructs of the research model, some control variables, so called covariates, were also assessed during the PROCESS analysis. The covariates age

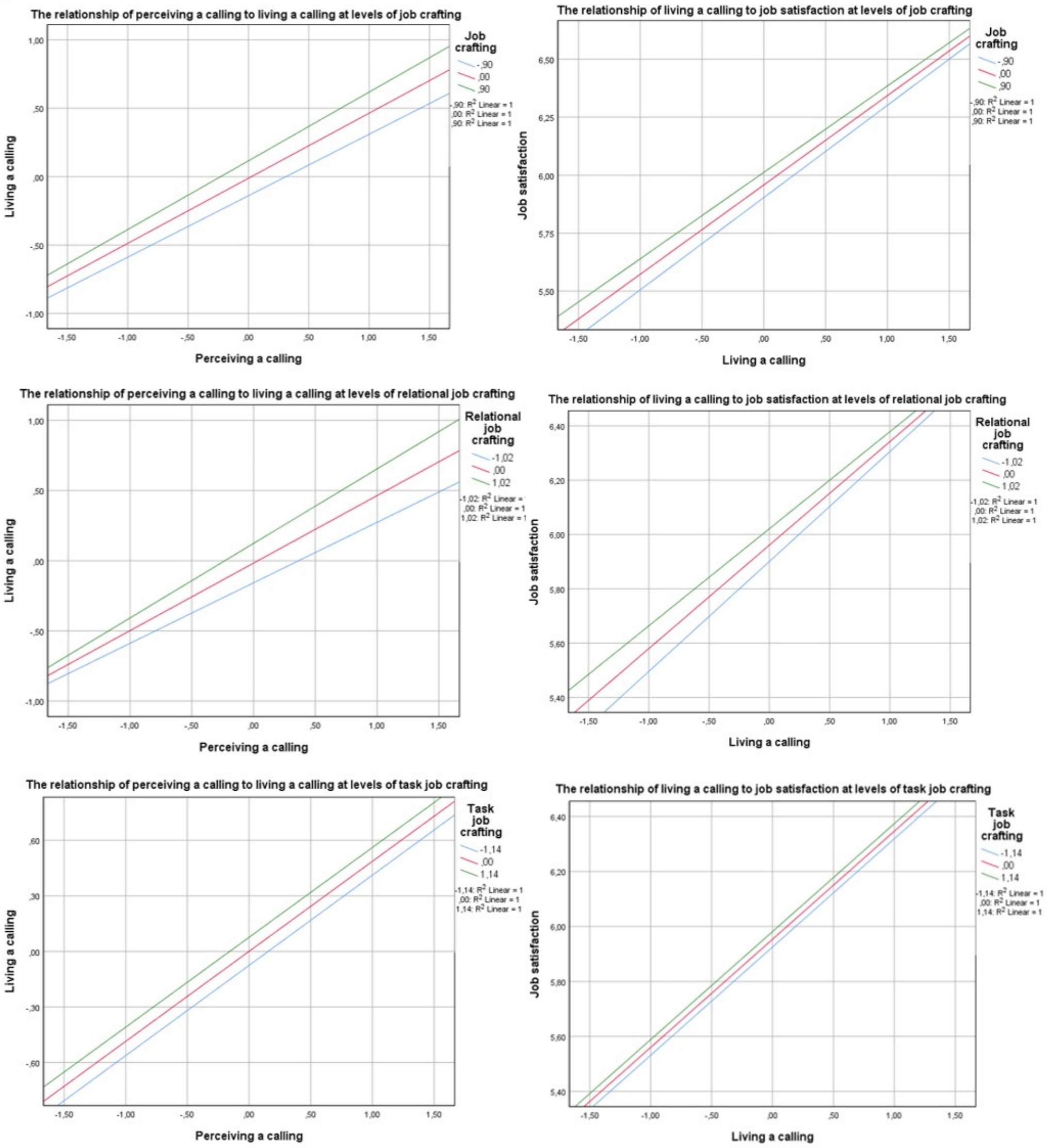
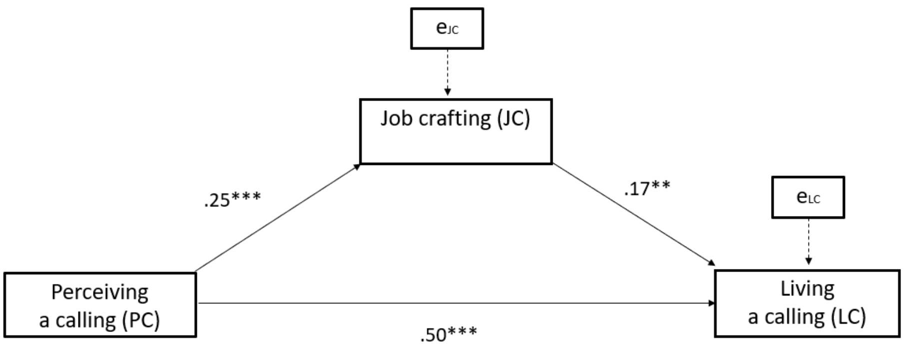


Figure 3: Moderating role of job crafting, relational job crafting, and task job crafting (Source: Output from SPSS PROCESS personally adjusted)



$N = 300$. $^{**}p < .01$; $^{***}p < .001$.

Figure 4: Mediation role of job crafting (Source: Own illustration based on Hayes, 2018)

Table 5: OLS regression model results for the moderated mediation including relational job crafting (Model C) (Source: Own illustration based on the SPSS PROCESS output)

$N = 300$. B = unstandardized regression coefficients; SE = standard error; $*p \leq .05$; $**p < .01$; $***p < .001$. Rel. craft. = relational job crafting, items 1-4 of the job crafting scale. c' displays the direct effect when the mediation was already proven. Organization: 1 = associations & foundations, 0 = social & public enterprises. Education: 1 = University degree, 0 = No university degree. Employment relation: 1 = full-time, 0 = part-time. Gender: 1 = female, 0 = male. Action scope: 1 = high action scope, 0 = low action scope.

	Consequent								
	Living a calling (M)				Job satisfaction (Y)				
Antecedent	Path	*B*	*SE*	*t*	Path	*B*	*SE*	*t*	Hyp.
Model C									
Age	a_4	.00	.01	.82	b_4	.00	.00	.24	
Membership	a_5	.00	.01	.30	b_5	.00	.01	.08	
Organization	a_6	− .01	.10	− .14	b_6	.02	.07	.30	
Education	a_7	− .24*	.12	− 2.03	b_7	− .14	.09	− 1.54	
Employment	a_8	.08	.10	.85	b_8	− .15*	.07	− 2.02	
Gender	a_9	.03	.10	.28	b_9	.24**	.08	3.04	
Action scope	a_{10}	.30**	.10	3.18	b_{10}	.24***	.07	3.33	
Constant	i_{LC}	− .26	.25	− 1.02	i_{JS}	5.79***	.19	30.50	
Perceiving (X)	a_1	.48***	.04	12.75	c'	.02	.04	.48	H1 ✔
Rel. craft. (W)	a_2	.14**	.05	2.94	b_2	.06	.04	1.68	
X x W	a_3	.05	.03	1.50					H4 ✖
Living (M)					b_1	.38***	.04	8.66	H3 ✔
M x W					b_3	− .02	.03	− .77	H5 ✖
R^2				.48				.45	H6 ✖

Table 6: OLS regression model results for the moderated mediation model including task job crafting (Model D) (Source: Own illustration based on the SPSS PROCESS output)

$N = 300$. B = unstandardized regression coefficients; SE = standard error; $*p \leq .05$; $**p < .01$; $***p < .001$. Task craft. = task job crafting, items 5-8 of the job crafting scale. c' displays the direct effect when the mediation was already proven. Organization: 1 = associations & foundations, 0 = social & public enterprises. Education: 1 = University degree, 0 = No university degree. Employment relation: 1 = full-time, 0 = part-time. Gender: 1 = female, 0 = male. Action scope: 1 = high action scope, 0 = low action scope.

	Consequent								
	Living a calling (M)				Job satisfaction (Y)				
Antecedent	Path	*B*	*SE*	*t*	Path	*B*	*SE*	*t*	Hyp.
Model D									
Age	a_4	.00	.01	.73	b_4	.00	.00	.11	
Membership	a_5	.00	.01	.48	b_5	.00	.01	.28	
Organization	a_6	− .08	.10	− .87	b_6	.01	.07	.12	
Education	a_7	− .25*	.12	− 2.13	b_7	− .13	.09	− 1.52	
Employment	a_8	.09	.10	.96	b_8	− .15*	.07	− 1.99	
Gender	a_9	.04	.10	.38	b_9	.25**	.08	3.19	
Action scope	a_{10}	.32***	.10	3.34	b_{10}	.26***	.07	3.51	
Constant	i_{LC}	− .20	.26	− .79	i_{JS}	5.79***	.19	30.28	
Perceiving (X)	a_1	.49***	.04	12.34	c'	.01	.04	.38	H1 ✔
Task craft. (W)	a_2	.07	.04	1.56	b_2	.03	.03	.77	
X x W	a_3	− .00	.03	− .03					H4 ✖
Living (M)					b_1	.39***	.04	9.00	H3 ✔
M x W					b_3	− .00	.03	− .02	H5 ✖
R^2				.47				.44	H6 ✖

($B = .00$, $t = .15$, NS, CI [−.01;.01]), membership ($B = .00$, $t = .23$, NS, CI [−.01;.01]), type of organization ($B = .01$,

Table 7: OLS regression model results for job crafting as mediator (Model E) (Source: Own illustration based on the SPSS PROCESS output)

$N = 300$. B = unstandardized regression coefficients; SE = standard error; $^{**}p < .01$; $^{***}p < .001$. Crafting = combined job crafting scale (8 Items).

	Consequent							
	Job crafting (M)				Living a calling (Y)			
Antecedent	Path	B	SE	t	Path	B	SE	t
Model E								
Constant	I_{JC}	3.73***	.20	18.87	I_{LC}	1.69***	.27	06.21
Perceiving (X)	a_1	0.25***	.04	06.51	c'	0.50***	.04	12.98
Crafting (M)					a_2	0.17**	.05	03.13
R^2				00.12				00.44

$t = .16$, NS, CI [−.13;.15]), and education ($B = -.14$, $t = -1.55$, NS, CI [−.31;.04]) did not show significant relations to job satisfaction. Opposed to these results, the covariates employment relation, gender, and scope of action were all three significantly related to job satisfaction. While employment relationship was negatively related to job satisfaction ($B = -.15$, $t = -2.09$, $p < .05$, CI [−.30; −.01]), gender ($B = .24$, $t = 3.09$, $p < .01$, CI [.09;.39]) and scope of action ($B = .25$, $t = 3.41$, $p < .001$, CI [.11;.39]) were positively related to job satisfaction. Since these variables have been subject to indicator coding, the coefficients need to be interpreted with regard to the comparison group. The following figure illustrates all path coefficients within the statistical diagram of the research model.

The regression coefficients lead to the following two regression equations excluding covariates:

$$LC = -20 + 0.48PC + 0.14JC + 0.03PCxJC$$
$$JS = 5.8 + 0.01PC + 0.39LC + 0.06JC - 0.01LCxJC.$$

Prediction accuracy of Model B was analyzed with a look at R^2 indicating which percentage of the variance within the dependent variable job satisfaction is explained by the various independent variables (Hair et al., 2014). Whereas perceiving a calling predicted 18% of the dependent variable job satisfaction (Model A, Table 4), the linear regression model including the mediator living a calling explains a larger part of the variance with $R^2 = .38$ (Model B, Table 4). The explained variance of job satisfaction continues to grow with the inclusion of the covariates into the regression model. With 45%, almost half of the dependent variable job satisfaction is explained. Thus, the addition of living a calling and the covariates results in a remarkable increase of R^2 by around 27%. Overall, the proposed research model shows a high level of predictive capacity.

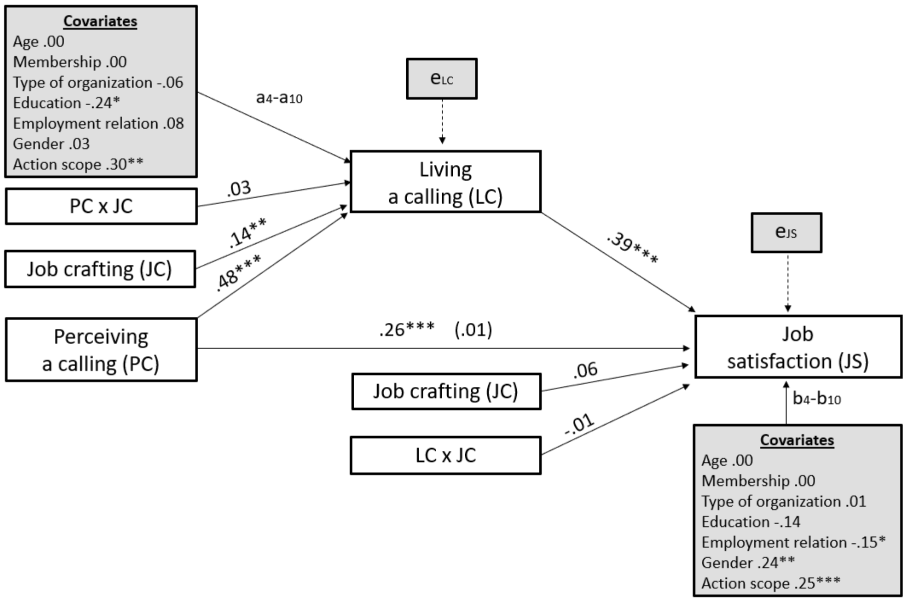
5. Discussion

5.1. Evaluation of the results

In the following two subchapters, the results of the data analysis are discussed. First, the results are evaluated with regard to the outcome variable job satisfaction. A significant relation between perceiving a calling and job satisfaction was found in this study whereby living a calling takes on a mediator role in this relationship. Besides, scope of action, employment relationship, and gender are significantly related to job satisfaction and are discussed in more detail. Second, referring to the research question, the influence of job crafting on the relationship between both types of calling and job satisfaction is explained and interpreted. Job crafting did not turn out to be a moderator of the mediated relationship between perceiving a calling and job satisfaction. However, it was found to be a partial mediator in the relationship between perceiving a calling and living a calling which is discussed subsequently.

5.1.1. The impact of callings and other predictors on job satisfaction

The results reveal a direct positive relationship between perceiving a calling and job satisfaction. This indicates that NPO employees who have initial internal ideas about their calling are content with their job. Having initial internal ideas of what their calling might be, NPO employees develop a deep understanding of their preferences and interests in a first step (Rosso et al., 2010). In a second step, NPO employees strive to follow their perceived preferences and interests in the work context. This is supported by the finding that perceiving a calling is positively related to living a calling. Employees who have initial ideas about their calling aim at living them out at work. As the results show, the living of a calling then leads to employees' satisfaction with their job. Consequently, not only the perception of a calling is positively related to job satisfaction but especially the living of a calling strongly fosters this relationship. Both types of callings, expressed through personal preferences and interests, lead to job satisfaction of NPO employees extending research in the field. While the relationship between perceiving a calling and job satisfaction has already been evaluated by Duffy et al. (2012b) who analyzed employed adults from the United States working in different occupations, the relationship of living a calling with job satisfaction has been confirmed by Chen et al. (2017) investigating a law enforcement agency.



$N = 300$. $^*p \leq .05$; $^{**}p < .01$; $^{***}p < .001$. Type of organization: 1 = associations & foundations, 0 = social & public enterprises. Education: 1 = University degree, 0 = No university degree. Employment relation: 1 = full-time, 0 = part-time. Gender: 1 = female, 0 = male. Action scope: 1 = high action scope, 0 = low action scope. Path c' is depicted in parentheses.

Figure 5: Statistical diagram of research model including path coefficients (Source: Own illustration based on Hayes, 2018)

Thus, previous research is further validated with this study by examining a sample of NPO employees.

The direct relationship between perceiving a calling and job satisfaction loses its significance with the inclusion of living a calling into the linear regression model. This implies that the relationship between perceiving a calling and job satisfaction via living a calling is an indirect-only mediation. An indirect-only mediation describes a relationship which is fully explained by the mediator variable (Zhao et al., 2010). Relating this to the model variables, the mere perception of a calling does not independently explain the construct of job satisfaction but rather living a calling becomes a main predictor of job satisfaction. Thus, the inclusion of living a calling as a full mediator is required to allow for a deeper understanding of the relationship between perceiving a calling and job satisfaction.

Moreover, the addition of living a calling to the linear regression analysis leads to a higher explained variance of the model. This is further proof for the importance of living a calling in the relationship between perceiving a calling and job satisfaction. Apparently, the mere detection of a calling does not suffice to exploit the full potential of job satisfaction. Employees who live out their calling, opposed to those who only perceive a calling, seem to be more satisfied because they can actually follow their own personal interests and preferences. This finding strengthens the hypotheses of the currently developed work as calling theory which has been tested only once so far (Duffy et al., 2018, 2019).

Stepping back to the explained variance of the research model, it also provides information about the influence of the control variables on the outcome variable job satisfactio. It was found that the explained variance increased when further adding the covariates into the linear regression analysis of the moderated mediation model. This finding provides initial evidence that perceiving and living a calling might not be the only driving predictors of job satisfaction. Rather, there might be some of the control variables which are strongly related to the outcome variable job satisfaction boosting the prediction accuracy of the proposed research model. Therefore, relevant control variables are discussed in the following paragraphs.

The control variables scope of action, employment relationship, and gender are significantly related to job satisfaction. The positive relationship between scope of action and job satisfaction indicates that employees with a high scope of action are a little more satisfied with their job than those with a lower scope of action in their job. The control variable scope of action was initially added to the questionnaire to control whether employees who engage in job crafting hold the formal power to adapt their work environment according to their calling. Therefore, employees with a very low scope of action were removed from the sample because they are not able to execute job crafting within the borders of their job. By doing this, the variable should rather serve for a plausibility check of the presumed moderating effect and was not yet considered in connection with the outcome variable job satisfaction. However, an additional finding was made. This finding of a positive relationship between a high scope of action and job satisfaction was not hypothesized before but it can be explained with the job characteristics model of work motivation by Hackman and Oldham (1976) presented in chapter 2.3.

The job characteristics model describes that several core job dimensions (job characteristics) lead to critical psychological states which in turn lead to different personal and work-related outcomes (Hackman & Oldham, 1976) (Appendix 3). More specifically, the authors predict that the job dimension *autonomy* leads to the psychological state *experienced responsibility for outcomes of the work* which in turn results in *high satisfaction* as one of the four outcome variables. Applying this model to the finding of this study, a high scope of action can be translated into autonomy at a job because people with a high scope of action work mostly autonomous from their managers. Thus, the psychological state *experienced responsibility for outcomes of the work* serves as a possible explanation of the relationship between a high scope of action and job satisfaction, found in this study. In addition to job satisfaction, the job characteristics model suggests three further outcome variables of autonomy. They are high internal work motivation, work performance, or low absenteeism and turnover. Derived from this proposed relationship, a high scope of action might also lead to other outcomes than merely job satisfaction. Some of these outcome variables have even been analyzed in context of callings too. While Kim et al. (2018) already examined the relationship between callings and in-role performance, Chen et al. (2017) and Esteves and Lopes (2016) brought in the turnover aspect. Intrinsic motivation as a positive side effect of callings is not yet analyzed.

The control variable employment relationship was the second one significantly related to job satisfaction. It was included in the questionnaire to test whether the work status influences employees' inclination to engage in job crafting. It was assumed that full-time employees are more likely to engage in job crafting than part-time employees because they have longer workdays and are willing to structure them according to their callings. The positive correlation between employment relationship and job crafting might be proof for this assumption. In addition to the proposed correlation, it was further found that employment relationship is negatively related to job satisfaction signifying that full-time employees tend to be less satisfied with their job than part-time employees.

A calling-related explanation for full-time employees being less satisfied with their job than part-time employees could be the circumstance that NPO employees not only have the calling for social contribution but also have leisure callings like being an actor or playing an instrument for example. Thus, they might have multiple callings in life which cannot all be satisfied at work (Berg et al., 2010a). A full-time job would then be a greater barrier to the fulfillment of leisure callings. Full-time employees with multiple callings which belong to both work-related callings and leisure-related callings remain with unanswered callings at work about their leisure calling (Berg et al., 2010a). Unanswered callings are much stronger for full-time employees than for part-time employees because they generally spend much more time at work. This reduces their available free time needed to pursue their private callings. Consequently, the lower satisfaction of full-time employees might result from the fact that they must spend more time at work which does not leave much time for other personal interests or callings. Employees who work part-time have more available time to pursue other callings than their work callings. Overall, it might be more important for NPO employees to fulfill two callings a little than only one to the fullest. Moreover, the different satisfaction levels of full-time and part-time employees could result from the fact that women make up a large proportion of part-time workers and gender seems to impact the degree of job satisfaction as described in the subsequent paragraph (Clinebell & Clinebell, 2007).

The results of this study revealed gender as the third control variable positively related to job satisfaction which implies that women working in NPOs tend to be a little more satisfied with their jobs than men. This finding is consistent with other studies investigating the relationship between gender and job satisfaction among full-time workers of different occupations and employees in the Turkish hotel industry (Hodson, 2016; Kara & Uysal, 2012). Sousa-Poza and Sousa-Poza (2010) suspect that due to the poor working conditions of women in the past, their low job expectations lead to higher job satisfaction. But research in the field is controversial. Studies analyzing management positions or secondary school teachers did not find significant relations between gender and job satisfaction (Mabekoje, 2009; Mason, 1995). Therefore, the relationship seems to highly depend on the exact study design and the selection of the sample. With regard to the sample of NPO employees, it is possible that women tend to be more interested in performing social jobs than men. The high number of female respondents in this study (Appendix 4) goes along with the fact that 75% of NPO employees are women (Zimmer & Priller, 2018). Consequently, women seem to live their calling because they are intrinsically motivated to execute socially relevant jobs which makes them more satisfied with their job.

To summarize, job satisfaction has several positive consequences. Satisfaction at work can increase the overall life satisfaction of employees which increases their overall mental health (Choi et al., 2017; Peterson et al., 2009; Slemp & Vella-Brodrick, 2014). Moreover, job satisfaction also induces better work performance of employees. This can be explained with Judge et al.'s (2001) statements on the relationship between job satisfaction and job performance. Employees might be better performers when they are satisfied.

5.1.2. The role of job crafting in context of callings

The phenomenon job crafting relates to aspects of the job design theory by Hackman and Oldham (1976) which suggests that various job characteristics lead to different personal and work-related outcomes (Appendix 3). By actively modifying the characteristics of a job, employees alter their work environment and thus engage in job crafting. In the course of this study, job crafting was assumed to strengthen the relationship between perceiving a calling and living a calling as well as between living a calling and job satisfaction. Against expectations, the mediated relationship from perceiving a calling via living a calling to job satisfaction was not conditional upon the degree of job crafting. Job crafting does not strengthen the relationship as a moderator. However, job crafting was found to be a complementary mediator and thus partially explains the relationship between perceiving a calling and living a calling (Zhao et al., 2010). Thus, the application of job crafting to some extent bridges the gap from the mere perception of a calling to its living. This finding of only a partial mediation could be explained as follows below.

NPO employees do not engage in job crafting in order to live out their calling to the assumed extent since they already feel like living out their calling due to the social outcomes of their work. With regard to their wish for social contribution, employees do not rank monotonous tasks too high but focus on the actual impact they can make by working in a NPO too (Alfes, Shantz, and Saksida, in press.; Grant, 2007). Consequently, employees in NPOs might not merely be intrinsically motivated to perform a specific task at work but their intrinsic motivation is connected with the results of their work - the impact they have on the beneficiaries. Administrative and repetitive tasks do not hinder NPO employees to live their calling at work. This finding contradicts the initial assumption that NPO employees will definitely engage in job crafting to compensate their monotonous administrative work. Accordingly, it rather seems to be a combination of both the purpose of the NPO and the tasks to be done which fosters their motivation and makes them feel to live their calling.

Furthermore, the results did not yield a moderating effect of job crafting and only a partial mediation because employees might not realize their own interference with the work environment. It is conceivable that employees are not always aware of their own changes of the work environment and therefore did not report so in the survey. This argument refers to a big disadvantage of self-reported data which will be discussed in more detail in the next chapter. Moreover, Leana, Appelbaum, and Shevchuk (2009) introduced collaborative job crafting with the analysis of early childhood education centers which might have similar features as NPOs. Collaborative job crafting describes the active change of the work environment induced by a whole group of employees and only by individuals. They found collaborative job crafting to significantly relate to job satisfaction and commitment. Thus, it is also plausible to assume that NPO employees engage in collaborative job crafting without being aware of it. Maybe complete work groups in NPOs collectively change their work environment and individuals do not perceive it as a real change because their own position is not directly affected. A wrong perception of their activities would then lead to questionable survey results concerning job crafting. This could be an additional explanation why job crafting - neither relational nor task job crafting - did not serve as a moderator and only as a partial mediator.

5.2. Recommendations for nonprofit organizations

The main finding of this study is that NPO employees who perceive a calling to some extent engage in job crafting to be able to live their calling at work. It was also found that living a calling at work leads to job satisfaction of NPO employees. Job satisfaction in turn positively impacts both employees and NPOs. Living a calling and job satisfaction lead to employees' psychological well-being (Elangovan et al., 2010; Ryan & Deci, 2000; Slemp & Vella-Brodrick, 2014) as well as to higher job performance of employees which improves organizational outcomes (Choi et al., 2017; Judge et al., 2001; Kim et al., 2018). Because of these positive effects, it is rewarding for organizations to foster the living of callings at work. The suggestions made to achieve this mainly refer to topics of external and internal human resource management in NPOs. Both recruitment processes and internal participation procedures should be oriented on applicants' and employees' sense of calling (Helmig & Boenigk, 2020). Since this study only analyzed permanent employees of NPOs and no volunteers, the recommendations are also addressed to NPO managers of permanent staff.

One way to secure employees living their calling is a well-grounded recruitment process of NPOs (Helmig & Boenigk, 2020). This will ensure that mainly candidates who consider their future job as their calling are shortlisted. Employees in NPOs who are living their calling are especially interested in making a social contribution with their job. Therefore, the selection process should be designed to unfold applicants' real expectations of the job and the impact they want to make. Moreover, managers should try to find a way to analyze applicants' motivation type because employees who live their calling are intrinsically motivated to do a job (Ryan & Deci, 2000). In addition, derived from the need to find applicants who perceive their future job in a NPO as their calling, managers should aim to emphasize the aspects of calling and social contribution in their external human resources marketing. As NPOs are not only pursuing financial rewards but also a social aim, they can use their mission as competitive advantage when recruiting employees that seek to pursue altruistic values. This might increase the likelihood that predominantly people with those interests apply for the job.

The implications presented next deal with the inclusionary and participative processes of the existing workforce in NPOs. With regard to employees' interest in the social outcomes of their NPO, managers of NPOs could provide their permanent staff with insights into the actual work with the beneficiaries by organizing excursions or events on a regular basis. Such events remind employees, usually engaged in the office, of their real social contribution and make them feel like they are living out their calling at work. Their compassion for the beneficiaries will then be kept in their mind and fosters their motivation for administrative work.

Moreover, managers could offer possibilities for employee participation concerning money distribution or project decisions (Scott-Ladd, Travaglione, & Marshall, 2006). Employee participation could be easily implemented with short internal online surveys asking NPO employees about their preferences for certain social projects. The results of the survey could then be used to lay the foundation for future project decisions. Of course, the proposed projects should be carefully examined by management beforehand to avoid complications with the staff which might result in the opposite direction of participation. In a second step, the implemented projects could later be summarized in an employee newsletter. In doing so, NPO employees can follow the internal decision processes of their organization as well as their operative effect for beneficiaries. These actions carried out by management would increase employees' intrinsic motivation for their job and make them feel living their calling. These actions might keep the staff motivated and fulfilled with their job (Men, 2014).

Furthermore, managers of NPOs should provide employees with a high scope of action. This study proves a positive relation between autonomy and job satisfaction. Knowing about the positive outcomes of job satisfaction such as employee well-being and performance, the provision of autonomy at a job is preferable. Besides, as job crafting takes a partial mediator role between perceiving and living a calling, a minimum scope of action is needed to ensure job crafting opportunities which foster to step from the perception of a calling to its living.

5.3. Limitations and reference to future research

One of the most important limitations of this study is its cross-sectional research design. With this design, data was collected at one point in time. A big disadvantage of such simultaneous data collection procedure is that it only allows statements about simple relationships or correlations but not about causal relationships (Hair et al., 2014). Thus, like most of the studies on calling, this is a correlational study only. Therefore, future research on calling and job crafting should be longitudinal studies or experiments to draw on causality. Longitudinal studies collect data at several points in time to assess the development of relevant variables (Bell et al., 2019). For instance, it might be interesting to analyze whether employees can better live their calling after having switched from one NPO to another. In experiments, the independent variable scope of action could be manipulated to carry out group comparisons more deeply.

The next limitation refers to the sampling technique snowball sampling which goes along with the aspect of representativeness. Snowball sampling is a non-random sampling technique where the selection of initial participants does not occur by chance, but it relies on the network and efforts of the person conducting the data. This person choses the initial representatives and asks them to distribute the survey further to reach an appropriate sample (Heckathorn, 2011). However, due to the following two aspects, a completely representative sample is hard to reach. On the one hand, it depends on the selection of the initial representatives whether different realms of a population are included. After having contacted the first participants, the researcher has very little control over the sampling. Depending on the motivation of each contacted person and her or his willingness to distribute the survey, the sample might be dominated by a specific group within the population. Thus, it is difficult to trace from whom the sample was mainly fostered (Sharma, 2017). On the other hand, it depends on the social situation of people whether they are confronted with the survey or not. Social people are more likely to receive a survey than isolated people who are not part of a social group. Mostly those two aspects lead to a biased sample which does not guarantee full representativeness (Johnson, 2014).

In addition to the previous limitation, the survey is restricted to German NPOs and people with internet access. This might also influence the representativeness of the study and might not allow for inferences to the whole population of NPOs. Customary, Germans tend to act aligned with given rules and regulations which does not always foster to think "out of the box" or to recreate the own work environment according to their callings (Schroll-Machl, 2016). Thus, future studies, especially with regard to the use of job crafting techniques which requires employees' self-initiative, are needed to reconstruct the correlation and partial mediation for other cultures and within various sectors of NPOs. Moreover, descriptive statistics show that the sample was highly educated with more than 80% having a university degree. It is possible that mostly high position employees in NPOs have access to email accounts whereas social workers who are in direct contact with the beneficiaries might not (Bell et al., 2019). Therefore, future research should analyze if there is a relationship between education and awareness for the nonprofit sector or if this result can be explained by the restricted internet access of some worker groups.

Moreover, the sample seems to be very heterogeneous as the list of the different types of organizations show (Appendix 4). Derived from the need for a short questionnaire to receive a high response rate, aspects like organizational sectors and sizes were not integrated as control variables in the survey. However, it is assumed that the surveyed NPOs belonged to various sectors and differed greatly in size which might have been influencing factors of employees' responses. Since NPOs are very diverse, the introduced control variables size and sector are required to be asked in future studies on NPOs in order to foster representativeness.

Another limitation refers to the selection of the statistical software. The results IBM SPSS PROCESS makes available are restricted to the main effects of mediation or moderation. Therefore, parts of the analysis were additionally calculated outside of PROCESS to get a deeper understanding of the data. Future research could use structural equation modelling in order to comprehend the relations between each of the variables more clearly. Moreover, studies with high missing rates and a need for much flexibility to design the research model in the statistical software should use structural equation modelling (Hair et al., 2011; Hayes et al., 2017).

The results of factor analysis yield an additional limitation. Opposed to previous studies, it is not clear whether the participants clearly understood the constructs of perceiving a calling and living a calling as two distinct constructs. Explorative factor analysis yield that the two scales both load on the same factor. Thus, only a marginal difference between the five items of the living a calling scale opposed to the perceiving a calling scale could be found. The similarity of the two scales might have influenced the impact of job crafting on the relationship because the constructs were not as strictly separable as expected. Moreover, the two subscales relational and task job crafting loaded on two different scales. Therefore, the sensitivity analyses have been conducted. Future research could create a new and short suitable job crafting scale including all aspects developed by Wrzesniewski and Dutton (2001) as well as a calling scale which better reveals the difference between perceiving and living a calling.

Self-reported data is a further limitation of this study. NPO employees might have reported differently than their managers would have done. Thus, the data might not be completely reliable (Bell et al., 2019). In case of this study, especially self-reported data concerning job crafting is critical since NPO employees are not always aware of their adjustments in the work environment. Their boss or colleagues might have given different answers to employees' degree of adjustments in the work environment. It is conceivable that employees unconsciously adapt their working environment to live their callings but have not indicated this in the survey. Moreover, it is possible that employee groups in organizations change the working environment collectively without being aware of it (Leana et al., 2009). Therefore, statements of individuals are not always completely reliable. In future research on job crafting, colleagues or managers should be asked whether employees actively change their work environment. It might happen that employees themselves do not recognize when they actively change their job role or influence people around them.

Another limitation of the study is its one-sided view on calling and job crafting. This study only considers the positive effects of calling with job satisfaction as outcome variable which does not reflect the full potential of callings. Future research should also look at critical aspects of living one's calling such as burnout, exploitation, or perfectionism (Duffy et al., 2018; Grant, 2007). Moreover, with the choice of the two scales, job crafting was only analyzed from its promotion-oriented perspective whereby tasks and interactions with others are increased or extended. The prevention-oriented subscales were not used in this study (Bindl et al., 2019; Tims, Bakker, & Derks, 2013). However, regarding the negative outcomes of calling, future research should also integrate prevention-oriented crafting because the use of prevention-oriented job crafting techniques might reduce burnout and exploitation. Example items for prevention-oriented crafting are "I minimized my interactions with people at work that I did not get along with" (prevention-oriented relationship crafting) or "I tried to simplify some of the tasks that I worked on" (prevention-oriented task crafting) (Bindl et al., 2019). In sum, future research could create a short job crafting scale including aspects of all subscales developed by Bindl et al. (2019).

The last limitation goes along with one of the most interesting findings of the study - the complementary mediating role of job crafting which was not hypothesized (Zhao et al., 2010). So far, job crafting was found to partially mediate the relationship between perceiving a calling and living a calling. Future research should analyze job crafting in an overall model including job satisfaction as outcome variable. It is possible that the direct relationship between perceiving a calling and job satisfaction is explained by a multiple mediator model with job crafting being the first mediator and living a calling being the second mediator.

6. Summary

The present work delivers initial evidence that the positive relationship between calling and job satisfaction, already analyzed by other researchers, is also valid for NPOs (Chen et al., 2017; Choi et al., 2017; Duffy et al., 2012a). Thus, calling at work leads to job satisfaction of NPO employees. In this study, the concept of calling is subdivided into two states: the mere perception of a calling and the living of a calling. Aligned with expectations, the constructs of perceiving a calling and living a calling are positively related. Therefore, the perception of a calling can be interpreted as a trigger moment which provides employees with an initial idea about what their calling is. Only after this first idea of a calling has arisen, employees actively strive to live it out. The living of a calling takes on a mediator role in the relationship between perceiving a calling and job satisfaction indicating that the relationship is better explained when living a calling is added to the research model. It is an indirect-only mediation effect because the direct effect from perceiving a calling to job satisfaction disappears when living a calling is included into the regression analysis (Zhao et al., 2010).

