The impact of COVID-19 on gender differences in job satisfaction in the Dutch labour market

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Abstract

This research examines the impact of COVID-19 on gender differences in employee perceptions of job satisfaction in the Netherlands. Using a fixed effects regression approach with longitudinal data from the LISS data archive from the years 2018 to 2022, this study examines the effects of COVID-19 on job satisfaction and investigates gender-specific differences. Contrary to initial expectations, the analysis finds no significant difference in job satisfaction between men and women when considering year-specific gender differences. Furthermore, the impact of COVID-19 on job satisfaction appears to be limited, with relatively stable levels observed across the examined years (2020, 2021, and 2022) compared to the base year of 2019. Thereby this research contributes to the understanding of job satisfaction dynamics in the Dutch labour market.

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1. Introduction

1.1 Background of the problem and research question

The COVID-19 pandemic has had a severe impact on our society. The COVID-19 pandemic was not only a global health crisis, but has also led to a significant decline in the global economy and thereby affected the employment outcomes and general well-being of employees (Ahmad et al., 2020; Alon et al., 2020; Padhan & Prabheesh, 2021; Meekes et al., 2023). One of the reasons that the decline in the economy was so large is that in order to mitigate the continued spread of COVID-19, governments implemented various lockdown measures and imposed temporary shutdowns of specific sectors of the economy. This mostly included economic sectors that were identified as potential contributors to the enhanced spread of COVID-19, such as catering and retail. This played a crucial role in the economic decline following from the pandemic, and subsequently caused a reduction in the demand for labour in the labour market (Meekes et al., 2023, p. 394).

Unlike other economic crises, the COVID-19 pandemic is believed to have varying effects on the employment outcomes and other characteristics of men and women in the labour market (Alon et al., 2020, 2021; Fuchs-Schündeln et al., 2020; Forsythe et al., 2020; Meekes et al., 2023). The literature mentions two main reasons to explain the gender differences in employment outcomes in regard to the COVID-19 pandemic. First, the temporary shutdowns of specific sectors of the economy have yielded different employment outcomes for men and women due to their differential levels of representation in particular economic sectors (Forsythe et al., 2020; Meekes et al., 2023). Second, the government's imposition of closures on childcare facilities and schools is believed to have disproportionately burdened women in taking the primary responsibility for childcare duties within the household, leaving less to hours to spend on employment (Alon et al., 2020; Del Boca et al., 2020; Hupkau & Petrongolo, 2020; Sevilla & Smith, 2020; Oreffice & Quintana-Domeque, 2021; Meekes et al., 2023).

Besides the effects on the demand for employment and employment outcomes also other labour market characteristics were affected by the COVID-19 pandemic. The pandemic imposed organizational challenges and required adaptation from both employers and employees (Bartik et al., 2020; Nemteanu et al., 2021). In general, the circumstances of the pandemic have negatively impacted productivity and reduced competitiveness for organizations operating in the Dutch labor market (ILO, 2020). Also, the feeling of job jeopardization is believed to have increased during the COVID-19 pandemic (Fernandes, 2020; Nemteanu, 2021). In regular economic crises, these circumstances are believed to negatively impact the overall perceptions of job security, job stability, and general job satisfaction (Strazdins et al., 2004; Bell & Blanchflower, 2011; Böckerman et al., 2011; Markovits et al., 2014). The question arises if this hypothesis also holds for the COVID-19 pandemic and if the consequences for the labour market can be interpreted in the same manner as that of a regular economic crisis. One can argue that the COVID-19 pandemic differs from other economic crises due to government support and the prevailing sense of solidarity witnessed at the onset of the pandemic. Also, as mentioned above, the pandemic is believed to have a different effect on the employment outcomes of men and women.

This research aims to look into this question by examining the impact of COVID-19 on employee perceptions of job satisfaction in the Netherlands, using a fixed effects regression approach with data from the Longitudinal Internet Studies for Social Sciences (LISS) from 2018 until 2022.

This leads to the following research question:

What is the impact of COVID-19 on gender differences in job satisfaction in the Dutch labour market?

1.2 Academic and societal relevance

Job satisfaction is an important topic for research as it plays an important role in the labour market, the functioning of the economy and in the general well-being of individuals (Hauret & Williams, 2017; Zaharie et al., 2018; Wnuk, 2019; Nemteanu et al., 2021). Within the labour market job satisfaction plays an important role in worker productivity, turnover effects, absenteeism, and the functioning of organizations in general. Numerous researchers have examined the identification of gender differences in employment outcomes as an effect of COVID-19 (Alon et al., 2020; Del Boca et al., 2020; Hupkau & Petrongolo, 2020; Sevilla & Smith, 2020; Oreffice & Quintana-Domeque, 2021; Meekes et al., 2023). This research contributes to existing research on the economic and labour market impacts of COVID-19 by examining the impact of COVID-19 on gender differences in job satisfaction in the Netherlands. Previous research on the effects of COVID-19 on different notions of job satisfaction results primarily focuses on the association between job insecurity, job instability and job satisfaction and find mixed results (Nemteanu et al., 2020). This study contributes to the debate by looking at the trend in perceived levels of job satisfaction between men and women following the shock of COVID-19 over time using year fixed effects. Also, this study makes use of data collected from respondents in the Netherlands, thereby it specifically contributes to research in the context of the Dutch labour market.

Examining the impact of COVID-19 on job satisfaction among men and women in the Netherlands is also of societal value. First of all, understanding how the COVID-19 pandemic has affected different notions of job satisfaction can provide valuable insights in the overall well-being and functioning of individuals in the workforce. Also, considering the potential gender disparities in the different notions of job satisfaction during the pandemic is crucial to understand and address issues regarding gender equality in the workplace. COVID-19 has brought about significant changes in the work environment and arrangements, such as remote working and increased workloads, which can lead to differential effects on the perceived job satisfaction of men and women. By investigating these effects, policymakers and organizations can gain a better understanding of the specific challenges faced by men and women, allowing for targeted policies to improve overall job satisfaction and gender equality in the workforce.

1.3 Outline of the research

This research starts with a chapter on the theoretical background regarding the concept of job satisfaction. This chapter discusses how job satisfaction is affected during an economic crisis, how men and women are affected differently, and how job satisfaction was affected during COVID-19, the section also provides the hypotheses of this research. The third chapter discusses the research design. This starts with an institutional background on government regulations and the spread of COVID-19 in the Netherlands. Followed by the research method, a description of the data that was used from the LISS data archive, the variable description, and the empirical model. Chapter four consist of the analysis, which includes the main results of the fixed effects regression analysis, the analysis of the results and two

robustness checks. The last chapter provides the conclusion. This consists of a summary and answer to the research question, limitations, and recommendations for further research.

2. Theoretical Framework

2.1 General Job satisfaction

The concept of job satisfaction is of great theoretical and managerial importance. Job satisfaction affects an employees' work investment and performance, productivity, and task efficiency (Hauret & Williams, 2017; Wnuk, 2019; Nemteanu, 2021). In addition, high levels of job satisfaction are believed to reduce turnover intention and enhance positive relationships with clients. In other words: job satisfaction is an important factor in the functioning of the economy and labour market.

Previous research indicates that job satisfaction consists of several aspects. The main indicators mentioned are atmosphere amongst colleagues, type of employment contract, responsibilities, hours worked, pay, and local labour market conditions (Hauret &Williams, 2017; Gerich & Weber, 2020). Spector (1997) identifies job satisfaction as an attitudinal variable, meaning it captures an individual's feelings or attitude towards aspects of their job. According to several scholars, job satisfaction is made up of both extrinsic and intrinsic satisfaction (Spector, 1997; Cooper-Hakim & Viswesvaran, 2005; Markovits et al., 2014). Extrinsic satisfaction is related to external conditions that determine the perceived level of satisfaction. These include: job security, salary and competitive pay, supportive management policies, and a stable work environment. Intrinsic job satisfaction is related to the amount of intrinsic satisfaction and motivation individuals derive from their jobs. This is reflected in individuals' feelings toward the nature of the work itself, general atmosphere at work and the atmosphere among colleagues.

Job security

Job security is believed to play a crucial role in determining job satisfaction, the productivity of employees, work investment, and turnover intention (Metin Camgoz et al., 2016; Wilczyska 2016; Nemteanu & Dabija, 2020; Nemteanu, 2021). Job insecurity is identified as the level of fear and anxiety employees experience about the possibility of losing their employment (Greenhalgh & Rosenblatt, 2010; Wilson et al., 2020; Zhang et al., 2020; Nemteanu, 2021). Vander Elst et al., (2013) assert that this is attributed to employees perceiving a lock of influence or control over their own situation. Several factors, such as age, gender, education, career stage, field of work, position within the organization, and the organization's competitiveness, contribute to the level of job insecurity individuals perceive (Metin Camgoz et al., 2016; Erdogan et al., 2020; Salas-Nicás et al., 2020). In addition, external factors such as social, economic, financial, and health crises also impact job security (Gasparro et al., 2020; Wilson et al., 2020). Ensuring job security is essential to promote positive employee satisfaction (Metin Camgoz et al., 2016; Nemteanu & Dabija, 2020).

The concept of job insecurity has also been examined by considering gender differences among employees. In the past, female employees displayed lower levels of intention to leave their jobs when faced with an insecure workplace compared to male employees (Metin Camgoz et al., 2016). Job insecurity is more commonly experienced by young individuals starting their careers and by older individuals nearing their retirement (Pickard, 2019; Salas-Nicás et al., 2020). In addition, strategic decisions that have a large influence on the success of an organization can make employees vulnerable in the event of failure (Shkoler & Tziner, 2020). When an organization or company is faced with an insecure or instable sphere, this has a direct impact on the productivity and competitiveness within an organization (Erlinghagen, 2007).

As job security is believed to largely influence job satisfaction, this leads to the following hypothesis:

H1: Job insecurity is negatively associated with perceived job satisfaction.

2.2 Gender differences in job satisfaction

There is an abundance of research indicating that female workers are on average more satisfied or experience the same level of job satisfaction compared to male workers (Hodson, 1989; Mason, 1995; Clark, 1997; Hauret & Williams, 2017; Perugini & Vladisavljević, 2019). This despite the fact that women often still experience poorer working conditions, lower wages, less promotion opportunities and job discrimination. Previous research has indicated several explanations for this gender paradox.

