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# **Does childcare availability influence the gender pay gap?**

## **A natural experiment using Swiss cantons**

Nora Bearth (41893)

### **Abstract**

Does an increase in childcare availability reduce the gender pay gap? I contribute to answering this question by investigating the effect of a childcare expansion in 2003 in Switzerland on the gender pay gap and hourly pay of men and women. For this purpose, I use administrative data from the Swiss Labour Force Survey (SAKE) on the employment of permanent residents of Switzerland and data on the number of childcare places in different cantons of Switzerland collected by Ravazzini, Delphine, and Suter (2016). I identify the causal effect of the reform using a difference-in-difference approach. The results show no significant impact on the gender pay gap or hourly pay of men and women. Nevertheless, I find a slight but significant decrease in men's pay for some subgroups.

*Keywords:* Gender Pay Gap, Childcare, Family Policies, Difference-in-Difference, Switzerland

*JEL:* C21, J13, J16, J18

Supervisor: Pamela Campa

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Discussant: Stasia Rudak

Examiner: Anders Olofsgard

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# 1 Introduction

Since 1981, the Swiss constitution has stated ‘Equal pay for equal work’ (Art. 8, Schweizerische Bundesverfassung). However, in 2018, men still earned on average 19% more than women. Even though factors such as a different educational background, working for different companies, or holding a different position can explain 54.6% of the gender pay gap, the remainder is still unexplained (Bundesamt für Statistik (BFS), 2019). Another explanation for the persistent gender pay gap is women taking time off work after having a child, leading to less work experience and an ongoing earning difference compared to men. In addition, the fear that a working woman might become pregnant and afterwards decide to stay at home caring for the child may cause some employers to discriminate against young women.

To improve gender equality, governments have implemented several well-intended family policies over the last decades, such as extended maternal and paternal leave options, subsidised childcare, and after-school care. Researchers find mixed results on the effect of subsidised childcare on maternal employment (e.g. Baker, Gruber, & Milligan, 2008; Baker & Milligan, 2008). The results depend on the situation before the reform, such as the availability and cost of childcare, how the strategy is implemented, and the level of reliance on informal childcare. In Switzerland, Ravazzini (2018) finds a small increase in women’s intensive labour force participation due to increased childcare availability. Moreover, recent research on the effect of subsidised childcare on the gender pay gap indicates that there is only a small effect, if any (Andresen & Nix, 2019; Kleven, Landais, Posch, Steinhauer, & Zweimüller, 2020). According to Goldin (2014), Kleven, Landais, Posch, Steinhauer, and Zweimüller (2019) and Bertrand (2011) the further closure of the gender pay gap will not come from government interventions but increased flexibility in the labour market and changed gender norms and preferences. However, family policies can help to change norms and preferences in the long run. Furthermore, childcare policies have other positive effects. For example, they lead to better development of cognitive abilities in children, independent of the education of their parents (e.g. Felfe, Lechner, & Thiemann, 2016), and to couples distributing household duties more fairly (Liebig et al., 2015).

In this thesis, I study the effect of the introduction of the Federal Law on Financial Aid for Supplementary Childcare in February 2003 on the gender pay gap in Switzerland. Several cantons<sup>1</sup> have increased their childcare places since then, though not all to the same extent (Ravazzini et al.,

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<sup>1</sup>Switzerland is divided into 26 different areas called cantons.

2016). This unique setting provides quasi-experimental data on the impact of childcare availability on the gender pay gap. To identify the causal effect of the reform on the gender pay gap, I use a difference-in-difference approach. Even though recent research (Andresen & Nix, 2019; Kleven et al., 2020) has not found any impact of childcare policies on the gender pay gap in Austria and Norway, the childcare reform could lead to a smaller gender pay gap in Switzerland, especially since childcare provision in Switzerland was deficient before the reform.

Nevertheless, no significant effect on the gender pay gap or the hourly pay of men and women is found in this thesis. The results are in line with previous research (Andresen & Nix, 2019; Kleven et al., 2020). However, I note a significant decrease in men's hourly pay of 1.9% and 1.6% in the second and third household income quintile. An explanation might be that childcare places are more critical for families in the lower part of the labour income distribution. High-income households could already afford other forms of external childcare, such as a nanny, before the reform. Furthermore, there is a negative effect (1.6% decrease) on men's hourly pay for individuals with secondary education. Similarly, Ravazzini (2018) finds the most substantial impact of the reform is on women's labour force participation for women with secondary education.

This thesis contributes to the field of gender economics and labour economics. To the best of my knowledge, there is no study exploring the effect of the childcare reform in 2003 on the gender pay gap in Switzerland. In policy discussions, better childcare is often mentioned as an instrument to improve gender equality. Before implementing such policies, it is crucial to be aware of the effects and the cost-effectiveness of the policy. Therefore, this thesis further helps Swiss policymakers make decisions on the implementation of future family policies.

The structure of this thesis is as follows. Section 2 reviews the current literature on the gender pay gap and the effects of childcare policies on the gender pay gap. Section 3 explains the institutional background of Switzerland. Section 4, describes the data. The identification strategy and the estimation method are described in Section 5. Section 6 presents the results, conducts several robustness checks, and discusses the findings. Finally, Section 7, provides a conclusion.

## 2 Literature review

Despite a reduction in the gender pay gap in developed countries over the last decades, there is still a considerable difference between women's and men's pay. Several studies try to explain the remaining difference. For a recent overview of gender pay gap literature, see F. D. Blau and Kahn (2017).

F. D. Blau and Kahn (2017) show that since 1955 the gender pay gap in the United States has decreased. In 1955, women earned on average 60% of what men earned, whereas, by 2014, the percentage had increased to 79%. Of particular interest is that the discrepancy between men and women is still higher at the upper end of the pay distribution; namely, women only earn 74% of men's pay. Similarly, in countries in the OECD<sup>2</sup>, women's median pay was 86.5% of men's median pay in 2016 (Bertrand, 2020). Simultaneously, women's education levels and commitment to work have increased over the last decades. On average, women now have a better education than men, though men still have slightly more work experience.

Consequently, the part of the gender pay gap explained by personal characteristics has decreased over recent years (F. D. Blau & Kahn, 2017). In contrast, different occupations and industries still play an essential role in explaining the gender pay gap. For example, a maximum of 20% of women in OECD countries choose a STEM<sup>3</sup> tertiary degree, whereas the percentage for men varies between 30% and 50%. These different choices affect pay levels later (Bertrand, 2020). In Switzerland, Schmid (2016) finds that one of the leading causes for the gender pay gap is occupational segregation. Women and men in female-dominated occupations have lower pay than individuals in male-dominated fields. The reason for choosing different occupations is often based on personal preferences between job and family.

According to several studies, having children affects men and women differently because women often take time off to care for their child, even after legal maternal leave ends (e.g. Budig & England, 2001; Sasser, 2005; Waldfogel, 1997). Schmelzer, Kurz, and Schulze (2015) finds that the earning differences in Germany are highly dependent on the length of women's parental leave. On the one hand, if women take only the legal minimum parental leave, the loss in earnings is small. On the other hand, if they defer their return to work for longer, the earning differences between women with children and women without children persist in the long term.

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<sup>2</sup>Organisation for Economic Co-operation and Development.

<sup>3</sup>Degree in science, technology, engineering, or mathematics.

Kleven, Landais, Posch, et al. (2019) uses a first child birth-event study to show that a first child does not affect a father’s pay but has a sharp and persistent effect on a mother’s pay. Long term<sup>4</sup> differences in earnings can be seen in several countries, such as Austria, Germany, the United States, and the United Kingdom. These earning differences can come from the extensive margin of labour supply (employment), the intensive margin of labour supply (hours worked), or the pay rate. In another study focusing on Denmark, Kleven, Landais, and Søgaaard (2019) find that if females grow up in a traditional family setting where the father is the primary earner, it is more likely that they will have a larger child penalty<sup>5</sup> when they become mothers themselves. Hence, family background shapes career and family preferences, showing the importance of gender norms and culture in explaining the gender pay gap. Andresen and Nix (2019) shows that the long term penalty most likely occurs due to preferences and gender norms. They use same gender and heterosexual couples to conclude that biology may play a minor role in explaining the short-term penalty but most likely not the long term penalty. However, in an earlier study, Angelov, Johansson, and Lindahl (2016) find that the less educated the mother is than her spouse, the wider the gender pay gap. They explain it as the direct effect of giving birth and often working part-time afterwards because they want to care for the child.

Loughran and Zissimopoulos (2009) state that the temporary absence of women from work due to childbearing lowers work tenure and experience and may lead to missed opportunities for promotion and professional development, even if childbearing itself has not had a direct effect on work productivity. Often this happens due to the high costs of external childcare. Without external childcare, someone must take care of the child and work less or stay at home. Often, this is the mother. Similarly, Goldin (2014) shows that there is a penalty for flexibility in some professions, especially law and business. In addition, it is not easy to work full-time if the children are in school as school finishes earlier than work and there are long school holidays (Bertrand, 2020). This leads to the horizontal segregation of women in lower-paying and more family-friendly jobs and men in higher paying jobs. Therefore, having more flexibility at work would reduce the gender pay gap (Goldin, 2014). Similarly, Bertrand, Goldin, and Katz (2010) identifies the reasons for the gender gap among MBA students as differences in interruptions, weekly hours worked, and training before the MBA course. Two of the main reasons have again to do with flexibility in the workplace.

Therefore, to achieve more gender equality it is highly relevant to estimating the impact of family

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<sup>4</sup>Long term means approximately ten years after the first child’s birth.

<sup>5</sup>A child penalty is defined as a shortfall in the pay of women with children compared to women without children.

policies, such as better childcare, on the gender pay gap. Olivetti and Petrongolo (2017) claim that family policies can affect the gender pay gap through two channels. In a competitive labour market, it depends on the shifts in labour supply and demand. On the one hand, the cost of childcare subsidies financed through taxes lowers demand in the labour force. On the other hand, childcare subsidies make it easier for women to stay in the labour market; therefore, women's labour force supply increases. The change in the gender pay gap depends on the relative shift of the two curves. Andresen and Nix (2019) found a positive effect of subsidised childcare when the children were two and three years old. The childcare subsidies reduced the child penalty by around 25%. Nevertheless, they found no effect on the long term child penalty. In a recent study by Kleven et al. (2020), the authors examine the impact of a massive joint expansion of parental leave and childcare subsidies over the last 60 years in Austria. They claim that these policies had virtually no impact on closing the gender pay gap. They found a short-term negative effect of parental leave but no effect in the long term. Furthermore, they found no effect of childcare subsidies. These zero effects are due to the crowding-out of informal care and the persistence of norms towards maternal care. Havnes and Mogstad (2011), and Givord and Marbot (2015) also find the crowding-out effect of informal childcare in favour of subsidised childcare for Norway and France. Krapf, Roth, and Slotwinski (2020) analyse the effect of an expansion in childcare in Switzerland in the canton of Bern. They found a decrease in the child penalty by 8.2 p.p. from 79% to 70.8% in municipalities with a childcare facility. 4.5 p.p. of the decrease is due to a reduction of the female child penalty and the other half comes from a reduction in the increase in men's pay. Without childcare facilities they found a long term increase in men's earnings after having a child. This is in line with the idea that men have to earn more so that household income remains stable after starting a family. Furthermore, they found that the highest impact of childcare is seen in the income quintiles below the median.

As explained above, some arguments help rationalise the gender pay gap. However, it is essential to understand why women make different choices than men. One explanation is that women and men have different skills or may prefer different jobs. In that case, it is crucial to identify and eliminate the causes of some female-oriented sectors, such as the care sector, paying less than male-oriented sectors, such as banking. Alternatively, it could be that men and women make different choices because of powerful stereotypes about how a woman or a man has to be and what role she or he has to take. Women still make their own choices by opting for different jobs or staying at home after

the first child, but gender stereotypes shape their views (Bertrand, 2020). For example, stereotypes can help explain why women provide more unpaid care or, as shown by Bertrand, Kamenica, and Pan (2015), spend more time on housework than their partner, even if they work more. If the man works more than the woman, he decreases the amount of time spent on household work.

One explanation could be that gender stereotypes directly shape women's preferences or that women do not want to deviate from the stereotypes because of social concerns (Bertrand, 2020). Gender stereotypes are often represented in the unexplained gender pay gap. The unexplained gender pay gap steadily decreased until the 1980s but has only decreased a little since then. This part of the gender pay gap is often referred to as a measure of discrimination (F. D. Blau & Kahn, 2017). There are other potential explanations for the unexplained gender pay gap. For example, women are less competitive and more risk averse. Niederle and Vesterlund (2007) and Leibbrandt and List (2015) find that men are more competitive and more likely to negotiate their pay than women. This might lead to worse pay outcomes in pay bargaining or self-selection into jobs where competition does not matter for women.

We learn from the literature review that there are several channels through which childcare can affect the gender pay gap. Some channels can affect the gender pay gap in the short term. Working more hours might lead to a smaller part-time penalty, leading to a smaller gender pay gap. Ravazzini (2018) finds an increase in hours worked per week due to the childcare reform in Switzerland. In contrast, the gender pay gap could increase if more and potentially less-educated women participate in the labour market. However, Ravazzini (2018) does not find this effect in Switzerland. Furthermore, if women work for companies that pay more but are less flexible, horizontal segregation in the labour market would diminish and reduce the gender pay gap. Last, the fertility rate of women could increase due to better family policies, potentially leading to an increase in the gender pay gap.

Other channels can affect the gender pay gap in the long term. With better childcare, women can work longer hours, leading to a higher promotion rate for women. Thus, women may catch up with men in management positions, probably leading to a smaller gender pay gap. Furthermore, this could result in better role models for girls, which may cause women to choose different jobs and education in the future. The effect would be seen in changes in the composition of occupations and again lead to a smaller gender pay gap. Last, norms could potentially change through the introduction of more family-oriented policies such as better childcare. Suppose it is normal for women

to stay in the labour market and work as much as men after having a child. In that case, employers may not discriminate against young women anymore because they do not fear losing them after their pregnancy. As a result, stereotypes will probably change, which again could influence the job decisions of females. However, these effects are hard to measure.

To conclude, it is difficult to predict what effect will be seen in the results as many factors affect the gender pay gap. On the one hand, it could be that there is no effect, which would be in line with previous literature (Andresen & Nix, 2019; Kleven et al., 2020). On the other hand, it could be that this increase in childcare availability has led to a decrease in the gender pay gap. It is unlikely that an increase in the gender pay gap will be seen.

### 3 Institutional background

In February 2003, the Swiss government introduced the Federal Law on Financial Aid for Supplementary Childcare. It is a temporary incentive programme designed to provide additional daycare places for children, namely, early childcare and after-school facilities. By 2020 the Swiss confederation had spent nearly CHF 400 million<sup>6</sup> to create almost 63,000 new childcare places since 2003. Childcare facilities must satisfy certain conditions to receive subsidies, such as having a specific ratio of educators per child and specific opening hours. Most childcare places are run by private institutions (Bundesamt für Sozialversicherungen, 2020).

The price that parents pay is often no lower than before the reform. The aim was to incentivise the cantons to provide more childcare places. Therefore, some fixed costs for opening and expanding childcare places are covered by the government. This leads to higher availability of childcare places, but it is still challenging to find a childcare space. The average capacity utilisation of the new childcare places is around 80%, but more than half of the childcare providers say that they cannot accommodate all applications. This is often because of the age of the children (lack of places for babies) and the available times (desired days are not free) (Bundesamt für Sozialversicherungen, 2020). The price for a childcare placement depends on parental income, i.e. whether the provision is subsidised, and the domicile. In most municipalities, a child has to enrol at a crèche in the place of residence to benefit from a subsidised place, along with other requirements such as household income below a certain threshold. According to Iten, Lechner, Stern, and Felfe (2013) 71% of children below three years live in a municipality with childcare provision. The amount paid by the parents varies from 30% to 100% of the costs, but data availability in Switzerland is insufficient to make statements regarding the influence of childcare costs (Iten et al., 2013). However, in comparison to other countries, a childcare place remains costly in Switzerland (Stern & Felfe, 2015) and in general, most of the costs are paid by the parents (Ecoplan, 2020). According to Bütler (2007), childcare places for two children cost around CHF 50,000<sup>7</sup> per year if the government does not subsidise the family. Therefore, the second earner of the family, often the mother, has to earn at least that much after tax. If not, it does not make economic sense in the short term for both parents to work. Therefore, it still does not make sense for low-income households to enrol the child at a childcare facility if they do not receive a subsidised place. To conclude, the Federal Law

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<sup>6</sup>This amount is equivalent to EUR 360 million.

<sup>7</sup>This amount is equivalent to EUR 45,670.

on Financial Aid for Supplementary Childcare has not substantially changed childcare costs, but has increased their availability.

As stated above, the Federal Law on Financial Aid for Supplementary Childcare also aimed to subsidise more after-school facilities. In 2010 only the cantons of Bern, Solothurn, and Zurich had established after-school care in their school laws. By 2015 Basel-Stadt, Graubünden, Lucerne, Neuchâtel, and Schaffhausen had also included it in their school laws. In these cantons, the municipalities are obliged to offer parents a slot and obtain finance for subsidised after-school care places (Felfe et al., 2016). According to Felfe et al. (2016), the increase in the availability of after-school places impacts the intensive female labour margin, but not the extensive labour margin. This expansion of after-school care might influence the gender pay gap and, therefore, affects my findings. This problem is discussed in the identification strategy in Section 5.1.

In 2005, the Swiss government introduced maternal leave. This regulation allows women to stay at home for 14 weeks after giving birth. During this time, women receive a minimum of 80% of their regular salary (Schubarth, 2015). In the private and public sectors, most employers had already established maternal leave in the early 1990s. Therefore, maternal leave was only seen as legal confirmation of what already existed (and for exceptional cases such as women in their first year of employment) and not as a major reform (Ravazzini, 2018). Hence, it most likely did not influence the gender pay gap. Furthermore, according to Baker and Milligan (2008) job continuity of mothers is not affected by a maternal leave of 17 to 18 weeks. With Switzerland being below this threshold, this maternal leave introduction should not have had any effect. On 1st January 2021, paternal leave was introduced. Since I only consider data until 2019, this reform has no impact on my analysis.

## 4 Data

First, the two datasets used in this thesis are introduced. In a second step, the selection of the sample is explained. Then, the definition of the outcome and treatment variable and their summary statistics is presented. Last, an overview of the control variables included in the analysis is given.

### 4.1 Overview

First, data from the Swiss Labour Force Survey (SAKE) of the Swiss Federal Statistical Office (BFS) is used to construct outcome and control variables. It is an annual survey<sup>8</sup> that focuses on the employment of permanent residents in Switzerland aged 15 and above. It contains cross-sectional data from 1991 to 2019. The selection plan for the standard SAKE is based on the basic principle of random sampling, stratified by major regions and cantons.<sup>9</sup> The variables included in the survey are sociodemographic characteristics (e.g. age, education, nationality, marital status, canton of residence, language region), labour supply indicators (e.g. labour income, labour participation, occupation), and some information about other household members (e.g. age, education, nationality).

Second, the definition of the treatment and the control group used in this thesis follows the approach of Ravazzini (2018). To this end, Ravazzini (2018) uses data on the number of childcare places collected since 1991 by Ravazzini et al. (2016).

### 4.2 Selected sample

The primary sample consists of individuals in the labour market, full- and part-time employees, 20–45 years old, namely, in their fertility phase.<sup>10</sup> It is unlikely that individuals below the age of 20 will have a child, and the pay for individuals at that age is often not representative. For example, most people in Switzerland either accept an apprenticeship or remain at school until 19. Therefore, pay is relatively low. Moreover, after 45, it is unlikely that an increase in childcare places would

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<sup>8</sup>From 1991 to 2009, the annual survey was conducted in the second quarter of the year. From 2010 onwards, the survey was conducted quarterly, and an annual dataset was constructed that includes the same variables, which leads to a possible seasonality problem. However, it is unlikely to affect my results.

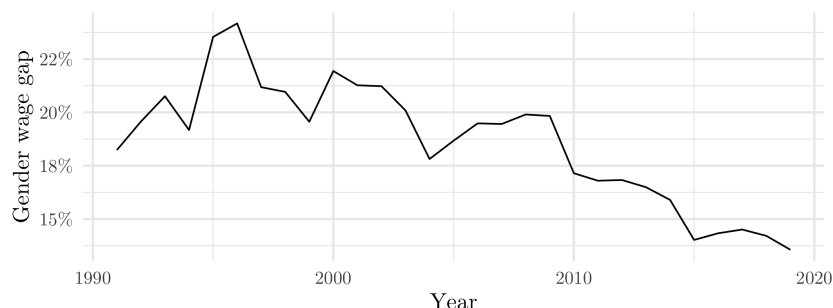
<sup>9</sup>In 1995 and from 2009 onwards, the stratification of individual observations is based on cantons. In the other years, the stratification is based on seven macro-regions: Region Lemanique (GE, VD, VS); Area Mittelland (BE, FR, NE, SO, JU); Northwest Switzerland (AG, BS, BL); Zurich; East Switzerland (SH, SH, AI, AR, TG, GL, GR); Central Switzerland (LU, UR, SZ, OW, NW, ZG); Ticino

<sup>10</sup>If a variable needed for the construction of the outcome variable (see Section 4.3) or a control variable (see Section 4.4) has a missing value in an observation, this specific observation is dropped.

affect income. The only possibility might be that there is a long term effect because women have a smaller child penalty in their fertility years. Nevertheless, to investigate that effect, I would need a longer timeline after the reform was introduced. In addition, I follow Djurdjevic and Radyakin (2007) and F. D. Blau and Kahn (2017) and exclude the agricultural sector, self-employed people, individuals doing an apprenticeship or in compulsory military service, and students. Djurdjevic and Radyakin (2007) point out that the agricultural sector depends on random factors such as weather conditions, and they likely explain their earnings. I exclude self-employed because it is hard to distinguish between labour and capital income (F. D. Blau & Kahn, 2017).