Drawing on the concept of job crafting, it was assumed to take a moderating role by strengthening the relationship between perceiving and living a calling as well as between living a calling and job satisfaction. Contrary to predictions, the mediated relationship from perceiving a calling via living a calling to job satisfaction was not conditional upon the degree of job crafting. Both hypothesized moderation effects have been rejected. Even the differentiation into relational and task job crafting with two sensitivity analyses did not show distinct findings. Referring to the research question, job crafting does not immediately appear to influence the relationship between calling and job satisfaction. However, a third sensitivity analysis yielded different results and showed that job crafting partially mediates the relationship between perceiving a calling and living a calling (Zhao et al., 2010). The partial mediation explains that employees working in NPOs feel to live their calling through both the change of their work environment by adapting their tasks and the social outcomes they foster with their work in a NPO. Thus, job crafting seems to bridge NPO employees' perception of a calling and the living of it to some extent.

In addition to previous hypotheses, a high scope of action, employment relationship, and gender were found to significantly relate to job satisfaction. The positive relationship between a high scope of action and job satisfaction can be explained with the psychological state *experienced responsibility for outcomes of the work* of the job characteristics model of Hackman and Oldham (1976). Moreover, employment relationship is negatively related to job satisfaction indicating that full-time employees are a little less satisfied with their job than part-time employees. An explanation for this result could be their unanswered leisure callings. Generally, employees are able to have several callings which belong to both the work realm and the leisure realm (Berg et al., 2010a). With a bigger number of working hours, it is difficult for full-time employees to follow their leisure callings. This might be the reason for their lower job satisfaction opposed to part-time employees. Lastly, women tend to be a little more satisfied with their jobs in NPOs than men. Previous research investigating this relationship found controversial results (Hodson, 2016; Mabekoje, 2009). Thus, the selection of the sample and the survey design seem to be the driving forces for this result. Considering the sample of NPO employees, women's interest and sense of calling for social jobs might be greater than those of men which leads to their higher job satisfaction.

In total, this study adds to research in the field of callings by investigating the relationship between perceiving a calling, living a calling and job satisfaction analyzing a sample of NPO employees. It is one of the first studies to evaluate a predictor of living a calling. Job crafting was found to predict living a calling as a partial mediator in the relationship between perceiving a calling and living a calling. Moreover, the study contributes to existing research on job crafting by considering it in relation with the outcome variable job satisfaction. Before, job crafting has not been considered with regard to possible outcomes. Last, research on job satisfaction is extended by revealing the influence of a high scope of action, employment relationship, and gender on job satisfaction with a sample of NPO employees.

Although the described findings strive research in the field, this study also has its limitations. Based on the finding that job crafting takes a partial mediator role, the most important limitation is that it was not yet tested in an overall model. Therefore, in order to fully answer the research question, a multiple mediator model with job crafting being the first mediator and living a calling being the second mediator in the relationship between perceiving a calling and job satisfaction is required. Other limitations of this study refer to the nature of self-reported questions and the study design. The cross-sectional study design only reveals correlations which need to be tested with longitudinal studies or experiments to draw a causal conclusion. Furthermore, self-reported answers are not fully reliable. It is important to test the hypotheses - especially those proposing a moderating effect of job crafting - with other samples as well (Bell et al., 2019; Hair et al., 2014). It is conceivable that surveys with employees from for profit organizations would yield different effects. Besides, the selection of adequate measures was problematic. It is not clear whether the perceiving and living a calling scales have been treated differently by participants. Moreover, the job crafting scale used in this study only comprises promotion-oriented techniques (Bindl et al., 2019). Prevention-oriented job crafting techniques should be considered in future research with regard to negative consequences of callings such as burnout or exploitation (Duffy et al., 2018; Grant, 2007).

Moving to the positive consequences of NPO employees living their calling, several management implications can be derived. The recommendations for NPO managers to foster employees' living of their calling predominantly refer to aspects of human resource management (Helmig & Boenigk, 2020). First, a well-grounded recruitment process in order to select only applicants who perceive their future job as their calling is needed. Second, participation strategies to make employees from the office feel connected to the beneficiaries should be introduced (Scott-Ladd et al., 2006). This could happen with regular events for office employees to meet the beneficiaries and see the social outcomes of their work. Last, NPO managers should provide employees with a high scope of action because it leads to higher job satisfaction and offer opportunities to craft a job.

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Variance Risk Premiums on German Government Bonds

Varianzrisikoprämien auf deutsche Staatsanleihen

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Abstract

Volatility and related to it the uncertainty inherent to financial markets has an eminent role. Variance swaps are suitable for the trading of it and have led to profound insights in various markets, especially regarding the variance risk premium.

However, research on government bonds is less common and insightful, which is why this study aims to fill the gap and extend the research on this topic. This is achieved by two main aspects: First, a European-wide comparison of the Bond variance risk premium is enabled by analyzing the German, French, and Italian Treasury markets. Secondly, two different approaches of structuring the Bond variance swap are considered. While one of them has its theoretical justification, the other is more suitable for practical applications. The results of this study show that the variance risk premium is to be found in the German as well as the European Treasury markets. By shorting the variance swaps attractive returns are feasible, but this varies greatly according to the considered country or approach of structuring.

Zusammenfassung

Volatilität und damit verwandt die Unsicherheit an den Finanzmärkten hat eine besonders wichtige Rolle. Varianzswaps eignen sich für das Handeln mit dieser und haben tiefgehende Erkenntnisse in vielen Märkten ermöglicht, vor allem die der Varianzrisikoprämie.

Forschungen auf den Staatsanleihenmärkten kommen jedoch zu kurz, weshalb sich diese Arbeit zum Ziel genommen hat, die Forschung in diese Richtung zu erweitern. Dies wird erlangt anhand von zwei wesentlichen Gesichtspunkten: Zum einen wird ein Vergleich der Anleihenvarianzrisikoprämie auf europäischer Ebene ermöglicht, da neben dem deutschen Staatsanleihenmarkt auch die französischen und italienischen betrachtet werden. Zum anderen werden zwei unterschiedliche Strukturierungsweisen von Anleihenvarianzswaps betrachtet. Während eines davon eher auf theoretischer Basis von Bedeutung ist, wird eine andere Bildungsweise vorgestellt, welches sich für die praktische Umsetzung eignet. Die Ergebnisse dieser Arbeit zeigen, dass die Varianzrisikoprämie in den deutschen sowie europäischen Staatsanleihenmärkten existent ist. Durch eine Short-Position in diesen Varianzswaps lassen sich attraktive Renditen generieren, wobei sich diese nicht nur zwischen den Ländern, sondern auch zwischen den Strukturierungsweisen stark unterscheiden.

Keywords: Varianzswaps; Volatilität; Varianzrisikoprämium; Staatsanleihen; modellfrei.

1. Einleitung

Das Betrachten der Volatilität hat in der Finanzwirtschaft eine weit zurückreichende Beständigkeit. Im Laufe der Zeit hat sich diese von einer reinen statistischen Kennzahl sogar in eine eigene Anlageklasse entwickelt. Ein prominentes Beispiel für die Volatilität als Investition und den damit verbundenen Risiken, ist der Fall des Hedge Fonds Long Term Capital Management (LTCM), welcher in jener Zeit als die „Zentralbank der Volatilität“ bezeichnet wurde.[1] Nach der Finanzkrise in Asien waren Anleger auf den Märkten mit erhöhter Nervosität konfrontiert und wollten sich dementsprechend durch das „Kaufen der Volatilität“ gegen weitere Sprünge in der Volatilität absichern. LTCM war allerdings der Meinung, dass die durch den Markt implizierten Volatilitäten für In-

[1] Vgl. Jacque (2015), S. 258ff.

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dizes wie dem U.S. S&P 500, dem französischen CAC 40 und dem DAX über deren historischen Werten befanden. Aufgrund dessen deckte LTCM den Bedarf der Nachfrage und verkaufte Volatilität in großem Rahmen. Der Gedanke dahinter war, dass die Volatilitäten fallen würden, doch durch das Eintreten der Russlandkrise 1998 geschah das Gegenteil und LTCM musste in ihrer Position starke Verluste erleiden.[2]

Während dieser Zeit wurden auch die ersten Volatilitätskontrakte in Form des Volatility Swaps gehandelt, doch nur wenige Jahre später konnten sich Varianzswaps als das meist gehandelte Volatilitäts-Derivat etablieren.[3] Dabei stellen Varianzswaps eine reine Investition in die Volatilität eines zugrunde liegenden Wertpapiers da und die Auszahlung wird nicht, im Gegensatz zu anderen Volatilitäts-Derivaten wie z.B. Straddles und Strangles, von etwaigen anderen Faktoren beeinflusst. Dabei stellen Varianzswaps eine Art Absicherung gegenüber erhöhter Unsicherheit an den Märkten dar und verlangen dafür, wie empirisch öfters gezeigt, eine Entschädigung von dem Varianzkäufer, die sogenannte Varianzrisikoprämie.

Diese Erkenntnis wurde für Aktienmärkte weitgehend untersucht und die Varianzrisikoprämie kann sich nicht nur in den globalen Aktienmärkten, sondern auch in den Rohstoff- und Zinsmärkten wiederfinden. Vergleichbare Untersuchungen kommen auf den Anleihenmärkten zu kurz, was dazu führt, dass die Varianzrisikoprämie auf diesen Märkten bei Weitem nicht so gut verstanden werden wie auf anderen. Neuere Forschungen von Choi, Mueller und Vedolin (2017) greifen genau dieses Problem auf und führen empirische Arbeiten für den U.S. Staatsanleihenmarkt aus, jedoch gibt es in dem europäischen Markt nach bestem Ermessen keine vergleichbaren Arbeiten.

Dabei ist dies von erhöhtem Interesse, da durch das zunehmende Angebot an Derivaten auf europäischen Staatsanleihen die Strukturierung von Varianzswaps erleichtert wird.[4] Zusammen mit der Tatsache, dass die Nachfrage nach Optionen auf europäische Staatsanleihen sehr hoch und steigend ist, welches vor allem aus Gründen der Absicherung gegen Unsicherheiten resultiert[5], ist es von besonderer Relevanz, Varianzswaps auf europäischen Staatsanleihenmärkten zu betrachten. Denn es liegt die Vermutung nahe, dass durch diese anwachsende Aktivität der Handel mit diesen an Bedeutung gewinnt. Diese Abschlussarbeit nimmt sich zum Ziel, die Anleihenvarianzrisikoprämie auf den europäischen Märkten zu untersuchen und damit die Literatur zu erweitern. Dabei werden vor allem der deutsche Staatsanleihenmarkt betrachtet und Vergleiche auf europäischer Ebene, im Speziellen zu französischen sowie italienischen Staatsanleihenmärkten, gezogen. Dies ist von besonderem Interesse, da man sich dadurch in einer einzigartigen Umgebung befindet. Die untersuchten Länder und Märkte haben zwar die gleiche Währung, doch verschiedene Ausprägungen und Verhaltensweisen der dazugehörigen Staatsanleihen. Beber, Brandt und Kavajecz (2009) verdeutlichen dies, in dem gezeigt wird, dass deutsche Staatsanleihen eine überdurchschnittlich hohe Qualität der Kreditwürdigkeit haben, dafür aber eine unterdurchschnittliche Liquidität, während bei den italienischen Staatsanleihen dies genau umgekehrt ist.

In den Untersuchungen im Rahmen dieser Abschlussarbeit konnte die Anleihenvarianzrisikoprämie für die deutschen und französischen Staatsanleihenmärkte festgestellt werden, während dies für die italienischen Märkte, zumindest in dem betrachteten Zeitraum, nicht behauptet werden kann. Dieser Befund kann durch eine Short-Position in die jeweiligen Anleihenvarianzswaps profitabel ausgenutzt werden. Solch eine Strategie liefert für einmonatige Varianzswaps auf 10-jährigen deutschen Staatsanleihen eine im Schnitt monatliche logarithmierte Rendite von 0,400 bei einer Sharpe Ratio von 0,885. Für die französische Variante wird eine monatliche durchschnittliche Rendite von 0,436 bei einer Sharpe Ratio von 0,821 erzielt. Die erzielten Überrenditen der deutschen Staatsanleihen können nicht von gängigen Risikofaktoren erklärt werden und weisen ein hohes und signifikantes Alpha auf. Die Anleihenvarianzrisikoprämie und die Profitabilität einer Short-Position bleiben auch nach Robustheitsanalysen erhalten. Für die Berechnungen der Volatilitäten und damit der Varianzswaps werden zwei Varianten benutzt: Zum einen die Generalized Treasury Variance Swap nach Choi et al. (2017) und zum anderen die Methode nach Kozhan, Neuberger und Schneider (2013). Dabei sind die Unterschiedlichkeiten der Ergebnisse zu bemerken, denn die Renditen einer Short-Position sowie die Anleihenvarianzrisikoprämien fallen im Fall der Methode nach Kozhan et al. (2013) stets geringer aus. Für die 10-jährigen deutschen Staatsanleihen wird hier eine monatliche durchschnittliche logarithmierte Rendite von 0,149, bei einer Sharpe Ratio von 0,218, erzielt, während für die französischen Staatsanleihen jegliche Varianzrisikoprämien verschwinden. Die Renditen am deutschen Staatsanleihenmarkt können jedoch auch hier nicht durch gängige Risikofaktoren erklärt werden.

Die Arbeit ist wie folgt aufgebaut: Im nächsten Kapitel werden aktuelle sowie grundlegende Forschungen in dem Bereich der Varianzswaps und der Varianzrisikoprämie vorgestellt, im darauffolgenden Kapitel wird auf die Theorie hinter Varianzswaps eingegangen. Dabei wird zunächst die allgemeine Konstruktionsweise betrachtet, danach im Speziellen die Konstruktion von Varianzswaps auf Staatsanleihen und die Bewertung jener anhand von diskreten Optionsdaten, im Anschluss werden Erklärungsansätze für die Varianzrisikoprämie ausgeführt. Im vierten Kapitel werden die für die Empirie benutzten Daten und Methodologien erläutert, während im fünften Kapitel die empirische Arbeit im Vordergrund ist und die zentralen Ergebnisse präsentiert werden. Im sechs-

[2]Vgl. Jacque (2015) S. 265ff. Die Verluste in dieser Investitionsstrategie waren maßgeblich für den Bankrott von LTCM und bildeten die zweitgrößte Verlustposition, welches dazu geführt hat.

[3]Vgl. Krügel (2007), S. 125ff.

[4]Das Produktportfolio an europäischen Staatsanleihen-Derivaten auf der Eurex besteht aus Futures sowie Optionen auf deutsche, schweizerische, italienische und französische Staatsanleihen. Zuletzt wurde das Angebot im Jahr 2015 mit Derivaten auf spanische Staatsanleihen erweitert.

[5]Vgl. https://www.eurexchange.com/exchange-en/about-us/news/Interview-with-market-participants-BTP-yields-continue-to-drive-Euro-BTP-volume-1397134, 18.02.2020.

ten Kapitel werden diverse Robustheitsanalysen vorgenommen, um die Ergebnisse unter verschiedenen Bedingungen zu testen und verifizieren. Im letzten Kapitel werden die Erkenntnisse und Befunde konkludiert und weitere Ausblicke diskutiert.

2. Literaturüberblick

Das Handeln mit der Volatilität hat sich mit der Entwicklung robuster Methoden für die Replikation und Bewertung von Volatilitätsinstrumenten als eigene Anlageklasse etabliert. Besonders die einflussreiche Arbeit von Carr und Madan (1998) ist maßgebender Bestandteil für diesen Fortschritt. Sie untersuchen drei Methoden, welche sich für das Handeln der realisierten Volatilität eignen: dem Handeln durch statische Positionen in Optionen, durch delta-hedging von Optionen und durch die Nutzung von Volatilitätskontrakten. Carr und Madan (1998) erkennen, dass das delta-hedging gegenüber dem statischen Halten von Optionen vorteilhafter ist, da Ersteres nicht durch den Preis des zugrunde liegenden Basiswertes beeinflusst wird. Dennoch hängt die Rendite von dem Endpreis und der Entwicklung des Preises ab, was sich als Problem darstellt, falls man eine reine Investition in die Volatilität anstrebt. Für solche Anliegen empfehlen Carr und Madan (1998) das Nutzen von Volatilitätskontrakten wie Varianzswaps. Diese und die damit verbundene Varianzrisikoprämie untersuchen Carr und Wu (2009) auf dem U.S. Aktienmarkt genauer, indem sie eine Methode für die Quantifizierung der Varianzrisikoprämie aufstellen. Dabei bewerten Carr und Wu (2009) Varianzswaps mittels europäischen Optionen und Futures in Analogie zu Carr und Madan (1998), mit dem wesentlichen Unterschied, dass Carr und Wu (2009) ihre Methode unter allgemeinen Bedingungen aufstellen, während Carr und Madan (1998) die Annahme über die Stetigkeit des Preises vom zugrunde liegenden Basiswert treffen. Demeterfi, Derman, Kamal und Zou (1999) sowie Kozhan et al. (2013)[6] untersuchen ebenfalls Varianzswaps auf den U.S. Aktienmärkten und es entwickelte sich eine tief greifende Literatur für die Untersuchung von Varianzswaps auf den europäischen Aktienmärkten.

Hafner und Wallmeier (2007) untersuchen Varianzrisikoprämien auf dem deutschen Aktienmarkt und dem EuroStoxx 50. Hierfür benutzen sie Daten von 1995 - 2004 für den DAX und von 2000 - 2005 für den EuroStoxx 50. Sie finden, konsistent mit der Literatur, große negative Varianzrisikoprämien auf beiden Märkten. Die Untersuchung der Varianzrisikoprämie auf dem deutschen Aktienmarkt führen Härdle und Silyakova (2010) ebenfalls durch, allerdings über einen kürzeren Zeitraum.[7] Dabei betrachten sie noch die Dispersions-Strategie, indem Härdle und Silyakova (2010) die Varianz des Indizes verkaufen und die Varianz der jeweiligen Einzelkomponenten kaufen.

Qiao, Xu, Zhang und Zhou (2019) betrachten Varianzrisikoprämien auf den Aktienmärkten von Schwellenländern und ziehen Kontraste zu den Beobachtungen auf den Märkten von Industriestaaten. Sie finden heraus, dass bestimmte Marktentwicklungen die beiden Gruppen unterschiedlich beeinflussen und dementsprechend andere Charakteristika bezüglich der Varianzrisikoprämien aufweisen. Als Beispiel zeigen Qiao et al. (2019), dass während der U.S. Subprime-Krise 2008 die Schwellenländer im Allgemeinen stärker betroffen waren als die Industrieländer, weshalb die Varianzrisikoprämie in diesem Zeitraum für die erste Gruppe höher ausfällt.

Die Forschung der Varianzrisikoprämie erstreckt sich über die globalen Aktienmärkte hinaus zu den Rohstoffmärkten. Vor allem der Artikel von Trolle und Schwartz (2010) ist hierbei ausschlaggebend, welcher Varianzswaps auf Rohöl und Erdgas durch eine robuste und Modell-freie Herangehensweise synthetisiert. Die Ergebnisse sind mit der Literatur übereinstimmend, so wie die von Duarte, Longstaff und Yu (2006), welche die Varianzrisikoprämie auf Zinsen mittels Zinscaps betrachten.

Neuere Untersuchungen beziehen sich dabei auf die Staatsanleihenmärkte. Eine wegweisende Arbeit hierfür stammt von Choi et al. (2017), welche Varianzswaps auf Staatsanleihen und die damit verbundene Varianzrisikoprämie erforscht. Dafür stellen Choi et al. (2017) eine neue Methode auf, die Generalized Treasury Variance Swap, wodurch die Forschung auf die Staatsanleihenmärkte vorangetrieben wird. Der Zweck dieser Abschlussarbeit ist es, die Methode von Choi et al. (2017) als Grundlage zu verwenden, um die Literatur mittels den Anleihenvarianzrisikoprämien auf europäischen Märkten zu erweitern.

Durch entsprechende Erweiterungen können Swaps von höheren Momenten, in Analogie zu den Varianzswaps, gebildet werden. Kozhan et al. (2013) unternehmen genau dies und bilden den Schiefeswap, welches eine Investition in den dritten Moment einer Zufallsvariablen, in diesem Fall der Aktienrendite, ermöglicht. Die Schiefe kann in diesem Zusammenhang als das Tail-Risiko angesehen werden, welches das Risiko extrem unwahrscheinlicher Ereignisse darstellt. Packham, Papenbrock, Schwendner und Woebbeking (2016) untersuchen hierfür eine auf ökonometrischen Methoden basierende Handelsstrategie, welche charakterisiert ist durch ein dynamisches Portfolio, das gegen solche Risiken absichern soll. Fan, Xiao und Zhou (2019) betrachten zudem die Risikoprämie dieser höheren Momente und untersuchen dabei deren Vorhersagefähigkeit von Aktienrenditen.[8] Dabei unterteilen sie die aggregierte Varianzrisikoprämie in die reine Varianzrisikoprämie, welches allein für das zweite Moment kompensiert, und in das higher-order Risikoprämium, welches Kompensationen über das zweite Moment hinaus darstellt.

[6] Die Forschungen von Kozhan et al. (2013) gehen jenseits von Varianzswaps spezieller auf Höhere-Momente und deren Risikoprämien ein.

[7] Die Daten für den DAX sind zwischen den Jahren 2000 bis 2004.

[8] Bollerslev, Marrone, Xu und Zhou (2014) betrachten die Vorhersagekraft der Varianzrisikoprämien und kommen zu dem Schluss, dass Aktienmarktrenditen durch diese vorhergesagt werden können. Fan et al. (2019) erkennen allerdings, dass diese Vorhersagefähigkeit nur für kurzfristige Zeiträume besteht, während die Vorhersagefähigkeit von der higher-order Risikoprämie auf mittelfristigen Zeiträumen erhalten bleibt.

Fan et al. (2019) finden heraus, dass die unterteilten Risikoprämien unterschiedliche ökonomische Interpretationen liefern.

3. Varianzswaps auf Staatsanleihenmärkten

Im nachfolgenden Abschnitt gilt es, Varianzswaps auf Staatsanleihenmärkten zu untersuchen. Dafür wird erst auf die allgemeine Konstruktionsweise eines Varianzswaps eingegangen, welche in Analogie zu Carr und Wu (2009), Carr und Madan (1998) sowie zu Trolle und Schwartz (2010) geschieht. Im Anschluss wird die Generalized Treasury Variance Swap nach Choi et al. (2017) hergeleitet, um die Funktionsweise von Varianzswaps auf Staatsanleihen verstehen zu können. Des Weiteren wird die Methode von Kozhan et al. (2013) betrachtet, welche die Bewertung des Varianzswaps unter diskreten Optionsdaten ermöglicht. Im abschließenden Teil dieses Abschnitts werden Erklärungsansätze für das Varianzrisikoprämium vorgestellt, um eine Intuition für die in Kapitel 5 ausgewiesenen Ergebnisse zu bekommen.

3.1. Konstruktion von Varianzswaps

Ein Varianzswap ist ein over-the-counter (außerbörslich gehandeltes) Derivat, welches eine Investition auf die Volatilität, also die Fluktuation der Kursentwicklung eines Wertpapiers, ermöglicht. Dabei stellt der Varianzswap einen Forward-Kontrakt auf die (annualisierte) realisierte Varianz eines Wertpapiers dar. Wie bei einem Forward-Kontrakt üblich, benötigt der Varianzswap einen Ausübungswert, den Strike, welcher in diesem Fall die implizierte Varianz ist. Die realisierte Varianz $RV_{t,T}$ über dem Intervall $[t,T]$ ist der sogenannte Floating Leg des Varianzswaps, dessen Auszahlung anhand der ex-post Varianz des Wertpapiers nach der Fälligkeit des Kontraktes bestimmt wird. Die implizierte Varianz $K_{t,T}$ ist der Fixed Leg, dessen Wert am Abschlussdatum des Kontraktes festgelegt wird. Bezeichnen wir den Nennbetrag des Varianzswaps mit L, welches die Auszahlung in Geldeinheiten pro annualisierte Varianz ermöglicht, ist der (long) Payoff eines Varianzswaps gegeben durch

$$L(RV_{t,T} - K_{t,T}). \tag{1}$$

Am Fälligkeitstermin wird der Handel durch einen Barausgleich abgeschlossen.[9] Fällt der Payoff positiv aus, so erfolgt eine Zahlung vom Varianz-Verkäufer an den Varianz-Käufer und andersherum, falls er negativ ausfällt. Der Strike eines Varianzswaps wird so angesetzt, dass der Kapitalwert des Payoffs beim Eröffnen des Handels null beträgt. Der Einstieg in einen Varianzswap trägt daher keine Kosten mit sich, weshalb, nach der Arbitragefreiheit (Carr und Wu (2009)), der Fixed Leg den risikoneutralen Erwartungswert der realisierten Varianz darstellt:

$$K_{t,T} = \mathbb{E}_t^{\mathbb{Q}}[RV_{t,T}]. \tag{2}$$

[9]Aufgrund von Margin-Anforderungen können auch während der Laufzeit des Kontraktes Zahlungen erfolgen.

Hierbei ist $\mathbb{E}_t^{\mathbb{Q}}[\cdot]$ der bedingte Erwartungswert auf dem risikoneutralen Maß $\mathbb{Q}$.

F_{t,T_1} sei der Preis eines Futures zum Zeitpunkt t mit der Fälligkeit $T_1 \geqslant T$. Nach Carr und Wu (2009) wird die Annahme getroffen, dass die Mark-to-Market-Bewertung des Futures stetig erfolgt, wodurch, nach Carr und Madan (1998), der Futures-Preis einem Martingal unter dem risikoneutralen Maß gleicht. Nun besagen Carr und Wu (2009), dass, unter der Arbitragefreiheit, der risikoneutrale Erwartungswert der realisierten Varianz bezüglich der Futures-Renditen über dem Intervall $[t,T]$ durch ein Kontinuum europäischer OTM-Optionspreise über alle Strike-Preise $X > 0$ und identischen Fälligkeiten T approximiert werden kann, also

$$\begin{aligned} K_{t,T} =& \mathbb{E}_t^{\mathbb{Q}}[RV_{t,T}] = \frac{2}{B(t,T)(T-t)}\Big(\int_0^{F_{t,T_1}} \frac{P_{t,T}(X)}{X^2}dX + \\ &\int_{F_{t,T_1}}^{\infty} \frac{C_{t,T}(X)}{X^2}dX\Big). \end{aligned} \tag{3}$$

$B(t,T)$ sei der Preis einer Nullkuponanleihe zum Zeitpunkt t mit der Fälligkeit zum Zeitpunkt T, $P_{t,T}(X)$ und $C_{t,T}(X)$ seien die Preise von europäischen Put- und Call-Optionen auf dem Futures zum Zeitpunkt t mit der Fälligkeit T und dem Strike-Preis X.[10]

Die realisierte Varianz wird je nach Ausgestaltung des Kontraktes für den Varianzswap berechnet. Demnach, so Carr und Wu (2009), sind im Vorhinein Rahmenbedingungen zu setzen, welche die Verwendung von logarithmierten oder prozentualen Renditen und das Nutzen von 365 oder 252 Tagen als Anzahl der Handelstage klären. Im Nachfolgenden wird die Vorgehensweise von Trolle und Schwartz (2010) ausgeführt. Sei $\mathscr{T} = [t_0, t_1, ..., t_n]$ die Partition des Samples mit den Handelstagen $t = t_0 < t_1 < ... < t_n = T$, N die Laufzeit und $\Delta t = t_i - t_{i-1} = 1/252$ für alle $i = 1, ..., n$ der Annualisierungsfaktor. Dann berechnet sich die realisierte Varianz mittels

$$RV_{t,T} = \frac{1}{N\Delta t}\sum_{i=1}^{N} R(t_i)^2 \tag{4}$$

mit

$$R(t_i) = log\left(\frac{F_{t_i,T_1}}{F_{t_{i-1},T_1}}\right). \tag{5}$$

Die Differenz zwischen der (ex post) realisierten Varianz $RV_{t,T}$ und der implizierten Varianz $K_{t,T}$ ist der Payoff eines Varianzswaps. Da dieser über die Zeit hinweg im Durchschnitt negativ und mit einer hohen Signifikanz charakterisiert ist, kann empirisch gesehen eine gewisse Struktur erkannt werden. Deshalb ist hier die Rede von der Varianzrisikoprämie (VRP).[11]

[10]Carr und Wu (2009) betrachten zudem einen Approximationsfehler ε, welcher nach Trolle und Schwartz (2010) einen kleinen Wert aufweist. Dieser ist null, falls der Futures-Preis stetig ist.

[11]Die Literatur hierfür ist sehr umfangreich. Verwiesen wird auf Carr und Wu (2009) sowie auf Demeterfi et al. (1999).

Nachdem die allgemeine Konstruktion eines Varianzswaps nun betrachtet wurde, wird im nächsten Abschnitt dieser speziell für Anleihen ausgeführt.

3.2. Bond Varianzswaps

Um die Strukturierung von Varianzswaps auf den Anleihenmärkten verstehen zu können, müssen zunächst grundlegende Unterschiede in der Bewertung für diese, im Gegensatz zu der allgemeinen Herangehensweise aus dem vorherigen Abschnitt, hervorgehoben und erläutert werden. Essenziell dafür ist das Verständnis des risikoneutralen Maßes $\mathbb{Q}$. Dieses ist ein Wahrscheinlichkeitsmaß, unter welchem der Wert einer Anlage ihrem diskontierten $\mathbb{Q}$-Erwartungswert gleicht.

Grundgedanke hierfür ist das Fundamental Theorem of Asset Pricing: In einem vollständigen Markt ist der Preis eines Derivates der diskontierte Erwartungswert der zukünftigen Auszahlungen unter dem eindeutigen risikolosen Maß. Solch ein Maß existiert genau dann, wenn der Markt arbitragefrei ist. Unter dem risikoneutralen Maß $\mathbb{Q}$ sind alle mit dem risikofreien Zins diskontierten Wertpapierpreise $\mathbb{Q}$-Martingale.[12] Der risikofreie Zinssatz wird in diesem Zusammenhang als das Numeraire-Gut von $\mathbb{Q}$ verstanden. Numeraire-Güter sind, nach Geman et al. (1995), positive, keine Dividenden zahlenden Anlagen und verstehen sich als Referenzanlagen, welche alle anderen Wertpapierpreise normieren. In der Literatur wird spezieller vom money market account geredet und nicht direkt vom risikofreien Zins, wenn man über das Numeraire von $\mathbb{Q}$ berichtet. Die hier betrachtete Definition ist von Brigo und Mercurio (2001)[13]:

Sei $B(t)$ der Wert eines Bankkontos zum Zeitpunkt $t \geq 0$. Angenommen wird, dass $B(0) = 1$ gilt und die Entwicklung des Bankkontos unter der folgenden Differentialgleichung erfolgt:

$$\partial B(t) = r_t B(t) \partial t. \tag{6}$$

Dabei ist r_t eine positive Funktion der Zeit. Daraus folgt, dass

$$B(t) = \exp\left(\int_0^t r_s ds\right). \tag{7}$$

Hier werden zwei Aspekte ersichtlich: Zum einen wird deutlich, dass der money market account eine risikolose Investition darstellt, indem der Gewinn sich stetig zum am Markt herrschenden risikofreien Zins verzinst und zum anderen, dass deterministische Zinsen angenommen werden. Dies ist problematisch, wenn die Konstruktion von Varianzswaps auf Anleihen unternommen wird. Die Annahme, dass der Zins deterministisch ist, stellt bei der Bewertung auf den Aktienmärkten keine Hürde da, denn die Veränderung des Zinses hat, im Vergleich zu der Veränderung des Preises der zugrunde liegenden Aktien, eine geringe Auswirkung auf die Preise von Aktienoptionen. Bei Produkten wie Anleihen, welche von dem Zinssatz abhängen, ist dies verständlicherweise nicht der Fall[14], weshalb deterministische Zinsen und somit das risikoneutrale Maß $\mathbb{Q}$ nicht für die Bewertung von Varianzswaps auf Anleihen geeignet ist.

Unter diesem Gesichtspunkt ist die Verwendung eines adäquaten risikoneutralen Maßes erforderlich, wie die des Terminrisikoneutralen Maßes $\mathbb{Q}_T$. Dieses benutzt als Numeraire-Gut den Preis einer Nullkuponanleihe, welches nur zum Zeitpunkt T eine Auszahlung von einer Geldeinheit verspricht[15] und dessen Wert für Zeitpunkte $t < T$ gegeben ist durch

$$P(t,T) = \mathbb{E}^{\mathbb{Q}}\left[\exp\left(-\int_t^T r(s)ds\right)\middle|\mathscr{F}_t\right]. \tag{8}$$

Dabei wird der Informationsfluss in der Ökonomie, welcher jedem Akteur in ihr zur Verfügung steht, durch die Filtration $(\mathscr{F}_t)_{t\in[0,T]}$ dargestellt (Geman et al. (1995)). Es gilt nun, den Maß $\mathbb{Q}_T$ zu definieren. Um den Preis eines Derivates $V(t)$ zu bestimmen, muss man nach den vorhergehenden Überlegungen also einen Numeraire-Gut $N(t)$ auswählen und einen risikoneutralen Erwartungswert gemäß eines Maßes $\mathbb{N}$ bilden, unter welchem der diskontierte Preis des Derivates einem Martingal entspricht. Formal muss also gelten, dass

$$\frac{V(t)}{N(t)} = \mathbb{E}^{\mathbb{N}}\left[\frac{V(T)}{N(T)}\middle|\mathscr{F}_t\right]. \tag{9}$$

Der Wert eines Derivates auf ein Zinsprodukt ist dann unter der Gleichung (9) und $B(t)$ als Numeraire-Gut[16]:

$$\begin{aligned} V(t) &= \mathbb{E}^{\mathbb{Q}}\left[\exp\left(-\int_t^T r(s)ds\right)V(T)\middle|\mathscr{F}_t\right] \\ &= \mathbb{E}^{\mathbb{Q}}\left[\frac{B(t)}{B(T)}V(T)\middle|\mathscr{F}_t\right]. \end{aligned} \tag{10}$$

Wird jetzt $P(t,T)$ als Numeraire-Gut gewählt und in die Gleichung (9) eingesetzt, so gilt

$$\begin{aligned} \frac{V(t)}{P(t,T)} &= \mathbb{E}^{\mathbb{Q}_T}\left[\frac{V(T)}{P(T,T)}\middle|\mathscr{F}_t\right] \\ &= \mathbb{E}^{\mathbb{Q}_T}\left[V(T)\middle|\mathscr{F}_t\right] \\ V(t) &= P(t,T)\mathbb{E}^{\mathbb{Q}_T}\left[V(T)\middle|\mathscr{F}_t\right]. \end{aligned} \tag{11}$$

Durch Hinzunahme von $P(t,T)$ in den Erwartungswert für

[12] Siehe Geman, El Karoui und Rochet (1995) und vgl. Krügel (2007), S. 37 ff.

[13] Vgl. Brigo und Mercurio (2001), S. 2 ff.

[14] Vgl. Brigo und Mercurio (2001), S. 3 ff.

[15] Es gilt also $P(T,T) = 1$.

[16] Hier wurde $B(t)$ für $N(t)$ eingesetzt, auf die rechte Seite der Gleichung gestellt und in den Erwartungswert genommen.

