

# Master thesis

*The influence of temporal anchoring devices on the relationship between employee downsizing and post-downsizing employee productivity.*

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## Abstract

Grounded in the psychological contract theory and downsizing and strategy literature, this research examines the effect of temporal anchoring devices, or TADs, on employee productivity. By viewing employee downsizing practices as a violation of the psychological contracts of employees, productivity is hypothesized to decline. TADs are hypothesized to moderate these effects, as they can provide employees perspective and therefore positively affect post-downsizing productivity. After collecting financial data for an extensive list of firms that issued social plans between 2011 and 2017, a total of 74 firms were included in this research of which the needed data was available. Furthermore, the issued social plans were analyzed using a text extractor tool of which the output consisted of the number of times a TAD was used. Overall, the findings of this research revealed that firms are able to engage in downsizing practices and improve productivity simultaneously. Also, the findings indicate that firms should use TADs in social plans, of all three categories, if they intend to increase direct- and short-term productivity, with the present TADs category having the biggest effect overall. However, the findings regarding TADs lack a level of significance in order to be generalizable. The results of this research hold relevance for companies engaging in downsizing practices, as they are provided with perspective on the essence of temporal orientation and indications of which type of TADs to use to which ends.

## 1. Introduction

Employee downsizing, which is the planned elimination of positions and jobs, has emerged as an integral part of organizational life in the past decades, as global competitive pressures have caused firms to critically assess their cost structures (Datta et al., 2013; “Strategic Responses to Crisis,” 2021). Firms often justify downsizing practices by creating the expectation that overall firm performance will increase (Datta & Basuil, 2015), as the basic reasoning behind applying employee downsizing is that by decreasing firm’s personnel costs, profits can be improved. It is therefore used as a management strategy to improve a firm’s economic situation, most often in times of economic downturn or as a response to a crisis (“Strategic Responses to Crisis,” 2021). However, it generally fails to do so and can often even lead to declining results as both inter- and intrafirm empirical research has pointed out (Aalbers, 2020; Schenkel & Teigland, 2017; Kwamboka & Nassiuma, 2017).

Being an integral part of organizational life and generating controversial results, many researchers have focused on analyzing a plethora of effects related to downsizing on outcomes, which Datta et al. (2010) summarized in an extensive review. However, this systematic review in the field of downsizing (Datta et al., 2010) showed that there is no consensus in the findings of the included researches, which could be an indication that downsizing may only be a viable thing to do in certain contexts and in a certain way (Datta & Basuil, 2015). These conflicting findings are also substantiated by more recent research, with researchers finding positive firm outcomes (Alnahedh & Alrashdan, 2021; de Meuse & Dai, 2013), no significant effects (Carriger, 2016) and negative firm outcomes (Aalbers, 2020; Schenkel & Teigland, 2017; Zorn et al., 2017) post-downsizing.

One of the areas that has received notable academic attention, is the relationship between employee downsizing practices and post-downsizing employee productivity (Baumol et al., 2005; Chalos & Chen, 2002; Chen et al., 2001; Cohee, 2019; Frone & Blais, 2020; Ifeoma et al., 2019; Kang & Shivdasani, 1997; McElroy et al., 2001). In this area, researchers also found conflicting results, as downsizing activities were found to negatively influence productivity post-downsizing (Cohee, 2019; Frone & Blais, 2020) or positively influence post-downsizing productivity compared to firms that did not engage in downsizing practices (Chen et al., 2001; Ifeoma et al., 2019; McElroy et al., 2001). Others found no significant relationship between downsizing practices and post-downsizing productivity

(Baumol et al., 2005; Chalos & Chen, 2002; Kang & Shivdasani, 1997), showing that the results are also contradictory in this area.

Something that has not yet been examined in this area, is the effect of a firm's temporal orientation on the relationship between employee downsizing activities and post-downsizing productivity. Temporal orientation is defined as the way in which firms capture time as part of its strategy (Dibrell et al., 2009). Since temporality, or time, is classified as a defining feature of strategic change, which includes employee downsizing (Kunisch et al., 2017), this provides a relevant gap for further examination. One way to grasp a firm's temporal orientation, is by analyzing the use of temporal anchoring devices, a concept which has recently been developed theoretically (Koornneef, 2021). Temporal anchoring devices, or TADs, are consciously used by firms in their time strategy regarding features, characteristics or values to their audiences and therefore it contributes to the organizational identity, as well as creating a sense of stability and continuity for internal and external audiences, during times of change and uncertainty (Yakura, 2002; Koornneef, 2021). TADs cannot eliminate this uncertainty in its entirety, but they can function as anchor points (Furnham & Boo, 2011; Gongaware, 2010; Tversky & Kahneman, 1974) and reference points (Yakura, 2002). An interesting angle of incidence regarding this subject is the planning school of Henry Mintzberg in which a goal is visualized and the strategy is planned accordingly through a formal process (Mintzberg et al., 2009). Using temporal anchoring devices can contribute to visualize the goals of a firm to employees, leading to an increase in commitment and performance (Susskind et al., 2018).

The subject of this research is very topical, as the COVID-19 pandemic has triggered many firms to apply strategic changes. The strategic management journal (2021) identified four types of responses to a crisis such as the aforementioned pandemic, being retrenchment, persevering, innovating and exit. Retrenchment refers to reductions in costs, assets or products in order to be able to survive ("Strategic Responses to Crisis," 2021), which includes the employee downsizing practices examined in this research. Many firms of varying sizes have already engaged in employee downsizing practices due to this crisis (Borden, 2020), resulting in a lot of uncertainty for employees.

Since overall firm productivity is a result of summing the individual productivity for each employee in a firm, it is relevant to incorporate a theoretical lens that can be applied to organizational as well as individual outcomes. A theory that is applied by many researchers

in the context of downsizing, is the psychological contract theory (Datta et al., 2010), specifically emphasizing the violation that occurs regarding these implicit contracts through downsizing. Violation of a psychological contract can negatively affect employee behavior and -commitment, resulting in a lower productivity and performance (Armstrong-Stassen, 1994; Dlouhy & Casper, 2021; Travaglione & Cross, 2006; van Hootegem et al., 2019). Since downsizing practices are established as a violation of psychological contracts (Rousseau & Tijoriwala, 1998), it can therefore be expected that employee productivity would decline post-downsizing. When linked to TADs however, one might expect that the provided stability during times of uncertainty caused by downsizing, could positively moderate the relationship between downsizing practices and employee productivity, as the employees are provided with long-term perspective (Yakura, 2002).

To fill the mentioned gap, this research examines whether a firm's usage of TADs influences the relationship between employee downsizing and post-downsizing employee productivity. In order to do so, an extensive dataset of publicly known downsizing cases in the Netherlands is used. These downsizing cases have been identified by collecting social plans, which are commonly written during a downsizing process (Aalbers & Dolfsma, 2014). Of these downsizing cases, relevant firm financial information was captured in order to be able to calculate employee productivity. Furthermore, temporal anchoring devices were captured by analyzing the social plans that were released surrounding the downsizing practices. The results will provide firms with relevant insights regarding the importance of temporal orientation and usage of TADs during times of strategic change, making them able to strategize accordingly.

## 2. Literature review and hypothesis development

In this part of the research, the concept of downsizing and its relationship with firm performance will be discussed firstly by reviewing recent literature. Next, the theoretical lens will be further explained, after which the current literature regarding the effect of employee downsizing practices on behavior and productivity is discussed. Then, the importance of time in strategy is elaborated upon and the concept of temporal anchoring devices and its functions are explained. Finally, the research question and the conceptual model of the research will be provided.

### 2.1 Employee downsizing and post-downsizing performance

#### 2.1.1 The key concepts

Employee downsizing can be described as a “planned set of organizational practices and policies that are aimed at reducing the workforce, with the goal of improving firm performances” (Chhinzer & Currie, 2014; Datta et al., 2010). It has been around for many years and has become one of the most popular radical management strategies to cut labor costs and restructure within an organization (Tsai & Yen, 2008).

The economic rationale behind executing employee downsizing in order to improve firm financial performance, assumes that profits can only be achieved when revenues exceed costs (Cascio et al., 2021). This means that in order to achieve an improved firm financial performance, a firm would have to increase revenues, decrease costs, or combine both. Since future revenues are not easily controllable and predictable, firms are often seeking to increase performance by eliminating costs through a reduction of the workforce and therefore its labor costs (Cascio, 2005). By doing so, eroding profitability is diminished and the likelihood of future profitability is increased. According to the economic rationale, executing an employee downsizing strategy would therefore positively influence firm performance. However, after conducting a comprehensive review of literature on downsizing, Datta et al (2010) concluded that the results of these researches have been mixed and equivocal. Besides the financial performance, the review also showed that neither efficiency or productivity was enhanced as well, which was confirmed by various researchers (Cascio, 1993, 2005; de Meuse & Dai, 2013; Guthrie & Datta, 2008; Trevor & Nyberg, 2008). These equivocal findings indicate that the effects of employee downsizing

practices on firm performance are complex and subject to contextual factors, as firms are experiencing contradictory results.

Over the last decade, various researchers further examined the relationship between employee downsizing practices and post-downsizing firm performance, using different moderating variables (Cascio et al., 2021; Chhinzer & Currie, 2014; de Meuse & Dai, 2013; Goesaert et al., 2015; Kawai, 2015). In the next part of this paragraph, several of these researches will be reviewed upon in order to provide an overview of recent developments.

#### 2.1.2 The antecedents of downsizing and post-downsizing firm performance

First of all, building on the findings of Datta et al. (2010), Cascio et al. (2021) identified six key antecedents that play a role in downsizing, all with varying magnitudes and results. Also, a distinction was made between different forms of downsizing, identifying three categories: assets, employees and a combination of both. The six antecedents identified in this research are company performance, managerial foresight, economy performance, political uncertainty, technology or productivity changes and industry effects (Cascio et al., 2021). After a thorough analysis of 61853 sets of observations for 4627 companies, it was concluded that downsizing is discouraged in the contexts of a high company performance, a well performing economy or industry and political uncertainty. Moreover, the research of Cascio et al. (2021) concluded that post-downsizing performance is lowest for firms that solely engage in employee downsizing practices, whereas a combination of both assets generates the best performance. On the contrary, the combination downsizers experience the greatest losses, with employee downsizers experiencing the best results in this area.

#### 2.1.3 The effects of downsizing on firm financial performance

De Meuse & Dai (2013) also examined the effect of downsizing on financial performance over time. In this research, downsizing activities are captured in times of economic prosperity, eliminating the question whether declining results can be attributed to employee downsizing or a worsening economic situation. The results added to the discussion of downsizing generating conflicting results, as the downsizing companies were outperformed by non-downsizing companies on the short term. On the long term however, the differences between the two diminished and some firms that engaged in downsizing even generated positive outcomes (de Meuse & Dai, 2013). Another research focusing on the relationship between employee downsizing and financial performance, is the research of Chhinzer and

Currie (2014), which uses rationale as a moderator. In this research, a distinction is made between positive and negative financial outcomes. Positive financial outcomes include lower overhead costs, a decrease in bureaucracy, improvements regarding the speed of decision-making and long-term improvements (Bruton et al., 1996; Espahbodi et al., 2000; Perry & Shivdasani, 2005). The negative financial outcomes of employee downsizing regard the short-sightedness and arbitrariness, the production of largely negative outcomes and the negative effects on long-term financial performance (Cascio et al., 1997; Guthrie & Datta, 2008; Scott et al., 2011). This research finally concluded that the reason why firms engage in downsizing affects post-downsizing financial performance, which is supported by the reports of Goesaert, Heinz & Vanormelingen (2015) and Kawai (2015).

Overall, by looking at this recent literature regarding downsizing and its effect on firm performance, it can be implied that there are many different contextual variables that influence the relationship with post-downsizing firm performance. This key concept, the performance of a firm, can be subdivided into two crucial dimensions: profitability and productivity (Bottazzi et al., 2006). This research focuses primarily on the productivity dimension and whether or not this is affected by employee downsizing practices.

#### 2.1.4 The effects of downsizing practices on employee productivity

Regarding the effects of downsizing practices on post-downsizing employee productivity, earlier researches also showed conflicting results (Baumol et al., 2005; Chalos & Chen, 2002; Chen et al., 2001; Cohee, 2019; Frone & Blais, 2020; Ifeoma et al., 2019; Kang & Shivdasani, 1997; McElroy et al., 2001). For example, Chen et al. (2001) found an increase in post-downsizing productivity, as profit margins and labor productivity increased. Moreover, downsizing firms were found to achieve an increase in corporate focus, contributing to the rising productivity (Chen et al., 2001). On the contrary, Frone & Blais (2020) found a decline in employee performance, which can be attributed to an established decrease in 9 out of 12 examined work conditions. Besides these two consequences, other researchers found no significant relationship between downsizing and post-downsizing employee productivity (Chalos & Chen, 2002; Kang & Shivdasani, 1997).

