ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor thesis Economics and Business Economics

Shifts in the Gender Pay Gap Faced by Women and Mothers Working from Home after the COVID-19 Pandemic

Name student: Anna Valk

Student ID number: 571227

Supervisor: Dana Sisak

Second assessor:

Date final version: 03/07/2023

Abstract

This study examines the impact of the COVID-19 pandemic and the increase in remote work on the gender pay gap faced by women and mothers. By analysing data from the Survey of Income and Program Participation (SIPP) from 2018 and 2021, the study explores the correlation between remote work, average hourly wages, and the gender pay gap. The findings reveal a significant rise in remote work after the pandemic, particularly among women. The study also confirms the existence of a gender pay gap, but notes a reduction in the amount of significant mean differences between men and women in certain parent and age groups over time. Consequently, the analysis reveals a decrease in the gender pay gap in 2021, particularly among specific age and parent cohorts. The study suggests that the rise in remote work may have contributed to this decline.

While the study's correlational design prevents establishing causality, the findings suggest that the rise in remote work has played a role in slightly reducing the gender pay gap. Consequently, the implications could emphasize the significance of offering flexible work arrangements, particularly for mothers, as a potential strategy to address the gender pay gap.

Table of content

1	Introduction	4
	1.2 History working from home	5
2	Literature review	6
	2.1 The gender pay gap	6
	2.2 Motherhood	7
	2.3 Mothers and working from home	8
	2.4 Working from home	9
	2.5 changes in working from home because of the Covid-19 pandemic	11
	2.6 hypothesis	12
3	Data	14
	3.1 Data set	14
	3.2 Control variables	16
4	Methodology	17
5	Results	19
6	Discussion	24
	6.2 limitations	28
7	Conclusion	29
8	References	30
9	Appendices	34
	A: Summary statistics	34
	B: Hypothesis 1	40
	C: Hypothesis 2	52
	D: Hypothesis 3	58

1. Introduction

The persistent gender pay gap has been a topic of extensive research and discussion in recent decades. Despite efforts to address this issue, the differences in wages between women and men holding similar positions continues to exist. While progress has been made in reducing the gender pay gap, the rate of improvement appears to be slowing down. This paper aims to explore the impact of the recent working from home increase on the gender pay gap, with a specific focus on the gender pay gap for parents.

In recent years, working from home has emerged as a potential solution for mothers seeking a better work-life balance. By offering more flexibility, companies can potentially address the challenges faced by mothers in the workforce. The COVID-19 pandemic has played a significant role in the rise of remote work. With widespread lockdown measures forcing people to stay home, companies hastily implemented work from home arrangements, initially facing challenges but eventually adapting smoothly and even offering more flexible work options after the lockdowns. This sudden shift in favour of remote work may have led to a decrease in the disadvantages faced by women working from home. Thus, the objective of this paper is to conduct a correlational empirical study to examine how the wage gap experienced by women and mothers working from home have changed in the United States after the COVID-19 pandemic. By addressing the research question, this paper aims to gain insights into the gender pay gap. The research question for this paper is:

How has the gender pay gap faced by women and mothers changed after the COVID-19 pandemic, because of the increase of working from home, in the United States?

If the findings indicate that widely available remote work reduces the gender pay gap, it could suggest a shift in focus towards remote work as a societal solution, it could inspire causal empirical research that could potentially eliminating the need for gender quotas. This would have significant implications for addressing this issue and could potentially reshape the approach to combating gender inequality in the workplace. This highlights the importance of these findings as they could potentially contribute to the idea that working from home reduces the gender pay gap.

The study employs the SIPP dataset, which uses a large sample of U.S. citizens. Specifically, the analysis relies on two sets of data: one from 2018, providing an overview prior to the COVID-19 pandemic, and another from 2021, capturing the changes during the end and after the pandemic. The primary objective of this research paper is to examine correlational evidence that supports the existing body of literature.

This paper will commence with chapter 1.2, which provides a historical overview of working from home arrangements. Following that, chapter 2 will present an extensive literature review including various

topics, consisting of women and mothers in the workforce, the pros and cons of remote work, the impact of remote work on women's positions, and the role of COVID-19. Based on the findings from the literature review, three hypotheses will be formulated to examine the trends and changes related to working from home and the gender pay gap.

Moving forward, chapter 3 will explain the data utilized in this study, along with explanations of the modifications made to address the research question. It will also explanations of the control variables. Subsequently, in chapter 4, the empirical methods employed for testing each hypothesis will be discussed in detail. Following this, chapter 5 will present the results of the analysis for each hypothesis, while chapter 6 will provide a comprehensive interpretation of these results, focusing on whether there have been changes after COVID-19. Lastly, chapter 7 will offer a concise conclusion to wrap up the paper.

1.2 History working from home

In the 1950s, the idea of telecommuting emerged, as observed by Jones (1957). It envisioned that advancements in technology would eventually enable individuals to work from locations other than the traditional office. However, the necessary technology was not available until the 1990s. With advancements in technology facilitating communication and a shift in management approaches prioritizing productivity over physical presence, telecommuting gained popularity. Telecommuting became a viable option (Baruch, 2001), with an expected increase in its popularity. In the 1990s, telecommuting was defined as working without physically being in the office, utilizing technology (Baruch, 2001; Gajendran and Harrison, 2007). Later, the term "working from home" (WFH) was introduced to describe flexible work arrangements that allow individuals to work from home with flexible hours. In this paper, the term "working from home" will be utilized and defined as individuals who work at least some portion of their work hours from home.

2. Literature review

This paper will now delve into the literature review, exploring relevant literature works concerning the gender pay gap, the challenges experienced by mothers in the workforce, and the implications of working from home. Furthermore, it will examine the changes that have transpired as a result of the COVID-19 pandemic. By examining these bodies of literature, the aim is to gain a comprehensive understanding of the factors influencing the gender pay gap and how working from home has impacted gender dynamics in the workplace, particularly for mothers.

2.1 The gender pay gap

The gender pay gap continues to persist, despite efforts to address it. In recent decades, there has been considerable attention given to the gender pay gap, which refers to the disparity in wages between women and men holding the same positions. While progress has been made in reducing this gap, the rate of improvement appears to be slowing down (Blau and Kahn, 2006; Gharehgozli, 2020). The convergence of female and male wages was more significant in the 1980s compared to the 1990s. According to Blau and Kahn (2006), who analysed PSID data, the female-to-male wage ratio increased by 9.0 percentage points from 59.7% to 68.7% in the 1980s, whereas in the 1990s, it only rose by 3.5 percentage points to 72.2%. This deceleration may be attributed to the fact that by the 1990s, the gender differences in terms of human capital had already significantly decreased, leaving limited room for further improvement (Blau and Kahn, 2016; Goldin, 2014).

In 2014, it was estimated that women earned approximately 79% of what men earned, accounting for differences in human capital factors (Blau and Kahn, 2016). Some researchers argue that the gender pay gap might be overestimated as it often fails to consider all relevant human capital factors (Altonji and Blank, 1999). It has been found that women typically do not begin their careers with a pay gap, but experience a substantial slowdown in wage growth right before and within the first few years after the birth of their first child (Bertrand, Goldin, and Katz, 2009; Goldin 2014).

Various theories have been proposed to explain the remaining gender pay gap, which persists to this day. One possible explanation is the presence of actual discrimination, resulting in lower pay (Altonji and Blank, 1999; Blau and Kahn, 2006; Blinder, 1973; Goldin, 2014). However, it is crucial to consider all alternative explanations before conclusively attributing gender discrimination in the workplace. Self-selection also plays a role as women may choose workplaces with less competition and better family-friendly policies, even at the cost of lower pay (Blau and Kahn, 2016; Bertrand, Goldin, and Katz, 2009). Women often switch jobs to seek family-friendly companies after becoming mothers or desiring better work-life balance. Also, differences in hours worked between men and women further contribute to the pay gap, especially among women with children (Bertrand, Goldin, and Katz, 2009; Goldin, 2014). Pay structures often follow a non-linear pattern based on hours worked, widening the gap (Goldin, 2014). Full-time employees generally earn more per hour than part-time employees, even in the same job. Besides that, career disruptions due to motherhood also perpetuate the gender pay gap (Blau and Kahn, 2016; Bertrand, Goldin, and Katz, 2009). Pregnancy-related breaks and subsequent leave periods lead to lower wages for women. The well-documented "motherhood penalty" reveals a negative correlation between the number of children a woman has and her wages (Blau and Kahn, 2016).

2.2 Motherhood

The concept of intensive mothering, which places higher expectations on mothers to be fully involved in their children's lives and adjust their schedules, has gained popularity in recent decades (Hilbrecht et al., 2008). However, women are now also more likely to participate in the workforce than they used to (Antecol, 2000), although their participation still is behind that of men (Sauré and Zoabi, 2013). Mothers now contribute a significant portion of the family income, accounting for approximately 40% in 2001 (Glass, 2004). This combination of increased workforce participation and the high expectations of motherhood has resulted in heightened pressure and stress for employed mothers (Chung 2011; Hilbrecht et al., 2008).

Despite their increased contribution to the workforce, mothers face the largest version of the gender pay gap. On top of the existing wage gap, mothers earn approximately 5% to 10% less per child than all other workers (Benard, Paik, and Correll, 2007; Gough and Noonan, 2013), taking into account factors such as human capital (education and work experience), race, and the number of hours worked. This phenomenon, known as the motherhood penalty, has shown no decline over time (Benard, Paik, and Correll, 2007). Mothers with children account for a majority of the gender pay gap (Correll, Benard, and Paik, 2007; Goldin, 2014; Gough and Noonan, 2013), implying that addressing the motherhood penalty would significantly reduce the overall gender pay gap. Not only do mothers earn less than men, but they also earn only about 80% of what women without children earn over their lifetime, despite similar qualifications. In fact, the wage gap between mothers and non-mothers is larger than the gap between men and women (Correll, Benard, and Paik, 2007), and women without children make comparable salaries compared to men (Goldin, 2014)

The wage gap experienced by mothers can be attributed to various reasons, some of which have been discussed in the previous section on the gender pay gap. Additionally, discrimination plays a role, with stereotypical associations and perceptions about mothers' competence leading to reduced opportunities for promotions. There is a theory suggesting that individuals have a fixed amount of effort to allocate, and mothers, who invest more effort in their families, may allocate less effort to work, resulting in lower pay (Gough and Noonan, 2013). Interestingly, while mothers face penalties and lower wages, fathers may actually earn more due to their parental status (Correll, Benard, and Paik, 2007).

2.3 Mothers and working from home

Mothers have been seeking ways to strike a balance between work and family responsibilities, leading to the exploration of alternatives such as working from home (Bélanger, 1998; Chung, 2011). Flexible

work arrangements like these have the potential to improve work-life balance for employees (Bélanger, 1998) and potentially reduce the gender pay gap (Goldin, 2014; Blau and Kahn, 2016). However, it's important to acknowledge that these arrangements may still come with lower wages and disadvantages in the workforce. Concerns about career consequences and potential judgment from colleagues and supervisors often discourage mothers from utilizing flexible work options. Research indicates that the need for flexibility is often more prominent among new mothers, while men tend not to exhibit the same desire for flexibility upon becoming fathers (Goldin, 2014).