$V(t)$ in Gleichung (11) gilt ferner die Beziehung

$$\begin{aligned} V(t) &= \mathbb{E}^{\mathbb{Q}}\left[\frac{B(t)}{B(T)}V(T)\middle|\mathscr{F}_t\right] \\ &\stackrel{!}{=} \mathbb{E}^{\mathbb{Q}_T}\left[P(t,T)V(T)\middle|\mathscr{F}_t\right] \\ &= \mathbb{E}^{\mathbb{Q}_T}\left[\frac{P(t,T)}{P(T,T)}V(T)\middle|\mathscr{F}_t\right]. \end{aligned} \tag{12}$$

Die letzte Gleichung in (12) ist zulässig, da $P(T,T)=1$ gilt.

Um nun das Maß von $\mathbb{Q}$ zu $\mathbb{Q}_T$ zu ändern, wird die Radon–Nikodym Ableitung $\frac{\partial \mathbb{Q}_T}{\partial \mathbb{Q}}$ gebildet. Dabei wird sie so angewendet, dass gilt $\mathbb{E}^{\mathbb{Q}_T}[X]=\mathbb{E}^{\mathbb{Q}}\left[X\frac{\partial \mathbb{Q}_T}{\partial \mathbb{Q}}\right]$:

$$\begin{aligned} \mathbb{E}^{\mathbb{Q}_T}\left[\frac{P(t,T)}{P(T,T)}V(T)\middle|\mathscr{F}_t\right] &= \mathbb{E}^{\mathbb{Q}}\left[\frac{P(t,T)}{P(T,T)}V(T)\frac{\partial \mathbb{Q}_T}{\partial \mathbb{Q}}\middle|\mathscr{F}_t\right] = \\ & \mathbb{E}^{\mathbb{Q}}\left[\frac{B(t)}{B(T)}V(T)\middle|\mathscr{F}_t\right]. \end{aligned} \tag{13}$$

Es ist leicht zu erkennen, dass die Radon–Nikodym Ableitung, welche das Terminrisikoneutrale Maß $\mathbb{Q}_T$ definiert, gegeben ist durch

$$\frac{\partial \mathbb{Q}_T}{\partial \mathbb{Q}} = \frac{B(t)/B(T)}{P(t,T)/P(T,T)} = \frac{\exp\left(-\int_t^T r(s)ds\right)}{P(t,T)}. \tag{14}$$

Unter diesem Maß sind Forwardpreise Martingale, während unter $\mathbb{Q}$ Futurespreise Martingale darstellen.

Nach diesen grundlegenden Überlegungen ist die Konstruktion von Varianzswaps auf Anleihen zu betrachten, da mittels $\mathbb{Q}_T$ nun stochastische Zinsen erlaubt sind. Angelehnt wird dabei auf die Vorgehensweise von Choi et al. (2017), welche für diesen Zweck die Generalized Treasury Variance Swap, oder auch GTVS, aufstellen. Die realisierte Varianz $\widetilde{RV}_{t,T}$ wird im GTVS definiert unter

$$\widetilde{RV}_{t,T} = 2\sum_{i=1}^{n}\left[\frac{F_{t_i,T}}{F_{t_{i-1},T}} - 1 - \log\frac{F_{t_i,T}}{F_{t_{i-1},T}}\right], \tag{15}$$

wobei $t=t_0<t_1<...<t_n=T$ die Handelstage und $F_{t,T}$ den Preis eines Forwards zum Zeitpunkt t mit Fälligkeit T auf eine zugrunde liegende Anlage X_T bezeichnen. Der Zeitpunkt wird dabei festgelegt auf $t=0$. Choi et al. (2017) leiten zudem den Log Treasury Variance Swap (LTVS) her, welcher für die realisierte Varianz die quadrierten logarithmierten Renditen in Analogie zu Gleichung (4) benutzt. Diese Vorgehensweise erweist sich allerdings als suboptimal, da sich durch die Quadrierung der Renditen die Absicherung für die LTVS als ineffizient erweist. Zudem ist in der LTVS die Annahme der Stetigkeit des Forwardpreises, während in der GTVS keinerlei Annahmen über $F_{t,T}$ getroffen werden. Dadurch ist die GTVS allgemeingültiger und erlaubt sogar Sprünge in dem Forwardpreis.

Der Floating Leg $\widetilde{RV}_{t,T}$ wird mit einem fairen Strike-Preis $\widetilde{F}_{t,T}$ ausgetauscht, welches definiert wird durch

$$\widetilde{F}_{t,T} = \mathbb{E}_t^{\mathbb{Q}_T}[\widetilde{RV}_{t,T}]. \tag{16}$$

Choi et al. (2017) liefern dadurch das zentrale Ergebnis für den GTVS unter ihrem 2. Satz:

Für jeden Prozess $F_{t,T}$ kann die Auszahlung $\widetilde{RV}_{t,T}$ perfekt durch eine statische Position in

$$\widetilde{F}_{t,T} = \frac{2}{p_{t,T}}\left(\int_0^{F_{t,T}}\frac{P_{t,T}(K)}{K^2}dK + \int_{F_{t,T}}^{\infty}\frac{C_{t,T}(K)}{K^2}dK\right) \tag{17}$$

und in einer dynamischen Position in dem zugrunde liegenden Wertpapier, welches in jedem Zeitpunkt $s \in \mathscr{T} = [t_0, t_1, ..., t_n]$ den Wert $2(\frac{1}{F_{s,T}} - \frac{1}{F_{t,T}})$ hält, repliziert werden.

$P_{t,T}(K)$ und $C_{t,T}(K)$ bezeichnen die Preise für europäische Put- und Call- Optionen zu dem Strike-Preis K und $p_{t,T}$ den Preis einer Nullkuponanleihe. Die über die Zeit hinweg durchschnittliche Differenz des Floating Legs zum Fixed Leg wird auch in diesem Kontext als das Varianzrisikoprämium verstanden.

3.3. Varianzswaps mit diskreten Optionen

In der Bewertung des Fixed Legs durch das Replikationsportfolio ist zu erkennen, dass die Integrale über alle möglichen und damit stetigen Strike-Preise integrieren. Dies ist zwar in der Theorie möglich, doch in der Praxis nicht vertretbar, denn es existieren nicht überabzählbar viele Strike-Preise für Optionen. Diese Tatsache ist weitbekannt, Härdle und Silyakova (2010) führen dies zum Beispiel weiter aus und meinen, dass der Wert des Replikationsportfolios dadurch in der Regel unterbewertet wird. Um dieses Problem zu umgehen, führen Härdle und Silyakova (2010) eine stückweise lineare Approximation durch, um zu bestimmen, wie viele Optionen ein Investor zum jeweiligen Strike-Preis erwerben sollte, um das Replikationsportfolio zu bewerten. In diesem Abschnitt wird eine alternative Methode von Kozhan et al. (2013) betrachtet, welches ebenfalls diese Problematik umgeht.

$P_{t,T}(K)$ und $C_{t,T}(K)$ seien wie gewohnt die Preise für europäische Put- und Call-Optionen und $B_{t,T}$ der Preis einer Anleihe zum Zeitpunkt t, wobei auch hier $B_{T,T}=1$ gelten muss. Weiterhin werde angenommen, dass zum Zeitpunkt t Call- und Put-Optionen zur Fälligkeit T zu $N+1$ verschiedenen Strike-Preisen K_i, wobei diese sortiert sind von K_0 bis K_N, gehandelt werden. Mit der Menge an Optionspreisen $C_{t,T}(K_i)$ und $P_{t,T}(K_i)$ kann man die implizierte Varianz, oder den Fixed Leg, nun nach folgender Weise bestimmen:

Man definiere zunächst die Funktion

$$\Delta I(K_i) = \begin{cases} \frac{K_{i+1}-K_{i-1}}{2}, & \text{für } 0 \le i \le N \text{ (mit } K_{-1} \equiv \\ & 2K_0 - K_1,\, K_{N+1} \equiv 2K_N - K_{N-1}) \\ 0, & \text{sonst.} \end{cases}$$

Nun kann man mit den diskreten Optionsdaten den Fixed Leg

IV_{Koz} bestimmen[17]:

$$IV_{Koz} = 2 \sum_{K_i \leq F_{t,T}} \frac{P_{t,T}(K_i)}{B_{t,T} K_i^2} \Delta I(K_i) + 2 \sum_{K_i > F_{t,T}} \frac{C_{t,T}(K_i)}{B_{t,T} K_i^2} \Delta I(K_i)$$
$$= \frac{2}{B_{t,T}} \left(\sum_{K_i \leq F_{t,T}} \frac{P_{t,T}(K_i)}{K_i^2} \Delta I(K_i) + \sum_{K_i > F_{t,T}} \frac{C_{t,T}(K_i)}{K_i^2} \Delta I(K_i) \right). \quad (18)$$

Den Floating Leg RV_{Koz} berechnen Kozhan et al. (2013) mit

$$RV_{Koz} = \sum_{i=t}^{T} [2(\exp(r_{i,i+1}) - 1 - r_{i,i+1})]. \quad (19)$$

Dabei ist $r_{t,T}$ die Log-Rendite eines Forwards zum Zeitpunkt t mit Fälligkeit T, also $r_{t,T} = \log\left(\frac{F_{T,T}}{F_{t,T}}\right)$.

Da nun die Konstruktion von Varianzswaps unter diversen Rahmenbedingungen verdeutlicht wurde, gilt es im Folgenden die Varianzrisikoprämie näher zu betrachten, denn das Verständnis dafür ist wesentlich für Überlegungen bezüglich der Volatilität.

3.4. Erklärungsansätze für das Varianzrisikoprämium

Da Varianzswaps vor allem während Zeiten erhöhter Nervosität hohe Renditen abwerfen, kann man von einer Absicherungsfunktion der VRP sprechen. Die Intuition dafür ist wie folgt: Risikoaverse Investoren scheuen sich vor Markteinbrüchen und die damit verbundene Volatilität, so Feunou, Jahan-Parvar und Okou (2015), weshalb sie dazu bereit sind, eine Prämie zu bezahlen, um sich vor diesen absichern zu können. Damit zusammenhängend zeigen Figlewski und Wang (2000), dass der Einfluss negativer Aktienrenditen auf die Volatilität deutlich stärker ist als der Einfluss positiver Aktienrenditen, weshalb sie von einem „down market effect“ reden. Diese Erkenntnis bestätigen Held und Omachel (2014), welche die VRP unterteilen in die obere und untere Semivarianzrisikoprämie und dadurch feststellen, dass die VRP fast ausschließlich durch Abwärtsrisiken erklärt werden kann. Die Annahme liegt demnach nahe, dass die Varianzrisikoprämie eine Entschädigung für die Absicherung gegen negative Unsicherheiten darstellt. Diese Erkenntnis ist auf Staatsanleihen übertragbar, da Anleihenrenditen, nach Chiang (2016), eine Schiefe aufweisen. Abhängig von der Kreditqualität ist es mehr oder weniger wahrscheinlich, dass am Laufzeitende eine Anleihe den vollen Betrag, oder weniger als diesen, zurückzahlt, während im Normalfall die Auszahlung diesen nicht überschreitet. Nach dieser asymmetrischen Verteilung der Renditen auf Anleihen liegt die Vermutung nahe, dass die Anleihenvarianzrisikoprämie ebenfalls hauptsächlich durch Abwärtsrisiken erklärt werden kann.

Mueller, Vedolin und Yen (2012) finden dabei heraus, dass die Höhe der Prämie, welche Investoren bereit sind zu bezahlen oder erhalten, um sich vor unerwarteten makroökonomischen Veränderungen abzusichern, von der Unsicherheit dieser abhängt. Speziell für Varianzrisikoprämien auf den Staatsanleihenmärkten erkennen Mueller et al. (2012), dass die Unsicherheit bezüglich der Inflation den größten Einfluss auf diese hat.[18]

Hafner und Wallmeier (2007) gehen eher von einem Diversifikationsvorteil der VRP aus. Nach ihnen ist die negative Korrelation zwischen dem Kurs eines Basiswertes und seiner implizierten Volatilität während Markteinbrüchen deutlich attraktiver als zu anderen Zeiten. Falls die Märkte effizient sind, so Hafner und Wallmeier (2007), sollten günstige Eigenschaften der Volatilität in höheren Bepreisungen von Volatilitätsinstrumenten resultieren. Doch sie nennen zudem eine alternative Erklärung für die VRP, die eher von struktureller Natur ist: Die Höhe der Prämie ist nicht durch ökonomische Faktoren bestimmt, sondern spiegelt die systematische Überbewertung von OTM Call- und Put-Optionen wider.[19]

4. Daten und Methodologie

Im Folgenden werden die für die empirische Arbeit benutzten Daten und Methodologien genauer betrachtet. Für die Replikation des GTVS werden Futures- und (amerikanische) Optionsdaten benötigt, welche aus der Karlsruher Kapitalmarktdatenbank (KKMDB) entstammen.[20] Die verfügbaren Daten beinhalten dabei tägliche Informationen zu Optionen und Futures auf deutschen Staatsanleihen mit den Laufzeiten 10-, 5- und 2-Jahren. Zu dem sind in dem Datensatz Informationen zu französischen und italienischen Staatsanleihen gegeben, jeweils mit zehnjähriger Laufzeit. Die Zeiträume unterscheiden sich jedoch deutlich zwischen den betrachteten Ländern: Die deutschen Staatsanleihen beinhalten tägliche Daten von Januar 2002 bis Dezember 2018, während die französischen von September 2013 bis Dezember 2018 und die italienischen von September 2017 bis Dezember 2018 laufen. Vor jeglicher Datenfilterung beträgt die Menge an Optionsdaten 8,205,276 und die Menge an Futuresdaten 51,897 Datenpunkte.

Die Datenfilterung beinhaltet folgende Kriterien: Es werden zunächst alle Datenpunkte entfernt, deren Futures- beziehungsweise der Optionspreis und der Strikepreis null betragen. Danach werden die Optionspreise entfernt, welche nicht die Randbedingungen der Arbitragefreiheit erfüllen. Des Weiteren werden nur Optionen ausgewählt, welche nahe OTM sind, also wo der Strikepreis einer Call-Option größer gleich 0,94-mal dem Futurespreis und der Strikepreis einer Put-Option kleiner gleich 1,06-mal dem Futurespreis

[17]Es werden, in Analogie zu dem stetigen Fall, über die OTM Put- sowie Call-Optionen aufsummiert.

[18]Eine Veränderung der Inflationsunsicherheit um eine Standardabweichung impliziert im Durchschnitt eine Veränderung der Varianzrisikoprämie um fast eine halbe Standardabweichung.

[19]Wie in den vorhergehenden Abschnitten gezeigt, werden OTM-Optionen für die Replikation des Fixed Legs eines Varianzswaps verwendet.

[20]Zu beachten ist, dass die Theorie für die Bewertung des GTVS europäische Optionen auf Forwards benutzt. Choi et al. (2017) zeigen allerdings, dass die Preisunterschiede zwischen amerikanischen Optionen auf Futures und europäischen Optionen auf Forwards vernachlässigbar klein sind.

ist. Die Optionen werden zu den jeweiligen Futures zugeordnet und der Zinssatz durch den dreimonatigen EURIBOR aus Bloomberg erhoben.

Diese Herangehensweise unterscheidet sich zu Choi et al. (2017) vor allem in den Kriterien der Datenfilterung. Während bei Choi et al. (2017) zusätzlich Datenpunkte entfernt werden, für die der open interest null beträgt, wird in dieser Arbeit aus folgendem Grund davon abgesehen: Nach der vorgestellten Datenbereinigung verbleiben 5,294,168 Optionsdaten (64,5% des Gesamtdatensatzes). Würden die Daten entfernt werden, welche einen open interest von null aufweisen, würde sich die Anzahl der verbleibenden Daten auf 1,786,194 (21,8% des Gesamtdatensatzes) verringern. Um genug Daten für die Empirie beibehalten zu können, wird dieses Kriterium nach Choi et al. (2017) hier nicht berücksichtigt, damit die berechneten Ergebnisse weitestgehend repräsentativ bleiben. Nach dieser Vorarbeit wird nun die Methodologie betrachtet.

Um den Implied Leg des GTVS berechnen zu können, geht man wie folgt vor: Zunächst müssen die implizierten Volatilitäten der Optionen mittels den verfügbaren Optionspreisen nach Black (1976)[21] bestimmt werden. Diese werden zusammen mit den jeweiligen Strikepreisen durch einen kubischen Spline mit natürlichen Randbedingungen interpoliert. Durch diese Interpolation ist es möglich, für jeden möglichen Strikepreis den Black (1976)-Wert einer (europäischen) Option zu bestimmen. Durch das Anwenden der Formeln (17) und (15) aus Abschnitt 3.2 können nun der Implied Leg und der Realized Leg des GTVS berechnet werden. Die Berechnungen unter der Beachtung diskreter Optionsdaten (Kozhan-Methode) erfolgt anhand der Vorgehensweise aus Kapitel 3 Abschnitt 3.

Unter dem GTVS-Setting (Kozhan et al. (2013)-Setting) ergeben sich für die deutschen 10-jährigen Staatsanleihen insgesamt 10,815 (9,494) Varianzswaps über alle Laufzeiten hinweg, für die 5-jährigen 10,387 (9,582) und für die 2-jährigen 10,048 (9,909). Für die französischen und italienischen jeweils 2,941 (1264) und 668 (339). Durch eine monatliche Betrachtungsweise ergeben sich für die deutschen Staatsanleihen maximal 192, für die französischen und italienischen jeweils 58 und 14 Beobachtungen. Die monatlichen Observationen der einmonatigen Varianzswaps für die deutschen Staatsanleihen mit den Laufzeiten 10, 5 und 2 Jahren belaufen sich in dem GTVS-Setting jeweils auf 146, 138 und 145. Für die französischen und italienischen beträgt die Anzahl an monatlichen Observationen jeweils 46 und 11. Mittels der Kozhan-Methode ergibt sich für die einmonatigen Varianzswaps auf deutschen Staatsanleihen 116, 112 und 114 monatliche Observationen für die Laufzeiten 10, 5 und 2 Jahren. Bei den französischen beträgt dies 10, während für die italienischen anhand der Kozhan-Methode keine einmonatigen Varianzswaps strukturiert werden konnten.[22]

5. Empirie

Dieses Kapitel stellt den Hauptteil dieser Abschlussarbeit dar und führt alle vorherigen Überlegungen zusammen. Eingegangen wird vor allem auf die Rendite der einmonatigen Anleihenvarianzswaps, mit besonderem Fokus auf den deutschen Staatsanleihenmärkten. Im zweiten Teil dieses Kapitels werden die Ergebnisse auf europäischer Ebene verglichen.

Die Auszahlung des Varianzswaps kann berechnet werden durch

$$\widetilde{RV}_{t,T} - \mathbb{E}_t^{\mathbb{Q}_T}[\widetilde{RV}_{t,T}], \tag{20}$$

skaliert um den fairen Strike-Preis ergibt sich die prozentuale Rendite

$$r_{t,T}^{GTVS} = \frac{\widetilde{RV}_{t,T}}{\mathbb{E}_t^{\mathbb{Q}_T}[\widetilde{RV}_{t,T}]} - 1. \tag{21}$$

Die Log-Rendite ist gegeben durch

$$lr_{t,T}^{GTVS} = \log\left(\frac{\widetilde{RV}_{t,T}}{\mathbb{E}_t^{\mathbb{Q}_T}[\widetilde{RV}_{t,T}]}\right).^{23} \tag{22}$$

5.1. Varianzswaps auf dem deutschen Staatsanleihenmarkt

Hier werden die Renditen der Anleihenvarianzswaps auf 10-, 5- und 2-jährige deutsche Staatsanleihen betrachtet. Zunächst werden die Ergebnisse vorgestellt und im Anschluss werden diese auf ihre Erklärbarkeit untersucht.

5.1.1. Renditen der Varianzswaps

Tabelle 1 fasst die annualisierten Renditen der GTVS und der Varianzswaps mittels der Kozhan-Methode auf deutsche Staatsanleihen zusammen. Das Alpha wurde hierbei durch Jensen's Alpha berechnet, für dessen Berechnung eine Zeitreihe der Marktrendite auf dem deutschen Staatsanleihenmarkt benötigt wird. Die Daten dafür basieren auf dem Barclays Germany Treasury Bond Index, welcher aus Bloomberg entnommen wurde.[24] Nach Carr und Wu (2009) ist die Log-VRP als die durchschnittliche jährliche Überrendite zu verstehen, welche durch eine Long-Position in einen Varianzswap und das Halten dieser bis zur Fälligkeit erzielt werden könnte. Anhand dieser Berechnung ist zu erkennen, dass Short-Positionen in die GTVS auf deutsche Staatsanleihen attraktive durchschnittliche Überrenditen generieren. Diese betragen 40% für die 10-jährigen, 39,9% für die 5-jährigen und 82,6% für die 2-jährigen Laufzeiten. Die Renditen sind höchst Signifikant; die t-Statistiken rangieren von 5,718 für die 2-jährigen bis zu 12,529 für die 5-jährigen Laufzeiten. Choi et al. (2017) finden qualitativ vergleichbare Werte, doch die Sharpe Ratio's in ihren Berechnungen

[21] Dieses Modell, auch Black-76 Modell genannt, eignet sich unter anderem für die Bewertung von Optionen auf Futures und Anleihen. Der Unterschied zu dem Modell nach Black und Scholes (1973) liegt in dem Ersetzen des aktuellen Aktienkurses durch den diskontierten Futurespreis.

[22] Wie in Kapitel 6 zur Robustheit zu sehen sein wird, wird dieses Problem behoben, indem Varianzswaps mit einer Laufzeit nahe einem Monat gebildet werden.

[24] In der Literatur ist zudem die Verwendung des deutschen Rentenindizes als Performance-Maß, der REXP, zu finden. Dieses wird in Kapitel 6 für die Robustheitsanalyse verwendet.

Tabelle 1: Varianzswaprenditen für deutsche Staatsanleihen

GTVS										
LZ	Mean	t-stat	Med	STD	Max	Skew	Kurt	SR	Alpha	t-stat
10-j.	-0,400	-9,390	-0,383	0,452	0,828	-1,048	6,060	-0,885	-0,439	-11,648
5-j.	-0,399	-12,529	-0,399	0,493	1,120	-0,889	5,476	-0,809	-0,500	-17,106
2-j.	-0,826	-5,718	-0,743	0,702	1,039	-0,203	-0,036	-1,177	-0,852	-6,154
Kozhan-Methode										
LZ	Mean	t-stat	Med	STD	Max	Skew	Kurt	SR	Alpha	t-stat
10-j.	-0,149	-2,869	-0,226	0,683	4,513	3,122	18,183	-0,218	-0,278	-5,181
5-j.	-0,076	-0,831	-0,191	0,676	3,601	2,537	9,727	-0,112	-0,128	-1,342
2-j.	-0,178	-3,385	-0,208	0,779	3,703	0,992	5,992	-0,228	-0,235	-4,595

Diese Tabelle berichtet die Ergebnisse der Log-Renditen für einmonatige Varianzswaps auf deutsche Staatsanleihen mit den Laufzeiten (LZ) 10, 5 und 2 Jahren. Die angegebenen Statistiken sind der Reihe nach der Mittelwert, der Median, die Standardabweichung, das Maximum, die Schiefe, die Kurtosis, die Sharpe Ratio und das Alpha. Die Daten wurden monatlich erhoben und die t-Statistiken wurden nach Newey und West (1987) korrigiert.

auf dem U.S. Staatsanleihenmarkt sind stets geringer als die hier berichteten.[25] Die Volatilität der Renditen ist auf einem relativ hohen Niveau und bewegt sich in dem Bereich von 45% für die 10-jährigen bis zu 70% für die 2-jährigen Laufzeiten. Die negative Schiefe über alle Laufzeiten hinweg ist zu bemerken, da dies, im Gegensatz zu Choi et al. (2017), impliziert, dass die Rendite der Short-Position in einen Varianzswap eine positive Schiefe aufweist. Die Alpha-Werte sind alle stets größer als die Renditen und weisen sehr hohe Signifikanzen auf, was darauf hinweist, dass die Renditen nicht durch die von dem Markt erklärt werden können. Dies ist vergleichbar mit den Ergebnissen von Choi et al. (2017).

Die Werte nach der Kozhan-Methode sind deutlich unterschiedlich: Die Renditen sind für alle Laufzeiten um einiges geringer und rangieren von 7,6% für 5-jährige bis zu 17,8% für 2-jährige Staatsanleihen mit geringeren Signifikanzen, welches vor allem bei den 5-jährigen Laufzeiten nicht signifikant von null unterschiedlich ist. Die Alpha's bleiben dennoch, bis auf die Laufzeit von 5 Jahren, relativ hoch und signifikant. Zudem ist hier die Kurtosis für alle Laufzeiten viel höher mit Werten von 5,992 für die 2-jährigen und 18,183 für die 10-jährigen. Dies impliziert ein höheres Risiko einer Short Varianzswap Strategie, was auch durch die höheren Standardabweichungen zu sehen ist: Die 2-jährige Laufzeit weist mit 77,9% den höchsten Wert und die 5-jährige mit 67,6% den niedrigsten Wert auf. Die stets positive Schiefe und damit die negative Schiefe in der Rendite für die Short Varianzswap Strategie ist ebenfalls in Kontrast zu der GTVS-Herangehensweise. Die niedrigeren Renditen und höheren Volatilitäten resultieren in geringeren Sharpe Ratio's, welche jeweils für die 10-, 5- und 2-jährigen Laufzeiten 0,218, 0,112 und 0,228 betragen.

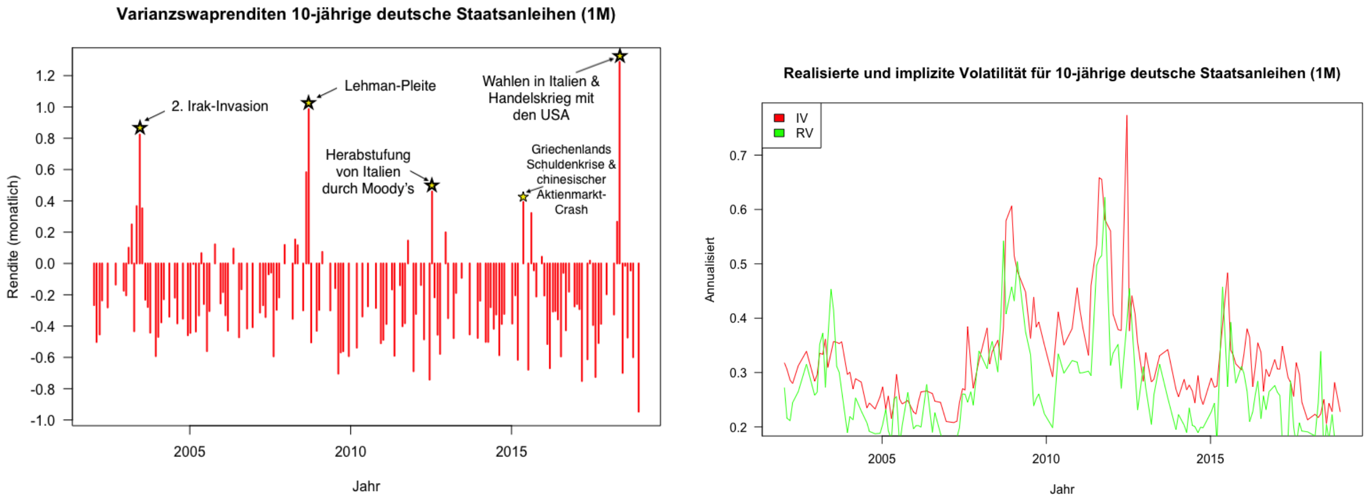
Um die Renditen der einmonatigen Varianzswaps zu veranschaulichen, werden diese zusammen mit den dazugehörigen Zeitreihen der realisierten und implizierten Volatilitäten in den Abbildungen 1 bis 6 geplottet.[26] Hierbei werden die Varianzswaprenditen, jeweils auf der linken Seite, durch die Gleichung (21) für GTVS und durch die Gleichung (22) für die Kozhan-Methode berechnet. Die Volatilitäten, jeweils auf der rechten Seite, sind annualisiert und in Prozentzahlen angegeben. Alle Daten wurden monatlich berechnet. Es ist deutlich zu erkennen, dass die realisierte Volatilität über die meiste Zeit hinweg geringer ist als die implizierte Volatilität und dass die Peaks, welche die höchsten Renditen bei einer Long Varianzswap Position abwerfen, mit ökonomisch relevanten Ereignissen verbunden sind. Dabei ist festzustellen, dass einige Peaks, unabhängig der Laufzeit der zugrunde liegenden Staatsanleihe, identisch sind. Solche Ereignisse sind beispielsweise die Lehman-Pleite, Griechenlands Schuldenkrise, das Brexit-Referendum sowie die 2. Irak-Invasion. Kürzlich sind die Wahlen in Italien, bei denen die Populisten die Mehrheit gewannen, für erhöhte Unsicherheit an den Märkten verantwortlich. Die Sorge war, dass es dadurch zu einem ähnlichen Event wie dem Brexit, dem „Italexit", kommen könnte.[27] Für große Unsicherheit an den Märkten sorgte zudem der Handelskrieg, welcher zwischen der E.U. und den U.S.A. Mitte 2018 entflammte.

Um einen Einblick in den deutschen Aktienmarkt zu bekommen, untersuchen Hafner und Wallmeier (2007) die Varianzrisikoprämie auf dem DAX und bilden dazu, mittels (europäischen) Options- und Futuresdaten, Varianzswaps mit ei-

[25] Es ist allerdings anzumerken, dass es sich bei den Ergebnissen von Choi et al. (2017) um prozentuale Renditen handeln. Das Vergleichen ihrer Ergebnisse mit den hier logarithmierten Renditen hat daher eine geringe Aussagekraft und wird verlagert in Kapitel 6, in welchem ebenfalls prozentuale Renditen betrachtet werden.

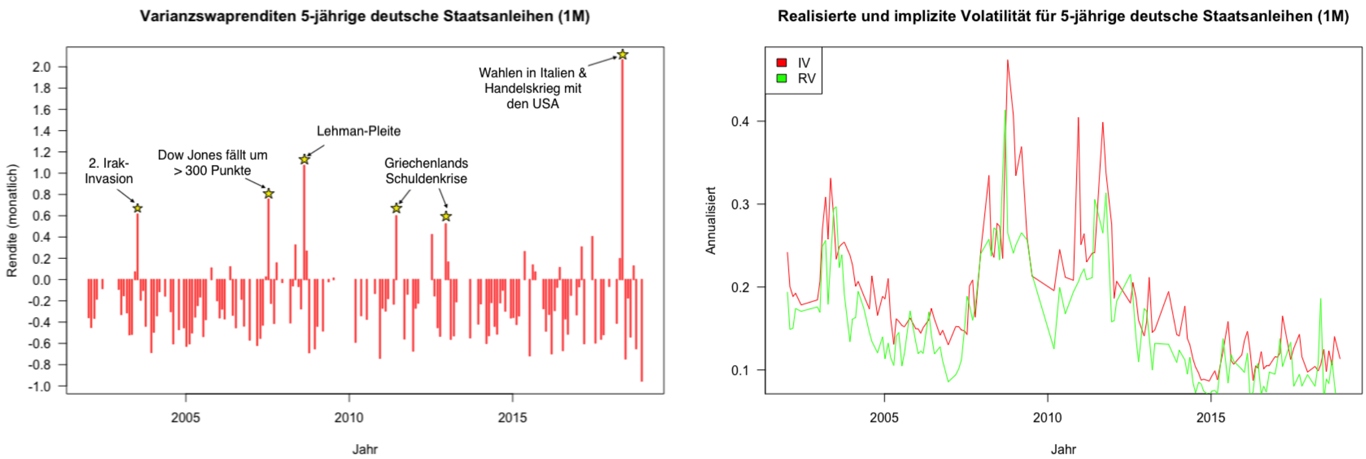
[26] Ein wesentlicher Aspekt, der durch diese Abbildungen deutlich wird, ist die Tatsache, dass für einige Monate keine Daten existieren. Dies liegt daran, dass für bestimmte Monate keine Varianzswaps mit einer Laufzeit von einem Monat gebildet werden konnten. Dieses Problem wird in dem Kapitel zur Robustheit aufgenommen.

[27] Vgl. z.B. https://www.handelsblatt.com/finanzen/maerkte/devisen-rohstoffe/italien-flammt-die-euro-krise-wieder-auf-drei-moegliche-italexit-szenarien/22620406.html?ticket=ST-335437-PnlNtvOYy6Nsi4Ldh3AH-ap2, 01.02.2020.



(a) Renditen **(b)** Volatilitäten

Abbildung 1: GTVS auf 10-jährige deutsche Staatsanleihen



(a) Renditen **(b)** Volatilitäten

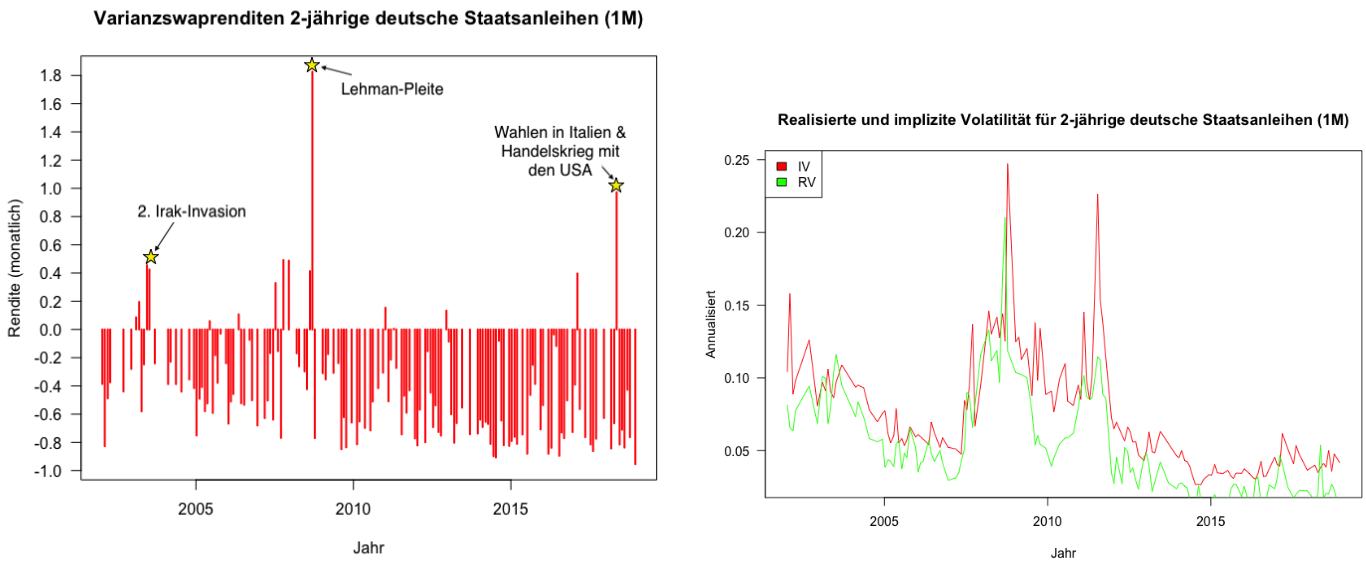
Abbildung 2: GTVS auf 5-jährige deutsche Staatsanleihen

ner Laufzeit von 45 Tagen. In ihrer Untersuchung, welche den Zeitraum von 1995 bis 2004 beinhaltet, finden Hafner und Wallmeier (2007) eine monatliche durchschnittliche logarithmierte Rendite von -0,271 bei einer Standardabweichung von 0,498, was in einer monatlichen Sharpe Ratio von -0,544 resultiert.

