

# Does the gender composition in couples matter for the division of labor after childbirth?<sup>a</sup>

by

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## Abstract

In this paper I compare the effect of entering parenthood on the spousal income gaps in lesbian and heterosexual couples using Swedish population wide register data. Comparing couples with similar pre-childbirth income gaps, a difference-in-differences strategy is used to estimate the impact of the gender composition of the couple on the spousal income gap after childbirth. The results indicate that the gender composition of the couple does matter for the division of labor after having children. Five years after childbirth the income gap is smaller in lesbian than in heterosexual couples also when comparing couples with the same pre-parenthood income gap. Heterosexual couples' division of labor seems to be influenced by traditional gender norms, regardless of their pre-childbirth income gap. In lesbian couples the partners' relative earnings before parenthood and a principle about fairness may be more important, as well as the partners' preferences for giving birth as the birth giving partner typically spends more time on parental leave.

Keywords: economics of gender; division of labor; labor supply; same-sex couples; transition to parenthood;

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## 1 Introduction

Despite the often observed gendered pattern of specialization in the family, most studies in economics do not focus on the impact of spousal gender itself as an explanation for the division of labor. The uneven division of market and household work between spouses is often attributed to the fact that men are relatively more productive in the labor market (i.e. they have higher wages) which makes specialization beneficial for the household. However the prediction that the spouse with the highest earnings potentials will do less of the domestic work regardless of gender cannot be confirmed empirically. Akerlof and Kranton (2000) for example present data from the US that shows that when the wife's income share increases, the husband's share of housework does not increase in a proportional amount. Likewise, Procher et al. (2014) find that when the earnings level of the woman exceeds that of the man, the woman still does more of the housework. Several studies in sociology, for example Tichenor (2005), also find that even when the woman earns substantially more, she still does significantly more of the household chores. These results contradict the gender neutral predictions in most economic theory.

Descriptive statistics show that the gendered division of labor seems to become more pronounced when a couple enters parenthood (SCB, 2012). This conclusion has also been reached in empirical research for example by Dribe and Stanfors (2009) who show that the presence of small children in the household strengthens a traditional division of labor among parents in Sweden. After entering parenthood women increase their hours of work in the home and reduce their hours of work in the labor market. Men on the other hand, do not change their behavior in the same way (see Dribe and Stanfors, 2009, for an overview of this literature). Angelov et al. (2016) who also study Swedish parents, show that the within couple labor income gap widens after childbirth and that this is a long term effect. This pattern is mostly caused by a large decrease in women's market labor supply after becoming mothers.

In this paper I ask the question of how the gender of the spouses influences the division of labor after childbirth. The *influence of gender* refers to all the ways in which biological sex and gender norms can influence spousal behavior. The possibility to dis-

tinguish between different aspects of these forms of influence of gender will be discussed throughout the paper. To identify the impact of parental gender I compare the division of labor in lesbian and heterosexual couples before and after having children. I use the within family income gap as a proxy for the division of labor in the couple and compare the development of the spousal income gap in lesbian and heterosexual couples before and after childbirth. In this way I can investigate if the gender composition in couples seems to matter for the division of labor after becoming parents. By studying lesbian couples I can investigate the effect of having children on couples where, at least theoretically, one can make no a priori assumption on which parent “should” take the main responsibility for the care of children according to traditional gender norms. If a couple consisting of two women behaves differently as compared to a couple consisting of one man and one woman, then this could shed some light on whether the parental gender composition matters for the behavior of couples. Earlier studies comparing specialization within same-sex and different-sex couples have in general found that heterosexual couples specialize the most and lesbian couples the least. The results for gay male couples are more mixed (Antecol and Steinberger, 2013, Giddings et al., 2014, Jepsen and Jepsen, 2015, Tebaldi and Elmslie, 2006).

The data used in this study is Swedish population wide register data that contains information on all lesbian and heterosexual couples who had their first child together at some time during the years 1995-2010. During this period, 502 lesbian and around 500,000 heterosexual couples who had their first child together can be observed in the data. Due to the small number of male same-sex couples with children (only 36 couples over a 15 year period) the analysis will be performed on lesbian and heterosexual couples only. To get comparable samples, lesbian and heterosexual couples are matched based on the birth year of the first child and the spousal income gap before childbirth. With this sampling technique only couples with the same pre-childbirth income gap and birth year of the first child are compared with each other in the empirical analysis. A difference-in-differences strategy is used to estimate whether there is a significant difference in the development of the spousal income gap after childbirth in lesbian and heterosexual couples given their pre-parenthood income gap and birth year of their first child. In this way

I can estimate if there is a significant difference in the division of labor after becoming parents in couples with different gender composition. To the best of my knowledge this is the first study to compare the effect of entering parenthood in lesbian and heterosexual couples using population wide panel data covering a long time period (20 years).

Heterosexual couples show increased specialization, in terms of a vast increase in their labor income gap, after becoming parents. This is a long term effect where the mother's income keeps falling behind, not catching up with the father's. The results suggest that fathers carry less of the financial cost in terms of foregone earnings and lost career opportunities associated with raising a child. In lesbian couples the income gap is in general smaller after childbirth also when comparing lesbian and heterosexual couples with the same pre-parenthood income gap. Initially the birth giving partner in both lesbian and heterosexual couples spends more time on parental leave compared to the non-birth giving partner. Consequently they experience a large decline in their labor market income in the years after childbirth. However, for most lesbian couples this initial increase in the income gap diminishes in the following years. The possibility to choose which partner should be the birth mother gives lesbian couples the opportunity to give birth to one child each. By taking turns giving birth, lesbian couples can share the costs in terms of foregone earnings when taking a longer time off work to stay on parental leave. The couples who do so have the most egalitarian division of income after entering parenthood.

The analysis shows that the parental gender composition matters for the division of labor after childbirth regardless of the pre-parenthood income gap. There are several possible explanations for this behavior. It might be that heterosexual couples use traditional gender norms as a "rule of thumb" when making their decision, while lesbian couples use some other principle such as fairness (Badgett, 2003, Blumstein and Schwartz, 1983). Possibly the spouses get a direct utility from acting according to gender norms and by seeing their partner do so as suggested by Akerlof and Kranton (2000). It might also be that the father in heterosexual couples enjoys a stronger bargaining position as a direct effect of his gender as proposed in for example Alesina et al. (2011). In lesbian couples, spousal gender could not directly influence the relative bargaining powers of the partners. Thus other factors such as relative earnings potentials might actually be more important

for the bargaining positions in these couples. The fact that in lesbian couples both partners can give birth to the child means that the decision making process when deciding to have children is different in these couples. The partners' preferences for biological motherhood can affect their decision and thereby the partners' income development after childbirth.

The remaining part of the paper is organized as follows; section 2 discusses related literature; section 3 gives a background on the institutional setting for families in Sweden; section 4 provides the identification strategy and econometric method; section 5 presents the data and descriptive statistics; in section 6 results from the main regression analysis are presented; section 7 investigates possible mechanisms behind the results. Finally, section 8 provides summary and concluding remarks.

## **2 Related literature**

Becker (1991) argues that in an efficient family the spouses should allocate their time according to their comparative advantages in order to maximize the total income and household production of the family. Becker assumed that for biological reasons and due to differences in human capital investments between the sexes, women have a higher productivity in household work and men in the labor market. For this reason a gender specific division of labor in the household is the most efficient and beneficial for both spouses. Becker further stresses the point that since women make a larger biological investment in their children (i.e. going through pregnancy, labor and breast feeding) they will be more keen to invest time and money in their children later on in order to get an adequate return to their investment. Thus, according to Becker's theory, the fact that women give birth to children in itself leads to specialization within households after childbirth.

The literature on bargaining in the family takes a somewhat different approach. The division of market and household work is assumed to be determined by differences in bargaining power between the spouses. The bargaining power is determined by whatever determines the outside option in case of divorce for example age, nonlabor income or earnings capacity (see e.g. Apps and Rees, 1997, Chiappori, 1988, 1992, Oreffice, 2011, or Procher et al., 2014). Gender is typically not considered to have a direct effect on bargaining power but at most an indirect effect by for example affecting the earnings po-

tentials of the individual. A common prediction of these models is that the spouse with the highest income or earnings potential will enjoy stronger bargaining power due to a better outside option, and consequently do less of the unpaid domestic work. Since the theory is gender neutral the models predict that if the relative earnings of the spouses are reversed, the proportion of domestic work should consequently also be reversed. However this prediction cannot be confirmed empirically. Akerlof and Kranton (2000) for example present data from the US that shows that when the wife's income share increases, the husband's share of housework does not increase by a proportional amount. Even when only the wife is working in the market the husband's share of housework is only around 35 percent. Procher et al. (2014) find that an increase in the share and/or absolute level of income of a spouse is associated with a decrease in housework for both men and women. However they also find that when the earnings level of the woman exceeds that of the man, the woman's amount of housework again increases. The same result has been found in several studies in sociology. For example Tichenor (2005) finds that when the woman earns substantially more, she still does significantly more of the household chores. The author explains this as a way to reestablish conventional gender norms in the family. Bertrand et al. (2013) study the relationship between gender and the effect of spousal gap in real and potential earnings. They find that if the wife's potential earnings exceed her husband's, the likelihood that she is employed decreases, and that if she does work her real earnings are more likely to be below her potential. These results all contradict the gender neutral predictions in most of the standard family economic theory, but can be explained if the importance of gender is incorporated into the theoretical framework. In a much cited paper, Akerlof and Kranton (2000) consider how a person's identity, for example gender identity, can be added to standard economic models (in the utility function) to better explain economic behavior. The authors propose a model where identities such as "man" or "woman" are prescribed to the individual. Norms regarding the prescribed identity affect both the preferences for and the payoffs of different actions for the individuals who act to confirm their identity as this gives them utility. Acting to confirm your prescribed identity can also lead to externalities as it gives others utility to see you do so. Likewise, violating the norms will result in a feeling of disutility both for the individual him/herself

and other people. This framework can explain why individuals sometimes act in a way that seems not to be in their best economic interest. The model proposed by Akerlof and Kranton (2000) predicts an asymmetric division of labor between the spouses. Adding gender identity to a standard model can explain why a woman, even if she is the main financial provider of the family, chooses to do more of the housework to confirm her gender identity. Similarly a man with a lower income than his wife might avoid "feminine" tasks in the household to maintain his self-image as a man.

Hypothetically same-sex couples could "take on" different gender roles and divide the household work in a similar fashion as heterosexual couples. However studies show that same-sex couples who do take on gendered roles (for example "butch" and "femme") do not assign household tasks according to these roles (Badgett, 2003, p. 157, Blumstein and Schwartz, 1983). Studies comparing hours spent on household chores in different types of couples have found that same-sex couples are more likely to share household tasks. Another consistent finding is that heterosexual women spend substantially more time on household chores than their husbands. Blumstein and Schwartz (1983) find, in one of the first studies on same-sex couples, that they more often than heterosexual couples prefer that both partners have an income. They suggest that one reason for this is that same-sex couples value a more fair financial situation. Kurdek (2007) find a more egalitarian division of labor in same-sex couples and suggests that this is because same-sex couples are more committed to "an ethic of equality in their relationships". In a survey of the research on same-sex couples in sociology and psychology in the US, Peplau and Fingerhut (2007) conclude that same-sex couples, in particular lesbian couples, have more egalitarian ideals than heterosexual couples. When studying the actual division of household chores, same-sex couples were indeed more egalitarian than the opposite-sex couple but they did not always live up to their own ideals as well as they thought.

Relevant for this paper are the studies on differences in earnings for individuals of different sexual orientation. Common findings in this literature is that gay men earn less than heterosexual men and that lesbians earn more than heterosexual women also when controlling for many individual and household characteristics (see for example Black et al., 2003, Plug and Berkhout, 2004 and Ahmed et al., 2011). Possible explanations are dis-



crimination, employers' expectation about higher or lower productivity of homosexuals due to stereotypes, or that homo- and heterosexuals have different preferences for work and leisure. Berg and Lien (2002) suggest that expectations about your partner's income can explain differences in the labor supply of hetero- and homosexuals. Given the fact that men have on average higher earnings than women, heterosexual women can expect a higher total household income when cohabiting with a partner than lesbian women can (and the opposite is true for heterosexual men). Once they are cohabiting the income effect caused by the partner's income is on average larger for heterosexual women than for lesbians. This gives lesbian women stronger incentives to work relative to heterosexual women. Since this would affect all lesbian women in the same way this argument does not predict any specialization within lesbian households. Becker (1991) also predicts less specialization in same-sex couples since the partners in same-sex couples have more similar human capital. Same-sex couples, Becker says, cannot enjoy the benefits of specialization based on gender differences in comparative advantages the way heterosexual couples can. Earlier empirical studies comparing specialization within same-sex and different-sex couples have in general found that heterosexual couples specialize the most and lesbian couples the least. The results for gay male couples have been somewhat more varied. Tebaldi and Elmslie (2006) finds that, among individuals who are married or cohabiting, lesbians are more likely to work and to work full time than heterosexual women. Gay men, on the other hand, are less likely to be employed and more likely to work part time if they work than heterosexual men. A consistent finding is that heterosexual men are the most likely to be employed, that heterosexual women are the least likely, and that heterosexual couples are most likely to have only one partner employed (Leppel, 2009, Black et al., 2007). Leppel (2009) further finds that the presence of young children decrease the probability of employment for heterosexual women and gay men but not for lesbians and heterosexual men.

Antecol and Steinberger (2013) stresses the point that when comparing same-sex and different-sex couples it is important to also take into account differences in labor supply between the partners in same-sex couples. They compare the earnings of primary and secondary earners in lesbian couples and compare them with the earnings of men and

women in heterosexual couples. They find that the within couple income gap is smaller in lesbian couples but that the lesbian primary earners' labor supply is closer to that of heterosexual men and that lesbian secondary earners' labor supply is closer to that of married heterosexual women. They also find that the presence of children can explain a large part of the unconditional difference in labor supply between secondary earner lesbian partners and married heterosexual women. Giddings et al. (2014) find that same-sex couples are less likely to choose a high degree of specialization, also when controlling for the presence of children. They also find that the "specialization gap" between same-sex and different-sex couples has narrowed substantially across cohorts with smaller differences between same-sex and different-sex couples of younger generations. Jepsen and Jepsen (2015) studies earnings-gaps as a proxy for specialization and find that heterosexual couples have the largest gaps, lesbian couples have the smallest gaps and gay male couples are more similar to heterosexual couples. When it comes to hours worked however male same-sex couples are more similar to lesbian couples who in general have small differences in hours worked.