Implementing more flexible work arrangements, where individuals can choose to work from home and tailor their hours to suit their lifestyles, has the potential to significantly reduce the gender pay gap (Goldin, 2014). Goldin argues that if companies didn't disproportionately reward those working outside the office, the pay gap would diminish. Sherman (2020) also suggests that making remote work widely available could reduce the disadvantages faced by mothers and contribute to reducing the gender pay gap. In a randomized field experiment, Sherman found no difference in the uptake of flexible work arrangements among men, women, and mothers when they were universally available within a company (Sherman, 2020). This suggests that if working from home becomes widely accessible, the disadvantages experienced by mothers would diminish as both men and women would have the opportunity to work from home, potentially reducing the gender pay gap (Sherman, 2020; Angelici and Profeta, 2020).

In addition to narrowing the gender pay gap, making flexible work arrangements widely available can help women achieve a better work-life balance and improve family relations. This can also lead to increased male participation in household and childcare tasks, thereby reducing stress experienced by women (Angelici and Profeta, 2020; Dockery and Bawa, 2018). However, it's crucial to consider potential drawbacks of working from home, such as increased stress levels and decreased happiness, particularly among parents and childless females, as indicated by self-reported surveys (Song and Gao, 2019).

2.4 Working from home

Working from home (WFH) represents a trade-off with both positive and negative effects. WFH offers several advantages for both men and women, such as reduced commuting and inspection costs, improved time management, lower turnover, decreased absence, and increased feelings of autonomy (Angelici and Profeta, 2020; Baruch, 2001; Gajendran and Harrison, 2007; Golden, Veiga, and Simsek, 2006; Tleuken et al., 2000). Moreover, it can increase employee satisfaction (Gajendran and Harrison, 2007; Golden, 2006; Wheatley, 2012), leading to more positive perceptions of the firm and increased dedication (Osterman, 1995). Work-family conflicts may also decrease with the adoption of WFH (Baruch, 2001; Gajendran and Harrison, 2007; Golden, Veiga, and Simsek, 2006; Konrad and Mangel,

2000; Mesmer-Magnus and Viswesvaran, 2006), and studies have shown that it reduces stress and depression for new mothers (Shepherd-Banigan et al., 2016). Additionally, the possibility of WFH has the potential to decrease the gender pay gap, as mentioned earlier. These positive effects can contribute to higher (perceived) productivity (Baruch, 2001; Bélanger, 1998; Gajendran and Harrison, 2007; Konrad and Mangel, 2000; Tleuken et al., 2022) and specifically for mothers (Sherman, 2020).

However, WFH can also have negative implications for (perceived) productivity and satisfaction (Song and Gao, 2019; Tleuken et al., 2022). Some of these drawbacks include reduced commitment to the firm, potential exploitation of freedom, increased visibility of family conflicts, and interference of family duties with work activities (Baruch, 2001). The blurred line between work and home can lead to increased overtime, higher stress levels, and worsened work-life balance (Mann and Holdsworth, 2003). Moreover, individuals working from home may experience a heightened sense of pressure (Russell, O'Connell, and McGinnity, 2009), leading to work-family conflicts due to the overlapping of workspace and home environment (Gajendran and Harrison, 2007). Social isolation is another significant concern associated with WFH (Mann and Holdsworth, 2003), along with limited visibility and reduced career development opportunities (Baruch, 2001; Bloom et al., 2014). Another crucial factor to consider is the share of time individuals work from home.

While working from home can have both positive and negative effects for the general population, it's important for individuals and firms to evaluate what works best for them. Offering more flexible work arrangements can help reduce the gender wage gap and support mothers. However, the impact of working from home on wages is somewhat ambiguous in the literature, with arguments for both increasing and decreasing wages. It's crucial to note that many correlations found between WFH and wages in the literature have an upward bias because flexible work arrangements are usually offered by high-performing firms, and therefore the wages would already be higher (Arntz, Yahmed, and Berlingieri, 2019).

One reason why working from home might lead to a wage penalty is that companies offering work-family programs tend to offer lower wages (Glass, 2004), and women often choose to self-select into these programs. Both men and women are willing to accept an 8% wage decrease for flexible options, but this willingness is higher for women, particularly those with children (Arntz, Yahmed, and Berlingieri, 2019). Additionally, flexibility is perceived as a cost for firms, especially in sectors such as corporate, financial, and legal domains, which face high communication costs when providing flexible work arrangements (Gariety and Shaffer, 2007; Goldin, 2014). In these sectors, the gender pay gap tends to be more pronounced, especially among parents (Goldin, 2014). Furthermore, companies may offer lower wages

to individuals working from home due to assumptions that productivity decreases when employees face more distractions (Arntz, Yahmed, and Berlingieri, 2019).

However, there are indications suggesting that remote work could lead to higher wages. Where Arntz, Yahmed, and Berlingieri (2019) discovered that women experience a 28% increase in monthly wages when they transition to remote work. The first reason could be that companies may promote WFH to save on office space and rent expenses. Additionally, WFH has the potential to boost productivity due to a positive work environment at, improved time management, and the gratitude employees feel for being granted the opportunity to work remotely (Arntz, Yahmed, and Berlingieri, 2019). While the impact of WFH on productivity is still a subject of ongoing debate, most causal studies indicate a productivity increase (Arntz, Yahmed, and Berlingieri, 2019). In a competitive labor market, these productivity gains would likely reflect into higher wages for workers (Feldstein, 2018; Konings and Marcolin, 2014).

Many productivity and WFH studies rely on subjective assessments, which can be unreliable. Measuring the effects of WFH on productivity is challenging due to the difficulty in quantifying productivity and the potential for reverse causality. However, certain causal studies have provided evidence supporting the idea that WFH enhances productivity. For example, Bloom et al. (2014) conducted a large-scale, long-term, randomized experiment in a Chinese call center and found that individuals working from home improved their performance by 13%. Another study by Angelici and Profeta (2020) implemented a randomized experiment in a major Italian firm, allowing some employees to work remotely. They also observed a productivity increase, with more files processed per day, particularly driven by women. While these studies offer valuable insights, it is important to consider external validity, as they were conducted in specific firms with relatively straightforward productivity measurement. Nonetheless, considering the likely productivity gains associated with WFH, it is reasonable to expect that wages would increase in a competitive labor market.

Overall, there is accumulating evidence suggesting a positive correlation between WFH and higher wages (Schroeder and Warren, 2005; Weeden, 2005), as well as a potential reduction in the gender wage gap by offering women the opportunity to work remotely (Arntz, Yahmed, and Berlingieri, 2019).

2.5 Changes in working from home because of the COVID-19 pandemic

Having established that widespread adoption of working from home could potentially reduce the gender pay gap by providing women with more opportunities to integrate work and household responsibilities and allowing them to work additional hours, it is valuable to examine the real-world implications. Interestingly, the COVID-19 pandemic has served as a significant trigger for increased remote working,

creating a massive natural experiment that enables research into the impact of working from home on the gender pay gap and other associated disadvantages.

The pandemic compelled a large number of individuals to spend substantial time within their own homes, leading to a considerable increase in remote work, which was a new experience for many (Deng, Morissette, and Messacar, 2020). Initially, the transition to remote work posed challenges as companies lacked the necessary infrastructure for seamless online communication and operations. However, as the pandemic progressed, people adapted and harnessed technology to their advantage. Following an initial adjustment period (Irawanto, Novianti, Roz, 2021; Niebuhr, 2022), both employers and employees discovered that working from home offered benefits in terms of work-life balance, job satisfaction, and productivity (Boland, De Smet, Palter, and Sanghvi, 2020; Niebuhr, 2022; Yang, Kim, and Hong, 2023).

During the initial lockdown, there were concerns about individual productivity. Studies indicated a decrease in productivity at the start of the pandemic (Bick et al., 2021; Yang, Kim and Hong, 2023). This decline could be attributed to the sudden shift to remote work without sufficient preparation. Additionally, families being confined together faced challenges as household members could distract one another. However, after an adjustment period, some research found that productivity actually increased while working from home (Bick et al., 2021; Yang, Kim and Hong, 2023; He, Balistreri, Kim and Zhang, 2022). This could be attributed to improved job satisfaction and the gradual adaptation to remote work practices which increased productivity. Many individuals started considering the option of continuing to work from home even after the main lockdowns ended (Deng, Morissette, and Messacar, 2020). Consequently, a significant number of people chose to work remotely for a portion of their time, which did not negatively impact their productivity (Bick et al., 2021; Yang, Kim, and Hong, 2023; He, Balistreri, Kim, and Zhang, 2022; LaSalle, 2021). Moreover, in most cases, wages remained stable or even increased (Irlacher and Koch, 2021; LaSalle, 2021). The wage increase is likely attributed to the factors previously mentioned, as companies observed during the lockdown that employee productivity did not decrease and, in many cases, even improved. The precise groups that benefited the most from the COVID-19 lockdown and the increased opportunities for remote work are still not entirely clear, although LaSalle (2021) proposed that the pandemic may have led to a reduction in the gender pay gap.

2.6 Hypothesis

In this paper, the objective is to investigate the changes in the gender pay gap faced by women and mothers who work from home following the COVID-19 pandemic. The study will be conducted in multiple steps, guided by three hypotheses.

The initial hypothesis aims to explore correlations related to working from home, based on existing literature. This hypothesis will be divided into three sub-hypotheses. Hypothesis 1.A seeks to identify if the SIPP dataset shows a positive correlation between working from home and wages in 2018, as suggested by Schroeder and Warren (2005) and Weeden (2005). This is crucial in understanding the potential impact of remote work on women's financial situations and its potential influence on the gender pay gap. Hypothesis 1.B examines the increase in remote work during the COVID-19 pandemic, drawing on studies by Boland, De Smet, Palter, and Sanghvi (2020), Niebuhr (2022), and Yang, Kim, and Hong (2023). These studies indicate a significant rise in individuals continuing to work from home even after the lockdown measures were lifted. This finding holds particular importance as flexible work arrangements, including working from home, can aid mothers in balancing their work and family responsibilities. After establishing these correlations, the analysis will further investigate the impact of the COVID-19 pandemic on working from home. Hypothesis 1.C examines which individuals have been engaging in remote work. According to literature, mothers, due to their childcare responsibilities, are more likely to opt for flexible work arrangements, including working from home (Goldin, 2014). The post-pandemic period has highlighted the viability of remote work in achieving a better work-life balance, leading to increased adoption, especially among groups with higher domestic responsibilities such as mothers and mothers of young children.

Hypothesis 1.A: Working from home is positively correlated with the average hourly wage in 2018.

Hypothesis 1.B: Working from home has increased during COVID-19.

Hypothesis 1.C: Mothers of young children have the highest rate of working from home and have experienced the highest increase, followed by mothers and women.

After examining the correlations related to working from home, the focus of this analysis will shift to the gender pay gap. Hypothesis 2 aims to establish the presence of a gender pay gap using data from 2018. Additionally, the analysis will explore whether the gender pay gap widens when women become mothers. Prior research (Blau and Kahn, 2016) has indicated that women earn approximately 79% of what men earn, and this gap tends to increase when women have children (Benard, Paik, and Correll, 2007; Gough and Noonan, 2013).