5.1.2. Analyse der Renditen

Nachdem die Renditen berechnet worden sind, liegt die Frage nahe, ob diese durch etwaige Risikofaktoren begründet werden können, also ob die Anleihenvarianzswap-Renditen auf dem deutschen Markt für bestimmte Risiken kompensieren. Um dies zu erforschen, wird ein Regressionsmodell auf die jeweiligen logarithmierten Renditen durchgeführt. Hierbei werden für die Faktoren, nach welchen untersucht werden sollen, ob die Renditen von diesen abhängen, die Rendite am deutschen Staatsanleihenmarkt (MRKT), das Size (SMB), der Book-to-Market (HML), das Momentum (MOM) sowie die Marktrendite am deutschen Aktienmarkt (EQM) betrachtet. Das Modell ist also das Carhart (1997) Vier-Faktoren Modell erweitert um die Aktienmarktrendite. Die Daten SMB, HML, MOM und EQM für den deutschen Markt werden von der Humboldt-Universität zu Berlin durch die wirtschaftswissenschaftliche Fakultät zur Verfügung gestellt, während für MRKT wieder der Bloomberg Barclays Germany Treasury Bond Index benutzt wird. Formal lautet das Regressionsmodell also:

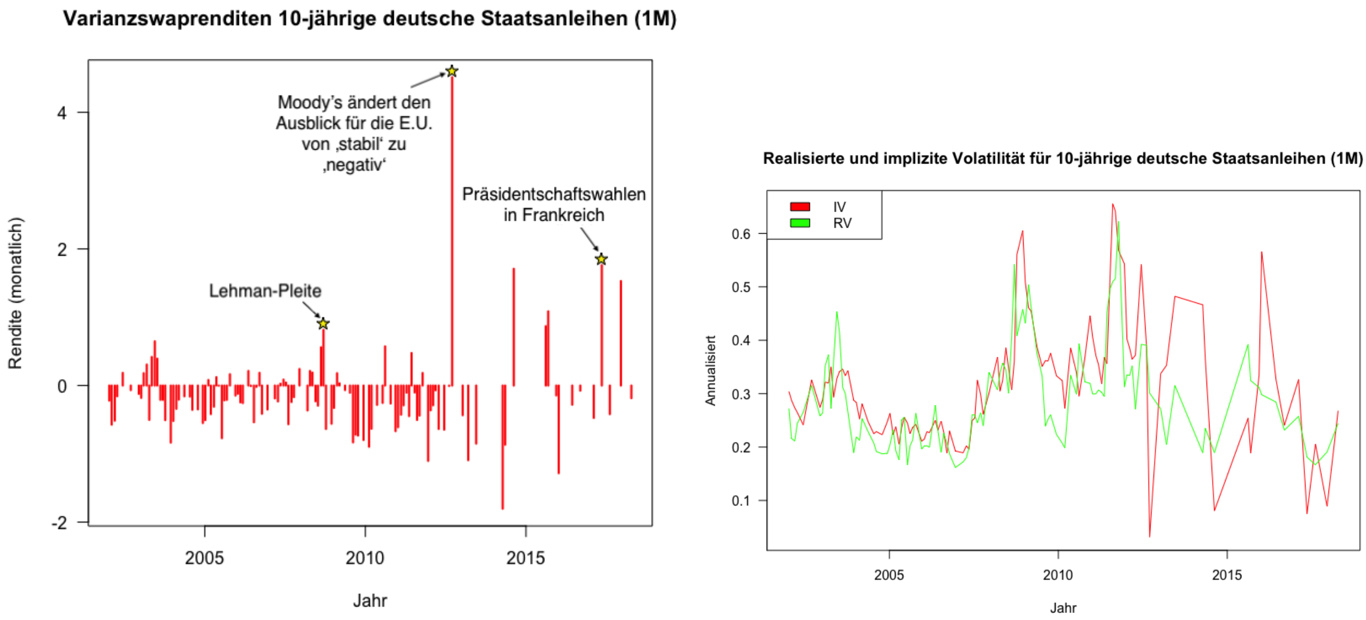
$$r_t^i = \alpha + \beta_1 r_t^{MRKT} + \beta_2 r_t^{SMB} + \beta_3 r_t^{HML} + \beta_4 r_t^{MOM} + \beta_5 r_t^{EQM}. \quad (23)$$



(a) Renditen

(b) Volatilitäten

Abbildung 3: GTVS auf 2-jährige deutsche Staatsanleihen



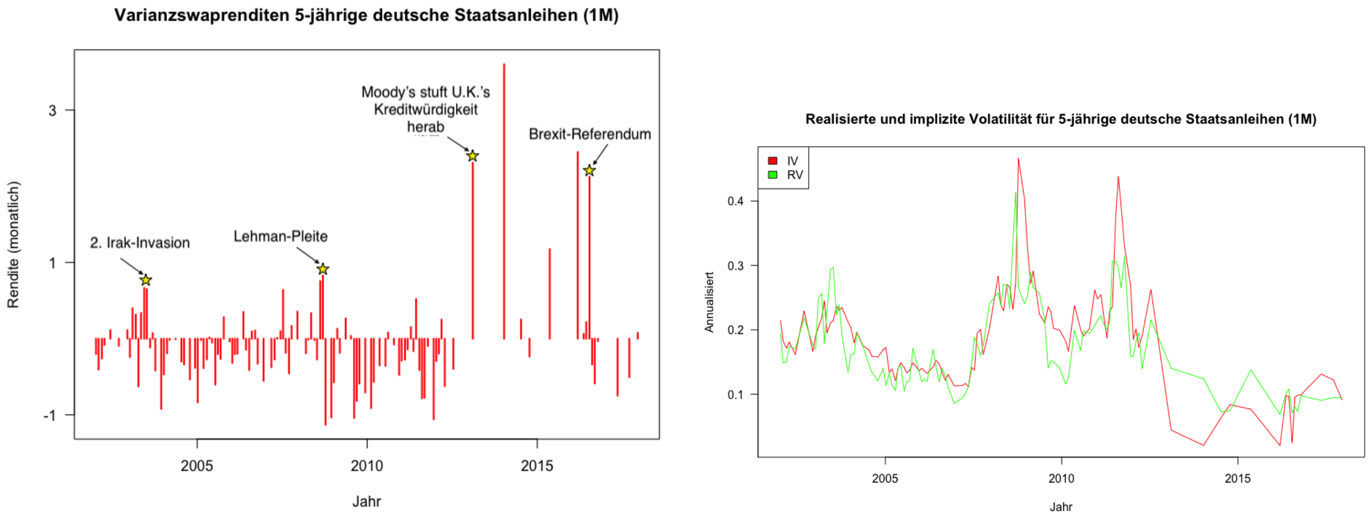
(a) Renditen

(b) Volatilitäten

Abbildung 4: Kozhan-Methode auf 10-jährige deutsche Staatsanleihen

Hierbei ist r_t^i die i-te Rendite zum Zeitpunkt t. Wichtig ist anzumerken, dass die Daten von der Humboldt-Universität nur tägliche Informationen bis Juni 2016 beinhalten, weshalb die Zeiträume der Daten, mit denen in dieser Abschlussarbeit bisher gearbeitet wurde, für die Analysen angepasst werden müssen. Die Zeitperioden der Daten für die Faktoren und der hier vorliegenden Daten für die Varianzswaprenditen wurden dementsprechend aneinander angepasst, diese laufen von Januar 2002 bis Juni 2016. Nach der GTVS sind für die 10-, 5- und 2-jährigen zugrunde liegenden deutschen Staatsanleihen insgesamt jeweils 122, 116 und 123 monatliche Daten zur Verfügung. Nach der Kozhan-Methode beträgt die Anzahl der monatlichen Daten 110, 105 und 110 für die 10-, 5- und 2-jährigen Laufzeiten. Tabelle 2 zeigt die berechneten Ergebnisse.

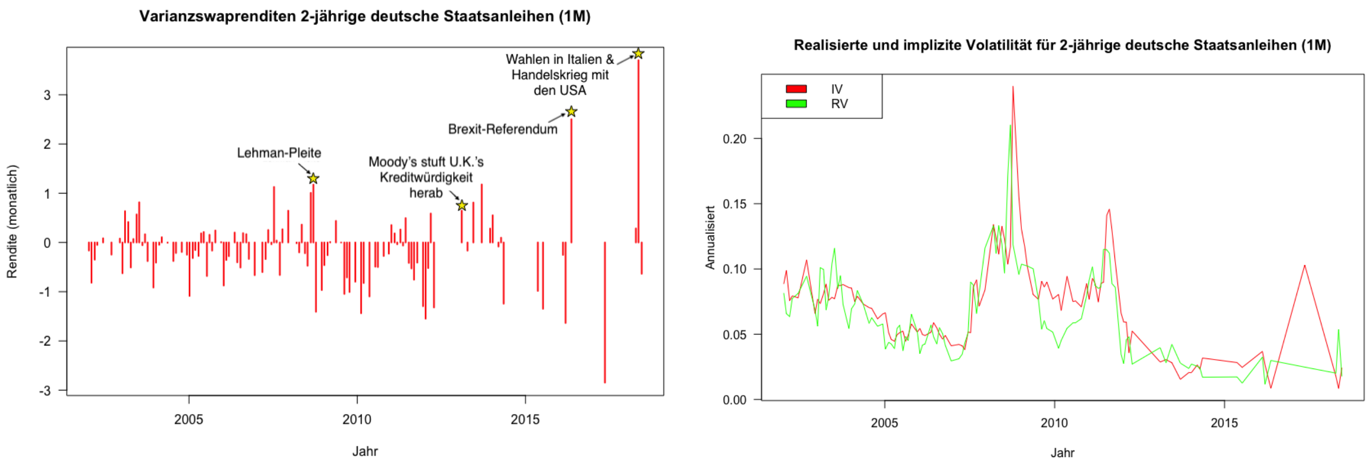
Das Alpha der Strategie ist für den GTVS nach wie vor



(a) Renditen

(b) Volatilitäten

Abbildung 5: Kozhan-Methode auf 5-jährige deutsche Staatsanleihen



(a) Renditen

(b) Volatilitäten

Abbildung 6: Kozhan-Methode auf 2-jährige deutsche Staatsanleihen

Tabelle 2: Risikoadjustierte Varianzswaprenditen für deutsche Staatsanleihen

GTVS												
LZ	Alpha	t-stat	MRKT	t-stat	SMB	t-stat	HML	t-stat	MOM	t-stat	EQM	t-stat
10-j.	-0,334	-6,026	-3,741	-0,997	-0,000	-0,025	-0,024	-1,415	-0,001	0,266	-0,010	-1,133
5-j.	-0,318	-10,179	-5,955	-3,035	-0,015	-1,703	0,000	0,002	-0,010	-1,061	-0,024	-2,236
2-j.	-0,670	-5,032	-4,933	-1,398	-0.028	-0,985	-0,018	-0,730	-0,020	-1,506	-0,033	-2,741
Kozhan-Methode												
LZ	Alpha	t-stat	MRKT	t-stat	SMB	t-stat	HML	t-stat	MOM	t-stat	EQM	t-stat
10-j.	-0,138	-2,514	-3,986	-1,086	-0,016	-0,833	-0,027	-1,405	-0,002	-0,502	-0,011	-2,629
5-j.	-0,075	-0,967	-2,987	-0,763	0,017	0,705	0,008	0,272	0,004	0,282	-0,001	-0,028
2-j.	-0,130	-2,447	-8,356	-1,838	-0,014	-0,608	-0,011	-0,488	-0,002	-0,211	-0,019	-1,901

Diese Tabelle berichtet die Ergebnisse des Regressionsmodells aus Gleichung (23) für einmonatige Varianzswaps auf deutsche Staatsanleihen mit den Laufzeiten (LZ) 10, 5 und 2 Jahren. Die Daten wurden monatlich erhoben und die t-Statistiken wurden nach Newey und West (1987) korrigiert.

stets negativ und weist hohe Signifikanzen auf. Interessant ist die Tatsache, dass die Rendite am Staatsanleihenmarkt (MRKT) und die Aktienmarktrendite (EQM) für die Renditen der 5-jährigen Laufzeit einen signifikanten Einfluss haben, jeweils bei einem p-Wert von kleiner als 0,001 und 0,01. Die Aktienmarktrendite ist zu dem signifikant für die Renditen der 2-jährigen Laufzeit bei einem p-Wert von kleiner als 0,001. Bei der Kozhan-Methode ist das Alpha wie zuvor über die Laufzeiten hinweg negativ, doch bei Weitem nicht so signifikant wie bei der GTVS. Zudem fällt auf, dass die Aktienmarktrendite für die 10-jährige Laufzeit signifikanter ist als das Alpha dessen, bei einem p-Wert kleiner als 0,001 (für EQM) und kleiner als 0,01 (für das Alpha). Auch für die 2-jährige Laufzeit weist EQM sowie MRKT eine gewisse Signifikanz auf, jeweils bei einem p-Wert von kleiner als 0,05.[28]

Abschließend kann man sagen, dass auf dem deutschen Staatsanleihenmarkt, in Analogie zu den Erkenntnissen auf dem U.S.-Markt von Choi et al. (2017), mit dem Handeln von Varianzswaps hohe durchschnittliche Renditen und attraktive Sharpe Ratios erzielt werden können (vor allem durch die GTVS-Methode). Das Alpha und dessen Signifikanz der betrachteten Strategie ist auf hohem Niveau und die Kontrolle durch bekannte Risikofaktoren zeigt, dass die generierte Überrendite keine Kompensation für diese ist.

5.2. Cross-Country-Vergleich auf europäischen Märkten

Im folgenden Abschnitt werden die Anleihenvarianzrisikoprämien auf den europäischen Märkten untersucht und verglichen. Hierfür werden insbesondere Varianzswaps auf französische und italienische 10-jährige Staatsanleihen betrachtet. Als Erstes werden die Ergebnisse jeweils einzeln betrachtet, danach werden diese in Relation zueinander und zu den 10-jährigen deutschen Staatsanleihen gesetzt. Alle Berechnungen geschehen dabei in Analogie zu Abschnitt 5.1.1.

5.2.1. Individuelle Ergebnisse

In der Tabelle 3 sind die Ergebnisse für einmonatige Varianzswaps auf 10-jährige französische und italienische Staatsanleihen angegeben. Auffällig sind hierbei zwei Aspekte: Zum einen, dass keine Werte für die 10-jährigen italienischen Staatsanleihen nach der Kozhan-Methode ausgewiesen werden. Dies liegt daran, dass hierbei keine einmonatigen Varianzswaps berechnet werden konnten. Dieses Problem wird in Kapitel 6 zu der Robustheit näher betrachtet. Zum anderen, dass bei der Kozhan-Methode die Varianzrisikoprämie für beide Länder komplett verschwindet.[29] Die durchschnittliche Rendite einer Short GTVS-Strategie ist höchst signifikant bei den französischen Staatsanleihen mit einem Wert von 0,436 monatlich und einer t-Statistik von 6,084, während dies für die italienischen nicht der Fall ist. Zudem ist die hohe Volatilität der Renditen für die italienischen Staatsanleihen zu bemerken, welche mit 1,073 die bisher höchste für die GTVS darstellt. Die Sharpe Ratio leidet dementsprechend bei den italienischen Werten und liegt bei 0,232, welche sich bei den französischen Werten mit 0,818 als deutlich attraktiver erweist. Anhand der Kozhan-Methode lohnt sich eine Short Strategie bei den französischen Staatsanleihen offensichtlich nicht, denn mit einem Wert von 0,772 wäre eine Long-Position rationaler. Dessen Signifikanz ist zwar auf hohem Niveau mit einer t-Statistik von 5,248, doch die Strategie kommt mit einem hohen Risiko bei einer Volatilität von 1,156.

In den Abbildungen 7 bis 9 sind die jeweiligen Renditen auf der linken Seite mit den dazugehörigen Volatilitäten dargestellt, welche jeweils auf der rechten Seite zu finden sind. Zumindest kann man anhand der Datenmenge der französischen Staatsanleihen die Aussage treffen, dass, anhand der GTVS, in diesem Markt die Varianzrisikoprämie existiert. Die realisierte Volatilität ist über den Zeitraum hinweg für die meiste Zeit unter der implizierten Volatilität, während dies bei den italienischen Staatsanleihen nicht gesagt werden kann. Die realisierte Volatilität liegt zwar in 8 von 11 Monaten unter dem Wert der implizierten Volatilität, doch der hohe Ausschlag jener im 5. Monat der Zeitreihe scheint jegliche Varianzrisikoprämie in dem Zeitraum zu kompensieren. Für die Kozhan-Methode ergibt sich für die französischen Staatsanleihen ein anderes Bild: Hier ist die realisierte Volatilität fast durchgängig, über den kompletten Zeitraum hinweg, höher als die implizierte Volatilität.

Abschließend lässt sich feststellen, dass, anhand der verfügbaren Daten, die VRP auf dem französischen Staatsanleihenmarkt existent ist und man mittels einer Short GTVS Strategie attraktive Renditen erzielen kann. In dem betrachteten Zeitraum der italienischen Staatsanleihen kann keine VRP ausfindig gemacht werden. Dies könnte ökonomisch damit begründet werden, dass der Markt für den hier vorliegenden Zeitraum die erwartete Volatilität und damit das Risiko in einer Anlage in italienische Staatsanleihen unterschätzt hat, was durch die geringe implizierte Volatilität, beziehungsweise durch den niedrigen Strike-Preis, angegeben wird. Die hohe realisierte Volatilität könnte darauf hinweisen, dass der Markt und dessen Teilnehmer überrascht wurden und dadurch das Risiko unterschätzt wurde, weshalb das Kaufen der Volatilität, oder die Absicherung gegen eine hohe realisierte Volatilität, auf italienische Staatsanleihen profitabel war. Hier wird die Versicherungsfunktion von Varianzswaps, welches in Abschnitt 3.4 diskutiert wird, erkenntlich.
Anleger hätten sich durch den Erwerb von Varianzswaps auf 10-jährige italienische Staatsanleihen gegen die hohe Nervosität an den Märkten profitabel absichern können.

5.2.2. Cross-Country-Vergleich

Nun ist von Interesse, wie und ob die jeweiligen Ergebnisse der 10-jährigen deutschen, französischen und italienischen Staatsanleihen und deren Varianzswaps miteinander verglichen werden können. Hierfür wurden die Zeiträume jeweils so angepasst, dass die Ergebnisse der Relationen aussagekräftig sind. Dabei wurden die Zeiträume der deutschen

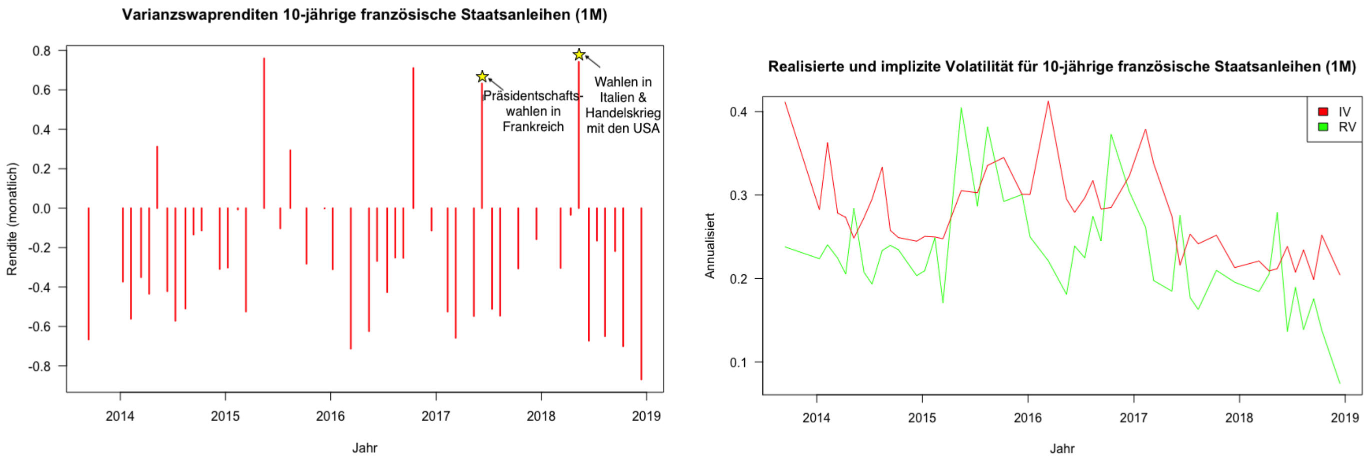
[28] Das adjustierte R^2 ist stets sehr gering und beläuft sich um null.

[29] Die prozentualen Renditen sind bei den italienischen Staatsanleihen, unabhängig von der Methode, positiv, während diese bei den französischen nach der GTVS-Methode negativ sind.

Tabelle 3: Varianzswaprenditen für französische und italienische Staatsanleihen

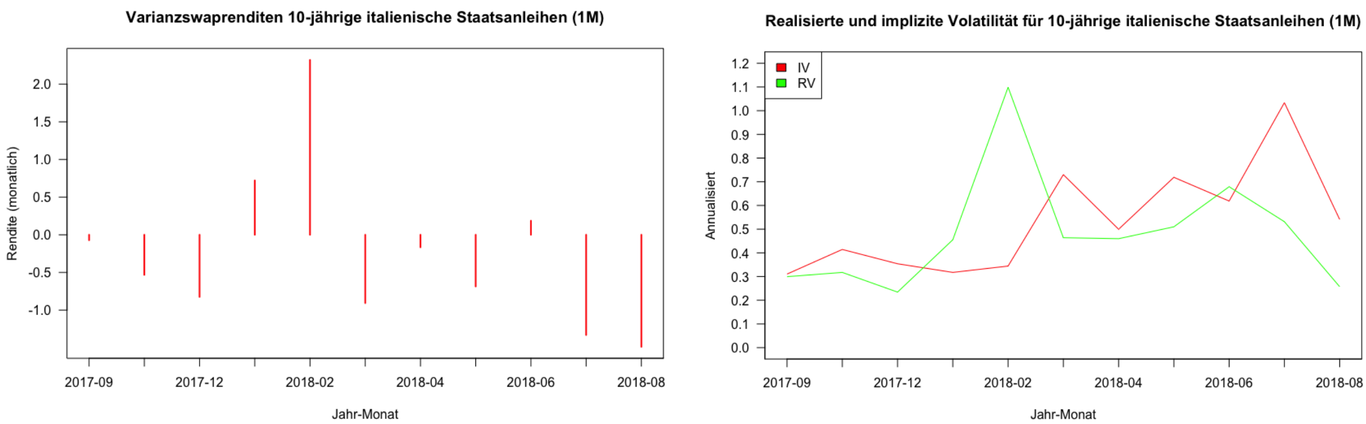
GTVS								
LZ	Mean	t-stat	Median	STD	Max	Skew	Kurt	SR
fr. 10-j.	-0,436	-6,084	-0,367	0,531	0,565	-0,279	0,546	-0,821
it. 10-j.	-0,253	-1,954	-0,533	1,073	2,321	1,219	1,051	-0,236
Kozhan-Methode								
LZ	Mean	t-stat	Median	STD	Max	Skew	Kurt	SR
fr. 10-j.	0,772	5,248	0,213	1,156	3,114	0,997	-0,439	0,668
it. 10-j.	-	-	-	-	-	-	-	-

Diese Tabelle berichtet die Ergebnisse der Log-Renditen für einmonatige Varianzswaps auf französische und italienische Staatsanleihen mit der Laufzeit (LZ) 10 Jahren. Die angegebenen Statistiken sind der Reihe nach der Mittelwert, der Median, die Standardabweichung, das Maximum, die Schiefe, die Kurtosis und die Sharpe Ratio. Die Daten wurden monatlich erhoben und die t-Statistiken wurden nach Newey und West (1987) korrigiert.



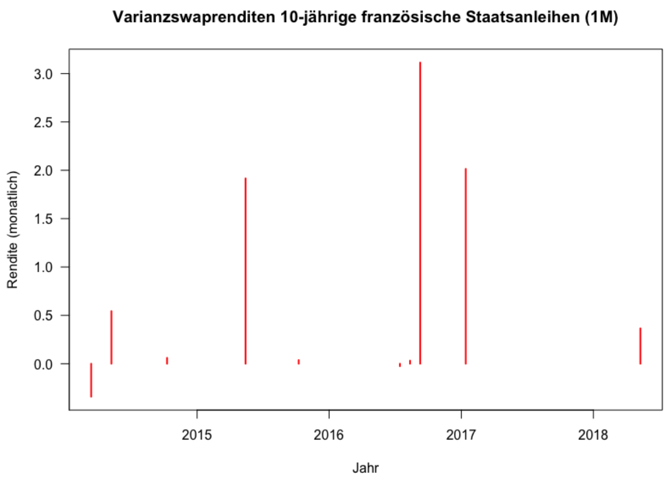
(a) Renditen **(b)** Volatilitäten

Abbildung 7: GTVS auf 10-jährige französische Staatsanleihen

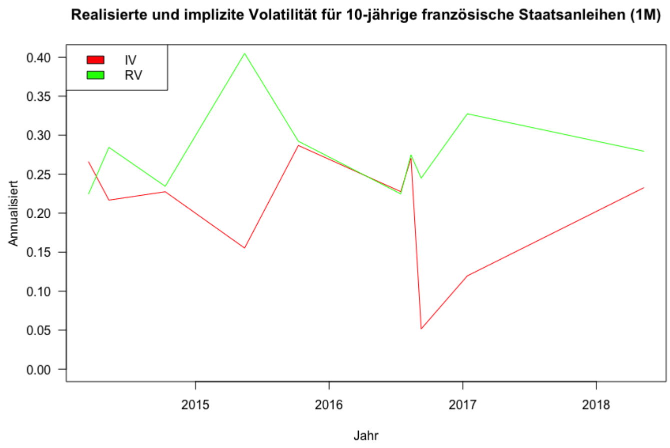


(a) Renditen **(b)** Volatilitäten

Abbildung 8: GTVS auf 10-jährige italienische Staatsanleihen



(a) Renditen



(b) Volatilitäten

Abbildung 9: Kozhan-Methode auf 10-jährige französische Staatsanleihen

Daten mit den französischen und italienischen abgeglichen und die Zeiträume der französischen mit den italienischen.[30]

In Tabelle 4 sind die Ergebnisse des Cross-Country-Vergleiches zu sehen. Hierdurch wird deutlich, dass die Varianzrisikoprämie für die deutschen Staatsanleihen erhalten bleiben, auch wenn diese mit den französischen und italienischen Zeiträumen angepasst werden. Die monatlich durchschnittliche (Log-) Rendite einer Short-Position in den GTVS beträgt in dem angepassten Zeitraum DE-FRA für die deutschen Staatsanleihen 0,498 und ist damit im Vergleich zu der Rendite der französischen Staatsanleihen mit 0,436 etwas höher als diese. Die hohe Signifikanz mit einer t-Statistik von 10,559 ist anzumerken, welche für die französischen Renditen 6,084 beträgt. Die Strategie zieht allerdings ein höheres Risiko gegenüber den französischen Staatsanleihen mit sich, denn in diesem Zeitraum ist die Volatilität der deutschen Renditen bei 0,561 und die Kurtosis bei 5,824, welche bei den französischen jeweils 0,531 und 0,546 betragen. Die Sharpe Ratio beträgt bei den deutschen Werten in diesem Zeitraum 0,886, was etwas höher ist als für die französischen Renditen, welche 0,821 betragen. Das Alpha für die deutschen Renditen, analog berechnet zu den Ergebnissen in Abschnitt 5.1.1, ist auch hier ziemlich hoch mit einem Wert von 0,522 und mit einer t-Statistik von 11,130 signifikant.

Der Vergleich der deutschen Renditen mit den italienischen liefert qualitativ vergleichbare Werte. Die durchschnittliche (Log-) Rendite der deutschen GTVS Short-Position ist in diesem Zeitraum ziemlich hoch mit einem Wert von 0,527, während bei der italienischen eine durchschnittliche Rendite von 0,253 erreicht werden kann. Die Strategie ist hier allerdings sogar riskanter als mit dem DE-FRA-Match, denn die Volatilität der Rendite beträgt 0,973, welche zwar immerhin kleiner ist als die Volatilität der italienischen Renditen (1,073), doch in einer geringeren Sharpe Ratio für die deutschen Renditen resultiert (0,538), die aber deutlich höher als die Sharpe Ratio der italienischen Renditen ist (0,236). Auch in diesem Zeitraum ist das Alpha der deutschen Rendite (0,549) hoch und etwa auf dem Niveau der durchschnittlichen Rendite.

Das Vergleichen der französischen mit den italienischen Renditen der Short GTVS zeigt, dass die französischen Staatsanleihen ihre VRP beibehalten und sich die durchschnittliche Rendite auf 0,564 beläuft. Die Volatilität ist auch hier für die französische Strategie ziemlich hoch bei 0,716, doch immer noch geringer als die der italienischen. Die Sharpe Ratio für die französischen Renditen ist hier ebenfalls, wie das Match zwischen Deutschland und Italien, höher als die Sharpe Ratio der italienischen Renditen. In Abbildung 10 werden die Zeitreihen der Volatilitäten für die Matches von den deutschen mit den französischen und von diesen mit den italienischen Werten gezeigt.

Rein qualitativ lässt sich feststellen, dass sich die Anleihenvarianzswaprenditen für die deutschen und französischen Staatsanleihen in dem identischen Zeitraum auf ungefähr gleichem Niveau bewegen. Dies ist nicht ganz verwunderlich, da, nach Ejsing und Sihvonen (2009), die Staatsanleihenmärkte beider Länder vergleichbar sind in Hinsicht auf die Kreditwürdigkeit, der Währung und der Anzahl an verfügbaren Staatsanleihen auf den Märkten.

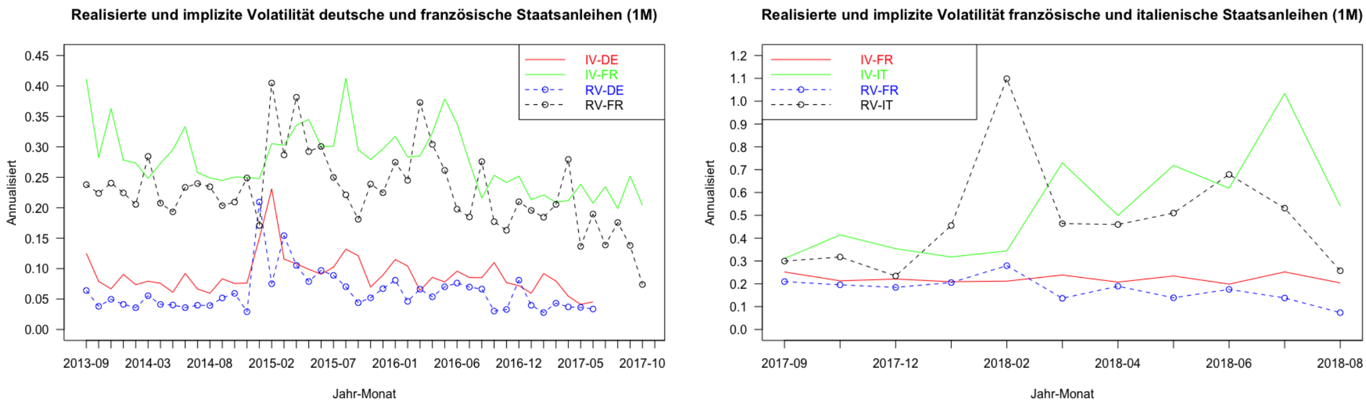
Um die ökonomischen Gründe der Unterschiedlichkeiten in den Renditen und damit zusammenhängend der von den Marktteilnehmern wahrgenommenen Risiken weiter zu untersuchen, ist es in diesem Fall sinnvoll, die Spreads zwischen den Staatsanleihen der betrachteten Länder zu vergleichen. Der Spread zwischen den deutschen und französischen Staatsanleihen rangierte in dem abgeglichenen Zeitraum zwischen 17,7 und 75,8 Basispunkten, während sich der Spread zwischen den italienischen und deutschen (fran-

[30]Anhand der höheren Datenmenge der GTVS-Methode wurden stets die Werte anhand dieser Vorgehensweise angepasst.

Tabelle 4: Varianzswaprenditen für die angepassten Zeiträume der Staatsanleihen

Match	Mean	t-stat	Median	STD	Max	Skew	Kurt	SR	Alpha	t-stat
DE-FRA	-0,498	-10,559	-0,419	0,561	0,828	-1,454	5,824	-0,886	-0,522	-11,130
DE-ITA	-0,527	-3,251	-0,395	0,973	0,828	-1,276	1,660	-0,538	-0,549	-3,384
FRA-ITA	-0,564	-4,361	-0,362	0,716	0,555	-0,570	-0,203	-0,784	-	-
FRA	-0,436	-6,084	-0,367	0,531	0,565	-0,279	0,546	-0,821	-	-
ITA	-0,253	-1,954	-0,533	1,073	2,321	1,219	1,051	-0,236	-	-

Diese Tabelle berichtet die Ergebnisse der Log-Renditen für einmonatige Varianzswaps der verfügbaren Staatsanleihen mit einer Laufzeit von 10 Jahren. Die angegebenen Statistiken sind der Reihe nach der Mittelwert, der Median, die Standardabweichung, das Maximum, die Schiefe, die Kurtosis, das Alpha (für die deutschen Staatsanleihen) und die Sharpe Ratio. Hierbei sind die Werte jeweils so zu verstehen, dass z.B. „DE-FRA" bedeutet, dass die Zeitreihe der deutschen Daten auf die französische angepasst wurde und die Statistiken sich auf diese beziehen. FRA und ITA sind die Werte für die individuellen Ergebnisse aus Tabelle 3, um die Vergleichbarkeit zu erleichtern. Die Daten wurden monatlich erhoben und die t-Statistiken wurden nach Newey und West (1987) korrigiert.



(a) RV & IV DE-FRA-Match

(b) RV & IV FRA-ITA-Match

Abbildung 10: Ausgewählte Zeitreihen der angepassten Volatilitäten

zösischen) Staatsanleihen in dem abgeglichenen Zeitraum zwischen 115,8 (92,5) und 314,3 (275,3) Basispunkten bewegte.[31]

Es wird deutlich, dass die Ähnlichkeit der Anleihenvarianzswaprenditen der deutschen und französischen Staatsanleihen durch eine, mehr oder weniger, identische Betrachtungsweise bezüglich dieser durch die Marktteilnehmer begründet werden kann, welches durch den relativ niedrigen Spread zwischen diesen impliziert wird. Die großen Unterschiede der deutschen und französischen Anleihenvarianzswaprenditen zu den italienischen wird nach analogem Gedankengang durch die jeweils hohen Spreads ebenfalls ersichtlich.

Abschließend kann behauptet werden, dass die VRP auf den europäischen Anleihenmärkten besteht, man mit einer Short-Position in einmonatige Anleihenvarianzswaps hohe durchschnittliche Renditen erzielen kann und somit in Konsistenz zu der vorherrschenden Literatur ist. Diese Aussage gilt vor allem auf den deutschen und französischen Staatsanleihenmärkten. Auf den italienischen Staatsanleihenmärkten lässt sich in dem betrachteten Zeitraum keine VRP feststellen, was zu der Annahme führt, dass der Erwerb von Varianzswaps auf diesem Markt eine profitable Absicherung darstellte. In dem Jahr 2018 war Italien mit hoher Unsicherheit auf den Märkten konfrontiert, sei es durch die politischen Rahmenbedingungen, die Steigerung des Spreads italienischer Staatsanleihen zu den deutschen Staatsanleihen oder der Budget-Konflikt mit der Europäischen Kommission.[32] Dementsprechend ist die Nichtexistenz der VRP auf dem italienischen Staatsanleihenmarkt nicht verwunderlich, denn das Absichern gegen die Volatilität war in dem Zeitraum nicht nur sinnvoll, sondern höchst profitabel.

