



THE EFFECT OF TELEWORK ON JOB SATISFACTION

The distinction between the private and the public sector, including other sectoral differences.

Abstract

In this thesis, I examined the relationship between telework and the level of job satisfaction. Especially, by making a distinction between teleworkers in the private and public sector in search of sectoral factors that may influence the effect of telework on job satisfaction to be more profound in one of these sectors. In order to investigate this effect, I used data from the Dutch Labor Supply Panel from the year 2012 to perform ordered logit models. After controlling for certain aspects of job satisfaction and personal characteristics, I find statistical support for the positive effect of telework on the level of job satisfaction. In line with the interpretation of an ordered logit model, this suggests that employees that telework are more likely to be in a higher level of job satisfaction. However, including a distinction between teleworkers in the private and the public sector appears to show no statistical significant differences between these sectors. Checking for sectoral differences among teleworkers on the level of job satisfaction seems to show little to no evidence.

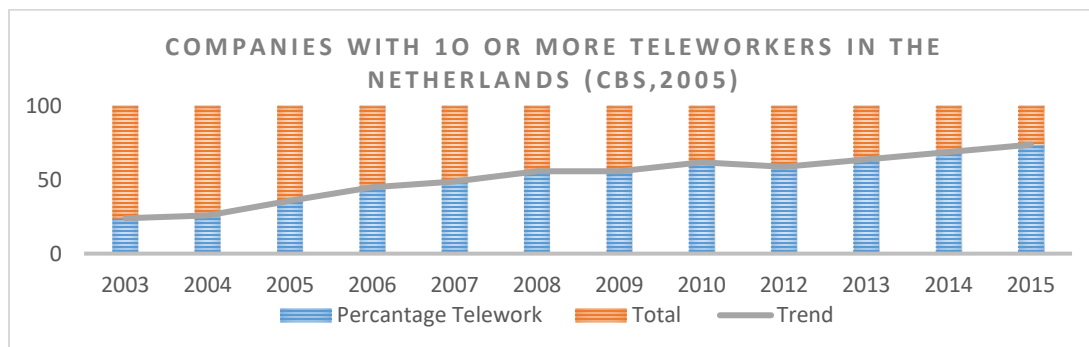
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1. Introduction

Teleworking has gained popularity over the past few years, especially in the Netherlands where 75 percent of the companies support telework (CBS, 2015). Teleworking consists of the possibility to work from home or a site other than the ordinary workplace through the use of technological connections (Fitzer, 1997). The research from the Dutch Central Bureau for Statistics (2015) shows that in the Netherlands companies within the business services and the information and communication sector support teleworking on the largest scale. Furthermore, they claim that ninety percent of the employees in this branches have the possibility to telework. However, in sectors where physical attendance is more necessary, there will be a lower degree of teleworking, for example, the catering industry (CBS, 2015). The chart below, shows the development of the overall implementation of telework from 2003 to 2015 in the Netherlands. This presents an increasing line. With this increase in implementation, it is worth to investigate the effects that telework has on the level of job satisfaction. Especially, since some companies nowadays come back from their decision to implement telework, and argue that telework has already reached its peak (de Groot, 2017).



Furthermore, as discussed above there are different sectors that show more presence of telework than others. The industries that support telework the most can be found mainly within the private sector. Nonetheless, because of this prevalence in the private sector, it might be of interest to examine telework in the public sector.

Green and Roberts (2010) look at the implementation of telework in the public sector in America and find that the government's implementation of telework did not keep up with the private sector that had a growth rate of 7.5 percent per year. They also argue that the government will never fully implement a teleworking program because of multiple obstacles, such as lack of funding and support. These findings might implicate that telework is less likely to be implemented in the public sector than the private sector. However, in Belgium telework appears to be more common in the public sector than the private sector.

In 2015 14.8 percent of the workers in the public sector teleworked on a structural or occasional basis, in comparison to the 11.5 percent in the private sector (Peeters, 2017). Given these findings, it may be worth investigating if these differences in prevalence are due to differences in effects per sector.

Addressing the previous findings of the effects of telework, a report from the International Labour Organization and Eurofound (2017) presents the benefits and challenges of teleworking. The report states that teleworking gives employees more autonomy in arranging their working hours, which gives them the opportunity to organize their work better and shorten their commuting time. This will lead to a better work/life balance and is said to increase productivity. They also discuss the adverse effects of teleworking, such as the tendency to work longer hours and increased work-life interference, which will lead to more stress. Current literature on the effect of telework on job satisfaction shows different outcomes. On the one hand, researchers discovered higher job satisfaction due to telework (Bélanger, 1999; Dubrin, 1991), where the increased autonomy improves coordination of the work/life balance (Duxbury, Higgins, & Mills, 1992). On the other hand, studies show that the benefits of telework can be offset by a decrease in social interaction and feelings of isolation, leading to dissatisfaction (Cooper & Kurland, 2002; Yap & Tng, 1990).

With examining the distinction between the private and public sector, employees in the public sector seem to gain more motivation by a supportive working environment, characterized by a traditional workplace (Buelens & Van den Broeck, 2007). Kumari and Pandey (2011) state that the objectives are more indefinite to the public sector than the private sector as the private sector has a clearer goal. They argue that the private sector is driven by making profit and less on doing good for the community. The drive for profitability makes the private sector more likely to invest in ICT governance, which is important for the applicability of telework, to gain a competitive advantage (Rocheleau & Wu, 2002).

With these differences in organizational structure and work values between the public and private sector, it would be possible that these sectors show different outcomes for the effect of telework on job satisfaction. The aim of this thesis is to contribute to the research of the effect of telework on job satisfaction by investigating whether teleworking is more effective in the private sector than in the public sector. To my knowledge, the current literature on the distinction between the private and public sector in examining the effect of telework on job satisfaction is scarce. By studying sectoral differences, I intend to create a deeper understanding of where the implementation of telework will be most effective. Next to the distinction between the private and public sector, I will explore the effects of telework in other subsectors to stimulate further research on the reasons behind sectoral effects if these effects are found.

1.1 Research Question

Previous studies have already addressed the relationship between teleworking and job satisfaction. In these studies, the main focus is on teleworkers in the private sector, primarily, in the business services and IT sectors. In this thesis, I will include teleworkers in the public sector and examine if there is a difference in the perceived job satisfaction for teleworkers in the private sector and the public sector. The research question is as follows:

Does telework have a positive effect on job satisfaction? And if so, is this effect more profound for the private sector than the public sector?

In order to answer the research question, I will focus on the overall perceived level of job satisfaction. The population of interest is the Dutch labor force, and all types of telework will be included. Hence, no distinction will be made in structural and occasional telework.

The remainder of this thesis is organized as follows. First, I will discuss the related literature on this topic. This will consist of the prior findings, the main determinants for the effect of teleworking on job satisfaction, and the difference between the private and public sector in this matter. Secondly, I will explain the data and methodology used to answer the research question. Third, the assumptions of the models will be tested and the results will be analyzed. Finally, the main findings will be summarized and discussed in the conclusion, and this section will also include the limitations and final recommendations for future research.