The work of Hodson (1989) differentiates between three potential explanations for gender differences in job satisfaction in the United States. His findings implicate that men and women assign different values to certain work characteristics. Thus, women prioritize different aspects of work, this hypothesis was originally suggested by Kanter (1977). The second hypothesis suggests that women place greater importance on their roles as homemakers in comparison to paid work. The third hypothesis suggests that women have lower expectations and tend to compare themselves to other women rather than men. As a result, they may be more satisfied with what they have.

Clark (1997) also finds that higher levels of job satisfaction amongst women stems from the finding that women generally have lower expectations compared to men. This idea is supported by the observation that the difference in job satisfaction between male and female workers is less among younger generations, higher educated, and those working in male-dominated environments. These groups are less likely to have significant gender disparities in their job expectations. Clark (1997) also introduced the idea of relative income as a significant factor influencing job satisfaction, suggesting that it is not only absolute income but also the income relative to others that matters. This research included measures of both income and comparison income, while controlling for various factors such as age, gender, region, industry, occupation, health, and race. Their findings revealed significant correlations between relative income and job satisfaction (Hauret & Williams, 2017, p. 207).

This leads to the following hypothesis:

H2: Women are on average more likely to be satisfied with their job compared to men.

2.3 Gender differences in Economic Crises

The effects of a declining economy affect men and women differently (Leschke & Jepsen, 2011; Gago & Kirzner, 2013; Alon er al., 2020; Meekes et al., 2023). Earlier research points out that male workers are usually more strongly affected by a decline in the economy than women. Evidence can be found in historical instances of economic recessions, such as the Great Recession of 2008-2009, where employment of male workers was notably more severely affected in comparison to that of female workers.

Previous research indicates that the differences in the way in which men and women are affected by economic crises can be explained by the following reasons. One factor is the presence of family support. The research of Alon et al., (2020) indicates that the fluctuation in labour supply during economic cycles is notably lower for married women (who

benefit from the family support mechanism) compared to unmarried women. The family support mechanism entails that women are likely to increase their labour participation in order to compensate for their husbands' unemployment or risk of unemployment (Ellieroth & Kathrin, 2019). This is, however, not the only indication as there is also a large volatility gap between unmarried men and unmarried women.

Another factor is the difference in the types of industries in which men and women are employed. During typical recessions, sectors such as manufacturing and residential construction tend to be significantly more affected compared to sectors like education and healthcare. Men tend to have a higher concentration of employment in sectors that are highly exposed to economic cycles, while women are more represented in sectors with relatively stable employment throughout the economic cycle. These findings are outlined in a study by Coskun and Dalgic (2020). For instance, the study reveals that employment in the sectors of 'Government' and 'Education and Health Service' is actually counter-cyclical, and mostly consists of female employees. On the other hand, the sectors of 'manufacturing', 'construction' and 'trade and transport' are highly affected by economic cycles and mostly consists of male employees. These two factors are not the only explanations, and they are interconnected (Coskun & Dalgic, 2020). For example, some women may prefer employment in counter-cyclical sectors to compensate for the cyclicality of their husbands' employment. Overall, however, previous economic downturns have had a more severe impact on men's employment compared to women.

Gender differences during COVID-19

COVID-19 has had different effects on men and women when it comes to general employment, working hours and wages (Alon et al., 2020; Fortysche et al., 2020; Zamarro et al., 2020; Meekes et al., 2023) The literature finds evidence that this has to do with the large impact of COVID-19 on specific economic sectors, and the composition of men and women within those sectors. A second reason they mention is that impact of the closing schools and childcare facilities has had a larger effect on women compared to men (Alon et al., 2020, 2021; Fuchs-Schündeln et al., 2020; Meekes et al., 2023). As schools and childcare facilities were closed and elderly faced a high risk of a COVID-19 infection, families had to handle childcare responsibilities on their own. This situation has led both men and women to increase their involvement in household activities, but previous research suggests that women still took on a larger share of the increased childcare responsibilities compared to men (Del Boca et al., 2020; Hupkau and Petrongolo, 2020; Sevilla and Smith, 2020; Oreffice and Quintana-Domeque, 2021; Meekes et al., 2023). As women often bear the primary responsibility for caregiving roles in households, they tend to allocate more time to childcare, home schooling, and household chores, thereby leaving fewer hours for paid employment.

This leads to the following hypothesis:

H3: COVID-19 had a more negative impact on the job satisfaction of women compared to men.

2.4 Job satisfaction during economic crises

Previous research indicates that economic crises in Europe have a large impact on the general well-being of employees, their general level of happiness in life and working conditions (Bell & Blanchflower, 2011; Markovits et al., 2014). Because of the increasing importance of having a job, employees are willing to tolerate lower job status and unfavourable conditions in

order to retain their current employment. This can lead to dissatisfaction and can have a negative effect on overall job satisfaction.

As economic crises affect the financial policy of governments and thereby indirectly can affect the wages of employees, it is a logic consequence that as wages determine overall job satisfaction, economic crises make people less satisfied with their wage and this makes them less satisfied with their job in general (Markovits, 2014). Another notion of job satisfaction mentioned in previous research is organizational commitment. Markovits et al., (2014) and Vandenberghe (2012) distinguish between affective commitment to an organization, where employees actively want to belong and remain part of their organization and to continuance commitment, where the costs of leaving an organization are the main motivation to stay, and lastly to normative commitment which refers to the duty or obligation felt by employees to remain loyal to their organization. Previous research finds that affective commitment is affected during an economic crisis as employees generally experience a lower level of well-being (VandenBerghe, 2012; Markovits et al., 2014). The level of continuance commitment tends to increase during and economic crisis, whereas the level of normative commitment remains the approximately the same.

Thus, as economic crises usually put forward negative, stress enhancing and threatening circumstances they are believed to have an overall negative effect on the different notions of job satisfaction.

This leads to the following hypothesis:

H4: COVID-19 is negatively associated with perceived job satisfaction.

3. Research design

3.1 Institutional setting

This section will distinguish the main waves and subsequent policy reforms of the Dutch government regarding the spread of COVID-19 in the Netherlands in the years 2020, 2021, and 2022. Lastly, the government aid provided to businesses and employees during the pandemic will be discussed.

COVID-19 timeline in 2020

The first case of COVID-19 in the Netherlands emerged on February 27th 2020 (Munnink et al., 2020). After the emergence of this first COVID-19 case, more cases of COVID-19 appeared in the province of Noord-Brabant, followed by a rapid spread across the rest of the country. This was the start of what was later distinguished as the first wave of Dutch COVID-19 infections, which occurred in March and early April 2020 (National Institute for Public Health and the Environment, 2022). The policies to prevent further spread of the COVID-19 virus by the Dutch government reflect the development of COVID-19 infections (Meekes et al., 2023).

Following the increasing number of COVID-19 infections in Noord-Brabant, the first press conference by the Dutch government was held on the 9th of March 2020. The first preventative measures against the spread of COVID-19 were announced. The Dutch prime minister advised people to stop shaking hands and banned events that included more than 1,000 visitors solely in the province of Noord-Brabant. This was then followed by a ban on all events in the country that included more than a hundred people, and people were requested to work from home as much as possible (van der Drift et al., 2022). People with COVID-19 symptoms were encouraged to stay home as much as possible. On the 15th of March 2020, non-essential industries such as restaurants, schools, and sports facilities were mandated to close. People with essential jobs, however, were still allowed to send their children to childcare or school if they did not display any symptoms of COVID-19. In May, the number of covid cases declined, therefore the majority of preventative measures was then released. Starting from the 11th of May, full childcare services for children aged 0-4 became available again, and primary school students were required to attend school for approximately half of the time, with regular teaching resuming from June 8. Furthermore, from June 1, the hospitality sector was permitted to reopen its outdoor areas. Secondary schools reopened on June 2, followed by higher education institutions on June 15. Based on this timeline, it is hypothesized that the most significant negative impact on the labour market occurred in April (Meekes et al., 2023, p. 4).

The second wave of COVID-19 infections started in September (National Institute for Public Health and the Environment, 2022). Following a rapid increase in the number of cases in October, the Dutch government announced a second partial lockdown on October the 13th which was followed and expanded from December with the complete closure of schools and day care facilities until February the 7th of 2021. It was, however, possible to make use of emergency day care (Meekes et al., 2023, p. 4).

COVID-19 timeline in 2021

In January 2021 the Netherlands was still in lockdown (Algemene Zaken, 2021). The first COVID-19 vaccinations started in January, with the first group being healthcare workers and healthcare workers in small-scale residential forms receiving vaccinations, starting from January the 6th. In the week of 18 January over 80 thousand people were vaccinated, most of

these were people working in care. The second group of people receiving COVID-19 vaccine were the elderly. The lockdown was extended, and the prolonged closing of educational institutions and childcare facilities is also allowed. At the end of January 2021 a night curfew applicable for the entire country was introduced (Algemene Zaken, 2021).

In February the lockdown is extended again, but elementary schools and childcare facilitates – with the exception of BSO's (out-of-school care) – are allowed to open on February the 8th. The government announced it wants to pay more attention to the socio-economic consequences of the lockdown and announces that all restaurants are allowed to open order and pickup facilities. At the end of February releasing measures of the lockdown were announced, as the government wants to re-open schools and universities for at least one day per week starting on the first of March. In March the number of covid cases increased again, this is referred to as the third wave of the COVID-19. The lockdown was therefore continued; however, some light releases were introduced, also the vaccination program continued (Algemene Zaken, 2021).

In May 2021 the number of COVID-19 cases started to decrease. On June the 5th the cabinet announced the end of the lockdown, as the number of COVID-19 cases dropped significantly in June and the vaccination rate kept increasing. Therefore, society re-opens again in compliance with 1.5 meters distance rule. Despite the 1.5 meters distance rule, the number of COVID-19 cases rapidly increased, therefore new preventative measures were introduced, and restaurants and cafes have to close between 00.00 until 06.00 in the morning. Also events that lasted more than one day were no longer allowed. These preventative measures lead to a decrease in the number of COVID-19 cases and therefore no additional measures are announced in august. The cabinet announces the 1.5 meters distance rule will be released at schools and universities starting September 2021(Algemene Zaken, 2021).