### 4.3 Outcome and treatment variable

The outcome variable is the hourly log wage.<sup>11</sup> Logarithmising pay is standard in the literature because level pay has a left-skewed distribution. The hourly wage is calculated using the annual labour income<sup>12</sup> and the weekly working hours defined in the working contract. Figure 1 shows the raw gender pay gap in percentage over the years for people between ages 20 and 45. It can be observed that the gap has constantly diminished since 1996. However, despite improvements over the last decades, the gap is still persistent.



*Note:* This figure shows the gender pay gap in percentages for individuals aged 20–45 from 1991 to 2019.

Figure 1: Raw gender pay gap 1991–2019 in %

As already explained in Section 4.1, I use data from Ravazzini et al. (2016) and follow the approach of Ravazzini (2018) to construct the treatment variable. A limitation of the data used is that the number of childcare places per canton is not available each year from 1991 to 2019. In order to still

<sup>11</sup>The difference in logarithms approximately equals the percentage difference in the geometric mean when applied to averages. Therefore, I can interpret the difference as a percentage pay gap between men and women.

<sup>12</sup>I use the net salary and assume 48 working weeks per year.

divide the cantons into a treatment and a control group, I follow Ravazzini (2018) and compare the number of childcare places per canton in the years 2002 and 2012. If data is missing, data from the years closest to 2002 and 2012 is used.<sup>13</sup> This makes intuitive sense because the number of childcare places does not change radically from one year to the next but gradually over the years. I follow Ravazzini (2018) and assign a canton to the treatment group if the percentual increase in childcare places per 100 children from 2002 to 2012 is above the national average. In total, data is available for 24 out of the 26 cantons.<sup>14</sup> The treatment group consists of ten cantons, and the control group consists of 14 cantons. Hence, the treatment variable is a binary variable that takes the value one if the increase in childcare places in a canton was above the average increase in Switzerland and zero otherwise. Figure 2 shows the division in treatment and control group across cantons in Switzerland. The treatment and control group are not divided by the language border in Switzerland (known as Röstigraben) and the main cities are in both groups. The two language parts of Switzerland and urban and country areas often differ in their political views on social matters, such as family policies.

#### 4.4 Control variables

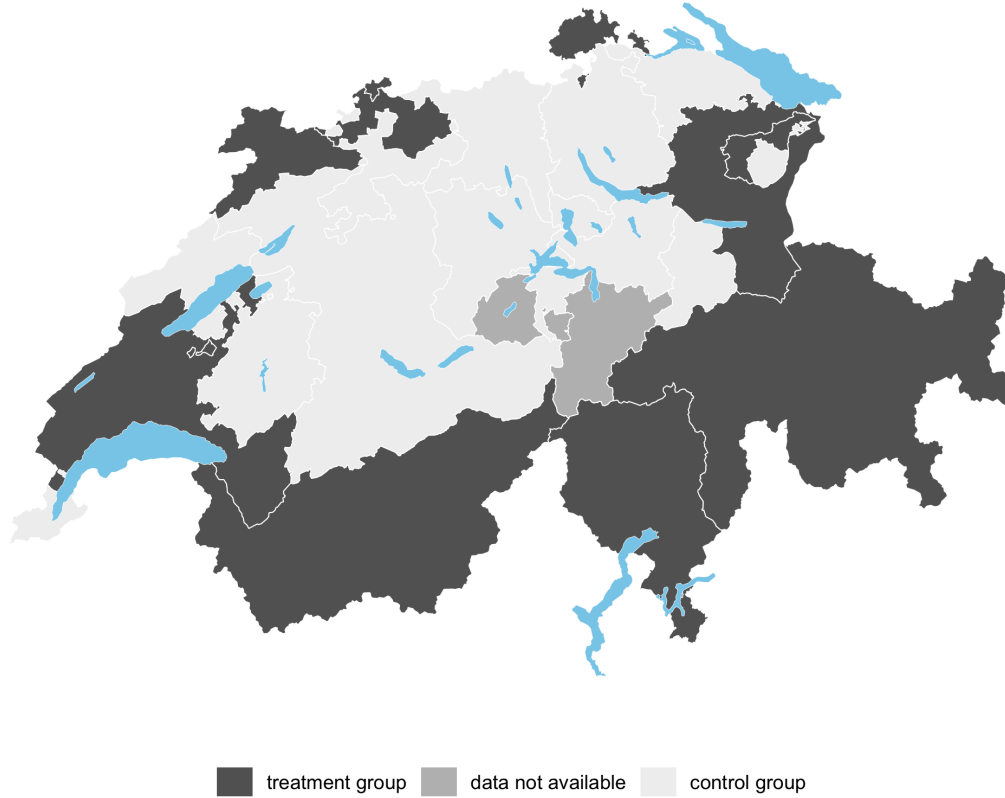
In general, I follow the approach of Djurdjevic and Radyakin (2007) in deciding which control variables to include. Thus, I include sociodemographic characteristics such as age, education and citizenship, marital status, number of children, and a dummy being equal to one if the individual has children aged three or below. These last three variables could potentially have the issue of reverse causality, which means that, for instance, married women with more children work less. Furthermore, there could be inadequate controls, i.e. the treatment could affect those control variables. For example, more childcare places might lead to having more children. I discuss this issue in Section 5.3.2. Nevertheless, I first run a specification without including any controls.

Furthermore, I include job characteristics, such as company size, supervisory function, occupation, contract, public sector, work experience, and working part-time. There are potential endogeneity problems with these control variables. The decision of women to work in a specific job or industry might be due to discrimination. This is called pre-labour market discrimination, and the unexplained gap would be underestimated. For estimating the effect of a childcare policy on the gender

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<sup>13</sup>Six of the cantons have information on the number of childcare places in 2010 rather than 2012 and 12 cantons have information on the number of childcare places one or two years before or after 2002.

<sup>14</sup>For the canton of Obwalden, I only have information on the number of childcare places from 2006 onwards and for the canton of Uri I only have information on the number of childcare places in 2003.



*Note:* This figure shows the cantons of Switzerland assigned to the treatment or the control group. Ten cantons are assigned to the treatment group, and 14 cantons are assigned to the control group. Two cantons, namely the canton of Uri and Obwalden, do not have enough data on the number of childcare places.

Figure 2: Cantons in treatment and control group

pay gap, this is not problematic as long as the control variables do not change with the treatment. If they change with the treatment status, it could explain how the reform impacted the gender pay gap. In a second specification, I run the analysis only with sociodemographic characteristics as control variables. For an overview and detailed explanation of all controls, see Appendix A.

Diverging from the approach of Djurdjevic and Radyakin (2007) I additionally include a variable for working part-time and divide the children variable into a dummy for children below three and a variable for the number of children. Furthermore, I do not include a variable for work experience

because it can be formed from age and education, and therefore, this variation is already captured.

Table 1 presents summary statistics for the treatment and control group before and after introducing the reform. The distribution of observations before and after the reform separated by treatment and control group is shown for discrete variables. The table depicts standard summary statistics such as mean, median, and standard deviation for continuous variables. Furthermore, the statistical difference between the treatment and control group before the reform is tested.<sup>15</sup> Some variables have a statistically significant difference. However, this is not problematic for the identification strategy used in this thesis, i.e. difference-in-difference estimation (see Section 5). In this setting, only the trends of the treatment and control group must be parallel. Section 5.3.2 offers a more detailed analysis of the underlying assumptions needed for a difference-in-difference estimation.

|                                     | Total | Treatment group |       | Control group |       |         |
|-------------------------------------|-------|-----------------|-------|---------------|-------|---------|
| Discrete Variables                  |       | Before          | After | Before        | After |         |
| Sociodemographics                   | %     | %               | %     | %             | %     | p-value |
| <b>Marital status</b> <sup>16</sup> |       |                 |       |               |       |         |
| single                              | 41.69 | 42.10           | 39.92 | 44.92         | 41.74 | 0.06    |
| married                             | 51.36 | 49.21           | 52.99 | 47.04         | 51.93 | 0.01    |
| divorced                            | 6.65  | 8.14            | 6.79  | 7.73          | 6.07  | 0.40    |
| widowed                             | 0.30  | 0.55            | 0.30  | 0.31          | 0.26  | 1.00    |
| <b>Level of education</b>           |       |                 |       |               |       |         |
| primary education                   | 10.35 | 10.92           | 11.67 | 9.17          | 9.85  | 0.19    |
| secondary education                 | 53.42 | 67.46           | 50.76 | 66.54         | 49.34 | 0.00    |
| tertiary education                  | 36.24 | 21.62           | 37.57 | 24.29         | 40.81 | 0.25    |
| <b>Citizenship</b>                  |       |                 |       |               |       |         |
| no Swiss citizen                    | 46.78 | 22.19           | 58.11 | 17.46         | 52.00 | 0.03    |
| Swiss citizen                       | 53.22 | 77.81           | 41.89 | 82.54         | 48.00 | 0.01    |
| <b>Children</b>                     |       |                 |       |               |       |         |
| children below 3 years              | 81.18 | 83.74           | 80.42 | 84.51         | 80.35 | 0.00    |
| no children below 3 years           | 18.82 | 16.26           | 19.58 | 15.49         | 19.65 | 0.17    |

<sup>15</sup>A proportion test is used for the discrete variables, and a t-test is used for the continuous variables to assess if the difference is statistically significant.

<sup>16</sup>Cohabiting couples are included in married individuals, and separated couples are included in divorced individuals.

|                             | Total | Treatment group |       | Control group |       |         |
|-----------------------------|-------|-----------------|-------|---------------|-------|---------|
| Job characteristics         | %     | %               | %     | %             | %     | p-value |
| <b>Company Size</b>         |       |                 |       |               |       |         |
| less than 50 employees      | 48.42 | 52.80           | 50.33 | 50.35         | 46.25 | 0.01    |
| between 50-100 employees    | 11.98 | 11.25           | 12.01 | 11.53         | 12.18 | 0.36    |
| over 100 employees          | 39.60 | 35.95           | 37.66 | 38.12         | 41.56 | 0.08    |
| <b>Supervisory function</b> |       |                 |       |               |       |         |
| management                  | 11.54 | 15.05           | 11.73 | 14.24         | 10.23 | 0.19    |
| supervisory function        | 26.60 | 22.23           | 26.60 | 24.34         | 27.84 | 0.21    |
| no supervisory function     | 61.86 | 62.71           | 61.67 | 61.42         | 61.93 | 0.00    |
| <b>Occupation</b>           |       |                 |       |               |       |         |
| managers                    | 5.82  | 3.96            | 6.12  | 4.16          | 6.37  | 0.78    |
| academicians                | 23.70 | 18.52           | 23.46 | 20.47         | 25.45 | 0.28    |
| technicians                 | 16.76 | 16.66           | 16.99 | 15.77         | 16.90 | 0.16    |
| clerical workers            | 18.18 | 24.04           | 16.80 | 23.53         | 16.66 | 0.10    |
| services                    | 13.08 | 12.99           | 14.07 | 12.16         | 12.81 | 0.22    |
| operators                   | 12.67 | 14.00           | 11.97 | 14.92         | 12.26 | 0.33    |
| handworkers                 | 4.78  | 5.34            | 4.95  | 4.97          | 4.56  | 0.55    |
| assistants                  | 5.00  | 4.49            | 5.64  | 4.02          | 4.99  | 0.59    |
| <b>Contract</b>             |       |                 |       |               |       |         |
| no permanent contract       | 6.10  | 5.45            | 7.38  | 4.77          | 5.87  | 0.49    |
| permanent contract          | 93.90 | 94.55           | 92.62 | 95.23         | 94.13 | 0.00    |
| <b>Part-time</b>            |       |                 |       |               |       |         |
| full-time                   | 72.89 | 78.28           | 72.87 | 76.51         | 71.16 | 0.00    |
| part-time                   | 27.11 | 21.72           | 27.13 | 23.49         | 28.84 | 0.21    |
|                             |       |                 |       |               |       |         |
| Continuous Variables        | Total | Before          | After | Before        | After |         |
| Sociodemographics           |       |                 |       |               |       | p-value |
| <b>Age</b>                  |       |                 |       |               |       |         |
| mean                        | 34.54 | 33.32           | 34.90 | 33.37         | 34.82 | 0.37    |
| median                      | 35.00 | 33.00           | 36.00 | 33.00         | 36.00 |         |
| min                         | 20.00 | 20.00           | 20.00 | 20.00         | 20.00 |         |
| max                         | 45.00 | 45.00           | 45.00 | 45.00         | 45.00 |         |
| 5-percentil                 | 23.00 | 23.00           | 23.00 | 23.00         | 22.00 |         |
| 95-percentile               | 44.00 | 44.00           | 44.00 | 44.00         | 45.00 |         |
| <b>Number of children</b>   |       |                 |       |               |       |         |
| mean                        | 0.76  | 0.70            | 0.80  | 0.67          | 0.77  | 0.00    |
| median                      | 0.00  | 0.00            | 0.00  | 0.00          | 0.00  |         |

|                        | Total   | Treatment group |        | Control group |         |
|------------------------|---------|-----------------|--------|---------------|---------|
| min                    | 0.00    | 0.00            | 0.00   | 0.00          | 0.00    |
| max                    | 7.00    | 7.00            | 7.00   | 6.00          | 7.00    |
| 5-percentil            | 0.00    | 0.00            | 0.00   | 0.00          | 0.00    |
| 95-percentile          | 3.00    | 3.00            | 3.00   | 3.00          | 3.00    |
| Number of observations | 280,411 | 22,312          | 76,452 | 36,648        | 144,999 |

Table 1: Balance table - treatment and control group

*Note:* This balance table shows the distribution of the observations for discrete control variables before and after the reform separated by treatment and control group. For continuous variables, the table depicts standard summary statistics such as mean and median before and after the reform separated by treatment and control group. The p-values show if the treatment group's distribution or mean is significantly different from the control group before the reform. To test if the difference is statistically significant, a proportion test is used for the discrete variables, and a t-test is used for the continuous variables. Reading example: The percentage of single individuals in the treatment group before the reform does not differ on the 5% significance level from the percentage of single individuals in the control group before the reform.

## 5 Empirical strategy

This section introduces the identification strategy used to estimate the causal effect of the childcare reform on the gender pay gap. The causal effect was identified using a difference-in-difference approach. First, the identification strategy and potential threats to it are discussed. Then, how the effect is estimated and what the underlying assumptions are is presented in detail.

### 5.1 Identification strategy

The empirical strategy relies on the fact that not all cantons of Switzerland used the additional funds for childcare to the same extent. Individuals living in cantons that have expanded their childcare availability more than the national average are assigned to the treatment group. In contrast, individuals living in cantons that expanded their childcare places less than the national average are assigned to the control group. Havnes and Mogstad (2011) in Norway and Bauernschuster and Schlotter (2015) in Germany used a similar definition for the treatment and control groups. As described previously, I use the same definition of treatment and control groups<sup>17</sup> as Ravazzini (2018) (see Section 4.3). Table 8 in Appendix B reports the childcare coverage across the cantons of Switzerland. Figure 3 depicts how the treatment and control cantons expanded their childcare availability. At first, there were more childcare places per 100 children in cantons assigned to the control group. In 2012, the cantons assigned to the treatment group had higher childcare availability than the cantons in the control group.

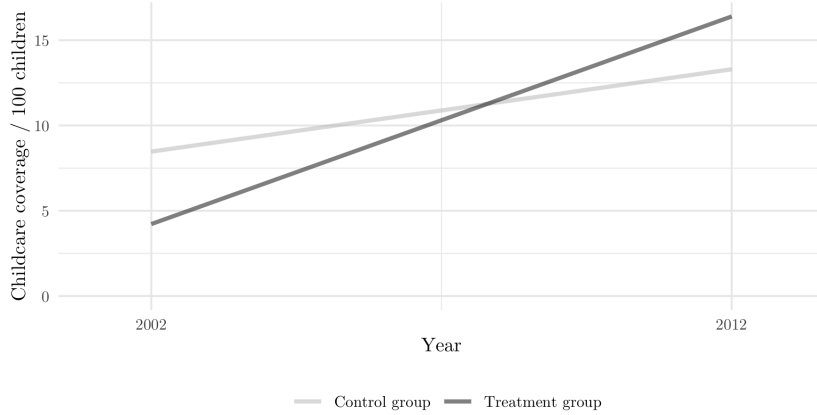
In a first step, I analyse the reform’s effect on the gender pay gap. Then, in a second step, I explore the reform’s impact on the men’s and women’s hourly pay separately to identify whose income changed due to the reform.

Recent literature shows a link between women’s labour outcomes and the cost of childcare (D. Blau & Currie, 2006; Lundin, Mörk, & Öckert, 2008). Not only the availability of childcare places affects the gender pay gap but also their cost. As exact childcare charges were not available, I run separate regressions for different household income types<sup>18</sup> to see if there is a difference between

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<sup>17</sup>Treatment group: Basel-Stadt, Basel-Landschaft, Schaffhausen, Appenzell A.Rh., St. Gallen, Graubünden, Ticino, Valais, Vaud, and Jura; Control group: Zurich, Bern, Glarus, Zug, Fribourg, Solothurn, Appenzell I.Rh., Thurgau, Neuchâtel, Geneva, Luzern, Schwyz, Nidwalden and Aargau

<sup>18</sup>To be able to compare households despite their different sizes and compositions, household income is converted into the income of a single person household. Income is divided by the equivalence measure according to the modified OECD scale. This size is determined by first weighting the individual household members. The first adult person is weighted by 1.0, the second and each additional person aged 15 and over by 0.5, and each child under 15 by 0.3. The concept of equivalence income assumes that a household is an economic unit whose total income benefits all



*Note:* This figure shows the childcare coverage per 100 children divided by treatment and control cantons. To construct this figure, data from Appendix B is used. The data is from Ravazzini et al. (2016) and shows the number of childcare places per 100 children per canton before (2002) and after (2012) the childcare reform. Most cantons have data from the years 2002 and 2012. If data for these years is missing, data from the years closest to 2002 and 2012 is used. For more details, see Section 4.3.

Figure 3: Childcare coverage

high-income and low-income households.<sup>19</sup> The effective thresholds of the household income quintiles have changed over the years and can be found in Appendix C. An increase in childcare places may not matter for high-income households because affording a nanny is not a problem if both parents want to work. If high-income households value a nanny as a good substitute for a childcare place, it is expected that the reform does not affect the gender pay gap.

Similarly, low-income households may not be able to afford childcare if they do not receive a subsidised placement. This would also lead to a small or no effect of the reform on low-income households. Nevertheless, it could also be the case that for low-income families, the effect is more substantial because additional income earned by women plays a more important role. Hence, the impact on low-income households is not clear.

Furthermore, according to Ravazzini (2018), and Stadelmann-Steffen (2007) the increase in childcare places has a higher effect on the labour force participation of individuals with secondary education than individuals with primary or tertiary education. On the one hand, less well-educated women are, in general, less likely to be active in the labour market because the jobs are not attrac-

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members to the same extent. The number of observations in the quintiles varies because the data has been cleaned (for example, without students / agricultural sector.).

<sup>19</sup>There are no household income quintiles for 2015. Hence, the analysis by household income quintiles is always without this year.

tive. However, if they are, they often have to be for economic reasons and are more likely to stay in the labour market after having a child. On the other hand, highly educated women are often active in the labour market regardless of childcare availability. Women with a secondary education have chances to perform well in the labour market, but it is not as straightforward as for highly educated women (tertiary education). Therefore, the availability of childcare plays a more crucial role in their decision whether or not to stay in the labour market. Ravazzini (2018) shows that the childcare reform increases the labour force participation of women with secondary education working between 50%–90% by five percentage points. No such effect was found for women with primary or tertiary education. Hence, it is expected that the effect on the gender pay gap is greater for individuals with secondary education.