2. Theoretical Framework

This section will provide an understanding of the main concepts used in this thesis, and contains an overview of the previous literature on this topic. First, the definitions will be explained, and after that, the hypothesis will be introduced by discussing relevant literature and findings of the effect of teleworking on job satisfaction.

2.1 Definitions

To provide an answer to the research question, it is important to understand the main concepts of interest in this thesis. Below I will define the interpretation used for job satisfaction, telework, the private and public sector and subsectors.

2.1.1 Job Satisfaction

Even though the term job satisfaction is commonly used within scientific research, no consensus is reached about what it represents (Aziri, 2011) and how it should be defined. In this thesis, job satisfaction will be conceptualized by synthesizing three definitions as provided in previous studies. Job satisfaction can be described as an attitude or feeling towards a job, where positive and favorable attitudes constitute job satisfaction, and negative and unfavorable attitudes constitute job dissatisfaction (Armstrong, 2006). Building on this definition, George and Jones (2008) argue that the attitude towards the job as a whole is determined by attitudes towards various job aspects, e.g., working conditions, colleagues, supervisors and salary. Moreover, Aziri (2011) stresses that nowadays the fulfillment of non-work related personal desires and needs of employees within the job are becoming increasingly important indicators of job satisfaction. In conclusion, job satisfaction is defined as the feeling towards a certain job, determined by attitudes towards different job aspects as well as the fulfillment of non-work related personal desires and needs.

2.1.2 Telework

Since the use and accessibility of telework have changed throughout the years, two definitions are used to conceptualize telework, one of the late nineties and one more recent. First, telework is described as the use of information and communication technology (ICT). This enables workers to shift their working place from the same location where all their coworkers and supervisors are stationed to a remote location (Qvortrup, 1998). Generally speaking, it is work that consists of technology-mediated forms of communication instead of colocation for delivering work output (Qvortrup, 1998). Secondly, ICT capabilities advanced over the years. Garret and Danziger (2007) worked on a more up-to-date definition of telework. They state that the ICT-use should reproduce certain components of the centralized working place, and provide access to needed information sources (e.g. Web-portals) while supporting multiple

forms of information manipulation and exchange. For example, when an employee accesses work-related content at a remote location on his Web-enabled device, this is seen as telework. With this new definition, the criterion of ICT-use has become narrower, excluding various aspects of working at home from the past, such as taking home paperwork or calling the office from home.

2.1.3 Private and Public sector

It is important to make a clear distinction between the private and public sectors and clarify what this distinction entails. Within the existing literature, the differences between the private and public sector have frequently been discussed (Buelens & Van den Broeck, 2007). First, the main difference between organizations in the private and public sector is their ownership (Rainey, Backoff, & Levine, 1976). The ownership of private organizations is in the hands of entrepreneurs and shareholders, while public organizations are held by the government. Secondly, the public and private sector differ in their funding. Private organizations obtain funding through transactions paid directly by customers, whereas public organizations obtain their funding largely by taxation (Wamsley & Zald, 1973). Thirdly, the public and private sector organizations are controlled by different forces. The private sector is driven by market forces and the economic system, whereas the public sector is predominantly controlled by political forces (Dahl & Lindblom, 1953).

2.1.4 Subsectors

When making a distinction between the private and public sector, various subsectors are assigned to either the private or the public sector. However, one can imagine that these subsectors show substantial differences in the type of work, work values, and economic activities. The Dutch Central Bureau of Statistics (CBS) uses a standard company classification, the so-called SBI 2008. This classification groups organizations into subsectors based on their main economic activity. Thus, when the definition subsector is being used it refers to one of the 10 following SBI 2008 classifications: agriculture, industry, construction, transportation, business services, other services, healthcare, government, education, trade, catering, and repair.

2.2 Telework and job satisfaction

The current literature on the effect of telework on job satisfaction suggests inconsistent findings, and both positive and negative effects have been found (Bailey & Kurland, 2002). Nonetheless, Pinsonneault and Boisvert (2001) state that increasing job satisfaction is the most perceived benefit obtained by telework. A lot of research dedicated to examining the relationship between telework and job satisfaction shows that most employees become more satisfied with their job by telecommuting (Bélanger, 1999; Dubrin,

1991; Fonner & Roloff, 2010). In these studies, the specific work arrangements of telecommuters significantly benefit them, due to their ability to choose their own work environment. With this new autonomy and flexibility given to work on a remote location, teleworkers can more easily adjust their work activities into fulfilling their personal needs. It also helps to balance work and family responsibilities (Duxbury, Higgins & Mills, 1992; Riley & McCloskey, 1997; Hill, Hawkins & Miller, 1996). The extent of controlling their own working hours seems to have the most impact on a positive work-life balance for teleworkers, which in turn gives them higher job satisfaction (Maruyama, Hopkinson, & James, 2009).

In contrast, there have been studies that argue that the positive benefits obtained by teleworking can be offset by the decrease in social interaction and feelings of isolation (Cooper & Kurland, 2002). This results in a non-significant relationship between telework and job satisfaction. Due to the separation of the teleworkers from the office environment, the negative impact of isolation and the decrease in social interaction will deteriorate the relationship between teleworkers with their supervisors and colleagues, in turn resulting in job dissatisfaction (Yap & Tng, 1990).

Furthermore, a study of Golden and Veiga (2005) showed a curvilinear relationship between telecommuting and job satisfaction to reconcile these inconsistent findings. The inverted U-shape of this curvilinear relation suggests that when the level of telecommuting is relatively low there will be an increase in job satisfaction. However, when the level of telecommuting is relatively high, the effects of loss of interaction and feelings of isolation will offset the benefits of satisfying both personal and organizational needs, causing a negative effect on job satisfaction. In addition, Virick et al. (2010) found the same U-shaped relation between the extent of teleworking and job satisfaction.

In conclusion, the effect of telework has previously shown positive, non-existent, as well as curvilinear outcomes on the level of job satisfaction. However, I expect that the adverse effects of telework, e.g., deteriorated work relationship or feelings of isolation, will not exceed the benefits of telework on the overall job satisfaction. Nowadays, teleworking is a more accepted way of working than it was in the time that most of the studies above were performed. Referring to the up-to-date definition of telework, the current ICT possibilities, such as videoconferencing, enhance the possibility of workers to transcend distance and time (Green & Roberts, 2010). With the current familiarization with ICT devices and telework, I expect the feelings of isolation to be less profound than before, and formulate the following hypothesis:

H1: Telework will have a positive effect on job satisfaction.

