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Working Paper 26185
http://www.nber.org/papers/w26185

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 2019

This paper has benefitted from feedback from Santosh Anagol, S. Anukriti, Rachel Heath, Melanie Khamis, Annemie Maertens, Laura Schecter, Thomas Fujiwara and seminar participants at Duke, Northwestern, Oxford, and UCL. Sunny Lee, Hu Liu and Imran Idzandqar provided excellent research assistance. All errors are my own. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 26185
August 2019
JEL No. J13,J16,J22,O12,O53

ABSTRACT

Combining eight years of panel data with an event study approach, we show that rural Chinese women's labor supply falls for one year following the birth of a daughter before returning to their pre-birth levels. The negative impact of the birth of a son on women's labor supply is much larger in magnitude and persists for four years. We also find that households reduce their cigarette consumption more following the arrival of a boy than a girl. Furthermore, there is an increase in the mother's probability of being in school, her leisure time, and her participation in household decision-making following the birth of boys relative to daughters. There is no evidence of increases in investments in boys that would be complementary to mothers' time, such as breastfeeding, immunizations or consumption of milk or meat. Together, these results are consistent with the idea that mothers are rewarded for giving birth to boys, leading them to have more leisure and work less.

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1 Introduction

In developing countries, theory suggests a U-shaped relationship between economic growth and female labor force participation (Goldin 1994, Mammen and Paxson 2000). At the initial stage, economic activity is dominated by household enterprises, mainly farming, and men and women both participate in this work. Economic development corresponds with a shift from family enterprises into formal manufacturing jobs; this corresponds with an improvement in labor market opportunities for men as well as overall positive income effects for households. As a result, female labor force participation declines. Then, the next stage of development entails a shift towards service and white-collar jobs which draws women back into the labor force.

Many of the existing papers in economics focus on policies and developments that increase female labor force participation (Jensen 2012, Heath and Mobarak 2015, Goldin and Katz 2000 and 2002, Bailey 2006), but there is less focus on declines in female labor force participation.[1] As shown in Panel A of Figure 1, labor force participation rates in China for both women and men have generally been declining for the past 25 years. Part of the reason for these overall trends is the shift away from the Communist labor market system that both expected everyone to work and facilitated the provision of jobs.[2] However, the decline for rural women is much steeper, providing some suggestive evidence that the economic shift away from agriculture to other jobs may drive these trends as predicted by theory of the U-shaped relationship between development and women's work.[3] This decline in labor force participation rates among rural women corresponds with a sharp increase in rural women reporting that they are housewives (Panel B of Figure 1).

The paper examines how the labor force participation of rural women and men in China responds to the birth of a son versus a daughter. We begin by exploiting a panel data set collected by the Chinese Ministry of Agriculture over an 8 year period that has a large enough sample to see a substantial number of births of boys and girls. This data set allows us to take an event-study

[1] Some exceptions include recent working papers studying declines in female labor force participation in India (Afridi, Dinkelman and Mahajan 2018, Fletcher, Pande and Moore 2017).

[2] As shown in Appendix Figure A.2, individuals reporting that they are unemployed (and searching for work) is generally increasing over this period.

[3] Figure 1 used data from a household survey called the China Health and Nutrition Survey. As shown in Appendix Figure A.1 with Ministry of Agriculture data, these trends are also evident in a much larger survey of rural households.

approach where we look at the labor market outcomes of the same individuals for the periods leading up to birth of sons and daughters as well as the years following birth. In a context in which most rural women are engaged in family agricultural enterprises, any impacts of birth on labor market outcomes are not about rigidities in formal sector jobs or labor market discrimination by employers. Rather, changes in the labor supply of women in the context where family agricultural work is the primary source of work tells us about the preferences of households.

The research question in this paper is particularly important for policy given the recent policy changes in China related to fertility. Implemented in 1979, the One Child Policy aimed at limiting population growth by introducing a system of carrots and sticks to encourage households to reduce their fertility. One unintended consequence of this policy was a dramatic increase in the male-to-female sex ratio at birth, as seen in Figure 2. Indeed, given that our paper documents different labor market responses to the birth of a son versus daughter, changes in the number of births of boys versus girls can have unintended effects on labor market outcomes.

The main result of the paper is that women reduce their labor force participation rates and amount of days worked more for boys than for girls. There is no corresponding decline in men's labor force participation or days worked following the birth of either a boy or a girl. The key threat to identification in this analysis is that the gender of the child may not be exogenous, and household preferences over the gender of their children are correlated with household preferences over whether women work after giving birth to any child. We present three sets of results that address this concern. First, we show that there are very few significant differences in the observable characteristics of individuals or households prior to birth of a son versus daughter. Second, we look at the sub-sample of first-born children, for whom the sex ratio at birth is less skewed. Third, we implement a bounding exercise where we re-assign some male births to female births in order to achieve a balanced sex ratio at birth and to maximize the impact of the sex selection on the outcomes.