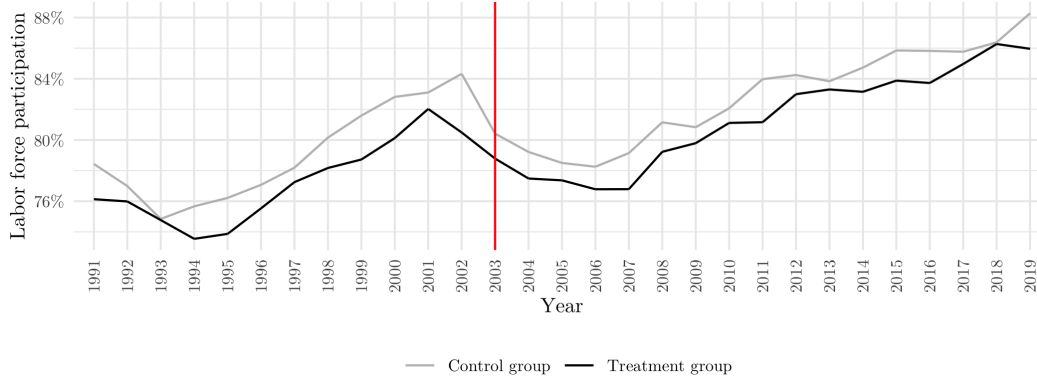
## 5.2 Potential threats to the identification strategy

If the change in childcare availability influences the extensive female labour force participation and, through this channel, influences the gender pay gap, a potential endogeneity problem could arise. It could be that more, less well-educated women enter the labour market, and thus, increase the gender pay gap. Ravazzini (2018) analyses the labour force participation of women with children below three years after introducing the childcare policy. She does not find an increase in labour force participation for mothers that do not participate in the labour market. Furthermore, I have formally checked if the reform affected female labour force participation by conducting a regression analysis. The results are reported in Appendix D. I found no significant effect.<sup>20</sup> This can also be seen graphically in Figure 4, which depicts female labour force participation over the years.

Another concern regarding the identification strategy arises if the expansion of childcare places in a canton is driven by greater demand from the population. The treated cantons substantially differ from the control cantons related to underlying trends in the gender pay gap. As long as the trends are not systematically related to the gender pay gap, there is no concern because I include canton fixed effects. However, there could be a concern if the treatment and control groups were divided by the language barrier (Eastern and Western part) called Röstigraben in Switzerland. In political votes, this division can often be seen for social matters. Another concern could be if the big cities were either in the control or in the treatment group because the urban areas often support social

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<sup>20</sup>Labour force participation is the percentage of women in the labour market (self-employed and employees) divided by the total number of women (unemployed and homemakers). People on an apprenticeship scheme, students, retired people, and others are excluded.



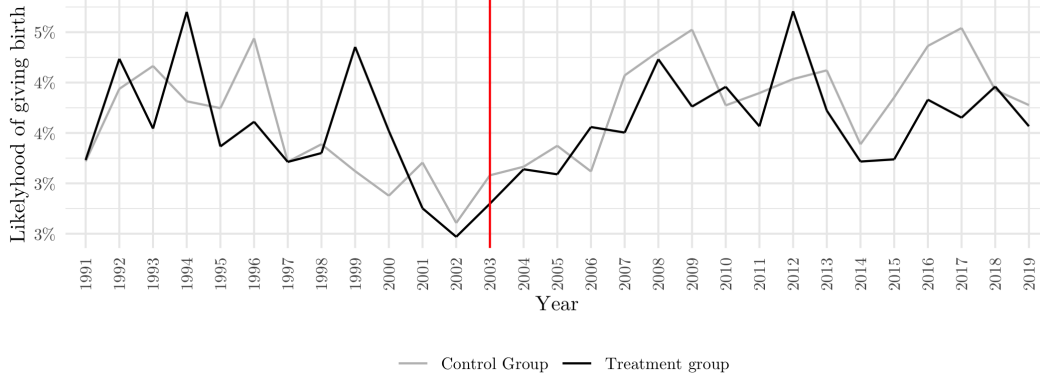
*Note:* This figure shows the female labour force participation in percentage from 1991 to 2019 for the treatment and control cantons separately. The vertical red line represents the childcare reform in 2003.

Figure 4: Female labour force participation

issues in political votes. However, Figure 2 suggests that both matters should not threaten the identification strategy. Furthermore, it could be that women in cantons with higher labour force participation have a higher demand for childcare, and hence, the municipality provides more. This concern is alleviated by Figure 4, which does not show substantial differences in women’s labour force participation between the treatment and control groups.

Another bias could arise if women’s fertility has increased due to better childcare availability. Bonoli (2008) has analysed the fertility rate in Switzerland and has found that childcare per canton and childcare benefits have positive and sometimes significant effects on fertility. Old determinants, such as urbanisation, tertiarisation, and formal gender equality, explain fertility in Switzerland best. If employers take higher fertility into account, the gender pay gap might increase. In this case, the actual effect would be larger than the estimated one. However, as long as the treatment group’s fertility does not change differently from the control group’s fertility, this increase in fertility is absorbed by fixed year effects. By reviewing Figure 5 it is reasonable to assume that the fertility rate has not increased due to the reform. In a regression analysis, reported in Appendix D, I do not find significant effects of the reform on the fertility rate.

As explained in Section 3, the Federal Law on Financial Aid for Supplementary Childcare aimed to subsidise more after-school facilities. Some cantons (Bern, Solothurn, and Zurich) established a school law to provide an after-school place to families before 2010. This could potentially influence the findings. However, all three cantons are in the control group. Consequently, the estimates



Note: This figure shows the likelihood of giving birth to a child in a specific year between 1991 and 2019 for women between 20 and 45 years old divided by treatment and control cantons. The vertical red line shows that the childcare reform was introduced in 2003.

Figure 5: Fertility rate

would be biased downwards. By 2015, other cantons such as Basel-Stadt, Graubünden, Lucerne, Neuchâtel, and Schaffhausen had also changed their school laws. Nevertheless, by restricting the analysis to the years up to 2012 as a robustness check, I can overcome the problem.

### 5.3 Estimation

In the following section, I explain how the causal effect is estimated. First, I describe the difference-in-difference approach. Then I state and check the underlying assumptions and clarify how my standard errors are calculated.

#### 5.3.1 Difference-in-difference approach

I use a difference-in-difference approach to estimate the causal effect of the policy on the gender pay gap. Because the gender pay gap is already a difference, a difference between two groups (F = female, M = male) in a treatment (T) and in a control (C) setting, before (B) and after (A) a reform is analysed. My difference-in-difference specification looks the following:

$$Y_{jit} = \beta_0 + \beta_1 F_i + \beta_2 T_j * F_i + \beta_3 F_i * A_t + \beta_4 T_j * A_t + \beta_5 T_j * F_i * A_t + \gamma X_{jit} + \delta C_j + \rho J_t + \epsilon_{jit} \quad (1)$$

where  $Y_{jit}$  is the log pay for individual  $i$ , in canton  $j$ , at time  $t$ .  $T_j$  is a dummy if treated or not,  $F_i$  is a dummy if female or not,  $A_t$  is a dummy if after the reform (2003–2019) or not,  $X_{jit}$  are control

variables (sociodemographic, firm and job characteristics),  $C_j$  canton fixed effects and  $J_t$  year fixed effects. With the assumption  $\mathbb{E}[\epsilon_{jit}|T_j, F_i, A_t] = 0$  it would be possible to calculate the estimator of interest as:

$$\hat{\beta}_5 = [(\bar{Y}_{T,F,A} - \bar{Y}_{T,F,B}) - (\bar{Y}_{C,F,A} - \bar{Y}_{C,F,B})] - [(\bar{Y}_{T,M,A} - \bar{Y}_{T,M,B}) - (\bar{Y}_{C,M,A} - \bar{Y}_{C,M,B})].$$

Since I need to include several control variables and fixed effects in my analysis, the coefficient of interest  $\beta_5$  is estimated using ordinary least squares (OLS).

In this difference-in-difference approach, I cannot say much about the exact change of men's or women's wages, only about their difference. However, it is interesting to see how women's and men's pay are affected by the reform from a policy perspective. Therefore, I additionally conduct two difference-in-difference regressions separately for both genders. The regressions appear as follows:

$$Y_{jt} = \alpha_0 + \alpha_1 T_j * A_t + \gamma X_{jt} + \delta C_j + \rho J_t + \epsilon_{jt}. \quad (2)$$

The causal effect of the reform on log pay (for men and women separately) is  $\alpha_1$ , which can again be estimated by OLS.

### 5.3.2 Underlying assumptions

To estimate the causal effect of the reform, I need the parallel trend assumption before the reform to hold and the assumption that the treatment does not change the composition of the treated and control groups (Eugster, 2015).

#### Assumption 1: Parallel trend assumption

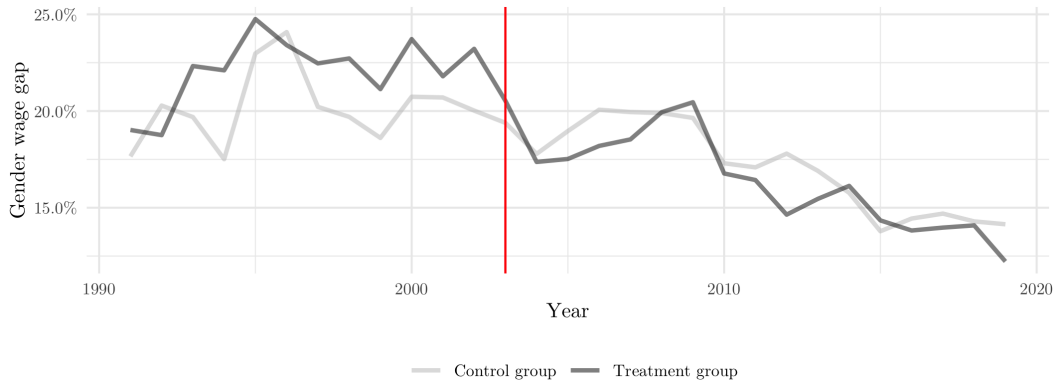
In the first difference-in-difference approach, the parallel trend assumption ensures that the relative difference in log pay of males and females in the treatment state is parallel to the relative difference in log pay of males and females in the control state. Formally, this means that:

$$\begin{aligned} & \mathbb{E}[(Y_{0,F,A} - Y_{0,F,B}) - (Y_{0,M,A} - Y_{0,M,B})|T = 1, X_{jit}, J_t, C_j] \\ &= \mathbb{E}[(Y_{0,F,A} - Y_{0,F,B}) - (Y_{0,M,A} - Y_{0,M,B})|T = 0, X_{jit}, J_t, C_j]. \end{aligned}$$

In the separate difference-in-difference regressions for men and women, the parallel trend assumption ensures that the trend of the hourly log pay in the treatment group is parallel to the trend of the hourly log pay in the control group, meaning formally:

$$\mathbb{E}[Y_{0,A} - Y_{0,B}|T = 1, X_{jit}, J_t, C_j] = \mathbb{E}[Y_{0,A} - Y_{0,B}|T = 0, X_{jit}, J_t, C_j].$$

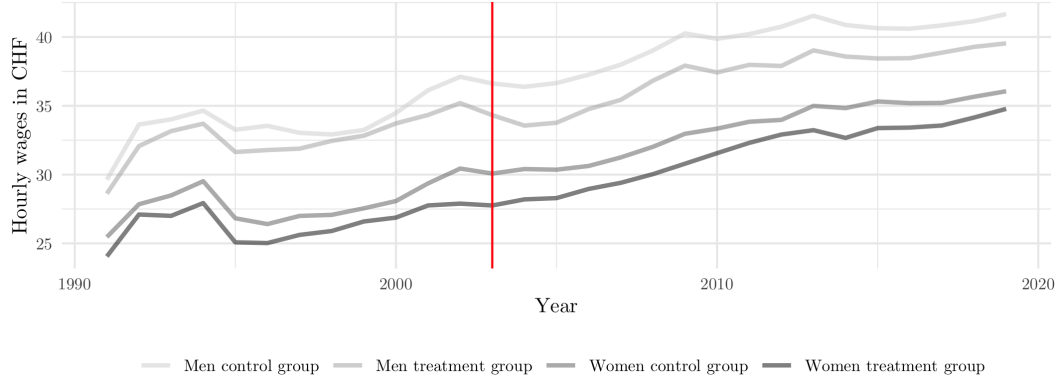
Figure 6 depicts the gender pay gap in percentage from 1991 to 2019 separated by treatment and control group. Figure 7 presents the hourly pay in CHF separated by gender and treatment status from 1991 to 2019. The red line in both figures indicates the year of the reform, i.e. the year 2003. By observing the gender wage gap in Figure 6 and the hourly wages of men and women in Figure 7 until the reform, it seems that the parallel trend assumption could hold for both difference-in-difference approaches. A more formal test verifies this.



*Note:* This figure shows the gender pay gap in percentage from 1991 to 2019 for treatment and control cantons separately. The vertical red line shows that the childcare reform was introduced in 2003.

Figure 6: Gender pay gap

More precisely, I test the parallel trend assumption by conducting a placebo analysis. In a placebo reform, only observations before the real reform are included in a new dataset, and a virtual reform is assumed in a specific year. Afterwards, the same regressions (Equation 1 and Equation 2) as in the main analysis are used to test if the virtual reform has a significant effect on the gender pay gap and the pay of men or women (Eugster, 2015). This procedure is repeated for each year from 1993 until 2001. For the parallel trend assumption to hold, none of the estimates of interest should be significant for the years before the reform. The estimates can be seen in Table 2. Only the estimates of interest for men in 1998 and 1999 are significant. After correcting for multiple



*Note:* This figure shows the hourly pay in CHF from 1991 to 2019 for treatment and control cantons and gender separately. The vertical red line shows that the childcare reform was introduced in 2003.

Figure 7: Hourly pay of men and women in CHF

testing (Bonferroni correction), none of them are significant anymore. Therefore, the parallel trend assumption is most likely not violated. This is only an indication, and it is not possible to fully assure that the parallel trend assumption is given.

| Year of placebo reform | 1993              | 1994              | 1995              | 1996              | 1997              | 1998              | 1999              | 2000              | 2001              |
|------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| <u>Whole sample</u>    |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| treated*after*female   | -0.020<br>(0.014) | -0.007<br>(0.014) | 0.005<br>(0.013)  | -0.003<br>(0.015) | -0.009<br>(0.014) | -0.012<br>(0.012) | -0.014<br>(0.011) | -0.011<br>(0.011) | -0.009<br>(0.016) |
| <u>Women</u>           |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| treated*after          | -0.012<br>(0.013) | -0.004<br>(0.012) | -0.003<br>(0.010) | 0.000<br>(0.011)  | -0.001<br>(0.011) | -0.002<br>(0.011) | -0.005<br>(0.009) | -0.006<br>(0.010) | -0.007<br>(0.010) |
| <u>Men</u>             |                   |                   |                   |                   |                   |                   |                   |                   |                   |
| treated*after          | 0.009<br>(0.009)  | 0.004<br>(0.006)  | -0.005<br>(0.006) | 0.005<br>(0.007)  | 0.010<br>(0.006)  | 0.011*<br>(0.005) | 0.010'<br>(0.006) | 0.006<br>(0.006)  | 0.001<br>(0.007)  |

*Note:* Placebo reforms have been conducted for the years 1993 to 2001. All controls as in the main regression (see Appendix A) have been included, and bootstrapped clustered errors on canton level have been used (shown in parentheses). After correcting for multiple testing (Bonferroni correction), none of the estimates are significant anymore on any common statistical significance level. \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 2: Placebo reforms

## Assumption 2: No change in the composition of groups

The assumption of there being no change in the composition of the groups requires that there is no endogenous entry into the treatment group due to the reform (Eugster, 2015). For example,

if families move to cantons with more childcare places, the assumption would be violated. Bonoli (2008) shows that internal migration is relatively high in Switzerland. Each year 1.4% of the population moves to another canton. However, this migration to other cantons mostly happens due to job opportunities and housing prices. Therefore, migration for better childcare availability is most likely not a major issue, especially since other childcare benefits are not more favourable in the same cantons. I can also test this assumption by performing a similar difference-in-difference analysis (see Equation 1 and Equation 2) with the control variables as the outcome variable. For categorical variables, probit regressions are used to estimate the coefficients of interest. For continuous variables, linear regressions are used.

Under the assumption of no change in the composition of groups, I expect that none of the estimates of interest is significant. If the reform has a significant effect on some of the control variables, they are potential channels through which the gender pay gap is affected.

Table 3 summarises the estimates of interest for the three different specifications. The reform has a significant effect on the company size where individuals work. Additionally, the reform impacted the marital status of men and decreased the number of men in a management function. Furthermore, the reform has a negative impact on women and all individuals who have children below three years of age (5% and 1% significance level). Moreover, the reform impacts some occupations. After correcting for multiple testing (Bonferroni correction), only the effect on the company size (below 50 employees and over 100 employees) for the whole sample is still significant on any conventional significance level. An explanation for the change in company size could be that larger companies are less flexible. Therefore, more childcare leads to individuals working more often in larger organisations because they do not need as much flexibility as before due to external childcare.

### 5.3.3 Standard errors

According to Abadie, Athey, Imbens, and Wooldridge (2017) clustered standard errors should be used in regression with fixed effects if there is clustering in the sample and heterogeneity in the treatment or clustering in the treatment assignment and heterogeneity in the treatment. The treatment assignment is clustered since the control and treatment groups depend on the canton. Therefore, I cluster my errors at the canton level.

The low number of clusters represents a potential issue for the asymptotics to work well in finite

|                             | Whole sample |            | Women       |            | Men         |            |
|-----------------------------|--------------|------------|-------------|------------|-------------|------------|
| Variable                    | Coefficient  | Std. error | Coefficient | Std. error | Coefficient | Std. error |
| <b>Age</b>                  |              |            |             |            |             |            |
| age                         | 0.2272       | (0.1627)   | 0.2374'     | (0.1335)   | 0.0435      | (0.1124)   |
| <b>Marital status</b>       |              |            |             |            |             |            |
| single                      | -0.0496      | (0.0498)   | 0.0365      | (0.0368)   | 0.0892*     | (0.0407)   |
| married                     | 0.0489       | (0.0393)   | -0.0198     | (0.0426)   | -0.0868*    | (0.0427)   |
| divorced/separated          | -0.0182      | (0.0638)   | -0.0061     | (0.0389)   | 0.0251      | (0.0568)   |
| widowed                     | 0.0565       | (0.1771)   | -0.1727'    | (0.1041)   | -0.2171     | (0.1886)   |
| <b>Education</b>            |              |            |             |            |             |            |
| primary                     | -0.0688      | (0.0484)   | -0.0478     | (0.0555)   | 0.0427      | (0.0470)   |
| secondary                   | 0.1088       | (0.0698)   | 0.0624      | (0.0728)   | -0.0487     | (0.0309)   |
| tertiary                    | -0.0742      | (0.0770)   | -0.0210     | (0.0658)   | 0.0576      | (0.0359)   |
| <b>Nationality</b>          |              |            |             |            |             |            |
| swiss                       | 0.0626       | (0.0381)   | 0.1131'     | (0.0675)   | 0.0321      | (0.0693)   |
| <b>Children below 3</b>     |              |            |             |            |             |            |
| children below 3 years      | -0.0930**    | (0.0355)   | -0.0762*    | (0.0335)   | 0.0279      | (0.0383)   |
| <b>Number of children</b>   |              |            |             |            |             |            |
| number of children          | -0.0200      | (0.0241)   | -0.0007     | (0.0184)   | 0.0265      | (0.0244)   |
| <b>Firm Size</b>            |              |            |             |            |             |            |
| below 50 employees          | -0.0849**    | (0.0290)   | -0.0350     | (0.0362)   | 0.0534      | (0.0375)   |
| 50 to 100 employees         | -0.0312      | (0.0330)   | -0.0124     | (0.0281)   | 0.0141      | (0.0281)   |
| over 100 employees          | 0.1048***    | (0.0292)   | 0.0447      | (0.0404)   | -0.0627'    | (0.0331)   |
| <b>Supervisory function</b> |              |            |             |            |             |            |
| management function         | 0.0479       | (0.0429)   | -0.0086     | (0.0276)   | -0.0642*    | (0.0322)   |
| supervisory function        | 0.0104       | (0.0466)   | 0.0711      | (0.0473)   | 0.0755      | (0.0583)   |
| no supervisory function     | -0.0281      | (0.0338)   | -0.0477     | (0.0377)   | -0.0238     | (0.0397)   |
| <b>Occupation</b>           |              |            |             |            |             |            |
| managers                    | -0.0066      | (0.0655)   | -0.0096     | (0.0759)   | 0.0080      | (0.0401)   |
| academicitans               | -0.0372      | (0.0447)   | 0.0220      | (0.0454)   | 0.0509      | (0.0318)   |
| technicians                 | 0.0189       | (0.0429)   | -0.0302     | (0.0398)   | -0.0421     | (0.0292)   |
| clerical workers            | 0.0513       | (0.0421)   | -0.0110     | (0.0321)   | -0.0550*    | (0.0268)   |
| services                    | -0.0449      | (0.0568)   | -0.0155     | (0.0472)   | 0.0183      | (0.0361)   |
| handworkers                 | -0.1414*     | (0.0707)   | -0.0789     | (0.0764)   | 0.0344      | (0.0501)   |
| operators                   | 0.0187       | (0.0672)   | 0.0313      | (0.0461)   | 0.0250      | (0.0440)   |
| assistants                  | 0.1008'      | (0.0608)   | 0.0406      | (0.0411)   | -0.0595     | (0.0439)   |
| <b>Permanent contract</b>   |              |            |             |            |             |            |
| permanent job               | -0.0210      | (0.0483)   | -0.0665     | (0.0447)   | -0.0553     | (0.0495)   |
| <b>Part-time</b>            |              |            |             |            |             |            |
| part-time                   | 0.0020       | (0.0738)   | 0.0421      | (0.0312)   | 0.0262      | (0.0539)   |

*Note:* This table shows the estimates of interest for the results for the effect of the reform on the control variables. For numeric variables, linear regressions have been used. For categorical variables, probit regressions have been used. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). After correcting for multiple testing (Bonferroni correction), only the estimates for the outcome variable firm size for the whole sample are significant anymore on any common significance level. \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 3: Effect of reform on covariates

samples (Angrist & Pischke, 2008). To overcome this problem, I follow Cameron, Gelbach, and Miller (2008) and use bootstrapped clustered errors. Moreover, the number of observations in each cluster is unbalanced, which could harm the inference even more (MacKinnon, Webb, et al., 2019). Additionally, by normally sampling from the 24 cantons, the proportion of treated and non-treated observations in a bootstrapped sample might not represent the whole sample. In an extreme case, it could even be that the sample only consists of either treated or non-treated cantons. I draw separately (with replacement) 10 cantons from the treatment group and 14 cantons from the control group to overcome this issue. The presented bootstrapping algorithm follows closely Cameron and Miller (2015):

### Bootstrapping algorithm

I form 24 clusters  $\{(y_1, X_1) \dots (y_{24}, X_{24})\}$  and divide the clusters into the treatment and control group. I then repeat the following steps  $B = 499$  times:

1. Create a bootstrapped sample by resampling with replacement 10 cantons from the treatment group and 14 clusters from the control group
2. Compute the estimate denoted by  $\hat{\beta}_b$  in the  $b^{th}$  bootstrap sample

After having estimated the coefficients 499 times, I calculate the standard deviation as

$$s = \sqrt{\frac{1}{B} \sum_{i=1}^B (\hat{\beta}_b - \bar{\beta})^2}$$

with  $\bar{\beta} = \frac{1}{B} \sum_{b=1}^B \hat{\beta}_b$ . It is important to note that I resample entire clusters, and not individual observations.