Hypothesis 2: There is a gender pay gap, which is most prominent among mothers in 2018.

Subsequently, the focus will shift to the core question of the gender pay gap, which may have been influenced by the increase in remote work during the COVID-19 pandemic. It is believed that remote work productivity has improved during this time (Bick et al., 2021; Yang, Kim, and Hong, 2023; He, Balistreri, Kim, and Zhang, 2022). Consequently, the disadvantages associated with working from home have diminished, and in a perfectly competitive market, increased productivity should translate into higher wages (Feldstein, 2018; Konings and Marcolin, 2014). Although real-world conditions may not always align with a perfectly competitive market, and there might be some time lag, there is typically a correlation between productivity and wages. In this analysis, different groups will be compared to assess whether the wage gaps have decreased. While various control variables will be considered, it is important to note that not every aspect will be accounted for, potentially introducing some bias. Nevertheless, the results will provide valuable insights into the changes in these correlations.

Hypothesis 3: The gender pay gap has decreased during COVID-19, particularly for mothers and mothers of young children.

The subsequent sections will focus on the empirical analysis, commencing with a detailed discussion of the data used in this study.

3. Data

This section will delve into the data used in the empirical analysis, along with an explanation of any modifications made to the dataset. Additionally, the control variables employed in this study will be discussed and possible missing control variables will be acknowledged.

3.1 data set

The Survey of Income and Program Participation (SIPP) datasets contain extensive yearly data collected in the United States. Each year, more than 50,000 respondents provide monthly data, resulting in over 600,000 data points per dataset. These datasets comprise over 5,000 variables primarily covering topics related to income, assets, and information about individuals' children, including their ages. In addition, background information such as race, gender and education are also available. The reliability of the SIPP dataset stems from its source, the U.S. Census Bureau, which is a government institution. The SIPP data employs a multistage-stratified sample, ensuring that it accurately represents the U.S. population. Moreover, the sample size is sufficiently large to capture a representative cross-section.

This paper aims to answer whether the increase of remote working has reduced the gender pay gap during covid 19. The SIPP data is particularly valuable for this purpose due to its annual collection, and

data from both 2018 and 2021 were selected to examine the pre- and post-pandemic periods. Of course, in 2021 the covid crisis was still in an ending stage, but the main lockdowns were over. It would be beneficial to look at the 2022 data set, but this has not been published yet. In this paper and in the SIPP data, working from home is defined as individuals working at least some time from home. Within the SIPP datasets, each individual can report multiple jobs. However, for this study, only the first job was considered as it represents individuals' primary employment, ensuring simplicity and accuracy.

Modifications were made to the dataset for this study. Firstly, since the data was collected monthly and most variables used in the analysis exhibit minimal changes over time (some were the simply copied over the months), yearly averages were calculated for each individual. This approach provides a more stable measure and prevents overestimating significance. Furthermore, to focus the analysis on the working population, the dataset was filtered to include only individuals aged 20 years and older and under 71 years. As a result, approximately 35% in both data sets were excluded.

Furthermore, the dataset was filtered based on participation in the workforce and minimum wage, with the exception of the data description regarding which groups worked. Since most of the analysis focuses on the working population, only individuals belonging to this group were included. Additionally, individuals earning less than the minimum hourly wage in the U.S., which is $7.25, were excluded from the analysis to ensure that all individuals included are engaged in legal work. In Table A.1.1 and A.1.2, the following information can be observed: Both the 2018 and 2021 data sets showed that around 30% of individuals did not participate in the workforce, with an additional 10% earning below the minimum wage. These groups were excluded from the analysis, resulting in a remaining sample size of approximately 60%, comprising 24,038 individuals in 2018 and 20,528 individuals in 2021. It is important to note that in the tables, it is visible that the group that earns below the minimum wage has a significantly higher percentage of young individuals, who are below the age of 30. In both data sets, the group 20-30 represents approximately 20% of the total sample and 40% of the group that makes less than the minimum wage. Since this research mainly focuses on women and parents, the focus is on the middle-aged class. Therefore, it is reasonable to exclude this particular group from the analysis.

After applying the necessary filters, the sample was categorized into three distinct age groups for analysis. The first group comprised young individuals aged 20 to 30, consisting of approximately 20% of the remaining population in both years. The second group consisted of middle-aged individuals ranging from 31 to 50, accounting for around 45%, while the final group included older individuals aged 51 to 70, representing approximately 35% (see tables A.1.1 and A.1.2). These age groups hold significant importance due to their impact on wages and gender-parenthood dynamics. The analysis explored variations among the age groups, finding the substantial and statistically significant correlations between

the age groups and average hourly wage, as well as the age groups and parental status (tables A.2 and A.3). Older individuals tended to have higher average hourly wages and were more likely to be parents. Recognizing the significance and magnitude of these correlations, it is crucial to account for these age groups in the subsequent analysis conducted in this paper. This can be achieved by either including age group as dummy variables or conducting separate analyses for each age group.

Additionally, parent groups were created to examine the distinct effects on women and men, in the case that they either had no children, children under the age of 5 or older children. Upon observing table A.4, it becomes evident that fathers and mothers with older children constituted the largest groups in both years, representing more than 20% each. In contrast, fathers and mothers with younger children constituted the smallest groups in both years, each accounting for less than 10%.

It is crucial to recognize that these modifications may affect the representativeness of the sample and introduce some form of bias. Additionally, not all individuals have data available for all variables, resulting in varying dataset sizes depending on the specific analysis.

3.2 Control variables

Now let's explore the control variables utilized in this paper, which were incorporated into the analysis to address potential confounding factors that could influence the relationship between the independent and dependent variables. By controlling for these variables, the accuracy and validity of the results were enhanced.

Regarding the variable of working from home, several control variables were selected. Firstly, age groups were included as control variables to identify patterns. Additionally, the number of children was considered, as it may impact a mother's inclination to work remotely. Marital status was also examined, recognizing that married women may prioritize domestic roles. Travel time to work was included due to its potential cost and its association with increased remote work needs. Lastly, the sector of employment was considered for its impact on the feasibility of remote work.

Additionally, for the average hourly wage variable, several control variables were included to account for potential effects on wages. Age groups were used to capture variations, with older workers typically earning higher wages. Next, the number of children was considered to address potential motherhood penalties. Then marital status was included, acknowledging that some women prioritize domestic responsibilities. Also, race was included to account for possible positive or negative wage influences resulting from discrimination. Whether an individuals has a degree was considered for its impact on wage levels. Finally, the sector of work was examined, recognizing its potential effects on wages.

This paper acknowledges that not all relevant background variables are accounted for due to their unavailability in the SIPP data. Consequently, this limitation could introduce additional biases into the findings. For instance, certain significant control variables such as the specific occupation of individuals, which greatly impacts both wages and the feasibility of remote work, were not included as part of the analysis. Other variables are the work experience individuals have accumulated, which may affect their earnings, and the type of degree they hold, which can also influence their wages. As a result, the comparison made in this paper does not provide a ceteris paribus comparison between men and women, where all factors are equal except for gender. Furthermore, it is important to note that workforce participation for women has not been considered in this study. This could potentially result in a misleading interpretation of the wage changes observed.

Having addressed the data and the control variables, this paper will now proceed with the empirical analysis, beginning with a description of the methodology employed for testing the hypotheses. Subsequently, the results of the analysis will be presented and thoroughly discussed.

4. Method

This analysis utilized two SIPP datasets from 2018 and 2021 to examine whether the gender pay gap faced by women and mothers working from home changed after the COVID-19 pandemic, in the United States. The study involved a step-by-step approach to understand the relationships between gender, parenthood, working from home, and the wage gap, employing correlational evidence rather than causal relationships. After the data reformation and reviewing the control variables, the focus now shifts the methodology of this paper. The analysis will commence by examining working from home through three sub-hypotheses. Subsequently, the wage gap will be assessed, followed by an investigation into whether the wage gap has decreased after the COVID-19 pandemic.

First, the analysis of Hypothesis 1.A will be explained, which aimed to establish a positive correlation between working from home and hourly wages in 2018. This was investigated through OLS regressions. The first regression analysed the relationship between working from home and average hourly wage, while a multiple variable regression was subsequently performed, incorporating additional control variables to reduce biases. The control variables used were age groups, number of children, marital status, degree, and job sector. These variables were selected due to their potential impact on average hourly wage, and thus, their inclusion could change the relationship between working from home and

average hourly wage. Although the addition of these control variables enhanced the accuracy of the estimation, it is important to note that not all potential confounding factors were accounted for.

Moving on to Hypothesis 1.B, where the aim is to assess whether there has been a substantial increase in the number of individuals working from home before and after the COVID-19 pandemic. This hypothesis was evaluated by conducting a T-test to compare the mean difference of WFH between 2018 and 2021. The null hypothesis assumes that the mean WFH in 2018 is equal to the mean WFH in 2021, while the alternative hypothesis suggests that the mean WFH in 2018 is less than the mean WFH in 2021. A P-value below 0.05 would indicate that the null hypothesis would be rejected. This analysis was performed for both the entire sample and different age groups.

The subsequent analysis focused on hypothesis 1.C, which investigates the gender-parent groups to determine which groups had the highest proportion of individuals working from home and experienced the largest increase. To test this hypothesis, T-tests comparing gender and working from home were conducted for both years. The entire population, as well as non-parents, parents of young children, and parents of older children, were included in these tests. Additionally, the different age groups within each parent group were taken into account. These T-test results determined if there were significant mean differences between men and women within each group and provided insights into the percentage variations in working from home. Conducting this analysis for both the 2018 and 2021 datasets provided the opportunity to compare the findings between the two years. The null hypothesis in this case was that the means of both genders were equal, while the alternative hypothesis suggested that women work from home more frequently than men. Consequently, a P-value below 0.05 would indicate that women indeed work from home significantly more than men, whereas a P-value above 0.95 would signify that men work significantly more from home than women.

Subsequent to the T-tests, separate multivariable regression analyses were conducted for each year and for all parent groups, on WFH. These regressions incorporated additional control variables which are, age groups, number of children, marital status, travel time, and job sector. These control variables were included because they can influence an individual's decision to work from home and could potentially impact the relationship between gender and working from home. By including these control variables, potential biases in the results were addressed, enabling a more accurate interpretation of the findings.

Hypothesis 2 suggests that there is a gender pay gap, which is most pronounced among mothers in 2018. To assess the overall gender pay gap, T-tests were conducted to compare the average hourly wage between men and women in the entire sample, as well as for non-parents and parents of both young and older children, with further breakdowns by age group. The null hypothesis states that men and

women have the same average hourly wage, while the alternative hypothesis suggests that women earn a lower average hourly wage. The tables display the differences in mean average hourly wage for both genders, along with the corresponding P-value. If the P-value is below 0.05, it indicates that women earn less than men, whereas a value above 0.95 suggests that men earn less than women. Additionally, separate multivariable OLS regressions were performed for the entire population and for all parent groups on average hourly wage. These regressions included the control variables age group, number of children, marital status, race, degree, and job sector. These variables were considered because they can influence the average hourly wage and, therefore, impact the relationship between gender and wage.