2.3 Telework and the private and public sector

In order to achieve a better understanding of the effects of telework on job satisfaction, it might be necessary to look at the organizational context of the sector these teleworkers are in. Cooper and Kurland (2002) look at the effect of teleworking on the perception of isolation and examine whether this effect depends on the sector teleworkers work in. They find that differences in organizational context and work values between the private and public sector cause the challenges in professional development to be higher for the private sector employees. In this research, the dependent variable is not job satisfaction but the perception of isolation which will influence job satisfaction. Thus, since there is a significant difference on the effect of teleworking on the perception of isolation depending on the sector. It might be possible that there is a different effect of teleworking on the overall job satisfaction between the employees in the private as compared to employees in the public sector.

Firstly, literature on the differences in the effect of teleworking on job satisfaction between the private and public sector is scarce. However, Buelens and Van den Broeck (2007) look at the motivational impact of a supportive working environment, where a supportive environment is a traditional workplace and not a remote location. They find that employees within the public sector significantly gained more motivation by working in a supportive working environment. In line with these findings, Posner and Schimdt (1996) find that executives within the federal government attach more values to their colleagues and supervisors than business executives do. In addition, employees within the public sector respond more positively to a people-oriented management style than employees in the private sector do (Zeffane, 1994). Furthermore, de Vries et al. (2018) studied teleworking public servants on a day-to-day basis. They found that these public servants experienced greater feelings of isolation, and loss of commitment towards the organization, on days they worked from home. By looking at these findings, it could be argued that public sector employees will value the social interaction at the office more than private sector employees. Therefore the beneficial effects of teleworking will be stronger for private sector employees.

Secondly, the differences between the ICT governances in the private and public sector are relevant when investigating the effect telework has on the job satisfaction. Campbell and McDonald (2007) argue that organizations that provide telework opportunities rely on Information and Communication Technology (ICT) to support these work arrangements on a remote location. ICT enables organizations to offer flexibility that was not available before by using new organizational structures. Moreover, organizations within the private sector are more likely to invest in innovative ICT to gain a competitive advantage, whereas challenges in resourcing and budgetary constraints are more profound for the public sector when

acquiring new ICT (Rocheleau & Wu, 2002). Hence, the acquisition of new ICT software within the public sector can be a lengthy process since they face greater accountability and many legal and formal constraints (Kraemer & Dedrick, 1997).

In conclusion, I expect that the ICT governance of organizations within the private sector will be more advanced than the ICT governance of organizations in the public sector, due to fewer challenges in acquiring new ICT. In addition, Daud (2016) argues that insufficient ICT governance will result in poor job satisfaction as the current workforce, with an increased number of millennials, considers technology more important. Given this research, a better ICT governance, that supports teleworking, will most likely enhance the level of job satisfaction. Taken the differences in work values between the private and public sector into account, where the public sector employees value social interaction and a supportive work environment more, the second hypothesis will be formulated as follows:

H2: The effect of telework on job satisfaction will be more profound for the private sector than the public sector.

2.4 Telework within subsectors

After looking at the distinction of the effect of telework on job satisfaction between the private and the public sector, it could be relevant to search for different effects between the subsectors within the private and public sector. All these subsectors perform different activities and some of them would be more suitable for telework than others. Hence, subsectors like construction, agriculture, healthcare, education, catering, and repair are characterized by the necessity of being physically present at work and do not necessarily seem suitable for telework. In contrast, subsectors like business services, government, and other services consist of mainly administrative workers, (IT) professionals, managers, and sales people, which are the occupational groups that show the most prevalence of telework (Lafferty & Whitehouse, 2000). Professionals and administrative workers are considered to be suitable for telework based on their job characteristics, nonetheless there are studies suggesting these workers may face more resistance from the management if they want to telework due to lack of control and distrust of the management (Mokhatarian, Bagley & Salomon, 1998; Peters, Den Dulk & de Ruijter, 2010). In subsectors with fewer telecommuters and administrative occupations, these challenges of resistance might be non-existent or less profound, which in turn will influence the level of job satisfaction. Since there are no real expectations of what the outcomes per subsector will show, this part of the thesis will be addressed in an explorative way instead of formulating a hypothesis.

3. Data and Methodology

In this section, the dataset and method will be discussed. First, the dataset and the boundaries of the dataset will be explained and the variables will be operationalized. Secondly, the method, the ordered logit model, will be explained.

3.1 Dataset

Data from the Dutch labor supply panel 2012 was used for the quantitative part of this study. This survey is issued by the Social and Cultural Planning Office (SCP) once every two years since 1985 and is used to highlight different aspects of the labor supply and follow these aspects over time. Important topics that are being covered in this survey are for example labor mobility, working hours and opinions about current jobs and colleagues. The panel of 2012 consist of 4,837 respondents from the Dutch population and these respondents are aged between 16 and 66 years, the so-called potential labor force. Moreover, students are included in the sample since 2004. The sample selection has been based on age, gender, household size and region, up until 2012. Since 2012, additional address sampling is applied with stratification based upon income, household situation and living in a large city or not.

The initial dataset consisted of the entire labor force, including jobseekers and non-participants. However, the effect of telework on job satisfaction can only be measured for workers. Thus the observations from the jobseekers and non-participants had to be dropped from the sample. Likewise, 370 students completed the survey, who reported side jobs but were not allowed to complete the parts of the survey on job satisfaction and telework. Therefore, also the students have been dropped from the sample. At last, there were 60 observations with missing values on either the level of job satisfaction, the ability to telework, the feelings towards *job autonomy* and *work atmosphere*, or had missing values due to an unclear description of the subsector. By dropping these missing values, the final sample consisted of 3.230 observations.

3.1.1 Defining the main variables

In the labor supply panel survey **telework** was measured by the following question: 'Do you sometimes work at home in your current job?'. Respondents were asked to answer with either yes (=1) or no (=0). By doing so, the workers selected themselves into being categorized as a telecommuter or not. The measure of telework in this thesis is not commonly used in other studies. However, this measure of telework presented in the labor supply panel survey is presented with the same question in other survey datasets provided by LISS Panel, which implies that this is an acceptable measure to use for research.

In the sample, 40.25 percent of the respondents indicated they sometimes work at a remote location (see Table 1). In addition, Table 1 as presented in Appendix A describes the main reasons for telework. In the dataset, approximately 40 percent of the teleworkers stated that their main reason to telework was to finish up work at home (overtime). Telework due to an office stationed at home and telework as a means of decreasing commuting time both presented a percentage of approximately 9 percent. Furthermore, 11 percent of the teleworkers chose telework to achieve a better work/life balance, and a few teleworkers had to work from home due to health reasons (+/-2.5 percent) or due to the lack of office space (+/- 1.5 percent). Finally, approximately 27 percent reported another reason than the ones mentioned above. These reasons were not captured in a category but indicate that there were more reasons than these commonly known motivators of telework.