To showcase that this bootstrap approach is more appropriate for the econometric framework of this thesis, I conduct a small simulation study ( $N = 5,000$ ). A detailed explanation of this simulation and the corresponding results can be found in Appendix G. Under the null hypothesis of no effect, a valid inference approach is expected to reject the hypothesis 5% of the time when testing on the 5% significance level. Amongst the considered standard error estimators, the bootstrapping algorithm presented above is closest to achieving this rejection rate in the simulation study. However, it is still conservative as it rejects only 4% of the times the null hypothesis.

## 6 Results and discussion

In the following section, the results of the empirical analysis are presented. First, I present the main estimation results. I then discuss the effect that household income and education level have on my main findings. Next, I present several robustness checks. Finally, the last subsection offers a discussion of the findings.

### 6.1 Main results

The main results are summarised in Table 4. The table depicts the estimated coefficients for the gender pay gap (Equation 1) and men and women’s pay (Equation 2). To show the influence of the control variables, I report three specifications for the main regressions. The first specification (1) shows the results without adding controls. The second specification (2) shows the results with only sociodemographic controls, and the third specification (3) shows the results when additionally controlling for job and company characteristics. However, the signs of the coefficients of interest are the same for all specifications.

Furthermore, only the gender pay gap estimate without any controls is significant at the 10% significance level. All the other estimates are not significant. The size of the potential effects diminishes by adding more controls. The gender pay gap decreases by 1.4% (all controls included). This 1.4% decrease comes from an increase in women’s pay of 0.7% and a reduction in men’s pay of 0.7%. However, due to the non-significance of the estimates, I do not reject the null hypothesis of no impact of the reform. According to the 95% confidence interval (C.I.), the reform may have decreased the gender pay gap by a maximum of 3.6%, or it may have increased by up to 1%. The results are in line with previous results from the literature (Andresen & Nix, 2019; Kleven et al., 2020).

The childcare reform was introduced in 2003, but the results presented thus far study the sample up to 2019. It is essential to calculate the yearly estimates of the treatment effect to see in which years the reform affected the gender pay gap, e.g. the hourly pay of men and women. Figure 8, 9 and 10 show the yearly estimates for the effect of the reform on the gender pay gap and women’s and men’s wages. Figure 8 illustrates that the effect on the gender pay gap is only significant at a 5% significance level in 2005, 2010, and 2012. All three estimates suggest a decrease in the gender pay gap of around 2% due to the reform. Furthermore, except the year 2015, all the estimates are

| Dependent variable: log hourly wage |                   |                   |                   |
|-------------------------------------|-------------------|-------------------|-------------------|
|                                     | (1)               | (2)               | (3)               |
| <u>Whole sample</u>                 |                   |                   |                   |
| after*treated*female                | 0.025'<br>(0.015) | 0.019<br>(0.012)  | 0.014<br>(0.011)  |
| Number of observations              | 280,411           |                   |                   |
| <u>Women</u>                        |                   |                   |                   |
| after*treated                       | 0.014<br>(0.011)  | 0.008<br>(0.010)  | 0.007<br>(0.008)  |
| Number of observations              | 131,063           |                   |                   |
| <u>Men</u>                          |                   |                   |                   |
| after*treated                       | -0.012<br>(0.012) | -0.012<br>(0.009) | -0.007<br>(0.007) |
| Number of observations              | 149,348           |                   |                   |
| Sociodemographic cotrols            | No                | Yes               | Yes               |
| Job & firm controls                 | No                | No                | Yes               |
| Canton FE                           | Yes               | Yes               | Yes               |
| Year FE                             | Yes               | Yes               | Yes               |

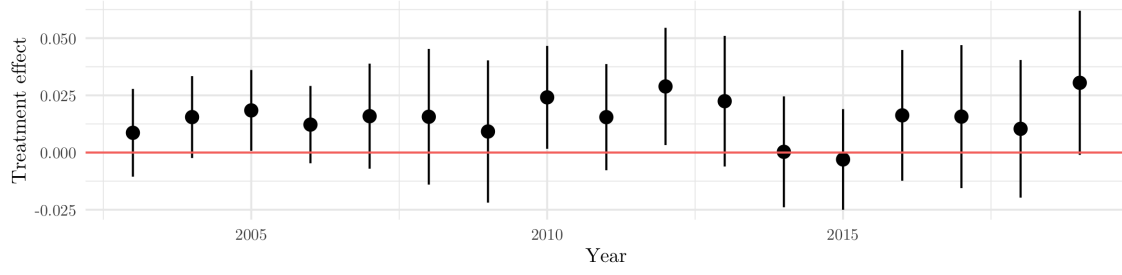
*Note:* This table shows the estimates of interest for the effect of the increase in childcare places on the dependent variable hourly log wage. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 4: Main estimates of interest

positive. The difference-in-difference estimates for the effect on women's pay are all insignificant and close to zero (see Figure 9). Moreover, the difference-in-difference estimates for the effect on men's pay are nearly all negative or close to zero (see Figure 10).

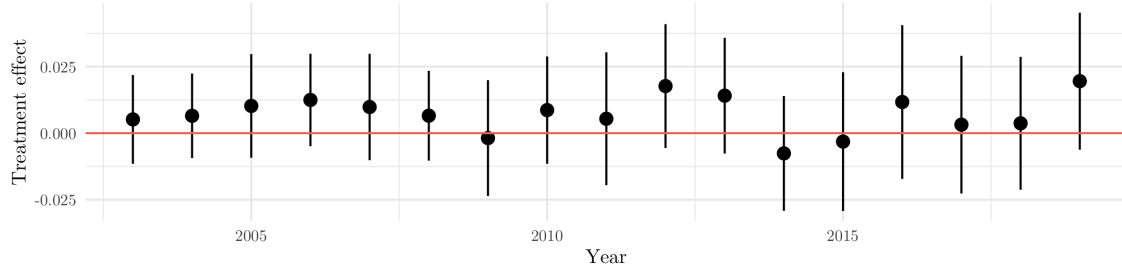
Table 5 shows the estimates of interest separated by household income. More precisely, I divide the dataset into five household income quintiles defined by the SAKE user manual<sup>21</sup> as explained in Section 5.1. Then, I run specification (3) in Table 4 for each household income quintile separately.

<sup>21</sup>The number of observations is not the same for each quintile because the dataset has been cleaned before conducting the analysis (for example, no individuals doing an apprenticeship, no students, only individuals between 20 and 45 years old, etc.)



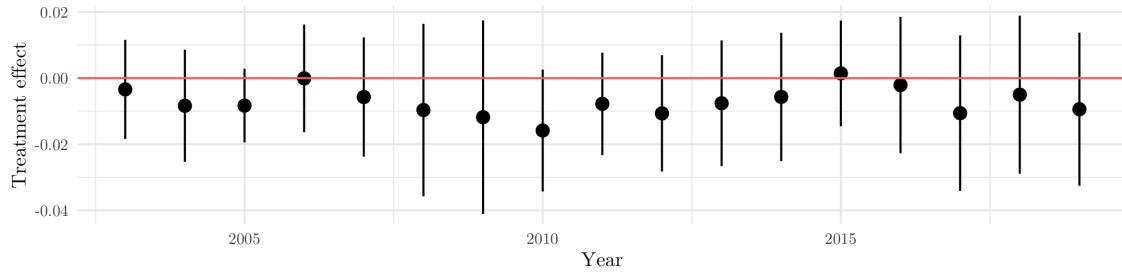
*Note:* This figure shows the yearly effects (2003 to 2019) of the reform on the gender pay gap. The black dots are the point estimate and the black lines the 95% C.I. The horizontal red line represents the zero effect.

Figure 8: Yearly effects of reform



*Note:* This figure shows the yearly effects (2003 to 2019) of the reform on the hourly log pay of women. The black dots are the point estimate and the black lines the 95% C.I. The horizontal red line represents the zero effect.

Figure 9: Yearly effects of reform for women



*Note:* This figure shows the yearly effects (2003 to 2019) of the reform on the hourly log pay of men. The black dots are the point estimate and the black lines the 95% C.I. The horizontal red line represents the zero effect.

Figure 10: Yearly effects of reform for men

Table 5 shows that all coefficients of interest are insignificant for the fourth and fifth household income quintile. Thus, I cannot reject the null hypothesis of no effect of the childcare reform on the pay for high-income households. This was expected because, as explained in Section 5.1,

| Dependent variable: log hourly wage |                  |                    |                    |                   |                   |
|-------------------------------------|------------------|--------------------|--------------------|-------------------|-------------------|
|                                     | 1st quintile     | 2nd quintile       | 3rd quintile       | 4th quintile      | 5th quintile      |
| <u>Whole sample</u>                 |                  |                    |                    |                   |                   |
| after*treated*female                | 0.021<br>(0.022) | 0.023<br>(0.024)   | 0.023'<br>(0.012)  | 0.006<br>(0.009)  | -0.008<br>(0.011) |
| Number of observations              | 19,936           | 48,005             | 58,254             | 63,512            | 58,961            |
| <u>Women</u>                        |                  |                    |                    |                   |                   |
| after*treated                       | 0.027<br>(0.027) | 0.009<br>(0.016)   | 0.006<br>(0.011)   | -0.007<br>(0.008) | 0.000<br>(0.013)  |
| Number of observations              | 9,268            | 21,965             | 27,309             | 29,407            | 25,939            |
| <u>Men</u>                          |                  |                    |                    |                   |                   |
| after*treated                       | 0.004<br>(0.018) | -0.019*<br>(0.008) | -0.016*<br>(0.007) | -0.010<br>(0.007) | 0.003<br>(0.009)  |
| Number of observations              | 10,668           | 26,040             | 30,945             | 34,105            | 33,022            |
| Sociodemographic cotrols            | Yes              | Yes                | Yes                | Yes               | Yes               |
| Job & firm controls                 | Yes              | Yes                | Yes                | Yes               | Yes               |
| Canton FE                           | Yes              | Yes                | Yes                | Yes               | Yes               |
| Year FE                             | Yes              | Yes                | Yes                | Yes               | Yes               |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each household income quintile. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 5: Estimates of interest by household income quintile

high-income households could already afford private external childcare before the reform if both parents want to work. For the third quintile, I find a significant decrease of the gender pay gap by 2.3%. The size of the estimates is similar for the first and second quintile but is, however, not significant. For low-income households, the increase in women's pay is the highest but is not significant. According to the 95% C.I., the reform might increase the women's hourly pay in the lower-income quintile by 8% or decrease it by 2.6%. A reason for the lack of significance could be the lower power ( $N = 9,268$ ). According to the literature, an explanation might be that the effect is more substantial for low-income households because additional income earned by women plays a more important role. The other estimates on women's pay are also not significant and close to zero. The estimates of the effect on men's pay are negative and significant for the second and

third quintile. Furthermore, the negative effect was highest for individuals in the second income quintile; namely, the reform decreases men's hourly pay by 1.9%. Several robustness checks must be completed to confirm these results.

Table 6 shows the results separated by education level. More precisely, the dataset is split into

| <b>Dependent variable: log hourly wage</b> |                   |                     |                    |
|--------------------------------------------|-------------------|---------------------|--------------------|
|                                            | Primary education | Secondary education | Tertiary education |
| <u>Whole sample</u>                        |                   |                     |                    |
| after*treated*female                       | 0.005<br>(0.032)  | 0.018'<br>(0.011)   | 0.006<br>(0.023)   |
| Number of observations                     | 29,009            | 149,786             | 101,616            |
| <u>Women</u>                               |                   |                     |                    |
| after*treated                              | 0.016<br>(0.023)  | 0.005<br>(0.011)    | 0.014<br>(0.019)   |
| Number of observations                     | 14,340            | 74,870              | 41,853             |
| <u>Men</u>                                 |                   |                     |                    |
| after*treated                              | 0.014<br>(0.016)  | -0.016'<br>(0.009)  | 0.006<br>(0.014)   |
| Number of observations                     | 14,669            | 74,916              | 59,763             |
| Sociodemographic cotrols                   | Yes               | Yes                 | Yes                |
| Job & firm controls                        | Yes               | Yes                 | Yes                |
| Canton FE                                  | Yes               | Yes                 | Yes                |
| Year FE                                    | Yes               | Yes                 | Yes                |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each education level. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 6: Estimates of interest by education level

individuals with only primary education, secondary education, or tertiary education. As explained in Section 5.1, an increase in childcare places is expected to have a higher effect on individuals with secondary education in Switzerland (Ravazzini, 2018; Stadelmann-Steffen, 2007). Therefore, I rerun specification (3) in Table 4 for each education level separately to identify the effects. I find that the gender pay gap decreases by 1.8% (10% significance level) for individuals with secondary education. This lower gender pay gap is again driven by a decrease of 1.6% for men's pay (10%

significance level). For individuals with primary and tertiary education, I find no significant effects. Therefore, the results are in line with the literature.

## **6.2 Robustness checks**

In the following section, several robustness checks for the different results are conducted. For better readability, the corresponding tables for the robustness checks can be found in Appendix F.

### **6.2.1 Varying years**

I only have data on childcare coverage until 2012. This could lead to the problem of not taking into account that more cantons expanded their childcare places up until 2019, distorting my results. As a robustness check, I conduct the same analysis with the data before 2012. The estimates of interest can be found in Table 20. When including all control variables (last column in Table 20) the estimates are close in magnitude to the ones presented in Table 6 and not significant at any conventional significance level. For the analysis divided by household income quintile, the results are reasonably robust. The estimates of interest can be found in Table 21. The negative effect on the men's pay is still significant and of a similar magnitude for the second and third quintile. Furthermore, the highest increase in female pay can be seen in the first quintile. However, the effect is still not significant and slightly smaller than in the main regression. For the analysis separated by education level, the estimates for secondary education are robust against changing the years of the analysis. Table 22 shows the estimates of interest. The negative estimate for men's hourly pay increases and is significant on the 5% significance level. Even though the size of the effect on the gender pay gap is unchanged, the effect is no longer significant at any conventional level.

I conclude that the analysis is quite robust against varying the years included in the analysis. There is still no effect in the main results, and I still find a negative impact on men's pay in the second and third household income quintiles and for men with secondary education.

### **6.2.2 Varying sample**

The following robustness check takes individuals between 15 and 55 years into account instead of considering only individuals in their fertility phase. The estimates of interest can be found in the first three columns of Table 23. I expect the estimated effects to be smaller than in the main results because a reform about childcare should affect individuals in their fertility phase more. This

is precisely the case. The estimates are still non-significant and have the same sign, but they are slightly smaller in magnitude. The results for the analysis separated by household quintile are depicted in the first column for each household income quintile in Table 24. The estimates for the effect on men's pay are only significantly lower in the third quintile. Additionally, women's pay is 4.8% higher in the first quintile due to the reform. This leads to a significant (on the 10% significance level) decrease in the gender pay gap of 4.5% in the first quintile. For the analysis divided by education level, the estimates of interest are shown in the first column for each education level in Table 25. The significant negative effect on men's pay reported previously reduces and is no longer significant after considering all individuals aged between 15 and 55. In general, these results are as expected and confirm that the reform had a higher impact on individuals in their fertility phase. However, the result for women in the first household income quintile was unexpected, and because there is no reasonable explanation, it should be considered with caution.

As a further robustness check, a sample consisting of only individuals with at least one child is created. The results can be found in the last three columns of Table 23. Potentially, there could be higher effects for individuals with children. However, it depends on how the reform influences the gender pay gap. If I assume that the policy changes norms and perceptions, it does not matter if individuals have children. However, if I assume that women are working more hours due to the reform, the effect should be higher for individuals with children because they directly profit from the reform. The estimates of interest are still non-significant and have the same sign. However, they are smaller in magnitude. This suggests that norms and expectations influence the gender pay gap. In the analysis separated by household quintile (see Table 24), men's pay is still significantly lower due to the reform in the second and third quintile. Furthermore, women's pay is significantly lower in the fifth quintile, leading to an increase in the gender pay gap of 8.5%. This result is unexpected, and I do not have an explanation for it. In the analysis divided by education level (see Table 25), the negative effect on men's pay increases and is still significant on the 5% significance level. Furthermore, the other estimates are still not significant.

To conclude, it can be said that the results are reasonably robust against changes in the sample and are mainly as expected.

### 6.2.3 Varying treatment and control group

In the following section, I address potential issues related to the definition of the treatment and control group. More precisely, the treatment and control groups are defined as the 25% of cantons that expanded their childcare coverage the most and least.<sup>22</sup> This robustness check helps identify if the division of the cantons in the treatment and control group is robust to changes in some cantons. The effect is expected to increase although, I lose power by only taking 12 cantons into account. It can be seen in Table 26 that there are no significant effects on the gender pay gap for the main regressions. However, after controlling for job and company characteristics, the estimates are slightly negative. From the regression results by household income quintiles reported in Table 27, I observe that the effect of the reform on the pay of men in the second and third quintile is no longer significant, but the magnitude of the point estimates does not vary that much. Furthermore, the reform's effect on women's pay is negative for the second (significant on the 10% significance level), third and fourth quintile. This is unexpected. For the analysis divided by education level (see Table 28), the negative estimates for men's pay are still significant on the 5% significance level and increase to -1.9%. However, it seems as though the pay for women also decreases, but the effect is not significant at any conventional level. In summary, the results for women's pay are not robust against only taking the six cantons with the highest increase and the six cantons with the lowest increase in childcare places per 100 children since the reform. On the other hand, the results of men's pay are quite robust against it.

Next, I investigate whether some individual cantons drive the results reported in Section 6.1. The estimates of interest for this analysis can be found in Table 29. By taking the canton Bern (control group) out of the sample, the gender pay gap decreases by 2%. Moreover, by removing the canton of Geneva (control group), the estimate for the change in the gender pay gap is smaller than before. Furthermore, by removing the canton of Vaud (treatment group), the pay for men decreases by 1.3% due to the reform. For these cantons, the reform might have influenced the gender pay gap through other channels. Bern, for example, increased after-school care, as stated in Section 5.1. Even though Bern is in the control group due to the low increase in childcare coverage, the reform might have influenced the gender pay gap through the after-school programme. A similar conclusion can be drawn by reviewing Table 24 which shows the estimates divided by household income quintiles. Only removing the canton of Geneva and Bern leads to quite a change in the estimates of the whole

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<sup>22</sup>Treatment group: Basel-Stadt, Basel-Landschaft, Appenzell A.Rh., Graubünden, Ticino, Vaud; control group: Bern, Luzern, Schwyz, Appenzell I.Rh, Aargau, Neuchâtel.

sample and the sample of men. However, it seems that the effect is not driven by one single canton. By studying the estimates without one canton for different levels of education (see Table 31), it can be seen that removing the canton of Vaud leads to a decrease in the estimates of individuals with secondary education and a high increase in the estimates for individuals with primary or tertiary education. The pay of women drives these effects. Furthermore, it seems that removing the canton of Zurich (control group) leads to a higher decrease in men's wages. Nonetheless, it also leads to a decrease in women's wages, which is not the case when including Zurich. By removing the canton of Bern, I observe a reduction in the gender pay gap of 2.4% for individuals with secondary education, which is higher than by removing most of the other cantons.