Overall, various researches in this area indicate that employee performance, or productivity, is an outcome of employee behavior and commitment, something which is affected by downsizing practices (Baumol et al., 2005; Cohee, 2019; Frone & Blais, 2020;

Ifeoma et al., 2019; McElroy et al., 2001). This is often linked to a violation of the psychological contract theory, which became evident in the extensive literature review of Datta et al (2010). This concept will be further elaborated upon in the following paragraph.

## 2.2 Psychological contract theory

Psychological contract theory originated in 1960 (Argyris, 1960), after which it was further developed by an American academic: Denise Rousseau. The core of this theory lies in the perception of the individual that a psychological contract exists between an employer and employee (Rousseau, 2001). This psychological contract consists of the understanding, commitment and belief of the employee with the employer, meaning it is intangible in nature and reliant on the perceptions of the individual (Rousseau, 1989). The psychological contract reflects the perceptions of each party regarding the agreed upon obligations, and can be seen as a contract with real power, as individuals are expected to act according to what they perceive is agreed upon (Rousseau, 1989). Furthermore, researchers Kickul and Lester (2001) established several dimensions of the psychological contract, which are the relational contract, employer employee relationship, emotional affinity, transactional relationship and internal advancement (Kickul & Lester, 2001). If a psychological contract were to be violated by an employer, no legal consequences will occur as it does not physically exist, but it can negatively affect employee commitment (van Buren, 2000).

Building on that statement, Robinson (1996) stated that since psychological contracts are critical to the beliefs and experiences of employees, a violation of these contracts will have important consequences for the attitudes and behaviors of a firm's employees. Aspects of employee behavior that are affected by psychological contract violation are trust, job satisfaction, turnover intention, obligation sense and performance (Robinson, 1996; Robinson & Morrison, 2000; Robinson & Rousseau, 1994). As these effects are all negative in nature, it is crucial for firms to understand and manage these psychological contracts in order to achieve a high level of employee commitment and warrant performance (Robinson & Morrison, 2000).

In the context of downsizing, psychological contract theory is often applied in order to be able to examine the influence these activities have on individuals and groups within a firm (Datta et al., 2010). Marks and De Meuse (2005) posit that downsizing should, in principle, improve competitiveness without impairments to a firm's ability to execute its

strategy. However, since contract terminations are decisions that affect the lives of people, it can be seen as a painful and difficult process (Marks & de Meuse, 2005). After the downsizing process has occurred, the remaining team leaders are expected to accomplish the same, or even more, with less resources. This can, in general, threaten the self-esteem and sense of fair play of the remaining employees (Marks & de Meuse, 2005), affecting commitment. This was supported by Zorn et al. (2017), who posited that surviving employees can experience a variety of adverse effects, such as decreased morale, insecurity about their job and increased stress and burnout (Probst et al., 2007; Shaw et al., 2005). Furthermore, post downsizing work environments come with a high level of conflicts regarding roles (Lewin, 2001) and a higher level of distrust in the firm (Brockner et al., 2004). All of these reactions can together be seen as the 'survivor syndrome' (Appelbaum et al., 1997), which relates to the behavior of the employees that are still working for a firm post-downsizing. Overall, this indicates that downsizing practices are often seen as a violation of the psychological contract by the survivors of downsizing as well as the victims (de Meuse et al., 2004; Rousseau & Tijoriwala, 1998).

Table 1 shows the result of a literature research that was conducted regarding the topic of the psychological contract theory in relation to downsizing. As can be seen in the 'type of finding' column, many aspects have been examined in the context of psychological contract theory post-downsizing, varying from performance indicators, to employee behavior and productivity, to firm perception. The common thread in all of these researches is that downsizing is very likely to affect post-downsizing employee behavior, due to clear indications of violation of psychological contracts. For example, Hopkins (1999) found that downsizing ethics are important, as unethical downsizing practices can lead to a decline in productivity and morale, which can be attributed to a decline of trust in the employer. This is confirmed by Kickul (2001), who found that employees whose employer did not fulfill certain promises, which can be seen as a violation of the psychological contract, had negative feelings towards the employer, negatively affecting motivation. Other researchers found a relationship between psychological contract violation and turnover intention (Arshad, 2016), innovative behavior (Niesen et al., 2017) and organizational citizenship behavior (Chahar, 2019). Overall, this table gives us a clear indication of how downsizing practices violate the psychological contract as well as the effects it has on post-downsizing indicators.

Table 1: Psychological Contract Theory (PCT) literature

	Sample	Type of Finding	Findings
(Hopkins & Hopkins, 1999)	209 individuals forming a total of 5 groups that were affected by downsizing practices	<i>Productivity and morale</i>	Groups affected by downsizing hold different perceptions regarding the downsizing ethics. Downsizing practices that are perceived to be unethical can lead to a productivity and morale decline.
(Andreicovici et al., 2020)	21.525 firm observations, with 2.163 unique firms. 1.316 firms reported LLD's (Large Labor Dismissals), with 706 firms reporting multiple.	<i>Firm perception</i>	Firms are effective in shaping behavior post-LLDs. The stakeholder perception of firms that manage earnings before LLDs is not affected post LLDs .
(Kickul, 2001)	322 employees enrolled in a part-time Business Administration course	<i>Feelings of injustice, Motivation</i>	Employees that perceived that the employer did not fulfill promises that were made, had negative feelings towards the employer (anger, frustration, disappointment, hostility). Motivation is also negatively affected by unfair processes and treatment.
(Dlouhy & Casper, 2021)	4.511 interviews were conducted, with 3.865 individuals participating from selected regions in Germany.	<i>Employee engagement and strain</i>	Psychological health is affected by downsizing, mediated by insecurity and work overload. Physical health is scarcely affected. Employee engagement is affected by downsizing, mediated by support and development opportunities.
(Love & Nohria, 2005)	The 100 largest industrial firms in the United States in 1977.	<i>Firm performance</i>	Downsizing has no main effect on firm performance, however slack, scope and timing were related to post-downsizing performance.
(Arshad, 2016)	281 downsizing survivors were surveyed in two phases.	<i>Turnover intention</i>	Violating a psychological contract is positively related to the post-downsizing turnover intention of employees. This relationship is moderated by cultural value orientations.
(Niesen et al., 2017)	Online questionnaire which, after data cleaning, resulted in a sample of 190 filled out questionnaires by employees.	<i>Job insecurity, innovative behavior</i>	No relationship between job insecurity and innovative behavior. Psychological contract breach mediates between job insecurity and innovative behavior and is positively associated with job insecurity. Uncontemplated, psychological contract breach was also positively related to innovative behavior.
(Chahar, 2019)	221 employees filled in a questionnaire regarding their Organizational Citizenship Behavior	<i>OCB</i>	A positive correlation exists between the psychological contract and OCB. The psychological contract is a strong predictor of OCB, indicating that management need to make sure that these contracts are fulfilled.

Overall, by applying this theory in the context of this research, the following expectation is created. Since downsizing practices are seen as a violation of the psychological contracts that exist between employees and firms, which can result in a lower productivity, it can be expected that firms will experience a lower level of employee productivity post-downsizing. This can be attributed to the earlier mentioned negative effects on employee satisfaction, commitment, behavior, trust, job security and morale. This will be further elaborated upon in the next paragraph, after which the first hypothesis will be stated accordingly.

### 2.3 Effects of employee downsizing practices on employee satisfaction, behavior and performance

Building on the previous paragraphs, we now review how downsizing practices affect post-downsizing employee satisfaction, behavior and performance and how this is related to

productivity. Employee satisfaction is suggested by studies to have a crucial role in a firm’s ability to achieve financial goals (Chi & Gursoy, 2009; Koys, 2003). The logic behind this, is that if a company treats its employees well, the employees will treat customers well. According to Chi & Gursoy (2009), customers have better experiences with organizations that have high employee satisfaction and engagement. Also, satisfied employees have a higher chance of being motivated and hardworking compared to dissatisfied employees, increasing productivity and allowing firms to achieve a better overall financial performance (Chi & Gursoy, 2009).

Furthermore, employee satisfaction leads to commitment, which can be distinguished into three antecedents. These antecedents of commitment are emotional attachment and belief, perceived economical value and ethical reasons of obligation to organization (Meyer et al., 1993). However, the level of commitment of an employee is perceived to be subject to the organizational context and therefore affectable by organizational changes (Chen & Indartono, 2011). Several researches have focused on the effects of change on employee commitment, where Perish et al. (2008) found that short-term opportunities lead to employees adjusting their behavior to respond. Also, when firms face uncertainty, different types of strategies would be adopted to retain competitive advantage (Desarbo & Grewal, 2008). By reacting differently to various situations at the organizational level, employee behavior within the firm would also be affected (Elias, 2009), negatively affecting productivity and consequently financial performance.

Linking the previous to the concept of downsizing, Marks and De Meuse (2005) identified eleven reactions to downsizing practices, which can be divided into two categories: psychological reactions and behavioral reactions. The eleven reactions identified can be found in the table below:

*Table 2: Reactions to employee downsizing practices (Marks & De Meuse, 2005)*

<b>Psychological reactions</b>	<b>Behavioral reactions</b>
<i>Survivor syndrome</i>	<i>Working harder, not smarter</i>
<i>Loss of confidence in management</i>	<i>Lack of direction</i>
<i>Heightened cynicism</i>	<i>Risk avoidance</i>
<i>Decreased morale</i>	<i>Role ambiguity</i>
<i>Dismal outlook</i>	

<i>Loss of control</i>	<i>Political behavior and loss of team play</i>
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All of the reactions identified in table 2 negatively influence the post-downsizing performance of employees (Marks & de Meuse, 2005). The psychological reactions are mostly related to the overall commitment of the remaining employees to the firm, whereas the behavioral reactions can be seen in the context of the way of working. Overall, Marks and De Meuse (2005) posit that it is crucial for managers to limit the psychological and behavioral reactions by preparing employees in advance, involve them, communicate open and honestly, provide a long-term vision, address the emotional side of the resizing process and take a long-term perspective. The negative effects of downsizing on employee commitment were substantiated by Lee & Corbett (2005), who found that when the downsizing practices increased in severity, the affective commitment post-downsizing would also be lower, resulting in a lower performance (Lee & Corbett, 2005).

When looking at the psychological contract theory in the context of downsizing, Rousseau and Tijorwala (1998) established that downsizing practices are often seen as a violation of the psychological contracts that exist between the employers and employees. This can generally be associated with the negative implications mentioned above, resulting in a lower productivity (Armstrong-Stassen, 1994; Travaglione & Cross, 2006). Overall, based on the literature review conducted in the first three paragraphs and by using the psychological contract violation theory as a lens, we can establish that engaging in downsizing practices can result in lower employee productivity. Therefore, the first hypothesis this research aims to examine is:

*H1: Engaging in employee downsizing practices negatively affects employee productivity post-downsizing*

## 2.4 Downsizing as a strategic change and the essence of time in strategy

### 2.4.1 The concept of strategic change

Strategic change is defined by Kunisch et al (2017) as a multifaceted and dynamic process involving various actors, which allows firms to seize opportunities or cope with threats in order to remain or become competitive. This relates to the concept of downsizing which, as was thoroughly explained in the previous paragraphs, is a process that is executed in order to cut

costs or reduce firm size with the aim of improving profitability. By comparing the definitions of these two concepts and the content of the previous paragraphs, it is possible to conclude that downsizing can be seen as an influential form of strategic change. Furthermore, when looking at strategic change in relation to firm performance, Boeker (1997) argued that strategic change is triggered by low performance, as the change is needed in order to turnaround the performance (Boeker, 1997). This also complies with researches conducted in the downsizing rationale area (Chhinzer & Currie, 2014; Goesaert et al., 2015; Kawai, 2015), which concluded that downsizing practices are most often executed as a result of low firm performance. Overall, as downsizing can be classified as an influential form of strategic change, it is important to elaborate on a crucial aspect of strategic change, namely time, and how it could be managed in strategy (Kunisch et al., 2017).

#### 2.4.2. The importance of time in strategy during strategic change

According to a systematic literature review regarding the aspect of time in strategic change by Kunisch et al (2017), time can be seen as a defining feature of all change of which the relevance can be divided in three key elements. The first element, which is the element this research mainly focuses on, regards the relationship between time and phenomena, because time is central to strategy, performance and survival (D'Aveni et al., 2010; Eisenhardt & Martin, 2000). Important aspects in this element are the moment when strategic change occurs, how frequently it occurs, the pace of change and the sequence of change (e.g. (Ancona & Chong, 1996; Huy, 2001; Huy & Mintzberg, 2003). The other two elements regard the cruciality of time to theories and methods of strategic change research, as time considerations and assumptions can be seen as crucial in reviewing what is known about strategic change (Kunisch et al., 2017). Furthermore, the review identified six pathways for future research, being temporality, actors, emotionality, tools and practices, complexity and tensions. All of these pathways are individually elaborated upon in the review, whereas this research is focused on further examining the pathway of tools and practices in order to be able to manage time (Kunisch et al., 2017). This will be further elaborated upon in the next paragraph, in which a tool will be introduced and thoroughly explained.