Most of the studies mentioned above use data from the U.S. There are however a few studies comparing the financial situation for same-sex and different-sex couples in Sweden. Ahmed et al. (2011) compare the individual, household and within couple differences in earnings in gay, lesbian and heterosexual couples in Sweden. They find that lesbian couples have more equal earnings than heterosexual couples, and that gay couples have the largest within couple income gaps. They also show that the total household income of lesbian couples is lower than that of both heterosexual and gay households. Aldén et al. (2015) studies the effects of entering registered partnership or marriage for couples of different gender compositions in Sweden. They find that entering a legal union had similar positive effects on fertility for lesbian and heterosexual couples but that the earnings gap within couples became larger only in heterosexual couples. Andersson et al. (2006) study the demographic characteristics of same-sex couples in registered partnerships in Norway and Sweden. They find that lesbian couples are more similar in terms of age, education and annual earnings than male couples. They also find that the risk of separation is larger in lesbian couples: 30 % separate within five years compared to 20 %

of the male couples. The corresponding number for heterosexual couples is 13 %.

The presence of children seems to be particularly important as a cause of increased specialization, at least for heterosexual couples. Angelov et al. (2016) shows that in Sweden the within couple labor income gap is widened by 32 percentage points 15 years after childbirth, as compared to the income gap before the couple had children. This is mostly caused by a large decrease in women's market labor supply when becoming mothers. The wages are affected only in the long run. The gender wage gap has increased by 10 percentage points 15 years after the first child is born. Angelov et al. (2016) also show that the spousal differences in pre-childbirth income and years of schooling matter for the spouses' division of labor post childbirth. They use quantile regressions to study the effect of the size in pre-parenthood income gap on the income gap post childbirth. In households where the woman's income is relatively higher than the man's, the spouses have a more even division of labor, but the woman still bears a larger financial cost of parenthood. In a study on Danish register data, Kleven et al. (2015) show that the female child penalty in Denmark of around 20 percentage points, 10 - 20 years after childbirth, compared to the earnings level before childbirth. There is no evidence of an earnings penalty for men when becoming fathers. Their results indicate that most of the remaining gender gap in earnings in Denmark can be explained by the dynamic effect of having children.

For lesbian couples the link between entering parenthood and an increased specialization is not as clear. Since there is no apparent way to assign child care and housework according to traditional gender norms within a couple consisting of two women, other factors such as economic opportunities or preferences might be more important as determining factors in these couples. Earlier studies have however found that biology also matters in these couples in the way that the biological mother, who gave birth to the child, typically spends more time taking care of the child she gave birth to. Still, the non-biological mother spends more time with the child than heterosexual fathers, and in general lesbian parents divide the child care in a more equal way than heterosexual couples (Badgett, 2003, p. 159). This result has been found in a number of studies for example in Reimann (1997) who studies 25 middle-class lesbian couples with children in the US through in-depth interviews. She concludes that the couples' division of labor is affected mostly by

the partners' preferences, economic considerations, and a strong commitment to shared motherhood and equality. Her analysis shows that biological motherhood initially gives the birth mother a closer bond to the child, but that this usually does not result in long term specialization of labor between the biological and non-biological mother. Patterson et al. (2004) compare the division of labor in 33 lesbian and 33 heterosexual parenting couples in the U.S.. They conclude that the lesbian couples, influenced by ideals about equality, were more likely to divide paid and unpaid work evenly, while heterosexual couples were more likely to specialize, mostly because of the better income opportunities of men in the labor market. Tornello et al. (2015) study the division of labor among 335 self-defined gay men in the U.S. with children living in the household. They, like lesbian couples, reported egalitarian ideals about, as well as actual equality in, the division of labor in their relationships. In a recent dissertation in psychology, Malmquist (2015) conducts in-depth interviews with lesbian couples with children in Sweden. In most cases, both partners spend long periods on parental leave, the birth mother typically taking the first period of leave. The couples often motivated their choice with the importance of equality between the partners and giving both parents a chance to form a close relationship with the child. Some couples perceived equality within the relationship when having children as a spontaneous achievement while others described it as the outcome of hard work. A minority of the couples divided the parental leave and parental roles in a way more similar to those in a traditional heterosexual couple, where the birth mother was seen as the child's primary parent.

### **3 Institutional setting for parents in Sweden**

In the following section there will be a short description of the rights and legal conditions for same-sex and opposite-sex couples with children in Sweden.<sup>1</sup>

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<sup>1</sup> The information presented below is gathered mostly from the official homepages of the Swedish government, the Swedish parliament (Riksdagen), the Swedish Tax Agency (Skatteverket), The National Board of Health and Welfare (Socialstyrelsen), The Swedish Social Insurance Agency (Försäkringskassan), The Swedish Federation for Lesbian, Gay, Bisexual and Transgender Rights (RFSL) and other LGBT organizations.

### **3.1 Parental leave and other rights and benefits for Swedish parents**

The Swedish parental leave system is one of the most generous in the world and was first introduced in 1974. For each child the parents can take at most 480 days of parental leave. Out of these, 390 days have a replacement rate that is proportional to each parent's income and for the other 90 days the replacement rate is on a basic level. Out of the 390 days at a higher replacement rate 60 are tied to each parent. The rest of the days can be split in any way the couple chooses. In order to utilize the parental leave the individual must be a legal parent of the child or live with the child's legal parent and either 1) already have children together, 2) be married or 3) be registered partners. Thus it is possible to take up parental leave benefits also for a partner who is not (yet) legally recognized as the child's parent. However this opportunity has been open to same-sex partners only since 2003.

Parents have a legal right to stay at home full time with job protection until the child is 18 months old. Thereafter the parents have the right to reduce their working hours up to 25 percent until the child turns 8 years old. If the child is sick and cannot attend school/pre-school the parents or another adult who has a close relation to the child can stay at home from work taking up temporary parental leave for a maximum of 120 days a year. The replacement rate for the temporary parental leave is proportional to each parent's income.

The extensive rights of Swedish parents thus give great opportunities for both parents to combine a career in the labor market with taking an active part in the child care. However women use around 75 percent of the parental leave days, and work part time when having small children to a much greater extent than do men.

### **3.2 Legal conditions for same-sex couples with children**

Nowadays same-sex and opposite-sex couples enjoy practically the same rights when it comes to marriage, inheritance, parental rights and so on. However this has only been the case for the last few years. Same-sex relationships were first legally recognized in Sweden in the Homosexual Cohabitees Act (Lagen om Homosexuella Sambor) in 1988 and in the Registered Partnership Act (Partnerskapslagen) in 1995. The Registered Partnership Act gave same-sex couples who registered as partners some of the rights of married couples

but did not enable them to for example both become legal parents of the same child.

In February 2003 the law was changed so that a child could have two legal parents of the same gender. This meant that same-sex couples could adopt children together and that it was possible to adopt your registered partner's biological child. In almost all of the same-sex adoption cases since 2003 the adopting parent has adopted his or her partner's biological child. It has turned out to be very difficult for same-sex couples to adopt children that are not the biological child of either one of the partners, and very few such adoptions have occurred.

In July 2003 the Cohabitees Act (Sambolagen) was changed so that same-sex couples could be legally recognized as cohabitees under the same legislation as heterosexual couples. According to the Cohabitees Act, if a cohabiting couple has a child the birth mother of the child automatically becomes a legal parent. Her partner on the other hand has to register as the child's parent at the Swedish Tax Agency (Skatteverket). Before being able to register, the parenthood is determined by the Social Welfare Committee (Socialnämnden) in the municipality where the child lives. After the registration the birth mother's partner is also recognized as the child's legal parent. The registration can be done even before the child is born.

The process of registering a partner as the child's legal parent sounds pretty straight forward. However for same-sex couples that is not always the case. The female partner of a birth mother can only register as a child's parent if the child has been conceived by insemination or IVF at a Swedish clinic. Insemination for lesbian couples has only been available in Sweden since July 2005<sup>2</sup>. If the child has been conceived through insemination in another country or with the help of a private donor, the non-biological parent has to adopt her partner's child in order to become the child's legal parent. The adoption process can start after the child is born and usually takes between a few months

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<sup>2</sup> The couples must be married, cohabiting or registered partners to get access to the treatment. Formally the law about insemination and IVF does not differ for lesbian and heterosexual couples. However the counties, who are responsible for health care services, have often chosen to treat lesbian and heterosexual couples differently. In some cases lesbian couples have had to pay up to 12,000 SEK per insemination while the fee for opposite-sex couple has been much lower (a few hundred SEK). In some counties lesbian couples have not gotten as many attempts of conceiving as have heterosexual couples. These rules have become more equal in the last few years.

up to a year. However if the parents are registered partners the non-biological mother can also stay on parental leave during the adoption process.

For male same-sex couples it is still rather difficult to become parents. In most cases male same-sex couples have had children through surrogacy abroad (surrogacy is not legal in Sweden). In these cases the biological father can register as the child's legal parent while his spouse has to adopt the child.

In May 2009 same-sex marriage became legal in Sweden. Formally all married couples have the same rights. However when an opposite-sex couple has a child the husband is assumed to be the father and is automatically given all parental rights. Married same-sex couples still have to register as parents or adopt their spouse's biological child to both become legal parents.

## 4 Identification and empirical strategy

### 4.1 Estimating the effect of parenthood on the division of labor in couples

To investigate the effect of entering parenthood on the division of labor in couples, labor market income will be used as a proxy for the labor supply of each spouse. The within couple difference in labor market income will be used as a measure of the difference in spousal labor supply. Labor income can be said to be a measure of both effort (wage) and the amount of work (hours). However when studying changes in labor income over time for the same individual this can be interpreted as changes in the amount of work, rather than changes in effort, especially if there is a large increase or decrease in labor income comparing two consecutive years.

The empirical model presented below, equation 1, (which is much like the one used in Angelov et al. 2016) estimates the effect of entering parenthood, which happens at time period 0, on the income gap between spouses 1 and 2 in couple  $i$ :

$$(\ln y_1 - \ln y_2)_{it} = c + \gamma (\ln y_1 - \ln y_2)_{i,t-2} + \sum_{k=0}^T \alpha_k 1_{t=k} + \beta X_{it} + \epsilon_{it} \quad (1)$$

where  $t \geq -1$ ,  $i$  denotes the couples,  $X_{it}$  is a vector of control variables for couple  $i$  at

time  $t$  and  $\epsilon_{it}$  is an error term that measures couple and time specific heterogeneity.

The dependent variable is the difference in log income between spouses 1 and 2 in couple  $i$  at time  $t$ . By using the log transformation, the spousal income gap can be interpreted as the percentage difference in income. The model controls for the pre-childbirth income gap in time period  $-2$ . The estimated  $\alpha_k$  can be interpreted as the percentage change in the income gap at time  $t$  compared to the gap in the pre-childbirth period. This specification identifies the effect of an event at time 0 (childbirth) on the difference in income between spouses. The assumption of strict exogeneity of the treatment on the outcome variable in this case implies that the time of childbirth needs to be exogenous to the changes in the spousal income gap. Under the assumption that the timing of childbirth is not induced by expectations about changes in the spousal income gap, the  $\alpha_k$  parameters for time periods  $t = 0$  to  $T$  identify the effects of entering parenthood on the within couple income gap for each year after the child is born. By studying the population of couples who have children together, the choice to form a family is left outside the analysis.

#### 4.2 Estimating the impact of gender composition in couples on the division of labor after childbirth

To study the impact of the parents' gender, I compare the behavior of couples with different gender composition. More specifically I compare the division of labor in lesbian and heterosexual couples before and after having children. For the purposes of this paper, identification rests on the assumption that sexual orientation does not determine the individual's ability in the labor market after childbirth. Under this assumption it is possible to estimate the impact of the parental gender composition on the division of labor after childbirth by comparing lesbian and heterosexual couples, similar in observable pre-childbirth characteristics. The following difference-in-differences model captures the impact of the gender composition in couples on the change in the income gap after entering parenthood:

$$(\ln y_1 - \ln y_2)_{its} = c + \gamma (\ln y_1 - \ln y_2)_{i-2s} + \theta_s + \sum_{k=0}^T \alpha_k 1_{t=k} + \sum_{k=0}^T \lambda_{sk} 1_{t=k} + \beta X_{it} + \epsilon_{it} \quad (2)$$



As before the  $\alpha_k$  parameters identify the effect of parenthood on the within couple income gap for each year after the child is born.  $\theta_s$  is a dummy for the gender composition of couple  $i$  (where  $\theta_s = 1$  if lesbian,  $\theta_s = 0$  if heterosexual) and captures the difference in income gap between lesbian and heterosexual couples in the year before childbirth. The  $\lambda_{sk}$  parameters capture the interaction effect of being a lesbian couple in a specific time period compared to being a heterosexual couple in that period. In other words they estimate the difference between lesbian and heterosexual couples in the change in the income gap between time  $t=-1$  and  $t = k$ . Hence the  $\alpha_k$  parameters identify the baseline effect of parenthood for heterosexual couples. In order to identify the impact of the gender composition on the division of labor in lesbian and heterosexual couples after becoming parents, it is important to estimate equation 2 only on lesbian and heterosexual couples who had similar specialization patterns before childbirth. In this setting, this is equivalent to the assumption of parallel trends in the outcome variable before treatment. For the parallel trends assumption to be valid, the income gaps in lesbian and heterosexual couples must develop in the same way before the "treatment" (in this case having children). That is, the income gap cannot be for example growing in heterosexual couples while diminishing in lesbian couples in the years before childbirth. If so the model does not estimate the difference in the effect of entering parenthood between the two types of couples but rather just captures a general difference in trends in the development of the income gaps that started already before childbirth. Even if sexual orientation can be assumed to be "exogenous" in the ways that it is not a choice variable or endogenously determined by life events after birth, the sample of lesbian and heterosexual couples cannot be assumed to be a random draw from the populations of couples in Sweden. There is a risk that lesbian and heterosexual couples might be systematically different in characteristics other than the gender composition that can affect the income gap.