A new variant of COVID-19 was discovered in October 2021, and it became clear that vaccinations were less effective for infection with this new variant. In November the number of covid cases increased across all regions of the country, societal contexts, and age cohorts. In response, the Cabinet reaches the decision to implement measures aimed at mitigating interpersonal interactions. These measures are scheduled to take effect on November 2nd. Subsequently, a partial lockdown is declared on November 12th. On November the 26th, an evening lockdown is introduced, necessitating the closure of a majority of establishments at 5 p.m (Algemene Zaken, 2021).

On December the 18th a harsh lockdown was announced again, this went into effect on December the 19th. The harsh lockdown was introduced as a precautionary measure as a new variant of COVID-19, the omicron variant, was causing an increase in hospital occupancy (Algemene Zaken, 2021).

COVID-19 timeline in 2022

The omicron variant reached the Netherlands in early January 2022. At the end of January initial steps towards the release of the harsh restriction of the lockdown that was imposed in December 2021 were announced. Elementary and secondary schools, along with BSO (out-of-school care) facilities, are scheduled to re-open on January 10, 2022. On January the 26th additional release of restrictive measures was announced. In March 2022 the last restrictive measures, such as mandatory face masks in public transportation, were released. In April 2022 almost all COVID-19 measures were released, with the exception of mandatory face masks at airports and airplanes. In May 2022, this measure is also released, and on May the 20th the temporary Corona Act is no longer in place (Algemene Zaken, 2023).

Government assistance
In order to financially support businesses and employees during the pandemic the Dutch government introduced the Temporary Emergency Measure for the Preservation of Jobs allowance (NOW). The NOW was the primary instrument of the Dutch government to support employers in maintaining their businesses and in preventing unemployment as a consequence of reduced labour demand (Algemene Zaken, 2023; Meekes et al., 2023). The NOW provided direct wage allowance to employers, allowing them to cover the reduced working hours of employees as a consequence of the lockdown. The NOW was put in place on October 7th, 2020, and extended and adapted several times during the pandemic. Employers that made use of the NOW have until June 2023 to reconcile it with their actual income loss (Algemene Zaken, 2023).

3.2 Research method

This research uses a fixed effects regression model to analyse the impact of COVID-19 on job satisfaction between men and women. A fixed effects regression model is a variation on a basic regression model that is suitable to analyse panel data (Allison, 2009; Angrist, & Pischke, 2014; Brüderl & Ludwig, 2015). Fixed effects regression models allow for the control of variables that may vary across individuals but remain constant over time (Allisson, 2009). The individuals within the dataset function as their own reference point, this way fixed effects estimates utilize each individual as their own control. This allows for the management of certain individual characteristics, eliminating the need for a separate control group and treatment group (Allison, 2009, p.8). This is why the fixed effects regression model is the most suitable research model for this research in particular, as in the context of studying the impact of COVID-19 on job satisfaction it is difficult to identify a suitable control group. COVID-19 was a worldwide pandemic that affected all individuals and industries, making it challenging to find data of individuals that were not affected by the pandemic. This is, for example, why the use of a difference-in-differences approach is difficult in this context. The absence of a suitable control group undermines the fundamental assumption of the difference-in-differences approach, namely the common trends assumption. This entails that treatment and control groups experience similar trends in the absence of the treatment, which does not hold in the case of a global pandemic (Callaway & Sant'Anna, 2021).

This research includes both individual fixed effects and year fixed effects in the model to account for two important factors: time-constant unobserved heterogeneity that is unique to each individual, and annual changes that impact all individuals in the dataset. By including individual fixed effects, the analysis controls for individual-specific characteristics that remain constant over time, allowing for a more accurate assessment of the relationship between the variables of interest. In addition, the inclusion of year fixed effects accounts for common changes experienced by all individuals within each year, enabling a clearer understanding of the effects of other variables on the outcome. There are two underlying assumptions for fixed effects regression models (Allisson, 2009, p.9):

1. "The dependent variable must be measured for each individual on at least two occasions, they must be directly comparable"

2. "The explanatory variables of interest must change in value across those multiple occasions for some substantial portion of the sample"

As this research makes use of LISS panel data, which measures the same set of variables across different times for the same sample of individuals, both assumptions are met.

3.3 Data

This research uses the LISS datasets on work and schooling and background in the years 2018 until 2022. The LISS dataset consists of panel data of drawn from a sample of approximately 5,000 households and 7,500 individuals in the Netherlands (LISS panel, n.d.). The work and schooling dataset is part of the LISS Core Study, which is a longitudinal study that is conducted on a yearly basis. This data consists of the same set of variables that are measured across different times for the same sample of individuals. The background dataset is part of a set of online questionnaires, which are conducted on a monthly basis (LISS panel, n.d.). The use of panel data allows for an extensive understanding in the complexity of human behaviour over time. As the LISS data is a longitudinal study this makes it possible to follow and understand changes in the same sample of individuals, while controlling for factors that may vary across individuals but remain constant over time. Therefore the LISS data is suitable for this research on job satisfaction in regard to COVID-19.

This research makes use of data from the years 2018 until 2022. As mentioned in the institutional background section, the first case of COVID-19 in the Netherlands was discovered in February 2020. In 2021 the effects of the pandemic and subsequent government regulations were still in place and in May 2022 this started to decline. Therefore, the year 2019 is chosen as the reference category. This means the level of job satisfaction individuals experience, while comparing differences between men and women, in 2019 is compared to the years 2018, 2020, 2021 and 2022. The sample solely consist of individuals that are in paid employment. The respondent group consists of 15,857 observations in 3102 unique individuals. The sample characteristics can be found in table 1.

3.4 Variable description

3.4.1 Key dependent variables

The concept of job satisfaction captures the overall feeling of individuals experience towards different aspects of their job (Spector, 1997). This consists of both extrinsic and intrinsic satisfaction (Cooper-Hakim & Viswesvaran, 2005; Markovits et al., 2014). Extrinsic satisfaction is related to external circumstances determining the perceived level of satisfaction. These entail: job security, salary and competitive salary, and a stable work environment. Intrinsic job satisfaction is related to the amount of intrinsic satisfaction and motivation individuals receive from their jobs. This is, among others, captured in feeling of individuals towards the nature of the work itself, the hours someone works, general atmosphere, and the joy in an organization and amongst colleagues.

The LISS data on work and schooling consists of several variables that capture both intrinsic and extrinsic job satisfaction. The first dependent variable that is used in this research captures a general level of job satisfaction. This variable is measured by asking the following question:

Y1) Everything considered I am satisfied with my job.

This variable is measured on a scale from 1 to 4. Respondents can choose from the categories: 1) disagree entirely, 2) disagree, 3) agree and 4) agree entirely. A dummy of this variable is made, where one indicates an individual disagrees (levels 1 and 2) with the statement and zero indicates an individual agrees with the statement (levels 3 and 4).

To measure the different aspects of job satisfaction that may be affected by COVID-19, there are four other key dependent variables included in the research. These variables are measured asking the following questions:

Y2) We would first like to know how satisfied you are with your wages or salary or profit earnings?

Y3) How satisfied are you with your working hours?

Y4) How satisfied are you with the type of work that you do?

Y5) How satisfied are you with the general atmosphere among your colleagues?

The variables are measured on a scale from 0 to 12. Zero indicates that the individual is not all satisfied with their job or a specific aspect of their job. Ten indicates the individual is fully satisfied with their job or a specific aspect of their job, eleven indicates the individual is unclear about his or her answer to the question. These dependent variables are reformed into dummy variables, where one (categories ≤ 5) indicates an individual is not satisfied with their job or a specific aspect of their job, and zero (categories ≥ 6) indicates the individual is satisfied with their job or a specific aspect of their job.

3.4.2 Key independent variables and covariates

First of all, there are several demographic characteristics that serve as control variables in the fixed effects regression analysis. These are gender, age category, educational background, origin, and contract type. As seen in the literature is gender believed to be a determining factor in different perceived levels of job satisfaction (Hodson, 1989; Mason, 1995; Clark, 1997; Hauret & Williams, 2017; Perugini & Vladisavljević, 2019). Also, people in different age categories are believed to experience different levels of job satisfaction as people that just entered the labour market are often more insecure about their jobs (Pickard, 2019; Salas-Nicás et al., 2020). Educational background and origin can contribute to demographic differences among individuals in the labour market and influence their employment outcomes, therefore it is important to control for these variables (Bisin, et al., 2014). Lastly, as job satisfaction is believed to be influenced job security, the variable contract type is added to the regression to differentiate between people in temporary and permanent contracts (Metin Camgoz et al., 2016; Wilczyska 2016; Nemteanu & Dabija, 2020; Nemteanu, 2021).

Second of all, the fixed effects regression model will be extended with two additional covariates, '*has children'* and '*sector work'* as the literature points out that having children to take care of at home, and the economic sector in which individuals are working can be determining factors in employment outcomes in the context of COVID-19 (Alon et al., 2020; Del Boca et al., 2020; Hupkau & Petrongolo, 2020; Sevilla & Smith, 2020; Oreffice & Quintana-Domeque, 2021; Meekes et al., 2023).

The section below describes how the variables are measured in the research.

Gender
The variable '*gender'* exhibits the gender of the respondent. This is indicated with one (1) if the respondent identifies themselves as male, with two (2) if a respondent identifies themselves as female. The variable gender is used to create a dummy variable '*female'*, in order to specify different subsets for men and women.

Age category
The variable *'age category'* displays age in categories. There categories are: 1) 15 - 24 years, 2) 25 - 34 years, 3) 35 - 44 years, 4) 45 - 54 years, 5) 55 - 64 years and 6) 65 years and older. Category one is used as a reference category in the analysis.

Educational background
The variable educational background measures the highest obtained level of education of the respondents and uses the scale of Statistics Netherlands. Respondents can choose from the categories: 1) primary school, 2) vmbo (intermediate secondary education, US: junior high school), 3) havo/vwo (higher secondary education/preparatory university education, US: senior high school), 4) mbo (intermediate vocational education, US: junior college), 5) hbo (higher vocational education, US: college), and 6) wo (university).

Origin
The variable '*origin'* displays the background of the respondent. Respondents can choose from the categories: 0) Dutch background, 101) First generation foreign, western background, 102) First generation foreign, non-western background, 201) Second generation foreign, western background, 202) Second generation foreign, non-western background, and 999) Origin unknown or part of the information unknown (missing values). A dummy of this variable is made where one indicates a Dutch background (former category 0), and the other categories make up the category 'Foreign Background', indicated by one. This is done to avoid collinearity problems and to enhance the statical and interpretational power of the model.