Furthermore, the way in which firms capture time as part of their strategy, is called the temporal orientation of the firm (Dibrell et al., 2009). According to Vinton (2011), this regards the way time related beliefs and attitudes that exist in a firm affects the responses to

challenges or opportunities in a time-based economy (Vinton, 2011). Ofori-Dankwa and Julian (2001) established in their review of various temporal orientations of firm, that a lack of temporal orientation in changing environments leads to threats regarding drift and stagnation, resulting in negative implications for overall firm performance (Ofori-Dankwa & Julian, 2001). Linking this to the concept of employee downsizing, this indicates that the temporal orientation of a firm can be seen as crucial whilst engaging in downsizing practices.

Linking the essence of time in strategy to the psychological contract theory and individual employee productivity, the planning school of Henry Mintzberg (Mintzberg et al., 2009) provides an interesting angle of incidence. The core of this strategy school lies in the fact that strategy formation is considered to be a formal process (Mintzberg et al., 2009), in which managers visualize a certain goal they would like to achieve and with this clear direction, plan the strategy accordingly. This provides employees of the firm with perspective and, if the employees are included in decision-making and communicated with effectively, also an increase in commitment and therefore performance (Susskind et al., 2018). Psychologically speaking, a future horizon point in times of uncertainty or strategic change, provides the sense of stability and continuity (Yakura, 2002) and therefore commitment. As psychological contracts are theorized to be violated by downsizing practices (Rousseau & Tijoriwala, 1998) and the temporal orientation of a firm is crucial during times of change (Ofori-Dankwa & Julian, 2001), this research therefore examines whether the temporal orientation of a firm moderates the relationship between employee downsizing practices and post-downsizing employee productivity. This leads to the second hypothesis of this research, which is:

*H2: The relationship between downsizing practices and post-downsizing employee productivity is moderated by the temporal orientation of a firm*

## 2.5 Temporal Anchoring Devices (TADs)

### 2.5.1 The concept of Temporal Anchoring Devices (TADs)

As mentioned in the previous paragraph, the essence of time is crucial in strategy. This is confirmed by Crilly (2017), who stated that construing the future is one of the core issues in strategy (Crilly, 2017). When construing the future, organizations are likely to use spatiotemporal language, which regards references to space and time. Using such references

to describe the future is done consciously by firms, as they can be seen as guidance in helping people grasp intangible constructs such as time (Lakoff & Johnson, 1980). One of the tensions firms often face regarding managing the future is the tension between a short-term and long-term orientation (Litov et al., 2012). Most of the times, when facing a dilemma between short- and long-term objectives, decisions are made based on the incentives that are known beforehand (Coles et al., 2006). However, firms do not always decide rationally, which is why the subjectively constructed nature of time can be seen as relevant in examining why certain strategic decisions are made and how these decisions affects people (Kaplan & Orlikowski, 2013; Mone & Bluedorn, 2003).

Furthermore, Hodgkinson (1992) noted that the perception to which extent people are able to influence events and their outcomes, prompts long-term planning and action (Hodgkinson, 1992). Bandura (2015) added that if people do not believe that they are capable of producing certain effects or that their actions will cause undesired effects, there is little to no incentive to act (Bandura, 2015). When placed in the context of downsizing, this would mean that the employees that survived the downsizing practices and whose psychological contracts could have been violated, would have to be provided realistic and achievable goals for the future as an incentive for working.

Recently, these references to time have been conceptualized by Koornneef (2021) as 'temporal anchoring devices'. Temporal anchoring devices, or TADs, are short references to a certain point in time (Koornneef, 2021). These references are often, but not necessarily, accompanied by a descriptor, which provides a conceptual and empirical link to time reckoning and the level of organizational practices. According to Bergmann (1992), time reckoning is the choice of temporal reference points and time measurement (Bergmann, 1992). A very common example of a TAD is the use of "*since year*" and "*in month*" in strategy, specifically referring to a certain point in the past, present or future (Koornneef, 2021).

According to the conceptualization of TADs by Koornneef (2021), the 'temporal' in TADs is a reference to an explicit, either visual or textual, point in time. This is possible in different forms, i.e. a certain year, date, clock, season, month etc. The 'anchoring' part of TADs refers to the grounding function, which makes the reference explicit. By doing so, a certain reference point in the past, present or future is highlighted, offering the audience the possibility for evaluation and interpretation. Finally, the 'device' part of TADs can be seen as

the part that creates intentionality in using it. This implies that a firm can choose to use TADs as a strategic device, stop using them, or abstain from using them in strategy in its entirety (Koorneef, 2021).

#### 2.5.2 Past, present and future TADs

First of all, past TADs refer to a certain point of time in the past, which can be a very distant past or a recent past (Koorneef, 2021). Most of the time, these TADs refer to the foundation date of the firm, but it can also be to other key events in the past, i.e. the opening of a second establishment, the implementation of a new production method or the winning of an important award. Using past TADs creates a temporal horizon in the past as well as the future, with the older the organization, the further the audience is capable of looking into the future (Flaherty, 2002; Noyes, 1980). This area of research was also touched upon by Ravasi et al (2019), who identified three different modes of engagement with history and identity, being identity stewardship, identity evangelizing and heritage mining (Ravasi et al., 2019). First of all, identity stewardship regards the way in which the historical artifacts can be used in order to continue them in future actions. Identity evangelizing on the other hand, can be used to highlight artifacts with noteworthy accomplishments in order to support decisions made in the present or for the future. Finally, heritage mining regards the use of artifacts that are distinctively associated with the organization in order to establish a certain culture by connecting them to memory and imagery (Ravasi et al., 2019). Overall, this shows the importance of history and the way in which past temporal anchoring devices can be used in order to construct identity. Suddaby et al. (2019) also substantiated the importance of using TADs, especially by looking at the past. He reasoned that being able to manage perceptions of the past, in the present and for the future, can be seen as a cognitive capacity that is critical for any dynamic capability. In his research, he argues that the ability to adapt to an uncertain future is based on resources acquired in the past and deployed in the present (Suddaby et al., 2020). Therefore, in order to be ready for the future, a firm must look at past TADs to improve its dynamic capabilities.

Next, present TADs refer to the present, i.e. “anno now” or “since current year” (Koorneef, 2021). These forms of TADs do not refer to longevity or survivability, but rather to being current and announcing new activities. Using present TADs can communicate a firm’s authenticity, which is the firm’s quality to be original, genuine, true, honest or real

(Beverland & Farrelly, 2010; Carroll, 2015; Gibson, 2009). Furthermore, present TADs can signal rarity and scarcity if something is only active for a given time but will cease to exist in the future (Koornneef, 2021).

Finally, future TADs, which refer to a certain point of time in the future (Koornneef, 2021). These TADs are an indication of things that will happen in the future or implying an end date, and are used to indicate what should be achieved or avoided before that given date. Furthermore, future TADs are tools that help in prospective sense-making and aid in understanding regarding necessary actions in times of change (Yakura, 2002).

### 2.5.3 Usage of TADs

Overall, the usage of TADs by firms can be subdivided in two, overarching areas (Koornneef, 2021). Firstly, TADs can be used in order to create, maintain and reinforce organizational identity. By consciously using TADs in strategy and communication, firms reference to certain points in time that are considered important, special or extraordinary. Since organizational identity is constituted of the aspects that an organization and its members deem enduring, central and distinctive (Albert & Whetten, 1985), the usage of TADs can contribute in forming this identity. Secondly, the usage of TADs can provide the sense of stability and continuity, especially in times of uncertainty and change. With the functions as anchor and reference points, TADs can mitigate consequences of uncertainty or threats, by subjectively creating the sense of certainty, stability and continuity (Koornneef, 2021). By using TADs in communication regarding strategy, firms are able to highlight positive events from the past, present or future in order to direct the focus of the audience. Consequently, possible threats or uncertainty will receive less attention (Brekhus, 1998), creating the sense of stability and continuity.

Overall, the included theory shows us that all three categories of temporal anchoring devices can positively affect several aspects that influence employee productivity. When a psychological contract violation occurs, it can therefore be expected that the relationship between downsizing and post-downsizing employee productivity is moderated by the three categories of TADs similarly and equally. Therefore, this research will examine the following hypothesis:

*H3: There is no difference in the effect of the use of past, present or future TADs on the relationship between employee downsizing and post-downsizing employee productivity*

## 2.6 Conceptual model

Overall, based on the theoretical review and identified gap, the research is focused on the following main question:

*How does the use of temporal anchoring devices in social plans influence the relationship between employee downsizing and post-downsizing employee productivity?*

Also, based on the theoretical review and main question, the following conceptual model was created which includes the three constructed hypotheses.

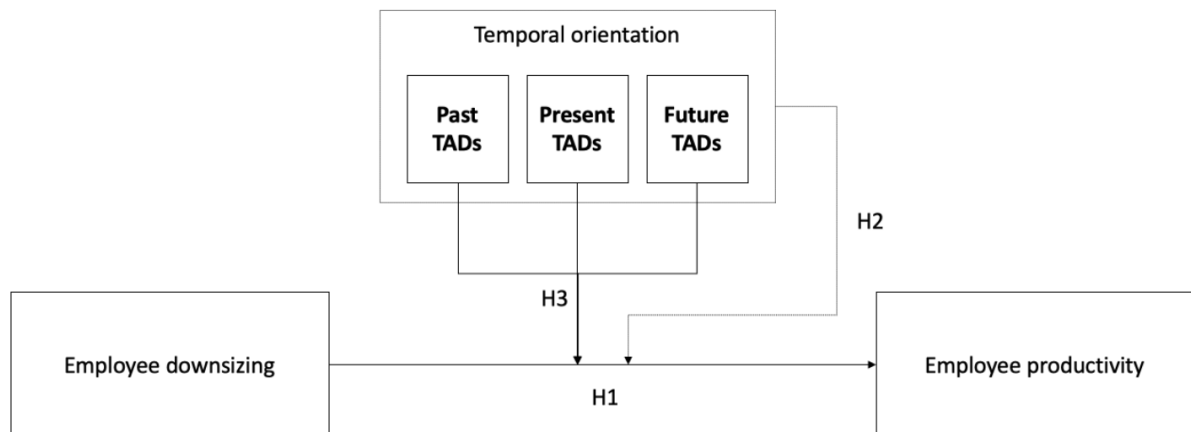


Figure 1: Conceptual model

## 3. Methods

### 3.1 Sample and data

In order to be able to test the hypotheses, a large sample of social plans by Dutch firms with a starting date between 2002 and 2020 were captured in an extensive dataset that is available within the Radboud University. In total, 1373 social plans are included in the dataset that is used in this research. This research can be seen as an extension on a working paper (van Boven & Aalbers, 2021) and prior research that used the same dataset (Aalbers & Dolfsma, 2014). This research focuses on the social plans that have a publication date between 2011 and 2017. These years have been selected as a scope due to the financial data that is needed from the included firms. As this research includes pre-downsizing productivity as a control variable and short- to medium-term results after downsizing, data is needed for 5 years surrounding the downsizing practices. By selecting this scope, the total number of included firms is substantial enough for the conducted analyses as well as limiting the amount of missing data.

Furthermore, the dataset contains financial performance data for the included firms, which was gathered from Orbis. Orbis is an extensive database for financial performance indicators of firms, providing opportunities to gather data from the past, which can be seen as an advantage. Also, the database of Orbis contains information for non-listed firms as well, which is an advantage since these firms are also included in the dataset. Overall, the data gathered in Orbis provides a respectable overview of the financial performance of the organizations included in this research, such as the Return on Assets (RoA), Return on Equity (RoE) and Total Assets (TA). These types of financial data are often used as firm performance indicators in research (Chhinzer & Currie, 2014; Datta et al., 2013; de Meuse & Dai, 2013). This existing dataset was extended by including Operating Revenue (OR) data in order to improve the overview of the included firms' performances and to be able to calculate employee productivity, which will be elaborated upon in the next paragraph. In order to be able to test all of the hypotheses, the mentioned financials of these firms post-downsizing are analyzed to up to 3 years after the social plan's publication date occurred, as well as the year prior to the publication date of the social plan. After gathering the necessary financial data related to the firms that constructed the social plans in the given time frame, a total of

74 social plans / firms remained (Love & Nohria, 2005), being sufficient for the analyses conducted.

Finally, in order to capture the firms' temporal orientation and usage of TADs, the social plans of the included firms are analyzed. These social plans contain collective arrangements and provisions for both remaining and departing personnel, which are often published following restructuring or downsizing practices (Aalbers & Dolfsma, 2014). Although not mandatory in the Netherlands (FNV, n.d.), many firms opt for a social plan to inform their stakeholders regarding the way to move forward. The contents of these social plans will be analyzed using a computer script called *TextExtractor* (Van Boven & Aalbers, 2018). This script uses certain expressions as input, in this research the operationalization of TADs, which afterwards can be searched for within the documents of the social plans. The output of these extractions will consist of the number of times TADs were used in each social plan of the firms involved, by checking these documents on the number of times the operationalizations of TADs were used.