To get comparable samples I match lesbian and heterosexual couples based on pre-parenthood characteristics that may determine the income gap in couples. In this way I can estimate the model on a sample of lesbian and heterosexual couples that are as similar as possible in labor market characteristics before becoming parents. I use a matching method similar to the one in Mörk, Sjögren, and Svaleryd (Mörk et al.) and Lundin

et al. (2008). All couples are divided into  $J$  different household types, one type for each possible combination of values of specific household characteristics. Observations in household types in which there is no common support (both lesbian and heterosexual couples) are dropped from the sample. The following model is estimated on the sample of matched couples:

$$(\ln y_1 - \ln y_2)_{its} = c + \gamma (\ln y_1 - \ln y_2)_{i-2s} + \theta_s + \sum_{k=0}^T \alpha_k 1_{t=k} + \sum_{k=0}^T \lambda_{sk} 1_{t=k} + \beta X_{it} + FE_j + \epsilon_{jt} \quad (3)$$

As before the  $\alpha_k$  parameters identify the effect of parenthood on the within couple income gap for each year after the child is born for the baseline heterosexual couples.  $\theta_s$  is a dummy for the gender composition of the couples that in this equation captures the average difference in income gap between lesbian and heterosexual couples before childbirth within a household type.

By adding household type fixed effects, the  $\lambda_{sk}$  parameters are estimated comparing only lesbian and heterosexual couples within the same household type. In this way it is possible to control for household characteristics that may affect the pre-childbirth income gap and differ systematically between the two types of couples. For the  $\lambda_{st}$  parameters to be unbiased, the parallel trends assumption needs to be fulfilled. In this setting this means that there can be no systematic difference between lesbian and heterosexual couples in the development of the income gap within the same household type before childbirth. If this assumption is fulfilled then the  $\lambda_{st}$  parameters can be said to estimate the impact of the gender composition on the change in the spousal income gap post childbirth comparing couples within the same household type. The error terms are clustered at the household type level and measure household type time specific heterogeneity.

### 4.3 Defining the income gap within couples

In most studies on heterosexual couples the income gap is defined as the man's income minus the woman's. To compare the income gaps in lesbian and heterosexual couples the gaps in both types of couples, in my opinion, need to be measured in the same way.

(However this is actually not the case in many studies comparing same-sex and different-sex couples.) In this study the main question is about the impact of gender. Thus it seems natural to divide the heterosexual couples according to this variable. That is to define the income gap as the man's income minus the woman's. Since in heterosexual couples it is always one partner (the woman) who gives birth to the child, defining the partners in lesbian couples by their birth giving status seems like the obvious choice. Thus, henceforth spouses 1 and 2 in the empirical model are defined as the man (1) and the woman (2) for the heterosexual couples and as the partner (1) and the birth mother (2) in lesbian couples.

#### **4.4 Possible threats to identification**

The basic assumption for  $\lambda_{sk}$  to capture the impact of the gender composition in couples on the spousal income gap post childbirth, is that given the same pre-childbirth characteristics in a household type any difference in behavior between lesbian and heterosexual couples is due to the difference in gender composition of the couples. However there are reasons to believe that even when comparing lesbian and heterosexual couples that have been matched on observed pre-childbirth characteristics they may differ in ways that could affect labor supply and the division of labor after having children.

One obvious difference is that the partners in lesbian couples can choose which of the partners is to give birth to the child. Also, for lesbian couples, becoming parents is more often a planned event. This means that the "treatment" of becoming parents is not exactly the same thing for the two types of couples. Lesbian couples may choose the partner who is best suited to give birth based on health reasons, labor market position or the partners' preferences for giving birth. The choice may also be the result of a within couple bargaining. In that case the partner with stronger bargaining power may bargain to give birth or not to do so depending on her preferences. She may also bargain for a certain division of labor after childbirth. Thus the decision process behind the choice of birth mother could be correlated with the division of labor after childbirth.

While heterosexual relationships are seldom questioned, the choice to enter a same-sex relationship may cause some social frictions and discrimination towards the individ-

ual. The choice to "come out" may be endogenous to other variables such as family background, financial independence and living area. There is probably a selection among gays and lesbians in the choice to enter such a relationship and have children together. Embracing your sexual orientation may also in itself affect the individual in many ways, for example by inducing more liberal values on family life. There are thus arguments to believe that lesbians and heterosexuals who form families may be different also in unobserved characteristics.

Besides the differences in characteristics between lesbian and heterosexual couples there may also be differences in how external factors affect the couples. For example, labor market opportunities may be affected by discriminatory attitudes among employers towards women and LGBT-persons. Gender discrimination in the labor market would affect both spouses in a lesbian couple, but only one of the spouses of an opposite-sex couple. Discrimination due to sexual orientation only affects lesbian couples. However such discrimination would be present also before childbirth. Thus discrimination due to sexual orientation is only a concern if it leads employers to treat employees differently after they become parents.

There are thus reasons to believe that lesbian and heterosexual couples, even though similar in many observable characteristics, still will differ in ways that affect the division of labor after childbirth. Therefore, estimates achieved using the strategy described above cannot be interpreted as a precise estimate of the causal effect of the gender composition in couples, but can still give an informative measurement on the difference in behavior between lesbian and heterosexual couples.

## **5 Data, descriptive statistics and sampling method**

The empirical analysis will be performed on Swedish registry data covering all residents of Sweden aged 16-65, during the period 1990 to 2010. In this data it is possible to see how many children in different age categories that are living in the household. The data contains information on the individual's biological and adopted children and their birth order for children born up until 2009. It is also possible to link spouses, registered partners and cohabitees (provided they have children together). Same-sex couples can

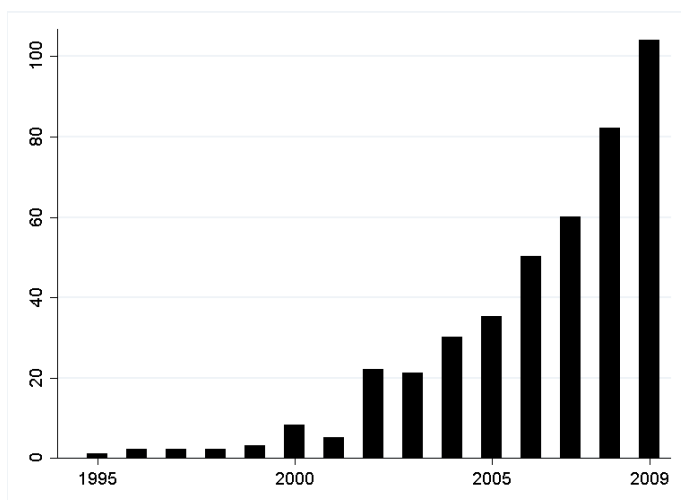
thus be identified in the data from 1995 and onwards since the Registered Partnership Act was implemented in that year. Besides family relations the data also contain information on labor market income, wages, educational level, parental leave benefits, municipality of residence, sex, age and other socioeconomic variables. Information on income comes from annual reports from employers to the Swedish Tax Agency. Thus one can only observe total annual income.

From this data I sample all same-sex and opposite-sex couples who were registered partners, cohabitees or married during the year 1995-2010. Out of these I keep all couples who had their first child together during that period. I exclude the couples where either of the spouses already had children from an earlier relationship. Thereafter, I sample information about these individuals for all the years 1990-2010. With this sampling method I can track the labor market income of each individual between five and 20 years before they had their first child and up to 15 years after. Following couples over years allows for an analysis of how the individuals' incomes and the income gap between spouses develop over time. Thus it is possible to capture the short and long term impact of having a child on the spouses' incomes as well as on the gap in labor market income in the household.

A number of 538 same-sex couples who had their first child together during the period can be identified in the data (couples where none of the partners had children from a previous relationship). Almost all of them are lesbian couples; only 36 are male same-sex couples. The main reasons for this are that in male couples none of the partners can give birth, adoption is largely unavailable for same-sex couples and surrogacy is not permitted in Sweden. *Figure 1* shows how many of these same-sex couples had their first child in each year. There is a vast increase in same-sex couples having children together over the period reflecting a response to legislative changes and changed attitudes in society. Due to lack of data linking children to their parents in 2010 the number for this year is underestimated and therefore not presented in the figure. During the same time period, 1995-2010, around 500,000 heterosexual couples who had their first child together can be identified.<sup>3</sup>

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<sup>3</sup> Please note that because of the differences in legal conditions and attitudes in society these numbers do not reflect the proportion of persons of different sexual orientations in the population.



**Figure I:** Number of same-sex couples who had their first child together in a certain year during the period 1995-2009 (couples where none of the partners had children since before). No same-sex couples can be identified before 1995. Due to lack of data linking children to their parents in 2010 this year is excluded from the figure.

## 5.1 Sample restrictions

Due to both ethical concerns and for statistical reasons (lack of observations) male same-sex couples are dropped from the sample. The empirical analysis is thus performed on the sample of lesbian and heterosexual couples only. In 389 out of the 502 lesbian couples it is possible to identify which partner is the biological mother of the child.<sup>4</sup> All of these couples had their first child together in the period 1996-2009. This subsample of 389 lesbian couples will be used in the analysis below. Most of the lesbian couples have children during the latter part of the period (when the legislation had become more favorable). For this reason the statistical analysis for the lesbian couples will be performed only up until 7 years post childbirth.

Out of all opposite-sex couples I keep a sample each year that is proportional to the number of lesbian couples in that year. This is because the number of lesbian couples with children increases vastly during this period. Since the real wages also increased significantly I need to adjust for this or else the income levels of the two groups will not be comparable. After taking a sample of opposite-sex couples proportional to the number of lesbian couples for each year, 73,507 opposite-sex couples remain.

<sup>4</sup> In 103 couples the child cannot be identified as either the biological or adoptive child of either partner mostly due to lack of data linking children to their parents in 2010.

**Table I: Descriptive statistics at couple level.**

	Heterosexual couples	Lesbian couples
First child's birthyear	2007 (3)	2007 (3)
Age at child birth, father/partner	32.2 (5.0)	33.6 (6.1)
Age at child birth, (birth)mother	29.9 (4.4)	32.9 (4.4)
Difference in age	2.4 (3.9)	0.7 (5.5)
Years of schooling, father/partner	13.9 (2.8)	14.6 (2.5)
Years of schooling, (birth)mother	14.5 (2.7)	14.6 (2.6)
Difference in years of schooling	-0.6 (2.8)	0.0 (2.7)
Yearly labor income, father/partner	279 (211)	218 (147)
Yearly labor income, (birth)mother	207 (148)	242 (143)
Difference in yearly labor income	72 (206)	-24 (181)
Number of couples	73507	389

Descriptive statistics (means) for heterosexual and lesbian couples. All statistics are for two years before the first child's birth. Yearly labor income in 1000's SEK, 2008 prices. Standard deviations in parentheses.

## 5.2 Descriptive Statistics

*Table I* gives some descriptive statistics for the 389 lesbian couples and the proportional sample of 73,507 opposite-sex couples described above. Due to the sampling method the average year for the first child's birth is the same for both groups. The lesbian couples are divided into the partner who gave birth to the couple's first child, who is referred to as the birth mother, and the other partner.

The lesbian birth mothers are on average a few years older than heterosexual women when having their first child. The partners in lesbian couples are more similar in age. In years of schooling heterosexual and lesbian woman are on par, while men have slightly lower levels. Lesbian couples are also more similar in yearly labor market income than heterosexual couples.

*Table II*, column 1, shows the coefficients when estimating an OLS regression on the

**Table II: Likelihood of being birth mother.**

	Lesbian couples	Heterosexual couples
Yearly labor income	0.0000369*** (0.0000132)	-0.0000450*** (0.0000173)
Age	-0.00440 (0.00413)	-0.0257*** (0.000338)
Years of schooling	-0.00627 (0.00737)	0.0380*** (0.000507)
Constant	0.642*** (0.151)	0.812*** (0.0104)
Number of individuals	742	144832

OLS regressions on the likelihood of being the birth mother in lesbian and heterosexual couples. Robust standard errors in parentheses.

likelihood of being the birth mother in a lesbian couple.<sup>5</sup> The only factor that significantly increases the likelihood of being the birth mother is a higher labor income. For comparison column 2 presents the same estimations performed on the heterosexual couples. Since these couples cannot choose who should give birth the estimates confirm that the heterosexual women are on average younger, have lower income and more years of schooling than their male partners.

### 5.3 Graphical Analysis

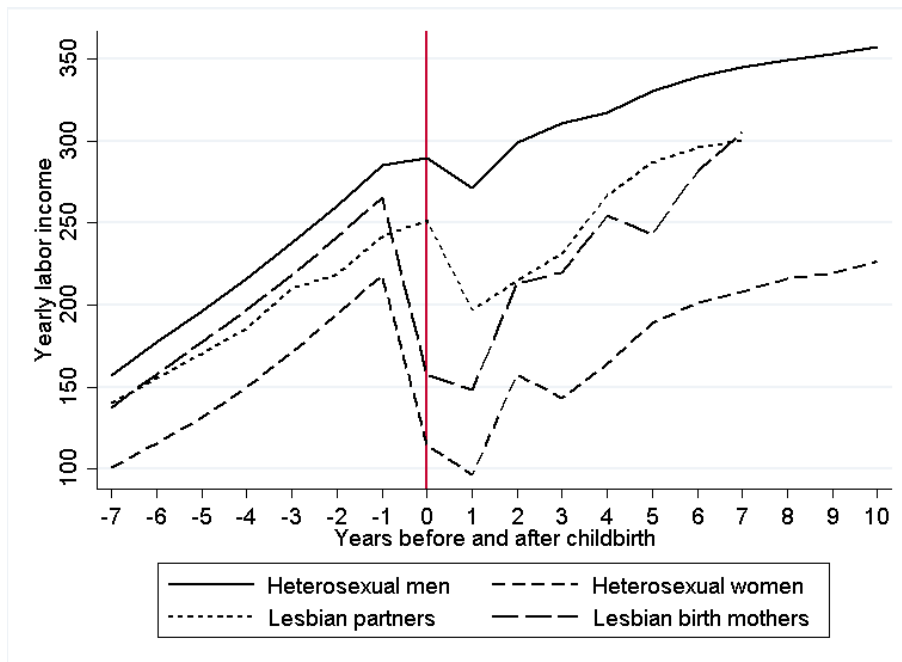
This section presents some graphical evidence on how the raw labor income gap in lesbian and heterosexual couples is affected by having children.

*Figure II* below shows the average annual labor market incomes of the spouses in heterosexual and lesbian couples before and after the birth of their first child (which happens in time period 0). Separate income trajectories are drawn for men and women in heterosexual couples and for the birth mothers and their partners in lesbian couples.