Contract type
The variable '*contract type'* indicates the different contract types of the respondents. This is indicated with 1) if the respondent is in permanent employment, 2) temporary employment, 3) on-call employee, 4) temp-staffer, 5) a self-employed/freelance worker, 6) an independent professional, 7) director, and 8) majority shareholder. A dummy '*permanent contract*' of this variable is created in order to differentiate between people with permanent and temporary contracts to control for the job security the respondents. This dummy consists of a category for respondents in temporary contracts (former categories two, three, four, five and six). And one for respondents in permanent contract (former categories one, seven and eight).

Has children
The variable '*has children'* indicates if respondents have children. No children is indicated by zero, and yes is indicated by one.

Sector work
The variable '*sector work'* indicates the different economic sectors in which respondents are working. Respondents can choose from the categories: 1) agriculture, forestry, fishery, hunting, 2) mining, 3) industrial production, 4) utilities production, distribution and/or trade , 5) construction, 6) retail trade, 7) catering, 8) transport, storage and communication, 9) financial, 10) business services, 11) government services, public administration and

mandatory social insurances, 12) education, 13) healthcare and welfare, 14) environmental services, culture, recreation and other services and 15) other. A dummy variable is made in order to differentiate between important economic sectors in the context of COVID-19. These are the following categories: *healthcare* (previous category 13), *education* (previous category 12), *retail* (previous category 6*), catering* (previous category seven) and *remaining* (previous categories 1, 2, 3, 4, 5, 8, 9, 10, 11, 14, 15).

3.4.3 Descriptive Statistics

Table 1 presents the descriptive statistics for the independent variables and covariates. The total sample that is used in this research consist of 3102 individuals, of which 47.7 percent are male and 52.4 percent are female. The distribution of the individuals among the different age categories is somewhat equal, the group between ages 15 and 24 is used as the reference category in the fixed effects regression analysis. The educational background of the individuals in the sample is also quite evenly distributed, the largest groups are HBO and MBO. The majority of the individuals in the sample fall in the category 'Dutch Background', 74.4 percent of the individuals have a permanent contract and 62.2 percent have children. When looking at different economic sectors in which respondents are working, the largest sector is 'other', in which 58.9 percent of the respondents are working, the second largest sector is health care with 20.9 percent, the other sectors are quite evenly distributed.

Table 1 – Descriptive Statistics Independent Variables and Covariates

	Categories	**N (%)**
Gender	*Male*	1478 (47.7)
	Female	1624 (52.4)
Age category	*15 – 24 years*	181 (5.8)
	25 – 34 years	607 (19.6)
	35 – 44 years	659 (21.2)
	45 – 54 years	715 (23.1)
	55 – 64 years	734 (23.7)
	65 and older	206 (6.6)
Origin	*Dutch background*	2445 (93.1)
	Foreign background	232 (7.5)
Educational background	*Primary school*	113 (3.7)
	VMBO	444 (14.3)
	HAVO / VWO	276 (8.9)
	MBO	847 (27.4)
	HBO	923 (29.8)
	WO	493 (15.9)
Contract Type	*Permanent*	2312 (74.4)
	Temporary	795 (25.6)
Have children	*Yes*	1788 (62.2)
	No	1088 (37.8)
Sector work	*Catering*	84 (2.7)
	Retail	244 (7.9)

	Healthcare	649 (20.9)
	Education	272 (8.8)
	Other	1859 (59.8)

Note: characteristics are provided in the year 2018.

Table 2 presents the descriptive statistics of the dependent variables. The differences in perceived levels of job satisfaction of men and women are displayed in both numerical values and percentages, overall both men and women show high levels of satisfaction with different aspects of their jobs. The categorical variables were compared between men and women using a chi square test. The results show that the difference between men and women in the sample for the variables '*satisfied everything considered'*, '*wage'* and '*type of work'* are statistically significant at respectively the 0.05, 0.01, and 0.05 levels, and that the men are overall slightly more likely to be satisfied with their job than the women in the sample.

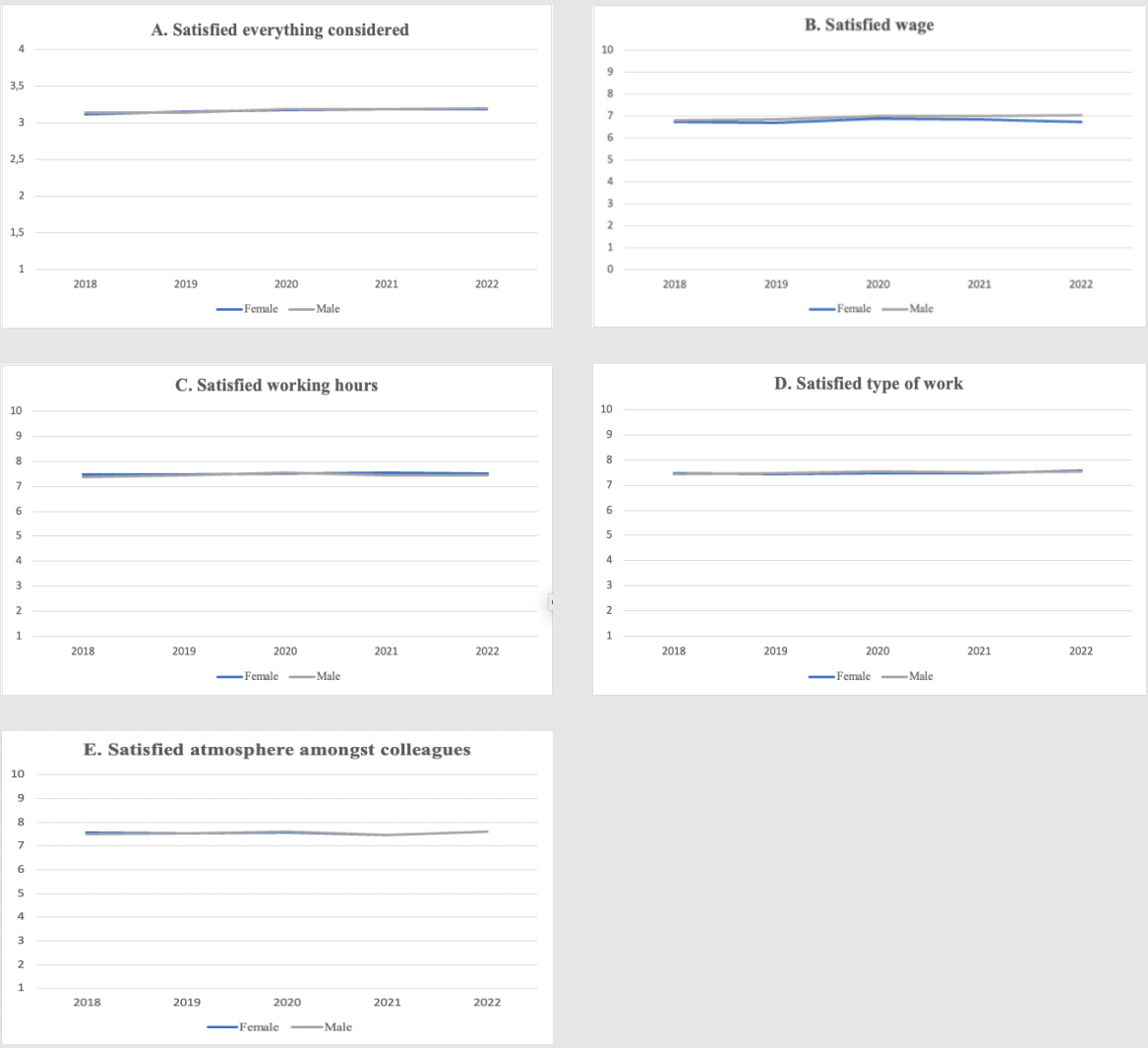
Table 2 – Descriptive Statistics Dependent Variables

Satisfied	**Men, N (%)**	**Women, N (%)**	**% Difference**
Everything considered	1324 (89.6%)	1440 (88.7%)	0.9**
Wage	1296 (87.7%)	1367 (84.2%)	3.5***
Working hours	1266 (85.7%)	1404 (86.5%)	0.8
Type of work	1291 (87.4%)	1408 (86.7%)	0.7**
Atmosphere colleagues	1151 (77.99%)	1299 (80.2%)	2.21

Note: results are provided in the year 2018. Gender differences were compared using Chi Squared Tests, *** significant at 1%; ** significant at 5%; * significant at 10%

Figure 1 shows different graphs illustrating the observed patterns for the different outcomes of job satisfaction for the male and female subset between the years 2018 and 2022. Overall, the graphs show that the perceived level of job satisfaction remains somewhat stable, and even has a slight increase over the years. Men and women follow a quite similar pattern for most outcomes, except for '*satisfied wage',* where women are slightly less satisfied compared to men starting from 2021. A more detailed version of the graphs can be found in appendix I.

Figure 1 – Descriptive Statistics Dependent Variables for male and female subset



3.5 Empirical model

The aim of this research is to examine the impact of COVID-19 on employee perceptions of job satisfaction in the Netherlands and thereby identify the differences between the men and women in the sample. In the main analysis the following specification is used in the Fixed Effects Regression Model:

$$Y_{it} = \alpha + \beta year_t + \gamma X_{it} + P_i + \varepsilon, (1)$$

In this specification, Y_{it} stands for the employee perception of job satisfaction, given a person i and time t, α is the constant. βYear represents the coefficient for the variable year, which is a set of dummy variables for the years 2018 to 2022. Each dummy variable indicates the year specific effect on the different notions of job satisfaction compared to the reference year 2019. This captures the effect of COVID-19 over the years. X_{it}indicates the control variables: age category, origin, educational background, and contract type. P_i stands for the individual characteristics that do not change over time, these are origin, and gender. ε is the error term or residual that captures the variation that cannot be explained by the independent variables, individual characteristics that do not change over time or other factors. This model is a generic model and is used to measure the effect of time on the different dependent variables that make up the concept of job satisfaction.

Model 2: Regression model for male subset

$$Y_{mit} = \alpha_m + \beta_m year_t + Y_m X_{it} + P_{mi} + \varepsilon, (2)$$

Model 3: Regression model for female subset

$$Y_{fit} = \alpha + \beta_f year_t + Y_f X_{it} + P_{fi} + \varepsilon, (3)$$

Models 2 and 3 are similar to model 1 but performed in the male and female subsets. Models 2 and 3 estimate the effect of time on the dependent variables that make up the concept job satisfaction for both men and women.