Table 1: Distribution of teleworkers

Telework	Frequency	Percentage
No	1,930	59.75
Yes	1,300	40.25
Total	3,230	100.00

The measure of **job satisfaction** was the self-assessed job satisfaction, which measured the individuals' perceived overall satisfaction with their job. In the survey the degree of job satisfaction was measured by a single item measure with a 4-point scale response to the following question: 'All things considered, how satisfied are you with your job'. The answer possibilities ranged from not at all satisfied (0) to very satisfied (3). This way of measuring job satisfaction on a Likert-type scale was also used in the study of Judge and Watanabe (1993). For measuring job satisfaction, a single item measure was chosen instead of multiple-item measures. Scarpello and Campbell (1983) state that using a single item measure of job satisfaction is more preferable than a multiple-item measure that is a sum of multiple job facet satisfactions. They argue that a multiple-item measure may neglect important determinants of job satisfaction, whereas a single-item measure on the overall satisfaction is seen as more inclusive. A study of Wanous et al. (1997) presents that the single-item measures of job satisfaction are correlated with multiple-item measures of job satisfaction, which contributes to their statement that the use of a single-item measurement is acceptable. Moreover, Oshagbemi (1999) argues that the greatest advantage of using a single-item measure is the simplicity of the measure and its applicability to measuring job satisfaction across miscellaneous jobs, which is the case within the dataset used in this thesis.

In table 2, the distribution of the satisfaction levels is presented, and the majority of the sample was 'relatively satisfied' or 'very satisfied'. Whereas, only circa 8 percent of the respondents were dissatisfied with their current job.

Table 2: The distribution of the categories of job satisfaction

Job satisfaction	Frequency	Percentage
<i>Very satisfied</i>	1,288	39.88
<i>Relatively satisfied</i>	1,677	51.92
<i>Not so satisfied</i>	243	7.52
<i>Not at all satisfied</i>	22	0.68
Total	3,230	100.00

For the distinction between the **private and public sector**, I created a dummy variable, with value '1' for employees within the private sector and value '0' for employees within the public sector. In the survey, the participants were asked to state in which subsector they work. These answers were subdivided into different **subsectors** based on the SBI 2008 classification of subsectors. For the creation of the private and public sector dummy, these subsectors were divided manually between the private and the public sector.

In table 3, the 10 subsectors are presented where agriculture, industry, construction, trade, catering, repair, transport, business services and other services were classified as the private sector. Healthcare, government and education were classified as the public sector. For some subsectors further detailing would have been desirable, since subsectors as healthcare, education and other services showed both private and public characteristics. Due to these mixed characteristics, the sector was chosen where the subsector had the greatest emphasis in. Overall this dichotomy included the main distinction between the private and the public sector.

Table 3: Teleworkers within the SBI-2008 classified subsectors

Subsectors, SBI-2008 in 10 classifications	Telework: no	Telework: yes	Percentage of telework	Subsectors, SBI-2008 in 10 classifications	Telework: no	Telework: yes	Percentage of telework
<i>Agriculture</i>	19	12	38.7%	<i>Business Services</i>	268	346	56.4%
<i>Industry</i>	254	107	29.6%	<i>Healthcare</i>	513	214	29.4%
<i>Construction</i>	110	43	28.1%	<i>Government</i>	153	152	49.8%
<i>Trade, Catering & Repair</i>	267	89	25%	<i>Education</i>	112	219	66.2%
<i>Transport</i>	153	32	17.3%	<i>Other services</i>	81	86	51.5%

As shown in Table 3, all the subsectors showed a substantial amount of teleworkers. Especially the subsectors business services and education revealed a high percentage of telecommuters, as more than half of the respondents stated that they sometimes worked from a remote location. Also within the government and other services, the distribution was approximately 50/50.

3.1.2 Defining the control variables

In all the analyses that were performed, the control variables *age*, *gender*, *partner*, *children*, *work atmosphere* and *job autonomy* were included.

Age, gender, partner and children

Gender was controlled for because men and woman are likely to experience different levels of the conflict between work and life (Greenhaus & Parasuraman, 2002). Furthermore, age, having a partner, or having children at home is of influence on the work-life conflict (Kossek, Lautsch, & Eaton, 2006). Since work-life balance is an important determinant of job satisfaction, and telework helps to improve this balance (Riley & McCloskey, 1997), these control variables were useful to include in the models.

The variable *age* was included as a continuous variable. The reported ages ranged from 16 to 66 years. Table 2 in Appendix A shows the distribution of the respondents' ages in 10-year classes. In the sample, the majority, approximately 77 percent, of the respondents were aged between 35 and 64 years.

The variable *gender* was measured with a dummy variable that took on value '1' for female and '0' for male. Table 3 of Appendix A shows that the percentage of males and females in the sample was almost equal. However, the percentage of teleworkers was 5 percent higher for males than females.

The variable *Partner* was measured as a dummy variable, where 'Married' or 'Living together with a partner' was valued as 1 and 'Single' as 0. Table 4 in Appendix A shows that the number of respondents with a partner was approximately 80 percent. Furthermore, this group contained a higher percentage of teleworkers than the group of singles.

At last, the dummy variable *children* was measured with the question if the respondents had children aged between 0 and 12 years that lived at home at the time of the survey, where yes was valued as 1, and no as 0. The percentage of respondents with children living at home was below 30 percent, however, these respondents had a higher percentage of telecommuting in comparison to people with no children living at home (Table 5 in Appendix A).

Job autonomy

As previously argued in the theoretical framework, one of the benefits of telework is the increased autonomy and flexibility by having control over their working hours and choosing their own location (Duxbury, Higgins, & Mills, 1992). Mann et al. (2000) argue for increased flexibility as a result of telework, since employees experience the freedom of managing their own time, which will improve the level of job satisfaction. Given these findings, the level of job autonomy had to be controlled for in the models. The variable *job autonomy* was conceptualized as the answer to the statement 'I can largely determine how I arrange my work' on a 5-point scale ranging from totally disagree to totally agree (Table 6 in Appendix A).

Work atmosphere

The problems that telework can cause, as previously been discussed, are the feelings of isolation and the disrupted relations with colleagues and or supervisors (Cooper & Kurland, 2002). If workers value the working atmosphere in the office more, these negative feelings due to telework will be more profound, resulting in job dissatisfaction (Yap & Tng, 1990). Therefore, the variable *work atmosphere* was included, which was conceptualized as the answer to the statement 'There is a pleasant working atmosphere at the office' also on a 5-point scale (Table 7 in Appendix A).

3.2 Method

In this section, the methodology will be discussed. First, I will explain how the ordered logit model works and why it is chosen. Secondly, the formulas of the actual models will be presented. Finally, the assumptions for an appropriate use of the ordered logit models will be explained.