6. Robustheit

In diesem Abschnitt sind zwei Aspekte im Vordergrund: Zum einen werden die Renditen der bisher berechneten und

[31] Vgl. http://www.worldgovernmentbonds.com/spread/france-10-years-vs-germany-10-years/, http://www.worldgovernmentbonds.com/spread/italy-10-years-vs-germany-10-years/ und http://www.worldgovernmentbonds.com/spread/italy-10-years-vs-france-10-years/, 21.02.2020.

[32] Vgl. https://www.eurexchange.com/exchange-en/about-us/news/Interview-with-market-participants-BTP-yields-continue-to-drive-Euro-BTP-volume-1397134, 21.02.2020.

berichteten Ergebnisse als prozentuale Renditen angegeben, um einen direkten Vergleich mit den Ergebnissen von Choi et al. (2017) zu ermöglichen. Zum anderen wird das Problem der zu wenig vorhandenen Daten bezüglich der einmonatigen Anleihenvarianzswaps behoben, indem stattdessen Anleihenvarianzswaps mit einer Laufzeit von nahe einem Monat gebildet werden. Diese werden „near one month“ oder n1M genannt und sind die Durchschnittswerte von Anleihenvarianzswaps, welche eine Laufzeit zwischen 21 und 30 Tagen aufweisen. Es könnten noch verschiedene Ausprägungsformen betrachtet werden, doch in dieser Abschlussarbeit wird diese Definition verwendet, um so viele Daten wie möglich für die Berechnungen beibehalten zu können. Zudem wird als Performance-Maß neben dem Bloomberg Barclays Germany Treasury Bond Index der REXP verwendet, um die Analysen der deutschen Staatsanleihen zu vollenden. Der REXP wird als Benchmark für deutsche Staatsanleihen ebenfalls von Korn und Koziol (2006) sowie von Detering, Zhou und Wystup (2012) benutzt. Die Daten dazu wurden aus Bloomberg entnommen.

Durch die n1M-Kalibration steigt in der GTVS-Methode die monatliche Anzahl an Daten für die 10-jährigen deutschen Staatsanleihenvarianzswaps von 146 auf 187, für die 5-jährigen von 138 auf 187 und für die 2-jährigen von 145 auf ebenfalls 187. Die monatlichen Daten steigen bei den französischen Staatsanleihenvarianzswaps von 46 auf 58 und bei den italienischen von 11 auf 14.

In der Kozhan-Methode ist ein ähnliches Bild zu sehen: Die Daten für die 10-jährigen deutschen Staatsanleihenvarianzswaps steigen von 116 monatlichen Daten auf 151, bei den 5-jährigen von 122 auf 141 und bei den 2-jährigen von 114 auf 161. Bei den französischen steigt die Anzahl an monatlichen Daten von 10 auf 19 und bei den italienischen von 0 auf 3.

Renditen der Varianzswaps

Tabelle 5 gibt die berechneten Ergebnisse für die deutschen, französischen sowie italienischen Staatsanleihen und deren Anleihenvarianzswaprenditen wieder. Hierdurch wird die hohe monatliche durchschnittliche Rendite der Short GTVS Strategie ersichtlich und es ergibt sich für die 10-jährigen deutschen Staatsanleihen nach der prozentualen Renditen ein sehr ähnliches Bild zu den 10-jährigen U.S.-Staatsanleihenvarianzswaprenditen nach Choi et al. (2017). In diesem Fall beträgt die deutsche Rendite 0,265 (1M) und die U.S. Rendite 0,276. Beide Werte sind höchst signifikant, mit einer t-Statistik für die deutsche Rendite von 10,284 und für die U.S. Rendite von 12,71. Die Volatilität der Renditen beider Länder ist auf gleichem Niveau, dabei beträgt die Standardabweichung der 10-jährigen deutschen Staatsanleihenvarianzswaps 0,327 und die der U.S. Renditen 0,353. Die Sharpe Ratio ist für diesen Fall allerdings attraktiver bei den deutschen Staatsanleihen, welches mit einer ungefähr gleichen Rendite aber einem geringeren Risiko kommt. Diese beträgt für die deutschen Renditen 0,853 und für die U.S. Renditen 0,784. Allgemein ist die hohe durchschnittliche Rendite und die hohen sowie signifikanten Alpha-Werte für die deutschen Staatsanleihen, unabhängig der Laufzeit, log-beziehungsweise prozentualen-Renditen und 1M oder n1M, anzumerken.

Die hohe Rendite einer Long-Position in einmonatige Varianzswaps auf italienische Staatsanleihen wird durch die prozentuale Betrachtungsweise nochmal ersichtlicher. In dem betrachteten Zeitraum ergab sich eine monatliche durchschnittliche Rendite von 60,4%, welches allerdings durch eine sehr hohe Volatilität bei einer Standardabweichung von 2,895 zu einer geringen Sharpe Ratio von 0,210 führte. Durch die n1M-Kalibration sinkt die durchschnittliche Rendite dabei auf 30,6% und verliert deutlich an Signifikanz, welches von 2,266 (1M-Laufzeit) auf 0,410 mittels der n1M-Laufzeit fällt.

Die Ähnlichkeit der Renditen für Anleihenvarianzswaps (anhand der GTVS-Methode) auf 10-jährige deutsche sowie französische Staatsanleihen lässt sich hier wieder bestätigen. Die durchschnittliche, monatliche prozentuale Rendite einer Short-Position in französische Staatsanleihenvarianzswaps ist mit 0,261 anhand der 1M-Laufzeit nahezu identisch zu den deutschen Renditen (0,265) und ist ebenfalls höchst signifikant mit einer t-Statistik von 7,499. Die höhere Volatilität bei einer Standardabweichung von 0,394 (im Gegensatz zu der Volatilität der deutschen Renditen von 0,327) führt allerdings zu einer geringeren Sharpe Ratio, welches bei den französischen Renditen 0,661 und bei den deutschen 0,853 beträgt.

Abbildungen 11 bis 13 geben die Plots für ausgewählte Renditen sowie deren (annualisierten) realisierten und implizierten Volatilitäten aus der Tabelle 5 wieder.

Analyse der Renditen

Des Weiteren werden die Risikoadjustierten Renditen mittels der Robustheitsanalyse dargestellt. Hierbei werden nur die prozentualen beziehungsweise die logarithmierten Anleihenvarianzswaprenditen auf 10-jährige deutsche Staatsanleihen betrachtet. Die Ergebnisse dafür befinden sich in Tabelle 6. Auffällig ist dabei die Tatsache, dass das Alpha, unabhängig von dem Performance-Index des deutschen Staatsanleihenmarktes und der 1M- oder n1M-Betrachtung, hoch und signifikant bleibt. Die Rendite des Aktienmarktes EQM ist dabei bei jeder n1M-Kalibration signifikant bei einem p-Wert von jeweils kleiner als 0,001. Die Rendite des Staatsanleihenmarktes hat zwar eine hohe ökonomische Signifikanz mit Werten von -1,127 bis -3,609, doch die niedrige Signifikanz anhand der t-Statistik steht dazu in Widerspruch.[33]

Cross-Country-Vergleich

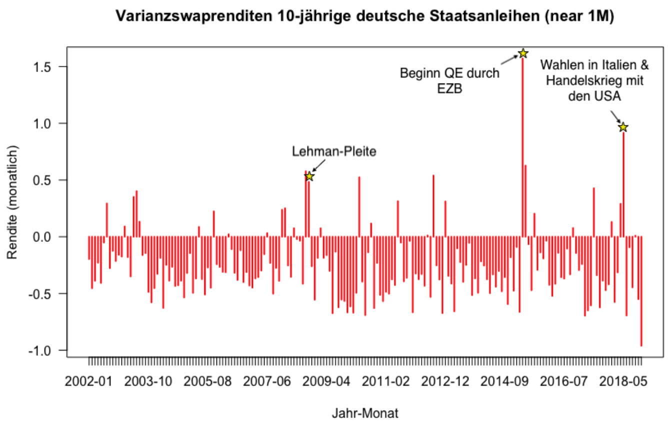
Die Robustheitsanalyse wird auf den Cross-Country-Vergleich ebenfalls angewendet, die Ergebnisse dafür sind in der Tabelle 7 zu finden. Die Abbildungen 14 und 15 geben

[33] Das adjustierte R^2 ist auch hier stets sehr niedrig und beläuft sich um null.

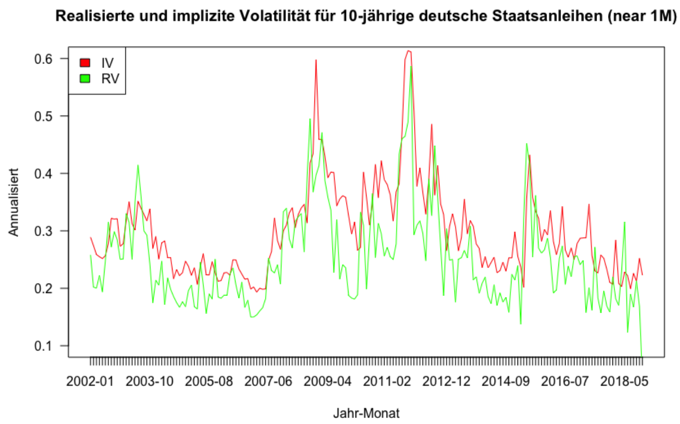
Tabelle 5: Varianzswaprenditen nach der Robustheitsanalyse

UN	LZ	Log(1/0)	1M/n1M	Mean	t-stat	STD	Max	Skew	Kurt	SR	Alpha 1	t-stat	Alpha 2	t-stat
GTVS														
DE	10	1	n1M	-0,387	-7,890	0,462	1,058	-1,313	10,159	-0,869	-0,418	-8,678	-0,361	-7,567
	10	0	1M	-0,265	-10,284	0,327	1,288	1,624	4,403	-0,853	-0,291	-13,295	-0,265	-12,091
	10	0	n1M	-0,252	-8,884	0,338	1,881	1,634	4,869	-0,789	-0,281	-10,050	-0,231	-8,276
	5	1	n1M	-0,414	-7,120	0,510	1,120	-1,690	17,101	-0,840	-0,481	-8,372	-0,458	-7,986
	5	0	1M	-0,249	-9,918	0,382	2,065	2,256	9,436	-0,693	-0,286	-11,407	-0,262	-10,442
	5	0	n1M	-0,259	-8,976	0,365	2,065	1,576	4,358	-0,749	-0,293	-10,301	-0,265	-9,303
	2	1	n1M	-0,862	-10,737	0,690	1,039	-0,573	2,815	-1,270	-0,811	-10,340	-0,745	-9,492
	2	0	1M	-0,448	-6,723	0,401	1,826	2,040	6,918	-1,151	-0,425	-6,992	-0,416	-6,850
	2	0	n1M	-0,474	-13,374	0,369	1,826	2,027	6,337	-1,325	-0,408	-12,046	-0,362	-10,698
FR	10	1	n1M	-0,416	-2,564	0,599	0,979	-1,032	5,440	-0,692	-	-	-	-
	10	0	1M	-0,261	-7,499	0,394	0,759	1,191	0,996	-0,661	-	-	-	-
	10	0	n1M	-0,226	-2,792	0,454	1,663	1,531	2,409	-0,495	-	-	-	-
IT	10	1	n1M	-0,413	-0,435	1,250	2,335	-1,701	12,292	-0,328	-	-	-	-
	10	0	1M	0,604	2,266	2,895	9,187	2,684	5,521	0,210	-	-	-	-
	10	0	n1M	0,306	0,410	2,020	9,329	3,024	9,072	0,153	-	-	-	-
Kozhan-Methode														
UN	LZ	Log(1/0)	1M/n1M	Mean	t-stat	STD	Max	Skew	Kurt	SR	Alpha 1	t-stat	Alpha 2	t-stat
DE	10	1	n1M	-0,198	-4,516	0,599	5,197	1,861	11,972	-0,366	-0,220	-5,039	-0,218	-4,995
	5	1	n1M	-0,170	-3,352	0,624	5,617	2,847	19,213	-0,307	-0,225	-4,452	-0,206	-4,071
	2	1	n1M	-0,187	-2,932	0,765	7,349	1,361	9,197	-0,270	-0,155	-2,439	-0,209	-3,288
FR	10	1	n1M	0,655	4,494	1,569	7,641	1,838	4,932	0,418	-	-	-	-
IT	10	1	n1M	1,282	15,191	0,826	2,630	0,333	-1,132	1,557	-	-	-	-

Diese Tabelle berichtet die Ergebnisse für einmonatige (1M) sowie nahe einmonatige (n1M) Varianzswaps der verfügbaren Staatsanleihen (UN) mit den jeweiligen Laufzeiten (LZ). Die angegebenen Statistiken sind der Reihe nach der Mittelwert, die Standardabweichung, das Maximum, die Schiefe, die Kurtosis, das Alpha (für die deutschen Staatsanleihen) und die Sharpe Ratio. Alpha 1 wurde berechnet mittels dem Bloomberg Barclays Germany Treasury Bond Index und Alpha 2 mittels dem REXP. Log(1/0) gibt an, ob die berechneten Werte die logarithmierten (1) oder die prozentualen (0) Renditen darstellen. Die Daten wurden monatlich erhoben und die t-Statistiken wurden nach Newey und West (1987) korrigiert.

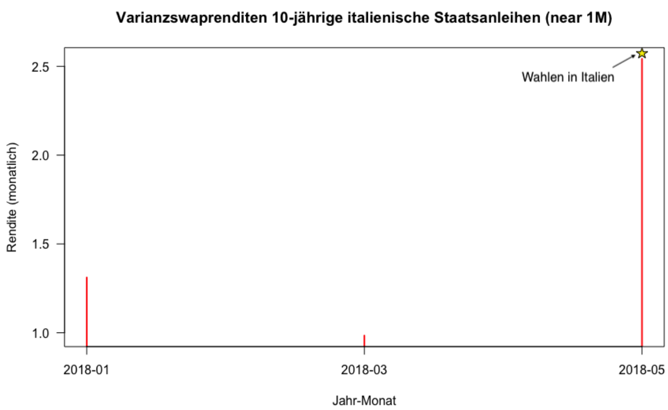


(a) Renditen

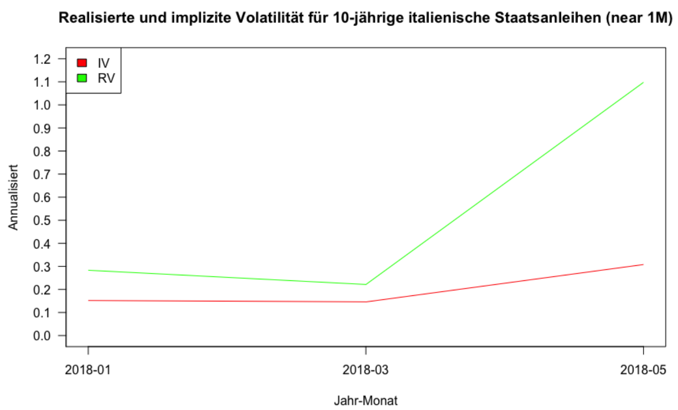


(b) Volatilitäten

Abbildung 11: GTVS auf 10-jährige deutsche Staatsanleihen (n1M)

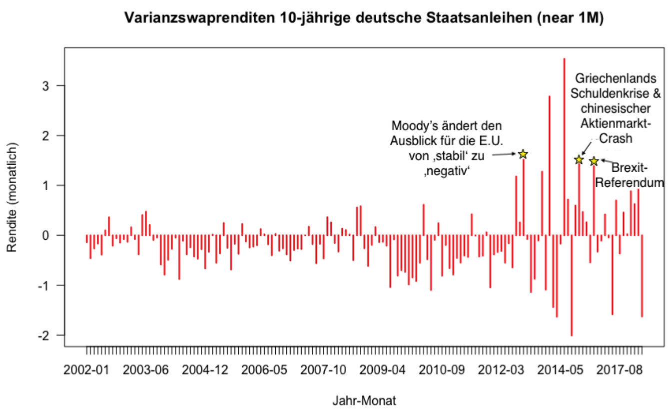


(a) Renditen

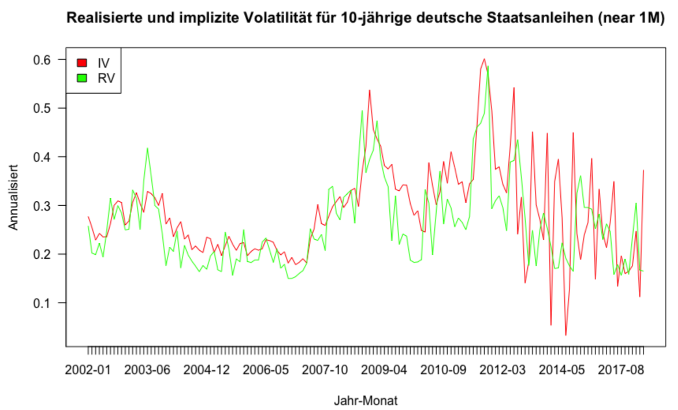


(b) Volatilitäten

Abbildung 12: Kozhan-Methode auf 10-jährige italienische Staatsanleihen (n1M)



(a) Renditen



(b) Volatilitäten

Abbildung 13: Kozhan-Methode auf 10-jährige deutsche Staatsanleihen (n1M)

Tabelle 6: Risikoadjustierte Varianzswaprenditen für 10-jährige deutsche Staatsanleihen

		Alpha	MRKT 1	SMB	HML	MOM	EQM
1M	10-j.	-0,226	-2,970	-0,002	-0,014	-0,002	-0,010
	t-stat	-5,600	-1,026	-0,198	-1,138	-0,523	-1,445
n1M	10-j.	-0,225	-2,211	-0,001	-0,001	-0,006	-0,015
	t-stat	-5,870	-0,532	-0,064	-0,137	-1,952	-2,879
n1M	10-j.	-0,342	-2,100	-0,003	-0,003	-0,006	-0,018
(Log)	t-stat	-6,919	-0,478	-0,165	-0,252	-1,769	-2,884
		Alpha	MRKT 2	SMB	HML	MOM	EQM
1M	10-j.	-0,233	-2,213	-0,002	-0,012	-0,002	-0,009
	t-stat	-5,826	-0,873	-0,185	-1,006	-0,501	-1,315
1M	10-j.	-0,339	-3,609	-0,000	-0,023	0,001	-0,009
(Log)	t-stat	-6,211	-1,147	-0,002	-1,301	0,239	-1,133
n1M	10-j.	-0,231	-1,127	-0,001	-0,001	-0,006	-0,014
	t-stat	-6,665	-0,318	-0,074	-0,056	-1,918	-2,656
n1M	10-j.	-0,347	-1,298	-0,003	-0,002	-0,006	-0,017
(Log)	t-stat	-7,405	-0,329	-0,173	-0,203	-1,748	-2,656

Diese Tabelle berichtet die Ergebnisse des Regressionsmodells aus Gleichung (23) für einmonatige (1M) und nahe einmonatige (n1M) Varianzswaps auf 10-jährige deutsche Staatsanleihen. Für MRKT 1 wurde der Bloomberg Barclays Germany Treasury Bond Index und für MRKT 2 der REXP verwendet. Die Daten wurden monatlich erhoben und die t-Statistiken wurden nach Newey und West (1987) korrigiert.

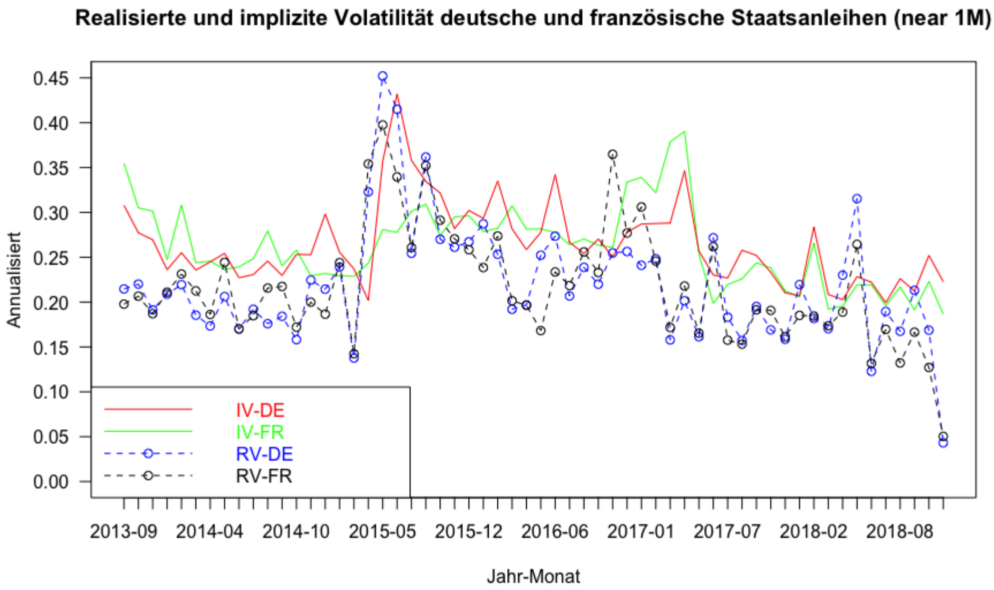
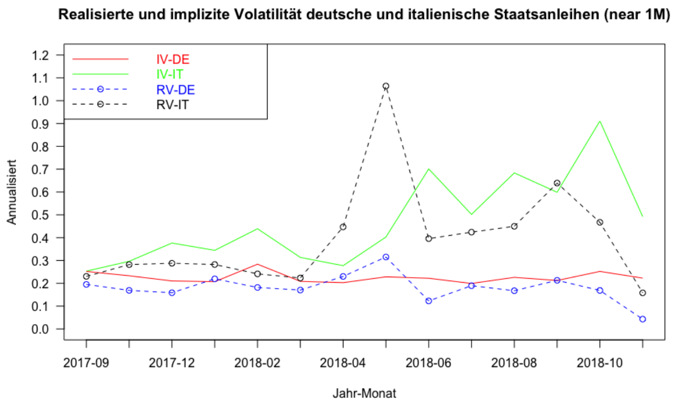


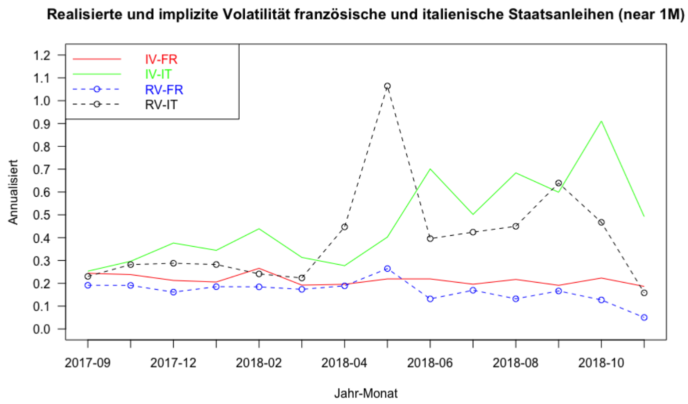
Abbildung 14: RV & IV DE-FRA-Match (n1M)

die Zeitreihen für die realisierten und impliziten Volatilitäten anhand der n1M-Kalibration wieder. Hier ist vor allem die hohe Ähnlichkeit der Entwicklung der deutschen und französischen realisierten sowie implizierten Volatilitäten anzumerken. Die negative durchschnittliche Anleihenvarianzswaprendite bei den französischen und deutschen Staatsanleihen werden beibehalten, auch nach einer Anpassung an den Zeitraum der italienischen Daten. In dem Fall einer Short-Position ist die deutsche Rendite (0,194) allerdings geringer als die französische (0,303), was auf eine geringere Nervosität auf dem deutschen Staatsanleihenmarkt hindeutet.

Abschließend kann gesagt werden, dass die Anleihenvarianzrisikoprämie sowie die hohen durchschnittlichen monatlichen Renditen einer Short Anleihenvarianzswap Strategie vor allem auf deutsche und französische Staatsanleihen auch nach einigen Robustheitsanalysen bestehen bleiben. Die hohen Renditen können weiterhin, im Falle des deutschen



(a) RV & IV DE-ITA-Match (n1M)



(b) RV & IV FRA-ITA-Match (n1M)

Abbildung 15: RV & IV der abgestimmten Zeitreihen (n1M)

Staatsanleihenmarktes, nicht durch gängige Risikofaktoren begründet werden.

7. Zusammenfassung

In dieser Abschlussarbeit wird die Anleihenvarianzrisikoprämie auf den europäischen Staatsanleihenmärkten untersucht. Hierbei liegt der Fokus auf den deutschen Staatsanleihenmärkten und es wird für die 10-, 5- und 2-jährigen Staatsanleihen eine Varianzrisikoprämie nachgewiesen. Die Varianzswaps werden mittels dem Choi et al. (2017) GTVS-Verfahren und nach der Methode von Kozhan et al. (2013) gebildet. Mittels einer Short-Position in einmonatigen Anleihenvarianzswaps können für die 10-jährigen deutschen Staatsanleihen nach der GTVS-Methode (Kozhan-Methode) eine monatliche durchschnittliche logarithmierte Rendite von 0,400 (0,149) bei einer Sharpe Ratio von 0,885 (0,218) erzielt werden, für die 5-jährigen Staatsanleihen beträgt die durchschnittliche Rendite 0,399 (0,076) bei einer Sharpe Ratio von 0,809 (0,112) und für die 2-jährigen Staatsanleihen beträgt die durchschnittliche Rendite 0,826 (0,178) bei einer Sharpe Ratio von 1,177 (0,228). Der Vergleich auf europäischer Ebene liefert dabei für die gleiche Strategie bei den 10-jährigen französischen Staatsanleihen eine durchschnittliche Rendite von 0,436 (-0,772) bei einer Sharpe Ratio von 0,821 (-0,668) und bei den 10-jährigen italienischen Staatsanleihen eine Rendite von 0,253 bei einer Sharpe Ratio von 0,236. Das Kontrollieren der Renditen auf dem deutschen Staatsanleihenmarkt liefert das Ergebnis, dass diese keine Kompensation für gängige Risikofaktoren darstellen. Die Ergebnisse bleiben auch nach Robustheitsanalysen aussagekräftig und in Konsistenz mit der vorherrschenden Literatur.

Ein wichtiger Aspekt ist jedoch, dass die verfügbare Datenmenge der französischen, aber vor allem der italienischen Staatsanleihen, im Gegensatz zu den deutschen Staatsanleihen nicht ausreicht. Weitere Forschungen auf europäischer Ebene sollten deshalb auf diesen Punkt aufbauen, um einen adäquaten Vergleich durchführen zu können. Die Betrachtung von Anleihenvarianzrisikoprämien auf anderen europäischen Ländern wie zum Beispiel in Griechenland oder in Großbritannien wäre ebenfalls wissenswert, denn diese Länder haben in den letzten zehn Jahren sehr volatile Phasen durchlaufen. Das Ausmaß etwaiger Varianzrisikoprämien sowie der Vergleich zu den in dieser Abschlussarbeit vorgestellten Ergebnissen wäre für das Verständnis dieser Thematik in Europa von Vorteil. Zum anderen stellen Varianzswaps nur einen der sogenannten Moment Swaps dar. Wie Kozhan et al. (2013) auf den U.S. Aktienmärkten zeigen, kompensieren Schiefeswaps (Skew Swaps) und Varianzswaps für die identischen Risiken. Interessant wären dementsprechend Untersuchungen von Schiefe- beziehungsweise Kurtosisswaps auf den europäischen Staatsanleihenmärkten.

Tabelle 7: Varianzswaprenditen für den Cross-Country-Vergleich nach der Robustheitsanalyse

Match	Log(1/0)	1M/n1M	Mean	t-stat	STD	Max	Skew	Kurt	SR	Alpha 1	t-stat	Alpha 2	t-stat
DE-FRA	1	n1M	-0,442	-6,587	0,583	0,941	-1,845	9,561	-0,755	-0,446	-2,634	-0,390	-2,301
DE-FRA	0	1M	-0,308	-13,591	0,358	1,288	1,921	6,402	-0,858	-0,319	-13,773	-0,293	-12,634
DE-FRA	0	n1M	-0,254	-8,208	0,408	1,571	2,116	6,343	-0,620	-0,262	-4,136	-0,213	-3,354
DE-ITA	1	n1M	-0,574	-4,542	0,944	0,643	-1,812	3,706	-0,605	-0,547	-0,045	-0,490	-0,040
DE-ITA	0	1M	-0,194	-2,622	0,599	1,288	1,325	1,538	-0,319	-0,203	-2,744	-0,177	-2,387
DE-ITA	0	n1M	-0,255	-5,513	0,474	0,916	0,992	0,768	-0,530	-0,246	-1,560	-0,196	-1,245
FRA-ITA	1	n1M	-0,629	-3,547	0,740	0,374	-1,716	3,242	-0,846	-	-	-	-
FRA-ITA	0	1M	-0,303	-4,996	0,441	0,742	1,014	0,944	-0,680	-	-	-	-
FRA-ITA	0	n1M	-0,355	-8,232	0,332	0,459	0,692	0,892	-1,059	-	-	-	-

Diese Tabelle berichtet die Ergebnisse für einmonatige (1M) sowie nahe einmonatige (n1M) Varianzswaps angewandt auf den Cross-Country-Vergleich aus Abschnitt 5.2.2. Die angegebenen Statistiken sind der Reihe nach der Mittelwert, die Standardabweichung, das Maximum, die Schiefe, die Kurtosis, das Alpha (für die deutschen Staatsanleihen) und die Sharpe Ratio. Alpha 1 wurde berechnet mittels dem Bloomberg Barclays Germany Treasury Bond Index und Alpha 2 mittels dem REXP. Log(1/0) gibt an, ob die berechneten Werte die logarithmierten (1) oder die prozentualen (0) Renditen darstellen. Die Daten wurden monatlich erhoben und die t-Statistiken wurden nach Newey und West (1987) korrigiert.

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Environmental Context and Team Structure

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Abstract

Drawing on contingency and information processing theory, this study examines how environmental complexity and unpredictability influence team structure, namely the vertical hierarchy and the horizontal specification. These relationships are tested empirically using worldwide data from the video game industry covering the period 1995 to 2007. Results show that both, the levels of hierarchy and specialization, increase when teams face a complex environment. Meanwhile, the extent of vertical hierarchy as well as the degree of specialization decrease when teams are exposed to an unpredictable environment. Thereby a trade-off between emphasizing efficiency or choosing a more flexible structure exists.

Keywords: Team structure; external environment; contingency theory; hierarchy; specialization.

1. Introduction

Just as buildings have a structure with stairways, numbers of floors and walls that divide rooms, an organization has a structure, which can analogously take different forms in terms of the hierarchical arrangements and the division of roles. In both cases the underlying structure will have an influence on individuals' activities. As Dalton, Todor, Spendolini, Fielding, and Porter (1980) noted the structure is the anatomy of an organization and forms the foundation of working processes, information flow and coordination between employees. Besides creating an infrastructure within the organization, the structure has an influence on individual's behaviour when regarded from a psychological perspective. As the origin of future actions, the structure of an organization is a widely studied topic. Thereby the main premise is that there is no one optimal structure which fits all organizations. In fact, structure will be contingent on several factors originating within and outside an organization.

Since early contingency theorists undertook their studies, the nature how work is conducted has changed significantly by shifting the focus to teamwork. Teams can be seen as temporal organizations within organizations established to accomplish a specific goal. Teamwork has been widely adapted and become the norm in the face of fast-pacing technology. Not only the work form changed, there has also been an alteration in the markets teams are operating in as a lot of new markets are emerging, the competitive landscape is unsettled in several markets and a lot of dynamics can be observed. These changes in work organization and environmental properties demand a reexamination of the underlying relationship.

Thus, this paper will address the question how the structure of a team is influenced by factors of the environment a team is operating in. Therefor a team's structure is examined from two perspectives. On the one hand the vertical dimension, which deals with the hierarchy within a team, on the other hand the horizontal dimension, addressing the specialization of team members' roles is studied. These elements are examined separately, linking each to both, the complexity and the unpredictability of the external environment. The hypotheses derived from this nexus are tested empirically on the basis of a dataset drawn from the video game industry, which is largely based on team work. Results show that in the context of environmental complexity teams set up more hierarchical layers and increase job specialization. In contrast, the extent of vertical hierarchy and the degree of specification decrease when facing an unpredictable environment.

This bachelor thesis has the following outline. It begins by giving an overview over prior research on structural contingency theory. Then the hypotheses regarding the influence elements of the external environment have on the vertical and horizontal dimension of team structure will be developed. This is followed by a description of the data used for the analysis, the operationalization of variables, and the

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methodology of this analysis. Subsequently results are presented, which is followed by their interpretation. Finally, the paper concludes with a discussion of these findings.

2. Literature Review

The notion that structure is contingent on the characteristics of an organization's environment has been introduced by several scholars in the 1960s (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Thompson, 1967). Thereby Burns and Stalker (1961) established the distinction between a mechanistic, namely a formalized, centralized, specialized organization, having many authority levels on the one hand and an organic organization, which is rather decentralised, informal, less specialized and only has few authority levels on the other hand. Subsequently they link these two types of organizational structures to the nature of innovation and the rate of change in a firm's environment. Burns and Stalker (1961) suggest that a stable environment leads to a mechanistic organisation, while an organic organization is the response to a dynamic environment. Though differing in their definitions of structure and a firm's environment early contingency theorists support this view.

When studying the environmental characteristics of an organization several discordant definitions have been introduced. Lawrence and Lorsch (1967) propose that an environment can have differing degrees of diversity and unpredictability, whereas Duncan (1972) attributes complexity and dynamism to an environment. There have been several attempts to merge the varying definitions of environmental properties into a typology (Jurkovich, 1974; Tung, 1979).

On the other hand, structure has been similarly examined from different perspectives, whereby the dimensions of structure have been studied individually in many cases rather than generalizing to mechanistic and organic organizations. Galbraith (1974) and Tushman and Nadler (1978) state that structural alterations are induced by a change in the amount of information an organization needs to process, which in turn depends on the uncertainty an organization faces. The information processing view has become an important basis when examining the hierarchy of an organization, a widely studied field among organization theorists (Reitzig & Maciejovsky, 2015). Keum and See (2017) linked the extent of hierarchy to the innovation process and argue that the degree of hierarchy is contingent on the situation. While a higher degree is beneficial as it improves information processing capacity and coordination, they found it hinders the generation of new ideas. Similarly, Zhou (2013) points to the ability of steeper hierarchies to coordinate complex and interdependent tasks. The degree to which departments or individuals are specialized implies a trade-off between specialization and thereby becoming an expert on the one hand and the need to coordinate among employees on the other hand (Becker & Murphy, 1992). Applying specialization to the individual level, several scholars have pointed to the effect specialized or general roles, by determining the degree of autonomy, have on creativity (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Oldham & Cummings, 1996).

When studying the structure of a team Bunderson and Boumgarden (2010) as well as Stewart and Barrick (2000) proposed examining the arrangement of vertical hierarchy and the specification of employees' jobs as shall be done in the present study. In the literature addressing team structure some attempts have been made to apply the ideas of contingency theory to the team level, however only few studies exist while each examines different aspects. Shenhar (2001) stresses the assumption that all projects should be managed in the same manner by investigating the impact of differing levels of technological uncertainty on management style and project organization. Hollenbeck et al. (2002) and Moon et al. (2004) have applied structural contingency theory to teams in terms of role specification and argued that a functional departmentation translates into specialized roles and divisional departmentation translates into more general, independent roles at the team level. While Hollenbeck et al. (2002) additionally study the fit between team structure and persons, Moon et al. (2004) investigate how shifting structure from divisional to functional and vice versa impacts performance. Both their empirical studies suggest that in a stable and predictable environment teams with specialized roles outperform teams with a low degree of role specification whereas in unstable and unpredictable environments teams with broadly defined roles perform better.