We explore several mechanisms that might explain why labor supply responses differ by a baby's gender. Two are related to health differences. If male infants have worse health than female infants, women may need to reduce work in order to provide care for their sons. Similarly, if male infants

correspond to higher risk births, then women themselves may be worse off after birthing boys and not be able to work. We are able to reject the health-based mechanisms by looking directly at the health status of mothers and their children.

We also consider two mechanisms driven by economic differences related to boys and girls. If there are higher returns to investments in boys than girls, households may want to invest more in boys (and have mothers provide inputs into sons rather than work). We test this hypothesis by examining whether there is evidence of other types of investments in boys that would be complementary to mothers' effort. We observe two changes that may be complementary investments: a decrease in household cigarette consumption and an increase in mothers' schooling. However, there are no other significant changes in investments in households in which boys are born, including spending on meat and milk, breastfeeding, and immunizations. Moreover, while women work less following the birth of a son, there is no evidence that they spend more time in child care on sons than daughters. Overall, the evidence does not strongly support the investment mechanism.

A related economic mechanism is that there is a pure wealth effect associated with a son (i.e. households need to save less for retirement) and even if they invest equally in sons and daughters, the wealth effect means that women can work less and consume more leisure. We test this hypothesis by examining whether consumption increases as expected with a positive wealth effect. We do not observe any increases in consumption following the birth of a boy, suggesting that the labor supply effects do not reflect a wealth effect.

Another possibility is that the mechanism is through total fertility and the gender of the birth provides information to the household about their total fertility. Given that the gender of the child does not predict subsequent household size in rural China, this also cannot explain the differences in the labor market responses to boys and girls.

Finally, we consider whether the results can be explained by household discrimination where households reward mothers for producing a son. These rewards can correspond to the changes we observe for women following a son's birth: less agricultural work, more investment in mothers' education and increased participation of women in household decision-making (over the purchase of durable goods). Given that women in China dislike smoking, the decrease in smoking following the

birth of a son can also be explained by this mechanism. The most compelling evidence to support this theory is that mothers do not provide more child care for sons than daughters but they spend more time in adult leisure activities after having a son relative to a daughter.

This paper contributes to an emerging literature on the labor market consequences of having children. Kleven, Landais and Sogaard (2018) show that the arrival of children in Denmark corresponds with a 20% drop in women's earnings relative to men's, driven by drops in participation rates, hours worked and wage rates.[4] Kuziemko et al (2018) show similar employment declines for women in the U.S. and U.K. following birth, and argue that this is driven by an information shock to households about how hard parenting is. This paper takes a similar empirical approach to these two papers in using an event study, but focuses on the effects of boys versus girls rather than just the effects of parenthood. The focus on gender is particularly relevant for the context that we focus on, rural China, which is very different from the contexts in the other papers.

There is a large existing literature that examines the consequences of having boys versus girls on parents' outcomes. Ichino, Lindstrom and Viviano (2014) find that women work less after a first-born son than a daughter in the U.S., U.K., Italy and Sweden, possibly due to the positive impact of a first-born son on total fertility. Lundberg and Rose (2002) find that fatherhood increases men's wages and labor supply in the U.S. more for boys than girls. Having a son increases women's decision-making power in China (Li and Wu 2011) but not in India or Bangladesh (Heath and Tan 2018, Zimmerman 2012). Having a son (rather than a daughter) leads to cleaner fuel use in India (Kishore and Spears 2014), heavier mothers during children's adolescence in the U.S. (Pham-Kanter 2010), less criminal activities of fathers (Dustmann and Landerso 2018) and changes marriage outcomes (Anukriti, Kwon and Prakash 2016, Dahl and Moretti 2008, Bedard and Dechenes 2005, Ananat and Michaels 2008). Because of small sample sizes and often the lack of panel data, none of the prior papers in this literature are able to employ the event study approach we utilize. In fact, none of them use any pre-birth data; they regress the outcomes of interest on the presence of a girl or boy.

There is a corresponding literature that looks at gender differences in investments in children in

[4]Kleven et al (2019) show similar declines in 5 other countries.

developing countries and generally finds more investments in boys than girls (Barcellos, Carvalho and Lleras-Muney 2014, Jayachandran and Kuziemko 2011). However, our focus is on the labor market outcomes of women rather than the outcomes on children.