3.2.1 Ordered Logit model

Techniques as Ordinary Least Squares (OLS) regressions require that the variable outcome is measured on ratio or interval level (Williams, 2016). Since the dependent variable, job satisfaction, is measured on an ordinal scale and not on a ratio or interval level, it is appropriate to use an ordered logit model (Greene, 1993). An ordered logit model takes the ceiling and floor effects of the different categories into account and makes sure no subjectively chosen values are assigned to these categories (McKelvey & Zavoina, 1975). Since the dependent variable (Y) is not continuous, the ordered logit model uses a collapsed version of the underlying unobserved variable, Y^* (Long & Freese, 2014). If thresholds of this underlying variable are being passed, the values of the ordinal dependent variable (Y) will change. In this research the dependent variable, job satisfaction, is coded into four categories, which are: not at all satisfied = 0, not so satisfied = 1, relatively satisfied = 2 and very satisfied = 3. Presumably, there are more than these four

categories of satisfaction, but in this survey respondents had to choose the category which best reflects their feelings to fall into. In the ordered logit model the interval that the Y^* falls into is known, but the exact value is not. Hence, this model allows to estimate the effect of the independent (X) variables on the underlying Y^* . However, the interpretation is different from the interpretation of a simple linear regression. With the interpretation of a general logit model you can only interpret the sign, but not the magnitude of the coefficients. Thus, if the sign of the coefficient is positive, an increase in this variable makes the respondent more likely to be in one of the higher categories of the dependent variable. However, when looking at the marginal effects of each category separately, the interpretation of a unit increase in the coefficient gives a percentage of how likely the respondent is to be in this particular category.

The ordered logit model can be explained by the following formula:

$$\ln\left(\frac{\text{probability}(\text{event})}{(1-\text{probability}(\text{event}))}\right) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n$$

Here, the left side of the equal sign is called a logit. This logit is the log of the odds that a certain event occurs. The coefficients on the right side of the equal sign show how much the logit changes based upon the values of the independent variables.

In an ordered logit model with four categories coded as 0, 1, 2 and 3, the following odds need to be defined:

$$\Theta_1 = \text{probability}(\text{score of } 0) / \text{probability}(\text{score higher than } 0)$$

$$\Theta_2 = \text{Probability}(\text{score of } 0 \text{ or } 1) / \text{probability}(\text{score higher than } 1)$$

$$\Theta_3 = \text{Probability}(\text{score of } 0, 1 \text{ or } 2) / \text{probability}(\text{score higher than } 2)$$

As seen above only three logits need to be specified instead of four logits. This is the case because the last probability will be 1 since there are no scores higher than 3. With the odds defined, a general equation of these odds can be formulated as:

$$\Theta_j = \text{probability}(\text{score} \leq j) / (1 - \text{probability}(\text{score} > j))$$

Hence, the ordered logit model can be described as:

$$\ln(\Theta_j) = a_j - \beta X$$

3.2.2 The actual models

In the actual models used to examine the relationship between telework and job satisfaction, the following odds of being in a certain category of job satisfaction were defined:

$$\Theta_1 = \text{probability (not at all satisfied) / probability (score higher than not at all satisfied)}$$

$$\Theta_2 = \text{Probability (score of not at all satisfied and not so satisfied) / probability (score higher than not so satisfied)}$$

$$\Theta_3 = \text{Probability (score of not at all satisfied, not so satisfied and relatively satisfied) / probability (score higher than relatively satisfied)}$$

The first hypothesis stated: *Telework will have a positive effect on job satisfaction.* To test this hypothesis the following model was specified as:

$$\ln(\text{Job_Satisfaction } j) = a_j + \beta_1 \text{Telework} + \beta_2 \text{Autonomy_Flexibility} + \beta_3 \text{Work_Atmosphere} + \beta_4 \text{Age} + \beta_5 \text{Gender} + \beta_6 \text{Partner} + \beta_7 \text{Children} \quad (1)$$

To test the second hypothesis: *'The effect of telework on job satisfaction will be more profound for the Private sector than the Public sector.'* the following model was performed:

$$\ln(\text{Job_Satisfaction } j) = a_j + \beta_1 \text{Telework} + \beta_2 \text{Private_Sector} + \beta_3 \text{Telework*Private_Sector} + \beta_4 \text{Autonomy_Flexibility} + \beta_5 \text{Work_Atmosphere} + \beta_6 \text{Age} + \beta_7 \text{Gender} + \beta_8 \text{Partner} + \beta_9 \text{Children} \quad (2)$$

At last, to test whether there were different effects of telework on job satisfaction within certain subsectors the following model was performed repeatedly for every single subsector in the dataset:

$$\ln(\text{Job_Satisfaction } j) = a_j + \beta_1 \text{Telework} + \beta_2 \text{Subsector}_i + \beta_3 \text{Telework*Subsector}_i + \beta_4 \text{Autonomy_Flexibility} + \beta_5 \text{Work_Atmosphere} + \beta_6 \text{Age} + \beta_7 \text{Gender} + \beta_8 \text{Partner} + \beta_9 \text{Children} \quad (3)$$

3.2.3 Assumptions ordered logit model

In order to appropriately use an ordered logit model, certain assumptions must hold. If all the corresponding coefficients are the same across the different logistic regression, then the requirements of the model are met. This means that when independent variables affect the likelihood of being in one of the ordered categories, the coefficients belonging to the independent variables should be the same across all the different outcomes. In for example model 1, telework will affect the likelihood of a respondent being very satisfied with their job the same as it will affect the likelihood of a respondent being not at all satisfied with their job.

These assumptions for the ordered logit model are called the parallel lines assumptions or the parallel regression assumptions (Williams, 2006). A commonly used name for the ordered logit model is the proportional odds model, hence the ratios of the odds of being in a certain category will be the same for all logistical regressions performed. To test for these assumptions, an assessment developed by Brant (1990) is used to determine if the observed deviations from the predictions of the ordered logit model are unlikely to be attributed to a coincidence. A non-significant result on this test is desired since a significant Brant test provides evidence that the parallel lines assumption has been violated, which implies the ordered logit model cannot be used.

4. Results

In this section, the results will be presented in order to answer the hypothesis. First, the results of the parallel line assumption of the ordered logit model will be discussed. Secondly, the model estimates will be presented per hypothesis.

4.1 Assumptions ordered logit model

As discussed in the method section the assumption of parallel lines must hold in order to appropriately apply an ordered logit model. In order to test for this assumption I performed Brant tests. Table 4 shows the results of the Brant test of parallel lines for all the different models. When examining model 1, the Brant test produced a significant result ($p < 0.024$), however, when the variable *partner* was excluded from the model it presented a non-significant result ($p < 0.170$). Since the variable *partner* evidently violated the parallel line assumption this variable was excluded from all the ordered logit models. Model 2, that included the dummy and interaction variables to make a distinction between the private and the public sector, met the assumption of parallel lines ($p < 0.093$), and therefore the use of an ordered logit model was allowed.