Next, the attention turned to the final hypothesis, hypothesis 3, which aimed to investigate whether the gender pay gap had decreased during COVID-19, particularly for mothers. To assess this, the same steps were followed as in hypothesis 2, but this time using the 2021 dataset. Initially, T-tests were conducted to compare the average hourly wage between men and women across various parent groups and age groups, following the same null and alternative hypotheses as in hypothesis 2. Furthermore, regression analysis was performed, incorporating the same control variables as in the regression analysis of hypothesis 2, to identify any potential biases in the findings. Finally, the results obtained from these tests were compared to the initial gender-parent pay gaps identified in the 2018 analysis. The next section will discuss the results obtained from these analysis.

5. Results

In this section, the results of the analysis will be discussed on a step-by-step basis. The corresponding tables containing the detailed results will be provided in the appendices, organized in accordance with the order of the hypotheses. The focus is on finding out if the wage gap has closed due to an increase in working from home because of the pandemic.

Table B.1 presents evidence supporting hypothesis 1.A, which suggested a positive correlation between WFH and the average hourly wage in 2018. In the first column, a simple OLS regression reveals a significant correlation between WFH and the average hourly wage. Moving to column 2, the OLS regression includes additional control variables alongside WFH. This analysis demonstrates that the coefficient for WFH is significantly lower compared to the first column, implying the presence of a negative bias, which could increase with additional control variables.

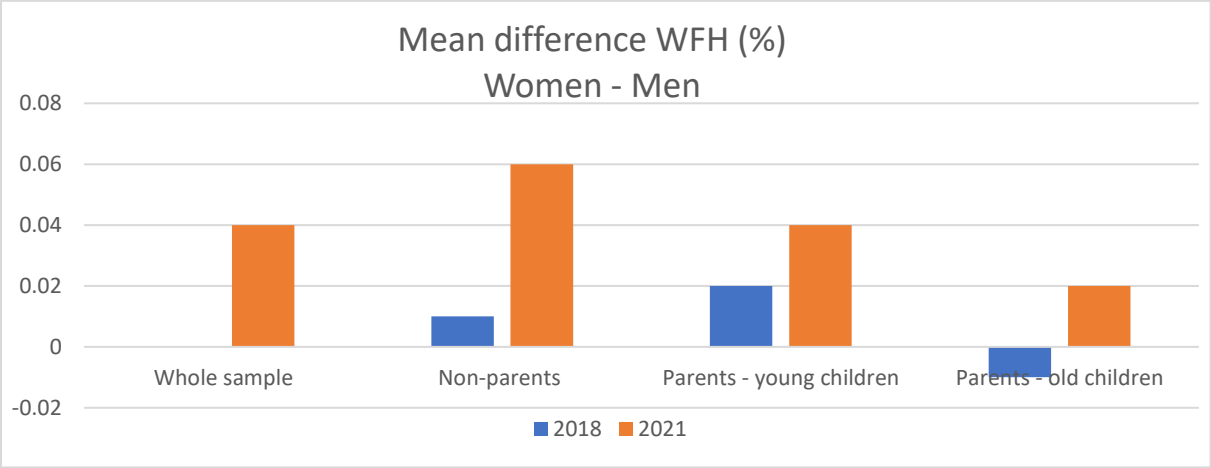
The subsequent analysis focuses on hypothesis 1.B, which examined if there is a significant shift in the proportion of individuals in the sample who work from home because of COVID-19. This investigation involved conducting a T-test across the entire population of 2018 and 2021, and within different age groups. The outcomes, presented in Table B.2, indicate a substantial and statistically significant difference across all groups and the entire sample, because all P-values are below 0.05. In 2018, the mean proportion of individuals working from home across the entire population was approximately 12% of individuals. By 2021, the mean proportion had risen to approximately 28% of the sample.

The next analysis focuses on the final sub hypothesis of hypothesis 1, hypothesis 1.C, examining which gender-parent groups worked from home the most and whether these differences have changed over the years. T-tests were conducted for the parent groups and across different age groups for both 2018 and 2021. The T-test results for 2018, presented in table B.3, indicate that there are few significant differences in the percentage means of working from home between men and women. No significant differences were found for the overall population and non-parents. However, for parents of young children, only the young age group exhibited a significant difference, with women working from home more than men. In the case of parents of older children, both the entire parent group and the older age group showed that men tended to work from home more frequently. The multivariable regressions in table B.4 suggest that the inclusion of control variables did not significantly alter the mean differences reported in table B.3.

Examining the T-test results for 2021 in table B.5, which compares the percentage of individuals working from home by gender, it becomes evident that there are significant mean differences between men and women. Women appear to be more likely to work from home than men across the entire population and for non-parents, as indicated by the p-values across all age groups. Among parents of young children, the pattern is consistent across all age groups except for the oldest group. For parents of older children, only the entire parent group shows that women tend to work from home more frequently. Notably, fathers do not work from home significantly more often than mothers in any case. The regression results in table B.6 indicate that the gender differences in working from home decrease when control variables are included, suggesting the presence of biases that may increase when additional control variables are added.

Comparing the outcomes between 2018 and 2021, it is evident that there have been shifts in who works from home. Women have become significantly more likely to work from home in most parent groups, which was not the case before. Additionally, in 2021, men are never more likely than women to work from home. This is visualized in Figure 1, which illustrates the mean percentage of individuals working from home categorized by gender.

Figure 1. Mean differences of working from home between women and men



Note: Data from SIPP data and 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting a visualisation of the mean differences in percentage of working from home between men and women. These results were from the whole sample and whole parent groups.

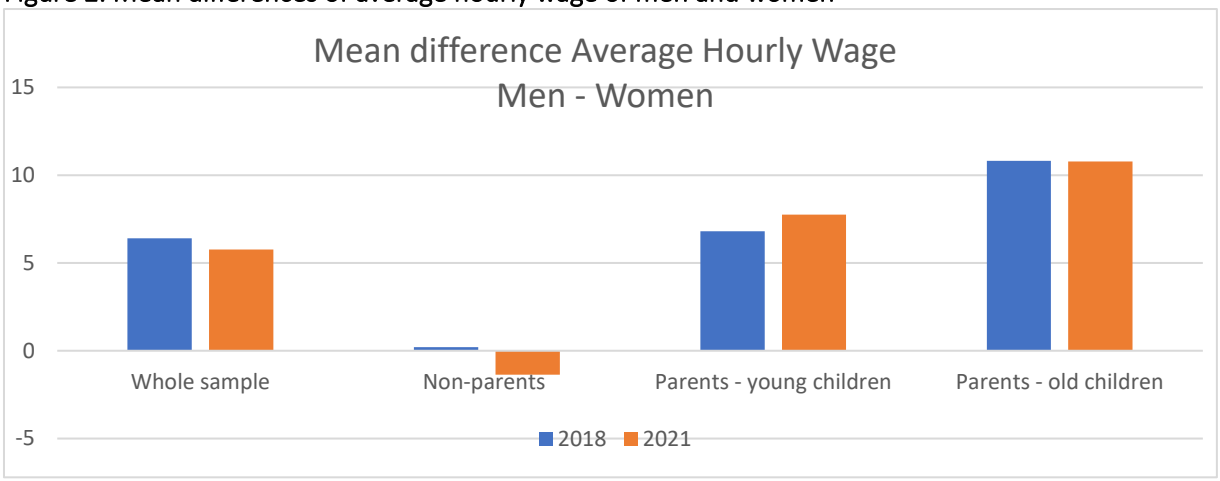
Moving on to hypothesis 2, which tries to establish whether there is a gender pay gap in 2018. The findings of the T-tests are summarized in table C.1, indicating that women earn significantly less than men in the entire population. Among parents of younger children, women also tend to earn less than men, except for the older age group. For parents of older children, the gender pay gap is significant across all age groups. However, for non-parents, the gender pay gap is less prominent, with only the youngest age group showing a significant difference. Upon examining the numerical values of the mean differences among the parent groups, it is evident that parents of older children face the largest gender pay gap. Analysing the multivariable regressions for the entire population and each parent group, as presented in table C.2, reveals that the gender pay gap is influenced by additional control variables. In the entire population and both parent groups, the mean difference in average hourly wage between men and women decreases when controlling for these variables. This suggests the presence of biases, although the differences remain statistically significant. On the other hand, for non-parents, the mean difference actually increases, but the difference between the groups is not statistically significant.

The subsequent analysis focuses on hypothesis 3, which suggests a decrease in the gender pay gap during COVID-19. In hypothesis 2, it was established that a gender pay gap existed in the 2018 dataset, observed across most parent and age groups, with men consistently earning more than women in various age categories, particularly among parents.

Now, let us examine the results from the 2021 dataset and compare them with the previous findings. Table D.1 presents the outcomes of the T-tests, indicating that gender pay gaps still persist, although not

across all groups. In the entire population, a gender pay gap remains noticeable, as well as in the older age group. However, for the younger and middle-aged groups, the gender pay gap is no longer present in 2021, whereas it was evident in the 2018 dataset. Notably, there are no gender pay gaps for non-parents in 2021, unlike the situation observed in the young group of non-parents in 2018. Among parents of young children, an overall gender pay gap persists, and this is also evident within the young age group. However, the middle-aged group no longer exhibits a gender pay gap, which contrasts with the findings in 2018. For parents of older children, a gender pay gap remains across all age groups, consistent with the 2018 results.

Figure 2. Mean differences of average hourly wage of men and women



Note: Data from SIPP data and 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting a visualisation of the mean differences in average hourly wage between men and women. These results were from the whole sample and whole parent groups.

While the gender pay gap diminishes for certain parent and age groups, it is important to note that in most cases, the numerical value of the gap decreases, except for parents of young children, as indicated in Figure 2. However, it is crucial to acknowledge the results presented in table D.2, which reveal a decrease in the mean disparity between men and women's wages when control variables are taken into account. This suggests the presence of biases that could potentially be amplified with the inclusion of additional control variables, making it uncertain whether actual gender pay gaps exist. Therefore, it is important to understand that comparing numerical mean differences cannot be considered as establishing causality and could be different in the real world.

Following the presentation of these results, the subsequent section will discuss and analyse these findings in relation to pertinent literature.

6. Discussion

In this section, the results obtained in the previous section will be discussion, focusing on each hypothesis individually. The findings will be critically compared to the existing literature to determine their alignment with prior research. Additionally, the main research question, "How has the gender pay gap faced by women and mothers changed after the COVID-19 pandemic, because of the increase of working from home, in the United States?" will be addressed, providing a possible answer based on the correlational analysis of the results. Furthermore, this paper will also include a section highlighting the limitations in the study. These limitations will be addressed to acknowledge any potential constraints or shortcomings that may have influenced the research process or the interpretation of the results. By acknowledging these limitations, the study's scope can be better understood, offering opportunities for future research to address these limitations and build upon the current findings.

Firstly, hypothesis 1.A suggests a positive correlation between working from home and average hourly wage in 2018, as evidenced by previous studies conducted by Schroeder and Warren (2005) and Weeden (2005). The hypothesis was tested using OLS regressions, incorporating control variables to examine potential biases in the estimators.