In order to be able to test the hypotheses of this research and construct an answer to the main question, several quantitative analyses will be conducted. First of all, it is important to determine the independent variable(s) and the dependent variable. As mentioned before, this research is focused on analyzing the effect of TADs usage on the relationship between employee downsizing and post-downsizing employee productivity. In this research context, employee productivity can be seen as the dependent variable, as it is the variable that is expected to be influenced by employee downsizing practices. Below, the measures for each variable will be given and explained.

### 3.2 Dependent variable

Following prior research in the field of strategy, we examine the impact of downsizing practices on firm performance using a quantitative research method (Chadwick et al., 2004; Love & Nohria, 2005). As substantiated in the literature review, this research uses employee productivity post-downsizing as the firm performance measure, constituting the dependent variable for this research.

Productivity is generally defined as the ratio between the output- and input volume (Krugman, 1994). This is confirmed by Sichel (2019), who stated that productivity is relatively easy to measure by merely dividing a measure of real output by labor input (Sichel, 2019).

However, it can be seen as difficult to obtain accurate measures. An example of productivity measurement can be found in the article of Konrad and Mangel (2000), who measured productivity by calculating the number of sales per employee (Konrad & Mangel, 2000). In this example, the total number of sales (output) is divided by the number of employees (input). Another research that used productivity as the dependent variable calculated it as the ratio of value added to the number of employees present in the firm (Li et al., 2009), a choice that was also based on prior literature.

Consistent with these earlier researches in the field of strategy, we calculate employee productivity through dividing a type of firm output in year X by the number of employees in year X. The dataset that is used in this research does not include the overall number of services or products created by each company, which is information that is very time consuming and often not possible to gather for such a large and extensive database. However, the size of the database does improve the generalizability of the results, meaning this research will use the data available as mentioned in the previous paragraph. Therefore, the type of firm output used in this research is operating revenue, or OR, an indicator which provides us with a solid picture of the output for each of the included firms. Overall, this means that in order to capture the employee productivity variable, the yearly overall operating revenue (the output) of a firm will be divided by the number of employees that were active in that year (the input). As both of these financial aspects are included in the dataset (Aalbers & Dolfsma, 2014); van Boven, 2018; van Boven & Aalbers, 2021), it is calculated by using a simple formula, namely:

$$\text{Employee productivity} = \frac{\text{Operating Revenue (OR)}}{\text{Number of Employees}}$$

Furthermore, in order to be able to examine the effect of the downsizing practices on employee productivity, data is needed for multiple years. Therefore, this variable consists of data for three time-dimensions, being employee productivity in the downsizing year, short-term employee productivity (1 year after downsizing) and medium-term employee productivity (2 or 3 years after downsizing, depending on the available data). By including this data for multiple years, it is possible to see how the employee productivity changes over

the course of several years and the varying effect sizes of the independent variables for each year.

### 3.3 Independent variable

The independent variable in this research is employee downsizing, of which the data consists of two types: social plans and number of employees (Aalbers & Dolfsma, 2014; van Boven, 2018; van Boven & Aalbers, 2021). Downsizing firms are identified through several ways in earlier research, of which a common way is to identify the percentage of workforce reduction (Cascio et al., 1997). Another common way to identify downsizing practices is by looking at firm's news messages that announce downsizing practices (de Meuse et al., 2004). This research however, identified firm downsizing practices by collecting publicly available social plans that were released between 2002 and 2020 in the Netherlands (van Boven, 2018, van Boven & Aalbers, 2021; Aalbers & Dolfsma, 2014). As mentioned earlier, social plans are not legally mandatory to constitute surrounding downsizing practices (FNV, n.d.), but many firms opt to do this to provide clarity for their stakeholders. These social plans are needed when layoffs occur, which include allowances for dismissed employees as well as an overview of changes and a plan for the remaining employees (FNV, n.d.).

However, not all firms that publish a social plan necessarily engage in downsizing. Social plans are, as mentioned before, also constructed when a reorganization takes place (FNV, n.d.; Aalbers & Dolfsma, 2014), which does not automatically imply that the firm will lay off employees. Therefore, by comparing the number of employees in the year of the start date of the social plan to the subsequent year, we can establish which firms engaged in downsizing and which firms did not. Overall, this provides all the data that is needed for this independent variable and provides opportunities for comparison. In this research, 50 out of the initial 74 included firms engaged in downsizing, meaning 24 did not. Appendix G shows the process that was executed in order to separate the downsizing from the non-downsizing firms. This is based on a cut-off point between a negative and positive outcome regarding the relative change of number of employees for the year subsequent of the release of the social plan.

### 3.4 Moderating variable

The moderating variables included in this research are 'temporal orientation' and the three categories of TADs. These will be included for hypotheses two and three in order to examine

if there is a moderating effect on the relationship between the independent and the dependent variable. The data for these covariates will be gathered using the computer script called *TextExtractor* (Van Boven & Aalbers, 2018). After a thorough operationalization of TADs based on earlier research (Dibrell et al., 2009; Furnham & Boo, 2011; Gongaware, 2010; Kunisch et al., 2017), these expressions will serve as input for the *TextExtractor* computer script, with which the use of TADs in firms' social plans will be captured. The output of this computer script will show the number of times TADs were used in each social plan as well as the accompanying text in which a TAD was found. By counting these extracts, quantitative data is created, combined representing the moderating variables of 'temporal orientation' and the three categories of TADs.

The first moderating variable of 'temporal orientation' contains data regarding the number of times TADs are used in social plans. Temporal orientation is a concept that is difficult to measure in its entirety, as firms are able to communicate and express their temporal orientation in many different ways. Earlier psychological research related to this subject used a very large sample of social media messages of individuals in order to classify the temporal orientation through past, present and future differences (Park et al., 2017). This research will take a similar approach, by including all of the TADs categories combined, providing insight to what extent the firms are temporally oriented. The overall magnitude of TADs used in the social plans will therefore describe the temporal orientation of each firm individually, with which the second hypothesis can be tested.

The extracted TADS are manually checked for the included firms and each TAD is placed into one of three categories: past TADs, present TADs or future TADs. The past TADs category contains references to occurrences in the years prior to the year in which the social plan was released. The present TADs category contains references to the year in which the social plan was released and finally, the future TADs category contains references to occurrences in the years after the year in which the social plan was released (Park et al., 2017). Furthermore, by manually checking the extracted TADs for the included firms, irrelevant data such as i.e. dates of birth are removed from the dataset.

### 3.5 Control variables

In addition to the dependent, independent and moderating variables, this research also incorporates several control variables. These control variables, firm size, prior productivity

and type of industry, provides us with more insights regarding the examined research subjects and hypothesized relationships.

#### 3.5.1. Firm size

The first control variable used in this research, is firm size. Earlier research showed that firm size can be of influence on firm performance (Cascio et al., 2021; Jackson & Schuler, 1995; Mas-Ruiz & Ruiz-Moreno, 2011). Also, when looking at firm size in the context of psychological contract theory, earlier research found that firm size can influence the psychological contracts of employees (Atkinson & Cuthbert, 2006). Therefore, firm size is included as a control variable in this research, as it can be expected that the results differ for varying firm sizes. This variable consists of the natural logarithm of total assets for the included firms.

#### 3.5.2. Productivity prior to downsizing

In addition to measuring employee productivity post-downsizing, this research controls for prior productivity as well. Controlling for firm performance indicators prior to downsizing activities is one of the most used control variables (Cascio et al., 2021; Datta et al., 2010), as it gives room for comparison. The most common way of including this as a variable, is through data of the year before the downsizing activities occurred. Therefore, this research includes employee productivity for the year before downsizing as well, by using the same formula as for the dependent variable.

#### 3.5.3. Downsizing magnitude

Another commonly used control variable in downsizing research is downsizing magnitude (van Boven & Aalbers, 2021; Brauer & Laamanen, 2014; Love & Nohria, 2005), which regards the percentage of employees that were laid off due to the downsizing practices. By using data regarding the number of employees of the firms for the year in which the downsizing occurred ( $t$ ) and the subsequent year, the downsizing magnitude is calculated using the following formula:

$$\text{Downsizing magnitude} = \frac{\text{Number of employees } (t + 1) - \text{Number of employees } (t)}{\text{Number of employees } (t)}$$

#### 3.5.4. Type of industry

Finally, in order to establish if there are differences in results for various types of industry, the type of industry for the included firms is controlled for. As industries often differ in performance (Datta et al., 2005) as well as it being one of the most common control variables in downsizing literature (Datta et al., 2010) it is included in this research.

#### 3.6 Research model(s)

In order to examine the effects of the earlier mentioned moderating variables, the following two research models are created. Both research models will be analyzed using an ordinary least square analysis for all three dependent variables. Therefore, this analysis is conducted a total of 6 times. The equations for the research models, which include all of the variables discussed above, can be found below:

##### **Research model 1: Temporal orientation (TADs)**

Productivity =  $\beta_0 + \beta_1$  Prior productivity +  $\beta_2$  Downsizing magnitude +  $\beta_3$  Firm size +  $\beta_4$  Industry +  $\beta_5$  Downsizing +  $\beta_6$  TADs +  $\beta_7$  Downsizing \* TADs

##### **Research model 2: Past, present and future TADs**

Productivity =  $\beta_0 + \beta_1$  Prior productivity +  $\beta_2$  Downsizing magnitude +  $\beta_3$  Firm size +  $\beta_4$  Industry +  $\beta_5$  Downsizing +  $\beta_6$  Past TADs +  $\beta_7$  Present TADs +  $\beta_8$  Future Tads +  $\beta_9$  Downsizing \* Past TADs +  $\beta_{10}$  Downsizing \* Present TADs +  $\beta_{11}$  Downsizing \* Future TADs

## 4. Analysis and results

This chapter will provide the results of the performed analyses. First of all, the descriptive statistics and correlation of the data sample are provided and elaborated upon, after which the assumptions are discussed that relate to the conducted analyses. Next, the results of the analyses will be given in an extensive overview of the results.

### 4.1 Descriptive statistics

Table 1 provides the descriptive statistics for all of the included variables. These descriptive statistics can be used to provide an overview of the used data in the research models and to see if there are potential problems. Also, these statistics can be used as a basic overview to see if there are relationships between different variables (Hair et al., 2018).

Table 1: Descriptive statistics											
Downsizing		Productivityin DSZyear	ShorttermPro ductivity	Mediumterm Productivity	TADs	Past TADs	Present TADs	Future TADs	PriorProducti vity	Downsizing magnitude	Firm size in DSZ year (TA)
Non-downsizing	Mean	542.1804	510.9883	495.2495	11.83	3.25	4.42	4.17	531.4544	8.9999%	\$912,784.0373
	N	24	24	24	24	24	24	24	24	24	24
	Std. Deviation	273.14341	272.68170	282.13184	8.328	3.814	2.781	2.854	274.62751	18.22353%	\$1,579,248.58497
	Minimum	150.73	130.80	119.43	2	0	1	1	133.75	0.00%	\$11,635.49
	Maximum	858.50	824.37	890.87	34	14	10	11	859.13	89.02%	\$6,247,293.00
Downsizing	Mean	413.9332	422.2500	393.9104	11.30	2.46	5.32	3.52	389.1002	-11.5562%	\$11,962,843.9363
	N	50	50	50	50	50	50	50	50	50	50
	Std. Deviation	210.45614	220.26040	217.18640	7.305	3.098	4.093	2.206	190.81567	13.08735%	\$67,122,542.05972
	Minimum	74.09	73.20	65.69	3	0	1	1	86.64	-64.71%	\$9,759.16
	Maximum	858.50	824.37	890.87	34	12	18	12	859.13	-0.81%	\$471,529,812.77
Total	Mean	455.5269	451.0300	426.7771	11.47	2.72	5.03	3.73	435.2691	-4.8893%	\$8,379,040.7258
	N	74	74	74	74	74	74	74	74	74	74
	Std. Deviation	238.51652	240.29331	242.94494	7.598	3.341	3.723	2.434	229.57387	17.70499%	\$55,245,872.78736
	Minimum	74.09	73.20	65.69	2	0	1	1	86.64	-64.71%	\$9,759.16
	Maximum	858.50	824.37	890.87	34	14	18	12	859.13	89.02%	\$471,529,812.77

Table 2: Descriptive statistics

As can be seen in the table, a total of 74 firms are included in this research after data cleaning, which will be elaborated upon in the next paragraph. Of these 74 firms, 24 did not engage in downsizing activities, as the number of employees increased or stayed the same in the year in which the social plan was released. The other 50 firms did engage in downsizing, with an average downsizing magnitude of 11.52 percent.

When we look at the dependent variables of this research, the results indicate that downsizing initially has a positive effect on productivity, but on the medium-term this transforms into a negative effect. For the non-downsizing firms, productivity decreases for all the dependent variables. This is already remarkable, as one of the hypotheses derived from literature stated that downsizing would have a negative effect on employee productivity, but these descriptive statistics already seem to reject that.