Model 4: Regression model with interaction effect

$$Y_{it} = \alpha + \beta_1 year_t + \beta_2 female_{it} + \beta_3 year_t * female_{it} + YX_{it} + P_i + \varepsilon, (4)$$

In model 4 the interaction effect $b3year * female$ is added to the fixed effects regression model. This coefficient measures the interaction between variables $year$ and $female$. It indicates the differences in job satisfaction of women compared to men in a given year. This allows for the identification of the different relationship for men and women between the dependent variable(s) and the year.

In addition, several covariates are added to model 4. These entail: having children and the economic sector(s) in which a respondent is working. As mentioned in the theory section and variable description are these important indicators in the context of COVID-19. The differences between respondents with and without children and in different economic sectors are compared.

3.6 Reflecting on validity and reliability

This research uses a fixed effects regression model based on panel data of respondents that actively participating in the Dutch labour market in the years 2018 until 2022, while controlling for external factors to limit potential bias. This analysis can be replicated when using the same dataset and variables and will then, subsequently, lead to the same outcomes. Also, the validity of this research is high as the fixed effects regression model provides a strong instrument to measure the relationship between time-constant unobserved heterogeneity that is unique to each individual, and annual changes that impact all individuals in the dataset. In section 4.3 two robustness checks are conducted that confirm the reliability of the results.

4. Analysis

4.1 Main Results

Table 3 presents the main results of model 1, 2 and 3. The results show the association between the variables '*year'* and '*job satisfaction'* for the total sample and the men and the women in the sample.

Table 3 – Main results models 1, 2 & 3

	2018	**2019 (base)**	**2020**	**2021**	**2022**	**R^2**
Everything considered						
Total (model 1)	-0.023	-	0.044***	0.060***	0.050***	0.001
	(.0146)		(.0138)	(.0144)	(.0156)	
Men (model 2)	-0.021	-	0.045**	0.072***	0.067**	0.001
	(0.020)		(0.019)	(0.020)	(0.021)	
Women (model 3)	-0.024	-	0.044**	0.052**	0.033	0.004
	(0.021)		(0.020)	(0.021)	(0.023)	
Satisfied wage						
Total (model 1)	-0.001	-	0.037***	0.030***	0.027**	0.001
	(0.010)		(0.008)	(0.010)	(0.010)	
Men (model 2)	0.003	-	0.034**	0.031**	0.033**	0.012
	(0.012)		(0.011)	(0.012)	(0.013)	
Women (model 3)	-0.003	-	0.039***	0.029**	0.021	0.004
	(0.012)		(0.012)	(0.013)	(0.014)	
Satisfied working hours						
Total (model 1)	-0.004	-	0.012*	0.020**	0.006	0.001
	(0.007)		(0.007)	(0.008)	(0.008)	
Men (model 2)	-0.003	-	0.015	0.013	0.010	0.002
	(0.010)		(0.010)	(0.011)	(0.012)	
Women (model 3)	-0.004	-	0.011	0.026**	0.004	0.002
	(0.010)		(0.010)	(0.011)	(0.012)	
Satisfied type of work						
Total (model 1)	0.004	-	0.004	0.013*	0.024***	0.003
	(0.007)		(0.007)	(0.007)	(0.008)	
Men (model 2)	0.006	-	0.001	0.013	0.024**	0.001
	(0.009)		(0.009)	(0.010)	(0.010)	
Women (model 3)	0.002	-	0.006	0.013	0.024**	0.005
	(0.010)		(0.010)	(0.010)	(0.011)	
Satisfied atmosphere colleagues						
Total (model 1)	-0.003	-	0.012*	-0.002*	0.020**	0.003
	(0.007)		(0.007)	(0.008)	(0.008)	
Men (model 2)	-0.005	-	-0.001*	-0.014	0.013*	0.002
	(0.009)		(0.009)	(.010)	(0.010)	

Women (model 3)	-0.001	-	0.022**	0.008	0.025**	0.003
	(0.009)		(0.010)	(0.011)	(0.013)	

Note: Standard errors are shown in parentheses. *** significant at 1%; ** significant at 5%; * significant at 10%

Looking at table 3, the first dependent variable is '*satisfied everything considered'.* In the total model (model 1), the coefficient (-0.023) for the year 2018 is not statistically significant. In 2020, 2021 and 2022 the coefficients increase and become statistically significant at the 0.01 percent level. This means that the the probability that employee's rate that they are satisfied with their job, has increased by respectively 0.044, 0.060 and 0.050 percentage points compared to base year 2019. Overall, the results for the total model of '*satisfied everything considered*' show a very small, but positive relationship between the independent and the dependent variable, although the results in 2018 are not statistically significant.

Model 2 shows the results for the men in the sample. The coefficient for 2018 is, again, not statistically significant. The coefficients of 2020, 2021 and 2022 exhibit a small positive trend over the years, with statistically significant coefficients at respectively the 0.05, 0.01 and 0.05 percent level. This means that the the probability that male employee's rate that they are satisfied with their job, has slightly increased.

Model 3, the subset for the women in the sample shows a similar trend, although the coefficient for 2022 is not statistically significant. In 2020 and 2021 the coefficients do show positive statistically significant effects (at the 0.05 percent level).

The second dependent variable is '*satisfied wage'.* In the total model (model 1), the coefficient (-0.001) for the year 2018 is not statistically significant. In 2020, 2021 and 2022 the coefficients slightly increase and become statistically significant at the 0.01 and 0.05 percent level. This means that the probability that employee's rate that they are satisfied with their wages, has increased by respectively 0.037, 0.030 and 0.027 percentage points compared to base year 2019. This is a similar trend as was seen for the dependent variable '*satisfied everything considered*'.

Model 2 shows the different coefficients for the subset of men. The coefficient for 2018 is negative, and not statistically significant. In 2020, 2021 and 2022 the coefficients are respectively 0.034, 0.031 and 0.033 and statistically significant at the 0.05 percent level. These shows a positive effect when compared to the base year 2019.

Model 3 shows the results for the women in the sample. Only the coefficients for 2020 and 2021 show statistically significant effects (respectively at the 0.01 percent level and 0.05 percent level). The coefficient for 2022 is, just as for the dependent variable *satisfied everything considered,* not statistically significant.

The third dependent variable is '*satisfied working hours'.* In the total model the coefficients for 2020, 2021 and 2022 are again positive, although not statistically significant in 2018 and 2022. This means that the the probability that employee's rate that they are satisfied with their working hours, has increased by 0.012 percentage points compared to base year 2019.

The coefficients for the second model are again positive, although not statistically significant. For the female subset, the year 2021 show a statistically significant increase in the probability that female employee's rate that they are satisfied with their wages of 0.026 percentage points.

The fourth dependent variable is '*satisfied type of work'.* In the total model, the coefficients of 2018 and 2020 do not show a statistically significant difference compared to base year 2019.

For the years 2021 and 2022 there is a very small and statistically significant increase in the probability that employee's rate that they are satisfied with their type of work.

When looking at models 2 and 3, the results for 2018, 2020 and 2021 do not show a statistically significant difference compared to base year 2019. In 2022 the coefficient for men and women are both 0.024 and statistically significant at the 0.05 percent level. This shows that in 2022 both men and women have an increase of 0.024 percentage points in the probability that they are satisfied with their type of work compared to base year 2019.

The fifth dependent variable is '*satisfied atmosphere colleagues'.* In the total model, the coefficients in 2018 and 2021 are negative, although being very small. The coefficients for 2020 and 2022 are positive and statistically significant at respectively the 0.1 and 0.05 percent level. Overall, the total model displays as a similar trend as seen in the other dependent variables. In the second model, the coefficient for 2020 shows a very small negative and statistically significant effect at the 0.1 percent level. In 2022 the coefficient is positive again and statistically significant at the 0.05 percent level. The coefficients for the female subset are all positive after 2018, and do not exhibit a significant decline in the probability that female employee's rate that they are satisfied with the atmosphere amongst colleagues.

Table 4 presents the main results of model 4. The results show the association between the variables '*year'* and '*job satisfaction'* for total sample and the men and the women in the sample.

Table 4 – Main results model 4

		Everything considered	Satisfied wage	Satisfied working hours	Satisfied type of work	Satisfied atmosphere colleagues
Interaction Effect	2018	0.009	-0.004	-0.001	-0.005	0.003
		(0.029)	(0.017)	(0.015)	(0.014)	(0.014)
	2019 (base)	-	-	-	-	-
	2020	0.025	0.0067	-0.001	0.008	0.025*
		(0.028)	(0.017)	(0.0143)	(0.014)	(0.013)
	2021	0.010	0.003	0.019	0.003	0.021
		(0.029)	(0.018)	(0.015)	(0.014)	(0.015)
	2022	-0.011	-0.009	-0.001	-0.002	0.005
		(0.031)	(0.018)	(0.016)	(0.014)	(0.015)
Sector work	Other (base)	-	-	-	-	-
	Catering	0.060	-0.092*	-	-0.035	-0.020
		(0.111)	(0.057)	0.180***	(0.060)	(0.043)
				(0.054)		
	Retail	-0.10	-0.062	-0.013	0.036	-0.019
		(0.080)	(0.039)	(0.030)	(0.034)	(0.031)
	Healthcare	0.108	0.0410	0.005	0.107***	0.054
		(0.067)	(0.037)	(0.026)	(0.031)	(0.034)
	Education	0.090	-0.046	0.014	0.084*	0.097**
		(0.116)	(0.049)	(0.036)	(0.051)	(0.045)

Have children	No (base)	-	-	-	-	-
	Yes	-0.008 (0.037)	0.015 (0.022)	-0.012 (0.020)	0.015 (0.016)	-0.001 (0.021)
Contract type	Permanent (base)	-	-	-	-	-
	Temporary	-0.144*** (0.028)	-0.042** (0.015)	-0.026** (0.013)	-0.036** (0.013)	-0.015 (0.013)
R^2		0.003	0.001	0.001	0.001	0.002

Note: Standard errors are shown in parentheses. *** significant at 1%; ** significant at 5%; * significant at 10%

The first part of table 4 consists of the interaction effects of females compared to men in a given year. The coefficients of the years 2018, 2020, 2021 and 2022 overall show that the interaction effect of female and year does not show a statistically meaningful relationship with the different dependent variables. Only in the year 2020 there is a small statistically significant increase in the probability that employee's rate that they are satisfied with the atmosphere amongst colleagues of 0.025 percentage points, but because the other coefficients are not statistically significant this outcome on its own does not hold a high level of validity. When looking at the covariates: *sector work, have children and contract type*, there are some remarks to be made. The coefficients of *have children* are negative, what would mean that having children would have a slightly negative effect on the dependent variable, but these coefficients are not statistically significant.