To conclude, it can be said that my significant results are semi robust against changing my treatment and control group. However, it does not seem that one single canton is driving the overall results. It is most likely that Vaud, Geneva, Bern, and Zurich have the most influence on the results. The reform might have influenced those cantons through other channels such as the after-schooling programme. However, it could also be that those cantons change the results more than other cantons because the number of individuals in these cantons is higher than in other cantons. Furthermore, it could be that the results are not robust if I only take 12 cantons into account (the six that expanded most/six that expanded least) because the cantons of Bern and Vaud are included in those cantons. As seen in the analysis, the reform's effect on the pay gap in these cantons is contrary to expectations. With fewer cantons included, these cantons have a higher impact on the results, and the significant estimates disappear.

### 6.3 Discussion

Some studies (Andresen & Nix, 2019; Kleven et al., 2020) have already addressed the effect of increasing childcare availability on the gender pay gap in other countries. However, the results often depend on the country and years chosen since the effect depends on availability and costs before the reform, how the policy was implemented and the level of reliance on informal childcare in a country. In Switzerland, childcare availability was underdeveloped before the reform and childcare places are still limited. Furthermore, childcare places are still quite expensive, and there are only a small number of subsidised childcare places. The highest proportion of the costs is still paid by parents (Ecoplan, 2020).

As seen in the results, I could not find an effect of childcare expansion on the gender pay gap,

which is in line with previous research (Andresen & Nix, 2019; Kleven et al., 2020). Nevertheless, there are some significant effects on subgroups. The expansion of childcare reduced the pay of men in the second and third quintile. Hence, the gender pay gap decreased. Furthermore, there is a negative effect on men’s pay for individuals with secondary education and, hence, the gender pay gap decreased. These decreases in men’s pay can potentially be explained by an increase in the working hours of women due to the reform. Women have increased their working hours, especially women with secondary education (Ravazzini, 2018). This has potentially led to more competition, and therefore, less bargaining power for men. However, I cannot test this explanation empirically, and therefore, further research on this explanation should be undertaken. The labour force participation rate of men has not changed over the years, and there is no effect of the reform on the labour force participation rate of men (Ravazzini, 2018). Therefore, the decrease in men’s pay cannot be because of a change in men’s labour force participation rate. Furthermore, it can be seen in Table 3 that the reform affected the size of companies where men and women work. Hence, the reform might have reduced horizontal segregation. It seems that women now work more often in firms with more than 100 employees. Usually, bigger companies pay higher salaries, which could also be a channel through which the gender pay gap has diminished. No mentionable effect on a change in occupation or supervisory function was found. An explanation could be that the time horizon is still too short, and some changes can only be seen in the long term. The results should be considered with some caution because by changing the treatment and control group as a robustness check (Subsection 6.2.3), the effects mostly vanish.

Furthermore, all the estimates are relatively small. For example, men’s pay decreases by roughly 2% due to the reform. With a median monthly pay of CHF 6,538<sup>23</sup> in Switzerland, the reform reduced men’s monthly pay by CHF 130<sup>24</sup> (Bundesamt für Statistik (BFS), 2020). The relatively small size of the effect might be related to the relatively small investment of CHF 400 million<sup>25</sup> spent to increase childcare coverage in Switzerland. A similar reform in the Netherlands involved an investment of two billion Euros (Bettendorf, Jongen, & Muller, 2015).

A potential reason that childcare policies do not affect the gender pay gap is the crowding-out effect of informal childcare due to institutional childcare. This crowding-out effect has been found in Norway by Havnes and Mogstad (2011), in France by Givord and Marbot (2015) and in Austria

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<sup>23</sup>This is equivalent to EUR 5,965.

<sup>24</sup>This is equivalent to EUR 119.

<sup>25</sup>This is equivalent to EUR 360 million.

by Kleven et al. (2020). Furthermore, according to Ravazzini (2018) there was a decrease in informal childcare in the treated cantons in Switzerland before 2004. However, from 2004 to 2009, there was no significant decrease in informal childcare. Furthermore, from the data provided by the BFS (Bundesamt für Statistik (BFS), 2014, 2018) it can be seen that the number of families using only institutional childcare has increased from 14.5% in 2012 to 20.3% in 2018. In contrast, the percentage of families only using informal childcare was stable, with 29.9% in 2012 and 29.5% in 2018. Therefore, it seems that there was not a considerable crowding-out of informal childcare due to the expansion of institutional childcare in Switzerland.

Another reason for being unable to identify an effect of the childcare reform could be that even if women work longer hours, the increase is not large enough for women to move to a higher paying position or another occupation. Therefore, pay rates and the gender pay gap do not change.

To conclude, the results presented in this thesis suggest that the reform had a minor impact or even no impact on closing the gender pay gap. This is in line with Goldin (2014) who suggests that it is not government interventions but changes in the labour market (structure of jobs and temporal flexibility) that will lead to the closure of the gender pay gap. Furthermore, the results are consistent with literature (Bertrand, 2011; Kleven, Landais, Posch, et al., 2019) suggesting that the further convergence of pay comes from changes in preferences and norms. Nevertheless, it is crucial to keep in mind that by introducing better childcare availability, or parental leave, norms and preferences can change in the long term. For example, with better childcare availability, it could become normal for women to stay in the labour market after having a child. However, to see such changes in norms and preferences, a time horizon longer than 15 years is needed. Nevertheless, as shown by Kleven et al. (2020), even huge expansions in family policies do not lead to a closure of the gender pay gap in the long term if norms and preferences are too strong and do not change.

## 7 Conclusion

This thesis aimed to identify the impact of an expansion of childcare availability on the gender pay gap and the hourly pay of men and women in Switzerland. I use a difference-in-difference approach to estimate the causal effect. The results show that the expansion of childcare most likely did not affect the gender pay gap, which is in line with previous research (Andresen & Nix, 2019; Kleven et al., 2020). Nevertheless, I found a decrease in men’s pay for some subgroups, such as men in the second and third household income quintiles and men with secondary education. Childcare places are more critical for the lower part of the income distribution because high-income households do not necessarily need childcare places since they could already afford an external private childcare solution (e.g. a nanny) before the reform. An increase in hours worked for women with secondary education may explain the negative effect on pay of men with secondary education.

Summing up, the evidence is consistent with research suggesting that closing the gender pay gap further is most likely not achieved through government interventions but through changes in gender norms and preferences (Bertrand, 2011; Kleven, Landais, Posch, et al., 2019). However, it is possible that through the introduction of family policies, gender norms and preferences can change in the long term. Furthermore, Ravazzini (2018) shows that the childcare reform has increased the intensive labour force participation of women, which supports women having equal opportunities to work as men. Therefore, despite the high cost of such family policies to governments and the potentially low short-term impact, it is important to implement these policies to improve gender equality for future generations.

In a further step, it would be interesting to verify if changing the estimation methodology of the gender pay gap affects the results. According to Wunsch and Strittmatter (2021) the methodology chosen matters. Therefore, future research could conduct the same analysis with, for instance, a matching approach (Nopo, 2008). Moreover, it will be important to investigate further the effect of family policies on gender norms in the long term. Finally, it is important to remember that the childcare data used in this thesis only includes the number of childcare places at the canton level. Further research should collect data at the municipality level and on costs to better capture the effect of an increase in childcare availability and costs.

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# Appendices

## A Control variables

| Variables                  | Description                                                                                                                                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sociodemographics          |                                                                                                                                                                                                                 |
| Age                        | Continuous variable: 20 - 45 (in second specification: 15 - 55)                                                                                                                                                 |
| Marital status             | 4 categories: single, married (& legal partnership), divorced, widowed                                                                                                                                          |
| Level of education         | 3 categories: primary (no education, primary school), secondary (apprenticeship, full-time professional school, university entrance qualification), tertiary (university degree (as well applied universities)) |
| Citizenship                | Dummy if Swiss                                                                                                                                                                                                  |
| Children below 3           | Dummy if children below three years                                                                                                                                                                             |
| Number of children         | Continuous variable: 0 - 7                                                                                                                                                                                      |
| Job & Firm characteristics |                                                                                                                                                                                                                 |
| Firm size                  | 3 categories: below 50 employees, 50 - 100 employees, over 100 employees                                                                                                                                        |
| Supervisory function       | 3 categories: management, supervisory function, no supervisory function                                                                                                                                         |
| Occupation                 | 8 categories: managers, academicians, technicians, clerical workers, services, manual workers, operators, assistants                                                                                            |
| Permanent job              | Dummy if permanent contract                                                                                                                                                                                     |
| Part-time                  | Dummy if part-time worker                                                                                                                                                                                       |

*Note:* This table shows the control variables included in the analysis. The different level of the control variables can be found in the second column.

Table 7: List of covariates

## B Childcare coverage across cantons

| <b>Canton</b>    | <b>2002</b> | <b>2012</b> | <b>Expansion in %</b> |
|------------------|-------------|-------------|-----------------------|
| Zurich           | 11.71       | 19.42       | 65.83                 |
| Bern             | 12.13       | 16.64       | 37.17                 |
| Luzern           | 5.98        | 7.36        | 23.05                 |
| Schwyz           | 4.15        | 5.52        | 33.14                 |
| Nidwalden        | 2.68        | 4.70        | 75.24                 |
| Glarus           | 5.33        | 10.26       | 92.34                 |
| Zug              | 10.11       | 14.61       | 44.58                 |
| Fribourg         | 6.60        | 10.24       | 55.14                 |
| Solothurn        | 6.12        | 10.84       | 77.25                 |
| Basel-Stadt      | 18.43       | 48.56       | 163.53                |
| Basel-Landschaft | 4.80        | 17.77       | 269.95                |
| Schaffhausen     | 7.45        | 19.06       | 156.04                |
| Appenzell A. Rh. | 2.61        | 9.80        | 274.75                |
| Appenzell I. Rh  | 0.87        | 0.90        | 3.59                  |
| St. Gallen       | 2.57        | 6.16        | 139.73                |
| Graubünden       | 2.00        | 8.42        | 321.57                |
| Aargau           | 7.48        | 8.98        | 20.01                 |
| Thurgau          | 4.54        | 8.39        | 84.89                 |
| Ticino           | 2.88        | 11.53       | 300.87                |
| Vaud             | 21.63       | 74.41       | 344.01                |
| Valais           | 7.45        | 15.59       | 109.32                |
| Neuchâtel        | 19.50       | 27.90       | 43.10                 |
| Geneva           | 15.41       | 23.52       | 52.66                 |
| Jura             | 3.22        | 7.32        | 127.07                |

*Note:* This table shows childcare coverage before and after the reform and the percentage of expansion by canton. The table is based on Ravazzini et al. (2016) and indicates the number of childcare places per 100 children before and after the reform and the percentage expansion per canton. There is no data for canton Uri and Obwalden.

Table 8: Childcare coverage across cantons

## C Threshold values of household income quintiles

| Year | Quintil 1                             | Quintil 2       | Quintil 3       | Quintil 4        | Quintil 5 |
|------|---------------------------------------|-----------------|-----------------|------------------|-----------|
|      | (0-20%)                               | (21-40%)        | (41-60%)        | (61-80%)         | (81-100%) |
| 1991 | 0 – 25,778                            | 25,778 – 37,143 | 37,143 – 48,750 | 48,750 – 65,000  | > 65,000  |
| 1992 | 0 – 27,600                            | 27,600 – 40,000 | 40,000 – 52,800 | 52,800 – 70,871  | > 70,871  |
| 1993 | 0 – 28,000                            | 28,000 – 40,194 | 40,194 – 53,875 | 53,875 – 72,995  | > 72,995  |
| 1994 | 0 – 29,143                            | 29,143 – 41,036 | 41,036 – 54,762 | 54,762 – 73,946  | > 73,946  |
| 1995 | 0 – 29,760                            | 29,760 – 42,000 | 42,000 – 56,000 | 56,000 – 75,000  | > 75,000  |
| 1996 | 0 – 28,800                            | 28,800 – 41,667 | 41,667 – 55,267 | 55,267 – 73,913  | > 73,913  |
| 1997 | 0 – 29,400                            | 29,400 – 41,555 | 41,555 – 55,177 | 55,177 – 74,471  | > 74,471  |
| 1998 | 0 – 29,437                            | 29,437 – 41,667 | 41,667 – 56,000 | 56,000 – 75,000  | > 75,000  |
| 1999 | 0 – 30,000                            | 30,000 – 42,160 | 42,160 – 56,118 | 56,118 – 75,930  | > 75,930  |
| 2000 | 0 – 30,000                            | 30,000 – 42,857 | 42,857 – 57,405 | 57,405 – 78,300  | > 78,300  |
| 2001 | 0 – 30,000                            | 30,000 – 43,333 | 43,333 – 57,974 | 57,974 – 79,731  | > 79,731  |
| 2002 | 0 – 32,000                            | 32,000 – 46,304 | 46,304 – 62,100 | 62,100 – 84,037  | > 84,037  |
| 2003 | 0 – 31,927                            | 31,927 – 46,146 | 46,146 – 62,047 | 62,047 – 84,818  | > 84,818  |
| 2004 | 0 – 32,057                            | 32,057 – 46,429 | 46,429 – 61,759 | 61,759 – 83,624  | > 83,624  |
| 2005 | 0 – 33,000                            | 33,000 – 47,619 | 47,619 – 63,149 | 63,149 – 86,501  | > 86,501  |
| 2006 | 0 – 32,580                            | 32,580 – 47,619 | 47,619 – 62,869 | 62,869 – 86,667  | > 86,667  |
| 2007 | 0 – 33,600                            | 33,600 – 48,600 | 48,600 – 65,189 | 65,189 – 90,000  | > 90,000  |
| 2008 | 0 – 36,459                            | 36,459 – 52,962 | 52,962 – 71,191 | 71,191 – 99,667  | > 99,667  |
| 2009 | 0 – 35,724                            | 35,724 – 50,792 | 50,792 – 67,296 | 67,296 – 92,249  | > 92,249  |
| 2010 | 0 – 36,000                            | 36,000 – 51,354 | 51,354 – 67,804 | 67,804 – 92,675  | > 92,675  |
| 2011 | 0 – 36,000                            | 36,000 – 52,000 | 52,000 – 69,333 | 69,333 – 94,792  | > 94,792  |
| 2012 | 0 – 36,839                            | 36,839 – 53,300 | 53,300 – 70,472 | 70,472 – 95,333  | > 95,333  |
| 2013 | 0 – 38,043                            | 38,043 – 54,000 | 54,000 – 72,000 | 72,000 – 97,098  | > 97,098  |
| 2014 | 0 – 38,640                            | 38,640 – 54,476 | 54,476 – 72,000 | 72,000 – 98,017  | > 98,017  |
| 2015 | No household income quintiles in 2015 |                 |                 |                  |           |
| 2016 | 0 – 37,500                            | 37,500 – 54,156 | 54,156 – 72,000 | 72,000 – 97,054  | > 97,054  |
| 2017 | 0 – 37,710                            | 37,710 – 54,492 | 54,492 – 72,258 | 72,258 – 97,800  | > 97,800  |
| 2018 | 0 – 38,400                            | 38,400 – 55,250 | 55,250 – 73,000 | 73,000 – 97,542  | > 97,542  |
| 2019 | 0 – 39,595                            | 39,595 – 56,400 | 56,400 – 74,250 | 74,250 – 100,000 | > 100,000 |

*Note:* This table shows the threshold values of household income quintiles from 1991 to 2019. Pay is shown in CHF/year/individual. The table is based on the SAKE data user manual.

Table 9: Threshold values for household income quintiles

## D Reform's effect on female labour force participation and fertility rate

|                                                       | after*treated     |
|-------------------------------------------------------|-------------------|
| Dependent variable: Female labour force participation |                   |
| after*treated                                         | 0.013<br>(0.013)  |
| Dependent variable: Fertility                         |                   |
| after*treated                                         | -0.013<br>(0.033) |
| Sociodemographic controls                             | Yes               |
| Job & firm controls                                   | No                |
| Canton FE                                             | Yes               |
| Year FE                                               | Yes               |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the extensive labour force participation of women and on the fertility rate. To estimate the effect on female labour force participation and the fertility rate, all female individuals between 15 and 55 years old have been considered. The Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 10: Effect on female labour force participation and fertility

## E Complete regressions of main results

### Main results

| Dependent variable: hourly log wage |         |         |           |         |           |         |
|-------------------------------------|---------|---------|-----------|---------|-----------|---------|
|                                     | (1)     |         | (2)       |         | (3)       |         |
|                                     | Coef    | SE      | Coef      | SE      | Coef      | SE      |
| age                                 |         |         | 0.016***  | (0.000) | 0.013***  | (0.000) |
| married                             |         |         | -0.016*** | (0.002) | 0.003     | (0.002) |
| divorced                            |         |         | -0.026*** | (0.002) | -0.008*** | (0.002) |
| widowed                             |         |         | -0.060*** | (0.014) | -0.026*   | (0.011) |
| secondary education                 |         |         | 0.208***  | (0.007) | 0.109***  | (0.004) |
| tertiary education                  |         |         | 0.482***  | (0.012) | 0.254***  | (0.007) |
| swiss                               |         |         | 0.053***  | (0.006) | 0.041***  | (0.004) |
| number children                     |         |         | 0.011***  | (0.002) | 0.017***  | (0.001) |
| children below 3                    |         |         | 0.059***  | (0.003) | 0.042***  | (0.002) |
| 50 - 100 employees                  |         |         |           |         | 0.043***  | (0.004) |
| more than 100 employees             |         |         |           |         | 0.092***  | (0.006) |
| supervisory function                |         |         |           |         | -0.084*** | (0.004) |
| no supervisory function             |         |         |           |         | -0.147*** | (0.005) |
| academicitans                       |         |         |           |         | -0.028*** | (0.006) |
| technicians                         |         |         |           |         | -0.127*** | (0.008) |
| clerical workers                    |         |         |           |         | -0.151*** | (0.008) |
| services                            |         |         |           |         | -0.348*** | (0.010) |
| handworkers                         |         |         |           |         | -0.260*** | (0.008) |
| operators                           |         |         |           |         | -0.310*** | (0.011) |
| assistants                          |         |         |           |         | -0.392*** | (0.012) |
| permanent contract                  |         |         |           |         | 0.171***  | (0.008) |
| part-time                           |         |         |           |         | -0.036*** | (0.004) |
| after*treated                       | -0.011  | (0.013) | -0.012    | (0.009) | -0.007    | (0.008) |
| treated*female                      | -0.020  | (0.022) | -0.020    | (0.017) | -0.019    | (0.016) |
| after*female                        | 0.035** | (0.012) | -0.001    | (0.010) | 0.011     | (0.009) |
| after*treated*female                | 0.025'  | (0.015) | 0.019     | (0.012) | 0.014     | (0.011) |
| Canton FE                           | Yes     |         | Yes       |         | Yes       |         |
| Year FE                             | Yes     |         | Yes       |         | Yes       |         |
| Number of Observations              | 280,411 |         | 280,411   |         | 280,411   |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the gender pay gap. The Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 11: Full output of main analysis

| Dependent variable: hourly log wage |         |         |           |         |           |         |
|-------------------------------------|---------|---------|-----------|---------|-----------|---------|
|                                     | (1)     |         | (2)       |         | (3)       |         |
|                                     | Coef    | SE      | Coef      | SE      | Coef      | SE      |
| age                                 |         |         | 0.015***  | (0.000) | 0.012***  | (0.000) |
| married                             |         |         | -0.066*** | (0.003) | -0.033*** | (0.002) |
| divorced                            |         |         | -0.047*** | (0.004) | -0.023*** | (0.003) |
| widowed                             |         |         | -0.087*** | (0.018) | -0.044**  | (0.014) |
| secondary education                 |         |         | 0.221***  | (0.008) | 0.090***  | (0.006) |
| tertiary education                  |         |         | 0.476***  | (0.011) | 0.234***  | (0.007) |
| swiss                               |         |         | 0.044***  | (0.006) | 0.026***  | (0.004) |
| number children                     |         |         | -0.009**  | (0.003) | 0.003     | (0.002) |
| children below 3                    |         |         | 0.094***  | (0.004) | 0.065***  | (0.003) |
| 50 - 100 employees                  |         |         |           |         | 0.042***  | (0.004) |
| more than 100 employees             |         |         |           |         | 0.085***  | (0.006) |
| supervisory function                |         |         |           |         | -0.061*** | (0.006) |
| no supervisory function             |         |         |           |         | -0.118*** | (0.006) |
| academicitans                       |         |         |           |         | -0.045*** | (0.009) |
| technicians                         |         |         |           |         | -0.124*** | (0.011) |
| clerical workers                    |         |         |           |         | -0.144*** | (0.010) |
| services                            |         |         |           |         | -0.377*** | (0.013) |
| handworkers                         |         |         |           |         | -0.331*** | (0.012) |
| operators                           |         |         |           |         | -0.396*** | (0.011) |
| assistants                          |         |         |           |         | -0.412*** | (0.014) |
| permanent contract                  |         |         |           |         | 0.161***  | (0.009) |
| part-time                           |         |         |           |         | -0.007'   | (0.004) |
| after*treated                       | 0.014   | (0.011) | 0.008     | (0.010) | 0.007     | (0.008) |
| Canton FE                           | Yes     |         | Yes       |         | Yes       |         |
| Year FE                             | Yes     |         | Yes       |         | Yes       |         |
| Number of Observations              | 131,063 |         | 131,063   |         | 131,063   |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the pay of women. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 12: Full output of main analysis for women