Furthermore, an average of around 11 TADs are used in social plans, with only minor differences between the non-downsizing and the downsizing firms. Regarding the different categories of TADs, bigger differences can be noticed. As can be seen in table 1, downsizing firms tend to use less past TADs, more present TADs and less future TADs than non-downsizing firms. Whether these established differences are significant or not, will be examined by executing the ordinary least squares analyses in one of the following sections of this research.

**Correlations<sup>a</sup>**

		Productivityin DSZyear	ShorttermPro ductivity	Mediumterm Productivity	TADs	Past TADs	Present TADs	Future TADs	PriorProducti vity	Firm size in DSZ year (TA)	Downsizing magnitude	Industry
ProductivityinDSZyear	Pearson Correlation	1										
ShorttermProductivity	Pearson Correlation	.938	1									
MediumtermProductivity	Pearson Correlation	.840	.891	1								
TADs	Pearson Correlation	-.073	-.024	.015	1							
Past TADs	Pearson Correlation	-.040	-.035	-.024	.793	1						
Present TADs	Pearson Correlation	-.080	-.027	.035	.838	.436	1					
Future TADs	Pearson Correlation	-.050	.014	.025	.751	.435	.489	1				
PriorProductivity	Pearson Correlation	.923	.890	.774	-.081	-.042	-.093	-.053	1			
Firm size in DSZ year (TA)	Pearson Correlation	.055	.053	.048	-.093	-.042	-.103	-.076	-.015	1		
Downsizing magnitude	Pearson Correlation	.279	.186	.109	-.090	-.066	-.132	.013	.220	-.004	1	
Industry	Pearson Correlation	-.132	-.109	-.162	.078	.096	.113	-.062	-.042	-.001	-.055	1

a. Listwise N=74

Table 3: Correlation matrix

As can be seen in table 3, there are several correlations that violate the rule of thumb by Hair et al. (2018), who argued that no correlations should exist above the 0.90 mark. However, these violating correlations only occur between the dependent variables of productivity and the control variable of prior productivity. It makes sense that these variables correlate, as the only difference between the data is the year in which it was calculated. Therefore, these correlations are accepted for this research.

#### 4.2 Dataset preparation and assumptions

In order to be able to conduct the analyses used in this research and reflect on the relationships between the independent and dependent variables, it is important to address the underlying assumptions (Field, 2013). If one or several assumptions are violated, the results of the analyses can be compromised. However, there are a large variety of tests available to assess the assumptions and therefore minimize the chance of violation. First of all, it is important to check if the dataset is missing a substantial amount of data, after which extreme values, or outliers, that could possibly impact the results of the analyses are examined and taken care of. Next, the data is checked for correlation and heteroscedasticity, as well as multicollinearity. Finally, the variables are checked for linearity and normality to see if variables need to be transformed. All these tests are individually discussed below.

#### 4.2.1 Missing data

First of all, the missing data test will be executed. According to Hair et al. (2018) the rule of thumb for assessing missing values is a threshold of 10 percent. This means that if less than 10 percent of the values of a variable is missing, it can generally be ignored. As can be seen in Appendix D, 10 of the 76 values for the prior productivity variable were missing. These values were missing due to the financial data being no longer publicly available. As this is higher than 10 percent of the total values and it could have a serious impact on the generalizability of this research if these cases were to be deleted, these values have been replaced. For the missing values of the prior productivity variable, an estimate was calculated based on the mean productivity of the year preceding the downsizing practices and the year in which these practices occurred. By calculating the relative change between these means, we can estimate the missing data by applying the same percentage to the data that is available

#### 4.2.2. Outliers

The next test conducted in this research regards outliers. Hair et al. (2018) described outliers as unique observations that can be identified as distinctly different from the rest of the gathered data. These outliers can have a serious, positive or negative, impact on the means and standard deviations of the variables and therefore have to be examined. As can be seen in Appendix C, all three dependent variables have very high standard deviations, as well as the control variables prior productivity and downsizing magnitude. As there are quite a few extreme values, as can be seen in Appendix D, these variables have been winsorized at the 95 percentage, following the research methods of earlier research (Schulz & Wiersema, 2018). Furthermore, 2 extreme values were found regarding the extracted TADs of the included firms, as can be seen in Appendix D. As this variable is not suited for winsorization due to the related categories, the record with the highest and lowest value for TADs have been removed from the dataset, lowering the N to 74.

#### 4.2.3. Multicollinearity

Another assumption of ordinary least squares analysis, regards the interrelatedness of the independent variables, also known as multicollinearity. If multicollinearity exists between independent variables, they both correlate highly with each other and explain a similar

amount of variance in the dependent variable (Hair et al., 2018), which is not desired. In order to test for multicollinearity, the variance inflation factor, or VIF, should be between 0.1 and 10 for all of the independent variables included. As can be seen in Appendix E, none of the VIF scores exceed these thresholds for both of the research models.

#### 4.2.4. Heteroscedasticity

Another assumption that has to be checked before conducting an ordinary least square analysis, is that of heteroscedastic data. This assumption assumes that the dependent variable shows similar variance levels for the entire range of predicting variables (Hair et al., 2018). If the dispersion is unequal, the data is heteroscedastic. However, if it is equal, the data is homoscedastic and measures have to be taken in order to be able to conduct the analysis. Heteroscedasticity can be tested for by looking at a scatter plot of all the independent and dependent variables. As can be seen in Appendix E, there is no clear pattern to be noticed, indicating that the assumption for heteroscedasticity is met.

#### 4.2.5. Linearity and normality

Finally, for an ordinary least squares analysis to be conducted, linearity and normality of the model is assumed (Hair et al., 2018). If these characteristics are not present, the results of the regression analysis could experience negative effects. As can be seen in Appendix F, both the normality and linearity of the model characteristics are present for the data in this research.

### 4.3 The effect of TADs on the relationship between downsizing and post-downsizing productivity

As mentioned in the previous chapter, a total of three models will be analyzed for the three categories of the dependent variable, being productivity in the downsizing year, short-term productivity and medium-term productivity. For this research, short-term productivity was classified as the productivity in the year after downsizing and medium-term productivity was classified as the productivity in either the second- or third year post-downsizing, depending on the available data. This can be seen as a similar research method to that of Carriger (2016), who also measured the effects of downsizing on firm financial aspects over a certain amount of years post-downsizing and categorizing these effects in short-term and long-term effects (Carriger, 2016). Another research including multiple dependent variables is that of

Tangpong et al (2015). In this research, several firm outcomes are included as dependent variables related to retrenchment, in order to be able to assess multiple effects (Tangpong et al., 2015). By taking a similar approach, this research can determine if there are differences between direct effects and short- to medium-term effects of TADs, extending on these research methods (Carriger, 2016; Tangpong et al., 2015).

The first ordinary least squares analyses conducted regard research model 1. For each dependent variable, a separate ordinary least squares analysis was conducted in order to assess possible changes between the included timeframes. Firm size was excluded as a control variable, as it only showed a very small effect of no significance (Appendix H). Table 4, 5 and 6 below show the results of these regression analyses of which the most noteworthy findings will be discussed.

Dependent variable:		Productivity in Downsizing year			
Model	1	2	3	4	
(Constant)	76.262*** (0.005)	42.001 (0.203)	32.022 (0.398)	61.316 (0.160)	
<b>Control variables</b>					
Prior Productivity	0.903*** (0.000)	0.919*** (0.000)	0.921*** (0.000)	0.921*** (0.000)	
Downsizing magnitude	0.076* (0.096)	0.122** (0.021)	0.126** (0.019)	0.116** (0.031)	
Industry	-0.090** (0.045)	-0.096** (0.030)	-0.098** (0.028)	-0.095** (0.032)	
<b>Independent variables</b>					
Downsizing		0.093* (0.085)	0.096* (0.077)	0.002 (0.984)	
TADs			0.024 (0.591)	-0.054 (0.456)	
<b>Interaction effects</b>					
Downsizing*TADs				0.129 (0.177)	
R-squared	0.866	0.872	0.872	0.876	
Adjusted R-squared	0.860	0.864	0.863	0.864	
Num. Obs.	74	74	74	74	

Table 4: Effect of TADs on productivity in Downsizing year. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

As can be seen in Table 4, a total of 4 models were constructed in order to execute the regression analysis for research model 1. The first model includes all of the control variables, after which an independent variable is added for each subsequent model. Finally, the interaction effect is included. The top number for each variable is the standardized beta-coefficient, or  $\beta$ , which shows the effect an increase of 1 in the variable has on the dependent variable. Below that number, the significance of that effect is stated between brackets.

As for the results, we can first of all see that all of the control variables have a significant effect on the productivity in the downsizing year. Prior productivity has a very substantial and significant effect on the dependent variable. This was expected, as both variables were highly correlated with the only difference being the year in which it was calculated. Furthermore, the magnitude of downsizing also seems positively and significantly related to the dependent variable, with a small effect size. Finally, the industry control variable also shows a small, but significant negative effect on the dependent variable, indicating that the industry in which a firm operates influences the productivity.

Looking at the independent variables of downsizing and TADs, we see that for Model 2 and 3, downsizing shows a small, but slightly significant at  $p < 0.10$ , positive effect. This effect however loses most of its size and its significance in Model 4. Overall, the positive nature of this variable is surprising, as downsizing was hypothesized to negatively influence post-downsizing productivity. Furthermore, the independent variable of TADs only shows a minor positive effect for model 3 and a minor negative effect for model 4, both non-significant. This indicates that using TADs in social plans does not significantly affect post-downsizing productivity, which refutes the second hypothesis of this research. The interaction effect between downsizing and TADs is relatively small in size and non-significant, but positive in nature. Given that this is a positive effect, this indicates that firms should use TADs when downsizing. However, as the effect lacks significance, this is not generalizable.

Figure 2 below illustrates the interaction effect, showing that for the downsizing firms it is best to use many TADs, as this provides them with the best results. Interestingly, the slope of the non-downsizing firms appears to be a negative one, making the combined effect a negative one overall. Although these results are non-significant, they partially support the second hypothesis of this research that TADs usage moderates the relationship between downsizing and post-downsizing productivity.

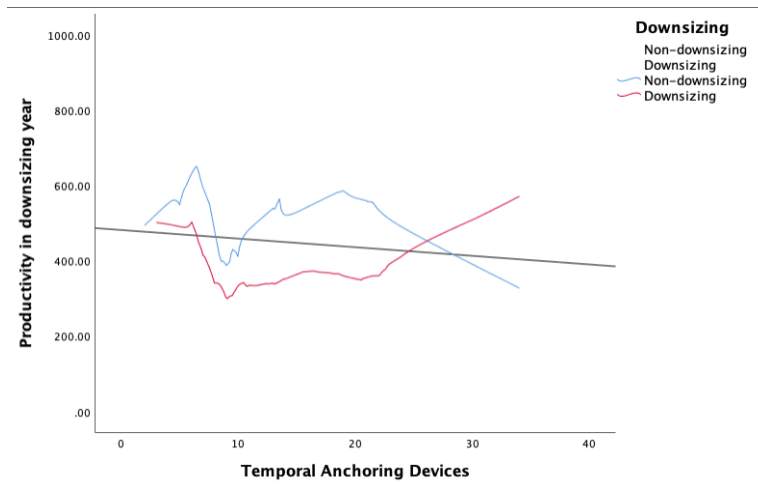


Figure 2: Interaction of Downsizing and TADs

Finally, the R-squared and Adjusted R-squared are quite high for each model, indicating that the included variables explain a large part of the variance in the dependent variable.

Table 5 below shows the exact same research model as table 4, with the only difference being the dependent variable. Instead of the productivity in the year of downsizing, this table focuses on the short-term productivity, which regards the year directly post-downsizing.

Dependent variable:	Short-term productivity			
Model	1	2	3	4
(Constant)	64.129* (0.055)	15.761 (0.696)	-12.650 (0.784)	20.813 (0.694)
<b>Control variables</b>				
Prior Productivity	0.890*** (0.000)	0.913*** (0.000)	0.919*** (0.000)	0.919*** (0.000)
Downsizing magnitude	-0.014 (0.802)	0.051 (0.418)	0.061 (0.337)	0.050 (0.436)
Industry	-0.072 (0.185)	-0.082 (0.128)	-0.087 (0.105)	-0.084 (0.118)
<b>Independent variables</b>				
Downsizing		0.130** (0.049)	0.140** (0.035)	0.033 (0.759)
TADs			0.067 (0.212)	-0.021 (0.813)
<b>Interaction effects</b>				
Downsizing*TADs				0.147 (0.206)
R-squared	0.797	0.808	0.812	0.817
Adjusted R-squared	0.788	0.797	0.799	0.801
Num. Obs.	74	74	74	74

Table 5: Effect of TADs on Short term Productivity. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

These results are quite similar to the results for the first dependent variable, with only small differences to be noticed. First of all, the only control variable that shows significance is that

of prior productivity, whereas in the previous research model all three had significant effects for all of the four models. This indicates that downsizing magnitude and industry only significantly affect productivity directly, but this significance disappears on the short-term. Also, it can be noticed that the effect sizes of the downsizing independent variable have increased, as well as the significance. Regarding the effect of TADs and the interaction effect of TADs and downsizing, only minor changes have occurred compared to the previous research model. Finally, the R-squared and Adjusted R-squared have decreased in size. For example, Model 4 had a R-squared of 0.876 in the previous research model, whereas it is 0.817 in this model. This indicates that over time, the variance in the dependent variable is explained more by other variables that are not included in the model.