For the explorative part of this thesis, the models 3 to 12 were performed. Model 3, that consisted of the variables *agriculture* and the interaction term *agriculture*telework*, did not have enough observations to perform an appropriate ordered logit model, therefore the Brant test was not performed for this model. For the models 6 (*Trade, catering, and repair*), 10 (*Healthcare*) and 12 (*Education*), the parallel lines assumption holds, because the test showed non-significant results. For the other models that included the subsectors: *Industry, Construction, Transport, Business services, Other services and Government*, the Brant test could not be performed due to a low number of respondents on the categories 'not at all satisfied' and 'not so satisfied'. However, when the outcome variable was transformed into a 3-point scale, where 'not at all satisfied' and 'not so satisfied' were taken together and classified as dissatisfied, it was possible to perform a Brant test¹. The Brant test provided non-significant outcomes for all these models with the 3-point scale, therefore the use of an ordered logit model was grounded. It could be argued that by combining the two lower categories of job satisfaction, the same has to be done for the higher categories. However, when taking the frequency distribution into account (table 1), where the lowest categories of job satisfaction combined consisted of 265 observations (22 'not at all satisfied' and 243 'not so satisfied'), in comparison to 1,677 'relatively satisfied' observations and 1,288 'very satisfied'

¹ It is important to note that valuable information is lost within these models that use the 3-point scale, since the distinction between 'not at all satisfied' and 'not so satisfied' is lost, and the ordered logit model will give only two intercepts.

observations. By combining the two higher categories of job satisfaction the frequency distribution would have been too large, therefore the highest categories were not combined.

Table 4: Grant test of parallel lines

	Chi-Square	DF	Significance
<i>Model 1 (initial with Partner variable included)</i>	26.22	14	0.024
<i>Model 1</i>	16.48	12	0.170
<i>Model 2</i>	23.84	16	0.093
<i>Model 3 (Agriculture)</i>	-	-	-
<i>Model 4 (Industry)</i>	10.19	8	0.252
<i>Model 5 (Construction)</i>	12.23	8	0.141
<i>Model 6 (Trade, catering and repair)</i>	22.33	16	0.133
<i>Model 7 (Transport)</i>	9.10	8	0.334
<i>Model 8 (Business services)</i>	14.65	8	0.066
<i>Model 9 (Other services)</i>	9.30	8	0.317
<i>Model 10 (Healthcare)</i>	18.63	16	0.288
<i>Model 11 (Government)</i>	9.97	8	0.267
<i>Model 12 (Education)</i>	21.20	16	0.171

4.3 Model estimates per hypothesis

In the following sections, the results on the different hypotheses will be discussed, and each will be either rejected or supported, based on the outcomes of the ordered logit models. First, the main effect of telework on job satisfaction will be discussed and the robustness checks will be presented. Secondly, the outcome of the effect of telework between the private and public sector on job satisfaction will be presented. At last, the estimates of the ordered logit models per subsector are presented, to review whether there are significant outcomes that have to be taken into consideration.

4.3.1 Model 1: the effect of telework on job satisfaction

In table 5 the outcome of the control model, including just the control variables, and the basic model, including the variable of *telework* is shown. Before the effect of telework on job satisfaction can be interpreted it is important to consider the model fitting information of the control model and the basic model. The likelihood ratio chi-square test of the control model showed a value of 927.60 ($p < 0.0000$), whereas the basic model showed a value of 1000.65 ($p < 0.0000$). This means that including the variables used in this models significantly enhanced the predictive performance of the model. Furthermore, the pseudo R-squared shows how well the models explain variances in the dependent variable. The control model took on a value of 0.1534 and the basic model took on a value of 0.1656. This suggests that the level of job satisfaction is explained by approximately 15.4 percent due to the variables used in the control

model, and by approximately 16.6 percent by the variables used in the basic model. The difference between these two outcomes showed the additional explaining power of the variable *telework* on the level of job satisfaction, which is approximately 1.2 percent.

In the basic model, the coefficient of the variable of interest *telework* was 0.283 and significant ($p < 0.01$). Since the magnitude of the coefficient could not be interpreted, the sign has been interpreted as follows: Telework has a positive significant effect on being in a higher level of job satisfaction, *ceteris paribus*.

The control variables *job autonomy* and *work atmosphere* proved to be statistically significant on a 1% significance level. The positive significant sign of the *job autonomy* variable is interpreted as follows: workers that experience higher autonomy and flexibility in their job are more likely to be in one of the higher levels of job satisfaction, *ceteris paribus*. And the significant positive coefficient of *work atmosphere* is interpreted as: workers that enjoy their work atmosphere more are more likely to be in the higher categories of job satisfaction, *ceteris paribus*. The variables *age*, *gender*, and *children* provided statistically non-significant outcomes, and therefore were not interpreted.

To check if the positive effect of telework on job satisfaction was robust to changes in the model, two robustness checks were performed. First, the independent variable *telework* was replaced by the independent variable *telework frequency* (Table 8 in Appendix A). Instead of only providing a yes or a no answer for telework, the variable *telework frequency* also showed the different effects per frequency. Secondly, the outcome variable was replaced by the 3-point scale of job satisfaction to check if the effect of telework would still hold if the levels of dissatisfied were combined as argued before. Table 5 shows the results of the basic model and the models containing the robustness checks. The outcomes of the coefficients proved to be approximately the same across the three models, even for the different frequencies of telework that ranged from more than twice a week to less than 1 time a month. However, the coefficient of teleworking more than twice a week showed a lower significance level than the other frequencies, which might imply that the overall effect is positive but within the lower frequencies this effect will be more profound. Overall, the positive effect of telework on job satisfaction was robust. Taken together all the results in table 5, hypothesis 1 is accepted.

Table 5: coefficient estimates control and basic model and robustness checks				
VARIABLES	(0) Control Model	(1) Basic Model	(1.1) Robustness Check Frequency Telework	(1.2) Robustness Check Job Satisfaction 3-point scale
Telework		0.283*** (0.079)		0.287*** (0.079)
>2x a week			0.214* (0.116)	
1x a week			0.284** (0.129)	
<1x a week			0.304** (0.134)	
<1x a month			0.352** (0.141)	
Work_Atmosphere	1.290*** (0.050)	1.293*** (0.051)	1.294*** (0.051)	1.291*** (0.051)
Job_Autonomy	0.364*** (0.037)	0.331*** (0.037)	0.332*** (0.037)	0.328*** (0.038)
Age	0.002 (0.003)	0.001 (0.003)	0.002 (0.003)	0.001 (0.003)
Gender	0.069 (0.074)	0.078 (0.075)	0.079 (0.074)	0.086 (0.075)
Children	0.001 (0.084)	-0.019 (0.084)	-0.018 (0.083)	-0.024 (0.084)
Observations	3,230	3,230	3,230	3,230
Likelihood ratio Chi2	927.60	1000.65	1001.07	994.10
Probability > Chi2	0.0000	0.0000	0.0000	0.0000
Pseudo R-squared	0.1534	0.1656	0.1656	0.1687

Standard errors in the parentheses

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

4.3.2 Model 2: the distinction between the private and public sector

In model 2 (see Table 6) the dummy for the distinction between the private and the public sector and the interaction term of this dummy with telework were included, to conclude if the effect of telework in the private sector on job satisfaction is more profound than the effect of telework in the public sector. First, the likelihood ratio chi squared test of this model proved to be significant and the pseudo R-squared was slightly higher than the basic model, however, the prediction power was still approximately 17%.