| Dependent variable: hourly log wage |         |         |          |         |           |         |
|-------------------------------------|---------|---------|----------|---------|-----------|---------|
|                                     | (1)     |         | (2)      |         | (3)       |         |
|                                     | Coef    | SE      | Coef     | SE      | Coef      | SE      |
| age                                 |         |         | 0.016*** | (0.001) | 0.012***  | (0.000) |
| married                             |         |         | 0.032*** | (0.004) | 0.031***  | (0.003) |
| divorced                            |         |         | 0.007    | (0.009) | 0.010     | (0.006) |
| widowed                             |         |         | -0.013   | (0.028) | -0.003    | (0.023) |
| secondary education                 |         |         | 0.191*** | (0.008) | 0.113***  | (0.005) |
| tertiary education                  |         |         | 0.474*** | (0.013) | 0.255***  | (0.010) |
| swiss                               |         |         | 0.060*** | (0.006) | 0.050***  | (0.005) |
| number children                     |         |         | 0.024*** | (0.002) | 0.023***  | (0.001) |
| children below 3                    |         |         | 0.027*** | (0.004) | 0.020***  | (0.004) |
| 50 - 100 employees                  |         |         |          |         | 0.046***  | (0.004) |
| more than 100 employees             |         |         |          |         | 0.100***  | (0.007) |
| supervisory function                |         |         |          |         | -0.095*** | (0.005) |
| no supervisory function             |         |         |          |         | -0.162*** | (0.007) |
| academicitans                       |         |         |          |         | -0.012'   | (0.007) |
| technicians                         |         |         |          |         | -0.131*** | (0.008) |
| clerical workers                    |         |         |          |         | -0.172*** | (0.008) |
| services                            |         |         |          |         | -0.310*** | (0.011) |
| handworkers                         |         |         |          |         | -0.240*** | (0.009) |
| operators                           |         |         |          |         | -0.285*** | (0.011) |
| assistants                          |         |         |          |         | -0.373*** | (0.012) |
| permanent contract                  |         |         |          |         | 0.182***  | (0.009) |
| part-time                           |         |         |          |         | -0.050*** | (0.009) |
| after*treated                       | -0.012  | (0.012) | -0.012   | (0.009) | -0.007    | (0.007) |
| Canton FE                           | Yes     |         | Yes      |         | Yes       |         |
| Year FE                             | Yes     |         | Yes      |         | Yes       |         |
| Number of Observations              | 149,348 |         | 149,348  |         | 149,348   |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the pay of men. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 13: Full output of main analysis for men

## Results by household income quintile

| Dependent variable: hourly log wage |              |         |              |         |              |         |              |         |              |         |
|-------------------------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|
|                                     | 1st Quintile |         | 2nd Quintile |         | 3rd Quintile |         | 4th Quintile |         | 5th Quintile |         |
|                                     | Coef         | SE      | Coef         | SE      | Coef         | SE      | Coef         | SE      | Coef         | SE      |
| age                                 | 0.006***     | (0.000) | 0.007***     | (0.000) | 0.009***     | (0.000) | 0.011***     | (0.000) | 0.016***     | (0.000) |
| married                             | 0.034***     | (0.006) | 0.022***     | (0.004) | 0.009**      | (0.003) | -0.015***    | (0.003) | -0.010*      | (0.004) |
| divorced                            | 0.028***     | (0.008) | 0.050***     | (0.006) | 0.016***     | (0.005) | -0.005       | (0.005) | 0.002        | (0.004) |
| widowed                             | 0.055        | (0.045) | 0.040        | (0.030) | -0.005       | (0.014) | -0.054***    | (0.016) | -0.037       | (0.026) |
| secondary education                 | 0.057***     | (0.006) | 0.074***     | (0.003) | 0.075***     | (0.004) | 0.096***     | (0.005) | 0.099***     | (0.012) |
| tertiary education                  | 0.114***     | (0.010) | 0.135***     | (0.005) | 0.157***     | (0.007) | 0.185***     | (0.006) | 0.224***     | (0.015) |
| swiss                               | 0.052***     | (0.004) | 0.055***     | (0.003) | 0.058***     | (0.004) | 0.038***     | (0.003) | -0.006       | (0.005) |
| number children                     | 0.039***     | (0.003) | 0.055***     | (0.002) | 0.081***     | (0.002) | 0.106***     | (0.003) | 0.068***     | (0.004) |
| children below 3                    | 0.009*       | (0.004) | 0.022***     | (0.004) | 0.028***     | (0.004) | 0.044***     | (0.006) | 0.051***     | (0.006) |
| 50 - 100 employees                  | 0.028***     | (0.005) | 0.037***     | (0.004) | 0.026***     | (0.004) | 0.032***     | (0.004) | 0.045***     | (0.003) |
| more than 100 employees             | 0.051***     | (0.006) | 0.058***     | (0.004) | 0.057***     | (0.004) | 0.059***     | (0.004) | 0.083***     | (0.005) |
| supervisory function                | -0.007       | (0.011) | -0.015**     | (0.005) | -0.037***    | (0.005) | -0.062***    | (0.005) | -0.100***    | (0.004) |
| no supervisory function             | -0.051***    | (0.010) | -0.065***    | (0.006) | -0.082***    | (0.004) | -0.096***    | (0.005) | -0.162***    | (0.005) |
| academicitans                       | 0.072**      | (0.023) | 0.068***     | (0.011) | 0.022**      | (0.008) | -0.003       | (0.006) | -0.036***    | (0.006) |
| technicians                         | 0.009        | (0.020) | 0.008        | (0.008) | -0.051***    | (0.009) | -0.077***    | (0.006) | -0.110***    | (0.007) |
| clerical workers                    | -0.014       | (0.021) | -0.017'      | (0.010) | -0.080***    | (0.009) | -0.097***    | (0.007) | -0.128***    | (0.010) |
| services                            | -0.151***    | (0.016) | -0.166***    | (0.008) | -0.231***    | (0.009) | -0.244***    | (0.007) | -0.289***    | (0.012) |
| handworkers                         | -0.032       | (0.020) | -0.069***    | (0.009) | -0.157***    | (0.007) | -0.178***    | (0.005) | -0.255***    | (0.008) |
| operators                           | -0.082***    | (0.018) | -0.122***    | (0.009) | -0.203***    | (0.008) | -0.197***    | (0.010) | -0.264***    | (0.010) |
| assistants                          | -0.157***    | (0.019) | -0.190***    | (0.008) | -0.266***    | (0.009) | -0.287***    | (0.009) | -0.414***    | (0.020) |
| permanent contract                  | 0.163***     | (0.012) | 0.130***     | (0.009) | 0.116***     | (0.006) | 0.110***     | (0.009) | 0.139***     | (0.013) |
| part-time                           | 0.066***     | (0.005) | 0.046***     | (0.005) | 0.014***     | (0.004) | -0.021***    | (0.006) | -0.065***    | (0.008) |
| after*treated                       | 0.008        | (0.018) | -0.017'      | (0.009) | -0.017*      | (0.007) | -0.011       | (0.008) | 0.006        | (0.010) |
| treated*female                      | -0.018       | (0.030) | -0.015       | (0.032) | -0.017       | (0.019) | -0.009       | (0.015) | 0.001        | (0.009) |
| after*female                        | 0.012        | (0.021) | 0.047*       | (0.019) | 0.013        | (0.011) | -0.002       | (0.007) | 0.001        | (0.007) |
| after*treated*female                | 0.021        | (0.022) | 0.023        | (0.024) | 0.023'       | (0.012) | 0.006        | (0.009) | -0.008       | (0.011) |
| Canton FE                           | Yes          |         | Yes          |         | Yes          |         | Yes          |         | Yes          |         |
| Year FE                             | Yes          |         | Yes          |         | Yes          |         | Yes          |         | Yes          |         |
| Number of Observations              | 19,936       |         | 48,005       |         | 58,254       |         | 63,512       |         | 58,961       |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the gender pay gap separately for each household income quintile. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 14: Full output for analysis by household income quintile

| Dependent variable: hourly log wage |              |         |              |         |              |         |              |         |              |         |
|-------------------------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|
|                                     | 1st Quintile |         | 2nd Quintile |         | 3rd Quintile |         | 4th Quintile |         | 5th Quintile |         |
|                                     | Coef         | SE      | Coef         | SE      | Coef         | SE      | Coef         | SE      | Coef         | SE      |
| age                                 | 0.006***     | (0.001) | 0.007***     | (0.000) | 0.008***     | (0.000) | 0.012***     | (0.000) | 0.016***     | (0.000) |
| married                             | -0.010       | (0.010) | -0.048***    | (0.005) | -0.061***    | (0.004) | -0.078***    | (0.003) | -0.046***    | (0.006) |
| divorced                            | 0.015'       | (0.009) | 0.032***     | (0.006) | 0.019**      | (0.006) | 0.003        | (0.008) | -0.004       | (0.007) |
| widowed                             | 0.037        | (0.050) | -0.004       | (0.033) | -0.016       | (0.017) | -0.072***    | (0.019) | -0.020       | (0.035) |
| secondary education                 | 0.042***     | (0.008) | 0.052***     | (0.007) | 0.054***     | (0.005) | 0.090***     | (0.006) | 0.103***     | (0.013) |
| tertiary education                  | 0.115***     | (0.014) | 0.119***     | (0.009) | 0.122***     | (0.007) | 0.176***     | (0.006) | 0.237***     | (0.019) |
| swiss                               | 0.032***     | (0.006) | 0.028***     | (0.005) | 0.032***     | (0.004) | 0.025***     | (0.004) | -0.004       | (0.006) |
| number children                     | 0.024***     | (0.004) | 0.032***     | (0.002) | 0.047***     | (0.003) | 0.053***     | (0.004) | 0.031***     | (0.005) |
| children below 3                    | 0.035***     | (0.009) | 0.035***     | (0.005) | 0.038***     | (0.007) | 0.069***     | (0.007) | 0.076***     | (0.009) |
| 50 - 100 employees                  | 0.039***     | (0.007) | 0.042***     | (0.005) | 0.026***     | (0.007) | 0.030***     | (0.005) | 0.037***     | (0.006) |
| more than 100 employees             | 0.055***     | (0.009) | 0.059***     | (0.005) | 0.050***     | (0.005) | 0.051***     | (0.003) | 0.073***     | (0.006) |
| supervisory function                | -0.006       | (0.022) | -0.011       | (0.012) | -0.022**     | (0.007) | -0.041***    | (0.006) | -0.080***    | (0.006) |
| no supervisory function             | -0.038*      | (0.019) | -0.052***    | (0.012) | -0.058***    | (0.007) | -0.073***    | (0.007) | -0.141***    | (0.007) |
| academicitans                       | 0.092**      | (0.033) | 0.108***     | (0.018) | 0.038*       | (0.016) | -0.006       | (0.010) | -0.044***    | (0.006) |
| technicians                         | 0.031        | (0.031) | 0.039*       | (0.018) | -0.032*      | (0.015) | -0.070***    | (0.011) | -0.111***    | (0.007) |
| clerical workers                    | 0.010        | (0.030) | 0.035'       | (0.019) | -0.048***    | (0.015) | -0.084***    | (0.012) | -0.146***    | (0.012) |
| services                            | -0.162***    | (0.025) | -0.158***    | (0.018) | -0.234***    | (0.014) | -0.268***    | (0.012) | -0.333***    | (0.017) |
| handworkers                         | -0.129***    | (0.038) | -0.124***    | (0.017) | -0.186***    | (0.011) | -0.196***    | (0.015) | -0.269***    | (0.022) |
| operators                           | -0.155***    | (0.034) | -0.165***    | (0.017) | -0.228***    | (0.017) | -0.235***    | (0.017) | -0.302***    | (0.047) |
| assistants                          | -0.166***    | (0.033) | -0.174***    | (0.015) | -0.259***    | (0.016) | -0.310***    | (0.019) | -0.421***    | (0.028) |
| permanent contract                  | 0.166***     | (0.014) | 0.117***     | (0.013) | 0.118***     | (0.012) | 0.098***     | (0.012) | 0.135***     | (0.013) |
| part-time                           | 0.104***     | (0.010) | 0.098***     | (0.005) | 0.080***     | (0.004) | 0.033***     | (0.005) | -0.043***    | (0.008) |
| after*treated                       | 0.027        | (0.027) | 0.009        | (0.016) | 0.006        | (0.011) | -0.007       | (0.008) | 0.000        | (0.013) |
| Canton FE                           | Yes          |         | Yes          |         | Yes          |         | Yes          |         | Yes          |         |
| Year FE                             | Yes          |         | Yes          |         | Yes          |         | Yes          |         | Yes          |         |
| Number of Observations              | 9,268        |         | 21,965       |         | 27,309       |         | 29,407       |         | 25,939       |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the pay of women separately for each household income quintile. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 15: Full output for analysis by household income quintile for women

| Dependent variable: hourly log wage |              |         |              |         |              |         |              |         |              |         |
|-------------------------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|
|                                     | 1st Quintile |         | 2nd Quintile |         | 3rd Quintile |         | 4th Quintile |         | 5th Quintile |         |
|                                     | Coef         | SE      | Coef         | SE      | Coef         | SE      | Coef         | SE      | Coef         | SE      |
| age                                 | 0.004***     | (0.000) | 0.006***     | (0.000) | 0.008***     | (0.000) | 0.010***     | (0.000) | 0.015***     | (0.000) |
| married                             | 0.090***     | (0.011) | 0.098***     | (0.006) | 0.071***     | (0.004) | 0.040***     | (0.004) | 0.020***     | (0.006) |
| divorced                            | 0.007        | (0.025) | 0.012        | (0.008) | -0.009       | (0.006) | -0.002       | (0.006) | 0.012'       | (0.007) |
| widowed                             | 0.040        | (0.059) | 0.103*       | (0.041) | -0.020       | (0.026) | -0.035'      | (0.020) | -0.081*      | (0.037) |
| secondary education                 | 0.052***     | (0.005) | 0.072***     | (0.004) | 0.076***     | (0.004) | 0.093***     | (0.007) | 0.089***     | (0.016) |
| tertiary education                  | 0.096***     | (0.012) | 0.120***     | (0.006) | 0.151***     | (0.006) | 0.172***     | (0.008) | 0.205***     | (0.017) |
| swiss                               | 0.068***     | (0.007) | 0.068***     | (0.004) | 0.067***     | (0.004) | 0.038***     | (0.004) | -0.009'      | (0.005) |
| number children                     | 0.046***     | (0.002) | 0.069***     | (0.002) | 0.101***     | (0.003) | 0.142***     | (0.004) | 0.088***     | (0.005) |
| children below 3                    | -0.017***    | (0.004) | 0.003        | (0.003) | 0.010*       | (0.004) | 0.018**      | (0.006) | 0.028**      | (0.009) |
| 50 - 100 employees                  | 0.023***     | (0.006) | 0.033***     | (0.003) | 0.024***     | (0.004) | 0.029***     | (0.004) | 0.049***     | (0.004) |
| more than 100 employees             | 0.054***     | (0.006) | 0.058***     | (0.005) | 0.058***     | (0.004) | 0.062***     | (0.005) | 0.089***     | (0.005) |
| supervisory function                | -0.012       | (0.007) | -0.015'      | (0.008) | -0.038***    | (0.006) | -0.060***    | (0.006) | -0.105***    | (0.006) |
| no supervisory function             | -0.059***    | (0.007) | -0.058***    | (0.008) | -0.077***    | (0.006) | -0.091***    | (0.007) | -0.165***    | (0.006) |
| academicitans                       | 0.057'       | (0.031) | 0.050***     | (0.011) | 0.021***     | (0.005) | 0.006        | (0.005) | -0.029***    | (0.007) |
| technicians                         | -0.014       | (0.023) | -0.008       | (0.008) | -0.058***    | (0.007) | -0.067***    | (0.005) | -0.109***    | (0.007) |
| clerical workers                    | -0.050*      | (0.023) | -0.067***    | (0.008) | -0.104***    | (0.009) | -0.102***    | (0.005) | -0.107***    | (0.011) |
| services                            | -0.133***    | (0.020) | -0.134***    | (0.009) | -0.191***    | (0.009) | -0.188***    | (0.007) | -0.246***    | (0.015) |
| handworkers                         | -0.026       | (0.022) | -0.064***    | (0.009) | -0.131***    | (0.006) | -0.146***    | (0.004) | -0.246***    | (0.008) |
| operators                           | -0.076***    | (0.020) | -0.112***    | (0.009) | -0.177***    | (0.009) | -0.166***    | (0.011) | -0.254***    | (0.009) |
| assistants                          | -0.145***    | (0.022) | -0.179***    | (0.006) | -0.236***    | (0.011) | -0.242***    | (0.009) | -0.406***    | (0.025) |
| permanent contract                  | 0.152***     | (0.015) | 0.136***     | (0.006) | 0.105***     | (0.007) | 0.120***     | (0.008) | 0.146***     | (0.013) |
| part-time                           | 0.055***     | (0.008) | 0.041***     | (0.010) | 0.011        | (0.009) | 0.012        | (0.010) | -0.034***    | (0.008) |
| after*treated                       | 0.004        | (0.018) | -0.019*      | (0.008) | -0.016*      | (0.007) | -0.010       | (0.007) | 0.003        | (0.009) |
| Canton FE                           | Yes          |         | Yes          |         | Yes          |         | Yes          |         | Yes          |         |
| Year FE                             | Yes          |         | Yes          |         | Yes          |         | Yes          |         | Yes          |         |
| Number of Observations              | 10,668       |         | 26,040       |         | 30,945       |         | 34,105       |         | 33,022       |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the pay of men separately for each household income quintile. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 16: Full output for analysis by household income quintile for men