The results reveal a significant and positive correlation between working from home and average hourly wage in both regression models, consistent with the findings of Arntz, Yahmed, and Berlingieri (2019). However, when introducing background variables into the analysis, the coefficient decreases significantly, indicating that the initial OLS regression overestimated the correlation. It is possible that additional biases exist, which could further diminish the relationship between working from home and average hourly wage. It has also been said that there might be reverse causality, where the likelihood of offering flexible work arrangements may be higher in better paying jobs (Arntz, Yahmed, and Berlingieri, 2019). Despite this, given the relatively high coefficient, it is highly likely that a positive correlation still remains, thereby supporting Hypothesis 1.A. This positive correlation may be attributed to increased productivity when individuals work from home, which subsequently affects their wages (Feldstein, 2018; Konings and Marcolin, 2014).

Subsequently, hypothesis 1.B states that working from home has increased during COVID-19. Existing literature suggests a rise in remote work, even beyond the pandemic period (Boland, De Smet, Palter, and Sanghvi, 2020; Niebuhr, 2022; Yang, Kim, and Hong, 2023). To test this hypothesis, a T-test was conducted to compare the proportion of individuals working from home in different years. The results of the analysis align with the literature and demonstrate a significant increase in the mean proportion

of individuals working from home across all age groups. Notably, the entire population witnessed a more than twofold increase in the number of individuals working from home. These findings support Hypothesis 1.B and confirm the trend of increased remote work during and after the COVID-19 pandemic.

Moving forward hypothesis 1.C proposes that mothers of young children have the highest rates of working from home and have experienced the greatest increase, followed by mothers and women. This idea is based on Goldin's (2014) argument that mothers, due to their childcare responsibilities, are more likely to seek flexible work arrangements such as remote work. To test this hypothesis, T-tests were conducted among different parent groups and across various age groups using data from both 2018 and 2021. Subsequently, OLS regressions were performed, incorporating relevant control variables to assess any biases in the findings.

The results from 2018 indicated minimal differences in the proportion of individuals working from home among various groups, suggesting that, in general, women did not work from home more often than men. These findings remained consistent even after accounting for control variables. This finding contradicts the existing literature suggesting that mothers prioritize work flexibility (Bélanger, 1998; Chung, 2011). It is possible that concerns about potential negative repercussions associated with working from home influenced women's decision-making. Sherman (2020) also found no gender difference in the uptake of working from home, which might be reflected in these results. Consequently, the first part of hypothesis 1.C, suggesting that mothers in 2018 were more likely to work from home, does not hold.

However, significant changes in remote work patterns were observed in 2021. In almost all groups, women were more likely to work from home compared to men. However, the eldest groups among non-parents and most age groups among parents of older children did not show significant mean differences. When control variables were included, the mean differences decreased, indicating potential bias that might increase with additional control variables. Therefore, the numerical interpretation of the results becomes uncertain, and it is possible that there may be no significant difference after all. However, the findings do indicate that women, overall, experienced a larger increase in working from home compared to men. Therefore, the second part of the hypothesis, suggesting that mothers have experienced the highest increase, followed by mothers and women, is not supported. In reality, women experienced the highest increase, followed by mothers of young children, and subsequently mothers.

In the next part, hypothesis 2 stated that there is a gender pay gap, which is most prominent for mothers in 2018. This hypothesis was based on existing literature that highlighted the persistence of a gender

pay gap, with women earning around 79% of men's earnings (Blau and Kahn, 2016). Moreover, previous studies suggested that the pay gap widened for women after becoming mothers (Benard, Paik, and Correll, 2007; Gough and Noonan, 2013). To test this hypothesis, T-tests were conducted to compare average hourly wages among different parent groups, separated by age groups. Multiple regression analyses were also performed to identify potential biases.

The findings of the analysis provided correlational evidence supporting the presence of a significant gender pay gap. Men consistently earned more than women across most parent groups, aligning with the findings of Blau and Kahn (2016). The gender pay gap was least significant for non-parents, consistent with previous research by Goldin (2014). However, it was most pronounced for parents with old children. It is important to note that there were biases present in all significant mean differences, as the inclusion of control variables led to a decrease in the mean differences. This aligns with literature suggesting that the gender pay gap may be overestimated (Altonji and Blank, 1999). Thus, the actual gender pay gap may be even smaller or potentially non-existent. However, the analysis indicates that the gender pay gap begins to emerge when women become mothers and tends to widen thereafter. These findings are consistent with existing literature, which has documented the emergence of a gender pay gap after individuals become parents (Benard, Paik, and Correll, 2007; Gough and Noonan, 2013). Moreover, it has been observed that mothers contribute significantly to the gender pay gap (Correll, Benard, and Paik, 2007; Goldin, 2014; Gough and Noonan, 2013). Therefore, this analysis substantiates Hypothesis 2, highlighting the persistent presence of a gender pay gap, particularly prominent among mothers.

It is important to note that not all control variables were included, potentially leading to additional biases, and the coefficients should not be interpreted causally. additionally, this analysis cannot draw definitive conclusions regarding a specific explanation for the persistence of the gender pay gap.

Finally, hypothesis 3 states that the gender pay gap has decreased during COVID-19, particularly for mothers and mothers of young children. This might be because of the increase of working from home during the pandemic. As found in the analysis of hypothesis 1, women are now slightly more likely to work from home. Previous research (Bick et al., 2021; Yang, Kim, and Hong, 2023; He, Balistreri, Kim, and Zhang, 2022) has indicated that working from home during COVID-19 has led to increased productivity. This suggests that the disadvantages typically associated with remote work may have diminished, and the improved productivity could be reflected in wages (Feldstein, 2018; Konings and Marcolin, 2014).

The analysis reveals that although a gender pay gap persists in 2021, there have been notable changes compared to 2018. Several groups that previously exhibited significant mean differences between men

and women no longer demonstrate such gaps. In the overall population, for both the youngest and middle-aged groups, the gender pay gap is no longer statistically significant. Similarly, non-parent groups show no gender pay gaps in 2021. Among parents of young children, the middle-aged does not have a significant mean difference anymore. However, the gender pay gap for parents of older children remains consistent, with all age groups continuing to experience significant differences in wages.

It is important to note that biases still persist in most groups, even after controlling for some relevant control variables. These biases are likely to be positive, as suggested by Altonji and Blank (1999). The reasons behind the remaining gender pay gap are still unclear, whether it stems from actual discrimination (Altonji and Blank, 1999; Blau and Kahn, 2006; Blinder, 1973; Goldin, 2014) or the career disruptions women face when becoming mothers (Blau and Kahn, 2016; Bertrand, Goldin, and Katz, 2009).

Although an overall gender pay gap still exists, it seems that it has slightly decreased and even disappeared for certain groups, in this sample. The decline in the gender pay gap could be attributed to the increase in remote work (Angelici and Profeta, 2020; Goldin, 2014). While no direct relationship has been established between working from home and the gender pay gap, logical reasoning supports the argument that the gender pay gap has decreased, partially due to the increase in remote working. Firstly, working from home has a significant positive correlation with average hourly wage, possibly because of increased productivity, as also observed in literature (Arntz, Yahmed, and Berlingieri, 2019). This could lead to an increase in wage for those that worked from home. Secondly, there has been a substantial increase in remote work, with signs that women are working from home slightly more than men, potentially because it allows for a better balance with work and family life (Angelici and Profeta, 2020; Bélanger, 1998; Dockery and Bawa, 2018). Moreover, the widespread adoption of remote work during the pandemic has increased acceptance of this working arrangement, which may not have been the case before (Arntz, Yahmed, and Berlingieri, 2019), and the costs associated with working from home may have decreased (Gariety and Shaffer, 2007; Goldin, 2014). Therefore, those who opted to work from home more did not experience negative effects on their wages and may have even seen a slight increase, as predicted by Feldstein (2018). Lastly, the slight decrease in the gender pay gap aligns with the period of increased remote work. Thus, it is plausible that the rise in remote work has contributed to the reduction of the gender pay gap. Furthermore, there is a possibility that this trend of a decreasing gender pay gap will continue in the future.

This has answered the main research question, which is: How has the gender pay gap faced by women and mothers changed after the COVID-19 pandemic, because of the increase of working from home, in the United States? The findings indicate a decrease in the gender pay gap during this period, possibly

attributed to the increased of remote working. However, it is important to note that the precise numerical decrease cannot be determined in this correlational study. Additionally, the direct relationships and underlying reasons for these changes are not conclusively established. Therefore, it is crucial to exercise caution in interpreting the results and acknowledge that further research is needed to gain a more comprehensive understanding of the dynamics involved.

6.1 Limitations of paper

This paper is subject to certain limitations and differences to literature that should be addressed. Firstly, it is important to note that all the findings presented are strictly correlational and do not establish causal relationships.

Unlike most literature on the gender pay gap, this paper takes a different approach in terms of the comparison between men and women. While previous studies have typically compared men and women who are identical in all aspects except their gender, this paper controls for only a few possible variables. As a result, the men and women being compared are not identical, and there may be differences between them that could explain the gender pay gap. It is important to acknowledge that men and women make different life choices, which may impact their earnings. Therefore, the results of the regressions in this study do not represent a perfect ceteris paribus comparison between men and women. Instead, they reflect the differences between men and women where their life choices and differences may influence the outcome, which might possibly represent a more realistic gender pay gap. However, these differences in life choices introduce biases in the coefficient for the wage gap, as the findings are not ceteris paribus and not all relevant background variables have been accounted for. Factors such as job type, work experience, type of degree, and other potentially influential variables have not been included in the analysis, which could affect the observed coefficients and the relationship between the dependent and independent variables. Consequently, in the presence of additional control variables, a gender pay gap, if initially observed, has the potential to diminish or even disappear when all other relevant factors are considered.

Furthermore, this study does not account for the labor participation of women and mothers, which could significantly influence the outcomes. If the labor participation rate had increased by 2021, any observed wage increases for specific groups might not be solely attributable to the change in working from home, but rather due to more women entering the labor market, resulting in an overall increase in the average wage for working women.

Another limitation pertains to the external validity of the study. While the SIPP data appears to be a reliable source, it cannot be assumed that it provides a perfect representation of the entire United States. Consequently, the findings of this study may not necessarily apply to other countries. Moreover, the completeness and accuracy of the data provided through the SIPP dataset cannot be guaranteed. Furthermore, it is crucial to acknowledge that the explanations provided for the findings are speculative hypotheses and are not definitive conclusions. Lastly, it is important to recognize that even though the lockdowns had ended in 2021, there may still have been lingering effects of COVID-19 that potentially influenced the increase in the number of people working from home. Therefore, it is advisable to replicate this study in the future to assess any long-term changes.

7. Conclusion

This study aimed to examine the changes in the gender pay gap among women and mothers working from home in the aftermath of the COVID-19 pandemic. The research question addressed was: How has the gender pay gap faced by women and mothers changed after the COVID-19 pandemic, because of the increase of working from home, in the United States? The analysis of the available data has provided valuable insights into the shifting dynamics of gender disparities in earnings during this period. The first insight is that the gender pay gap exist mainly for parents. Also, it is evident that there has been a substantial increase in remote work and a notable reduction in the amount of significant mean differences in the gender pay gap among parents, particularly in certain age groups. While a definitive causal relationship cannot be established, these findings, in conjunction with existing literature, suggest that the surge in remote work has contributed to a decrease in the gender pay gap.