Secondly, looking at the outcomes of the model, the dummy variable *private sector* showed a statistically significant negative coefficient on a 5% significance level, which means that people working in the private sector are more likely to be in the lower levels of job satisfaction in comparison to people working in the public sector. The interaction term *telework*private sector* presented a non-significant outcome, and therefore one cannot conclude whether teleworkers in the private sector are more or less likely to be in the higher categories of job satisfaction than teleworkers in the public sector. Hence, since no significant effect of the interaction term was found, Hypothesis 2 is rejected. There is no distinction to be made between working in the private and public sector when measuring the effect of telework on job satisfaction.

Table 6: coefficient estimates private and public sector	
(2)	
VARIABLES	Private versus Public sector
Telework	0.267** (0.117)
Private_Sector	-0.205** (0.153)
Private_Sector*Telework	0.003 (0.153)
Control variables included	YES
Number of observations	3,230
Likelihood ratio chi2	1007.23
Probability > chi2	0.0000
Pseudo R-squared	0.1667

Standard errors in the parentheses
 *** p<0.01, ** p<0.05, * p<0.1
 Controls: age, gender, children, work atmosphere and job autonomy

4.3.3 Model 4 till 12: The differences between telework in subsectors on job satisfaction.

For the explorative part of this thesis, the models 4 to 12 were performed, each model separately included one of the subsectors from the dataset and the interaction term of this specific subsector with telework. The model which included *agriculture* could not be performed, since it did not have enough observations, which made it impossible to conduct an appropriate ordered logit model. By including interaction terms between telework and the different subsectors, where the reference category is 0 for all other subsectors, the possibility of specific sectorial effects could be studied. However, only the model that included the subsector construction showed a statistically significant negative effect of the interaction term. This

means that teleworkers in the construction sector are more likely to be in the lower categories of job satisfaction, *ceteris paribus*.

Furthermore, there were two subsectors that showed a significant result on the coefficient of the subsector, these were the healthcare and the trade, catering and repair sector. The significant positive coefficient of healthcare implied that workers within this sector are more likely to be in the higher levels of job satisfaction, keeping all other variables equal. The opposite is implied by the negative coefficient of the trade, catering and repair sector, namely that the workers in this sector are more likely to be in the lower categories of job satisfaction. Given these results, there is little to no evidence that making a distinction between teleworkers in a specific sector is necessary when conducting research on the effect of telework on job satisfaction.

Table 7: coefficient estimates subsectors

VARIABLES	(4) Industry	(5) Constructio n	(6) Trade, Catering and Repair	(7) Transport	(8) Business Services	(9) Other Services	(10) Healthcare	(11) Governme nt	(12) Education
Telework	0.286*** (0.083)	0.324*** (0.080)	0.252*** (0.082)	0.296*** (0.080)	0.295*** (0.088)	0.275*** (0.081)	0.281*** (0.087)	0.279*** (0.082)	0.303*** (0.084)
Telework*Subsector _j	-0.071 (0.255)	-0.804** (0.383)	0.163 (0.270)	0.004 (0.416)	0.072 (0.192)	0.219 (0.339)	0.128 (0.194)	0.029 (0.252)	-0.074 (0.255)
Subsector _j	-0.101 (0.144)	0.340 (0.207)	-0.306** (0.137)	0.171 (0.177)	-0.193 (0.139)	-0.071 (0.236)	0.220* (0.113)	0.137 (0.175)	-0.057 (0.200)
Control variables included	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	3,230	3,230	3,230	3,230	3,230	3,230	3,230	3,230	3,230
Likelihood ratio chi2	995.21	998.89	1006.01	995.24	996.83	994.57	1008.48	995.54	1001.42
Probability > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo R-squared	0.1689	0.1695	0.1665	0.1689	0.1692	0.1688	0.1669	0.1690	0.1657

Standard errors in the parentheses

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

Controls: age, gender, children, work atmosphere and job autonomy

5. Conclusion

In the conclusion section, the results will be further discussed and will be connected to the additional framework and literature. Furthermore, the limitations of the research will be presented and recommendations for future research will be provided.

5.1 Conclusion and discussion

This thesis examined the effect of telework on job satisfaction in the Netherlands. By dividing the sample into employees from the private and the public sector a comparison could be made to answer the research question:

Does telework have a positive effect on job satisfaction? And if so, is this effect more profound for the private sector than the public sector?

The results of the ordered logit models show a significant positive result of the effect of telework on the level of job satisfaction, as suggested by previous studies (e.g., Bélanger, 1999; Dubrin, 1991; Fonner & Roloff, 2010). Furthermore, by conducting a robustness check on the frequency of telework, evidence was found that could potentially indicate an inverted U-shape, as studied by Golden and Veiga (2005) and Virick et al. (2010). Hence, the overall effect of telework on job satisfaction is positive, but the frequency of teleworking more than twice a week showed lower statistical significance than the other lower frequencies. However, comparing significance levels is not a formal statistical test, and therefore I cannot conclude if there is a U-shaped relation. The positive effect of telework could be explained by the improved work-life balance, which in turn increases the level of job satisfaction (Duxbury, Higgins, & Mills, 1992).

The results of the model that included the distinction between the private and public sector showed that no significant differences were found in the effect of telework on job satisfaction when comparing the two sectors. Nonetheless, I initially argued for the presence of differences in work values and ICT governance between the private and public sector, which could potentially affect the level of job satisfaction to be higher for teleworkers in the private sector. Maidani (1991) provided evidence that there are no significant differences on the means of intrinsic motivational job factors between the private and public sector that influence job satisfaction. Hence, studying differences in the effect of motivational factors, such as telework, on job satisfaction between the private and public sector may not be necessary and differences cannot be found. Also, the initially more advanced ICT governance of the private sector in comparison to the public sector may be overrated. Windum and Koch (2008) argue that the role of the public sector as an innovator is underestimated, since the public sector played a significant role in the

development and implementation of a number of new ICT technologies used for teleworking. Therefore, the public sector is not expected to lag behind on the private sector. Taken together, the ICT governance and work values might not substantially differ between the private and public sector and thus will not cause the effect of telework within one of these sectors to be higher.

On an explorative note, the influence of teleworking on the level of job satisfaction was examined on each subsector separately to determine if there were unexplored subsectors that showed a significant effect. However, little to no evidence was found to support that teleworking in a specific subsector contributed to a significant difference in job satisfaction. An exception to this is the construction subsector, in which telework has a negative effect on job satisfaction. Since very little people work at home, approximately 28 percent of the employees in the construction sector, this significant negative effect appears very interesting. Especially, considering the necessity of being physically present at work for the majority of the occupations in this sector. Therefore, it would be recommended to further examine this sector to discover why these employees experience a negative effect of telework on job satisfaction.

5.2 Limitations and recommendations

The presented results should be seen in the light of this thesis's limitations and should be interpreted with caution. Below, the limitations will be explained, which in turn could be addressed in future research.

First, taking into account that the sample only contains observations from the Dutch labor force, these results cannot be generalized for other countries, since each labor force will be characterized differently.