The average spousal income gap is larger in heterosexual couples before childbirth. In the lesbian couples the birth mother of the first child has on average higher income before childbirth as was found in the descriptive tables. In the birth year of the first child the income of both the birth mothers in lesbian couples and heterosexual women drops significantly. The graph suggests that the birth mother in lesbian couples takes more time

<sup>5</sup> Couples where at least one of the partners is above 45 years old at the time of the child's birth have been dropped from the sample in order to only include couples who can choose either partner as birth mother.





**Figure II:** Income trajectories (in 1000's SEK, 2008 prices) of men and women in heterosexual couples and the birth mothers and their partners in lesbian couples before and after childbirth.

off work than her partner in the first year of the child's life.

Heterosexual men display a changed trend in their income trajectory in the birth year of the child and a drop in income in the following year. The fathers' incomes recover quickly however and resume a positive trend. The lesbian partners seem largely unaffected in the birth year of the child but experience a drop in their incomes in the next year.

Heterosexual mothers keep falling behind, their incomes increasing but not reaching their pre-parenthood level for many years. The lesbian birth mothers' incomes recover a bit faster. Two years after becoming parents and onwards the average income gap in lesbian couples seems to be small. Heterosexual couples, on the other hand, continue to have a large average income gap, vastly larger than before becoming parents.

The graph can also be seen as an informal test of the parallel trends assumption in the difference-in-differences analysis when comparing lesbian and heterosexual couples. *Figure II* shows that the income gaps in lesbian and heterosexual couples cannot be assumed to develop in the same way before childbirth. Since the two types of couples also have vastly different income levels before having children, they are not comparable in

their labor market situation in the pre-childbirth period.

#### 5.4 Construction of household types

In order to get comparable samples of lesbian and heterosexual couples and to attain parallel trends in the development of the pre-childbirth income gap, a matching method is used as described in chapter section 4. All households are divided into  $J$  different household types, one type for each possible combination of values of specific household characteristics. All households in a specific household type should be as similar as possible in pre-parenthood characteristics that may affect the spousal income gap. The small sample of lesbian couples makes selecting the number and type of variables to use to define the household types a balance between finding as good and as many matches as possible for all couples. Even with the very large pool of heterosexual couples it is difficult to find matches for all lesbian couples when a too narrow definition is used to define the household types.

A transparent and straight forward choice is to match the couples based on their actual spousal income gap before childbirth. In this way all households within a household type will have similar differences in market labor supply before childbirth. The actual income gap also reflects the spouses' current labor market position and can be assumed to be closely related to earnings potentials in the future. Since income opportunities are strongly affected by the current labor market conditions in a certain year, the birth years of the child is another important factor to take into account.

In the analysis below the household types are defined based on the actual spousal income gap two years before childbirth, in intervals of 1,000 SEK in monthly earnings, and the birth year of the first child. Since information on monthly earnings is not available in the data the income intervals are defined as spans of 12,000 SEK in spousal gap in annual earnings. The spousal income gap in lesbian couples is defined as the partner's income minus the birth mother's. In heterosexual couples it is defined as the father's income minus the mother's. Matching on the spousal income gaps two years before childbirth is equivalent to matching on spans of the term  $(\ln y_{1i-2} - \ln y_{2i-2})$  in the econometric model. Thus by construction this term is roughly similar for all households of the same household

**Table III: Descriptive statistics. Household type level.**

	Heterosexual couples	Lesbian couples
First child's birthyear	2006 (3)	2006 (3)
Age at first child's birth, father/partner	32.2 (1.6)	34.0 (5.2)
Age at first child's birth, (birth)mother	30.2 (1.7)	33.2 (3.8)
Difference in age	2.0 (0.9)	0.8 (4.7)
Years of schooling, father/partner	14.0 (0.7)	14.7 (2.2)
Years of schooling, (birth)mother	14.7 (0.8)	14.7 (2.2)
Difference in years of schooling	-0.7 (0.9)	0.0 (2.5)
Yearly labor income, father/partner	221 (130)	217 (147)
Yearly labor income, (birth)mother	252 (146)	248 (149)
Difference in yearly labor income	-31 (216)	-31 (216)
Number of household types	235	235

Descriptive statistics for heterosexual and lesbian couples at the household type level. All statistics are for two years before first child's birth. Yearly labor income in 1000's SEK, 2008 prices. Standard deviations in parentheses.

type. The couples are divided into 235 household types. By defining household types in this way it is possible to find at least one match for all of the 389 lesbian couples and many more for most of them. Heterosexual couples who cannot be matched with lesbian couples are dropped from the sample. *Table III* shows descriptive statistics for the matched lesbian and heterosexual couples collapsed at the (household type) × (couple type) level. By construction the difference in yearly labor income and birth year of the first child are the same for the two couple types. The descriptive statistics show that the matching process produces a good match also on the levels of income of the spouses. There are still some differences in average age and years of schooling in lesbian and heterosexual couples within the same household type.

*Figure HB.I* in Appendix B shows the average annual labor incomes of the spouses in heterosexual and lesbian couples before and after becoming parents in the sample of

matched couples collapsed at the household type level. The graphs confirm that the matching on the spousal income gap two years before childbirth result in a good match also on the levels of income of the spouses. Note that with this matching method the average income of the father is lower than that of the mother in heterosexual couples before childbirth. The income trajectories of the fathers and the lesbian partners show a relatively similar trend in the years before having children. The incomes of the heterosexual mothers and the lesbian birth mothers are very similar in the three years before childbirth. A few years earlier on the other hand heterosexual women have lower average incomes. This might be a concern if it reflects a difference in productivity or earnings potentials between the two groups. The spousal income gap is by construction similar in lesbian and heterosexual couples two years before childbirth. Also one year and three years before childbirth the income gaps are reasonably similar in the two groups. However for earlier years the income gaps show different trends in the two samples. The parallel trends assumption thus seems to hold for the years right before childbirth, but perhaps not for earlier years. After entering parenthood the matched couples show a pattern that is quite similar to that in the full sample. The income gap widens vastly in heterosexual couples, whilst in lesbian couples it becomes smaller.

*Figure HB.II* in Appendix B shows density plots of the monthly spousal income gap (in 1000's SEK) in the lesbian and heterosexual couples for each time period,  $t = -2$  to  $t = 6$ , before and after childbirth (at time period 0). The graphs show the average spousal income gap at the (household type)  $\times$  (couple type) level. Again, because of the matching method, the spousal income gaps in lesbian (dotted lines) and heterosexual couples (solid lines) are the same at time  $t = -2$ . It is also quite similar in the year before becoming parents. There is however a clear difference in the development of the income gap in the two types of couples after having children. The income gap in the lesbian couples is centered close to zero (indicated by the vertical lines) for all time periods except the birth year of the child. For heterosexual couples the spousal income gap shifts very clearly to the right indicating that the fathers' income is higher than the mothers' in these time periods.

## 6 Results

The first step in the regression analysis is to estimate the average effect of entering parenthood on the income gap within lesbian and heterosexual couples separately. This is done primarily for illustrative purposes.<sup>6</sup> All tables can be found in Appendix A.

*Table HA.I* and *Table HA.II* present the results when estimating equation 1 (described in section section 4) on the samples of lesbian and heterosexual couples described in section section 5.1. That is, all lesbian couples and a proportional sample of heterosexual couples for each of the years 1996-2009. Equation 1 is estimated three times for each sample: In specification (1) no control variables are added, specification (2) includes controls for calendar years and specification (3) also controls for the within couple age difference and difference in years of schooling, immigration status of each spouse and type of municipality of residence.<sup>7</sup> The standard errors are clustered at couple level.

As can be seen in *Table HA.I* the effect of parenthood on the income gap within lesbian couples is positive and significant for the child's birth year ( $t=0$ ) and year 1 (the year when the child turns one year old). Note that by using the difference in the logarithm of the spouses' incomes, the gap between spouses can be interpreted as the percentage difference in income for small differences on the log scale. However since the log difference is a good approximation of the percentage gap only for small differences, the estimate of  $\alpha_t$  should be interpreted in order of magnitude rather than as a precise estimate of the percentage change in the income gap. For larger differences the log-points can be transformed into percentage points to get more precise estimates.<sup>8</sup>

The estimates of the  $\alpha_t$  can be interpreted in the following way for example for year 0: The income gap within lesbian couples changes about 87 log points (138 percentage

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<sup>6</sup> This part of the analysis is much like the one in Angelov et al. (2016) but with a slightly different model specification and on a sample drawn from a different time period. In Angelov et al. (2016) the analysis was performed on all opposite-sex couples in Sweden who had their first child together during the years 1990-2002.

<sup>7</sup> The municipality types are defined according to definitions used by the Swedish Association of Local Authorities and Regions (SKL).

<sup>8</sup> To transform a difference in log-points to percentage points the following transformation is used:

$$pp_k = 100 \times (\exp^{\alpha_k} - 1) \quad (4)$$

where  $\alpha_k$  ( $k = 0, \dots, 7$ ) are the parameters from equation 1.

points) in a positive direction when comparing the gap in the birth year of the child with the pre-birth gap. Since the average income gap in lesbian couples is negative before childbirth, this means moving from a negative to a positive income gap. In other words, entering parenthood changes the situation in lesbian couples from one where, on average, the birth mother has a higher income level (pre-childbirth) to one where the partner has a higher income (in the birth year of the child) since the gap is defined as the partner's income minus the birth mother's.

*Table HA.II* shows the results when estimating equation 1 on the sample of heterosexual couples. The estimates for the  $\alpha_t$  parameters are always positive and significant. Compared to the results in Angelov et al. (2016) the point estimates are smaller. Possibly this can be explained by a change in behavior of heterosexual couples over time. Angelov et al. (2016) studied couples who had their first child between 1990 and 2002, while most of the couples in my sample had their first child after 2002.

*Table HA.III* presents the results from the difference-in-differences regressions estimating the impact of the gender composition in couples on the change in the spousal income gap after entering parenthood. The columns represent three different specifications of equation 3 estimated on the sample of matched lesbian and heterosexual couples described in section section 5.4. As before, in specification (1) no control variables are added, specification (2) includes controls for calendar years and specification (3) also controls for the within couple age difference and difference in years of schooling, immigration status of each spouse and type of municipality of residence. All specifications include household type fixed effects. Standard errors are clustered at the household type level.

The table shows estimates for the  $\alpha_t$  (indicated by " $t = k$ "),  $\lambda_{st}$  (referred to as "Lesbian in  $t = k$ ") and  $\theta_s$  (referred to as "Lesbian") parameters in equation 3. Since the heterosexual couples are used as baseline, the  $\alpha_t$  parameters can be interpreted as the effect of entering parenthood on the spousal income gap for the heterosexual couples in the matched sample. The  $\alpha_t$  parameters are positive and statistically significant for all time periods. The estimated interaction effects of being a lesbian couple in a specific year are negative and statistically significant for all years. This indicates that being a

lesbian couple is associated with a smaller change of the spousal income gap post childbirth compared to the change in heterosexual couples. Reassuringly the estimates do not change much when adding calendar year fixed effects and other control variables.

The estimations presented in the table can be interpreted in the following way: The income gap in the heterosexual couples changes on average 110 log-points (200 percentage points) in a positive direction in the child's birth year compared to the pre-childbirth level in the most preferred specification i column (3). Since the pre-childbirth gap was negative, this indicates a change from a negative gap, where the father had a lower income, to one where he earns more. Being a lesbian couple reduces the change in the gap by on average 19 log-points (21 percentage points). The estimated coefficients associated with being a lesbian couple is larger for later time periods. This indicates that the difference in the development of the income gaps in heterosexual and lesbian couples increases over time. To see the effect of entering parenthood on the spousal income gap in lesbian couples one needs to add the coefficients for  $\alpha_t$  and  $\lambda_{st}$  in a specific time period. When doing so it appears that the effect of entering parenthood is much smaller in lesbian couples from time period 1 and onwards. For the last time periods the log-point change might even be negative for the lesbian couples, indicating that the income gap is now even more to the birth mother's advantage compared to the gap before childbirth.

Five years after having children the income gap in heterosexual couples has changed by on average 62 log-points (86 percentage points). For lesbian couples the change is on average 62 log-points smaller. This implies that five years after having children the income gap in heterosexual couples has changed to the fathers' advantage while in lesbian couples the income gap is of the same size as before becoming parents.

The  $\theta_s$  parameter captures the effect of being a lesbian couple on the income gap in time period  $t=-1$ , the year before childbirth. Since the couples are matched on the income gap in  $t = -2$ , whether this parameter is significant or not can be seen as an informal test of the parallel trends assumption that the income gaps in lesbian and heterosexual couples develop in the same way before parenthood. It is thus reassuring so see that the  $\theta_s$  coefficient is insignificant in all specifications.

As a further check of the parallel trends assumption, the specifications in *Table HA.III*

are estimated again adding pre-childbirth periods. For the parallel trends assumption to be credible the interaction terms  $\lambda_{st}$  should be precisely estimated around zero in the time periods before childbirth. If not the assumption of parallel trends in the development of the income gaps before childbirth is not confirmed. The results of this exercise can be found in *Table HA.IV*. The estimates are close to zero in the periods right before childbirth and there is no significant difference in the income gaps between the lesbian and heterosexual couples in the five years before entering parenthood. Based on this test I cannot reject the assumption of parallel trends in the pre-treatment period.

## 7 Discussion on possible mechanisms

In the following section I will discuss some possible mechanisms that might explain the estimated results presented in chapter section 6, that the gender composition in couples seems to have an effect on the division of labor between parents after childbirth. The regression tables discussed below can be found in Appendix A.

One important difference between heterosexual and lesbian couples is that for heterosexual couples a pregnancy may be unplanned, while in a lesbian couple a pregnancy is typically a planned event. If parenthood is more carefully considered in lesbian couples then this may affect the results. Marriage indicates a more stable relationship and therefore increases the likelihood that the pregnancy is planned. To investigate if this difference affects the estimates, column (2) of *Table HA.V* reestimates the baseline specification in column (3) in *Table HA.III*, dropping all heterosexual couples who were not married at least two years before having children. Column (1) replicates the results in column (3) in *Table HA.III*, the baseline results. This restriction of the sample makes the estimates slightly smaller but does not change the conclusion that there is a difference in behavior between the two types of couples.