## Results by education level

| Dependent variable: hourly log wage |                   |         |                     |         |                    |         |
|-------------------------------------|-------------------|---------|---------------------|---------|--------------------|---------|
|                                     | Primary education |         | Secondary education |         | Tertiary education |         |
|                                     | Coef              | SE      | Coef                | SE      | Coef               | SE      |
| age                                 | 0.007***          | (0.000) | 0.012***            | (0.000) | 0.017***           | (0.000) |
| married                             | -0.004            | (0.006) | 0.001               | (0.003) | 0.012**            | (0.004) |
| divorced                            | 0.021*            | (0.009) | -0.006'             | (0.003) | -0.022***          | (0.005) |
| widowed                             | 0.048**           | (0.018) | -0.035*             | (0.016) | -0.048*            | (0.024) |
| swiss                               | 0.049***          | (0.006) | 0.054***            | (0.002) | 0.024***           | (0.006) |
| number children                     | 0.021***          | (0.002) | 0.013***            | (0.001) | 0.015***           | (0.002) |
| children below 3                    | 0.016**           | (0.005) | 0.044***            | (0.003) | 0.047***           | (0.003) |
| 50 - 100 employees                  | 0.029***          | (0.005) | 0.037***            | (0.003) | 0.063***           | (0.006) |
| more than 100 employees             | 0.065***          | (0.005) | 0.076***            | (0.005) | 0.119***           | (0.008) |
| supervisory function                | -0.041**          | (0.014) | -0.065***           | (0.004) | -0.102***          | (0.004) |
| no supervisory function             | -0.103***         | (0.013) | -0.117***           | (0.005) | -0.179***          | (0.006) |
| academicitans                       | 0.143***          | (0.027) | 0.018**             | (0.007) | -0.039***          | (0.008) |
| technicians                         | -0.003            | (0.027) | -0.078***           | (0.007) | -0.134***          | (0.009) |
| clerical workers                    | -0.057'           | (0.032) | -0.096***           | (0.007) | -0.163***          | (0.008) |
| services                            | -0.184***         | (0.029) | -0.295***           | (0.008) | -0.387***          | (0.013) |
| handworkers                         | -0.106***         | (0.028) | -0.205***           | (0.007) | -0.320***          | (0.010) |
| operators                           | -0.155***         | (0.027) | -0.247***           | (0.010) | -0.385***          | (0.017) |
| assistants                          | -0.205***         | (0.028) | -0.355***           | (0.011) | -0.546***          | (0.017) |
| permanent contract                  | 0.108***          | (0.009) | 0.149***            | (0.006) | 0.198***           | (0.010) |
| part-time                           | 0.018**           | (0.006) | -0.030***           | (0.003) | -0.056***          | (0.008) |
| after*treated                       | 0.013             | (0.017) | -0.014'             | (0.008) | 0.007              | (0.015) |
| treated*female                      | -0.003            | (0.030) | -0.022              | (0.015) | -0.015             | (0.020) |
| after*female                        | 0.031             | (0.022) | 0.020**             | (0.007) | -0.011             | (0.011) |
| after*treated*female                | 0.005             | (0.032) | 0.018'              | (0.011) | 0.006              | (0.023) |
| Canton FE                           | Yes               |         | Yes                 |         | Yes                |         |
| Year FE                             | Yes               |         | Yes                 |         | Yes                |         |
| Number of Observations              | 29,009            |         | 149,786             |         | 101,616            |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the gender pay gap separately for each education level. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 17: Full output for analysis by education level

| Dependent variable: hourly log wage |                   |         |                     |         |                    |         |
|-------------------------------------|-------------------|---------|---------------------|---------|--------------------|---------|
|                                     | Primary education |         | Secondary education |         | Tertiary education |         |
|                                     | Coef              | SE      | Coef                | SE      | Coef               | SE      |
| age                                 | 0.006***          | (0.001) | 0.012***            | (0.000) | 0.017***           | (0.000) |
| married                             | -0.054***         | (0.006) | -0.039***           | (0.003) | -0.011*            | (0.005) |
| divorced                            | -0.002            | (0.013) | -0.024***           | (0.005) | -0.033***          | (0.007) |
| widowed                             | 0.006             | (0.020) | -0.053*             | (0.022) | -0.058             | (0.037) |
| swiss                               | 0.037***          | (0.008) | 0.034***            | (0.003) | 0.018*             | (0.007) |
| number children                     | 0.012**           | (0.004) | -0.004*             | (0.002) | -0.001             | (0.003) |
| children below 3                    | 0.022**           | (0.008) | 0.065***            | (0.004) | 0.075***           | (0.005) |
| 50 - 100 employees                  | 0.035**           | (0.011) | 0.038***            | (0.004) | 0.053***           | (0.007) |
| more than 100 employees             | 0.077***          | (0.007) | 0.069***            | (0.005) | 0.108***           | (0.009) |
| supervisory function                | -0.020            | (0.016) | -0.044***           | (0.005) | -0.080***          | (0.009) |
| no supervisory function             | -0.067***         | (0.015) | -0.090***           | (0.005) | -0.153***          | (0.009) |
| academicitans                       | 0.113**           | (0.044) | 0.019               | (0.012) | -0.070***          | (0.009) |
| technicians                         | 0.034             | (0.030) | -0.063***           | (0.014) | -0.139***          | (0.011) |
| clerical workers                    | 0.014             | (0.030) | -0.065***           | (0.013) | -0.209***          | (0.011) |
| services                            | -0.161***         | (0.030) | -0.307***           | (0.016) | -0.455***          | (0.013) |
| handworkers                         | -0.152***         | (0.033) | -0.251***           | (0.015) | -0.355***          | (0.014) |
| operators                           | -0.200***         | (0.032) | -0.308***           | (0.012) | -0.406***          | (0.041) |
| assistants                          | -0.191***         | (0.034) | -0.354***           | (0.016) | -0.552***          | (0.030) |
| permanent contract                  | 0.081***          | (0.008) | 0.156***            | (0.009) | 0.176***           | (0.012) |
| part-time                           | 0.035***          | (0.008) | 0.006*              | (0.003) | -0.039***          | (0.007) |
| after*treated                       | 0.016             | (0.023) | 0.005               | (0.011) | 0.014              | (0.019) |
| Canton FE                           | Yes               |         | Yes                 |         | Yes                |         |
| Year FE                             | Yes               |         | Yes                 |         | Yes                |         |
| Number of Observations              | 14,340            |         | 74,870              |         | 41,853             |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the pay of women separately for each education level. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 18: Full output for analysis by education level for women

| Dependent variable: hourly log wage |                   |         |                     |         |                    |         |
|-------------------------------------|-------------------|---------|---------------------|---------|--------------------|---------|
|                                     | Primary education |         | Secondary education |         | Tertiary education |         |
|                                     | Coef              | SE      | Coef                | SE      | Coef               | SE      |
| age                                 | 0.007***          | (0.000) | 0.011***            | (0.000) | 0.017***           | (0.001) |
| married                             | 0.038***          | (0.007) | 0.035***            | (0.005) | 0.031***           | (0.004) |
| divorced                            | 0.021'            | (0.012) | 0.017*              | (0.007) | -0.003             | (0.011) |
| widowed                             | 0.093*            | (0.040) | -0.015              | (0.025) | -0.016             | (0.034) |
| swiss                               | 0.055***          | (0.008) | 0.070***            | (0.004) | 0.025***           | (0.007) |
| number children                     | 0.023***          | (0.003) | 0.021***            | (0.002) | 0.020***           | (0.002) |
| children below 3                    | 0.002             | (0.007) | 0.015***            | (0.004) | 0.030***           | (0.004) |
| 50 - 100 employees                  | 0.027***          | (0.007) | 0.037***            | (0.003) | 0.069***           | (0.006) |
| more than 100 employees             | 0.063***          | (0.006) | 0.083***            | (0.006) | 0.127***           | (0.008) |
| supervisory function                | -0.054***         | (0.016) | -0.078***           | (0.006) | -0.110***          | (0.006) |
| no supervisory function             | -0.123***         | (0.014) | -0.133***           | (0.007) | -0.188***          | (0.007) |
| academicitans                       | 0.178***          | (0.043) | 0.030***            | (0.008) | -0.020*            | (0.010) |
| technicians                         | -0.038            | (0.048) | -0.088***           | (0.008) | -0.135***          | (0.010) |
| clerical workers                    | -0.127*           | (0.050) | -0.144***           | (0.009) | -0.127***          | (0.009) |
| services                            | -0.223***         | (0.047) | -0.257***           | (0.006) | -0.332***          | (0.017) |
| handworkers                         | -0.101*           | (0.044) | -0.198***           | (0.007) | -0.303***          | (0.013) |
| operators                           | -0.143**          | (0.045) | -0.239***           | (0.009) | -0.371***          | (0.018) |
| assistants                          | -0.211***         | (0.041) | -0.342***           | (0.013) | -0.549***          | (0.025) |
| permanent contract                  | 0.125***          | (0.014) | 0.143***            | (0.007) | 0.223***           | (0.011) |
| part-time                           | -0.018            | (0.015) | -0.046***           | (0.009) | -0.054***          | (0.011) |
| after*treated                       | 0.014             | (0.016) | -0.016'             | (0.009) | 0.006              | (0.014) |
| Canton FE                           | Yes               |         | Yes                 |         | Yes                |         |
| Year FE                             | Yes               |         | Yes                 |         | Yes                |         |
| Number of Observations              | 14,669            |         | 74,916              |         | 59,763             |         |

*Note:* This table shows the results of the difference-in-difference estimation of the effect of the childcare reform on the pay of men separately for each education level. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 19: Full output for analysis by education level for men

## F Tables of robustness checks

### Varying years

| Dependent variable: hourly log wage |                   |                   |                   |
|-------------------------------------|-------------------|-------------------|-------------------|
| Years                               | 1991 - 2012       |                   |                   |
|                                     | (1)               | (2)               | (3)               |
| <u>Whole sample</u>                 |                   |                   |                   |
| after*treated*female                | 0.018<br>(0.012)  | 0.018'<br>(0.010) | 0.013<br>(0.008)  |
| Number of observations              | 249,093           |                   |                   |
| <u>Women</u>                        |                   |                   |                   |
| after*treated                       | 0.011<br>(0.011)  | 0.011<br>(0.008)  | 0.008<br>(0.007)  |
| Number of observations              | 115,119           |                   |                   |
| <u>Men</u>                          |                   |                   |                   |
| after*treated                       | -0.009<br>(0.010) | -0.009<br>(0.008) | -0.006<br>(0.007) |
| Number of observations              | 133,974           |                   |                   |
| Sociodemographic controls           | No                | Yes               | Yes               |
| Job & firm controls                 | No                | No                | Yes               |
| Canton FE                           | Yes               | Yes               | Yes               |
| Year FE                             | Yes               | Yes               | Yes               |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log wage. The analysis is restricted to the years from 1991 to 2012. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 20: Robustness check varying years: main analysis

| Dependent variable: hourly log wage |                  |                     |                    |                   |                   |
|-------------------------------------|------------------|---------------------|--------------------|-------------------|-------------------|
| Years                               | 1991 - 2012      |                     |                    |                   |                   |
|                                     | 1st Quintile     | 2nd Quintile        | 3rd Quintile       | 4th Quintile      | 5th Quintile      |
| <u>Whole sample</u>                 |                  |                     |                    |                   |                   |
| after*treated*female                | 0.019<br>(0.023) | 0.030<br>(0.025)    | 0.022*<br>(0.011)  | 0.000<br>(0.010)  | -0.010<br>(0.013) |
| Number of observations              | 13,696           | 33,640              | 40,433             | 43,782            | 41,038            |
| <u>Women</u>                        |                  |                     |                    |                   |                   |
| after*treated                       | 0.025<br>(0.028) | 0.014<br>(0.016)    | 0.006<br>(0.010)   | -0.012<br>(0.010) | 0.001<br>(0.013)  |
| Number of observations              | 6,225            | 15,119              | 18,812             | 20,023            | 17,684            |
| <u>Men</u>                          |                  |                     |                    |                   |                   |
| after*treated                       | 0.001<br>(0.019) | -0.023**<br>(0.008) | -0.015*<br>(0.006) | -0.010<br>(0.008) | 0.005<br>(0.011)  |
| Number of observations              | 7,471            | 18,521              | 21,621             | 23,759            | 23,354            |
| Sociodemographic controls           | Yes              | Yes                 | Yes                | Yes               | Yes               |
| Job & firm controls                 | Yes              | Yes                 | Yes                | Yes               | Yes               |
| Canton FE                           | Yes              | Yes                 | Yes                | Yes               | Yes               |
| Year FE                             | Yes              | Yes                 | Yes                | Yes               | Yes               |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each household income quintile. The sample is restricted to the years from 1991 to 2012. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 21: Robustness check varying years: analysis by household income quintile

| Dependent variable: log hourly wage |                   |                     |                    |
|-------------------------------------|-------------------|---------------------|--------------------|
|                                     | Primary education | Secondary education | Tertiary education |
| Years                               | 1991 - 2012       |                     |                    |
| <u>Whole sample</u>                 |                   |                     |                    |
| after*treated*female                | 0.011<br>(0.031)  | 0.018<br>(0.012)    | 0.008<br>(0.024)   |
| Number of observations              | 21,700            | 105,544             | 57,035             |
| <u>Women</u>                        |                   |                     |                    |
| after*treated                       | 0.017<br>(0.024)  | 0.001<br>(0.011)    | 0.016<br>(0.018)   |
| Number of observations              | 11,056            | 52,195              | 21,432             |
| <u>Men</u>                          |                   |                     |                    |
| after*treated                       | 0.016<br>(0.015)  | -0.020*<br>(0.008)  | 0.004<br>(0.015)   |
| Number of observations              | 10,644            | 53,349              | 35,603             |
| Sociodemographic cotrols            | Yes               | Yes                 | Yes                |
| Job & firm controls                 | Yes               | Yes                 | Yes                |
| Canton FE                           | Yes               | Yes                 | Yes                |
| Year FE                             | Yes               | Yes                 | Yes                |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each education level. The sample used is restricted to the years from 1991 to 2012. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 22: Robustness check varying years: analysis by education level

## Varying sample

| Dependent variable: hourly log wage |                   |                   |                   |                           |                   |                   |
|-------------------------------------|-------------------|-------------------|-------------------|---------------------------|-------------------|-------------------|
| Years                               | Full sample       |                   |                   | Individuals with children |                   |                   |
|                                     | (1)               | (2)               | (3)               | (1)                       | (2)               | (3)               |
| <u>Whole sample</u>                 |                   |                   |                   |                           |                   |                   |
| after*treated*female                | 0.020<br>(0.015)  | 0.017<br>(0.012)  | 0.011<br>(0.010)  | 0.016<br>(0.029)          | 0.016<br>(0.024)  | 0.008<br>(0.019)  |
| Number of observations              | 397,630           |                   |                   | 116,946                   |                   |                   |
| <u>Women</u>                        |                   |                   |                   |                           |                   |                   |
| after*treated                       | 0.013<br>(0.012)  | 0.010<br>(0.010)  | 0.007<br>(0.008)  | 0.008<br>(0.020)          | 0.004<br>(0.017)  | 0.002<br>(0.015)  |
| Number of observations              | 185,961           |                   |                   | 53,708                    |                   |                   |
| <u>Men</u>                          |                   |                   |                   |                           |                   |                   |
| after*treated                       | -0.008<br>(0.010) | -0.007<br>(0.008) | -0.004<br>(0.007) | -0.006<br>(0.017)         | -0.013<br>(0.013) | -0.007<br>(0.011) |
| Number of observations              | 211,669           |                   |                   | 63,238                    |                   |                   |
| Sociodemographic controls           | No                | Yes               | Yes               | No                        | Yes               | Yes               |
| Job & firm controls                 | No                | No                | Yes               | No                        | No                | Yes               |
| Canton FE                           | Yes               | Yes               | Yes               | Yes                       | Yes               | Yes               |
| Year FE                             | Yes               | Yes               | Yes               | Yes                       | Yes               | Yes               |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log wage. The first sample includes all individuals aged 15 to 55. The second sample is restricted to individuals with children. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 23: Robustness check varying sample: main analysis

| Dependent variable: hourly log wage |                   |                   |                   |                    |                    |                    |                   |                   |                   |                    |
|-------------------------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|--------------------|
| Sample                              | 1st Quintile      |                   | 2nd Quintile      |                    | 3rd Quintile       |                    | 4th Quintile      |                   | 5th Quintile      |                    |
|                                     | (1)               | (2)               | (1)               | (2)                | (1)                | (2)                | (1)               | (2)               | (1)               | (2)                |
| <u>Whole sample</u>                 |                   |                   |                   |                    |                    |                    |                   |                   |                   |                    |
| after*treated*female                | 0.045'<br>(0.026) | 0.014<br>(0.030)  | 0.014<br>(0.021)  | 0.027<br>(0.025)   | 0.016<br>(0.012)   | 0.008<br>(0.015)   | -0.003<br>(0.009) | 0.017<br>(0.044)  | -0.007<br>(0.012) | -0.085*<br>(0.038) |
| Number of observations              | 27,109            | 13,939            | 64,721            | 33,109             | 80,880             | 30,000             | 91,021            | 17,855            | 86,061            | 11,299             |
| <u>Women</u>                        |                   |                   |                   |                    |                    |                    |                   |                   |                   |                    |
| after*treated                       | 0.048'<br>(0.026) | 0.011<br>(0.028)  | 0.011<br>(0.014)  | 0.011<br>(0.019)   | 0.002<br>(0.009)   | -0.008<br>(0.015)  | -0.007<br>(0.007) | -0.007<br>(0.029) | -0.002<br>(0.011) | -0.064*<br>(0.029) |
| Number of observations              | 12,638            | 6,069             | 29,551            | 14,371             | 37,902             | 13,551             | 42,357            | 8,270             | 37,285            | 5,215              |
| <u>Men</u>                          |                   |                   |                   |                    |                    |                    |                   |                   |                   |                    |
| after*treated                       | 0.002<br>(0.014)  | -0.009<br>(0.016) | -0.008<br>(0.008) | -0.020*<br>(0.009) | -0.013*<br>(0.006) | -0.018'<br>(0.009) | -0.004<br>(0.007) | -0.019<br>(0.018) | 0.001<br>(0.009)  | 0.023<br>(0.024)   |
| Number of observations              | 14,471            | 7,870             | 35,170            | 18,738             | 42,978             | 16,449             | 48,664            | 9,585             | 48,776            | 6,084              |
| Sociodemographic controls           | Yes               | Yes               | Yes               | Yes                | Yes                | Yes                | Yes               | Yes               | Yes               | Yes                |
| Job & firm controls                 | Yes               | Yes               | No                | Yes                | Yes                | Yes                | Yes               | Yes               | Yes               | Yes                |
| Canton FE                           | Yes               | Yes               | Yes               | Yes                | Yes                | Yes                | Yes               | Yes               | Yes               | Yes                |
| Year FE                             | Yes               | Yes               | Yes               | Yes                | Yes                | Yes                | Yes               | Yes               | Yes               | Yes                |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each household income quintile. (1) is a sample with all individuals age between 15 and 55. (2) is a sample with all individuals with children. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 24: Robustness check varying sample: analysis by household income quintile

| Dependent variable: hourly log wage |                   |                   |                     |                    |                    |                   |
|-------------------------------------|-------------------|-------------------|---------------------|--------------------|--------------------|-------------------|
|                                     | Primary education |                   | Secondary education |                    | Tertiary education |                   |
| Sample                              | (1)               | (2)               | (1)                 | (2)                | (1)                | (2)               |
| <u>Whole sample</u>                 |                   |                   |                     |                    |                    |                   |
| after*treated*female                | 0.024<br>(0.022)  | -0.009<br>(0.035) | 0.009<br>(0.009)    | 0.023<br>(0.017)   | -0.001<br>(0.018)  | -0.021<br>(0.054) |
| Number of observations              | 47,529            | 16,279            | 211,030             | 58,448             | 139,071            | 42,219            |
| <u>Women</u>                        |                   |                   |                     |                    |                    |                   |
| after*treated                       | 0.028<br>(0.019)  | -0.006<br>(0.027) | 0.002<br>(0.010)    | 0.004<br>(0.017)   | 0.009<br>(0.016)   | -0.007<br>(0.038) |
| Number of observations              | 24,406            | 8,058             | 106,366             | 29,755             | 55,189             | 15,895            |
| <u>Men</u>                          |                   |                   |                     |                    |                    |                   |
| after*treated                       | 0.009<br>(0.015)  | 0.007<br>(0.013)  | -0.009<br>(0.008)   | -0.025*<br>(0.012) | 0.008<br>(0.012)   | 0.016<br>(0.018)  |
| Number of observations              | 23,123            | 8,221             | 104,664             | 28,693             | 83,882             | 26,324            |
| Sociodemographic controls           | Yes               | Yes               | Yes                 | Yes                | Yes                | Yes               |
| Job & firm controls                 | Yes               | Yes               | No                  | Yes                | Yes                | Yes               |
| Canton FE                           | Yes               | Yes               | Yes                 | Yes                | Yes                | Yes               |
| Year FE                             | Yes               | Yes               | Yes                 | Yes                | Yes                | Yes               |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each education level. (1) is a sample with all individuals age between 15 and 55. (2) is a sample with all individuals with children. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 25: Robustness check varying sample: analysis by education level