These findings may serve as an initial foundation for future research aimed at identifying alternative approaches to diminishing the gender pay gap. It suggests that gender quotas or intricate programs may not be the sole necessities. As subsequent research and time progress, if it demonstrates a continual decline in the gender pay gap attributed to remote work, providing flexible work arrangements could contribute to further reducing the remaining gender pay gap.

It is important to acknowledge that this study provides only correlational evidence and has certain limitations. Further research incorporating more recent data sets, exploring additional control variables, and delving into the specific mechanisms through which working from home impacts the gender pay gap would enhance our understanding of the post-COVID-19 effects.

8. References

Altonji, J. G., & Blank, R. M. (1999). Race and gender in the labor market. Handbook of labor economics, 3, 3143-3259.

Angelici, M., & Profeta, P. (2020). Smart-working: Work flexibility without constraints.

Antecol, H. (2000). An examination of cross-country differences in the gender gap in labor force participation rates. Labour Economics, 7(4), 409-426.

Arntz, M., Sarra, B. Y., & Berlingieri, F. (2019). Working from home: Heterogeneous effects on hours worked and wages. ZEW-Centre for European Economic Research Discussion Paper, (19-015).

Baruch, Y. (2001). The status of research on teleworking and an agenda for future research. International journal of management reviews, 3(2), 113-129.

Bélanger, F. (1999). Workers' propensity to telecommute: An empirical study. Information & Management, 35(3), 139-153.

Benard, S., Paik, I., & Correll, S. J. (2007). Cognitive bias and the motherhood penalty. Hastings LJ, 59, 1359.

Bertrand, M., Goldin, C., & Katz, L. F. (2010). Dynamics of the gender gap for young professionals in the financial and corporate sectors. American economic journal: applied economics, 2(3), 228-255.

Bick, A., Blandin, A., & Mertens, K. (2021). Work from home before and after the COVID-19 outbreak. Available at SSRN 3786142.

Boland, B., De Smet, A., Palter, R., & Sanghvi, A. (2020). Reimagining the office and work life after COVID-19.

Blau, F. D., & Kahn, L. M. (2006). The US gender pay gap in the 1990s: Slowing convergence. Ilr Review, 60(1), 45-66.

Blau, F. D., & Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. Journal of economic literature, 55(3), 789-865.

Blinder, A. S. (1973). Wage discrimination: reduced form and structural estimates. Journal of Human resources, 436-455.

Bloom, N., Liang, J., Roberts, J., & Ying, Z. J. (2015). Does working from home work? Evidence from a Chinese experiment. The Quarterly journal of economics, 130(1), 165-218.

Chung, H. (2011). Work-family conflict across 28 European countries: A multi-level approach. Work-life balance in Europe: The role of job quality, 42-68.

Correll, S. J., Benard, S., & Paik, I. (2007). Getting a job: Is there a motherhood penalty?. American journal of sociology, 112(5), 1297-1338.

Deng, Z., Morissette, R., & Messacar, D. (2020). Running the Economy Remotely: Potential for Working from Home during and after COVID-19.

Dockery, A. M., & Bawa, S. (2018). When two worlds collude: Working from home and family functioning in Australia. *International Labour Review*, *157*(4), 609-630.

Feldstein, M. (2008). Did wages reflect growth in productivity?. *Journal of policy modeling*, *30*(4), 591-594.

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: meta-analysis of psychological mediators and individual consequences. Journal of applied psychology, 92(6), 1524.

Gariety, B. S., & Shaffer, S. (2007). Wage differentials associated with working at home. Monthly Lab. Rev., 130, 61.

Gharehgozli, O., & Atal, V. (2020). Revisiting the gender wage gap in the United States. Economic Analysis and Policy, 66, 207-216.

Glass, J. (2004). Blessing or curse? Work-family policies and mother's wage growth over time. Work and occupations, 31(3), 367-394.

Golden, T. D. (2006). The role of relationships in understanding telecommuter satisfaction. Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 27(3), 319-340.

Golden, T. D., Veiga, J. F., & Simsek, Z. (2006). Telecommuting's differential impact on work-family conflict: Is there no place like home?. Journal of applied psychology, 91(6), 1340.

Goldin, C. (2014). A grand gender convergence: Its last chapter. American Economic Review, 104(4):1091–1119.

Gough, M., & Noonan, M. (2013). A review of the motherhood wage penalty in the United States. Sociology Compass, 7(4), 328-342.

He, X., Balistreri, E. J., Kim, G. H., & Zhang, W. (2022). A general equilibrium assessment of COVID-19's labor productivity impacts on china's regional economies. Journal of productivity analysis, 58(2-3), 129-150.

Hilbrecht, M., Shaw, S. M., Johnson, L. C., & Andrey, J. (2008). 'I'm home for the kids': contradictory implications for work–life balance of teleworking mothers. *Gender, Work & Organization*, *15*(5), 454-476.

Irawanto, D. W., Novianti, K. R., & Roz, K. (2021). Work from home: Measuring satisfaction between work–life balance and work stress during the COVID-19 pandemic in Indonesia. Economies, 9(3), 96.

Irlacher, M., & Koch, M. (2021). Working from home, wages, and regional inequality in the light of COVID-19. Jahrbücher für Nationalökonomie und Statistik, 241(3), 373-404.

Konings, J., & Marcolin, L. (2014). Do wages reflect labor productivity? The case of Belgian regions. *IZA Journal of European Labor Studies*, *3*(1), 1-21.

Konrad, A. M., & Mangel, R. (2000). The impact of work-life programs on firm productivity. Strategic management journal, 21(12), 1225-1237.

LaSalle, M. (2021). The Gender Wage Gap Before and After COVID-19.

Osterman, P. (1995). Work/family programs and the employment relationship. Administrative science quarterly, 681-700.

Mann, S., & Holdsworth, L. (2003). The psychological impact of teleworking: stress, emotions and health. New Technology, Work and Employment, 18(3), 196-211.

Mesmer-Magnus, J. R., & Viswesvaran, C. (2006). How family-friendly work environments affect work/family conflict: A meta-analytic examination. Journal of labor research, 27(4), 555-574.

Niebuhr, F., Borle, P., Börner-Zobel, F., & Voelter-Mahlknecht, S. (2022). Healthy and happy working from home? Effects of working from home on employee health and job satisfaction. International journal of environmental research and public health, 19(3), 1122.

Tleuken, A., Turkyilmaz, A., Sovetbek, M., Durdyev, S., Guney, M., Tokazhanov, G., ... & Karaca, F. (2022). Effects of the residential built environment on remote work productivity and satisfaction during COVID-19 lockdowns: An analysis of workers' perceptions. *Building and Environment*, *219*, 109234.

Russell, H., O'Connell, P. J., & McGinnity, F. (2009). The impact of flexible working arrangements on work–life conflict and work pressure in Ireland. Gender, Work & Organization, 16(1), 73-97.

Sauré, P., & Zoabi, H. (2014). International trade, the gender wage gap and female labor force participation. Journal of Development Economics, 111, 17-33.

Schroeder, C., & Warren, R. S. (2004). The effect of home-based work on earnings. Unpublished paper, University of Georgia.

Shepherd-Banigan, M., Bell, J. F., Basu, A., Booth-LaForce, C., & Harris, J. R. (2016). Workplace stress and working from home influence depressive symptoms among employed women with young children. *International journal of behavioral medicine*, *23*, 102-111.

Sherman, E. L. (2020). Discretionary remote working helps mothers without harming non-mothers: Evidence from a field experiment. *Management Science*, *66*(3), 1351-1374.

Song, Y., & Gao, J. (2020). Does telework stress employees out? A study on working at home and subjective well-being for wage/salary workers. Journal of Happiness Studies, 21(7), 2649-2668.

Weeden, K. A. (2005). Is there a flexiglass ceiling? Flexible work arrangements and wages in the United States. Social Science Research, 34(2), 454-482.

Weichselbaumer, D., & Winter-Ebmer, R. (2005). A meta-analysis of the international gender wage gap. Journal of economic surveys, 19(3), 479-511.

Wheatley, D. (2012). Good to be home? Time-use and satisfaction levels among home-based teleworkers. New Technology, Work and Employment, 27(3), 224-241.

Yang, E., Kim, Y., & Hong, S. (2023). Does working from home work? Experience of working from home and the value of hybrid workplace post-COVID-19. Journal of corporate real estate, 25(1), 50-76.

9. Appendices

Appendix A: Summary statistics

Table A.1.1: Age group per wage group 2018

Wage group	Age 20-30	Age 31-50	Age 51-70	observations
All individuals	8,601	`15,506	16,724	40,831
(100%)	(21.06%)	(37,98%)	(40.96%)	
Non workers	2,025	3,334	7,497	12,856
(31.49%)	(15.75%)	(25.93%)	(58.32%)	
Under minimum wage	1,772	1,295	920	3,937
(9.64%)	(43.74%)	(32.89%)	(23.37%)	
Above minimum wage	4,854	10,877	8,307	24,038
(58.87%)	(20.19%)	(45.25%)	(34.36%)	

Note: Data from SIPP data 2018. Filtered on age (20 – 70), using averages hourly income over year. Representing four wage groups, and the three age groups. The numbers mean how many individuals are in each group and in between brackets is the percentage of people in age group per wage group.

Table A.1.2: Age group per wage group 2021

Wage group	Age 20-30	Age 31-50	Age 51-70	observations
All individuals	7,148	12,978	15,979	36,105
(100%)	(19.80%)	(35.95%)	(44.26%)	
Non workers	1,630	2,742	7,250	11,622
(32.19%)	(14.03%)	(23.59%)	(62.38%)	
Under minimum wage	1,510	1,263	1,182	3,955
(10.95%)	(38.18%)	(31.93%)	(29.89%)	
Above minimum wage	4,008	8,973	7,547	20,528
(56.86%)	(19.52%)	(43.71%)	(36.76%)	

Note: Data from SIPP data 2021. Filtered on age (20 – 70), using averages hourly income over year. Representing four wage groups, and the three age groups. The numbers mean how many individuals are in each group and in between brackets is the percentage of people in age group per wage group.

Table A.2. : Simple regression: Age group on Average hourly wage, 2018 and 2021

	Average hourly wage OLS (2018)	Average hourly wage OLS (2021)
Age group		
(20 – 30)		
31 – 50	10.84***	13.96***
	(0.95)	(1.48)

51 – 70	15.14***	13.69***
	(1.00)	(1.52)
Constant	20.33***	24.04***
	(0.79)	(1.23)
Observations	24,038	20,528

*Note: : Data from SIPP data 2018 and 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Results from simple OLS regression with age groups on average hourly wage. Wage is in US dollars. Between the brackets is the standard error term. *=p<0.10, **=p<0.05, ***=p<0.01*

Table A.3. : Simple regression: Age group on being a parent, 2018 and 2021

	Parent OLS (2018)	Parent OLS (2021)
Age group		
(20 – 30)		
31 – 50	0.47***	0.48***
	(0.01)	(0.01)
51 – 70	0.54***	0.57***
	(0.01)	(0.01)
Constant	0.28***	0.22***
	(0.01)	(0.01)
Observations	24,038	19,860

*Note: : Data from SIPP data 2018 and 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Results from simple OLS regression with age groups on being a parent. Between the brackets is the standard error term. *=p<0.10, **=p<0.05, ***=p<0.01*

Table A.4: summary statistics Gender-Parent groups, 2018 and 2021

Gender-Parent group	Frequency (2018)	Frequency (2021)
Men	7,315	4,249
	(17.92%)	(20.70%)
Women	5,821	3,491
	(14.26%)	(17.01%)
Father, child =>5	9,733	5,065
	(23.84%)	(24.67%)
Mother, child =>5	12,389	5,110
	(30.34%)	(24.89%)
Father, child < 5	2,632	1,512
	(6.45%)	(7.37%)
Mother, child < 5	2,941	1,101
	(7.20%)	(5.36%)

Observations	24,038	20.528

Note: : Data from SIPP data 2018 and 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting summary statistics with the frequency per Gender-Parent group over the sample and in brackets the percentage. There is no overlap in groups.