Earlier studies have shown that the risk of separation is higher in lesbian partnerships than in heterosexual marriages (Andersson et al., 2006). The same pattern can be found in my sample where 13 percent of the lesbian couples, but only 7 percent of the heterosexual couples separate before the child turns eight years old. Since separation may affect the labor supply decisions of the spouses this may affect the income gap post childbirth. In



column (3) in *Table HA.V*, all couples who separate at some point during the estimation period have been excluded from the sample. This restriction makes the estimates for the interaction terms  $\lambda_{st}$  slightly larger for later time periods, indicating that among the couples who stay together the difference between lesbian and heterosexual couples is larger.

Column (4) in *Table HA.V* presents the results when the baseline specification is reestimated dropping all couples who had their first child before 2003. The legal framework changed in 2003 enabling both partners in a same-sex couple to be legally recognized as parents of the same child. This made the choice of entering parenthood less risky for both partners. Before 2003 the birth mother risked ending up having to bear all parental obligations including the financial. Her partner, on the other hand, risked ending up without any right to spend time with the child in case of separation. However estimating the model on couples who had their first child under the new legal framework does not change the results much. The estimates for the interaction term are larger for later time periods, but since with this restriction these estimates are based on very few observations they should be interpreted with great care.

### **7.1 Different effects of the pre-childbirth income gap**

It has been shown that the size of the pre-childbirth income gap matters for the division of labor after entering parenthood (Angelov et al., 2016). Column (2) of *Table HA.VI* presents the results when estimating the baseline specification only on households where the lesbian birth mother/heterosexual woman had a higher income than her partner two years before childbirth. Column (3) presents the results for couples where the father/partner had the highest income. Column (1) of *Table HA.VI* replicates the baseline results. Graphs of the income trajectories for the spouses in these samples can be found in Appendix B (*Figure HB.III* and *Figure HB.IV*).

The results indicate that the spousal income gap in heterosexual couples changes more to the woman's disadvantage if she has a higher income than her partner before childbirth. This is because regardless of her income level before childbirth, she has a lower income than her partner after becoming a mother. Thus if she had a higher income pre-childbirth

her income loss is larger.

As can be seen in *Figure HB.III* the income trajectories of lesbian birth mothers and heterosexual women follow each other closely before childbirth. So do the income trajectories of the fathers and lesbian partners. After childbirth the income trajectory of fathers is much closer to the one of the lesbian birth mother. The heterosexual women's incomes develop in a similar way to that of the lesbian partners. The spouses in heterosexual couples thus seem to switch roles in terms of relative incomes after becoming parents.

The estimated effect of being a lesbian couple is quite similar in both samples. Also among couples where the father/partner has a higher pre-parenthood income the lesbian couples have a smaller income gap post childbirth. The relative earnings of the spouses clearly matter for the division of labor after becoming parents. It is also clear that the income distribution before childbirth does not have the same effect for the development of the income gap after childbirth for lesbian and heterosexual couples.

## **7.2 Differences in the division of parental leave**

The division of the parental leave could have an effect on the division of labor later on. The partner who takes more time off work to be on parental leave will accumulate more child rearing abilities while the other partner will accumulate more labor market experience. Economic theory predicts that the couples should utilize this by specializing according to their comparative advantages (Becker, 1991).

*Table IV* describes the take up of parental leave and temporary parental leave during the child's first two years of life. Temporary parental leave can be used when the child is sick or by the father/partner to stay at home with the child and birth mother during the first two weeks after the child is born. The table shows that the division of parental leave and temporary parental leave is quite similar in the matched lesbian and heterosexual couples. Since the level of parental leave benefits depends on the individual's income, and the matched couples are very similar in terms of income before childbirth, a similarity in the total amount of benefits can be interpreted as a similarity in the total time on parental leave. Lesbian birth mothers and heterosexual mothers take up more of the parental leave benefits in the child's first and second year of life. This indicates that women who give

**Table IV: Division of parental leave and temporary parental leave benefits.**

	Heterosexual men	Heterosexual women	Partners in lesbian couples	Birth mothers in lesbian couples
Parental leave benefits at time=0	4 (12)	59 (43)	4 (11)	61 (46)
Parental leave benefits at time=1	30 (35)	74 (44)	42 (40)	72 (48)
Temporary parental leave benefits at time=0	7 (6)	1 (5)	6 (8)	1 (6)
Temporary parental leave benefits at time=1	3 (6)	1 (5)	2 (5)	2 (7)
Prob. any parental leave at time=0	0.24 (0.43)	0.91 (0.28)	0.23 (0.42)	0.89 (0.32)
Prob. any parental leave at time=1	0.72 (0.45)	0.96 (0.19)	0.76 (0.43)	0.94 (0.24)
Prob. any temp. parental leave at time=0	0.75 (0.44)	0.07 (0.25)	0.67 (0.47)	0.07 (0.26)
Prob. any temp. parental leave at time=1	0.39 (0.49)	0.27 (0.44)	0.40 (0.49)	0.28 (0.45)
Number observations	78824	78824	389	389

Total amount of parental leave and temporary parental leave benefits in 1000'th SEK, 2008 prices, taken up by the partners in the matched samples of lesbian and heterosexual couples during the child's first two years of life and the probability that they will take up any benefits in a specific year. Standard deviations in parentheses.

birth make a larger time investment in their newborn child than their partner, regardless of the partner's gender. The non-birth giving partner in lesbian couples takes up more parental leave in the child's second year of life than heterosexual fathers, but still significantly less than the birth mother. The temporary parental leave is also divided in a quite similar way in both types of couples. One reason that the birth-giving partners take up less temporary parental leave is that you need to be working in order to take up this benefit.

The fact that the partners in both lesbian and heterosexual couples do not divide the parental leave evenly means that the partners will accumulate different kinds of human capital during the child's first years of life. Economic theory predicts that this should lead to an increased specialization between the partners. However the results presented in chapter section 6 indicate that this effect is more pronounced in heterosexual couples. The uneven division of parental leave does not seem to affect the couples in the same way. In conclusion, a difference in time spent on parental leave does not seem to be the reason for the difference in the development of the income gaps later on.

### 7.2.1 Birth induced investments in children?

One may ask why the birth giving parent in both types of couples spends more time on parental leave. The fact that the (birth giving) mother takes a larger responsibility for the care of the child could be a consequence of her being the one carrying, giving birth to and breastfeeding the child. Some may see this as a biologically determined behavior. An economic argument would be that since women for biological reasons are induced to invest in child caring abilities they acquire a comparative advantage in terms of parenting skills. Becker (1991) argued that women, because of their larger biological investment in the child, will be more willing to invest time and money in raising it. Note that these arguments hold also for lesbian birth mothers suggesting that they would be expected to take a larger responsibility for the childcare. However if giving birth induces the woman to make a larger time investment in the child, then one would expect the birth giving partner in both types of couples to continue to make larger time investments in her child also when it gets older. This can be observed for heterosexual women, but not as much for lesbian birth mothers. The empirical analysis thus can confirm the theory about birth induced investments only for the child's first two years.

An alternative explanation is that the difference in time investments in the child between lesbian partners is caused by differences in preferences. Since lesbian couples can choose which partner will give birth it might be that they select the one with stronger preferences for taking care of children. Then the difference in time on parental leave between the lesbian partners reflects a difference in preference rather than a biologically induced behavior. However if lesbian partners select into giving birth because of a preference to devote more time to child rearing, then the birth mother would be expected to continue to act according to this preference in later years. The findings in this study cannot confirm this, since the general pattern in lesbian couples is that of very similar income trajectories a few years after childbirth. Also birth mothers who had a higher pre-childbirth income do not seem to specialize in home production (child care).

Another possible explanation is that there is a social norm that women who give birth to a child should be the primary care giver of that child at least during infancy. Immediately going back to work and letting someone else take the full responsibility for an

**Table V: Statistics on the couples' second child.**

	Heterosexual women	Partners in lesbian couples	Birth mothers in lesbian couples
Prob. gives birth to second child.	0.44 (0.36)	0.23 (0.40)	0.09 (0.26)
Years between first and second child.	2.08 (0.69)	2.77 (1.30)	2.68 (1.23)
Number of household types	235	235	235

Descriptive statistics for heterosexual and lesbian couples at the household type level. Standard deviations in parentheses. Due to data restrictions it is only possible to follow many individuals for a few years post the birth of the first child. For this reason the numbers in *Table V* underestimate the true fertility of the couples in the sample.

infant is often frowned upon. A norm that birth giving women should be the primary care giver of her infant would affect all couples in the same way. Hence this could explain the similarity in behavior when it comes to the division of parental leave regardless of the gender composition of the couple.

### 7.3 Differences in biological restrictions

A difference in biological restrictions between the two types of couples is that in lesbian couples typically both partners can give birth. Thus they have the opportunity to "take turns" giving birth thereby splitting the costs of pregnancy and nursing. If this is common it would affect the spouses' income trajectories since being the birth mother seems to induce a longer time spent on parental leave.

*Table V* shows the proportion of lesbian birth mothers (of the first child), lesbian partners and heterosexual mothers who give birth to a second child (for the lesbian partner this would be her first biological child). 44 % of the heterosexual couples but only 32 % of the lesbian couples have a second child during the period that they can be observed in the data. The table shows that it is more than twice as common that the partner of the first child's birth mother gives birth to the couple's second child as that the birth mother herself does so. It is more than four times as common that a heterosexual mother gives birth to a second child than that a lesbian birth mother (of the first child) does so.

If giving birth to a second child leads to a long period away from the labor market then this can explain some of the differences in the income trajectories between heterosexual and lesbian birth mothers. It can also explain why the income trajectories of the lesbian

partners are more similar for later years when the other partner may have spent more time on parental leave. The fact that lesbian partners take turns giving birth is perhaps unexpected. Since the birth mother of the first child has accumulated more childrearing specific human capital it would be expected that the same partner is selected again to carry and care for the second child. An explanation might be that only by giving birth can a woman in a lesbian partnership achieve biological motherhood. It can also be seen as a form of cost-sharing in lesbian couples since a longer time on parental leave can have negative consequence for your career.

To investigate how the opportunity to take turns giving birth impacts the development of the income gap in lesbian couples compared to that in heterosexual couples, the baseline specification is reestimated on three subsamples. Column (2) of *Table HA.VII* presents the results for couples who only have one child together during the period of analysis. Column (3) presents the results for couples where the partner of the birth mother in lesbian couples and the heterosexual mother gave birth to a second child. Finally column (4) presents the results for couples where the birth mother in lesbian couples and the heterosexual mother gave birth to a second child. Column (1) replicates the baseline results. Graphs for the income trajectories of the spouses in these subsamples can be found in Appendix B (*Figure HB.V*, *Figure HB.VI* and *Figure HB.VII*).

For couples who only have one child together the only significant difference between lesbian and heterosexual couples occurs during the second year of the child's life. The graph indicates that this is caused by the lesbian partners making larger time investments in the child during the first few years compared to heterosexual fathers. In these couples both lesbian birth mothers and heterosexual mothers experience a permanent negative effect of parenthood on their income trajectory. The results in column (3) reveal that letting the other partner give birth to the second child greatly affects the development of the spousal income gap when comparing lesbian couples with heterosexual couples who had another child. The income trajectories within the lesbian couples develop in a very similar way and the income gap is small compared to heterosexual couples who have a second child. In couples where the lesbian birth mother gave birth to a second child it seems that she has a substantially higher income than her partner before childbirth

(*Figure HB.VII*). This seems to affect the relative income trajectories of the partners in later time periods since after a few years the birth mother again has a higher earnings level than her partner, something that could not be observed in lesbian couples that only have one child together. Since this subsample consists of only 9 % of the lesbian couples and the parallel trends assumption is not fulfilled one cannot draw any conclusions from the regressions analysis for this sample.

The choice of birth mother of the children is clearly important for the development of the income gap in lesbian couples. Considering these results it seems that the fact that lesbian couples use the possibility to take turns giving birth is an important explanation for the income gap being on average smaller within these couples compared to heterosexual couples.

#### **7.4 Differences in the within couple decision making process**

Considering the results found in the empirical analysis, in what follows I discuss how the gender composition in couples can influence the decision making process in couples.

##### **7.4.1 Different “rules of thumb” for the division of labor**

It has been suggested that heterosexual couples use traditional gender roles as a rule of thumb when assigning tasks such as child rearing and providing for the family (Badgett, 2003). Since lesbian couples cannot use gender as a rule they may use some other principle when deciding on the division of labor at home and in the market. Previous studies have shown that lesbian couples who take on gendered roles (for example "butch" and "femme") do not assign household tasks according to these roles (Badgett, 2003, 157). Blumstein and Schwartz (1983) find that same-sex couples prefer that both partners have an income since this is perceived as more "fair". They suggest that fairness might be an alternative "rule of thumb" for same-sex couples. The results in this study give some support for this hypothesis. Especially for lesbian couples who take turns giving birth, the theory that lesbian couples use fairness as a rule seems to be accurate. These couples share the costs and benefits of biological motherhood and the division of labor market work after having children.

If heterosexual couples use gender as a rule for the division of labor this would influ-

ence the spouses to choose a gendered division of labor regardless of other factors such as relative earnings. When investigating the effect of the pre-childbirth relative incomes one can conclude that the pre-childbirth income gap does matter for the income distribution post childbirth, but that the effect differs between lesbian and heterosexual couples. In the case where the birth giving partner (lesbian or heterosexual) has a higher pre-parenthood income, the heterosexual couples still seem to specialize according to traditional gender roles. The lesbian couples on the other hand seem to be more influenced by their relative earnings potentials, letting the birth mother continue to be the main provider also after having children. In the case where the birth giving partner has a lower income pre-parenthood, both types of couples specialize to a higher degree after childbirth. However the income distribution in heterosexual couples is more unequal than in lesbian couples. It seems as if regardless of the relative earnings potentials of the spouses, the gender composition does influence the couples inducing heterosexual couples to have a more traditional division of labor.

In conclusion it seems as though the theory of gender as a rule of thumb can explain some of the difference in behavior between lesbian and heterosexual couples. For lesbian couples there is some support for fairness as a rule of thumb influencing their behavior.

#### **7.4.2 Differences in the bargaining process in couples**

The decision on the division of labor can be seen as an outcome of a bargaining process within the couple. The spouses' relative bargaining power is usually seen as determined by the spouses' outside options in case of divorce. This could be determined by for example age, nonlabor income or earnings capacity. Here I will focus on relative earnings as a proxy for bargaining power and the possible influence of gender norms.