This paper aims to contribute to existing literature by applying the main ideas drawn from organizational contingency theory to the team level. Thereby a model is offered, which defines a team's structure by consisting of a vertical and a horizontal dimension. Furthermore, it tests the link from a team's environment to its structure based on a large dataset drawn from one the fastest growing industries, which is not limited to one country but provides worldwide data on teams.

3. Theory and Hypotheses Development

Drawing on structural contingency theory, the main assumption made is that there is no one structure that fits all situations, rather structure is conditional on both, internal and external factors. Since it shall be examined which structural configuration is most suitable dependent on external factors a distinction must be made between the differing environments a team can face. Firstly, one can distinguish between a complex and an uncomplex environment. While in an uncomplex environment fewer critical information categories exist, a complex environment is characterized by imposing a high amount of information on a team, while the likelihood of exceptions increases. A higher number of environmental considerable components exists and changes are more likely to occur in complex environments, resulting in higher pressure on the team. Examples for environmental complexity are intense competition, technological changes or shifting customer demands. An important implication for teams is that a higher amount of critical information needs to be processed.

Besides environmental complexity, a further type of environment can be defined as being unpredictable, which implies the inexistence of knowledge in- and outside a team about task accomplishment as well as uncertainty about the existence of customer demand and the features of customer requirements. The most common example of an unpredictable environment exists in the course of establishing a new market by the introduction of a new type of product. Thereby it is important to note that a complex environment need not necessarily be an unpredictable environment as long as the complexity remains analysable (Liedtka, 1985).

Both types of environments will have an impact on a team's structure, which shall be addressed in the following. When speaking of team structure, one can divide it into the vertical distribution of roles and the horizontal division of tasks (Bunderson & Boumgarden, 2010; Stewart & Barrick, 2000). As different incentives underlie to apply each, they are examined separately.

3.1. Vertical Hierarchy

It is indispensable to direct one's attention to the composition of the hierarchy when studying team structure. The vertical hierarchy refers to the number of layers from the person in the highest position to the individuals in the lowest layer. When looking at an organizational or team hierarchy, one can see how many levels it takes to pass critical information to the person in the team having the most global perspective over all operating procedures. A hierarchy establishes an internal information infrastructure. While information flows up the hierarchy, control and decisions come down the hierarchical layers. This is due to the tendency of hierarchical teams to be centralized, while in a flat structure decision rights are shared among multiple individuals. At the same time tighter control can be exerted (Dalton et al., 1980). In teams with fewer hierarchical levels one supervisor is in charge of overseeing a higher number of individuals than in a team with more hierarchical layers, all other factors being equal. Cognitive limitations cause that he or she cannot control the individuals reporting to him or her as tightly as if an additional intermediate hierarchical level was employed. With an additional hierarchical level fewer persons are reporting to one supervisor, implicating a narrower span of control, which results in tighter control mechanisms. A hierarchy is often referred to being a means to coordinate individuals working in a complex system (Keum & See, 2017; Zhou, 2013).

The question of interest is whether the team structure will contain additional hierarchical layers or reduce the levels of hierarchy when facing a complex environment.

Since a complex environment imposes more infrequencies on a team and requests a higher amount of information to be processed, the team needs to implement a structure which allows to process the amount of information quickly and in the most efficient way. When a team member is confronted with a critical information, which he or she wishes to pass on, the transfer of information and decision making will occur in different ways in teams with differing extents of hierarchy. If there is a flat structure and no particular person is in charge of decision making, many interconnections in form of communication lines will arise. This may result in a very profound examination, however, at the same time it will require a lot of time as redundant communication is caused, effort needs to be coordinated and conflict is more likely to occur in the absence of a decision maker. This can be detrimental under the pressure which arises from the complex environment. In contrast, in a hierarchically structured team, every individual noticing infrequencies will aim to pass the information to a person having a more global perspective to take the decision. As environmental complexity will lead to many critical information needed to be passed on, the hierarchy will soon be overloaded (Galbraith, 1974). This problem can be solved by employing an additional, intermediate level of hierarchy. Not only will this expand information processing capacity as information can flow more efficiently, it also economizes on communication by coordinating it to a higher degree (Keum & See, 2017). When creating vertical communication channels, the likelihood of inefficient, redundant and dublicated communication decreases. The steeper the hierarchy, the more coordinated and predetermined working processes and information flow are (Halevy, Chou, Galinsky, & Murninghan, 2012; Zhou, 2013). This reduction in communication and coordination costs saves time and allows teams to exploit on routine behaviours, which matches the external pressure as it leads to a quicker responsiveness to environmental requirements.

Furthemore, the coordinated processing of critical information leads to higher efficiency in decision making and reduces decision mistakes. Reducing mistakes is particularily important when facing a complex environment since its properties, like intense competition, can easily lead to the penalization of mistakes in form of loosing one's position in the market landscape. A narrower span of control additionally contributes to the minimization of costly mistakes. This results from the fact, that there will be more interaction between a single team member and his or her supervisor as in the case of narrower spans of control fewer employees are supervised by one individual resulting in more time a supervisor can spare on each employee. Therefore a supervisor can oversee working processes more closely and address problems that might occur faster. In addition to that team members can receive more extensive and prompter feedback (Gittell, 2001). Overall a narrower span of control will speed up processes and allow focusing on the efficient execution of tasks.

Thus, the impact that environmental complexity has on the vertical hierarchy of a team is formalized in the following hypothesis.

> Hypothesis 1a: The higher the degree of environmental complexity, the more hierarchical layers will be employed in a team.

As previously stated a complex environment induces a team to work as efficient as possible by imposing more hierarchical layers. When an environment becomes unpredictable the efficiency strategy ought to be reconsidered. Since the contingencies of this environment induce that a team cannot refer to existing patterns or gain knowledge from the external environment, the team's main task becomes exploration and generating new ideas. Therefor employees will need to experiment with options far from existing knowledge and solve problems in non-routine ways (Jansen, Van Den Bosch, & Bolberda, 2006). That implies that possibilities to preplan become restricted, which may result in changing procedures during the course of the project. If so, the regulated infrastructure imposed by a steeper hierarchy may be too static and get in the way of changing procedures. Thus, more hierarchical layers will hinder flexibility. Thereby interdependencies between team members are likewise less predictable implicating a lack of ex ante understanding on how to set up the hierarchy at the outset. During the course of the project and the appearance of unplanned contingencies, interdependencies between individuals will emerge. Hence, communication lines will arise naturally based on the emerged interdependencies. In this case it is more beneficial if individuals build their own communication lines instead of having to follow a predetermined infrastructure. These emerged interdependencies may however be fluid, resulting in a frequent need to reassemble work and therefore high flexibility within the team. Thus, it appears that coordination practices ought to be adaptive and will partially be improvised (Ben-Menahem, Von Krogh, Erden, & Schneider, 2016; Okhuysen & Bechky, 2009). It is therefore not possible to economize on coordination costs by setting up a steep hierarchy, which establishes a highly regulated coordination system, rather coordination must be understood as a dynamic process. The emergence of informal communication patterns will be more time consuming and less efficient than a regulated communication infrastructure. However, the aim to reduce communication costs by implementing more hierarchical levels into a team structure is outweighed by the need for more diverse communication lines to generate ideas and the inability to identify definite interdependencies.

From a psychological perspective, the manager's aim is to create a working atmosphere in which each team member is encouraged to propose, critisize and refine innovative ideas. Thereby a high degree of vertical hierarchy is the least participative structure since decision rights are most likely centralized at the upper hierarchical layers and the decision maker is more distant from the average team member (Olson, Walker Jr, & Ruekert, 1995). Consequently individuals will tend to be more passive when bringing in new ideas is in question, though the genreation of new ideas is the most critical aspect in the face of an unpredictable environment (Keum & See, 2017). When the extent of vertical hierarchy is decreased and decision rights are shared among more employees, decision making is more participative and individuals feel more centrally involved. As communication is less regulated, more exchange between different team members will take place and individuals will be encouraged to communicate more openly.

In accordence with these assertions, the following hypothesis is presented.

> Hypothesis 1b: The more unpredictable a team's environment becomes, the smaller the extent of vertical hierarchy within a team.

3.2. Horizontal Specification

When moving from the vertical to the horizontal dimension of team structure, the specification of team members' roles is of interest, which refers to how differentiated the roles of individuals are. When roles are defined very narrowly and precise, they are considered to have a high degree of specialization, whereas a broad definition implies a low degree of specialization. Thereby the extent of specification implicates the degree of personal discretion, as a very narrowly defined role sets precise expectations and limits the field of responsibilities, while broadly defined roles leave it up to the individuals to find their roles and endow them with more holistic tasks.

As the specification increases, each specialized employee has a smaller overview over the output a group of individuals assigned to the same functional category produces. This results from the process of developing high levels of expertise on one task, but at the same time the understanding of related tasks executed by others decreases. Consequently, the interdependence between multiple employees, executing differing tasks, increases (Moon et al., 2004; Zhou, 2013). The interdependence requires coordination among individuals, which results in more communication (Arrow, 1974). As has been discussed previously, the aim is to reduce coordination costs when facing a complex environment since infrequencies occur often and fast reactions are required. The greater need for communication and coordination of individuals will overload communication lines and slow down processes. In order to achieve a reduction of communication and coordination costs the interdependencies between individuals ought to be reduced. Relative independence of team members is achieved by decreasing specification and formulating their roles more generally (Moon et al., 2004). This may come at the cost of efficiency in task execution itself, however this cost is outweighed by the reduction of high coordination and communication costs as the pressure on communication lines becomes too high in complex environments and the efficiency of the entire output production is in question. A more generally defined role implies a more global, output oriented understanding and coordination requirements are limited between subgroups in a team who execute distant tasks, not covered by the competences required by the range of responsibilities within one individual's role. Besides reducing coordination costs, the broader definition of tasks implicates higher flexibility of team members, which makes it possible for individuals to cover co-worker's tasks due to their wider sphere of competence. This flexibility is beneficial when having to adapt to changes in the environment.

Accordingly, I propose the following hypothesis.

> Hypothesis 2a: The more complex the environment a team faces, the less specialized the roles of individuals working on the team will be.

When considering environmental unpredictability, the question arises whether reduced specification is still beneficial. An unpredictable environment is characterized by imposing a lack of knowledge about how to accomplish a required task. This inexistence of expertise does not only refer to the team, but the entire environment, implying the team can neither resort to familiar procedures, nor leverage knowledge from the outside into the team. The contingencies of an unpredictable environment demand creativity and innovativeness from team members in order to accomplish the desired task. Since creativity does not originate in personality traits exclusively, but is affected by the work environment, it is very critical to design jobs in the way, that mostly enables team members to be creative. One essential aspect is giving autonomy to them, which will signal confidence in their competences, encourage them to think outside the box and pursue more risky ideas (Amabile et al., 1996; Oldham & Cummings, 1996). Additionally, several scholars pointed to autonomy's contribution to developing intrinsic motivation, which will in turn enhance creativity (Hackman & Oldham, 1976; Ryan & Deci, 2000). As less specified roles implicate wider personal discretion and more independence, it is a form of giving autonomy to employees (Moon et al., 2004). The freedom experienced by not being assigned to a specialized job will increase an individual's perception of empowerment and output overview. Moreover, broader job definitions will lead to more creative ideas as they allow individuals to take multiple dimensions of their work into account when looking for new ideas, while narrowly specified roles induce limited perspectives and direct the focus on a smaller range of possibilities.

A further important fact to be considered is that the exact role an individual should take on during a project cannot be foreseen in an unpredictable environment. Since it is impossible to anticipate all contingencies in an unknown task, a team will dismiss and adapt procedures several times during the execution of the project. It is for that reason the requirements for team members cannot be formalized. The jobs will emerge during task execution, whereby the adaptive and proactive behaviour of employees will be of major importance (Griffin, Neal, & Parker, 2007). One can see how the unpredictability of the environment in this manner forces a team into less specialization and leaves it to its members to sort into required tasks.

Hence, the influence an unpredictable environment has on the specification of jobs within a team is formalized in the following hypothesis.

> Hypothesis 2b: The more unpredictable the environment a team faces, the less specified the roles of team members will be.

4. Methods

4.1. Industry and Sample

The dataset used was obtained from the video game industry. The industry has grown rapidly in the past years and is expected to continue growing, with innovation being the main source of profit. In 2019 the revenues of the global games market were forecasted to reach $148,8 billion, with China, the USA and Japan being the three largest geographical markets by game revenue (Newzoo, 2019). For the present analysis the industry is particularly suitable as team-based work is the norm. Generally, the gaming industry is composed of publishers, developing studios and companies and the teams working on the game development. Thereby the publisher provides the finance for a game to be developed, whereas developers are mainly engaged in the technical development, such as programming, game design, art and testing. In several cases the publisher and developing studio are the same company. A characteristic of the industry essential mentioning is that individuals employed in the video game industry tend to change their employer frequently, resulting in a high overall industry turnover rate.

The data for this analysis were drawn from Moby, a website collecting a wide range of information on video games, and NPD, a market research firm. The merged dataset contains 325 700 observations, covers the period 1995 to 2007 and includes games developed in different countries worldwide. The data can be examined at multiple levels, whereby individuals are the smallest unit of analysis. These are nested within teams, developing companies and publishing companies. In the present analysis, the level of interest is the team level. Thereby a team consists of all individuals who have worked on a game for a specific platform. Some of the independent variables are however computed at the developer level.

Prior to merging both datasets, there were over one million observations available. Later nearly 790 000 observations had to be dropped from the sample since they could not be merged. Additional observations were removed if information containing the developer, introduction date of the game, a personal identification or a person's job title was not available, as these are indispensable information to run the analysis.

In order to define the external environment of the analysed teams, there are several possibilities to specify a market. One option is to look at the entire industry as one single market. Alternatively, markets can also be defined more narrowly. Each game can be assigned to at least one of eight broadly defined genres.[1] For the present analysis a team's closest operating market is used, namely the subgenre, a narrower definition, resulting in 121 different markets. Thereby each game belongs to exactly one subgenre.

4.2. Variables

4.2.1. Dependent Variables

The dependent variables are measures of team structure, one measuring the vertical structural element, namely the levels of hierarchy, while the other measures the specification of jobs as the horizontal structural element.

[1] The eight genres are: action, adventure, educational, racing, role-play-games, simulation, sports and strategy.

The number of hierarchical layers in the team is counted to measure the extent of vertical hierarchy. Thereby no difference is made regarding the precise titles the individuals positioned in higher hierarchical levels hold. This is due to the assumption that the differing names for higher-level positions will to a considerable extent result from firm-specific practices. However, it is of interest to know how many hierarchical levels are generally employed in a team, to determine a team's infrastructure provided for information flow and control. Thereby the variable is defined by taking the value of zero if no position in the hierarchy exists that is one level above the other team members. In this case it can be referred to as a flat hierarchy. The maximum of possible hierarchical layers in the underlying dataset are five levels.

To examine the specification within a team, the job titles members have and to what extent they differ within a job category are analysed. Thereby 15 broadly defined job groups, such as designer, artist or programmer, exist, in which jobs can be categorized.[2] In order to measure the job specification a ratio between the number of differing job titles in a job category and the total number of individuals belonging to this job category in the team was calculated. Having determined the ratio for each functional category existing in a team, the mean of these ratios was obtained for every team. The overall team ratio takes a value of one in the case of fully specialized job roles, while a decreasing value indicates more broadly defined job roles.

4.2.2. Independent Variables

In order to test the proposed hypotheses a set of independent variables is computed, which can all be assigned to a team's environment as these factors do not have their origin within the borders of a team. Each of these variables measures a form of environmental complexity or unpredictability the team faces.

A first measure of a complex environment is the number of competitors, as more competition puts a team under pressure. This results from higher competitor response and customers being offered a wider range of options, which increases the likelihood they might buy products from another provider. For this purpose, the number of competitors, namely other developers, that are active at the time a developer releases a game is counted. Therefor all developers are considered who released a game in the same market during the period ranging from twelve months before the introduction of the game and the actual introduction month. The length of the period being twelve months was chosen for the reason that developers themselves would wait twelve months after a game release to introduce a new game in order to not cannibalize themselves.

Besides the number of competitors, market concentration is introduced as an additional measure of environmental complexity. The concentration of a market gives insights about the competitive landscape by measuring the extent to which market shares are concentrated between a small number of market participants. A less concentrated market indicates complexity as competition takes place between a range of coequal market players and is therefore expected to be more intense with developers having to consider a higher number of equally strong competitors. For the present analysis market concentration was computed by the Herfindahl Index, squaring the market share of each developer competing in a given subgenre and thereupon summing the resulting numbers. Therefor market shares were calculated by dividing a developer's revenue generated in the period ranging from twelve months before the introduction of the game and the actual introduction month in a subgenre by the sum of revenues all developers made during the same period in a given subgenre.

Additionally, an interaction term between the Herfindahl Index and a dummy variable, indicating whether a developer is the market leader has been computed. For the creation of the dummy variable the market shares used for computing the market concentration were sorted and the developer with the largest market share within a subgenre in the given time period was assigned a value of one, otherwise the variable takes a value of zero. The interaction effect between both is included to control for possibly differing effects of market concentration on team structure between developers being the incumbent and those who are smaller players in the market. The distinction between both groups is of special interest when market concentration increases since the perceived environment in which a team operates differs.

A further variable employed provides information about a developer's market entry. Entering a new market results in facing a complex environment since a team has to confront a new set of competitors, a new customer group, possibly new technologies while dealing with an overall new task. A dummy variable is introduced to determine the project which marks a developer's temporally first game in a market. Thus, the dummy variable is one in case of a developer's market entry.

All so far introduced variables were measures of environmental complexity. A further variable shall be included in the analysis which measures the unpredictability of an environment. The creation of a completely new market will serve as a measure of environmental unpredictability as the existence of a demand is uncertain and the requirements customers will have, are unknown. Since the market is newly created no expertise knowledge exists on the market. In order to identify a new market creation by the introduction of a game, a dummy variable was created, taking the value one for each first game released in a subgenre.

4.2.3. Control Variables

Besides factors external of the team, the structure of a team will most probably also be influenced by some factors originating within the borders of a team. For this purpose, a set of internal factors are included in the model as control

[2] The full range of job categories are: designer, artist, programmer, tester, scientific advisor, producer, cin-ematics, voice actor, audio, manual packaging, localization, customer service, business legal, human resources, marketing and pr. Not every team employs individuals in all these categories.

variables. Firstly, the size of a team is included, measured by the number of individuals who worked on a game for a certain platform. The importance to control for team size when analysing the vertical hierarchy results from increased coordination requirements in larger teams. When running regressions on job specification, it is important to note, that at some point teams can get larger, but members cannot become more specialized. As the marginal effect of team size depends on the actual size of the team, the logarithm of the variable is included in the model. Additionally, the model controls for the experience a developer has accumulated in a given market. The number of games a developer has already introduced prior to the examined game was used to measure a developer's experience in a subgenre. A further variable provides information about the average experience an entire team has, taking into account all individuals working on the team. Akin to the experience of a developer, the number of games each individual has already worked on is counted and then the team average consisting of all individual members' experiences is build. When looking at the distribution of team size, developer experience and team experience one can notice that for each of these variables the mass of observations is concentrated on the left of the distribution, implicating a right-skewed distribution.

Besides including internal factors, another control variable, namely a dummy variable was employed, which turns one whenever it is possible to play a specific game with more than one player. The reason for controlling for single player and multiplayer games is that it impacts the frequency a customer will buy a new game. It is common that multiplayer games are played for a longer period of time than single player games. Moreover, structures, namely the number of hierarchical layers and the degree of role specification, that had been employed by developers in the project prior to the present one, are included as control variables. For each case the dependent variable is therefore lagged by one developer's project. The reason for doing so is that organizations and teams tend to maintain a structure they have already worked with even when its value is no longer evident because internal or external factors have changed. This organizational inertia can be explained by entrainment theory, stating that a once in a social system established set of norms and habitual activities will remain (Moon et al., 2004; Pérez-Nordtvedt, Payne, Short, & Kedia, 2008). It is important to note that the lag variable is limited in the case of the very first game of a developer as no prior game exists. In these cases, the variable takes the value of the structure implemented in the first game following the stated assumption that managers will stick to known structures. In response to this limitation a further control variable is included, namely a dummy variable, taking the value one for every developer's first game in the dataset.

4.3. Analyses and Results

Ordinary least square (OLS) regressions were run in order to test the hypotheses. Firstly, the variable counting the levels of hierarchy was employed as the dependent variable and the effect the environmental factors have on it estimated. The second set of regressions estimates the effect the same set of independent variables has on job specification. The independent variables and the main control variables, accounting for internal factors, and the correlations among them are presented in table 1.

4.3.1. OLS Regression Results

Table 2 shows regression results for vertical hierarchy, allowing to test Hypotheses 1a and 1b. Model 1 merely includes the independent variables, excluding all control variables. One can notice that all external factors have negative coefficients if internal factors and other controls are not being accounted for. Although all coefficients are statistically significant, the model does only explain a small amount of variance ($R2 = 2\%$). Model 2 includes control variables, which results in a considerable increase of accounted variance compared to model 1, indicating the necessity for including these statistically significant control variables in order to test the hypotheses. In model 3 the interaction effect between the market concentration and the dummy variable indicating whether a developer is the market leader is additionally included.

Hypothesis 1a states that a more complex environment will lead to an increase in levels of hierarchy in a team. In order to test this hypothesis, one should examine the coefficients and their statistical significance of the variables measuring the developer density, the subgenre's concentration and a developer's subgenre entry. The density of developers is found to significantly ($p < 0{,}01$ in model 2 and $p < 0{,}05$ in model 3) influence the number of hierarchical layers. The positive coefficient states that the more competitors a developer faces, the steeper a team's hierarchy c.p., which supports hypothesis 1a. However, the impact the number of competitors has, is very small. As expected, a subgenre's concentration has a negative effect on the number of hierarchical layers. The implication of the effect is that the more concentrated the market shares are among a small number of developers, the less hierarchical levels will be employed within a team c.p.. In other words, a smaller Herfindahl Index, which implies more complexity, leads to an increase in the extent of hierarchy. Thereby the coefficient is also statistically significant at the 1% level ($p < 0{,}01$) in model 2 and model 3, supporting Hypothesis 1a. Model 3 shows that the interaction effect between the market concentration and the market leader variable is positive and statistically significant ($p < 0{,}01$). This indicates that the negative effect a higher market concentration has on the number of hierarchical layers is in amount smaller for developers having the largest market share. When directing one's attention to the coefficient estimating the effect a subgenre entry has on the vertical hierarchy of a team, a positive impact can be observed. The coefficient is statistically significant at the 1% level ($p < 0{,}01$) as can be derived from both, model 2 and model 3. This implies that entering a new market will c.p. positively affect the number of hierarchical layers. Hypothesis 1a is supported by this result as well. Having examined all three coefficients, one can say that it is not possible to reject Hypothesis 1a, in-

Table 1: Summary Statistics and Correlations

Independent variables	mean	sd	min	max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) new_subgenre	0.0194368	0.1380547	0	1	1.00							
(2) subgenre_entry	0.5480225	0.4976893	0	1	0.1279	1.00						
(3) developer_density_sub	7.300953	5.719901	1	35	-0.1536	-0.0405	1.00					
(4) herfindahl_index_sub	0.4614767	0.2693486	0.0645702	1	0.2702	0.0501	-0.7309	1.00				
(5) herf_leader_sub	0.2412854	0.35914	0	1	0.2834	-0.0280	-0.5227	0.7841	1.00			
(6) team_size	190.1751	149.8379	1	1224	-0.0720	-0.2097	0.0616	-0.0703	0.0451	1.00		
(7) developer_experience_sub	1.639383	2.514734	0	14	-0.0880	-0.6510	0.0430	-0.0377	0.0831	0.2839	1.00	
(8) team_experience_sub	0.6221962	0.7814658	0	5.84	-0.1003	-0.3607	0.1116	-0.1517	-0.0518	0.1886	0.5242	1.00
Dependent variables												
hierarchy_levels	3.512001	1.265637	0	5								
specialization	.559869	.1321629	.0409035	1								

Table 2: Results of OLS Regression - Effects on Vertical Hierarchy[3]

	hierarchy_levels		
VARIABLES	(1)	(2)	(3)
new_subgenre	-0.581***	-0.269***	-0.297***
	(0.0166)	(0.0134)	(0.0135)
subgenre_entry	-0.0944***	0.122***	0.121***
	(0.00443)	(0.00484)	(0.00484)
developer_density_sub	-0.00111**	0.00171***	0.000975**
	(0.000562)	(0.000450)	(0.000453)
herfindahl_index_sub	-0.481***	-0.202***	-0.336***
	(0.0122)	(0.00989)	(0.0135)
herf_leader_sub			0.119***
			(0.00820)
ln_team_size		0.692***	0.687***
		(0.00246)	(0.00248)
developer_experience_sub		-0.0356***	-0.0372***
		(0.00102)	(0.00102)
team_experience_sub		0.0566***	0.0565***
		(0.00275)	(0.00275)
Controls	N	Y	Y
Constant	3.806***	-0.765***	-0.700***
	(0.00960)	(0.0146)	(0.0153)
R-squared	0.020	0.374	0.375

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
The full table can be found in appendix 1[4].

dicating that the complexity of the environment a team faces will impact the extent of vertical hierarchy in a team positively.

Hypothesis 1b states that environmental unpredictability will have a negative impact on vertical hierarchy. The coefficient of new market creation is ought to be examined in order to test this hypothesis. Creating a new market will c.p. lead to a decreased number of hierarchical layers. This results from a negative and statistically significant ($p < 0,01$) coefficient of the new subgenre variable in both, model 2 and model 3. Hence, Hypothesis 1b is supported as well.

When directing one's attention to table 3 the regression results for job specification are shown. Alike the regressions run on vertical hierarchy, model 1 of table 3 contains regression results if merely independent variables without control variables are included. As can be seen in the increase of R2 when comparing model 2 to model 1, including control variables improves the explanatory power of the model. Model 3 additionally contains the interaction term between the Herfindahl Index and the dummy variable for market leader.

Hypothesis 2a claims that in a more complex environment, the specification of roles in teams decreases. Anew, when examining environmental complexity, the coefficients of developer density, market concentration and market entry ought to be analysed. Firstly, the effect of the number of competitors on the degree of specification is positive and the coefficient statistically significant at the 1% level ($p < 0,01$)

Table 3: Results of OLS Regression - Effects on Job Specification[5]

	specialization		
VARIABLES	(1)	(2)	(3)
new_subgenre	0.0192***	-0.00828***	-0.0118***
	(0.00174)	(0.00154)	(0.00155)
subgenre_entry	0.0461***	0.0159***	0.0157***
	(0.000464)	(0.000557)	(0.000557)
developer_density_sub	0.000669***	0.000358***	0.000266***
	(5.88e-05)	(5.18e-05)	(5.21e-05)
herfindahl_index_sub	0.00565***	-5.00e-05	-0.0169***
	(0.00128)	(0.00114)	(0.00156)
herf_leader_sub			0.0150***
			(0.000944)
ln_team_size		-0.0670***	-0.0676***
		(0.000272)	(0.000274)
developer_experience_sub		-0.00237***	-0.00257***
		(0.000117)	(0.000118)
team_experience_sub		0.00815***	0.00812***
		(0.000310)	(0.000309)
Controls	N	Y	Y
Constant	0.526***	0.786***	0.794***
	(0.00100)	(0.00196)	(0.00202)
R-squared	0.031	0.252	0.253

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
The full table can be found in appendix 2.

in model 2 and model 3. This result does not support Hypothesis 2a as it implies that an increase in the number of competitors an organization faces c.p. leads to an increase in the specialization of jobs. Alike the case when running regressions on the vertical dimension of team structure, the influence the number of competitors has on the degree of horizontal specification is thereby very small in amount. Turning one's attention to the impact the market concentration has on job specification, a negative effect can be observed. Thereby the coefficient is not statistically significant in model 2 and becomes statistically significant at the 1% level ($p < 0{,}01$) in model 3. That implies that the more equally market shares are distributed among all developers competing in a subgenre, the more specialized roles will be within a team, which does not support Hypothesis 2a. Model 3 shows that the interaction term between market concentration and the dummy variable for market leader is positive and statistically significant at the 1% level ($p < 0{,}01$). When including the interaction term, one can note that the effect the market concentration has on job specification becomes very small for market leaders, while the effect is still negative. At the same time an increase in market concentration has a negative and according to amount larger impact on job specification in teams whose developer is not a market leader than for those who are. Contrary to the assumption made, the coefficient of subgenre entry is positive and statistically significant at the 1% level ($p < 0{,}01$) as can be derived from model 2 and model 3 of table 3. This means that entering a new market will c.p. lead to an increase in the degree of job specification, which does not support Hypothesis 2a either. Altogether Hypothesis 2a can be rejected, in fact all three effects point in a direction, which implies that the horizontal specification increases when a team faces a complex environment.

Hypothesis 2b states that the more unpredictable an environment is, the less specified team members' roles will be. As shown in both, model 2 and model 3 of table 3, the new subgenre has a negative coefficient, which is statistically significant at the 1% level ($p < 0{,}01$). This entails that a team creating a new subgenre by the introduction of a game will have less specified roles. Hypothesis 2b is supported by this result, as it cannot be rejected at the 1% level.

4.3.2. Robustness Checks

Several robustness checks have been conducted to test the validity of the results of the OLS regressions. In order to undertake a robustness check with hierarchical levels being the dependent variable, an ordered logit model was estimated. This model is suitable since the number of hierarchical layers is an ordered variable, with a team being able to have none up to five hierarchy levels. The estimated coefficients of the ordered logit confirm the results of the OLS estimators as shown in appendix 3.

In order to test the validity of results when regressing on job specification a further robustness check was conducted by operationalising the dependent variable in a different way. Instead of estimating the specialization within a job category, the specification is computed by the ratio between differing job titles within a hierarchical layer across all job categories and the number of individuals employed in that level of hierarchy. Subsequently the average specification between all layers is built. As can be derived from appendix 4 the coefficients of the independent variables point in the same direction apart from the coefficient estimating the number of developers in a subgenre. However, the coefficient was in amount already very small in the initial regression. Therefore, results are mainly confirmed.

As priorly mentioned a team's environment can be defined more broadly than by the subgenre. Regression results for the industry and genre level can be found in appendix 5-7. The coefficient for the creation of the industry is insignificant as only one project in the dataset takes the value one in this case.

4.4. Interpretation

Although all coefficients indicate a rather small effect in amount, they are in most cases highly significant and clearly show whether managers tend to increase or decrease the extent of hierarchy and job specification. In this context the effects shall be interpreted in the following.

4.4.1. Vertical Hierarchy

Both, a higher number of competitors and a lower concentration in the market, impose pressure from outside on the team as they account for how strong competition is. Though the coefficient of developer density is very small, it shows the tendency that facing more direct competitors results in extending the vertical hierarchy. The positive coefficient of developer density and the negative coefficient of the Herfindahl Index indicate that the reaction to the pressure of competition is to reduce the span of control by employing more hierarchical layers within the team. As customers have a wider range of choices with more or equally successful providers operating in the market, the hurdle to buy a product from another provider is lower. In response to that developers will aim to increase quality and meet customer demands in order to remain competitive. A tighter control aims to reduce costly mistakes, which will be easily penalized in the face of a high number of competitors or a low market concentration as other developers are waiting in the wings to steal market share. A steeper hierarchy will additionally increase the speed of operations and decision making, which will be sought by managers in order to keep up with competitors or even be faster with introductions than they are (Jansen et al., 2006). The implementation of a highly coordinated system with a communication infrastructure will enable to establish routine procedures in the course of time. These will allow to exploit existing knowledge and thereby increase speed and work on quality instead of experimenting with new procedures. The additional inclusion of the interaction term shows that a difference exists in the size of the effect when comparing firms having the largest market share in a subgenre and other market participants. The perception of the environment faced differs as market concentration increases. In highly concentrated markets organizations, which are not the market leader, will most likely have a very small market share. The results show that an increased market concentration will lead to a flatter structure as environmental complexity has decreased, which indicates that the competitive landscape is settled and one or few market participants concentrate a large part of market shares. However, when developers are not the leader in a subgenre, teams are even flatter compared to market leaders. This can be explained by the aim of non-market leaders to challenge the incumbent firm in the market by experimenting with new procedures and generating new ideas in order to gain market share. While market leaders comparatively put more emphasis on efficiency, smaller competitors aim to implement a more adaptive structure helping them to deal with new tasks and possibly achieve the implementation of a new technology faster.

A similar effect can be observed when directing one's attention to the market entry of a developer. The positive impact entering a market has on a team's hierarchy points to the reaction of meeting the higher amount of information to be processed employed by the newness of environmental components by regulated information channels.

Both, entering a market and creating a new market, direct a team into a new environment. However, in case of market entry the environment is merely perceived complex by the team entering, whereas, depending on who the new entrant is, for other participants in the market the only environmental change is facing a new competitor. Contrary to a new market creation, when entering a market, a team has the possibility to observe the market and its participants prior to entering and thereby gain some market insights. Moreover, the deviant result when compared to market entry as the first mover can be explained by a team's possibility to employ individuals from other developers who have already worked in the given market and in this manner leverage knowledge from the external environment into the team. The industry's high turnover rate supports this procedure and indicates that individuals employed in the video game industry are willing to change their job, which is in favour of developers looking for persons with expertise in a market. When the team is composed of some individuals having experience and others working in a market for the first time, the team will be structured in a way that puts expertise knowledge to most efficient use. Employing hierarchy can achieve this in two different ways. On the one hand experienced individuals may be deployed into positions, in which they have a narrow span of control over unexperienced team members, so they can oversee working processes tightly and be able to give feedback. On the other hand, hierarchy improves the use of expertise knowledge by enabling unexperienced employees, who will be confronted with unfamiliar situations, which may not be new to members having priorly worked in the market, coordinated communication with experienced members. This is reached by setting up vertical communication channels, so information can be passed to experienced individuals. The steeper the hierarchy, the tighter the exerted control and the more coordinated the communication, which explains the positive effect of market entry.

Unlike the entrance of an existing market, creating a new market by being the first mover introduces a major change in the external environment. The response to this situation is the implementation of a flatter hierarchy. In contrast to entering an already existing market it is impossible to hire experienced individuals into the team and positions that enable them to overview working processes. The inability to exploit existing knowledge demands exploration from team members. As different individuals will explore on different fields, information sharing will be essential. Instead of passing information up the hierarchy, which would save time, information exchange will occur on the basis of bilateral communication lines. The emergence of informal networks will be most adaptive as new ideas and changing procedures occur when developing a new product that does not exist in this form yet. The team engages in a risky project when developing a game which creates a new market since it cannot be known whether customers will show interest for the new product. That is why managers will opt to be more flexible allowing for unplanned changes and alternating expectations when predicting customer requirements. Thereby the role of efficiency becomes less important compared to flexibility as the efficiency of working processes comes to the fore when knowledge about an existing customer base exists. This flexibility is achieved to a greater extent when reducing hierarchical layers as that at the same time implies a reduction in predetermined coordination. It is important to note that broader definitions of markets than the one chosen for the present analysis are possible and in the case of defining markets more broadly the effect of creating a new market will probably increase (appendix 7). That results from the fact that more narrowly defined markets might allow for insights from existing markets sharing some similarities with the new market, such as guessing who potential customers may be based on their preferences in existing markets. In broader defined markets however, the unpredictability of the environment increases additionally as the difference to existing markets is larger.