The rest of the paper proceeds as follows. The next section discusses in greater detail the mechanisms through which the gender of the child may matter for women's labor market choices. Section 3 discusses the data sets and presents summary statistics. After outlining the empirical specification in Section 4, the next two sections present the empirical results. Finally, the paper concludes.

2 Conceptual Framework

There are many reasons that a women's labor market outcomes may respond differently to the birth of a son versus a daughter. First, we discuss two mechanisms that relate to physical and developmental differences in boys and girls. Next, we consider two mechanisms related to differences in the economic returns to having boys and girls. Finally, there are three mechanisms related to fertility and conscious or unconscious gender discrimination by households and firms.

2.1 Physical Differences

The results may be explained by the idea that boys require more care than girls due to health differences after birth. Under this scenario, households treat boys and girls differently in order to bring boys up to the same level of outcomes as girls. Indeed, newborn boys are less robust physically than newborn girls, including having a higher probability of being born premature (Pongou 2013). Furthermore, research has shown that boys have higher rates of developmental and behavioral disorders, including hyperactivity and autism.[5] To test the idea that women leave the labor force to provide more time and care to male babies due to their health issues, we can use the household's own reports of the health status of children following birth to examine this hypothesis.

A related story is that the physical recovery process for mothers is different following the birth of a boy than of a girl. Indeed, research suggests that boys do correspond to higher risk pregnancies,

[5]See Kraemer (2000) for a review of the literature.

including gestational diabetes and pre-eclampsia, and hence higher risk deliveries, including higher rates of cesarean deliveries (Eogan et al 2003, Verburg et al 2016). Negative health outcomes corresponding to delivering boys may lead women to leave the labor force. We are able to test this hypothesis by using individual-level data on self-reported health status of mothers.

2.2 Economic Differences

Another possible mechanism is not about physical differences in delivery or physical needs during infancy, but women take more time out of the labor force for boys because the economic returns to their time and effort spent with boys is higher. This may be driven by the fact that men earn more than women, or even if their earnings were equal, it is possible that men provide more financial support for elderly parents than daughters. Consistent with this idea, parents are much more likely to co-reside with an adult son than with an adult daughter in China. However, the literature on whether daughter or sons provide more financial transfers in China is mixed (Gruijters 2018, Zhu 2016). To test this, we can examine investments made in children, including child care hours, breastfeeding, expenditures on child-specific services (immunizations) and cigarette consumption.[6]

A related mechanism is that boys will contribute more to household lifetime earnings, and the reduction in female labor supply is not a direct investment in boys but a response to a pure wealth effect associated with a boy. Women work less because households don't need to save as much (i.e. for retirement) following the birth of a boy than a girl. To test the idea of the arrival of a boy being treated as a positive wealth shock on the household, we can examine consumption expenditures. Note that prior research suggests the opposite. There is the potential for a *negative* wealth effect of having a son in China; when the sex ratio is skewed and brides are scarce, households have to save more for a boy in order to provide their son with a better match (Wei and Zhang 2011).[7]

2.3 Other Explanations

We also consider the idea that the arrival of a son versus daughter provides information to the household about their total fertility and any differences in work behavior are driven by total fertility.

[6] Cigarette consumption has negative effects on children's health through second-hand smoke.

[7] Brideprice is the cultural norm in China where the groom's family pays the bride's family at the time of marriage.

For example, an existing literature suggests that son preference in India may lead households to target a desired number of sons (e.g. Gupta 1987, Jayanchandran and Kuziemko 2011, Jensen 2003, Rosenblum 2013).[8] Under such stopping rules, households continue to have children until they reach their desired number of sons. The key implication of this behavior is that households with boys will be smaller on average; boys then have on average more resources per child than girls even if each household splits resources equally among girls and boys within the household. Note that the standard stopping rule framework, targeting a number of boys would suggest that households with boys have fewer total children, and women with boys would be *less* likely to stop working in anticipation of their total fertility. We can examine whether there are differences in fertility following the arrival of a boy versus a girl.

Another explanation is that the labor market treats women who have boys differently from women who have girls. In this scenario, the results aren't driven by the preferences of women or the households that they are in, but that firms treat women who give birth to boys differently from women who give birth to girls. We can test this hypothesis by examining whether the results are different for women who work in family enterprises, including agriculture, and for women who work for others.