There are reasons to believe that the bargaining processes in lesbian and heterosexual couples may differ. For example Alesina et al. (2011) suggest that gender could have a direct influence on relative bargaining power in heterosexual couples. If gender norms prescribe more bargaining power to the father in heterosexual couples, then this could explain the difference in outcomes between the two types of couples. This would enable fathers to successfully bargain to do less child rearing and invest more time in their careers



post childbirth even in the case where they have somewhat lower earnings pre-childbirth. This could explain why the division of labor in heterosexual couples is generally more to the husband's favor in terms of labor income compared to the pattern in lesbian couples.

Since the partners' gender could not have a direct influence on the balance of power in lesbian couples other factors such as relative earnings might actually be more important in these couples. A component that enters the bargaining process in lesbian couples, but not heterosexual, is the choice of which partner should give birth to the children. Since giving birth seems to induce a long period on parental leave this choice will affect the future income trajectories of the partners. If the partner with higher relative earnings is assumed to have a stronger bargaining power her preferences for biological motherhood will be a determining factor for the choice of birth mother and thus for the income distribution in the couples post childbirth. It seems reasonable to think that if the higher income partner bargains not to give birth, she is also less likely to have preferences for child rearing in later time periods. Thus it is likely that she will bargain for an uneven division of labor where she can spend more time on market work than her partner. The results discussed in section 7.1 confirm this as in couples where the higher income partner does not give birth there is an uneven division of labor after childbirth (even though smaller than in heterosexual couples).

In couples where the higher income partner has preferences for giving birth the division of labor is more even. The birth mother's income decreases as a consequence of spending time on parental leave. However after the initial drop in income the birth mother recovers more quickly than comparable heterosexual women (who also had higher income than her partner before childbirth). As can be seen in *Figure HB.III* the roles are sort of reversed post childbirth in heterosexual couples where the mother had a higher income before childbirth, a pattern that cannot be observed in lesbian couples. This difference in the division of labor in these couples post childbirth can be the result of a difference in the bargaining processes where in heterosexual couples the father's gender gives him an advantage, while in lesbian couples the birth mother has a stronger bargaining position because of her higher earnings potential.

In couples who only have one child together the birth mother's income is on aver-

age higher before parenthood, but is permanently lower than her partner's in the post-childbirth period. If the birth mother's partner does not have any preferences for biological motherhood this could explain why the income distribution is more to the partner's advantage in the post-childbirth period. Perhaps the non-birth giving partner's relative bargaining power is permanently improved after the birth mother's labor income drastically decreases after childbirth.

The most egalitarian among the lesbian couples are those where both partners have preferences for biological motherhood and who take turns giving birth. In these couples the partners' incomes develop in a very similar way due to the fact that they both make a large time investment in their biological child while being on parental leave. Thus both partners' preferences for giving birth affect the outcome of the bargaining process in these couples and are thus important for the division of labor and the development of the income gap in lesbian couples.

#### **7.4.3 The influence of gender norms and identity**

According to the gender identity theory proposed by Akerlof and Kranton (2000) individuals act in accordance with the norms associated with one's gender as it gives the individual utility to confirm his/her self-image. The individual also gets utility from seeing others act in accordance with their prescribed gender identity, and consequently it gives people a positive payoff/reaction to act according to these norms. Partners in a couple can thus increase both their own and the partner's utility by mutually confirming their own and their partner's gender identity.

If in heterosexual couples the spouses can gain utility both from acting to confirm their own gender identity and by seeing their spouse do so, then this can explain the gender specific division of labor after childbirth. The mother will do more of the "feminine" work such as household work and child care and the couple will actively choose to let the father be the main provider of the family to confirm his gender identity.

For the lesbian couples there is no obvious scope to increase the partners' utility by dividing the household and labor market work according to gender norms, since both partners have the same gender. An even division of "feminine" tasks in the household could

be optimal if both partners get utility from confirming their identities as women. Many associate pregnancies and caring for an infant as something that strengthens a person's identity as a woman. Perhaps this is why it is more common among lesbian couples who have more than one child together to give birth to one child each so that both partners can have this experience. When it comes to labor market opportunities and investing time in one's career, in lesbian couples there is no specific utility gain from prescribing one partner the role as main provider. Thus the partners can disregard gender identity as a factor when deciding on their labor market supply. There are economic arguments for letting both partners invest time in market work since this will make the family more financially secure in case one of the partners loses her job. The gender identity theory can thus explain why heterosexual couples have a more traditional division of labor than lesbian couples given the same pre-childbirth distribution of income.

## **8 Summary and concluding remarks**

When comparing lesbian and heterosexual couples with children in the whole population, lesbian couples have on average smaller income gaps before childbirth and a more egalitarian division of labor after becoming parents. Also when comparing a matched sample of lesbian and heterosexual couples with similar pre-childbirth income gaps, lesbian partners in general have more similar income trajectories a few years after having children. Lesbian and heterosexual couples are matched so that they have similar pre-childbirth income gaps and the birth year of the first child is the same. In this sample the spousal income gap in heterosexual couples on average changed 62 log-points (86 percentage points) more to the father's advantage five years after having children. For lesbian couples the change in the income gap is 62 log-points smaller. In other words, five years after having children the income gap in heterosexual couples has changed to the fathers' advantage, while in lesbian couples the income gap is essentially the same as before becoming parents. Thus it seems clear that, in this sample, the gender composition of the couple has a significant impact on the division of labor and market labor supply of the spouses after childbirth.

The birth giving partner in both lesbian and heterosexual couples spends more time

on parental leave in the first two years of the child's life. Consequently they experience a large decline in their labor market income directly after childbirth. In later years the division of labor in lesbian couples depends mainly on which partner gave birth to the child/children and the spouses' relative earnings before childbirth. Lesbian couples where the partners give birth to one child each are the most egalitarian.

The analysis shows that the difference in behavior is not primarily caused by differences in partnership stability, the fact that for lesbian couples parenthood is more planned or changes in legal conditions for lesbian couples. The spouses' relative earnings pre-childbirth affects the spousal division of labor in different ways in lesbian and heterosexual couples. Heterosexual couples show a gendered pattern of specialization after becoming parents regardless of their pre-parenthood income gap. In lesbian couples, if the birth giving partner had a higher pre-childbirth income, she will in general continue to be the main provider of the family also after childbirth.

The fact that lesbian couples can choose which partner should give birth to the child seems to be of great importance. This extra degree of freedom means that lesbian couples can split the costs and benefits of pregnancy and infant child rearing by taking turns giving birth to their children. Among lesbian couples who have a second child it is more common to let the other partner, who did not give birth to the first child, be the birth mother of the second child. The biological mother of each child, at least initially, usually takes the main responsibility for the care of that child. Hence the effect of childbirth on the income gap in lesbian couples depends to a large extent on which partner gave birth to the child/children.

The gender composition of the spouses could influence the decision making process in couples in several ways. It might be that heterosexual couples use traditional gender roles as a "rule of thumb" when making their decision. The spouses might also get a direct utility from acting to confirm their and their partner's gender identity, assigning "feminine" and "masculine" tasks according to gender norms. Lesbian partners might instead divide "feminine" tasks more evenly in order to confirm each partner's identity as a woman. There are some indications that a principle about fairness could influence the behavior of lesbian couples. The decision on the spouses' labor supply can also be seen as the outcome of a bargaining process. It has been suggested that men in heterosexual

couples have a stronger bargaining position as a direct effect of their gender. In that case men can more successfully bargain to do less child rearing and invest more time in their careers post childbirth. In lesbian couples gender cannot directly influence the relative bargaining power of the partners the way it can in heterosexual couples. Since in lesbian couples both partners can give birth the choice of who should be the birth mother also enters the decision making process. If the partner giving birth typically spends a longer time on parental leave, the choice of birth mother may lead to a change in the partners' relative earnings and consequently in their relative bargaining power. Thus each partner's preference for biological motherhood is an important factor for their future income trajectories and division of labor.

The results in this study indicate that parental gender does play an important role for the parents' division of labor at home and their labor market supply post childbirth. Since earlier studies on family economics has mostly concentrated on other factors, this paper contributes to the literature by presenting suggestive evidence that spousal gender does affect couple behavior. These results suggest that the impact of spousal gender should not be ignored in any economic analysis of the family.

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## **Appendix**

### **Appendix A - Tables**

**Table HA.I:** Effect of parenthood on spousal income gap. Lesbian couples.

	(1)	(2)	(3)
t=0	0.898*** (0.0996)	0.874*** (0.105)	0.867*** (0.109)
t=1	0.676*** (0.144)	0.704*** (0.169)	0.685*** (0.174)
t=2	0.137 (0.177)	0.184 (0.205)	0.122 (0.214)
t=3	0.242 (0.222)	0.290 (0.259)	0.239 (0.268)
t=4	0.328 (0.252)	0.381 (0.296)	0.323 (0.294)
t=5	0.0511 (0.239)	0.0984 (0.289)	-0.0258 (0.289)
t=6	-0.138 (0.296)	-0.0753 (0.368)	-0.203 (0.369)
t=7	-0.500 (0.351)	-0.437 (0.426)	-0.480 (0.429)
Constant	-0.0872 (0.0922)	0.796 (0.984)	0.902 (1.069)
Calendar year FE	No	Yes	Yes
Household controls	No	No	Yes
N	2048	2048	2048
Number of Cluster	389	389	389

**Table HA.II:** Effect of parenthood on spousal income gap. Heterosexual couples.

	(1)	(2)	(3)
t=0	1.040*** (0.00787)	1.059*** (0.00840)	1.054*** (0.00846)
t=1	1.420*** (0.0120)	1.444*** (0.0128)	1.437*** (0.0130)
t=2	0.838*** (0.0136)	0.862*** (0.0149)	0.853*** (0.0152)
t=3	1.000*** (0.0161)	1.028*** (0.0177)	1.017*** (0.0181)
t=4	0.732*** (0.0182)	0.763*** (0.0202)	0.747*** (0.0206)
t=5	0.503*** (0.0209)	0.539*** (0.0233)	0.520*** (0.0237)
t=6	0.431*** (0.0245)	0.474*** (0.0274)	0.450*** (0.0278)
t=7	0.369*** (0.0302)	0.415*** (0.0334)	0.381*** (0.0338)
Constant	0.163*** (0.00730)	0.147 (0.0915)	0.147 (0.101)
Calendar year FE	No	Yes	Yes
Household controls	No	No	Yes
N	345172	345172	345030
Number of Cluster	73507	73507	73507

Note: Table HA.I and Table HA.II present the results when estimating equation 1 on the samples of lesbian and heterosexual couples described in Table I. In column (1) no control variables are added, column (2) includes controls for calendar years and column (3) also controls for the within couple age difference and difference in years of schooling, immigration status of each spouse and type of municipality of residence. The standard errors are clustered at couple level.

**Table HA.III: Main results table.**

	(1)	(2)	(3)
t=0	1.099*** (0.0131)	1.107*** (0.0254)	1.105*** (0.0235)
t=1	1.499*** (0.0199)	1.513*** (0.0513)	1.509*** (0.0470)
t=2	0.917*** (0.0217)	0.949*** (0.0745)	0.944*** (0.0680)
t=3	1.091*** (0.0231)	1.132*** (0.0995)	1.127*** (0.0906)
t=4	0.816*** (0.0250)	0.867*** (0.125)	0.862*** (0.113)
t=5	0.558*** (0.0282)	0.621*** (0.150)	0.616*** (0.137)
t=6	0.432*** (0.0287)	0.507*** (0.176)	0.502*** (0.160)
t=7	0.353*** (0.0324)	0.433** (0.202)	0.427** (0.184)
Lesbian in t=0	-0.201** (0.102)	-0.191* (0.102)	-0.189* (0.103)
Lesbian in t=1	-0.822*** (0.142)	-0.802*** (0.142)	-0.802*** (0.142)
Lesbian in t=2	-0.829*** (0.177)	-0.810*** (0.178)	-0.826*** (0.178)
Lesbian in t=3	-0.922*** (0.229)	-0.899*** (0.229)	-0.914*** (0.230)
Lesbian in t=4	-0.563** (0.246)	-0.541** (0.247)	-0.532** (0.246)
Lesbian in t=5	-0.609** (0.240)	-0.592** (0.240)	-0.624*** (0.240)
Lesbian in t=6	-0.715** (0.300)	-0.696** (0.301)	-0.721** (0.301)
Lesbian in t=7	-1.009*** (0.318)	-0.989*** (0.319)	-1.003*** (0.313)
Lesbian	-0.0243 (0.0946)	-0.0388 (0.0950)	-0.0588 (0.0943)
Constant	0.128*** (0.0151)	0.0322 (0.162)	0.121 (0.149)
Household type FE	Yes	Yes	Yes
Calendar year FE	No	Yes	Yes
Household controls	No	No	Yes
N	486829	486829	486464
Number of Cluster	235	235	235

*Note:* Effect of gender composition in couples on change in spousal income gap post childbirth. *Table HA.III* presents the results from the difference-in-differences regressions estimating the effect of the gender composition in couples on the change in the spousal income gap after entering parenthood. The columns represent three different specifications of equation 3 estimated on the sample of matched lesbian and heterosexual couples described in section 5.4: lesbian and heterosexual couples divided into household types with the same income spousal income gap two years before childbirth. In specification (1) no control variables are added, specification (2) includes controls for calendar years and specification (3) also controls for the within couple age difference and difference in years of schooling, immigration status of each spouse and type of municipality of residence. All specifications include household type fixed effects. Standard errors are clustered at the household type level.