Second, in the survey, the respondents selected themselves into telework based on the question if they sometimes work from home. No general definition of telework is given, besides the question that formulated telework as 'sometimes work from home'. This does not even include the option of a remote location. The open interpretation of the definition of telework could be connected to the reported main reasons for telework, which were provided by the respondents. These reported reasons varied tremendously, and also included reasons as health issues, reduction in commuting time or better coordination of work and life responsibilities. Future research might want to focus on the motivational reasons separately, as all these reasons will affect the level of job satisfaction on different aspects. It is important to gain a deeper understanding of how the reason to telework contributes to the effect of telework on job satisfaction.

Third, no boundaries were set for the extent of telework, therefore all possibilities ranging from less than one hour a week up to eighty hours a week were included in the sample. For future research, it may be

desirable to demarcate the definition of telework better to compare the effect on employees that telework on a structural or occasional basis (Lafferty & Whitehouse, 2000). This distinction will also allow to further explore the U-shaped relation between the frequency of telework on job satisfaction discovered by Golden and Veiga (2005).

Fourth, the distinction between the private and public sector in this thesis may be flawed due to the inability to include the parapublic sector. A few subsectors, as healthcare and education, showed characteristics of both the private and public sector but were allocated to the sector they had their main emphasis in. However, Lyons et al. (2006) revealed significant work value differences when comparing the private, the public, and the parapublic sector. Where the parapublic sector is described as the extended public sector, including publicly subsidized educational and health institutions. Future research could include the parapublic sector to capture these differences in work values and their potential effect on telework and job satisfaction.

Fifth, in this thesis I used a single-item measure for job satisfaction, as the use of a single-item measure in some cases suggests better face validity compared to multiple-item measurements (Dolbier, Webster, Mallon, & Steinhardt, 2005). However, Gardner et al. (1998) found evidence that neither multiple-item nor single-item measures appear to be better than one another, but still suggest to choose a multiple-item measure when it is possible in the research situation. Since a multiple-item measure can provide a more valid understanding of the different aspects of job satisfaction. Especially, for managers who want to improve the satisfaction level of their employees, single-item measurement of job satisfaction is of little value (Oshagbemi, 1999). This is explained by the fact that the strength and weaknesses of certain job aspect are not revealed by this single-item measure. This makes it impossible to detect flaws or successes of the managers, while the overall satisfaction may still remain the same (Oshagbemi, 1999). Since the decision of the management to implement teleworking programs is likely to be influenced by studies that show the effects of telework, multiple-item measurements, which reveal effects on different job aspects, is desirable for future research.

Moreover, the statistical explanation power of the models used in this thesis may be flawed due to the inability to measure for causal effects. By using ordered logit models, this research was limited to only interpreting the sign of the estimated effect of telework. Future research could explore the use of panel data regressions since these regressions allow for the estimation of causal effects, which can be interpreted besides only their sign. In addition, it would be interesting to perform an impact evaluation

on groups of employees that turn to telework over time, hence a before and after comparison can be made.

Throughout this thesis, I attempted to argue that better equipped ICT services have a beneficial influence on the experienced satisfaction with telework, and therefore will contribute to a higher job satisfaction. Daud (2016) argues this to be true for millennials. However, the sample in this thesis consists of approximately 20 percent of millennials whereas the rest of the sample is of older generations. This was partly due to the fact that working students had to be dropped from the sample because they were not allowed to fill in the part of the survey about telework. Future research could explore the effect of telework on millennials by including factors as ICT governance. Hence their understanding of the ICT devices used for telework is more profound and they are more familiar with the concept of telework, since it nowadays is a common practice.

Lastly, the findings of this thesis underline the importance of researching variables that may influence the effect of telework on job satisfaction. The distinction made on the effects of teleworking within a certain sector showed little to no significant effect on job satisfaction. One may expect that teleworking does not show a direct effect in certain sectors, but surprisingly all sectors including even agriculture, construction and repair showed reasonable percentages of teleworkers. Occupational groups and company structures could be connected to these findings, because, for instance, administrative or managerial functions can be found across all sectors. Research on these factors will contribute to a deeper understanding of the prevalence of telework in these sectors, in light of their potential effect on the level of job satisfaction.

5.3 Final remark

In this thesis, I have shown that telework has a significant positive effect on the level of job satisfaction. I stressed the importance of studying sectoral differences between teleworkers, but concluded that no significant differences between the private and public sector were found. I propose that researchers further explore linkages between telework and different groups in the labor force, for instance, occasional versus structural teleworkers, or millennials. This may reveal additional variables that will further develop our understanding of the effect telework will have on job satisfaction. Also, different methods and measurements can be used to more validly capture employees' job satisfaction towards telework, as well as to gain insights on their motivational reasons behind telework.

6. Appendix A

Main Reason for telework	Frequency	Percentage
<i>Finishing up work/overtime</i>	519	39.92
<i>Office stationed at home</i>	120	9.23
<i>Decrease in commuting time</i>	118	9.07
<i>Work/life balance improvement</i>	143	11
<i>Health reasons</i>	34	2.62
<i>No traditional office space</i>	18	1.38
<i>Other</i>	347	26.69

Age in 10-year classes	Frequency	Percentage	Percentage telework
<i>16-24</i>	185	5.73	16.22
<i>25-34</i>	524	16.22	37.98
<i>35-44</i>	770	23.84	44.42
<i>45-54</i>	1,024	31.70	41.24
<i>55-64</i>	699	21.64	42.06
<i>65-67</i>	28	0.87	46.42
Total	3,230	100.00	-

Gender	Frequency	Percentage	Percentage telework
<i>Male</i>	1,603	49.63	43.29
<i>Female</i>	1,627	50.37	37.25
Total	3,230	100.00	-

Partner	Frequency	Percentage	Percentage telework
<i>Single</i>	629	19.47	36.41
<i>Partner</i>	2,601	80.53	41.18
Total	3,230	100.00	-

Children, aged 0 till 12, living at home	Frequency	Percentage	Percentage telework
<i>No</i>	2,292	70.96	38.48
<i>Yes</i>	938	29.04	44.56
Total	3,230	100.00	-

Job autonomy	Frequency	Percentage
<i>Totally disagree</i>	141	4.37
<i>Disagree</i>	343	10.26
<i>Neutral</i>	730	22.60
<i>Agree</i>	1,348	41.73
<i>Totally agree</i>	668	20.68
Total	3,230	100.00

Work atmosphere	Frequency	Percentage
<i>Totally disagree</i>	32	0.99
<i>Disagree</i>	133	4.12
<i>Neutral</i>	532	16.47
<i>Agree</i>	1486	46.01
<i>Totally agree</i>	1047	32.41
Total	3,230	100.00

Telework frequency	Frequency	Percentage
<i>Never</i>	1943	59.86
<i>More than twice a week</i>	430	13.31
<i>Once a week</i>	321	9.94
<i>Less than one time a week</i>	291	9.01
<i>Less than once a month</i>	254	7.86
Total	3,246	100.00

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