## Varying treatment and control group

| Dependent variable: hourly log wage |                   |                   |                   |
|-------------------------------------|-------------------|-------------------|-------------------|
|                                     | Full sample       |                   |                   |
|                                     | (1)               | (2)               | (3)               |
| <u>Whole sample</u>                 |                   |                   |                   |
| after*treated*female                | 0.005<br>(0.014)  | 0.001<br>(0.010)  | -0.005<br>(0.009) |
| Number of observations              | 148,544           |                   |                   |
| <u>Women</u>                        |                   |                   |                   |
| after*treated                       | 0.012<br>(0.014)  | -0.002<br>(0.013) | -0.003<br>(0.011) |
| Number of observations              | 69,761            |                   |                   |
| <u>Men</u>                          |                   |                   |                   |
| after*treated                       | -0.000<br>(0.018) | -0.008<br>(0.014) | -0.002<br>(0.010) |
| Number of observations              | 78,783            |                   |                   |
| Sociodemographic controls           | No                | Yes               | Yes               |
| Job & firm controls                 | No                | No                | Yes               |
| Canton FE                           | Yes               | Yes               | Yes               |
| Year FE                             | Yes               | Yes               | Yes               |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log wage. The sample only includes the cantons that expanded childcare the most (six cantons) and the least (six cantons). Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 26: Robustness check varying treatment and control group: main analysis

| Dependent variable: hourly log wage |                   |                    |                   |                    |                   |
|-------------------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|
|                                     | 1st Quintile      | 2nd Quintile       | 3rd Quintile      | 4th Quintile       | 5th Quintile      |
| <u>Whole sample</u>                 |                   |                    |                   |                    |                   |
| after*treated*female                | -0.007<br>(0.038) | -0.026<br>(0.022)  | 0.008<br>(0.011)  | 0.000<br>(0.008)   | -0.013<br>(0.020) |
| Number of observations              | 11,162            | 26,591             | 31,621            | 33,752             | 28,517            |
| <u>Women</u>                        |                   |                    |                   |                    |                   |
| after*treated                       | 0.014<br>(0.042)  | -0.024'<br>(0.015) | -0.009<br>(0.010) | -0.012<br>(0.011)  | 0.010<br>(0.014)  |
| Number of observations              | 5,182             | 12,291             | 14,903            | 15,837             | 12,421            |
| <u>Men</u>                          |                   |                    |                   |                    |                   |
| after*treated                       | 0.008<br>(0.021)  | -0.011<br>(0.010)  | -0.019<br>(0.012) | -0.016*<br>(0.008) | 0.016<br>(0.017)  |
| Number of observations              | 5,980             | 14,300             | 16,718            | 17,915             | 16,096            |
| Sociodemographic controls           | Yes               | Yes                | Yes               | Yes                | Yes               |
| Job & firm controls                 | Yes               | Yes                | Yes               | Yes                | Yes               |
| Canton FE                           | Yes               | Yes                | Yes               | Yes                | Yes               |
| Year FE                             | Yes               | Yes                | Yes               | Yes                | Yes               |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each household income quintile. The sample only includes the cantons that expanded childcare the most (six cantons) and the least (six cantons). Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 27: Robustness check varying treatment and control group: analysis by household income quintile

| Dependent variable: hourly log wage |                   |                     |                    |
|-------------------------------------|-------------------|---------------------|--------------------|
|                                     | Primary education | Secondary education | Tertiary education |
| <u>Whole sample</u>                 |                   |                     |                    |
| after*treated*female                | -0.004<br>(0.037) | 0.003<br>(0.015)    | -0.023<br>(0.035)  |
| Number of observations              | 15,292            | 81,178              | 52,074             |
| <u>Women</u>                        |                   |                     |                    |
| after*treated                       | -0.004<br>(0.034) | -0.010<br>(0.015)   | 0.012<br>(0.029)   |
| Number of observations              | 7,561             | 40,596              | 21,604             |
| <u>Men</u>                          |                   |                     |                    |
| after*treated                       | -0.005<br>(0.014) | -0.019*<br>(0.009)  | 0.025<br>(0.019)   |
| Number of observations              | 7,731             | 40,582              | 30,470             |
| Sociodemographic controls           | Yes               | Yes                 | Yes                |
| Job & firm controls                 | Yes               | Yes                 | Yes                |
| Canton FE                           | Yes               | Yes                 | Yes                |
| Year FE                             | Yes               | Yes                 | Yes                |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each education level. The sample only includes the cantons that expanded childcare the most (six cantons) and the least (six cantons). Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 28: Robustness check varying treatment and control group: analysis by education level

| Dependent variable: hourly log wage |                        |                 |                 |
|-------------------------------------|------------------------|-----------------|-----------------|
|                                     | whole sample           | women           | men             |
|                                     | treatment*after*female | treatment*after | treatment*after |
| without Zürich                      | 0.013                  | 0.002           | -0.010          |
| without Bern                        | 0.020*                 | 0.010           | -0.010          |
| without Luzern                      | 0.013                  | 0.007           | -0.006          |
| without Schwyz                      | 0.014                  | 0.008           | -0.006          |
| without Nidwalden                   | 0.014                  | 0.007           | -0.007          |
| without Glarus                      | 0.015                  | 0.007           | -0.007          |
| without Zug                         | 0.014                  | 0.008           | -0.007          |
| without Fribourg                    | 0.014                  | 0.008           | -0.007          |
| without Solothurn                   | 0.015                  | 0.009           | -0.006          |
| without Basel-Stadt                 | 0.016                  | 0.008           | -0.007          |
| without Basel-Landschaft            | 0.012                  | 0.005           | -0.007          |
| without Schaffhausen                | 0.013                  | 0.007           | -0.006          |
| without Appenzell A. Rh.            | 0.015                  | 0.008           | -0.007          |
| without Appenzell I. Rh.            | 0.014                  | 0.007           | -0.007          |
| without St. Gallen                  | 0.014                  | 0.009           | -0.005          |
| without Graubünden                  | 0.014                  | 0.008           | -0.006          |
| without Aargau                      | 0.016                  | 0.007           | -0.009          |
| without Thurgau                     | 0.014                  | 0.005           | -0.009          |
| without Ticino                      | 0.015                  | 0.010           | -0.006          |
| without Vaud                        | 0.017                  | 0.004           | -0.013*         |
| without Valais                      | 0.010                  | 0.004           | -0.007          |
| without Neuchâtel                   | 0.015                  | 0.010           | -0.006          |
| without Genève                      | 0.008                  | 0.006           | -0.004          |
| without Jura                        | 0.015                  | 0.009           | -0.007          |
| Sociodemographic controls           | Yes                    | Yes             | Yes             |
| Job & firm controls                 | Yes                    | Yes             | Yes             |
| Canton FE                           | Yes                    | Yes             | Yes             |
| Year FE                             | Yes                    | Yes             | Yes             |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log wage. I always take one canton out of the sample to see if this canton drives the whole effect. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 29: Robustness check take one canton out of the sample: Main analysis

| Dependent variable: hourly log wage |              |       |         |        |        |       |        |        |        |        |        |           |           |         |        |
|-------------------------------------|--------------|-------|---------|--------|--------|-------|--------|--------|--------|--------|--------|-----------|-----------|---------|--------|
|                                     | whole sample |       |         |        |        | women |        |        |        |        | men    |           |           |         |        |
| without                             | (1)          | (2)   | (3)     | (4)    | (5)    | (1)   | (2)    | (3)    | (4)    | (5)    | (1)    | (2)       | (3)       | (4)     | (5)    |
| Zürich                              | 0.018        | 0.017 | 0.019   | 0.009  | -0.011 | 0.015 | 0.002  | -0.002 | -0.010 | -0.002 | -0.005 | -0.019*   | -0.017*   | -0.014* | 0.005  |
| Bern                                | 0.026        | 0.027 | 0.029** | 0.006  | -0.004 | 0.030 | 0.013  | 0.009  | -0.008 | 0.002  | 0.004  | -0.018*   | -0.020*** | -0.011  | 0.002  |
| Luzern                              | 0.012        | 0.022 | 0.024'  | 0.005  | -0.009 | 0.021 | 0.009  | 0.007  | -0.008 | -0.001 | 0.007  | -0.018*   | -0.015*   | -0.011' | 0.003  |
| Schwyz                              | 0.023        | 0.026 | 0.023'  | 0.005  | -0.011 | 0.031 | 0.012  | 0.006  | -0.007 | -0.001 | 0.005  | -0.020*   | -0.016*   | -0.009  | 0.005  |
| Nidwalden                           | 0.021        | 0.023 | 0.023'  | 0.006  | -0.008 | 0.028 | 0.010  | 0.006  | -0.007 | -0.000 | 0.005  | -0.019*   | -0.016**  | -0.010  | 0.003  |
| Glarus                              | 0.018        | 0.024 | 0.024*  | 0.006  | -0.008 | 0.026 | 0.010  | 0.007  | -0.007 | -0.000 | 0.006  | -0.019*   | -0.017**  | -0.010  | 0.003  |
| Zug                                 | 0.022        | 0.023 | 0.023'  | 0.005  | -0.008 | 0.027 | 0.009  | 0.006  | -0.006 | 0.000  | 0.003  | -0.019*   | -0.016*   | -0.009  | 0.003  |
| Fribourg                            | 0.022        | 0.022 | 0.023'  | 0.006  | -0.008 | 0.031 | 0.008  | 0.007  | -0.006 | -0.000 | 0.006  | -0.019*   | -0.016*   | -0.009  | 0.003  |
| Solothurn                           | 0.024        | 0.025 | 0.025*  | 0.007  | -0.008 | 0.029 | 0.011  | 0.009  | -0.006 | -0.000 | 0.004  | -0.018*   | -0.015*   | -0.010  | 0.004  |
| Basel-Stadt                         | 0.026        | 0.029 | 0.027*  | 0.008  | -0.004 | 0.033 | 0.011  | 0.008  | -0.007 | -0.001 | 0.010  | -0.017*   | -0.014*   | -0.009  | -0.002 |
| Basel-Landschaft                    | 0.019        | 0.019 | 0.019   | 0.005  | -0.014 | 0.024 | 0.008  | 0.003  | -0.007 | -0.005 | 0.004  | -0.017'   | -0.016**  | -0.008  | 0.005  |
| Schaffhausen                        | 0.017        | 0.025 | 0.022'  | 0.007  | -0.012 | 0.028 | 0.010  | 0.004  | -0.008 | -0.001 | 0.009  | -0.021*   | -0.017**  | -0.011' | 0.006  |
| Appenzell A. Rh.                    | 0.019        | 0.024 | 0.024*  | 0.008  | -0.008 | 0.025 | 0.010  | 0.006  | -0.006 | 0.001  | 0.003  | -0.020*   | -0.018**  | -0.011' | 0.005  |
| Appenzell I. Rh.                    | 0.020        | 0.023 | 0.023*  | 0.005  | -0.008 | 0.027 | 0.009  | 0.006  | -0.007 | 0.000  | 0.005  | -0.019*   | -0.017**  | -0.010  | 0.003  |
| St. Gallen                          | 0.020        | 0.024 | 0.024*  | 0.003  | -0.007 | 0.035 | 0.011  | 0.007  | -0.010 | 0.002  | 0.013  | -0.019*   | -0.016*   | -0.011' | 0.004  |
| Graubünden                          | 0.019        | 0.021 | 0.023'  | 0.005  | -0.008 | 0.025 | 0.007  | 0.007  | -0.006 | 0.002  | 0.003  | -0.019*   | -0.015*   | -0.010  | 0.004  |
| Aargau                              | 0.026        | 0.032 | 0.024'  | 0.008  | -0.008 | 0.030 | 0.014  | 0.006  | -0.005 | -0.004 | 0.000  | -0.022**  | -0.016*   | -0.009  | -0.000 |
| Thurgau                             | 0.017        | 0.023 | 0.023'  | 0.006  | -0.009 | 0.026 | 0.008  | 0.005  | -0.009 | -0.002 | 0.006  | -0.021**  | -0.016**  | -0.011' | 0.002  |
| Ticino                              | 0.022        | 0.026 | 0.021'  | 0.007  | -0.003 | 0.014 | 0.012  | 0.007  | -0.003 | 0.003  | -0.008 | -0.021*   | -0.014*   | -0.009  | 0.002  |
| Vaud                                | 0.022        | 0.033 | 0.021   | 0.002  | -0.003 | 0.030 | 0.012  | 0.005  | -0.012 | 0.002  | 0.007  | -0.026*** | -0.017*   | -0.010  | -0.000 |
| Valais                              | 0.024        | 0.008 | 0.023'  | 0.004  | -0.010 | 0.026 | 0.002  | 0.005  | -0.008 | -0.000 | -0.006 | -0.013*   | -0.018**  | -0.010  | 0.004  |
| Neuchâtel                           | 0.032'       | 0.026 | 0.022'  | 0.005  | -0.009 | 0.039 | 0.012  | 0.008  | -0.006 | -0.000 | 0.005  | -0.019*   | -0.014*   | -0.009  | 0.004  |
| Genève                              | 0.010        | 0.009 | 0.015   | -0.001 | -0.004 | 0.017 | -0.000 | 0.002  | -0.007 | 0.010  | 0.003  | -0.018*   | -0.017**  | -0.007  | 0.007  |
| Jura                                | 0.022        | 0.023 | 0.023'  | 0.007  | -0.008 | 0.030 | 0.009  | 0.007  | -0.006 | -0.000 | 0.003  | -0.019*   | -0.016**  | -0.010' | 0.004  |
| Sociodemographic controls           | Yes          | Yes   | Yes     | Yes    | Yes    | Yes   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes       | Yes       | Yes     | Yes    |
| Job & firm controls                 | Yes          | Yes   | Yes     | Yes    | Yes    | Yes   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes       | Yes       | Yes     | Yes    |
| Canton FE                           | Yes          | Yes   | Yes     | Yes    | Yes    | Yes   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes       | Yes       | Yes     | Yes    |
| Year FE                             | Yes          | Yes   | Yes     | Yes    | Yes    | Yes   | Yes    | Yes    | Yes    | Yes    | Yes    | Yes       | Yes       | Yes     | Yes    |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each household income quintile. I always take one canton out of the sample to see if this canton drives the whole effect. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 30: Robustness check take one canton out of the sample: analysis by household income quintile

| Dependent variable: hourly log wage |              |        |        |        |        |       |        |          |        |
|-------------------------------------|--------------|--------|--------|--------|--------|-------|--------|----------|--------|
|                                     | whole sample |        |        | women  |        |       | men    |          |        |
| without                             | (1)          | (2)    | (3)    | (1)    | (2)    | (3)   | (1)    | (2)      | (3)    |
| Zürich                              | 0.023        | 0.016  | 0.001  | 0.018  | -0.004 | 0.008 | -0.000 | -0.022** | 0.009  |
| Bern                                | 0.002        | 0.024* | 0.013  | 0.013  | 0.009  | 0.014 | 0.015  | -0.017'  | 0.001  |
| Luzern                              | 0.005        | 0.018  | 0.004  | 0.016  | 0.005  | 0.012 | 0.013  | -0.014'  | 0.005  |
| Schwyz                              | 0.006        | 0.018  | 0.004  | 0.018  | 0.005  | 0.015 | 0.015  | -0.016*  | 0.008  |
| Nidwalden                           | 0.006        | 0.018  | 0.006  | 0.017  | 0.004  | 0.015 | 0.014  | -0.016'  | 0.006  |
| Glarus                              | 0.006        | 0.019' | 0.007  | 0.017  | 0.005  | 0.015 | 0.014  | -0.016*  | 0.006  |
| Zug                                 | 0.005        | 0.019  | 0.006  | 0.016  | 0.005  | 0.015 | 0.015  | -0.016*  | 0.006  |
| Fribourg                            | 0.006        | 0.018' | 0.005  | 0.017  | 0.006  | 0.013 | 0.014  | -0.015'  | 0.006  |
| Solothurn                           | 0.008        | 0.018  | 0.006  | 0.022  | 0.006  | 0.015 | 0.016  | -0.014'  | 0.006  |
| Basel-Stadt                         | 0.006        | 0.022* | 0.009  | 0.015  | 0.007  | 0.016 | 0.014  | -0.014'  | 0.005  |
| Basel-Landschaft                    | -0.004       | 0.020' | -0.007 | 0.012  | 0.007  | 0.001 | 0.019  | -0.015'  | 0.004  |
| Schaffhausen                        | 0.006        | 0.017  | 0.003  | 0.018  | 0.004  | 0.014 | 0.014  | -0.016*  | 0.008  |
| Appenzell A. Rh.                    | 0.003        | 0.020' | 0.007  | 0.014  | 0.006  | 0.016 | 0.015  | -0.017*  | 0.006  |
| Appenzell I. Rh.                    | 0.006        | 0.018  | 0.006  | 0.015  | 0.005  | 0.015 | 0.013  | -0.016*  | 0.006  |
| St. Gallen                          | 0.013        | 0.014  | 0.006  | 0.020  | 0.006  | 0.016 | 0.010  | -0.012'  | 0.007  |
| Graubünden                          | 0.001        | 0.020' | 0.001  | 0.012  | 0.006  | 0.014 | 0.014  | -0.017*  | 0.010  |
| Aargau                              | 0.006        | 0.019  | 0.009  | 0.018  | 0.003  | 0.014 | 0.016  | -0.017'  | 0.003  |
| Thurgau                             | 0.002        | 0.017  | 0.007  | 0.013  | 0.003  | 0.013 | 0.013  | -0.016*  | 0.004  |
| Ticino                              | 0.008        | 0.020' | 0.009  | 0.016  | 0.005  | 0.022 | 0.010  | -0.017*  | 0.010  |
| Vaud                                | 0.031        | 0.009  | 0.032  | 0.033  | -0.004 | 0.023 | 0.006  | -0.016'  | -0.006 |
| Valais                              | -0.002       | 0.016  | 0.002  | 0.010  | 0.001  | 0.010 | 0.014  | -0.017*  | 0.006  |
| Neuchâtel                           | 0.010        | 0.018  | 0.009  | 0.024  | 0.007  | 0.018 | 0.017  | -0.014'  | 0.006  |
| Genève                              | -0.014       | 0.014  | 0.001  | -0.001 | 0.004  | 0.022 | 0.012  | -0.014'  | 0.013  |
| Jura                                | -0.001       | 0.021* | 0.007  | 0.015  | 0.006  | 0.016 | 0.018  | -0.018*  | 0.007  |
| Sociodemographic controls           | Yes          | Yes    | Yes    | Yes    | Yes    | Yes   | Yes    | Yes      | Yes    |
| Job & firm controls                 | Yes          | Yes    | Yes    | Yes    | Yes    | Yes   | Yes    | Yes      | Yes    |
| Canton FE                           | Yes          | Yes    | Yes    | Yes    | Yes    | Yes   | Yes    | Yes      | Yes    |
| Year FE                             | Yes          | Yes    | Yes    | Yes    | Yes    | Yes   | Yes    | Yes      | Yes    |

*Note:* This table shows the estimates of interest for the effect of an increase in childcare availability on the dependent variable hourly log pay separately for each education level. I always take one canton out of the sample to see if this canton drives the whole effect. Bootstrapped clustered standard errors at cantonal level have been used (shown in parentheses). \*\*\*, \*\*, \* and ' stand for a rejection of the null hypothesis with a p-value smaller than 0.1%, 1%, 5% and 10%.

Table 31: Robustness check take one canton out of the sample: analysis by education level

## G Simulation study to test clustered standard errors

According to MacKinnon et al. (2019), unbalanced clusters could be a problem when conducting inference in finite samples, especially with a small number of clusters. Furthermore, there is a problem in that the treatment is assigned to the different clusters. Therefore, I sample 10 treatment cantons and 14 control cantons separately. For a detailed description of the bootstrapping algorithm, see Section 5.3.3.

To verify that my clustered standard errors are not misleading, following Cameron and Miller (2015) and MacKinnon et al. (2019) I conduct a Monte Carlo simulation with 5,000 replications. I construct a data generating process (DGP) with 24 clusters, where 10 are the treatment group and 14 the control group. The sample size of the clusters is randomly drawn with replacement from a discrete uniform distribution, i.e.  $\text{unif}(500, 1, 500)$ . This procedure is performed for 20 different years. The covariate correlation and the correlation of the standard errors vary between clusters but stay constant within the cluster over the years. The correlation per cluster is drawn randomly with replacement from a continuous uniform distribution, i.e.  $\text{unif}(0, 0.9)$ . I estimate the following regression:

$$y = \beta_1 \textit{treated} + \beta_2 * \textit{after} + \beta_3 * \textit{treated} * \textit{after} + \beta_4 * X + \epsilon \quad (3)$$

where  $X$  is a covariate included in the regression which is randomly drawn from a normal distribution with mean ten and standard deviation two ( $N(10,2)$ ),  $\epsilon$  is randomly drawn from a normal distribution with mean zero and standard deviation one ( $N(0,1)$ ). Furthermore, the  $\beta$ 's are defined as:  $\beta_1 = 1$ ,  $\beta_2 = 1$ ,  $\beta_3 = 0$ ,  $\beta_4 = 2$ .

I compare normal standard errors, clustered standard errors, bootstrapped standard errors with 24 random draws from the treatment and control groups, bootstrapped standard errors with 10 random draws from the treatment group and 14 random draws from the control group. To assess the credibility of the standard errors, I assume that there is no effect and set  $\beta_3$  to zero and calculate how many times the null hypothesis is rejected on the 10%, 5% and 1% significance level. Thus, if the standard errors are correctly estimated, the rejection rate should be around 10%, 5% and 1%. Note that by conducting the simulation study in this way, I am unable to calculate the power of the test but only compute the rejection rate.

Table 32 shows the rejection rates on a 10%, 5% and 1% significance level for the different standard errors. Not clustered standard errors clearly reject the null hypothesis too many times. This confirms the significance of cluster standard errors. Cluster standard errors and bootstrapped standard errors are more conservative, and each reject around 7%, 4% and 1% of the null hypothesis. In this thesis, I choose the bootstrapped standard errors (balanced). On the 10% and 5% significance level this approach performs best. On the 1% significance level this method rejects slightly too many times the null hypothesis, however, the 5% and 10% significance level are more important in this thesis. Therefore, the standard errors used are valid.

| Standard error                 | Rejection rate |       |       |
|--------------------------------|----------------|-------|-------|
|                                | 90%            | 95%   | 99%   |
| Normal SE's                    | 0.474          | 0.468 | 0.460 |
| Clustered SE's                 | 0.067          | 0.035 | 0.011 |
| Bootstrapped SE's (unbalanced) | 0.067          | 0.036 | 0.009 |
| Bootstrapped SE's (balanced)   | 0.071          | 0.040 | 0.011 |

*Note:* This table shows the rejection rates for different estimations of the standard errors for different significance levels.

Table 32: Rejection rates in % for different standard errors