**Table HA.IV:** Placebo test for time effects on spousal income gap.

	(1)	(2)	(3)
t=-7	0.347*** (0.0261)	0.286*** (0.0365)	0.316*** (0.0360)
t=-6	0.293*** (0.0233)	0.244*** (0.0317)	0.272*** (0.0311)
t=-5	0.232*** (0.0187)	0.188*** (0.0255)	0.213*** (0.0252)
t=-4	0.135*** (0.0160)	0.0996*** (0.0206)	0.121*** (0.0200)
t=-3	0.0385** (0.0183)	0.0111 (0.0194)	0.0255 (0.0191)
t=-2	-0.0454* (0.0244)	-0.0624** (0.0241)	-0.0620** (0.0243)
t=0	1.099*** (0.0131)	1.127*** (0.0136)	1.125*** (0.0137)
t=1	1.498*** (0.0199)	1.552*** (0.0201)	1.549*** (0.0201)
t=2	0.921*** (0.0224)	0.995*** (0.0250)	0.992*** (0.0254)
t=3	1.105*** (0.0242)	1.193*** (0.0281)	1.190*** (0.0282)
t=4	0.827*** (0.0272)	0.935*** (0.0312)	0.933*** (0.0313)
t=5	0.571*** (0.0312)	0.700*** (0.0351)	0.698*** (0.0350)
t=6	0.451*** (0.0333)	0.606*** (0.0381)	0.605*** (0.0383)
t=7	0.393*** (0.0392)	0.562*** (0.0448)	0.560*** (0.0449)
Lesbian in t=-7	-0.355* (0.193)	-0.373* (0.192)	-0.394** (0.194)
Lesbian in t=-6	-0.380** (0.183)	-0.388** (0.183)	-0.412** (0.184)
Lesbian in t=-5	-0.196 (0.155)	-0.199 (0.155)	-0.221 (0.156)
Lesbian in t=-4	-0.185 (0.154)	-0.188 (0.154)	-0.207 (0.155)
Lesbian in t=-3	-0.0643 (0.130)	-0.0679 (0.130)	-0.0823 (0.130)
Lesbian in t=-2	-0.0184 (0.107)	-0.0251 (0.107)	-0.0246 (0.107)
Lesbian in t=0	-0.201** (0.102)	-0.193* (0.102)	-0.192* (0.102)
Lesbian in t=1	-0.822*** (0.142)	-0.808*** (0.142)	-0.806*** (0.142)
Lesbian in t=2	-0.819*** (0.177)	-0.804*** (0.177)	-0.805*** (0.178)
Lesbian in t=3	-0.912*** (0.229)	-0.895*** (0.229)	-0.903*** (0.230)

(Cont. on next page)

Note: As a further check of the parallel trends assumption the specifications in Table HA.III are estimated again in Table HA.IV adding pre-childbirth periods. Table HA.IV continues on next page.

	(1)	(2)	(3)
<i>(Cont. from prev. page)</i>			
Lesbian in t=4	-0.553** (0.246)	-0.539** (0.247)	-0.550** (0.248)
Lesbian in t=5	-0.599** (0.239)	-0.590** (0.240)	-0.621** (0.241)
Lesbian in t=6	-0.692** (0.301)	-0.683** (0.301)	-0.718** (0.303)
Lesbian in t=7	-0.984*** (0.324)	-0.973*** (0.323)	-0.990*** (0.321)
Lesbian	-0.0392 (0.0929)	-0.0410 (0.0928)	0.0351 (0.0942)
Constant	0.112*** (0.0113)	-0.0691** (0.0286)	-0.120*** (0.0311)
Household type FE	Yes	Yes	Yes
Calendar year FE	No	Yes	Yes
Household controls	No	No	Yes
N	914993	914993	910177
Number of Cluster	235	235	235

*Note:* As a further check of the parallel trends assumption the specifications in *Table HA.III* are estimated again in *Table HA.IV* adding pre-childbirth periods. *Table HA.IV* begins on previous page.

**Table HA.V:** The effect of a more planned childbirth, separation and legislative changes in 2003.

	(1)	(2)	(3)	(4)
t=0	1.105*** (0.0235)	1.117*** (0.0346)	1.089*** (0.0213)	1.090*** (0.0145)
t=1	1.509*** (0.0470)	1.435*** (0.0683)	1.500*** (0.0412)	1.465*** (0.0212)
t=2	0.944*** (0.0680)	0.928*** (0.102)	0.946*** (0.0585)	0.901*** (0.0245)
t=3	1.127*** (0.0906)	1.024*** (0.132)	1.160*** (0.0783)	1.071*** (0.0266)
t=4	0.862*** (0.113)	0.789*** (0.169)	0.899*** (0.0968)	0.793*** (0.0278)
t=5	0.616*** (0.137)	0.550*** (0.205)	0.657*** (0.117)	0.531*** (0.0306)
t=6	0.502*** (0.160)	0.424* (0.237)	0.538*** (0.136)	0.411*** (0.0334)
t=7	0.427** (0.184)	0.357 (0.274)	0.461*** (0.156)	0.376*** (0.0502)
Lesbian in t=0	-0.189* (0.103)	-0.203* (0.104)	-0.200* (0.103)	-0.214** (0.105)
Lesbian in t=1	-0.802*** (0.142)	-0.722*** (0.146)	-0.883*** (0.148)	-0.811*** (0.146)
Lesbian in t=2	-0.826*** (0.178)	-0.825*** (0.182)	-0.844*** (0.186)	-0.863*** (0.196)
Lesbian in t=3	-0.914*** (0.230)	-0.811*** (0.232)	-0.961*** (0.241)	-0.986*** (0.257)
Lesbian in t=4	-0.532** (0.246)	-0.435* (0.247)	-0.735*** (0.260)	-0.579** (0.278)
Lesbian in t=5	-0.624*** (0.240)	-0.518** (0.240)	-0.863*** (0.291)	-0.657** (0.305)
Lesbian in t=6	-0.721** (0.301)	-0.562* (0.297)	-1.049*** (0.304)	-0.633 (0.425)
Lesbian in t=7	-1.003*** (0.313)	-0.794** (0.306)	-1.538*** (0.392)	-1.488** (0.634)
Lesbian	-0.0588 (0.0943)	-0.0397 (0.101)	-0.0114 (0.102)	-0.0252 (0.0995)
Constant	0.121 (0.149)	0.0258 (0.209)	0.0917 (0.124)	1.260*** (0.0762)
Household type FE	Yes	Yes	Yes	Yes
Calendar year FE	Yes	Yes	Yes	No
Household controls	Yes	Yes	Yes	Yes
N	486464	163562	446218	366424
Number of Cluster	235	235	235	207

*Note:* Column (1) of *Table HA.V* replicates the baseline specification; column (3) in *Table HA.III*. Column (2), (3) and (4) reestimates the baseline specification, dropping all heterosexual couples who were not married at least two years before having children, column (2), dropping all couples who separate at some point during the estimation period, column (3), and last dropping all couples who had their first child before 2003, column (4).

**Table HA.VI:** The effect of the pre-childbirth income gap.

	(1)	(2)	(3)
t=0	1.105*** (0.0235)	1.278*** (0.0179)	0.927*** (0.0113)
t=1	1.509*** (0.0470)	1.733*** (0.0251)	1.224*** (0.0165)
t=2	0.944*** (0.0680)	1.257*** (0.0239)	0.535*** (0.0140)
t=3	1.127*** (0.0906)	1.433*** (0.0279)	0.654*** (0.0198)
t=4	0.862*** (0.113)	1.202*** (0.0289)	0.306*** (0.0179)
t=5	0.616*** (0.137)	0.978*** (0.0260)	-0.0119 (0.0252)
t=6	0.502*** (0.160)	0.889*** (0.0256)	-0.191*** (0.0226)
t=7	0.427** (0.184)	0.838*** (0.0464)	-0.352*** (0.0255)
Lesbian in t=0	-0.189* (0.103)	-0.121 (0.160)	-0.337*** (0.119)
Lesbian in t=1	-0.802*** (0.142)	-0.983*** (0.229)	-0.692*** (0.168)
Lesbian in t=2	-0.826*** (0.178)	-1.043*** (0.266)	-0.727*** (0.220)
Lesbian in t=3	-0.914*** (0.230)	-0.913*** (0.341)	-1.044*** (0.299)
Lesbian in t=4	-0.532** (0.246)	-0.752** (0.379)	-0.417 (0.277)
Lesbian in t=5	-0.624*** (0.240)	-0.733* (0.389)	-0.662*** (0.242)
Lesbian in t=6	-0.721** (0.301)	-0.881* (0.456)	-0.740* (0.378)
Lesbian in t=7	-1.003*** (0.313)	-1.167** (0.532)	-1.018*** (0.320)
Lesbian	-0.0588 (0.0943)	0.0931 (0.144)	-0.0939 (0.113)
Constant	0.121 (0.149)	-0.425*** (0.0441)	0.798*** (0.0342)
Household type FE	Yes	Yes	Yes
Calendar year FE	Yes	Yes	Yes
Household controls	Yes	Yes	Yes
N	486464	181651	304813
Number of Cluster	235	130	112

Note: Column (1) of Table HA.VI replicates the baseline specification; column (2) in Table HA.III. Column (3) presents the results when estimating the baseline specification on households where the lesbian birth mother/heterosexual woman had a higher income than her partner two years before childbirth. Column (3) presents the results for couples where the father/partner had the highest income.

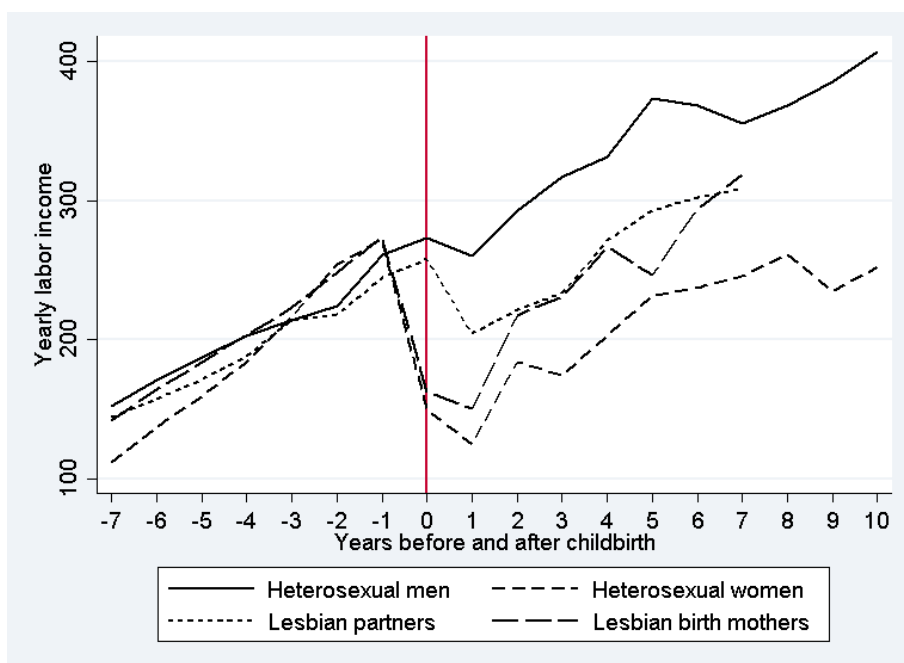


**Table HA.VII:** The effect of number of children and being birth mother.

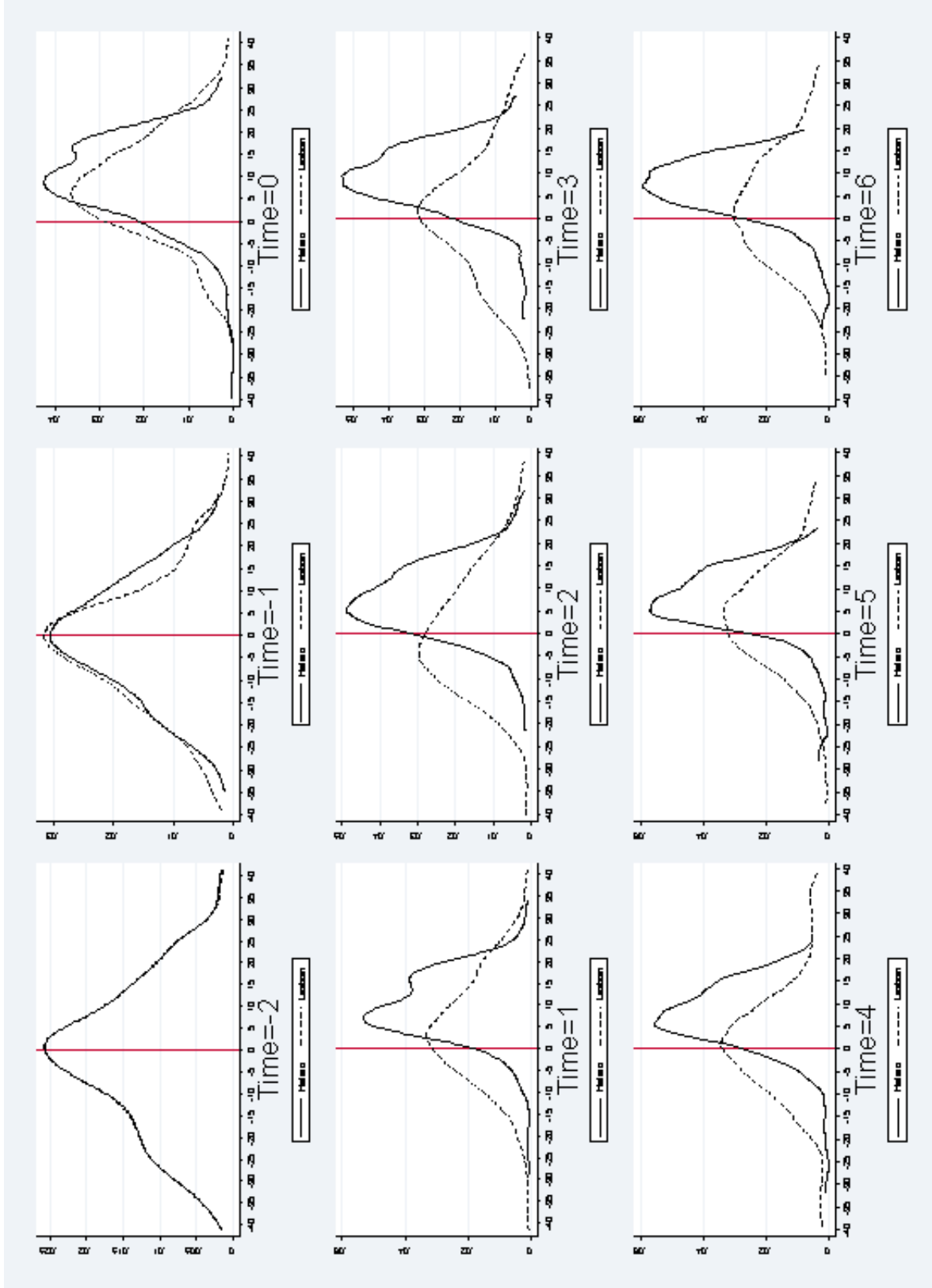
	(1)	(2)	(3)	(4)
t=0	1.105*** (0.0235)	1.074*** (0.0232)	1.173*** (0.0242)	1.173*** (0.0246)
t=1	1.509*** (0.0470)	1.464*** (0.0440)	1.573*** (0.0474)	1.572*** (0.0482)
t=2	0.944*** (0.0680)	0.621*** (0.0585)	1.170*** (0.0688)	1.168*** (0.0701)
t=3	1.127*** (0.0906)	0.608*** (0.0776)	1.356*** (0.0899)	1.354*** (0.0918)
t=4	0.862*** (0.113)	0.529*** (0.0957)	0.993*** (0.113)	0.991*** (0.116)
t=5	0.616*** (0.137)	0.385*** (0.110)	0.706*** (0.137)	0.703*** (0.140)
t=6	0.502*** (0.160)	0.353*** (0.123)	0.566*** (0.162)	0.562*** (0.166)
t=7	0.427** (0.184)	0.383** (0.151)	0.458** (0.185)	0.453** (0.189)
Lesbian in t=0	-0.189* (0.103)	-0.0599 (0.125)	-0.607*** (0.164)	-0.0356 (0.291)
Lesbian in t=1	-0.802*** (0.142)	-0.631*** (0.164)	-1.452*** (0.277)	-0.871 (0.616)
Lesbian in t=2	-0.826*** (0.178)	-0.254 (0.214)	-1.529*** (0.322)	-1.175* (0.617)
Lesbian in t=3	-0.914*** (0.230)	-0.153 (0.320)	-1.372*** (0.344)	-1.276** (0.542)
Lesbian in t=4	-0.532** (0.246)	0.129 (0.423)	-0.903*** (0.237)	-1.145* (0.591)
Lesbian in t=5	-0.624*** (0.240)	0.175 (0.385)	-0.795*** (0.192)	-1.863*** (0.653)
Lesbian in t=6	-0.721** (0.301)	0.345 (0.495)	-1.044*** (0.195)	-2.160*** (0.823)
Lesbian in t=7	-1.003*** (0.313)	-0.430 (0.538)	-1.025*** (0.254)	-2.469*** (0.904)
Lesbian	-0.0588 (0.0943)	-0.126 (0.112)	0.0370 (0.159)	0.485 (0.382)
Constant	0.121 (0.149)	0.107 (0.0940)	0.196 (0.174)	0.199 (0.178)
Household type FE	Yes	Yes	Yes	Yes
Calendar year FE	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes
N	486464	179431	306906	306576
Number of Cluster	235	234	186	186