Dependent variable:		Medium-term productivity			
Model	1	2	3	4	
(Constant)	97.014** (0.036)	92.179 (0.111)	55.318 (0.401)	48.929 (0.522)	
<b>Control variables</b>					
Prior Productivity	0.784*** (0.000)	0.786*** (0.000)	0.794*** (0.000)	0.794*** (0.000)	
Downsizing magnitude	-0.070 (0.357)	-0.064 (0.476)	-0.051 (0.570)	-0.049 (0.593)	
Industry	-0.133* (0.076)	-0.134* (0.077)	-0.141* (0.063)	-0.142* (0.064)	
<b>Independent variables</b>					
Downsizing		0.013 (0.888)	0.026 (0.780)	0.046 (0.762)	
TADs			0.086 (0.255)	0.103 (0.409)	
<b>Interaction effects</b>					
Downsizing*TADs				-0.028 (0.866)	
R-squared	0.621	0.621	0.628	0.628	
Adjusted R-squared	0.605	0.599	0.601	0.595	
Num. Obs.	74	74	74	74	

Table 6: Effect of TADs on Medium term Productivity. \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

In table 6, the research model is applied to the last dependent variable of this research, being medium-term productivity. Interesting to notice here is that the industry control variable shows significance again when using p<0.10, for all four models. Also, the effect sizes of downsizing, which showed a remarkable increase for the previous research model, have decreased substantially in this research model. This indicates that over time, downsizing does not affect productivity as much as it does directly and on the short-term. Regarding the interaction effect, a switch from a small positive effect to a minor negative effect can be noticed, which remains non-significant. This indicates that when looking at the medium-term productivity post-downsizing, it might be better for firms to abstain from using TADs in social plans as it negatively affects employee productivity. However, these

results remain far from significant, meaning that the results should not be generalized. Finally, the R-squared has decreased substantially for each model, going down to 0.628 for Model 4 from 0.817 in the previous research model.

Overall, when looking at the results of research model 1, few significant effects were found regarding the subject of this research. The usage of TADs in social plans by firms appears not to significantly affect post-downsizing productivity. Positive as well as negative effects were found, fluctuating for the three included dependent variables, but as these effects are non-significant these results cannot be generalized. However, significant and surprising effects were found regarding the first hypothesis of this research, which stated that downsizing would negatively affect post-downsizing productivity. As the results showed, a positive and significant effect was found in for two of the three dependent variables, refuting this hypothesis.

#### 4.4 The effect of past, present and future TADs on the relationship between downsizing and post-downsizing productivity

The results of the ordinary least square analyses for research model 2 can be found below in tables 7, 8 and 9. These analyses were conducted in a similar way to the analyses of research model 1, with a few minor changes. First of all, instead of including the overall number of TADs used for each firm, the earlier established categories are included. These categories are included in isolation in models 3 to 5, after which the interaction effects with downsizing are included in models 6 to 8 for each isolated category. Finally, model 9 shows the results of including all of the categories and interaction effects in one model. Below, the results can be found for the first dependent variable of research model 2, being productivity in the downsizing year.

Dependent variable: Productivity in downsizing year									
Model	1	2	3	4	5	6	7	8	9
(Constant)	76.262*** (0.005)	42.001 (0.203)	34.738 (0.323)	35.067 (0.326)	40.738 (0.302)	52.792 (0.158)	53.989 (0.226)	67.017 (0.138)	60.743 (0.221)
<b>Control variables</b>									
Prior Productivity	0.903*** (0.000)	0.919*** (0.000)	0.921*** (0.000)	0.920*** (0.000)	0.919 (0.000)	0.920*** (0.000)	0.923*** (0.000)	0.916*** (0.000)	0.916*** (0.000)
Downsizing magnitude	0.076* (0.096)	0.122** (0.021)	0.127** (0.018)	0.125** (0.020)	0.123** (0.022)	0.121** (0.024)	0.118** (0.029)	0.114** (0.033)	0.119** (0.032)
Industry	-0.090** (0.045)	-0.096** (0.030)	-0.099** (0.027)	-0.099** (0.028)	-0.096** (0.031)	-0.099** (0.027)	-0.097** (0.031)	-0.089** (0.048)	-0.096** (0.041)
<b>Independent variables</b>									
Downsizing		0.093* (0.085)	0.099* (0.072)	0.092* (0.089)	0.093* (0.089)	0.045 (0.506)	0.040 (0.655)	0.005 (0.956)	0.013 (0.903)
Past TADs			0.027 (0.542)			-0.045 (0.512)			-0.039 (0.731)
Present TADs				0.023 (0.606)			-0.047 (0.660)		0.050 (0.775)
Future TADs					0.003 (0.953)			-0.059 (0.387)	-0.054 (0.545)
<b>Interaction effects</b>									
Downsizing * Past TADs						0.102 (0.171)			0.088 (0.417)
Downsizing * Present TADs							0.095 (0.472)		-0.049 (0.817)
Downsizing * Future TADs								0.109 (0.232)	0.078 (0.501)
R-squared	0.866	0.872	0.872	0.873	0.872	0.876	0.873	0.874	0.877
Adjusted R-squared	0.860	0.864	0.863	0.862	0.862	0.865	0.862	0.863	0.857
Num. Obs.	74	74	74	74	74	74	74	74	74

Table 7: Effect of TAD categories on Productivity in downsizing year. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

As can be seen in table 7, similar to the previous research model, all of the control variables show significant effects for all 9 models, with the most substantial effect being that of the prior productivity variable. Furthermore, the effect of downsizing is positive for all models, whereas it is significant for models 2 to 5. Similar to the previous research model, this indicates that downsizing firms experience an increase in productivity post-downsizing. The effects of the categories of TADs are all small in size and non-significant. The category with the biggest effect is past TADs, followed by present TADs and then future TADs. However, as these effects lack significance, nothing can be concluded based on these findings. The interaction effects are also included for each category, with the future TADs category showing the biggest effect size on the dependent variable. The interaction effects of downsizing with the other two categories are not much smaller, but again, all lack significance. Also, the effects of all three categories transform to a negative effect when the interaction effects are included. Finally, model 9 shows that individually, the future TADs category affects the dependent variable most substantially, whereas the interaction effect of downsizing and past TADs can be seen as the most influential interaction effect. The three

included interaction effects can be found in Appendix I, with all three models illustrating a positive effect for the downsizing firms and a negative effect for the non-downsizing firms. This indicates that all categories of TADs have a similar effect on post-downsizing employee productivity, partially supporting the third hypothesis of this research.

Dependent variable: Short-term productivity									
Model	1	2	3	4	5	6	7	8	9
(Constant)	64.129* (0.055)	15.761 (0.696)	7.632 (0.860)	-2.978 (0.945)	-20.696 (0.664)	20.558 (0.657)	16.620 (0.759)	23.265 (0.666)	17.818 (0.766)
<b>Control variables</b>									
Prior Productivity	0.890*** (0.000)	0.913*** (0.000)	0.915*** (0.000)	0.916*** (0.000)	0.920*** (0.000)	0.914*** (0.000)	0.919*** (0.000)	0.914*** (0.000)	0.913*** (0.000)
Downsizing magnitude	-0.014 (0.802)	0.051 (0.418)	0.057 (0.379)	0.057 (0.368)	0.057 (0.369)	0.052 (0.423)	0.051 (0.434)	0.043 (0.498)	0.044 (0.499)
Industry	-0.072 (0.185)	-0.082 (0.128)	-0.085 (0.118)	-0.088 (0.103)	-0.078 (0.144)	-0.084 (0.121)	-0.086 (0.111)	-0.065 (0.218)	-0.068 (0.220)
<b>Independent variables</b>									
Downsizing		0.130** (0.049)	0.137** (0.043)	0.128* (0.052)	0.144** (0.030)	0.098 (0.237)	0.074 (0.495)	-0.002 (0.982)	0.006 (0.959)
Past TADs			0.030 (0.579)				-0.021 (0.803)		-0.034 (0.803)
Present TADs				0.061 (0.255)			-0.010 (0.937)		0.047 (0.823)
Future TADs					0.075 (0.161)			-0.026 (0.745)	-0.024 (0.820)
<b>Interaction effects</b>									
Downsizing * Past TADs						0.073 (0.428)			0.043 (0.741)
Downsizing * Present TADs							0.097 (0.542)		-0.042 (0.869)
Downsizing* Future TADs								0.181* (0.098)	0.167 (0.232)
R-squared	0.797	0.808	0.809	0.812	0.814	0.811	0.813	0.821	0.822
Adjusted R-squared	0.788	0.797	0.795	0.798	0.800	0.794	0.796	0.805	0.793
Num. Obs.	74	74	74	74	74	74	74	74	74

Table 8: Effect of TAD categories on Short term Productivity. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

Similar to the results of research model 1, the effects of the control variables have lost its significance for the dependent variable of short-term productivity, excluding the prior productivity variable. Furthermore, many of the effects have increased in size, such as the effects of downsizing, which have also become more significant. Regarding the isolated effects of the categories of TADs, a remarkable increase in size can be noticed compared to the previous model for the present- and future TADs categories, with the past TADs only showing a minor increase. Regarding the interaction effects, the most noticeable change can be found for the downsizing and future TADs interaction, with the effect increasing substantially in size and showing significance for  $p < 0.10$ . This indicates that, when downsizing, firms should use future TADs in social plans if they want to increase the short-

term productivity. Finally, regarding the R-squared and Adjusted R-squared, a similar decrease has occurred as it did in research model 1.

Dependent variable:		Medium-term productivity								
Model	1	2	3	4	5	6	7	8	9	
(Constant)	97.014** (0.036)	92.179 (0.111)	86.675 (0.161)	55.905 (0.363)	61.569 (0.369)	76.808 (0.247)	32.909 (0.667)	56.404 (0.476)	22.332 (0.796)	
<b>Control variables</b>										
Prior Productivity	0.784*** (0.000)	0.786*** (0.000)	0.788*** (0.000)	0.793*** (0.000)	0.792*** (0.000)	0.788*** (0.000)	0.790*** (0.000)	0.793*** (0.000)	0.786*** (0.000)	
Downsizing magnitude	-0.070 (0.357)	-0.064 (0.476)	-0.060 (0.509)	-0.052 (0.554)	-0.059 (0.509)	-0.056 (0.539)	-0.045 (0.620)	-0.057 (0.528)	-0.049 (0.602)	
Industry	-0.133* (0.076)	-0.134* (0.077)	-0.136* (0.076)	-0.146* (0.053)	-0.131* (0.085)	-0.136* (0.077)	-0.148* (0.052)	-0.132* (0.087)	-0.145* (0.069)	
<b>Independent variables</b>										
Downsizing		0.013 (0.888)	0.018 (0.850)	0.009 (0.923)	0.024 (0.791)	0.047 (0.688)	0.071 (0.643)	0.041 (0.792)	0.102 (0.566)	
Past TADs			0.020 (0.792)			0.059 (0.622)			-0.103 (0.596)	
Present TADs				0.118 (0.120)			0.201 (0.268)		0.302 (0.320)	
Future TADs					0.063 (0.410)			0.074 (0.524)	0.020 (0.897)	
<b>Interaction effects</b>										
Downsizing * Past TADs						-0.055 (0.672)			0.042 (0.820)	
Downsizing * Present TADs							-0.113 (0.612)		-0.208 (0.564)	
Downsizing * Future TADs								-0.021 (0.893)	-0.025 (0.901)	
R-squared	0.621	0.621	0.621	0.634	0.625	0.622	0.636	0.625	0.639	
Adjusted R-squared	0.605	0.599	0.594	0.607	0.597	0.589	0.603	0.591	0.581	
Num. Obs.	74	74	74	74	74	74	74	74	74	

Table 9: Effect of TAD categories on Medium term Productivity. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

Finally, the ordinary least squares analysis was conducted for the last dependent variable, namely medium-term productivity. Again, similar to research model 1, the significance has returned for the effects of the industry control variable. Another similarity can be found in the sizes of the R-squared and Adjusted R-squared, which have decreased to similar sizes. The similarities between these research models are logical, as they include the exact same variables with the only difference being that the TADs variable is subdivided into three categories. Furthermore, the effects of the downsizing variable have lost its significance compared to the previous model. Regarding the effects for each isolated category, the most remarkable finding regards the increase of the effect size of present TADs, nearly doubling in size as well as significance. Finally, the interaction effects have all changed from positive- to negative effects. This includes the interaction effect of downsizing and future TADs, which was slightly significant and much more substantial in size.