The variable sector work does show four statistically significant results. First, people working in the catering sector are on average 0.092 percentage points less likely (statistically significant at the 0.10 percent level) to rate that they are satisfied with their wages compared to the other economic sectors. Respondents working in healthcare are 0.107 percentage points more likely to be satisfied with their type of work compared to the other economic sectors, this result is statistically significant at the 0.01 percent level, meaning that the result is highly reliable. Also respondents working in education show a higher level of satisfaction when it comes to their type of work, they are on average 0.084 percentage points more likely to be satisfied compared to the other economic sectors. Respondents working in education also show a higher level of satisfaction when it comes to atmosphere amongst colleagues. They are on average 0.097 percentage points more likely to be satisfied with the atmosphere amongst colleagues compared to the other economic sectors.

Lastly the coefficients of the covariate '*contract type'* show some noticeable results. The coefficients of temporary contracts are all negative, this means that respondents with a temporary contract are on average less likely to be satisfied with different aspects of their job compared to respondents with permanent contracts. When it comes to '*satisfied everything considered',* respondents with temporary contracts are on average 0.114 percentage points less likely to be satisfied than respondents with permanent contracts, this result is statistically significant at the 0.01 percent level, meaning that the result is highly reliable. This is also the largest effect that is measured in this regard. When it comes to satisfied with wage, working hours and type of work, they are also more likely to experience a more negative level of satisfaction compared to respondents with permanent contracts.

4.2 Analysis

Impact of COVID-19 on job satisfaction

This study examined the impact of COVID-19 on gender differences in job satisfaction in the Dutch labour market. When comparing base year 2019 to the years 2020, 2021 and 2022, job satisfaction remained relatively stable. Thus, the impact of COVID-19 on the perceived levels of job satisfaction is limited. When looking at table 3, model 1 (total model) provides small positive and significant results for all dependent variables, expect for a very small decline in '*satisfied atmosphere colleagues'* in 2021 of 0.002 percentage points. The coefficients for '*satisfied everything considered'* show the largest increase (0.044, 0.060 and 0.050) and capture a respondent's overall perception of job satisfaction, this outcome is especially interesting when looking at the years 2020 and 2021 compared to 2019 as the Netherlands was in full lockdown during these times (Algemene Zaken, 2021). This finding is not as hypothesized in hypothesis 4 (*H4 COVID-19 is negatively associated with perceived job satisfaction).*

The literature points out that the perceived levels of job satisfaction are mostly affected negatively during economic crises (Bell & Blanchflower, 2011; Vandenberghe, 2012; Markovits et al., 2014). The different outcomes of this research in the context of COVID-19 could be explained by the fact that unlike other economic crises, that mainly consisted of retrenchments, the Dutch government provided financial assistance to entrepreneurs in order to mitigate the economic consequences of COVID-19. This adds to the argument that the COVID-19 pandemic was different from other economic crises. Another reason could be that because of the pandemic, individuals were more aware of the importance of having a job and therefore expressed relatively stable levels of job satisfaction.

Table 3 also shows that in general, individuals did not become less satisfied with their wages, but when looking at the results of table 4 the coefficient for the catering sector does show a small decline (-0.092) in '*satisfied wage'*. This can partially be explained by the mandatory closing of restaurants which led to a loss in income (van der Drift et al., 2022). The decline in wage satisfaction is, however, relatively small which could be explained by the government aid (NOW) that was provided in this period.

Impact of COVID-19 on gender differences in job satisfaction

Table 1 (descriptive statistics) showed that on average, across all years, the men in the sample experienced slightly higher levels of job satisfaction compared to the women. In contrast, the results of the fixed effects regression model (table 3 and 4) show that there is no significant difference between job satisfaction for men and women when looking at year-specific gender differences. When looking at table 3, the coefficients for model 2 and 3 (men and women separately) for the variables '*satisfied everything considered'*, '*satisfied wage'*, '*satisfied working hours'*, and '*satisfied type of work*' follow the same trend. Both men and women separately experience a very small increase in the measures of job satisfaction. The coefficients for '*satisfied atmosphere colleagues'* do show a different trend as the group of men tends to be less satisfied with the atmosphere amongst colleagues. The difference between men and women is, however, not statistically significant.

These findings are not as hypothesized in hypotheses 2 and 3 *(H2: Women are on average more likely to be satisfied with their job compared to men, H3: COVID-19 had a more negative impact on the job satisfaction of women compared to men).* Previous research indicates that women are in general often more satisfied with different aspects of their job compared to men (Hodson, 1989; Mason, 1995; Clark, 1997; Hauret & Williams, 2017; Perugini & Vladisavljević, 2019). Also, previous research indicates that COVID-19 has had a stronger impact on the labour market outcomes of women compared to men (Alon et al.,

2020; Fortysche et al., 2020; Zamarro et al., 2020; Meekes et al., 2023). The different results in this research could partially be explained by the fact that job satisfaction is a different measure of employment outcomes than the employment rate, working hours, and hourly wage as measured in previous research. Whereas women might be affected differently in employment outcomes by these factors, this research finds no discernible difference in job satisfaction between men and women resulting from the COVID-19 crisis. This could be attributed to the overall satisfaction of individuals that were able to retain their jobs, government aid that aimed to mitigate the effects of the pandemic, and a prevailing sense of solidarity in society.

Association between job insecurity and perceived job satisfaction
The results in table 4 show that job insecurity, measured in terms of permanent and temporary contracts, negatively impacts the perceived levels of job satisfaction. Respondents with temporary contracts are on average less satisfied compared to the base level 'permanent contract'. This is in line with hypothesis 1 (*H1: Job insecurity is negatively associated with perceived job satisfaction)* and the findings of Nemteanu et al., (2020) that found the same result in the context of Romania.

4.3 Robustness checks

In order to validate the findings, a robustness check for models 1,2 and 3 was conducted with 2018 as base year instead of 2019. Table 5 shows that for the dependent variable '*satisfied everything considered'*, the outcomes of the fixed effects regression do not really differ from the results with base year 2019. Overall, there is a very small increase in the amount of job satisfaction experienced by individuals in models 1,2 and 3 when comparing 2019, 2020, 2021 and 2022 with base year 2018. This is a similar trend as was found in table 3 section 4.1.

The outcomes for the fixed effects regression on '*satisfied wage'* also follow a similar trend as was seen in the results with base year 2019. Similar to the results found with 2019 as the base year, the results for *'satisfied working hours', 'satisfied type of work', and 'satisfied atmosphere colleagues',* show less significant results for models 2 and 3. Although not statistically significant, the coefficients for '*satisfied type of work'* become negative in the years 2019 and 2020. Thus, overall the same trend is visible as with base year 2019, there is no significant decline in the perceived levels of job satisfaction.

Table 5 – Robustness check base year 2018

	2018 (base)	**2019**	**2020**	**2021**	**2022**	**R^2**
Everything considered						
Total (model 1)	-	0.004	0.018**	0.034***	0.037***	0.003
		(0.008)	(0.008)	(0.008)	(0.010)	
Men (model 2)	-	0.014	0.073***	0.081***	0.092***	0.002
		(0.022)	(0.023)	(0.024)	(0.027)	
Women (model 3)	-	0.032	0.069***	0.065**	0.040	0.020
		(0.023)	(0.023)	(0.024)	(0.026)	
Satisfied wage						
Total (model 1)	-	0.006	0.032***	0.026**	0.023**	0.001
		(0.009)	(0.010)	(0.010)	(0.011)	

Men (model 2)	-	0.009	0.036**	0.031**	0.029**	0.002
		(0.012)	(0.013)	(0.014)	(0.016)	
Women (model 3)	-	0.004	0.030**	0.022	0.018	0.002
		(0.014)	(0.014)	(0.015)	(0.016)	
Satisfied working hours						
Total (model 1)	-	0.003	0.013*	0.022**	0.007	0.001
		(0.008)	(0.008)	(0.009)	(0.009	
Men (model 2)	-	0.006	0.016	0.020	0.0070	0.001
		(0.012)	(0.011)	(0.012)	(0.013)	
Women (model 3)	-	0.001	0.011	0.023**	0.007	0.003
		(0.011)	(0.011)	(0.012)	(0.013)	
Satisfied type of work						
Total (model 1)	-	-0.003	-0.002	0.004	0.015*	0.001
		(0.007)	(0.007)	(0.008)	(0.008)	
Men (model 2)	-	-0.005	-0.008	0.005	0.018	0.002
		(0.010)	(0.011)	(0.011)	(0.012)	
Women (model 3)	-	-0.002	0.003	0.003	0.012	0.003
		(0.011)	(0.010)	(0.012)	(0.012)	
Satisfied atmosphere colleagues						
Total (model 1)	-	0.005	0.015**	-0.003	0.015	0.006
		(0.007)	(0.008)	(0.009)	(0.014)	
Men (model 2)	-	0.010	0.004	-0.009	0.008	0.002
		(0.010)	(0.011)	(0.012)	(0.012)	
Women (model 3)	-	0.001	0.025**	0.003	0.021	0.002
		(0.010)	(0.011)	(0.014)	(0.015)	

Note: Standard errors are shown in parentheses. *** significant at 1%; ** significant at 5%; * significant at 10%

A second robustness check was conducted by changing the thresholds for satisfaction in the dummy variables of the dependent variables in the fixed effects regression for model 1. The thresholds are increased, which makes the criteria for satisfaction more stringent, resulting in a lower group of individuals being classified as the '*satisfied'* group. For '*satisfied everything considered'* the threshold for '*satisfied'* is increased to four, for the other dependent variables the threshold is increased to 9 for '*satisfied'*.