Note: Column (1) of *Table HA.VII* replicates the baseline specification; column (3) in *Table HA.III*. Column (2) of *Table HA.VII* presents the results for couples who only have one child together during the period of analysis. Column (3) presents the results for couples where the partner of the birth mother in lesbian couples and the heterosexual mother gave birth to a second child. Finally column (4) presents the results for couples where the birth mother in lesbian couples and the heterosexual mother gave birth to a second child.

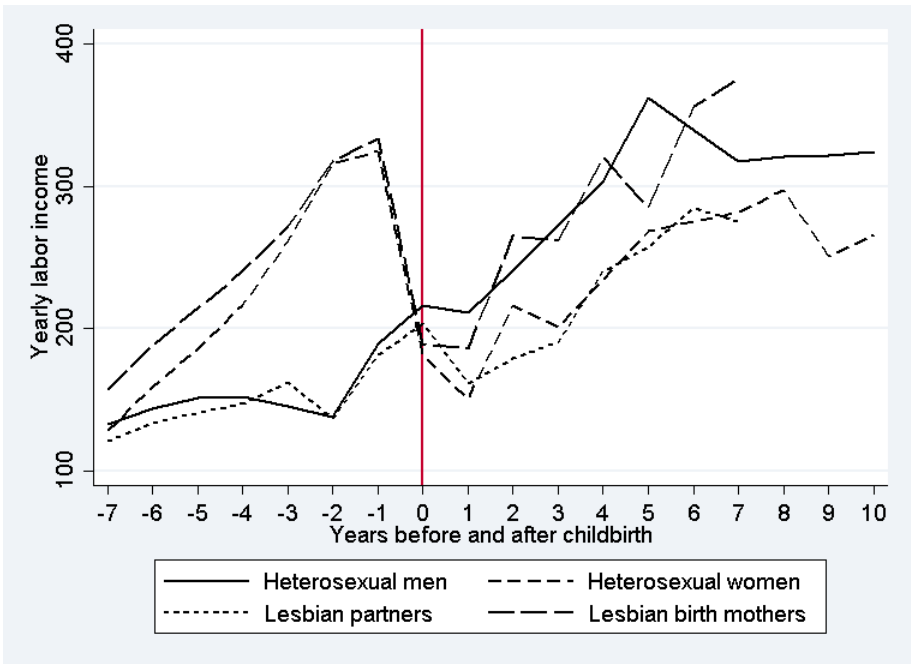
## Appendix B - Graphs



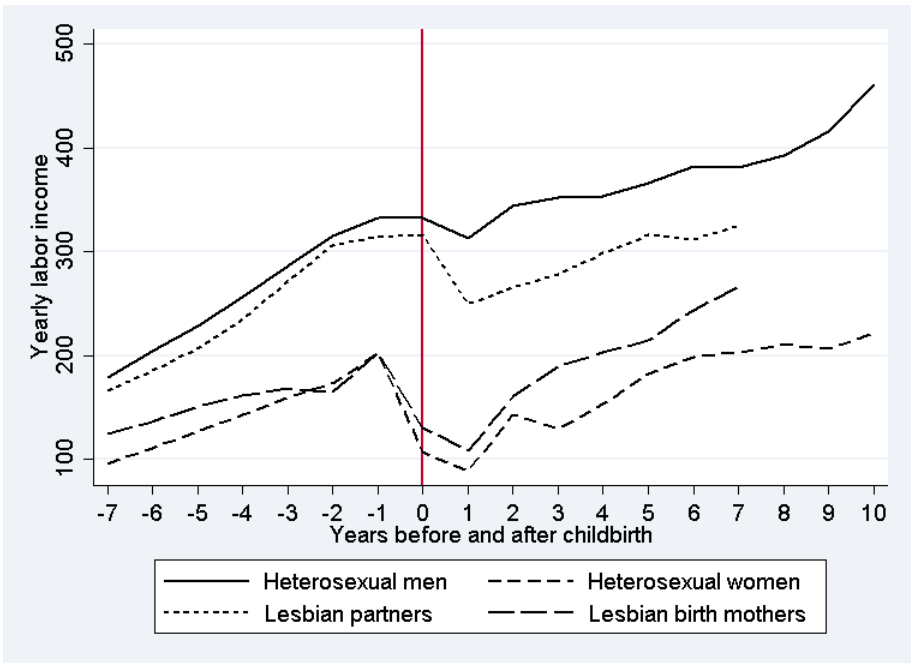
**Figure HB.I:** Income trajectories (in 1000's SEK, 2008 prices) of men and women in heterosexual couples and the birth mothers and partners in lesbian couples before and after childbirth in the matched sample.



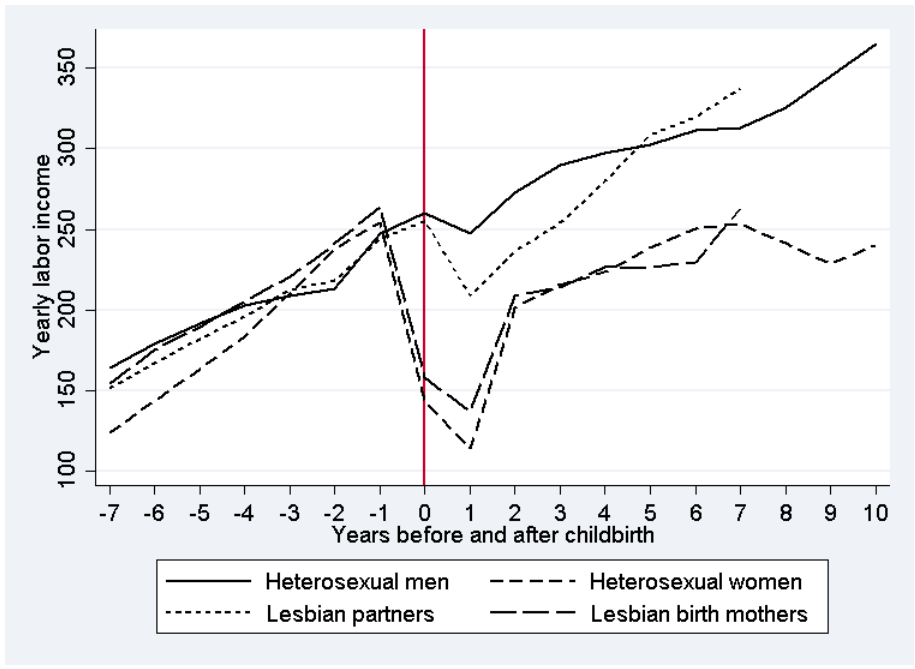
**Figure HB.II:** Density of monthly spousal income gap (in 1000's SEK, 2008 prices) in lesbian (dotted lines) and heterosexual (solid lines) couples for each time period,  $t = -2$  to  $t = 6$ , before and after childbirth.



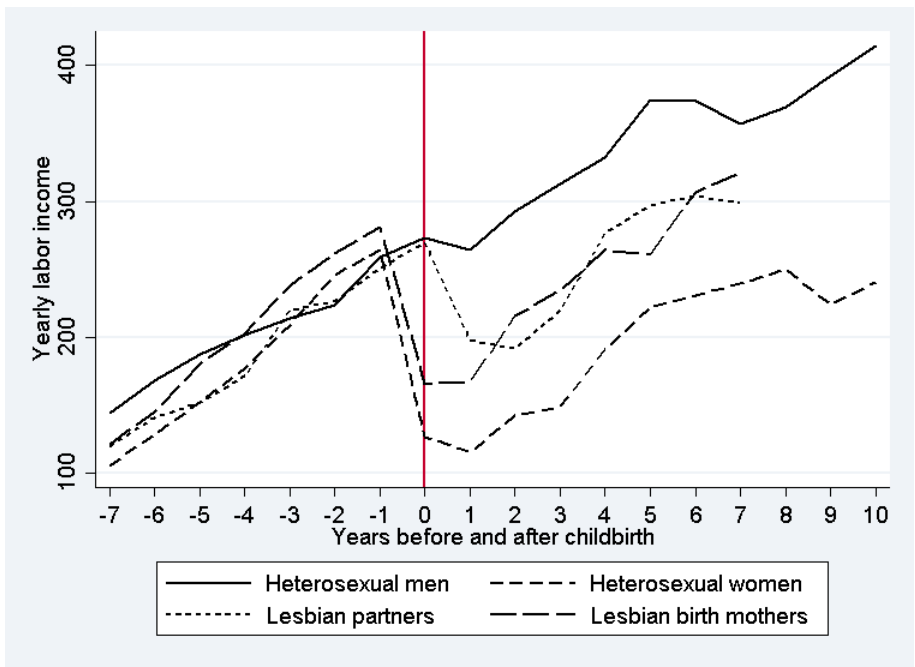
**Figure HB.III:** Income trajectories (in 1000's SEK, 2008 prices) of men and women in heterosexual couples and the birth mothers and partners in lesbian couples before and after childbirth for couples where the birth mother/heterosexual woman had the highest income before childbirth.



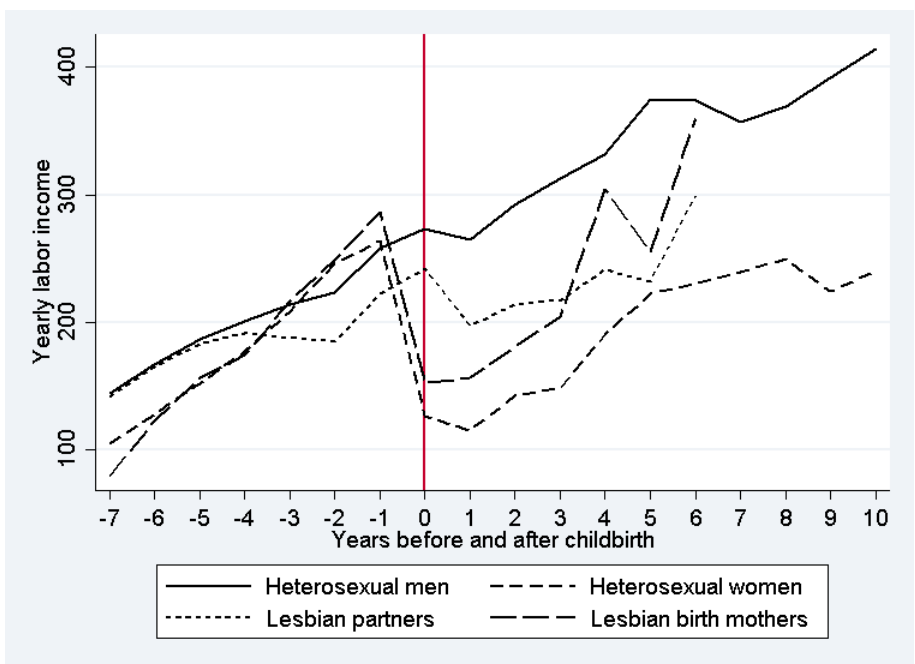
**Figure HB.IV:** Income trajectories (in 1000's SEK, 2008 prices) of men and women in heterosexual couples and the birth mothers and partners in lesbian couples before and after childbirth for couples where the father/partner had the highest income before childbirth.



**Figure HB.V:** Income trajectories (in 1000's SEK, 2008 prices) of men and women in heterosexual couples and the birth mothers and partners in lesbian couples before and after childbirth in the matched sample who only have one child together.



**Figure HB.VI:** Income trajectories (in 1000's SEK, 2008 prices) of men and women in heterosexual couples and the birth mothers and partners in lesbian couples before and after childbirth in the matched sample where the birth mother's partner and the heterosexual mother gave birth to a second child.



**Figure HB.VII:** Income trajectories (in 1000's SEK, 2008 prices) of men and women in heterosexual couples and the birth mothers and partners in lesbian couples before and after childbirth in the matched sample where the birth mother and the heterosexual mother gave birth to a second child.