Appendix B: hypothesis 1.A, 1.B and 1.C

Table B.1 : Regressions: working from home on average hourly wage, per parent groups, with control variables 2018 and 2021

	Average hourly wage OLS (2018) (1)	Average hourly wage OLS (2018) (2)	Average hourly wage OLS (2021) (3)	Average hourly wage OLS (2021) (4)
Working from home	18.58***	13.76***	19.17***	16.58***
	(1.10)	(1.11)	(1.24)	(1.27)
Age group				
(20 - 30)				
31 – 50		7.91***		10.12***
		(1.07)		(1.78)
51 – 70		11.42***		10.09***
		(1.17)		(1.92)
Number of children		-0.76***		-0.16
		(0.29)		(0.47)
Marital status				
(never married)				
Married		6.59***		6.41***
		(1.01)		(1.60)
Divorced		0.20		-1.59
		(1.24)		(2.00)
Race				
(white)				
Black		-0.42		-4.32**
		(1.12)		(1.93)
Asian		3.95***		11.77***
		(1.47)		(2.29)
Other		-0.40		-1.79
		(1.98)		(3.14)
Degree		-2.50***		-2.39
		(0.94)		(1.61)
Job sector				
(government)				
Private for profit		0.22		2.40
		(0.97)		(1.54)
Private non-profit		0.11		0.03
		(1.45)		(2.28)
Self employed		22.52***		19.21***
		(1.73)		(2.70)
Constant	28.46***	17.60***	30.20***	16.82***
	(0.38)	(1.23)	(0.66)	(2.01)

Observations	23,303	23,303	19,914	19,347

*Note: : Data from SIPP data 2018 and 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Results from 4 OLS regressions with working from home on average hourly wage. Wage is in US dollars. Between the brackets is the standard error term. *=p<0.10, **=p<0.05, ***=p<0.01*

Table B.2: T-Test: Working from home by year, 2018 and 2021

	Mean 2018	Mean 2021	Mean difference	T-Statistic	P-Value (Ha: diff<0)
Working from home	0.12	0.28	0.17	-44.72	0.00
	(0.00)	(0.00)			
Working from home	0.06	0.21	0.14	-19.48	0.00
Age 20 – 30	(0.00)	(0.01)			
Working from home	0.13	0.32	0.19	-32.78	0.00
Age 31-50	(0.00)	(0.00)			
Working from home	0.13	0.28	0.15	-24.05	0.00
Age 51-70	(0.00)	(0.01)			

Note: : Data from SIPP data 2018 and 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting results of T-Tests, the first one includes the whole sample and under need are the separate age groups. Ho: mean WFH 2018 = mean WFH 2021. Ha : mean WFH 2018 < mean WFH 2021. The mean and in brackets the standard deviation. And in column 4 the T-Statistic, and in column 5 the P-Value.

Table B.3: T-Test: Working from home by year, per gender, per parent group, 2018

	Mean Women	Mean Men	Mean difference	T-Statistic	P-Value (Ha: diff>0)
		Whole population			
Working from home	0.12	0.12	0.00	-0.34	0.63
	(0.00)	(0.00)			
Working from home	0.07	0.06	0.01	1.08	0.14
Age 20 – 30	(0.01)	(0.00)			
Working from home	0.13	0.13	0.00	-0.29	0.62
Age 31 – 50	(0.00)	(0.00)			
Working from home	0.12	0.13	-0.01	-1.13	0.87
Age 51 - 70	(0.01)	(0.01)			
		Non-parents			
Working from home	0.11	0.10	0.01	1.50	0.07
	(0.01)	(0.00)			
Working from home	0.07	0.07	0.00	0.05	0.48
Age 20 – 30	(0.01)	(0.01)			

Working from home	0.15	0.13	0.02	1.28	0.10
Age 31 – 50	(0.01)	(0.01)			
Working from home	0.15	0.13	0.02	1.34	0.09
Age 51 – 70	(0.01)	(0.01)			
		Parents of young children			
Working from home	0.13	0.11	0.02	1.44	0.07
	(0.01)	(0.01)			
Working from home	0.09	0.04	0.04	2.84	0.00
Age 20 – 30	(0.01)	(0.01)			
Working from home	0.15	0.14	0.01	0.83	0.20
Age 31 – 50	(0.01)	(0.01)			
Working from home	0.25	0.14	0.11	0.57	0.29
Age 51 – 70	(0.25)	(0.05)			
		Parents of old children			
Working from home	0.11	0.13	-0.01	-2.53	0.99
	(0.00)	(0.00)			
Working from home	0.03	0.06	-0.03	-1.05	0.85
Age 20 – 30	(0.01)	(0.03)			
Working from home	0.12	0.13	-0.01	-1.28	0.90
Age 31 – 50	(0.01)	(0.01)			
Working from home	0.12	0.13	-0.02	-1.90	0.97
Age 51 - 70	(0.01)	(0.01)			

Note: : Data from SIPP data 2018. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting results of T-Tests, within the group named above the test, the first row per group includes the whole sample and under need are the separate age groups. Ho: mean WFH men = mean WFH women. Ha : mean WFH men < mean WFH women. The mean and in brackets the standard deviation. And in column 4 the T-Statistic, and in column 5 the P-Value.

Table B.4: Regressions: gender on working from home, per parent groups, with control variables 2018

	Working from home (OLS) (1)	Working from home (OLS) (2)	Working from home OLS (3)	Working from home OLS (4)
Male	-0.00			
(All individuals)	(0.00)			
Male		-0.01		
(non-parents)		(0.01)		
Male			-0.02**	
(Children < 5)			(0.01)	
Male				0.00
(Children => 5)				(0.01)

Age group				
(20-30)				
31 – 50	0.04***	0.05***	0.06***	0.03*
	(0.01)	(0.01)	(0.01)	(0.02)
51 – 70	0.04***	0.04***	0.11***	0.03*
	(0.01)	(0.01)	(0.04)	(0.02)
Number of children	-0.01***		-0.02***	-0.01***
	(0.00)		(0.00)	(0.00)
Marital status				
(never married)				
Married	0.04***	0.03***	0.06***	0.05***
	(0.01)	(0.01)	(0.01)	(0.01)
Divorce	0.01*	-0.02	0.00	0.03***
	(0.00)	(0.01)	(0.02)	(0.01)
Travel time to work	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Job sector				
(government)				
Private for-profit	0.01**	0.02**	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Private non-profit	0.03***	0.03**	0.04**	0.03***
	(0.01)	(0.01)	(0.02)	(0.01)
Self employed	0.20***	0.19***	0.24***	0.20***
	(0.01)	(0.02)	(0.02)	(0.01)
Constant	-0.01	-0.00	-0.01	-0.02
	(0.01)	(0.01)	(0.02)	(0.02)
Observations	22,515	7,184	3,302	12,029

*Note: : Data from SIPP data 2018. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Results from OLS regressions of gender on working from home per parent group, including various control variables. *=p<0.10, **=p<0.05, ***=p<0.01*

Table B.5: T-Test: Working from home by year per gender, per parent group, 2021

	Mean Women	Mean Men	Mean difference	T-Statistic	P-Value (Ha: diff>0)
		Whole population			
Working from home	0.30	0.27	0.04	5.51	0.00
	(0.00)	(0.00)			
Working from home	0.22	0.19	0.04	2.66	0.00
Age 20 – 30	(0.01)	(0.01)			
Working from home	0.35	0.30	0.05	4.74	0.00
Age 31 – 50	(0.01)	(0.01)			

Working from home	0.29	0.27	0.02	2.34	0.01
Age 51 - 70	(0.01)	(0.01)			
		Non-parents			
Working from home	0.32	0.26	0.06	6.08	0.00
	(0.01)	(0.01)			
Working from home	0.23	0.20	0.03	2.19	0.01
Age 20 – 30	(0.01)	(0.01)			
Working from home	0.42	0.31	0.11	5.95	0.00
Age 31 – 50	(0.01)	(0.01)			
Working from home	0.34	0.27	0.07	3.17	0.00
Age 51 – 70	(0.02)	(0.02)			
		Parents of young children			
Working from home	0.33	0.29	0.04	2.14	0.02
	(0.01)	(0.01)			
Working from home	0.21	0.16	0.05	1.68	0.05
Age 20 – 30	(0.02)	(0.02)			
Working from home	0.38	0.33	0.06	2.48	0.01
Age 31 – 50	(0.02)	(0.01)			
Working from home	0.33	0.29	0.04	0.23	0.41
Age 51 – 70	(0.17)	(0.06)			
		Parents of old children			
Working from home	0.28	0.26	0.02	1.82	0.03
	(0.01)	(0.01)			
Working from home	0.15	0.11	0.03	1.00	0.16
Age 20 – 30	(0.02)	(0.02)			
Working from home	0.29	0.27	0.02	1.44	0.08
Age 31 – 50	(0.01)	(0.01)			
Working from home	0.28	0.27	0.02	1.02	0.15
Age 51 - 70	(0.01)	(0.01)			

Note: : Data from SIPP data 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting results of T-Tests, within the group named above the test, the first row per group includes the whole sample and under need are the separate age groups. Ho: mean WFH men = mean WFH women. Ha : mean WFH men < mean WFH women. The mean and in brackets the standard deviation. And in column 4 the T-Statistic, and in column 5 the P-Value.