Overall, fluctuating results were found regarding the effects of the different categories of temporal anchoring devices, of which none were significant. The only significant effect which included TADs was found to be the interaction between downsizing and future TADs on short-term productivity. The effect size of past TADs was found to be the smallest out of the three, whereas the effects of present- and future TADs fluctuated but showed to be quite similar. The results of both research models will be further elaborated and reviewed upon in the discussion part of this research, where the results will also be linked to the hypotheses.

## 5. Discussion and conclusion

In this part of the research, the results of the analyses will be discussed, linking them to the in the literature review established hypotheses. Afterwards, the limitations and directions for future research will be discussed, after which the overall conclusion for the research will be given.

### 5.1 Discussion

Grounded in the psychological contract theory, this research examined if downsizing practices affect employee productivity and whether or not this relationship is moderated by the usage of TADs. First of all, this research contributes to the understanding of the effects of downsizing on post-downsizing firm performance, for which earlier researchers have found conflicting results. For example, De Meuse & Dai (2013) found that downsizing practices led to increased performance over time, whereas other researchers found that downsizing practices led to declining results (Aalbers, 2020; Schenkel & Teigland, 2017; Zorn et al., 2017). Regarding employee productivity, the findings were equally conflicting, with some researchers finding no negative effects post-downsizing (McElroy et al., 2001), others found an increase in productivity (Chen et al., 2001) and some did not find a significant relationship between the two variables (Baumol et al., 2005; Chalos & Chen, 2002; Kang & Shivdasani, 1997). Based on recent downsizing research in the context of the psychological contract theory, negative effects were expected regarding employee behavior, - engagement, -commitment and productivity (Andreicovici et al., 2020; Arshad, 2016; Dlouhy & Casper, 2021; Niesen et al., 2017).

The results of this research, however, showed a positive and significant effect for downsizing on short-term productivity. Also, regarding the direct effects in the downsizing year, a slightly significant positive effect was found. For the dependent variable of medium-term productivity, a non-significant and minor effect was found. These results were also substantiated by the descriptive statistics, showing a mean increase for short-term productivity and a decrease for medium-term productivity. On the contrary, the non-downsizing employee productivity means decreased for each of the established time frames. This all indicates that employee behavior and productivity are not negatively affected by the downsizing practices. Overall, these results refute the first hypothesis of the research and show support that downsizing practices lead to an increase in employee productivity.

Furthermore, this research examined if the usage of TADs in social plans moderates the relationship between downsizing and post-downsizing employee productivity. In doing so, this research furthers our understanding regarding the essence of time references in strategy. Time is established to be a defining feature of strategic change (Kunisch et al., 2017) and TADs are theorized to eliminate uncertainty and create a sense of stability and continuity for employees (Furnham & Boo, 2011; Gongaware, 2010). According to Susskind et al. (2018), TADs would also contribute in visualizing the goals of a firm to employees, which leads to increased commitment and performance (Susskind et al., 2018). This research therefore hypothesized that the usage of TADs in social plans constructed surrounding downsizing practices, would positively moderate the relationship between downsizing and post-downsizing employee productivity.

This research found confirming results for this hypothesis and earlier research, for the direct- and short-term employee productivity dependent variables. The interaction effect between downsizing and TADs was positive, indicating that a firm should use TADs in social plans if they want to increase post-downsizing productivity. On the contrary, the interaction effect was negative for the medium-term employee productivity variable. However, these outcomes all lack a level of significance, meaning that the findings cannot be generalized. This does not imply that these effects do not exist, but merely that it was not measured in the dataset used for this research.

Finally, based on earlier research, three different types of TADs were identified and examined in this research (Carroll, 2015; Ravasi et al., 2019; Suddaby et al., 2020; Yakura, 2002). The identified categories of TADs were past TADs, present TADs and future TADs, for which the effects were analyzed in isolation as well as in interaction with downsizing. By doing so, this research contributes to the understanding regarding which type of time reference is most effective to use during downsizing practices, an area that was not examined before. As each of the categories of TADs are theorized to positively affect employees (Carroll, 2015; Ravasi et al., 2019; Suddaby et al., 2020; Yakura, 2002), this research hypothesized a positive and similar moderating effect for all three categories.

The outcomes of the conducted analyses showed a small positive effect for all of the categories on all three dependent variables, with the present TADs having the largest effect overall. However, all of these effects were found to be non-significant. Regarding the

interaction effects with downsizing, positive effects were found for the direct- and short-term employee productivity variables and negative effects for the medium-term employee productivity variable. One interaction effect showed a minor level of significance when using  $p < 0.10$ , which was the effect of the interaction between downsizing and future TADs on short-term employee productivity. This indicates that, when downsizing, firms should use future TADs if they want to increase employee productivity on the short-term. Overall, even though the interaction effect plots of the three categories showed similarity regarding the nature of the effect being positive, varying effect sizes and levels of significance were present, refuting the final hypothesis of this research. Again, the fact that these results were mostly non-significant does not imply that the effects do not exist, but merely that they were not measured using this dataset. If the dataset were to be extended by including more firms or more types of communication containing TADs, significant effects might be found.

Overall, the findings of this research add to downsizing literature and provide firms perspective on the essence of temporal orientation during a downsizing process. Even though this research did not find many significant effects, managers who have to strategize a downsizing process can use this research as support for effective communication, whilst maintaining or even increasing employee productivity.

## 5.2 Limitations and directions for future research

This research has several limitations that need to be recognized and examined in future research. First of all, of the extensive dataset of 1373 social plans, only 74 were included as the needed data was not available for more. This means that the results are not entirely generalizable, as there might be very different effects and relationships to be found for the excluded firms. Also, this research focuses entirely on Dutch firms, which can be seen as a limitation. For example, Dutch culture or legislation could be influencing the results of this research. Therefore, future research should include the social plans of firms outside of the Netherlands as well, providing a higher number of research subjects and improving the overall generalizability of the research.

Furthermore, employee productivity is measured in a way that complies with the definition of Krugman (1994), but it is not entirely known what is happening regarding assets besides employees. For example, a production-oriented company could have acquired a new

machine which makes the individual employees capable of producing more products on a yearly basis, improving their productivity. In this case, the actual effects of downsizing on productivity will be difficult to capture, as this contextual factor is not included in the research. Also, number of sales has proven to be one of the most frequently used indicators of productivity (Datta et al., 2010; Konrad & Mangel, 2000) and measures the output of each employee most precise. However, as this data was not available for the included firms, another slightly less precise measure was used to capture employee productivity. Future research should therefore focus on gathering a more precise indication of employee productivity and really capture absolute sales numbers to improve the productivity variable.

Also, the research only includes social plans as a data source for TADs. There are of course many other ways a firm can express its temporal orientation and use TADs to its employees and other stakeholders, i.e. internally through email, face to face, website content and many more. However, due to the limited timeframe in which this research needs to be executed as well as the content of the already available dataset, this report only includes the data of social plans in order to establish temporal orientation and firm usage of TADs. In order to improve this aspect, future research should focus on gathering more and different types of communication to really capture all of the TADs used by a firm.

Finally, the TADs were automatically extracted by a tool that is available within the Radboud University, but the categorization of the extracted TADs was done manually. Due to the given time frame in which this research was executed, this was only done by one person. In order to improve the reliability of this aspect, future research should have multiple researchers categorize the extracted TADs and compare the results. This would improve the intercoder reliability as well as the overall reliability of the research.

### 5.3 Conclusion

Based on an extensive literature review regarding downsizing practices, the role of time in strategy and the psychological contract theory, the effects of temporal anchoring devices on the relationship between downsizing and employee productivity was examined. First of all, various researchers found downsizing practices to negatively affect post-downsizing performance (Aalbers, 2020; Schenkel & Teigland, 2017; Zorn et al., 2017). In this research, however, findings revealed that the firms that engaged in downsizing practices achieved a higher level of productivity post-downsizing than the non-downsizing firms. This indicates

that, when using the psychological contract theory as a lens, psychological contracts between employers and employees are not violated by downsizing practices, as a violation is established to lead to declining employee performances by earlier research (Hopkins & Hopkins, 1999; Love & Nohria, 2005; Niesen et al., 2017; Chahar, 2019; Dlouhy & Casper, 2021). Furthermore, the findings revealed that it is beneficial for a downsizing company to use TADs in social plans, as the interaction positively affects direct- and short-term employee productivity. These findings show empirical support for the positive effect of using temporal anchoring devices in firm communication (Yakura, 2002; Mintzberg et al., 2009; Crilly, 2017; Koornneef, 2021). Looking at medium-term productivity, this effect changes into a negative one, providing an interesting angle for future research. However, these effects were all found to be non-significant, meaning that the findings cannot be generalized. Finally, similar effects were found for the examined categories of TADs, as all interaction effects were found to be positive for direct- and short-term productivity and negative for medium-term productivity, only varying in size. This shows empirical support for earlier research, which posited that all categories positively affect performance (Yakura, 2002; Carroll, 2015; Ravasi et al., 2019; Suddaby et al., 2019; Koornneef, 2021). Again however, the results lack a level of significance for the findings to be generalized.

Overall, the findings of this research revealed that firms are able to engage in downsizing practices and improve productivity simultaneously. Also, the results of the analyses indicate that firms should use TADs in social plans constructed surrounding downsizing practices, of all three categories, if they intend to increase direct- and short-term employee productivity, with the present TADs category having the biggest effect overall. These findings hold relevance for companies engaging in downsizing practices, as they are provided with perspective on the essence of temporal orientation and indications of which type of TADs to use to which ends.

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## Appendix A: Regular Expressions used in the Text Extractor tool

<pre>^(?=.*?b(ln)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei juni juli  augustus september oktober november december\b).*\$ ^(?=.*?b(Vanaf)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei juni juli  augustus september oktober november december\b).*\$ ^(?=.*?b(Sinds)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei juni juli  augustus september oktober november december\b).*\$ ^(?=.*?b(Omstreeks)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei  juni juli augustus september oktober november december\b).*\$ ^(?=.*?b(Per)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei juni juli  augustus september oktober november december\b).*\$ ^(?=.*?b(Tot)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei juni juli  augustus september oktober november december\b).*\$ ^(?=.*?b(Na)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei juni juli  augustus september oktober november december\b).*\$ ^(?=.*?b(Op)\b)(?=.*?b(?:171819 20 21)[0-9]{2})januari februari maart april mei juni juli  augustus september oktober november december\b).*\$</pre>		<p>These regular expressions find all the references to dates, months and years in combination with various key words.</p>
<pre>^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$</pre>		<p>This regular expression finds all numerical written dates</p>
<pre>^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$ ^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$ ^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$ ^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$ ^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$ ^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$ ^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$ ^\.[0-9][0-9]-[0-9][0-9]-[0-9][0-9][0-9]\b.*\$</pre>		<p>These regular expressions find TADs through a combination of regularly used words in the Dutch language</p>

## Appendix B: Descriptive statistics without cleaning

		Descriptive statistics					
DSZ		PROD in DSZ year	Short-term PROD	Medium-term PROD	PROD prior to DSZ year	Firm size in DSZ year (TA)	Downsizing magnitude
Downsizing	N	51	51	51	45	51	51
	Mean	440.924	448.368	401.211	436.339	11728451.33	-11.3790%
	Std. Deviation	333.5463	307.2593	255.7221	365.9302	66469006.87	13.01747%
	Minimum	74.1	73.2	65.7	86.6	\$8,821.00	-64.71%
	Maximum	2199.0	1633.5	1328.3	2471.1	471529812.8	-0.81%
Non-downsizing	N	25	25	25	21	25	25
	Mean	1020.975	957.448	1070.819	1109.491	932419.4358	8.8496%
	Std. Deviation	1615.7722	1491.5508	1973.1884	1929.8864	1549111.701	17.85566%
	Minimum	150.7	130.8	119.4	133.7	\$11,635.49	0.00%
	Maximum	7882.1	6994.5	7850.6	8968.0	\$6247293.00	89.02%
Total sample	N	76	76	76	66	76	76
	Mean	631.730	615.829	621.477	650.524	8177125.049	-4.7248%
	Std. Deviation	992.4010	912.5902	1178.8985	1156.0483	54518423.7	17.50781%
	Minimum	74.1	73.2	65.7	86.6	\$8,821.00	-64.71%
	Maximum	7882.1	6994.5	7850.6	8968.0	471529812.8	89.02%

## Appendix C: Missing values & Extreme values

### Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes <sup>a</sup>	
				Count	Percent	Low	High
PRODpriortoDSZyear	66	650.524	1156.0483	10	13.2	0	5
PRODinDSZyear	76	631.730	992.4010	0	.0	0	6
ShorttermPROD_A	76	615.829	912.5902	0	.0	0	4
MediumtermPROD_A	76	621.477	1178.8985	0	.0	0	7
Downsizingmagnitude	76	-4.7248%	17.50781%	0	.0	3	3
FirmsizeinDSZyearTA	76	8177125.05	54518423.7	0	.0	0	14
DSZorNOT	76			0	.0		
IndustryDUMMY	76			0	.0		

a. Number of cases outside the range (Q1 - 1.5\*IQR, Q3 + 1.5\*IQR).