4.4.2. Horizontal Specification

As the pressure from the external environment increases by a more intense competition, one can see that a higher number of competitors as well as a lower market concentration, although insignificant in model 2 of table 3, have a positive effect on the specification of job roles within teams, contrary to the prediction of Hypothesis 2a. This result can possibly be explained as follows. As mentioned above the pressure from competition results in the aim to reduce decision time and increase quality. The increase of job specification may hence be the intent for team members to develop distinctive skills on the narrow task they were assigned to and become an expert on that narrow field. Comparing the expertise an employee can develop on the same narrowly defined task (1) when being assigned to the one task only and (2) when this task is merely one part of the individual's broader defined role, a difference is expectable. In the first case the individual can focus on a narrow task, maximizing the efficiency of executing it, while in the latter case the individual will maximize globally over the whole range of separate tasks belonging to the overall assigned role. That is why in the latter case the individual's knowledge on a broader field increases, whereas the efficiency and possibly quality on the narrow subtask decreases in comparison to the first case. With assigning every team member to a narrowly defined task and thereby initiating an increase in expertise and subsequently efficiency on the execution of this task, the overall quality of the product may increase.

As priorly discussed a higher degree of specification increases coordination requirements since more interdependencies between employees exist. The increased demand for coordination will be more time consuming. This coordination cost may be however accepted by managers in return for increased efficiency on task execution and possibly saving time by precisely allocating roles to team members and thereby eliminating any possible ambiguity resulting from broadly defined jobs. Moreover, the emergence of coordination costs may be decreased in a different way, namely by increasing the number of hierarchy levels. Since bilateral coordination costs have increased due to a lack of understanding the counterpart's work, moving coordination to individuals employed in a higher hierarchical level with a more global perspective can economize on coordination costs. In that way a steeper hierarchy can help managing the trade-off between increasing efficiency by specialisation and the need of coordination (Zhou, 2013). In response to that the degree of specialization has been included as a further control variable when regressing on hierarchical layers in appendix 8, supporting this suggestion. The inclusion of the interaction term between being the market leader and overall market concentration shows that specification decreases in the face of an uncomplex environment, especially for teams whose organizations can only attribute a small market share to themselves. As previously stated, this effect can be explained by the aim of non-market leaders to challenge the big players by coming up with new and innovative ideas to attract customers and survive in the market. Therefor managers aim to enable creativity by giving a higher degree of autonomy to team members.

Similarly, entering a new market induces more specification of job roles within a team. The task novelty and new environment a team is facing may be seen as a disadvantage compared to other competitors who are already experienced in the market. At the same time the team aims to be successful and gain a foothold in the market. The increase in specification can therefore be explained by the aspiration of managers to be as efficient as possible and seek to exploit knowledge from markets they have priorly operated in. Thus, managers will aim to assign employees to tasks they have already worked on before, so they can apply parts of existing knowledge gained while working in another market. If the degree of job specification had been decreased, team members would have been assigned to more challenging tasks, which might have been beneficial for their motivation, however it would have decreased efficiency. Increasing specification by contrast, decreases the difficulty of the task itself, which may be beneficial in the face of the already imposed difficulty of operating in an unknown market. Thereby the emphasis is placed on adapting to the entered market while organizing work in the most efficient way. In addition, efficiency is increased as role ambiguity is decreased, which may be especially suboptimal in the face of task and market novelty, which already challenge routinized processes. More broadly defined roles may cause role ambiguity as clear boundaries of responsibility are lacking. In order to establish competitiveness in a new market, managers will aim to reduce work ambiguity and enable focus and learning.

Moreover, the clear division of task areas and narrow definition of roles implies that employees only have to give attention to a smaller part of the new environment. This will come at the cost of low coordination requirements as individuals not only have a narrow view concerning the produced output itself, but additionally on the new environment. As previously stated, managers may accept these coordination requirements induced by a higher degree of specialization as they can achieve coordination by adapting a steeper hierarchy. Thereby, individuals can be hired into the team who have already worked in the market and be assigned to coordinate tasks and provide team members with knowledge, which will help them to increase efficiency.

Seeking to develop experts on a given task and decrease ambiguities in order to gain a position in the competitive landscape such as the possibility to achieve coordination through vertical hierarchy may explain a manager's choice to increase job specification when facing a complex environment.

When examining the degree of specification in the context of an unpredictable environment, results show that there is a tendency to define tasks more generally. This confirms the notion that managers put emphasis on fostering creativity within a team when incapable of predicting the properties and development of the newly created market. New ideas and creative processes are important in order to attract potential customers and find technological solutions. That is why managers seek to create a working atmosphere which allows team members to be creative by assigning them to more holistic jobs through broadly defined roles. Instead of exploiting capabilities with a high degree of specialization, individuals are given a more challenging role providing them with more autonomy. As employees will be able to self-select into roles by proactive behaviour their motivation to work on the project, which marks the creation of a new market, may be fostered. Apart from creating a working environment that enables team members to be creative, coordination costs decrease as individuals have a better understanding of the overall output produced. In that way team members will more likely be able to contribute to potential solutions of their colleagues' problems and discussions among multiple employees and the whole team will be based on a higher level of mutual understanding.

A further result stands out particularly, which was not part of the initial focus of analysis, however, yields an unexpected result, namely the negative effect developer experience has on both, the number of hierarchical layers and the degree of job specification. The common assumption is that the more mature a company becomes in a market, the more structured teams will be (Sine, Mitsuhashi, & Kirsch, 2006). In contrast to that the present analysis emphasizes the contrary. More experienced developers in the market tend to build teams with flatter hierarchies and a lower degree of job specification.

5. Discussion

5.1. Theoretical Implications

The present study has illustrated that a distinction must be made between different types of environments. It is not sufficient to subdivide into a simple and complex environment, rather a further distinction based on the predictability of environmental factors is needed as one can see that complexity and unpredictability have opposing effects on team structure. While a complex environment is met with imposing a more regulating structure, namely a higher degree of both, vertical hierarchy and specialization, an unpredictable environment leads to a decrease of both, aiming to foster team members' creativity.

It follows therefrom that the vertical and horizontal dimension of team structure go hand in hand. The central trade-off made is between a more efficient and a more flexible structure. Efficiency is achieved by employing more levels of hierarchy as coordination and communication costs are reduced, decision making is less time consuming and teams can establish routine procedures in that manner. At the same time a higher degree of specification is efficient as individuals can concentrate on a very narrow field and develop distinguished capabilities in accomplishing the respective task. In case of an unpredictable environment teams adjust their structure in order to facilitate creativity, on the one hand by reducing hindering information infrastructures and enabling emerging and fluid interdependencies between employees, on the other hand by motivating through a more participative structure and by giving more autonomy through more broadly defined jobs. Although efficiency is lost in that case, the benefits of efficiency seem to be outweighed by a more enabling work environment and gained flexibility.

This study contributes to existing literature in multiple ways. Firstly, it suggests a typology of team and organizational environment and challenges the validity of studies merely dividing the environment into being simple or complex. Additionally, it tests for both dimensions of structure, namely the vertical and horizontal, separately, following differing mechanisms underlying each of them. The results of this study state that both are increased (decreased) depending on the environment a team faces, suggesting that there may be an interdependence between both and testing for an increase or decrease in the overall extent of structure is valid. As priorly mentioned one dependence will result from the increase in coordination costs when jobs are specialized to a higher degree, and in turn achieving coordination by employing more hierarchical layers. Moreover, the results shed light into the ambiguity of past results and challenge the widespread assumption that environmental complexity must necessarily lead to a flatter structure. Instead, a coordinated information flow and narrower spans of control yield higher efficiency sought by managers when facing a complex environment. Apart from that, the study tests the main assumption made by contingency theorists on the team level and shows that not only a firm's but also a team's structure is adapted depending on the environmental context. The applicability of contingency theory to the team level is derived from an empirical analysis on one of the world's fastest growing industries and is not restricted to a cultural context as the data covers teams operating all over the world.

5.2. Practical Implications

Constantly changing markets and the emergence of multiple new markets impose a challenge on managers assigned with the task of structuring teams as being responsive to one's environment is indispensable. Several managerial implications can be derived from the results of this study.

When the team operates in a very competitive and yet unsettled market with a high number of market participants and there is no one particular or few incumbent firms who dominate the market, rather market shares are divided equally, managers ought to employ steeper hierarchies. The resulting narrower spans of control enable a regular exchange between employees and their supervisors allowing for feedback and overseeing team members more tightly, which will accelerate working processes. Additionally, employees should be embedded in a regulated work environment, so they know whom to pass on new information and turn to when facing difficulties. In this manner the team can exploit strengths to stay competitive. This can additionally be achieved by assigning employees to specialized roles facilitating them to become an expert on the narrowly defined task and outperform counterparts in the market, working on the same field, but having a broader area of responsibilities. The same holds for entering a new market. As managers perceive the entered market to be attractive, which other firms will perceive equally and the market already has participants, establishing oneself in the market landscape sustainably will be the aim. Entering a market is usually preceded by market studies and observing competitors already operating in the market with the challenges they face. In that way teams explore the market before entering it. When the market is entered managers should put acquired knowledge to best use by coordinating and controlling working processes by setting up steeper hierarchies. This will lead to developing routines while knowing whom to address when facing challenges. Furthermore, managers should seek that their employees gain a high level of expertise on a task and therefor increase job specialization. In turn the developed skills can be used efficiently and teams can produce quality products quickly, which will help establishing oneself in the competitive landscape.

When building up teams for entering a market as the first mover, which implies no predictions can be made, neither if there will be a demand, nor how many further competitors will enter in the future, the emphasis should be put on the development of creative ideas. In order to attract customers, managers should strive for their employees to be enabled to be as creative as possible. Therefor the structure ought to be flatter, so it is more adaptive to new procedures and employees are allowed to build their own networks in the course of the creative process. Furthermore, managers can motivate their team members by assigning them to challenging tasks, namely giving them more autonomy, which can be achieved by not specifying jobs too much.

5.3. Limitations and Future Research

Some potential limitations of the present study should be taken into account. One concern might arise from the high turnover rate in the video game industry, possibly limiting the applicability to industries with a lower overall employee mobility. In response to the industry's high turnover rate, the structure of a team operating in the video game industry might be adapted to meet frequent employee changes by making it decomposable in order to simplify the replacement of an individual. A further point to be considered is that the observations for the job titles of individuals are drawn from the game credits, which were probably created by the end of the project. Therefore, it cannot be excluded that the job title in the end does not fully correspond the job title given to an individual at the beginning of a project.

Turning one's attention to the regression itself, it would be of interest to conduct a further robustness check by running the regressions with a hierarchical linear model since the present data is analysable at multiple levels. As the dependent variable is on a lower level, namely the team level, than the independent variable counting the number of developers in a market, which is at the developer level, sampling variance might be affected (Hox, 2013, p.148).

Regarding the regression results of a company's experience in a market discussed earlier, it may be of interest to examine the relationship between a company's maturity in a market and the structure it employs more profoundly in future research projects. A further suggestion for future research results from the present analysis' results suggesting that managers increase the degree of both structural dimensions when facing a complex environment, while decreasing the extent of both when operating in an unpredictable environment. Since the effects point in the same direction, future studies should test the effect on the interaction between vertical and horizontal structure on the team level.

6. Conclusion

To sum up, the present study has shown how the external environment, in terms of complexity and unpredictability, has an influence on a team's structure. Thereby managers face a trade-off between emphasizing efficiency by improving information processing capacity, routinizing processes and specializing jobs or choosing a more flexible structure with emerging interdependencies and a working atmosphere, which enables creativity. Results show that in the face of a complex environment teams tend to have more hierarchical layers and team members' jobs are specified to a higher degree, whereas an unpredictable environment induces managers to reduce the extent of vertical hierarchy and assign individuals to more broadly defined jobs.

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The Role of Large Institutional Ownership on Goodwill Impairment under the SFAS 142 Regime

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Abstract

This paper examines the effect of large institutional owners on accounting for goodwill and its resulting impairment charges. Economies of scale predict stronger incentives for large institutional owners to engage in monitoring. Employing a multivariate linear probability model on a sample of U.S. companies with goodwill on their balance sheets during the period from 2009 to 2019, I find that the likelihood of an impairment is more strongly related to an expected impairment when the share of equity held by the firm's largest institutional owners is higher. Results prove to be economically meaningful and are generally robust to different specifications. This evidence is consistent with the active monitor hypothesis by large shareholders to protect their significant investments.

Keywords: Goodwill accounting; goodwill impairment; institutional ownership; ownership concentration; monitoring; FASB; SFAS 142.

1. Introduction

This paper examines whether the presence of large institutional owners is associated with a firm's decision to impair goodwill.[1] In detail, this paper aims to shed light on the question whether an increase in the firm's largest institutional owners is associated with an increased likelihood of a firm to report an expected impairment of goodwill, as indicated by the firm's book-to-market ratio. Lapointe-Antunes, Cormier, and Magnan (2009) provide evidence that an impairment of goodwill is negatively associated with the firm's share price. Consistent with this, AbuGhazaleh, Al-Hares, and Haddad (2012) argue that goodwill impairments are significant accounting decisions that receive considerable attention by capital market participants. According to the annual goodwill impairment study by Duff and Phelps (2019), goodwill impairments by U.S. publicly listed companies reached a total of $78.9 billion in 2018. This is an increase of 125% over the amount recorded in 2017. Given its growing prevalence and that it negatively affects net income, goodwill impairment is subject to considerable debate by academics, standard setters, and practitioners. This has been noticed predominantly in recent years, as goodwill has become an increasingly larger portion of the assets transferred to a firm in business combinations due to the fact that the value of many firms has shifted from tangible assets to intangible assets. Hence, goodwill impairments have an increasing influence on the firm's financial reporting outcome and are therefore highly relevant to outside investors as any impairment directly affects their shareholdings. Yet, relatively little is known about how large institutional owners behave with regard to the goodwill impairment decision of firms. This paper aims to provide some insights on this association.

With the introduction of Statement of Financial Accounting Standards (SFAS) 142, standard setters usually refer to the private information argument when claiming the conceptual advantages of the impairment-only approach over the systematic amortization of goodwill (AbuGhazaleh, Al-Hares, & Roberts, 2011). The private information argument refers to the assumption that managers have private information that is unknown to outside shareholders. In this context of asymmetric information, the decision whether and to what extent goodwill is impaired reveals information to the

[1] Institutional ownership is defined following the Form 13F by the United States Securities and Exchange Commission (SEC). All institutional investment managers with over $100 million of equity assets under management report their shareholdings quarterly using the SEC's Form 13F filing.

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public about the expected future cash flows of the respective reporting unit to which goodwill has been allocated (Fields, Lys, & Vincent, 2001). However, this argument is subject to the implicit assumption that both managers and shareholders of firms pursue the same objectives. Consequently, the impairment-only approach has been discussed controversial among academics, standard setters and practitioners. While proponents argue that the impairment-only approach better reflects economic reality (Chalmers, Godfrey, & Webster, 2011), critics argue that it provides opportunities of managerial discretion as impairment tests are unverifiable (Ramanna & Watts, 2012). As a result, research has found strong evidence that decision makers at the firm-level may delay or avoid recording impairments by using the subjectivity inherent in the goodwill impairment test procedure opportunistically (e.g., Li & Sloan, 2017; Ramanna & Watts, 2012).

Regarding the role and behavior of institutional owners, corporate governance literature establishes monitoring as a powerful governance solution available to shareholders to influence managers (Demsetz, 1983; Shleifer & Vishny, 1986). In a seminal paper concerning the role of large shareholders, Shleifer and Vishny (1986) argue that a shareholder who owns a large stake of the firm has proper incentives to monitor its management to safeguard their significant shareholdings. However, monitoring comes with costs, and institutional owners may rely on governance mechanisms other than monitoring or pursue a passive investment strategy. In this vein, prior research finds evidence that, instead of engaging in costly monitoring, institutional owners might choose to rely on "exit" and sell off their shareholdings (Coffee, 1991; Manconi, Massa, & Yasuda, 2012).

To empirically examine whether large institutional owners compel managers to record an impairment of goodwill, I follow prior research (Beatty & Weber, 2006; Francis, Hanna, & Vincent, 1996; Ramanna & Watts, 2012) and use a market-based indicator of goodwill impairment: The firm's book-to-market ratio. This approach is based on the rationale that the firm's market capitalization is a suitable proxy for shareholders' estimate of the firm's net present value of future cash flows. As SFAS 142 requires an impairment whenever the fair value of the reporting unit is below its carrying value, I argue that shareholders expect an impairment when the firm's market value of equity is below its book value of equity. Consequently, there are only two explanations for the management not to record an impairment of goodwill when the market value of equity is below its book value. First, in line with the private information argument, managers possess inside information that the net present value of future cash flows is higher than expected by the market. Second, managers opportunistically use the available discretion to their own advantage and delay necessary impairments of goodwill.

Using a sample of U.S. publicly listed companies with goodwill on their balance sheets during the period from 2009 to 2019, I find evidence consistent with the monitoring view. Specifically, as the share of the largest institutional owners increases, there is a higher likelihood that the firm reports more timely goodwill impairments. Further, I perform an additional set of sensitivity analyses to stress the economic significance of the results. Results prove to be robust to narrowing the definition of goodwill impairments to only those that are material to the firm, using an alternative accounting-based indicator of goodwill impairment, and excluding the period of the financial crisis from the sample.

In summary, the paper adds to the literature in at least two ways. First, I contribute by examining a further determinant of accounting choices of goodwill impairment by managers. I find evidence that the accounting decision to record a necessary goodwill impairment is at least partly affected by monitoring activities of the firm by institutional owners. Second, I look at the effect of institutional owners on financial reporting outcomes by showing that institutional owners effectively serve as monitors on firm behavior. In this way, my results suggest that ownership concentration helps in mitigating agency frictions by reducing information asymmetries, making it more difficult for managers to refer to the private information argument and instead forcing them to record more timely impairments of goodwill.

2. Accounting for goodwill

For many years, goodwill acquired in business combinations was treated similarly to other intangible assets. It was presumed that goodwill has a finite life and thus should be amortized over its useful life. The maximum amortization period was up to 40 years. In June 2001, the U.S. Financial Accounting Standards Board (FASB) significantly changed the treatment for accounting for goodwill by introducing the SFAS 141 Business Combinations and SFAS 142 Goodwill and Other Intangible Assets (Financial Accounting Standards Board, 2001a, 2001b).

With the introduction of these standards, the amortization of goodwill approach was abolished. Instead, firms are required to conduct an impairment test based on the reporting unit's fair value at least once a year. The central objective of SFAS 142 is to improve the reflection of the true economic value of goodwill in financial reporting. Under the provisions of SFAS 142, the impairment-only approach is described as a two-step process. First, the firm needs to determine the fair value of the reporting unit and compare it to its carrying amount. According to paragraph 30 of SFAS 142, a reporting unit is defined as the lowest level of business units for which discrete financial information is available (Financial Accounting Standards Board, 2001b, para. 30). In the event the fair value exceeds the carrying amount, no further testing is required, and thus no impairment is required. Second, only in the event, the carrying amount of the reporting unit exceeds the fair value, the implied fair value of goodwill needs to be calculated by measuring the reporting unit's fair value of net assets other than goodwill. Finally, the calculated value needs to be subtracted from the fair value of the reporting unit, and the difference is subject to impairment.

To sum up, on the one hand, the use of estimates on goodwill's fair value allows managers to release their private information on future cash flows. On the other hand, managers are granted a certain degree of discretion in exercising the associated accounting choices. The first accounting choice is the managerial flexibility in defining the reporting units. The second accounting choice is the managerial discretion in determining the fair value of the reporting unit. The assessment of the fair value requires the management to make subjective judgments on future economic performance, discount rate, and current replacement values of assets. Taken together, SFAS 142 allows for managerial discretion in estimating impairment charges with respect to its timing and amount.

3. Literature review

This section is divided into two parts. The first part offers a review of previous research on accounting for goodwill, focusing on the goodwill impairment decision and its determinants. The second part looks at research on the role and the behavior of institutional owners in monitoring firm behavior. Special attention is given to evidence on corporate governance mechanisms that impact the goodwill impairment decision.

3.1. Goodwill impairment

The primary purpose of this paper is to extend the existing literature on accounting for goodwill and the determinants driving the goodwill impairment decision. A stream of literature closely related to the current paper includes studies on the antecedents of goodwill impairment reporting. Reviewing these papers indicates that the decision to write down goodwill balances is associated with characteristics of the initial acquisition and agency-theory based motives (e.g., Gu & Lev, 2011; Hayn & Hughes, 2006; Li & Sloan, 2017; Ramanna & Watts, 2012).

Specifically, Hayn and Hughes (2006) look at the post-acquisition performance of U.S. based firms between 1988 and 1998. They find that the likelihood of an impairment of goodwill "is related to an initial overpayment as indicated by acquisition characteristics such as payment of a large premium over the pre-acquisition stock price of the target and the use of stock rather than cash as a mean of payment" (Hayn & Hughes, 2006, p. 241). In the same vein, Gu and Lev (2011) find that the buyer's overvalued share price at acquisition induces managers to overpay for the target that ultimately results in the impairment of goodwill.

A large body of research finds that the impairment-only approach under the SFAS 142 regime provides opportunities for managerial discretion as impairment tests are unverifiable (e.g., Beatty & Weber, 2006; Li & Sloan, 2017; Ramanna & Watts, 2012). The underlying theoretical framework is referred to as agency theory and predicts the management to opportunistically use the available discretion in their own interests (Jensen & Meckling, 1976; Watts & Zimmermann, 1986). According to prior research, incentives for opportunistically managing goodwill impairments predicted by agency theory are based on: (i) contractual issues such as compensation agreements or debt covenants written on goodwill accounts (Fields et al., 2001; LaFond & Watts, 2008), (ii) management reputation concerns (Francis et al., 1996; Gu & Lev, 2011), or (iii) equity market valuation concerns (Beatty & Weber, 2006).

First, contractual issues refer to contracts linked to accounting ratios that include impairment effects of goodwill and thus incentivize managers to delay necessary impairments as they would be directly harmed by its consequences. Furthermore, the potential violation of debt covenants written on accounting ratios can cause the decision to delay necessary goodwill impairments (Fields et al., 2001).

Second, as an impairment decision by definition conveys information to shareholders that expected future cash flows no longer hold, the impairment decision bears the risk of reputational damages of the firm's management. In consequence and confirmed by prior research, shareholders may question the managerial capabilities of managers responsible for the underlying acquisition (Gu & Lev, 2011). In this regard, Francis et al. (1996) provide arguments that decision makers on the firm-level tend to manage goodwill impairment opportunistically to protect their reputation, such as the opportunistic reporting of goodwill impairments to meet market expectations.

Third, based on the reasoning that goodwill impairments impact the firm's stock price, managers could use the available managerial discretion to inflate earnings and thus, the stock price. Beatty and Weber (2006) examine the determinants of a (non-) impairment decision in the SFAS 142 transition period. They find that market incentives and contracting incentives impact managerial decisions on whether, when, and how much goodwill impairment to record. In detail, they find that the likelihood of managers to record an impairment of goodwill is associated with incentives related to earnings-based compensation, CEO tenure, and exchange delisting. This view is supported by Guler (2007), who finds that concerns of negative valuation consequences lead managers to manipulate financial statements with respect to the true value of goodwill. Thus, agency theory offers a strong theoretical framework for arguing that goodwill impairments are not a mere reflection of economic reality but rather the opportunistic use of the available managerial discretion to maximize manager's own utility.

Along these lines, Ramanna and Watts (2012) study a sample of firms with market indications of goodwill impairment and test whether a decision to not impair goodwill is either related to the release of private information held by the firm's management or the opportunistic use of available managerial discretions predicted by agency theory.[2] They find evidence in line with agency-based predictions. Based on these findings, the recent paper by Li and Sloan (2017) studies the timeliness of goodwill impairments both before and after the implementation of SFAS 142. They find that the elimination

[2] Ramanna and Watts (2012) define market indications of goodwill impairment as positive book goodwill and a book-to-market ratio above one.

of systematic amortization and the introduction of unverifiable impairment tests has resulted in a relative increase in inflated goodwill balances and less timely impairment decisions. Contrariwise, Lee (2011) finds that the adoption of SFAS 142 with its impairment-only approach has increased the ability of goodwill to forecast future cash flows.

Another stream of literature closely related to my work includes studies on the impact of different governance mechanisms on the goodwill impairment decision. Glaum, Landsman, and Wyrwa (2018) research the effectiveness of monitoring by institutional owners as a substitute for a weak public enforcement environment. Using a sample of stock-listed firms from 21 countries, they find that monitoring by institutional owners compensates for a weak public enforcement environment with respect to the goodwill impairment decision. Ayres, Campbell, Chyz, and Shipman (2019) argue that the presence of financial analysts pressures managers towards more timely impairments of goodwill. In detail, they find that the likelihood of a firm to report a necessary impairment of goodwill increases with the number of analysts following a firm. In a somewhat related paper, L. H. Chen, Krishnan, and Sami (2015) finds that an increased level of institutional ownership mitigates the negative effects of goodwill impairments on analyst forecast dispersion. Lastly, the paper by Li and Sloan (2017) provides some initial evidence that higher institutional ownership mitigates the managerial discretion in goodwill testing and leads to more timely impairments of goodwill. All these findings stress the important effects of outside monitors on the firm's information environment

3.2. Institutional ownership

The prior section discussed some of the potential motives of managers to opportunistically manage goodwill impairment losses at the expense of the outside shareholders. This section provides an overview of prior research on the role and the behavior of institutional owners with regard to their shareholdings. Formally, the conflicting interests between outside shareholders and managers evolve from the separation of the decision and the risk-bearing function and is referred to as an agency problem (Berle & Means, 1932). Prior research has established several governance solutions that can mitigate agency frictions. Monitoring of the management by shareholders is regarded as such a mechanism and has been the subject of research for decades (e.g., Jensen & Meckling, 1976; Monks & Minow, 1995; Shleifer & Vishny, 1986).

In addition to monitoring, other mechanisms and governance devices have evolved to control for agency problems. For instance, the capital market exercises an inherent monitoring function by exerting pressure on a firm's management to drive decisions toward shareholder interests (Holmström & Tirole, 1993). Further, the market for corporate control disciplines the firm's management by providing external parties the opportunity to replace existing management with poor performance (Manne, 1965).

Nevertheless, monitoring has been frequently featured as a powerful governance mechanism available to shareholders (e.g., Brous & Kini, 1994; Demsetz, 1983; Shleifer & Vishny, 1986). As monitoring involves both costs and benefits, the ultimate decision on whether to engage in monitoring depends on the outcome of a cost-benefit analysis. Thus, based on the assumption of rationality, a shareholder is willing to engage in monitoring as long as the benefit of monitoring outweighs its costs.

The study by Bushee (1998) on the influence of institutional ownership on managerial incentives to decrease investments in research and development (R&D) finds a negative association between the level of institutional ownership and the likelihood to reduce R&D expenses to reverse a decline in earnings. This finding emphasizes that institutional owners favor long-term value creation over short-term profit generation. In a further paper, Bushee (2001) confirms that finding by showing that there is a positive association between institutional ownership and the proportion of firm value reflected in future earnings. Both findings suggest that a large capital investment in a firm provides incentives for institutional owners to monitor managers' actions to ensure that they aim for long-term profitability. In this vein, Chung, Firth, and Kim (2002) examine the effect of monitoring by institutional owners on opportunistic earnings management. They find that the degree of monitoring institutional owners prevents managers from the opportunistic steering of reported profits towards the level of profit desired by the managers of the firm.

With regard to the monitoring thesis, Monks and Minow (1995) provide evidence that sophisticated institutional owners with large stakes are likely to monitor and discipline managers towards actions that are aligned with the goal of long-term value creation instead of engaging in short-term profit generation. In line with that finding, Bethel, Liebeskind, and Opler (1998) argue that the acquisition of a larger stake by activist shareholders improves the long-term operating performance of firms. X. Chen, Harford, and Li (2007) postulate that within a cost–benefit framework, long-term oriented institutions focus on monitoring and influencing, rather than engaging in short-term profit trading. In a similar spirit, Jiambalvo, Rajgopal, and Venkatachalam (2002) test whether institutional owners engage in monitoring and mitigate firm agency costs or exacerbate these costs. They provide evidence consistent with the monitoring view.

Regarding the impact of institutional ownership on the firm's financial reporting behavior, Liu (2014) researches a sample of firms that surpassed analysts' expectations over a period from 1988 to 2006. Their results indicate that institutional owners reduce distortions in financial reporting and concurrently pressure managers to release bad news earlier. Burns, Kedia, and Lipson (2010) find that an increased concentration of monitoring institutional owners reduces the likelihood of financial misreporting. This view is supported by McCahery, Sautner, and Starks (2016), who find evidence that institutional owners frequently employ their voice in order to intervene if they are dissatisfied with the managers' actions.

Institutional owners are considered a heterogeneous rather than a homogeneous group (Gompers & Metrick, 2001). Prior theoretical research argues that the largest institutional owners are an important source in mitigating agency problems through monitoring (Huddart, 1993; Maug, 1998; Shleifer & Vishny, 1986). For instance, Maug (1998) argues that independent institutions with large shareholdings have increased incentives to monitor because they can profitably trade private information acquired by monitoring. Based on that theoretical work, empirical research provides further evidence that large institutional owners perform successful monitoring (Bethel et al., 1998; Brav, Jiang, Partnoy, & Thomas, 2008; Del Guercio & Hawkins, 1999; Gillan & Starks, 2000). Del Guercio and Hawkins (1999) empirically examine the motivation of the five largest pension funds by studying their shareholder proposals from 1987 to 1993. They find that these funds actively engage in monitoring to maximize fund value. Using the theory of economies of scale, Gillan and Starks (2000) argue that institutions with large shareholdings have an increased incentive to monitor as a larger claim on the firm leads to a higher share of the benefit resulting from monitoring and are therefore more likely to offset the costs incurred. They further argue that their shareholdings are frequently so large that selling off their holdings drives down the share price, thereby incurring additional losses.

However, there is a body of research arguing that institutional owners may behave less activistic and more short-term focused (e.g., Coffee, 1991; Manconi et al., 2012). Within a cost-benefit framework, institutional owners may rely on governance mechanisms other than monitoring. In this regard, prior research finds evidence that institutional owners may prefer to sell off their holdings in the case of unfavorable performance rather than engaging in monitoring activities (Coffee, 1991; Manconi et al., 2012). Furthermore, there is empirical support that institutional owners themselves exert pressure on the short-term performance of firms, and thus biasing management towards short-term profit generation (Bushee, 1998; Graves & Waddock, 1990). Besides empirical evidence, Bolton, Scheinkman, and Xiong (2006) provide a theoretical framework on short-termism by presenting a multiperiod agency model demonstrating that institutional owners use executive compensation contracts as a mean to incentivize managers to take short-term actions „ which increase the speculative component in the stock price" (Bolton et al., 2006, p. 577).

4. Hypothesis development

As Ramanna and Watts (2012) stated, the annual impairment test for goodwill under the SFAS 142 regime allows for a certain degree of discretion as impairment tests are unverifiable. Agency theory provides a strong theoretical framework and predicts the management to use the available discretion opportunistically, which is line with prior empirical evidence (e.g., Li & Sloan, 2017; Ramanna & Watts, 2012).

The objective of this paper is to investigate the role of large institutional owners in explaining variation in the reporting of goodwill impairment that has potentially lost its economic value. In light of the costs and benefits of monitoring, institutional owners face a decision whether to engage in monitoring or instead rely on other governance mechanisms. In this context, monitoring is both the process of information collection and activities to influence managers' actions. The prior literature provides ambiguous evidence regarding the role and behavior of large institutional owners on the governance of corporations.

The body of literature arguing for the monitoring view, suggests that monitoring by institutional owners is a frequently applied governance solution to influence management towards shareholders' interests in order to protect their significant investments (e.g., Monks & Minow, 1995; Shleifer & Vishny, 1986). Among the group of institutional owners, the largest institutional owners are particularly likely to monitor (Brav et al., 2008; Del Guercio & Hawkins, 1999) for at least two reasons. First, economies of scale suggest that monitoring is particularly attractive to large shareholders if the cost of monitoring has a constant component. Second, as large institutional owners often have significant holdings, it is both difficult and costly to sell their shareholdings (Graves & Waddock, 1990). Furthermore, due to their professionalism, these investors have the required capabilities and expertise to monitor management and ensure that they are not engaging in activities that adversely affect shareholders' wealth.

According to this active monitoring hypothesis, institutional owners who engage in monitoring diminish the available managerial discretion in the goodwill impairment decision. This leads to fewer direct agency conflicts between management and shareholders and disciplines the management towards shareholders' interest (Shleifer & Vishny, 1986). Consequently, monitoring by institutional owners' pressure managers to make timelier goodwill impairments. Presupposing that large institutional owners engage in monitoring the firm leads to the hypothesis that in the presence of market indications of goodwill impairment, the share of equity held by the largest institutional owners is positively associated with the firm's likelihood to report an expected impairment of goodwill.

However, there are at least two reasons why I would expect to find no association. First, monitoring actions are difficult to trace. For instance, it may be in the interest of the large shareholders to not record an expected impairment of goodwill. Because goodwill impairments have a negative impact on the share price (AbuGhazaleh et al., 2012), large institutional owners may have motives to prevent a necessary impairment, as they suffer the greatest losses in absolute terms on their shareholdings. Second, institutional owners may choose not to engage in costly monitoring activities and rely on other governance mechanisms or pursue a passive investment strategy. For example, they may prefer to sell off their holdings in the case of unfavorable performance rather than engaging in costly monitoring (Coffee, 1991; Manconi et al., 2012).

Ultimately, it is an empirical question to which extent ownership concentration compels managers to record an expected impairment of goodwill. Therefore, I formulate my hypothesis in its null form as follows:

> Hypothesis: The likelihood of firms to record an expected goodwill impairment is not associated with the share of equity held by the firms largest institutional owners.

5. Research methodology

5.1. Empirical model

In this section, I will discuss and develop the empirical strategy for estimating how monitoring by institutional owners affects the likelihood of goodwill impairment. To test the hypotheses established, I estimate a multivariate linear probability model where the dependent variable, $Impair$, is a dichotomous variable that equals 1 if goodwill is impaired in a given firm-year, and 0 otherwise.

On the lines of Francis et al. (1996), I include the firm's book-to-market ratio with a value above unity, Btm, as an indication that a firm's goodwill is economically impaired. Following the argumentation that a book-to-market ratio above one suggests that the market expects an impairment of goodwill, Btm equals 1 if the firm's book-to-market ratio in a given firm-year is above one, and 0 otherwise. Hence, Btm is expected to be positively related to the impairment decision.[3]

In order to examine the effect of monitoring by institutional owners, I use two different proxies for firm's institutional ownership structure. First, I estimate the equation with the proportion of equity shares held by the firm's top one institutional owner in a given firm-year, OS_Top1. As a second model, I estimate the equation using a variable, OS_Top3, defined as the cumulative proportion of equity shares held by the firm's top three institutional owners in a given firm-year. From a methodological point of view, the research question to be tested aims at the effect of monitoring by the largest institutional owner when a firm shows market indications of goodwill impairment. This specification helps in exploring whether firms with market indications of goodwill impairment may be more likely to report an impairment of goodwill, the higher the proportion of equity shares held by the largest one (three) institutional owners. An interaction term incorporates the joint effect of two variables on the dependent variable ($Impair$) over and above their separate effect.