Table 6 shows the results of the fixed effects regression for model 1 with different thresholds. Overall, the coefficients still exhibit a consistent positive trend over the years, although not statistically significant in 2022. The coefficients for 'satisfied type of work' show a very small decline in 2021 and 2022, although also not statistically significant. Thus, overall the results remain stable when changing the threshold, and do not exhibit a significant decline in job satisfaction followed from the shock of COVID-19.

Table 6 – Robustness check different thresholds dependent variables

	2018	2019 (base)	2020	2021	2022	R^2
Everything considered						
Total (model 1)	-0.014	-	0.028***	0.011*	0.001	0.010
	(0.011)		(0.010)	(0.012)	(0.012)	
Satisfied wage						
Total (model 1)	0.001	-	0.028***	0.029***	0.005	0.012
	(0.008)		(0.008)	(0.009)	(0.010)	
Satisfied working hours						
Total (model 1)	0.001	-	0.004	0.001	-0.019	0.011
	(0.014)		(0.011)	(0.011)	(0.012)	
Satisfied type of work						
Total (model 1)	0.005	-	0.008	-.0116	-0.011	0.001
	(0.010)		(0.010)	(0.011)	(0.012)	
Satisfied atmosphere colleagues						
Total (model 1)	0.020	-	0.021	0.015	0.009	0.001
	(0.010)		(0.011)	(0.012)	(0.014)	

Note: Standard errors are shown in parentheses. *** significant at 1%; ** significant at 5%; * significant at 10%

5. Conclusion

5.1 Short summary and answer to the research question

This research examined the impact of COVID-19 on gender differences in employee perceptions of job satisfaction in the Netherlands using a fixed effects regression approach with data from the LISS archive from the years 2018 until 2022. The results of the fixed effects regression analysis on the impact of COVID-19 on job satisfaction reveal interesting findings. Contrary to the initial hypothesis, there is no significant difference in job satisfaction between men and women when considering year-specific gender differences. Additionally, the impact of COVID-19 on job satisfaction appears to be limited, with relatively stable levels of job satisfaction observed across the examined years (2020, 2021, and 2022) compared to the base year of 2019. This same result was found in the robustness check with 2018 as the base year. This then answers the research question: *what is the impact of COVID-19 on gender differences in job satisfaction in the Dutch labour market?*

The analysis does demonstrate a significant association between job insecurity, operationalized through the distinction between permanent and temporary contracts, and individuals' perceived levels of job satisfaction. Specifically, respondents with temporary contracts exhibit lower levels of job satisfaction compared to the reference category of permanent contracts. This research finds some small statistically significant effects when looking at different economic sectors. Although the coefficients being rather small, employees in the catering sector are less likely to be satisfied with their wages compared to other sectors, while individuals in the healthcare sector are more likely to be satisfied with their type of work. Employees in the education sector demonstrate higher satisfaction levels in both their type of work and the atmosphere amongst colleagues.

The main finding of this research – no observation of a significant decline in job satisfaction followed from the shock of COVID-19 in the Dutch labour market – contrasts with expectations based on previous research indicating the negative effects of economic crises on job satisfaction. A reason for this could be the overall satisfaction of individuals that were able to retain their jobs, government aid, and a prevailing sense of solidarity in society. Further research is necessary to test this hypothesis.

5.2 Limitations and recommendation(s)

One of the limitations of this research is that, despite the use of a fixed effects regression design, this research has no control group. Therefore, we cannot distinguish between what would have happened to the levels of perceived job satisfaction if COVID-19 did not take place. This is then also a recommendation for further research, as the use of a differences-in-differences model could be possible if more data from previous years would be included to see how the trend in perceived levels of job satisfaction develops. As mentioned in the results section, are the outcomes for model one, two, three and four in the year 2018 not statistically significant. This could mean that the years 2018 and 2019 show quite similar trends in perceived levels of job satisfaction and that from 2020 onwards a discontinuity becomes visible, this could be further examined using a difference-in-difference approach.

Bibliography

Ahmad, T., Baig, M., & Hui, J. (2020). Coronavirus disease 2019 (COVID-19) pandemic and economic impact. Pakistan journal of medical sciences, 36(COVID19-S4), S73.

Alberto Bisin and others, Ethnic identity and labour market outcomes of immigrants in Europe, Economic Policy, Volume 26, Issue 65, 1 January 2011, Pages 57–92

Allison, P. D. (2009). Fixed effects regression models. SAGE publications.

Angrist, J. D., & Pischke, J. S. (2014). Mastering'metrics: The path from cause to effect. Princeton University Press.

Bartik, A. W., Bertrand, M., Cullen, Z., Glaeser, E. L., Luca, M., & Stanton, C. (2020). The impact of COVID-19 on small business outcomes and expectations. Proceedings of the National Academy of Sciences, 17 (30) 17656–17666.

Bell, D. N., & Blanchflower, D. G. (2011). The crisis, policy reactions and attitudes to globalization and jobs.

Brüderl, J., & Ludwig, V. (2015). Fixed-effects panel regression. The Sage handbook of regression analysis and causal inference, 327, 357.

Böckerman, P., Ilmakunnas, P., & Johansson, E. (2011). Job security and employee well-being: Evidence from matched survey and register data. Labour Economics, 18 (4), 547–554.

Callaway, B., & Sant'Anna, P. H. (2021). Difference-in-differences with multiple time periods. Journal of Econometrics, 225(2), 200-230.

CentERdata. (n.d.). About the Panel | LISS Panel Data. LISS Panel.

Clark, A. E. (1997). Job satisfaction and gender: why are women so happy at work?. Labour economics, 4(4), 341-372.

Cooper-Hakim, A., & Viswesvaran, C. (2005). The construct of work commitment: Testing an integrative framework. Psychological bulletin, 131(2), 241.\

Coskun, Sena, and Husnu Dalgic. 2020. "The Emergence of Procyclical Fertility: The Role of Gender Differences in Employment Risk." CRC TR 224 Discussion Paper Series No. 142.

Del Boca, D., Oggero, N., Profeta, P., and Rossi, M. (2020) Women's and men's work, housework and childcare, before and during COVID-19, Review of Economics of the Household, 18, 1001–17.

Doepke, Matthias, and Michèle Tertilt. 2016. "Families in Macroeconomics." Chapter 23 of Handbook of Macroeconomics, Vol. 2. North Holland.

Ellieroth, Kathrin. 2019. “Spousal Insurance, Precautionary Labor Supply, and the Business Cycle.” Unpublished Manuscript, Indiana University.

Erlinghagen, M. (2007). Self-Perceived Job Insecurity and Social Context: A Multi-Level Analysis of 17 European Countries. European Sociological Review, 24 (2), 183–197.

Fernandes, N. (2020). Economic Effects of Coronavirus Outbreak (COVID-19) on the World 78 Journal of Competitiveness Economy. IESE Business School Working Paper No. WP-1240-E. http://dx.doi.org/10.2139/ ssrn.3557504

Fuchs-Schündeln, N., Kuhn, M., and Tertilt, M. (2020) The Short-Run Macro Implications of School and Child-Care Closures (IZA Discussion Paper No. 13353), Institute of Labor Economics, Bonn, Germany.

Gago, E. G., & Kirzner, M. S. (2013). Women, gender equality and the economic crisis in Spain. In Women and Austerity (pp. 250-269). Routledge.

Greenhalgh, L., & Rosenblatt, Z. (2010). Evolution of Research on Job Insecurity, International Studies of Management and Organization, 40 (1), 6–10.

Gerich, J., & Weber, C. (2020). The ambivalent appraisal of job demands and the moderating role of job control and social support for burnout and job satisfaction. Social Indicators Research, 148, 251-280.

Gutiérrez Banegas, A., Olivera Pérez, E., Bastida Escamilla, E., & Castillo Soto, M. (2022). Factors of job satisfaction during an economic crisis. A systematic review. Visión de futuro, 26(2), 22-35.

Hauret, L., & Williams, D. R. (2017). Cross-National Analysis of Gender Differences in Job Satisfaction. Industrial Relations (Berkeley), 56(2), 203–235.

Hodson, R. (1989). Gender differences in job satisfaction: Why aren't women more dissatisfied?. The Sociological Quarterly, 30(3), 385-399.

Hupkau, C. and Petrongolo, B. (2020) Work, care and gender during the COVID-19 crisis, Fiscal Studies, 41, 623–51.

Hsiao, C. (2007). Panel data analysis—advantages and challenges. Test, 16(1), 1-22.

ILO (2020). ILO Monitor: COVID-19 and the world of work. Fifth edition Retrieved from https://reliefweb.int/report/world/ilo-monitor-covid-19-and-world-work-fifth-edition-enru?gclid=CjwKCAjwhdWkBhBZEiwA1ibLmGsrAU2zk-_1wPgUgdmsupqmcr420cOTc-vdgw8_kMKqTLxFQ33PAxoCo6kQAvD_BwE

Jordy Meekes, Wolter H J Hassink, Guyonne Kalb, Essential work and emergency childcare: identifying gender differences in COVID-19 effects on labour demand and supply, Oxford Economic Papers, Volume 75, Issue 2, April 2023, Pages 393–417.

Kanter, Rosabeth M. 1977. Men and Women of the Corporation. New York: Basic

Leschke, J., & Jepsen, M. (2011). The economic crisis–challenge or opportunity for gender equality in social policy outcomes. A comparison of Denmark, Germany and the UK Brussels: ETUI aisbl.

LISS panel. (n.d.). [Dataset].

Markovits, Y., Boer, D., & van Dick, R. (2014). Economic crisis and the employee: The effects of economic crisis on employee job satisfaction, commitment, and self-regulation. European Management Journal, 32(3), 413-422.

Mason, E. S. (1995). Gender differences in job satisfaction. The Journal of Social Psychology, 135(2), 143-151.

Metin Camgoz, S., Tayfur Ekmekci, O., Bayhan Karapinar, P., & Kumbul Guler, B. (2016). Job insecurity and turnover intentions: Gender differences and the mediating role of work engagement. Sex Roles, 75, 583-598.