Table B.6: Regressions: gender on working from home, per parent groups, with control variables 2021

	Working from home (OLS) (1)	Working from home (OLS) (2)	Working from home OLS (3)	Working from home OLS (4)
Male	-0.03***			
(All individuals)	(0.01)			

Male		-0.04***		
(non-parents)		(0.01)		
Male			-0.03	
(Children < 5)			(0.02)	
Male				-0.02**
(Children => 5)				(0.01)
Age group				
(20-30)				
31 – 50	0.06***	0.07***	0.09***	0.10***
	(0.01)	(0.01)	(0.02)	(0.03)
51 – 70	0.05***	0.03**	0.17***	0.09***
	(0.01)	(0.01)	(0.06)	(0.03)
Number of children	-0.02***		-0.03***	-0.02***
	(0.00)		(0.01)	(0.00)
Marital status				
(never married)				
Married	0.06***	0.04***	0.10***	0.08***
	(0.01)	(0.01)	(0.02)	(0.02)
Divorce	0.01	0.00	0.07*	0.03*
	(0.01)	(0.02)	(0.04)	(0.02)
Travel time to work	0.00***	0.00***	0.00	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Job sector				
(government)				
Private for-profit	-0.09***	-0.10***	-0.05**	-0.10***
	(0.01)	(0.01)	(0.02)	(0.01)
Private non-profit	-0.00	0.02	0.05	0.03*
	(0.01)	(0.02)	(0.03)	(0.02)
Self employed	0.05***	0.02	-0.02	0.06***
	(0.01)	(0.03)	(0.04)	(0.02)
Constant	0.16***	0.18***	0.13***	0.09**
	(0.01)	(0.02)	(0.03)	(0.03)
Observations	16,543	5,771	2,098	8,674

*Note: : Data from SIPP data 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Results from OLS regressions of gender on working from home per parent group, including various control variables. *=p<0.10, **=p<0.05, ***=p<0.01*

Appendix C: hypothesis 2

Table C.1: T-Test: Average hourly wage per gender, per parent group, 2018

	Mean Women	Mean Men	Mean difference	T-Statistic	P-Value (Ha: diff<0)
		Whole population			
Average hourly wage	27.08	33.47	-6.40	-8.93	0.00
	(0.57)	(0.45)			
Average hourly wage	19.21	21.26	-2.05	-3.08	0.00
Age 20 – 30	(0.44)	(0.48)			
Average hourly wage	27.97	34.00	-6.03	-9.38	0.00
Age 31 – 50	(0.50)	(0.51)			
Average hourly wage	30.28	40.27	-9.99	-5.58	0.00
Age 51 - 70	(1.45)	(1.08)			
		Non-parents			
Average hourly wage	26.84	27.05	-0.20	-0.16	0.43
	(1.27)	(0.49)			
Average hourly wage	19.87	21.72	-1.85	-2.10	0.02
Age 20 – 30	(0.59)	(0.62)			
Average hourly wage	30.91	30.75	0.15	0.09	0.53
Age 31 – 50	(1.44)	(0.91)			
Average hourly wage	35.36	32.58	-2.78	0.55	0.71
Age 51 – 70	(5.29)	(1.23)			
		Parents of young children			
Average hourly wage	26.11	32.92	-6.80	-4.94	0.00
	(0.84)	(1.00)			
Average hourly wage	18.31	19.96	-1.65	-1.92	0.03
Age 20 – 30	(0.66)	(0.56)			
Average hourly wage	30.39	37.18	-6.79	-3.75	0.00
Age 31 – 50	(1.24)	(1.23)			
Average hourly wage	25.46	60.94	-35.47	-0.52	0.30
Age 51 – 70	(11.04)	(19.28)			
		Parents of old children			
Average hourly wage	27.42	38.24	-10.81	-10.23	0.00
	(0.72)	(0.77)			
Average hourly wage	15.95	19.19	-3.24	-2.16	0.02
Age 20 – 30	(0.80)	(1.40)			
Average hourly wage	26.15	34.29	-8.14	-9.53	0.00
Age 31 – 50	(0.53)	(0.68)			

Average hourly wage	29.18	41.83	-12.65	-6.79	0.00
Age 51 - 70	(1.34)	(1.29)			

Note: : Data from SIPP data 2018. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting results of T-Tests, within the group named above the test, the first row per group includes the whole sample and under need are the separate age groups. Ho: mean average hourly wage men = mean average hourly wage women. Ha : mean average hourly wage women < mean average hourly wage men. The mean and in brackets the standard deviation. And in column 4 the T-Statistic, and in column 5 the P-Value.

Table C.2: Regressions: gender on average hourly wage, per parent groups, with control variables 2018

	Average hourly wage OLS (1)	Average hourly wage OLS (2)	Average hourly wage OLS (3)	Average hourly wage OLS (4)
Male	5.63***			
(All individuals)	(0.72)			
Male		0.24		
(non-parents)		(1.29)		
Male			5.28***	
(Children < 5)			(1.43)	
Male				8.28***
(Children => 5)				(1.03)
Working from home	13.92***	7.34***	12.58***	17.76***
	(1.11)	(2.07)	(2.18)	(1.56)
Age group				
(20 – 30)				
(31 – 50)	7.86***	8.17***	11.85***	6.49*
	(1.07)	(1.49)	(1.62)	(3.86)
(51 – 70)	11.39***	10.48***	35.23***	10.56***
	(1.17)	(1.83)	(5.78)	(3.89)
Number of children	-0.69**		0.41	-1.05**
	(1.24)		(0.65)	(0.46)
Marital status				
(single)				
Married	6.36***	3.62**	7.71***	10.19***
	(1.01)	(1.50)	(2.01)	(2.07)
Divorce	0.69	-0.59	-4.43	5.53**
	(1.24)	(2.28)	(2.83)	(2.19)
Race				
(white)				
Black	-0.10	2.22	0.45	-1.19
	(1.12)	(2.07)	(2.24)	(1.59)
Asian	3.98***	4.75*	0.81	4.08**
	(1.47)	(2.56)	(2.74)	(2.18)

Other race	-0.40	-2.09	2.43	0.35
	(1.98)	(3.36)	(3.50)	(3.04)
Degree	-2.23**	-1.27	2.44	-3.83***
	(0.94)	(1.78)	(1.88)	(1.29)
Job sector				
(government)				
Private for-profit	-0.45	-0.81	-2.02	-0.06
	(0.97)	(1.78)	(1.93)	(1.36)
Private non-profit	0.91	-2.98	3.01	2.44
	(1.46)	(2.67)	(2.96)	(2.04)
Self employed	21.23***	25.90***	-0.33	23.59***
	(1.73)	(3.71)	(3.50)	(2.29)
Constant	14.92***	19.86***	-0.33	10.80***
	(1.27)	(2.02)	(3.50)	(4.07)
Observations	23,303	7,425	3,406	12,472

*Note: : Data from SIPP data 2018. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Results from OLS regressions of gender on average hourly wage per parent group, including various control variables. *=p<0.10, **=p<0.05, ***=p<0.01*

Appendix D

Table D.1: T-Test: Average hourly wage per gender, per parent group, 2021

	Mean Women	Mean Men	Mean difference	T-Statistic	P-Value (Ha: diff<0)
		Whole population			
Average hourly wage	32.13	37.90	-5.77	-5.29	0.00
	(0.95)	(0.58)			
Average hourly wage	22.93	25.06	-2.13	-1.59	0.06
Age 20 – 30	(0.95)	(0.94)			
Average hourly wage	36.11	39.63	-3.53	-1.63	0.05
Age 31 – 50	(2.06)	(0.94)			
Average hourly wage	32.47	42.58	-10.12	-7.82	0.00
Age 51 - 70	(0.81)	(0.99)			
		Non-parents			
Average hourly wage	32.35	30.98	1.37	0.62	0.73
	(2.29)	(0.67)			
Average hourly wage	23.72	24.94	-1.22	-0.75	0.23
Age 20 – 30	(1.19)	(1.09)			
Average hourly wage	41.10	34.10	6.99	1.28	0.90
Age 31 – 50	(6.28)	(1.01)			
Average hourly wage	35.39	36.56	-1.17	-0.44	0.33
Age 51 – 70	(2.22)	(1.53)			
		Parents of young children			
Average hourly wage	31.54	39.29	-7.75	-2.45	0.01
	(2.45)	(2.03)			
Average hourly wage	19.83	24.23	-4.40	-2.51	0.01
Age 20 – 30	(0.90)	(1.53)			
Average hourly wage	37.16	43.90	-6.74	-1.53	0.06
Age 31 – 50	(3.59)	(2.67)			
Average hourly wage	23.52	36.71	-13.19	-0.91	0.18
Age 51 – 70	(7.50)	(6.01)			
		Parents of old children			
Average hourly wage	31.95	42.74	-10.79	-9.34	0.00
	(0.72)	(0.90)			
Average hourly wage	23.84	33.42	-9.59	-1.80	0.04
Age 20 – 30	(1.44)	(5.16)			
Average hourly wage	32.66	41.21	-8.55	-4.51	0.00
Age 31 – 50	(1.29)	(1.39)			

Average hourly wage	32.03	44.51	-12.48	-8.38	0.00
Age 51 - 70	(0.88)	(1.20)			

Note: : Data from SIPP data 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Presenting results of T-Tests, within the group named above the test, the first row per group includes the whole sample and under need are the separate age groups. Ho: mean average hourly wage men = mean average hourly wage women. Ha : mean average hourly wage women < mean average hourly wage men. The mean and in brackets the standard deviation. And in column 4 the T-Statistic, and in column 5 the P-Value.

Table D.2: Regressions: gender on average hourly wage, per parent groups, with control variables 2021

	Average hourly wage OLS (1)	Average hourly wage OLS (2)	Average hourly wage OLS (3)	Average hourly wage OLS (4)
Male	5.15***			
(All individuals)	(1.16)			
Male		-1.82		
(non-parents)		(2.48)		
Male			5.96*	
(Children < 5)			(3.38)	
Male				9.28***
(Children => 5)				(1.21)
Working from home	16.84***	15.57***	14.49***	17.74***
	(1.27)	(2.71)	(3.63)	(1.34)
Age group				
(20 – 30)				
(31 – 50)	9.89***	10.85***	15.20***	1.09
	(1.78)	(2.90)	(4.08)	(5.27)
(51 – 70)	9.89***	9.35***	13.21	1.38
	(1.92)	(3.48)	(11.93)	(5.27)
Number of children	-0.10		-1.59	-0.08
	(0.47)		(1.54)	(0.56)
Marital status				
(single)				
Married	6.25***	3.00	7.55	11.09***
	(1.61)	(2.89)	(5.00)	(2.41)
Divorce	-1.10	-1.85	-5.17	3.96
	(2.00)	(4.28)	(7.68)	(2.57)
Race				
(white)				
Black	-3.91**	0.47	-4.36	-5.42***
	(1.93)	(4.28)	(5.75)	(1.97)
Asian	11.87***	19.48***	5.37	7.19***
	(2.29)	(4.73)	(6.13)	(2.51)

Other race	-1.77	-4.03	-5.82	2.75
	(3.14)	(6.19)	(8.32)	(3.59)
Degree	-2.29	-3.75	-0.02	-1.87
	(1.61)	(3.56)	(4.61)	(1.64)
Job sector				
(government)				
Private for-profit	1.82	1.26	5.07	1.36
	(1.54)	(3.38)	(4.51)	(1.58)
Private non-profit	0.70	-2.83	1.61	2.56
	(2.29)	(5.01)	(6.89)	(2.32)
Self employed	18.24***	16.72*	8.75	19.76***
	(2.70)	(6.72)	(8.46)	(2.58)
Constant	14.44***	19.44***	11.37*	16.48***
	(2.08)	(3.92)	(6.78)	(5.41)
Observations	19,347	6,839	2,495	10,013

*Note: : Data from SIPP data 2021. Filtered on age (20 – 70), on working population, on wage above minimum wage (7.25$), using averages over the year. Results from OLS regressions of gender on average hourly wage per parent group, including various control variables. *=p<0.10, **=p<0.05, ***=p<0.01*