For this reason, the model includes an interaction effect between the dichotomous variable of the book-to-market ratio and the share of the largest institutional owners, namely $Btm \times OS\_Top$.[4]

[3] Additionally, Beatty and Weber (2006) and Ramanna and Watts (2012) also use the firm's book-to-market ratio as a dichotomous expected impairment measure.

[4] I estimate the model for the proportion of equity shares held by the top one institutional owner (OS_Top1) and the cumulated proportion of equity shares held by the top three institutional owners (OS_Top3) separately.

Based on prior literature, I control for several factors that have been documented to affect the impairment decision. In detail, control variables include proxies for economic determinants, managerial and firm-level incentives, monitoring and governance indicators.

Following the research by Francis et al. (1996), I include the firm's stock market return as a market-based measure of economic performance. I interpret a negative (positive) stock market return as an indicator that the firm lost (gained) its abilities to generate future cash flows. Thus, the stock market return serves as an indicator of necessary goodwill impairments. Consequently, I include the firm's stock market return in a given firm-year, $Return$, and the respective stock market return in the prior year, $ReturnLag$. Everything else equal, I expect a negative sign on both variables.

Furthermore, the model contains variables reflecting managerial incentives associated with a potential influence on the impairment of goodwill. According to the literature on earnings management, a firm's management is intended to reduce earnings when it is abnormal high to avoid raising expectations of stakeholders for future earnings, i.e. income smoothing (e.g., Acharya & Lambrecht, 2015; Riedl, 2004). On the contrary, firms with abnormal low earnings in a given firm-year may take discretionary actions to reduce even further the current periods' earnings, as management is not penalized proportionately more for additional losses to its already low earnings (Riedl, 2004). Because goodwill impairment is one mechanism available to the management to perform these two types of earnings management, I include two dichotomous variables accounting for this. The first variable, $Smooth$, equals 1 if a firm's net income in a given firm-year is positive, and the change in income is above the median change of firms with a positive change in income, otherwise the variable equals 0. The second variable, $Bath$, equals 1 if a firm's net income in a given firm-year is negative, and the change in income is below the median change of the firms with a negative change in income, otherwise the variable equals 0. I expect a positive relation to the goodwill impairment decision for both variables, $Smooth$ and $Bath$.

As a further incentive-related variable, I add a dichotomous variable equal to 1 if the CEO received a cash bonus in a given firm, named $Bonus$, and 0 otherwise. Prior research has shown that in the case of firm performance-related managerial compensation, managers may have an incentive to make use of the managerial discretion available and avoid or delay necessary impairments of goodwill (Beatty & Weber, 2006; Ramanna & Watts, 2012). Consequently, I expect a negative association between Bonus and $Impair$. Additionally, I include a further CEO-related variable, $CeoChange$, which is a dichotomous variable that equals 1 if there is a change in the CEO in a given firm-year, and 0 otherwise. This follows the findings by Francis et al. (1996) that a recent change in top management is associated with more frequent and greater impairments of goodwill. All other things being equal, I expect a positive sign on this variable.

Furthermore, prior research establishes a link between debt contracting and the decision of whether to impair goodwill (Beatty & Weber, 2006; Ramanna & Watts, 2012). Debt contracts written on goodwill accounts have proven to provide incentives to a firm's management to delay or avoid goodwill impairments. The model takes this into account by incorporating a variable, $Leverage$, which is the firm's total liabilities divided by total assets before goodwill impairment in a given firm-year.

Following prior research (e.g., Lapointe-Antunes, Cormier, & Magnan, 2008; Ramanna & Watts, 2012), I include independent variables related to the balance sheet item of goodwill. The first is a proxy for the number of reporting units, $Segment$, which is defined as the number of operating segments of a firm in a given year. The second variable captures the ratio of goodwill before impairment of goodwill divided by total assets before impairment of goodwill, GW/TA.

Further, I add a set of additional control variables related to incentives at the wider firm-level, which have been included in prior studies (e.g., Beatty & Weber, 2006; Francis et al., 1996; Ramanna & Watts, 2012). As a proxy for the size of a firm, I include the variable $Size$, which is the logarithm of the firm's total assets at the end of the year before goodwill impairment (Li & Sloan, 2017). The variable $AnalystFollow$ is defined as the logarithm of one plus the average number of security analysts that follow a firm over a given year.[5] As indicated by Moyer, Chatfield, and Sisneros (1989), security analysts perform an important monitoring activity and thus reduce agency costs. Consequently, I expect a positive relation to the impairment decision. The variable Roa captures information about the firm's economic performance and is defined as a firm's net income divided by its total assets in a given year. Based on economic reasoning, I expect a negative relationship with the impairment decision.

To sum up, the statistical equation for the multivariate linear probability model has the following general form. Following Petersen (2009), I use robust standard errors clustered at the firm-level. I estimate the equation including industry and year fixed effects to control for unobserved differences in industry characteristics and time specific trends, potentially reducing bias or inconsistency. To obtain meaningful coefficients for the main effects, I standardize the independent continuous variables. Therefore, the coefficient of each of the independent continuous variables represents its typical effect on the goodwill impairment decision. This is its effect when the other independent continuous variables are at their mean, and the magnitude of the coefficient represents the change in the dependent variable ($Impair$) associated with a change of one standard deviation in the independent continuous variable. The subscripted t represents the different time periods, while i typifies each sample firm included in the model.

$$
\begin{aligned}
Impair_{i,t} =\ & \beta_0 + \beta_1 Btm_{i,t} + \beta_2 OS\_Top_{i,t} \\
& + \beta_3 Btm_{i,t} \times OS\_Top_{i,t} + \beta_4 Return_{i,t} \\
& + \beta_5 ReturnLag_{i,t} + \beta_6 Smooth_{i,t} + \beta_7 Bath_{i,t} \\
& + \beta_8 Bonus_{i,t} + \beta_9 CoeChange_{i,t} + \beta_{10} Leverage_{i,t} \\
& + \beta_{11} Segment_{i,t} + \beta_{12} GW/TA_{i,t} + \beta_{13} Size_{i,t} \\
& + \beta_{14} AnalystFollow_{i,t} + \beta_{15} Roa_{i,t} \\
& + \sum \beta_t Year + \sum \beta_j Industry_{j,i} + \varepsilon_{i,t}
\end{aligned} \tag{1}
$$

In this specification, the coefficient β_3 represents the association between large institutional ownership and the firm's likelihood to report an expected impairment of goodwill. An insignificant coefficient would suggest that the presence of large institutional owners do not affect the relationship between an expected impairment and an actual impairment. In contrast, a positive (negative) and significant coefficient would indicate that an increase in the share held by the largest institutional owners leads to a higher (smaller) likelihood of expected impairments.

5.2. Sample selection

The data for the subsequent empirical analysis is gathered from U.S. publicly listed companies. I use firm-level data on goodwill and institutional ownership from a variety of sources. My starting point is the data platform Wharton Research Data Services (WRDS), which contains detailed accounting information for all U.S. publicly listed firms from different sources. Appendix A[6] provides a detailed description of all variables and the respective data source. The sample consists of firms belonging to the S&P 500 index. The S&P 500 index consists of the 505 largest firms by market capitalization listed on stock exchanges in the U.S.. The index is considered to be a good representation of the U.S. stock market and thus, a suitable object for empirical research.

Table 1 presents the sample construction process. Firstly, the top 505 U.S. firms by total market capitalization as listed by the S&P 500 at July 1, 2020 are selected for a time period of eleven years from 2009 through 2019. This results in initial 555 firm-year observations. I exclude 774 firm-year observations belonging to the financial sector.[7] As described by Glaum et al. (2018), the average balance sheet and capital structure of financial firms are significantly different from those of classical nonfinancial firms, which implies that employing the same coefficients on the model could be restrictive and thereby introduce coefficient bias. Further, 657 firm-year observations with book goodwill less than $1 million and 93 firm-year observations with a negative book-to-market ratio are excluded. Finally, I lose 1811 observations due to missing or insufficient data. Taken together, the fi-

[5] Following Yu (2008), I assume that firms not covered by the Thomson Reuters I/B/E/S database have no analyst coverage.

[6] The Appendix can be found on `https://jums.academy`.

[7] Classified as Financials with GICS Code 40 in Compustat.

Table 1: Sample construction

	Firm-year observations
The 505 S&P 500 firms (as listed on July 1, 2020) for the time period from 2009 through 2019	5555
Firm-year observations belonging to the Financials industry	(774)
Firm-year observations with book goodwill below $1 million	(657)
Firm-year observations with a book-to-market ratio below zero	(93)
Firm-year observations with insufficient/missing data	(1154)
Final sample	2877
Goodwill impairers	302
Material goodwill impairers: >1% of total assets	123
Material goodwill impairers: >$10 million	257
Non goodwill impairers	2575
Observations with book-to-market ratio above one	44
Observations with a return on assets below minus 10%	38

This table shows the construction process for the final sample.

nal sample of firms for which all data items were available consists of 343 firms, resulting in a total of 2877 firm-year observations, of which 302 record an impairment of goodwill.

Table 2 displays a breakdown of the final sample by year. All firms were assigned to their respective sector (sector and industry are considered interchangeably) based on the Global Industry Classification Standard (GICS). Appendix C shows a breakdown of the final sample by industry. In order to reduce the effect of possibly spurious outliers in the tails of the sample, I winsorize the independent continuous variables at the top and bottom one percent.[8]

5.3. Descriptive statistics

Table 3 provides the descriptive statistics of all variables. According to the variables of interest, the untabulated statistics for the book-to-market ratio reveals a mean value of 0.334, indicating that the shareholders of these sample firms perceive these firms to be highly profitable. Even firms in the ninetyfifth percentile show a book-to-market ratio of 0.763 and thus below one. However, as shown in Table 1 there are 44 firm-year observations with a book-to-market ratio above one. The proportion of equity shares held by the firm's top one institutional owner vary between 1% and 22.6%, with an average value of 7%. For the firm's top three institutional owners the values vary between 2.9% and 34.5% with an average value of 12.9%, respectively. These values reveal a certain degree of heterogeneity in the ownership structure among the sample firms. Mean of Impair indicates that in 10.5% of the firm-years, the sample firms report an impairment of goodwill.

The mean values of $Return$ and $ReturnLag$ differ notably, which might be partially driven by the fact that $ReturnLag$ includes the returns of the year 2008 and thus the stock market crash caused by the financial crisis as indicated by the increased standard deviation of 32.9%. In 30.3% of the firm-years, firms tend to engage in earnings smoothing ($Smooth$), whereas only 4.5% of the firm-years show evidence of big bath accounting ($Bath$). Regarding the CEO-related control variables, the CEO of the sample firms received a bonus payment in 12.2% of firm-year observations. Furthermore, sample firms report a change in the CEO role in 10.7% of the firm-years. The mean level of leverage reaches 57.6%, indicating that selected firms are largely financed by debt rather than equity. Thus, debt covenants of contracts written on goodwill accounts and the resulting incentives to delay or avoid goodwill impairments might play a role. The sample firms reveal an average number of operating segments of 3.703. The number of operating segments varies between 1 and 11. Furthermore, sample firms report a goodwill-to-assets ratio of 21.2% with a maximum value of 60.3%. The mean sample firm reports a profitable return on assets of 7.2%, whereas at the final ninetyfifth percentile firms report a return on assets of 17.1%. The $Size$ variable, defined as the logarithm of total assets before goodwill impairment, ranges from 6.695 to 12.528. On average, there are 17 analysts following the firm (determined by the exponential of the logarithm value in Table 2, less one).

In Table 4, I perform a mean difference analysis to test for significant differences between firms that impair and those that do not. I find significant evidence that firms with a book-to-market ratio above one are more likely to engage in a goodwill impairment decision indicating that a firm's book-to-market ratio is an adequate measure for market indications of goodwill impairment. Furthermore, impairing firms tend to have a slightly more concentrated ownership structure with respect to the proportion of equity shares held by the top one and the top three institutional owners, respectively. However, for both ownership variables, OS_Top1 and OS_Top3, this difference is not statistically significant.

[8] To test for the sensitivity of the decision whether to winsorize the data, I re-perform the main analysis without winsorization. The inferences remain unchanged.

Table 2: Sample breakdown by year

Year	Number of observations	Impairments	Percentage
2009	235	40	8.17%
2010	238	20	8.27%
2011	241	19	8.38%
2012	242	29	8.41%
2013	252	23	8.76%
2014	278	26	9.66%
2015	273	28	9.48%
2016	280	24	9.73%
2017	287	23	9.98%
2018	283	33	9.84%
2019	268	37	9.32%
Total	2877	302	100%

This table shows a breakdown of the sample by year.

Table 3: Descriptive statistics of all variables

Variable	Mean	Median	Min.	Max.	St.Dev.	Percentiles 10	Percentiles 95
Btm	0.015	0	0	1	0.123	0	0
OS_Top1	0.07	0.065	0.01	0.226	0.036	0.03	0.137
OS_Top3	0.129	0.12	0.029	0.345	0.06	0.059	0.244
$Impair$	0.105	0	0	1	0.307	0	1
$Return$	0.122	0.13	-0.828	1.32	0.269	-0.202	0.543
$ReturnLag$	0.068	0.106	-1.637	1.32	0.329	-0.337	0.538
$Smooth$	0.303	0	0	1	0.46	0	1
$Bath$	0.045	0	0	1	0.208	0	0
$Bonus$	0.122	0	0	1	0.327	0	1
$CeoChange$	0.107	0	0	1	0.309	0	1
$Leverage$	0.576	0.582	0.113	0.986	0.179	0.338	0.869
$Segment$	3.703	4	1	11	2.327	1	8
GW/TA	0.212	0.186	0	0.603	0.153	0.022	0.498
$Size$	9.493	9.45	6.695	12.528	1.217	7.926	11.639
$AnalystFollow$	2.698	2.89	0	3.871	0.784	1.946	3.497
Roa	0.072	0.067	-0.213	0.341	0.062	0.01	0.171
Firm-year observations	2877						

This table reports descriptive statistics of all variables. All continuous variables are winsorized at the first and ninetyninth percentiles. All variables are defined in Appendix A.

With respect to the control variables, impairing firms tend to underperform both contemporaneous and lagged stock market returns versus non-impairing firms. The mean difference analysis also reveals a positive association between the change of the CEO and big bath accounting on the one hand and the goodwill impairment decision on the other hand. Finally, impairing firms appear to be larger, have more operating segments, report a lower return on assets, and display a higher debt-to-assets, as well as a goodwill-to-assets ratio.

5.4. Correlation analysis

In addition to the descriptive statistics, I conduct Bravais-Pearson, and Spearman (rank) correlation analysis to examine the linear relationship between all independent variables. The results are outlined in Table 5, where Bravais-Pearson correlations are shown in the lower left triangle and Spearman (rank) correlations are provided in the upper right triangle.

None of the two independent variables of interest (Btm, OS_Top1, and OS_Top3) show a correlation above the level of 0.4. Following the ranges provided by Evans (1996), I conclude that there is only a very weak to a weak correlation between the two variables on institutional ownership and the remaining control variables.[9] Thus, multicollinearity is not

[9] Evans (1996) defines a correlation as very weak if it ranges between

Table 4: Mean differences

Variable	Impair=0	Impair=1	t-statistics
Btm	0.012	0.040	-3.666***
OS_Top1	0.070	0.072	-0.664
OS_Top3	0.129	0.134	-1.282
Return	0.129	0.064	3.984***
ReturnLag	0.081	-0.042	6.188***
Smooth	0.308	0.261	1.645
Bath	0.028	0.195	-13.703***
Bonus	0.118	0.152	-1.702
CeoChange	0.101	0.162	-3.284***
Leverage	0.572	0.608	-3.343***
Segment	3.636	4.272	-4.505***
GW/TA	0.209	0.240	-3.378***
Size	9.458	9.789	-4.488***
AnalystFollow	2.701	2.673	0.579
Roa	0.076	0.035	11.050***
Firm-year observations	2575	302	

This table show mean values for non-impairing and impairing firm-years. p-values are two-tailed and indicated as stars according to their significance level as follows: *p<0.05, **p<0.01, ***p<0.001. All continuous variables are winsorized at the first and ninetyninth percentiles. All variables are defined in Appendix A

Table 5: Bravais-Pearson and Spearman (rank) correlations of all independent variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.*Btm*		0.007	0.036	-0.130***	-0.04*	-0.002	0.123***	0.006	0.003	-0.057**	0.005	0.002	0.091***	0.000	-0.130***
2.*OS_Top1*	0.009		0.777***	0.048*	0.008	0.069***	0.054**	-0.041*	-0.006	-0.070***	-0.143***	0.112***	-0.291***	-0.088***	-0.077*
3.*OS_Top3*	0.039*	0.768***		0.038*	0.013	0.073***	0.081***	-0.01	-0.009	-0.079***	-0.150***	0.112***	-0.371***	-0.142***	-0.099***
4.*Return*	-0.136***	0.041*	0.027		-0.108***	0.112***	-0.082***	-0.007	-0.033	-0.026	-0.056**	-0.003	-0.119***	-0.048*	0.061**
5.*ReturnLag*	-0.041*	-0.028	-0.017	-0.163***		0.144***	-0.114***	-0.033	-0.059**	-0.015	-0.034	0.017	-0.069***	0.008	0.166***
6.*Smooth*	-0.002	0.062***	0.072***	0.126***	0.129***		-0.143***	-0.024	-0.037*	-0.014	-0.033	-0.022	-0.020	-0.032	0.127***
7.*Bath*	0.123***	0.060**	0.077***	-0.098***	-0.115***	-0.143***		0.026	0.065***	0.038	0.015	0.004	0.029	0.016	-0.35***
8.*Bonus*	0.005	-0.041*	-0.009	0.000	-0.046*	-0.024	0.026		0.077***	-0.0411*	0.068***	0.032	0.013	-0.065***	-0.024
9.*CeoChange*	0.003	-0.011	-0.011	-0.035	-0.055**	-0.037*	0.065***	0.077***		0.0172	0.002	0.000	0.032	0.016	-0.027
10.*Leverage*	-0.055**	-0.078***	-0.090***	-0.034	-0.013	-0.019	0.037*	-0.046*	0.021		0.112***	-0.068***	0.308***	-0.029	-0.296***
11.*Segment*	0.000	-0.137***	-0.148***	-0.062***	-0.041*	-0.034	0.013	0.080***	0.008	0.116***		0.180***	0.296***	-0.107***	-0.166***
12.*GW/TA*	0.001	0.123***	0.109***	-0.0103	0.019	-0.020	0.003	0.045*	0.000	-0.055**	0.157***		-0.032	-0.085***	-0.079***
13.*Size*	0.081***	-0.281***	-0.354***	-0.119***	-0.049**	0.023	0.023	0.019	0.035	0.316***	0.311***	-0.025		0.350***	-0.260***
14.*AnalystFollow*	-0.006	-0.029	-0.058**	-0.039*	0.023	-0.030	0.018	-0.088***	-0.013	0.013	-0.075***	-0.056**	0.231***		0.113***
15.*Roa*	-0.118***	-0.077***	-0.112***	0.086***	0.165***	0.160***	-0.456***	-0.036	-0.038*	-0.244***	-0.149***	-0.116***	-0.192***	0.049**	

This table shows Bravais-Pearson correlations in the lower left triangle. Spearman (rank) correlations are provided in the upper right triangle. p-values are two-tailed and indicated as stars according to their significance level as follows: *p<0.05, **p<0.01, ***p<0.001. All continuous variables are winsorized at the first and ninetyninth percentiles. All variables are defined in Appendix A.

expected to be a relevant issue for the independent variables of interest.

However, it is worth noting that some of the control variables show significant correlation effects with other independent variables, namely *Roa*, *Size*, *Btm*, *AnalystFollow*, and *Segment*. Again, none of the correlations exceeds the level of 0.4, and thus, multicollinearity is not expected to be a relevant issue either. Furthermore, there are no substantial differences between Bravais-Pearson and Spearman (rank) correlations, which suggests that there are no significant outlier effects in the final sample.

0.00 and 0.19 and as weak if it ranges between 0.20 and 0.39, in absolute terms, respectively.

5.5. Multivariate analysis

This section presents the results of the multivariate linear probability model. Table 6 shows the results of two regression models that estimate the effect of the top one (*OS_Top1*) and the cumulative share of the top three institutional owners (*OS_Top3*) on the goodwill impairment decision when a firm shows market indications of goodwill impairment, respectively. The dependent variable is a dichotomous variable equal to 1 if a firm impaired goodwill in a given firm-year, and 0 otherwise. The adjusted R-squared is reported in the fourth last row, and the sample size is reported in the last row. Both models control for year and industry fixed effects.

Regression model (1) ((2)) includes an interaction term between the proportion of equity shares held by the firm's top one (three) institutional owners and a dichotomous variable

Table 6: Regression results

Variable	Pred. Sign	(1)		(2)	
		Coefficient	t-statistics	Coefficient	t-statistics
Btm	+	0.05	1.08	0.025	0.54
OS_Top1	+	0	0.08		
OS_Top3	+			0.004	0.44
$Btm \times OS\_Top1$	+	0.0965**	2.33		
$Btm \times OS\_Top3$	+			0.104**	2.17
$Return$	-	-0.019***	-2.99	-0.020***	-3.03
$ReturnLag$	-	-0.022***	-2.83	-0.022***	-2.8
$Smooth$	+	0.030**	2.42	0.030**	2.38
$Bath$	+	0.281***	6.59	0.282***	6.57
$Bonus$	-	0.006	0.29	0.007	0.31
$CeoChange$	+	0.03	1.45	0.031	1.49
$Leverage$	?	0.002	0.3	0.003	0.32
$Segment$	+	0.019**	2.2	0.019**	2.2
GW/TA	?	0.006	0.9	0.006	0.84
$Size$	?	0.011	1.16	0.013	1.29
$AnalystFollow$	+	-0.004	-0.45	-0.004	-0.48
Roa	-	-0.035***	-4.49	-0.034***	-4.34
Adjusted R-squared		0.113		0.113	
Year fixed effects		Yes		Yes	
Industry fixed effects		Yes		Yes	
Firm-year observations		2877		2877	

This table presents the estimation results of a multivariate linear probability model. The table presents regression coefficients and the respective t-statistics. p-values are two-tailed and indicated as stars according to their significance level as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered on the firm-level (Petersen, 2009). All continuous variables are standardized. All continuous variables are winsorized at the first and ninetyninth percentiles. All variables are defined in Appendix A.

whether the firm's book-to-market ratio is above one. The regression results show significantly positive effects on this interaction term for both models, respectively (t-statistics = 2.33 and 2.17).

Consequently, I find statistically significant evidence that firms with larger concentration of ownership are more likely to report goodwill impairment when the firm shows market indications of goodwill impairment. Ceteris paribus, among the firm-years that show market indications of goodwill impairment, one standard deviation point increase in the cumulative proportion of equity shares held by the top one (three) institutional owners (OS_Top1 and OS_Top3) has a significant positive effect of 9.65% (10.4%) on the likelihood for a firm to actually report an impairment of goodwill. The adjusted R-squared for both models is comparable to those documented in prior research.[10] Thus, the results provides evidence that large institutional owners effectively monitor firms towards an impairment when the firm shows market indications of goodwill impairment. To test for multicollinearity issues, I perform a variance inflation factor assessment. Untabulated results suggest that there are no serious multicollinearity issues impacting my results.[11]

With regard to the control variables, my results are broadly in line with the findings of prior research and thus providing further validation for my main results as well as the model itself. For both regression models, both contemporaneous and lagged stock market returns ($Return$ and $ReturnLag$) are significantly negatively related to the goodwill impairment decision. These findings are in line with the findings by Glaum et al. (2018). The coefficients of the two control variables related to earnings management ($Smooth$ and $Bath$) display the expected positive sign. However, only the variable related to the big bath theory of earnings management shows a significant coefficient.

Concerning the CEO-related control variables, $Bonus$ and $CeoChange$, I find coefficients consistent with the predicted sign. However, both variables are not significant.[12] The

[10] The adjusted R-squared in Table 5 for both models is 11.8% similar to the results of other papers on the goodwill impairment decision (e.g., Glaum et al., 2018; Ramanna & Watts, 2012).

[11] Following the recommended maximum values for the variance inflation factor provided by Hair, Black, Babin, and Anderson (1998), I use a maximum tolerance value of ten. All variables of interest are comfortable below this value.

[12] According to Glaum et al. (2018), it may be the case that $CeoChange$ reflects effects that are similar to Bath and thus subject to multicollinearity.

coefficient of the control variable related to debt-covenant, *Leverage*, is insignificantly slightly positive. This finding is supported by Beatty and Weber (2006), who also find small insignificant coefficients for the firm's debt-to-assets ratio. Finally, my finding on the firm's number of operating segments, *Segments*, reveal a significant positive effect in line with prior research (Glaum et al., 2018; Lapointe-Antunes et al., 2008). To sum up, the results of the multivariate linear probability model provide evidence in line with the monitoring hypothesis. The control variables of the model are generally consistent with the findings by prior research in terms of both significance and magnitude.

6. Robustness analyses

To further validate my results on the influence of large institutional ownership on the decision whether to record necessary impairments of goodwill, I conduct additional robustness analyses to stress the economic relevance and provide further validity. First, I narrow the definition of the dependent variable to those impairments that are material to the firm. Second, the main results are based on a market-related indicator for goodwill impairment. In order to analyze the sensitivity of the definition of the impairment indicator proxy used in the main analysis, I estimate the model using an alternative accounting-based measure for indications of goodwill impairment. Lastly, I follow recent literature and exclude the year 2009, which belongs to the period of the financial crisis, from the sample. All three specifications prove to be robust with regard to my main results. Thus, the subsequent robustness analyses provide further evidence on the role of large institutional owners monitoring firms towards necessary goodwill impairments.

6.1. Dependent variable

The first robustness analysis aims to provide further evidence on the economic relevance of the influence of large institutional owners on necessary goodwill impairments. In order to do so, I narrow the definition of the dependent variable to those impairments that are material to the firm. Thus, I modify equation (1) by specifying the dependent variable, *Impair*, equal to 1 if the reported goodwill impairment is classified as a material impairment, and 0 otherwise. Inspired by Jarva (2009), I define an impairment of goodwill as material if it exceeds $10 million (model (1) and (2)). Alternatively, I define an impairment of goodwill as material if it exceeds 1% of the firm's total assets before the impairment (Model 3 and 4). The final sample reveals 257 (123) impairments with a magnitude exceeding $10 million (1% of total assets) compared to a number of 302 total impairments. All independent variables remain the same as those included in equation (1). Both specifications prove to be significantly positive for both the top one and the top three institutional owners, respectively.

Table 7 shows the results of the specification. The coefficients are largely consistent in magnitude with my main results. Thus, these results provide further evidence on the role of large institutional owners on necessary goodwill impairments. Furthermore, this specification represents impairments with increased economic impact, which are particularly relevant in the tension between the diverging interests of the principal and the agent. Therefore, I argue that these results reinforce monitoring by large institutional owners as a governance device reducing agency costs.

6.2. Independent variable

As the initial measure for impairment expectations is based on market values (*Btm*), I use an accounting-related measure (Return on assets) to test the robustness of the main results. I use the firm's return on assets (*Roa*) to proxy for circumstances in which goodwill has potentially lost its economic value and is consequently subject to impairment. This argument is supported by the mean difference analysis (Table 4), where impairing firms reveal a significant lower return on assets. Thus, I define an impairment of goodwill as necessary if the firm reports a return on assets below the value of minus 10%.[13] Accordingly, I create a dichotomous variable, *RoaD*, equal to 1 if the firm's return on assets is below the value of minus 10% in a given firm-year, and 0 otherwise. I adjust equation (1) by replacing the continuous variable Roa with the dichotomous variable *RoaD*. Furthermore, I replace the dichotomous variable *Btm* with a continuous variable of the firm's book-to-market ratio. All other variables remain the same as those included in equation (1). Table 8 displays the results of the replaced variable as well as for the adjusted interaction term. I continue to document significantly positive results. Considering that an accounting-related measure is somehow different from a market-related measure, I interpret these findings as supporting evidence for my primary inferences.

6.3. Excluding 2009

As a further test of robustness, I follow recent literature and perform a sample cut to exclude observations belonging to the year 2009, i.e. the year of the financial crisis. By doing so, I ensure that my results are not driven by observations incurred during this time. Indeed, the sample reveals the largest proportion of goodwill impairments in that year. Thus, it may be the case that there are exceptional conditions related to the financial crisis that impact the goodwill impairment decision. I estimate equation (1) after excluding observations from 2009. Again, the results remain significantly positive for the variables of interest. I do not tabulate these results for brevity.

7. Limitations and future research

Even though the paper provides some evidence that the largest institutional owners effectively monitor firms towards

[13] Ayres et al. (2019) use a similar approach by incorporating the continuous value of the return on assets in their interaction term as the main variable of interest.

Table 7: Robustness tests of dependent variable

Variable	Impairments >$10 million		Impairments >1% of total assets	
	(1)	(2)	(3)	(4)
Btm	0.123*** (2.65)	0.097** (2.15)	0.061 (1.27)	0.035 (0.74)
OS_Top1	0.001 (0.24)		0.002 (0.25)	
OS_Top3		-0.002 (-0.42)		0.002 (0.28)
$Btm \times OS\_Top1$	0.106** (2.32)		0.0931** (2.17)	
$Btm \times OS\_Top3$		0.111** (2.19)		0.104** (2.14)
Adjusted R-squared	0.175	0.1176	0.121	0.122
Control variables	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firm-year observations	2877	2877	2877	2877

This table presents the estimation results of a multivariate linear probability model. The table presents regression coefficients and the respective t-statistics in parentheses. p-values are two-tailed and indicated as stars according to their significance level as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered on the firm-level (Petersen, 2009). All continuous variables are standardized. All continuous variables are winsorized at the first and ninetyninth percentiles. All variables are defined in Appendix A.

Table 8: Robustness tests of independent variable

Variable	(1)		(2)	
	Coefficient	t-statistics	Coefficient	t-statistics
$RoaD$	0.176**	2.46	0.122	1.53
OS_Top1	0.002	0.29		
OS_Top3			0.006	0.74
$Road \times OS\_Top1$	0.185***	3.5		
$Road \times OS\_Top3$			0.177***	2.99
Adjusted R-squared	0.114		0.114	
Control variables	Yes		Yes	
Year fixed effects	Yes		Yes	
Industry fixed effects	Yes		Yes	
Firm-year observations	2877		2877	

This table presents the estimation results of a multivariate linear probability model. The table presents regression coefficients and the respective t-statistics. p-values are two-tailed and indicated as stars according to their significance level as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered on the firm-level (Petersen, 2009). All continuous variables are standardized. All continuous variables are winsorized at the first and ninetyninth percentiles. All variables are defined in Appendix A.

necessary goodwill impairments, I acknowledge several limitations related to this paper.

First, my results only provide an association, but not a causal relationship, between the proportions of equity shares held by the firm's top institutional owners and the goodwill impairment decision. In particular, potential endogeneity issues regarding the institutional ownership variables may bias my results. For instance, the results may be subject to a self-selection bias in the sense that institutional owners preferably invest in firms with relatively strong governance mechanisms. Because strong governance mechanisms may promote both the degree of institutional ownership concertation and the goodwill impairment decision, the results may be biased upwards. Thus, it is encouraged that future research investigates the relationship by making use of different empirical models.[14]

Second, the sample only consists of U.S. publicly listed firms, which limits the generalizability of my results. Because research results on that topic are quite diverse and vary by the country examined, further research should investigate how the results change if the analysis is conducted including multiple countries.[15] Further, because the sample is limited to firms belonging to the S&P 500, the results are only valid for relatively large firms. Therefore, one might expect a somewhat different result for smaller firms.

Third, this paper is limited to the role of institutional owners in monitoring fair value estimates of goodwill subsequent to business combinations (i.e. ex-post monitoring). One potential concern is that institutional owners may intervene prior to an acquisition takes place and thus prevent unprofitable or overpriced business combinations ex-ante (i.e. ex-ante monitoring). Based on the finding by Gu and Lev (2011) that the overvaluation of the firm's share causes managers to undertake value-destroying acquisitions, I encourage future research to shed light on the ex-ante influence of large institutional owners on business combinations and the resulting goodwill impairment charges in later years.

8. Conclusion

This paper examines the role of large institutional owners on the goodwill impairment decision when a firm shows market indications of goodwill impairment. The data used consists of 343 U.S. publicly listed firms during the period 2009 to 2019, resulting in 2877 firm-year observations. I test whether ownership concentration indicated by the share of equities held by the firm's largest institutional owners is associated with an increase of the likelihood for a firm to report a necessary impairment of goodwill. Following prior research, I define the firm's book-to-market ratio as a suitable proxy for market indications of goodwill impairment (Beatty & Weber, 2006; Francis et al., 1996; Ramanna & Watts, 2012). Hence, firms with positive goodwill on their balance sheet and a book-to-market ratio above one are expected to record a goodwill impairment.

Estimating a multivariate linear probability model, I find evidence that the largest institutional owners effectively help in diminishing the available managerial discretion in the annual goodwill impairment test through their monitoring activities in order to protect their significant investments. I am, to the best of my knowledge, the first empirically arguing that large institutional owners effectively monitor firms towards a necessary impairment decision. Therefore, there is no prior research with which I can directly compare my results.

The results for both the top one institutional owner and the cumulative share of equity held by the top three institutional owners are consistent as they provide evidence for effective monitoring towards necessary goodwill impairments. In the broadest sense, these results expand the literature on the influence of institutional ownership on financial reporting outcomes and, in particular, on the goodwill impairment decision. My results are in line with the active monitoring hypothesis and the associated theory of an increased incentive of larger shareholders to monitor the firm (Huddart, 1993; Maug, 1998; Shleifer & Vishny, 1986). Thus, large institutional owners effectively reduce agency costs by diminishing the available managerial discretion of the impairment-only approach towards the interest of shareholders. In this connection, my results provide further evidence on the finding by Callen and Fang (2013) that institutional owners prevent management from hoarding bad news. Furthermore, my results are in accordance with findings reported by Li and Sloan (2017). Their cross-sectional regression results suggest that institutional ownership leads to more timely impairment decisions. A somewhat related paper on the firm's information environment by Ayres et al. (2019) concludes that higher analyst coverage increases the likelihood of an impairment. In that vein, my results offer further evidence on the positive influence of the firm's information environment on the impairment decision, i.e. the monitoring by large institutional owners.

A common point of criticism of the impairment-only approach versus the systematic amortization approach is the lack to provide more value-relevant information with respect to the true economic value of goodwill due to managerial discretion prevalent in the annual impairment test. Against this background, my results show that monitoring by institutional owners can help to substitute the lack of the SFAS 142 regime to enforce transparency regarding the true economic value of goodwill.

Overall, this paper adds to extant academic research in two ways. In a more general context, I look at the effect of institutional ownership on firms' financial reporting behavior and find that they monitor firms towards more timely goodwill impairments. In the context of goodwill, I show that ownership concentration indicated by the share of equity held by the firm's largest institutional owner is a further determinant of the manager's goodwill impairment decision.

[14] For instance, prior studies on institutional ownership use a propensity score model in order to control for potential endogeneity issues of institutional ownership, e.g. Lindemanis, Loze, and Pajuste (2019). Alternatively, other papers use an instrumental variable two-stage least squares approach to deal with potential endogeneity issues, e.g. Callen and Fang (2013).

[15] Glaum et al. (2018) find that the strength of a country's enforcement regime affects both the timeliness and the managerial incentives related to the goodwill impairment decision.

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