Ministerie van Algemene Zaken. (2023a, January 4). Januari 2021: Invoering avondklok en start vaccinatie. Coronavirus Tijdlijn | Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/coronavirus-tijdlijn/januari-2021-invoering-avondklok-en-start-vaccinatie

Ministerie van Algemene Zaken. (2023, January 4). Mei 2022: Corona gaat steeds meer naar de achtergrond en voorbereiding voor eventuele nieuwe golf. Coronavirus Tijdlijn | Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/coronavirus-tijdlijn/mei-2022-corona-gaat-steeds-meer-naar-de-achtergrond-en-voorbereiding-voor-eventuele-nieuwe-golf

Ministerie van Algemene Zaken. (2023c, January 4). Ontwikkelingen coronavirus in 2022. Coronavirus Tijdlijn | Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/coronavirus-tijdlijn/2022

Ministerie van Algemene Zaken. (2023, April 19). Informatie voor vaststelling NOW. Coronavirus: Financiële Regelingen | Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/coronavirus-financiele-regelingen/overzicht-financiele-regelingen/now

Nemteanu, M. S., Dinu, V., & Dabija, D. C. (2021). Job insecurity, job instability, and job satisfaction in the context of the COVID-19 pandemic. Journal of Competitiveness, 13(2), 65.

National Institute for Public Health and the Environment. (2022) COVID-19 cumulatieve aantallen per gemeente, https://data.rivm.nl/meta/srv/eng/catalog.search#/metadata/1c0fcd57-1102-4620-9cfa-441e93ea5604

Oreffice, S. and Quintana-Domeque, C. (2021) Gender inequality in COVID-19 times: Evidence from UK prolific participants, Journal of Demographic Economics, 87, 261–87.

Oude Munnink, B. B., Nieuwenhuijse, D. F., Stein, M., O'Toole, Á., Haverkate, M., Mollers, M., ... & Koopmans, M. (2020). Rapid SARS-CoV-2 whole-genome sequencing and analysis for informed public health decision-making in the Netherlands. Nature medicine, 26(9), 1405-1410.

Padhan, R., & Prabheesh, K. P. (2021). The economics of COVID-19 pandemic: A survey. Economic analysis and policy, 70, 220-237.

Panaccio, A., & Vandenberghe, C. (2009). Perceived organizational support, organizational commitment and psychological well-being: A longitudinal study. Journal of vocational behavior, 75(2), 224-236.

Perugini, C., & Vladisavljević, M. (2019). Gender inequality and the gender-job satisfaction paradox in Europe. Labour Economics, 60, 129-147.

Salas-Nicás, S., Sembajwe, G., Navarro, A., Moncada, S., Llorens, C., & Buxton, O. M. (2020). Job insecurity, economic hardship, and sleep problems in a national sample of salaried workers in Spain. Sleep health, 6(3), 262-269.

Sevilla, A. and Smith, S. (2020) Baby steps: the gender division of childcare during the COVID-19 pandemic, Oxford Review of Economic Policy, 36, S169–S186.

Shkoler, O., & Tziner, A. (2020). Leadership Styles as Predictors of Work Attitudes: A Moderated–Mediation Link. Amfiteatru Economic, 22 (53), 164–178.

Spector, P. E. (1997). Job satisfaction: Application, assessment, causes, and consequences (Vol. 3). Sage.

Strazdins, L., D'Souza, R. M., Lim, L. L. Y., Broom, D. H., & Rodgers, B. (2004). Job Strain, Job Insecurity, and Health: Rethinking the Relationship. Journal of Occupational Health Psycholog y, 9 (4), 296–305.

van der Drift, S., Wismans, L., & Olde Kalter, M. J. (2022). Changing mobility patterns in the Netherlands during COVID-19 outbreak. Journal of Location Based Services, 16(1), 1-24.

Vandenberghe, C. (2012). Organizational commitments. In Commitment in organizations (pp. 120-156). Routledge.

Wilson, J. M., Lee, J., Fitzgerald, H. N., Oosterhoff, B., Sevi, B., & Shook, N. J. (2020). Job Insecurity and Financial Concern During the COVID-19 Pandemic Are Associated Worse Mental Health. Journal of Occupational and Environmental Medicine, 62 (9), 686–691.

Zamarro, G., Perez-Arce, F., & Prados, M. J. (2020). Gender Differences in the Impact of COVID-19. KTLA. Accessed on July, 16, 2021

Zhang, S. X., Liu, J., Afshar Jahanshahi, A., Nawaser, K., Yousefi, A., Li, J. & Sun, S. (2020). At the height of the storm: Healthcare staff's health conditions and job

satisfaction and their associated predictors during the epidemic peak of COVID-19. Brain, Behavior, and Immunity, 87, 144–146

Appendix I

The figures show a more zoomed-in version of figure 1 as presented in the descriptive statistics section 3.4.3. The figures below, again describe that the measured increase in the different aspects of job satisfaction is very small.

Figure 1: Satisfied everything considered, detailed

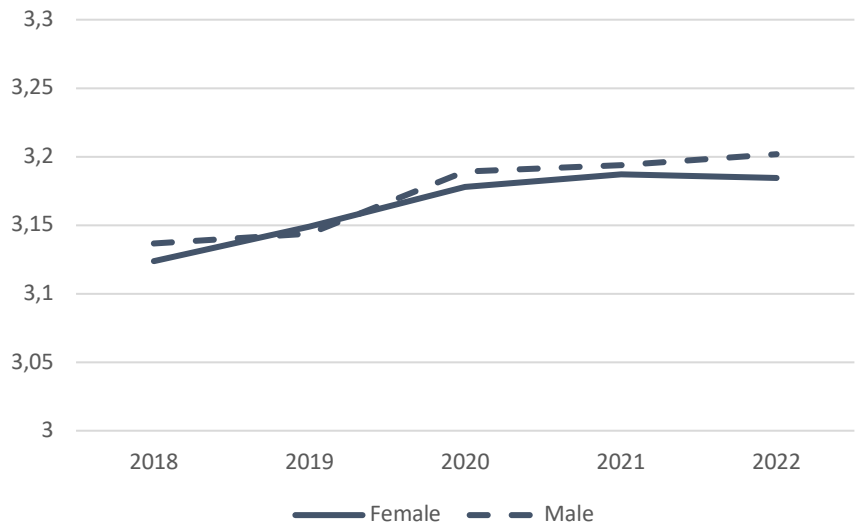


Figure 2: satisfied wage, detailed

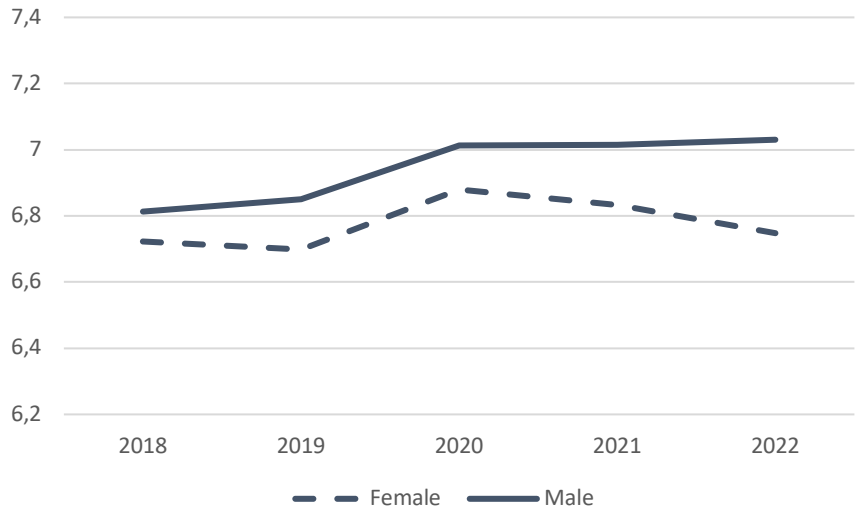


Figure 3: Satisfaction type of work, detailed

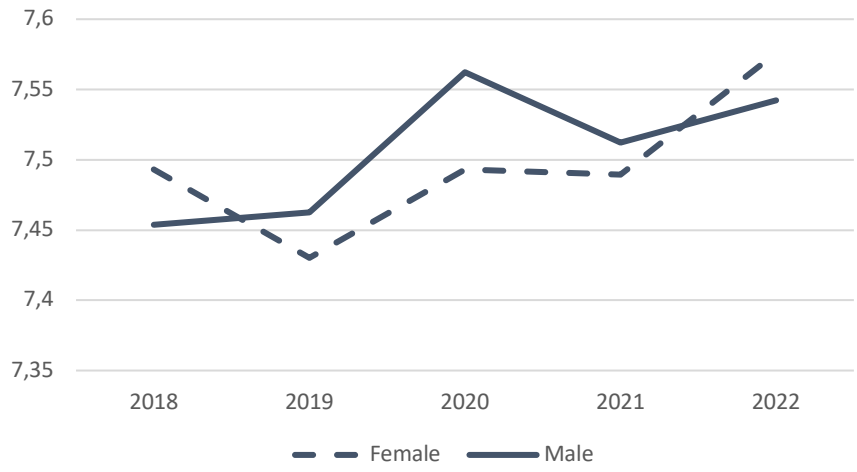


Figure 4: Satisfaction working hours, detailed

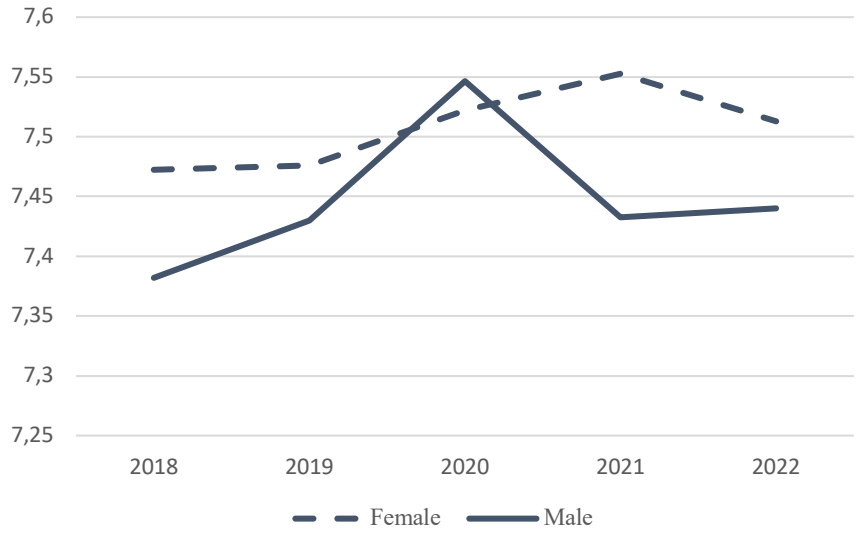


Figure 5: Satisfied atmosphere amongst colleagues, detailed