			Case Number	Value
TADs	Highest	1	55	72
		2	27	34
		3	41	34
		4	22	32
		5	23	30
	Lowest	1	70	0
		2	32	2
		3	68	3
		4	56	3
		5	51	3 <sup>a</sup>

a. Only a partial list of cases with the value 3 are shown in the table of lower extremes.

Appendix D: Multicollinearity tests

**Research model 1:**

**Coefficients<sup>a</sup>**

Model		Collinearity Statistics	
		Tolerance	VIF
1	TADs	.974	1.027
	PriorProductivity	.947	1.056
	Firm size in DSZ year (TA)	.991	1.009
	Downsizing magnitude	.945	1.058
	Industry	.991	1.009

a. Dependent Variable: MediumtermProductivity

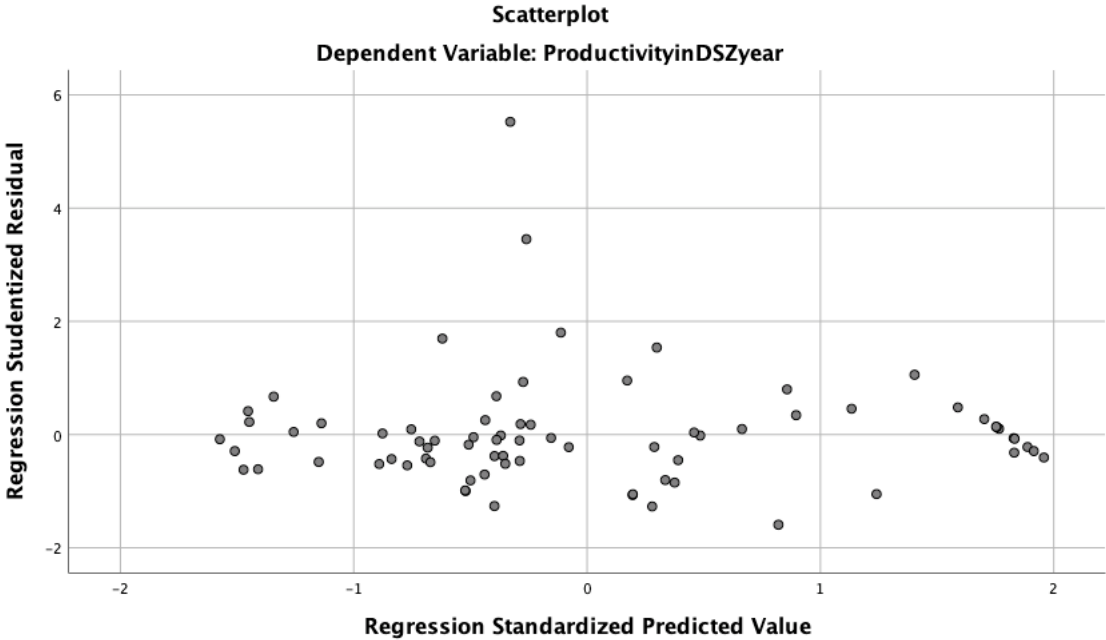
**Research model 2:**

**Coefficients<sup>a</sup>**

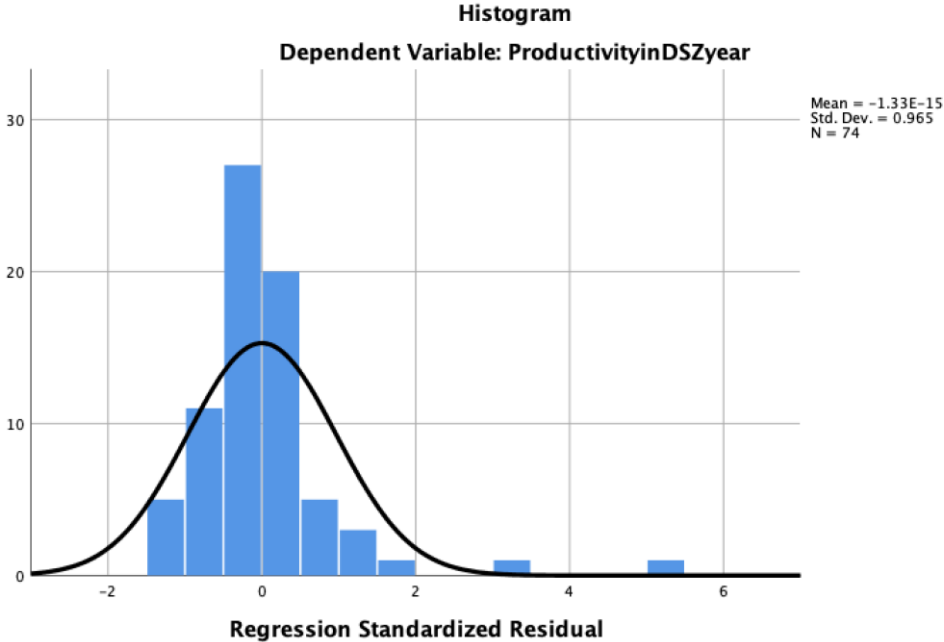
Model		Collinearity Statistics	
		Tolerance	VIF
1	Past TADs	.738	1.356
	Present TADs	.669	1.494
	Future TADs	.676	1.480
	PriorProductivity	.945	1.058
	Firm size in DSZ year (TA)	.988	1.013
	Downsizing magnitude	.929	1.076
	Industry	.959	1.043

a. Dependent Variable: ProductivityinDSZyear

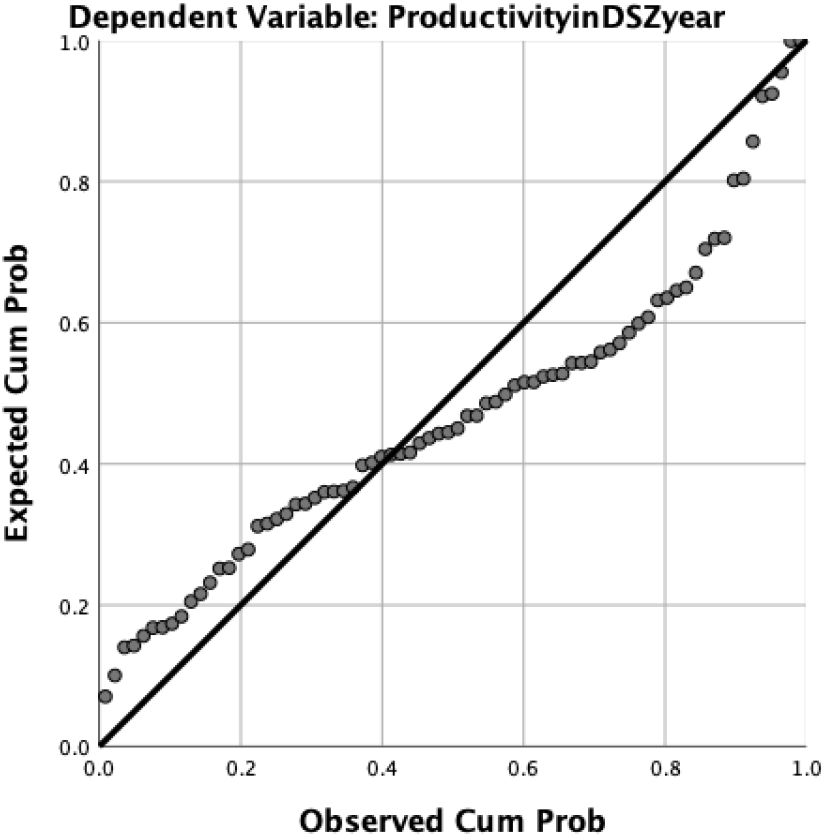
Appendix E: Heteroscedasticity



Appendix F: Normality and linearity



**Normal P-P Plot of Regression Standardized Residual**



## Appendix G: Independent variable

Since it cannot be automatically implied that a firm has engaged in downsizing practices when a social plan is published, this research distinguishes between downsizing and non-downsizing firms for the independent variable. For all of the included firms, data is available regarding the number of employees for each year surrounding the year of the downsizing practices (van Boven & Aalbers, 2021; Aalbers & Dolfsma, 2014; van Boven, 2018). In this research, a firm is regarded as a downsizing firm if the number of employees has decreased in the year following the release of the social plan. If the number of employees increased or remained equal, the firm is regarded as a non-downsizing firm. In other words, if the equation below provides a negative outcome, the firm is classified as downsizing. If the outcome is 0 or above, the firm is classified as non-downsizing.

$$\frac{\text{Number of employees } (t + 1) - \text{Number of employees } (t)}{\text{Number of employees } (t)}$$

## Appendix H: Firm size effects

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	42.409	32.411		1.308	.195
	PriorProductivity	.954	.047	.918	20.454	.000
	Downsizing magnitude	1.594	.692	.118	2.303	.024
	Firm size in DSZ year (TA)	2.657E-7	.000	.062	1.428	.158
	Industry	-11.714	5.277	-.096	-2.220	.030
	Downsizing Dummy	42.639	26.751	.084	1.594	.116
2	(Constant)	30.204	37.367		.808	.422
	PriorProductivity	.957	.047	.921	20.353	.000
	Downsizing magnitude	1.649	.700	.122	2.356	.021
	Firm size in DSZ year (TA)	2.760E-7	.000	.064	1.473	.146
	Industry	-12.003	5.317	-.098	-2.258	.027
	Downsizing Dummy	44.660	27.033	.088	1.652	.103
3	TADs	.915	1.376	.029	.665	.509
	(Constant)	62.001	42.649		1.454	.151
	PriorProductivity	.957	.047	.921	20.543	.000
	Downsizing magnitude	1.498	.701	.111	2.138	.036
	Firm size in DSZ year (TA)	2.978E-7	.000	.069	1.599	.115
	Industry	-11.592	5.275	-.095	-2.198	.031
	Downsizing Dummy	-7.736	43.986	-.015	-.176	.861
	TADs	-1.726	2.225	-.055	-.776	.441
InteractionTADsandDownsizing	4.200	2.797	.141	1.502	.138	

a. Dependent Variable: ProductivityinDSZyear

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.129	40.190		.401	.689
	PriorProductivity	.955	.058	.912	16.508	.000
	Downsizing magnitude	.648	.858	.048	.755	.453
	Firm size in DSZ year (TA)	2.395E-7	.000	.055	1.038	.303
	Industry	-10.000	6.544	-.081	-1.528	.131
	Downsizing Dummy	62.343	33.172	.122	1.879	.064
2	(Constant)	-14.398	45.865		-.314	.755
	PriorProductivity	.962	.058	.919	16.664	.000
	Downsizing magnitude	.787	.859	.058	.916	.363
	Firm size in DSZ year (TA)	2.653E-7	.000	.061	1.153	.253
	Industry	-10.723	6.526	-.087	-1.643	.105
	Downsizing Dummy	67.396	33.181	.132	2.031	.046
3	TADs	2.288	1.689	.072	1.355	.180
	(Constant)	21.480	52.487		.409	.684
	PriorProductivity	.962	.057	.919	16.776	.000
	Downsizing magnitude	.616	.863	.045	.715	.477
	Firm size in DSZ year (TA)	2.899E-7	.000	.067	1.265	.210
	Industry	-10.259	6.491	-.083	-1.580	.119
	Downsizing Dummy	8.276	54.132	.016	.153	.879
	TADs	-.692	2.739	-.022	-.253	.801
InteractionTADsandDownsizing	4.740	3.442	.158	1.377	.173	

a. Dependent Variable: ShorttermProductivity

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	92.579	57.295		1.616	.111
	PriorProductivity	.832	.082	.786	10.083	.000
	Downsizing magnitude	-.928	1.224	-.068	-.758	.451
	Firm size in DSZ year (TA)	2.607E-7	.000	.059	.793	.431
	Industry	-16.618	9.329	-.133	-1.781	.079
	Downsizing Dummy	2.482	47.291	.005	.052	.958
2	(Constant)	53.383	65.554		.814	.418
	PriorProductivity	.840	.082	.794	10.185	.000
	Downsizing magnitude	-.750	1.228	-.055	-.610	.544
	Firm size in DSZ year (TA)	2.938E-7	.000	.067	.894	.375
	Industry	-17.546	9.327	-.141	-1.881	.064
	Downsizing Dummy	8.970	47.425	.017	.189	.851
3	TADs	2.938	2.414	.092	1.217	.228
	(Constant)	49.599	76.083		.652	.517
	PriorProductivity	.840	.083	.794	10.110	.000
	Downsizing magnitude	-.732	1.250	-.053	-.585	.560
	Firm size in DSZ year (TA)	2.912E-7	.000	.066	.876	.384
	Industry	-17.595	9.410	-.141	-1.870	.066
	Downsizing Dummy	15.205	78.467	.029	.194	.847
	TADs	3.252	3.970	.102	.819	.416
InteractionTADsandDownsizing	-.500	4.990	-.016	-.100	.921	

a. Dependent Variable: MediumtermProductivity

Appendix I: Interaction effect plots of the TADs categories