A final explanation is taste-based discrimination where households reward women with more leisure (and less work) for having a boy. There is anecdotal evidence to support this idea. In one newspaper story, Linlin describes how her in-laws had a lot of conflict with her after her marriage to their son, but this reversed immediately after she had a boy; after the birth of the son, the in-laws started doing a lot of cooking and housework for her (Fan and Qing 2014).[9] We can test this idea by looking at the amount of leisure time of women following a boy versus girl. However, an increase in leisure following the birth of a boy may also be consistent with a model of returns to investment in which mothers exert more effort in caring for boys, and hence need extra recovery time to maintain a higher level of effort in her interactions and care of a son. Another outcome

[8]To our knowledge, there is no research showing evidence for stopping rule behavior in China. This may not be surprising given the restrictive fertility policies that may encourage households to engage in sex selective abortion rather than stopping rules to have sons.

[9]There are also stories of poor treatment of Chinese women following the birth of a daughter. For example, one article describes a mother-in-law beginning to physically abuse her daughter-in-law after the birth of a daughter (Yangtse News 2016).

that we can examine to test this mechanism is female participation in household decision-making.

3 Data

3.1 Ministry of Agriculture National Fixed Point Survey Data

It is rare to find a panel data set of households in developing countries where the survey is conducted on an annual basis and contains a large enough sample to have a substantial number of births. One such data is called the National Fixed Point Survey (NFP) collected by the Research Center of Rural Economy (RCRE) of the Chinese Ministry of Agriculture. While the survey first began in 1986, we focus on the annual waves between 2003 and 2010 because the structure of the survey changed substantially in 2003. The wave 2003 is the first period in which there are some questions, including on employment and health, that are asked at the *individual* level.[10] The individual-level questions are key to looking at the separate effects of a birth on the labor supply of women versus men.

At the individual level, the survey asks a relatively small set of questions including age, gender, education and training, relation to the household head, self-reported health status, the number of days the individual worked, occupation, industry, and whether the person is currently enrolled in school. At the household level, in addition to detailed questions about agricultural inputs and outputs, the survey also asks about total household income and several categories of consumption.

There are several limitations to the data set. The main goal of the survey is to ask agricultural households about farm inputs and outputs. Thus, the data lack detail on non-agricultural decision-making of households. For example, it might be interesting to know about child care time or cash expenditures on boys versus girls, but this is not available in the data.

Another important limitation of the data is that it doesn't have specific questions about birth, so we need to infer the timing of birth by the arrival of a zero or one year old baby into the panel. For a child who arrives in the household and is reported to be age one, we assign the prior calendar

[10] Prior to 2003, all of the questions were asked at the household level. In other words, we can observe how many days of work the total household supplied but we couldn't separate out whether a woman or man worked those days if the household contained both a woman and man.

year as the child's birth year. However, this may lead to our assignment of birth year actually capturing the year prior to birth in many cases. This is because there seems to be a substantial amount of rounding up of an infant's age to one year. For example, in the data set, there are 668 reports of a child of age zero and 7141 reports of a child of age one.

Because the parentage of each child is not specifically asked, we assign the father and mother of a child based on a question about the relationship to the household head. If a child to the household head is born in a year, the household head and spouse are assigned as its father and mother. In rural China, households often include three generations, so many babies born in households are the grandchild of the head of household. In this scenario, we only assign the child of the head and spouse of the head's child as the parents if there is only one child of the head and corresponding spouse residing in the household. In other words, if two adult children of the household head reside in the household, we cannot determine which sibling is the parent of the baby.

Given that a woman may give birth to more than one child in the 8 year panel, we focus our analysis on the first birth that occurs within the sample. We also exclude from the sample the birth of twins (or higher order multiple births).[11] Finally, we exclude the rare cases where the assignment of a child to parent corresponds to a parent who is under age 11.

3.1.1 NFP Variables and Statistics

We present summary statistics for individual-level variables in the year prior to the birth of a son or daughter in Table 1. The first four columns show statistics for women and the last four columns show the same statistics for men.[12] In addition to showing the mean and standard deviation for individuals prior to the arrival of a son or a daughter, we show the p-value of the test of whether these two means are statistically different. For women, there are no significant differences in any of these variables. For men, out of the 11 variables, only the probability of working is statistically different (at the 1% level) prior to the arrival of a son versus daughter. This provides some assurance for the identification strategy that compares individuals before and after the arrival of daughter

[11] The main issue with twins is we cannot assign gender properly in the regression equation.

[12] The sample size is slightly larger for men because women are less likely to have pre-birth data. This is because women are more likely to join their husbands' families than vice versa. If she joins the NFP household at marriage and gives birth in the same year, then we don't observe any pre-birth periods for her.

with individuals before and after a son is born.

The work indicator is defined based on the number of days that the individual worked in the past year. About three-quarters of women were working in the year prior to the arrival of a son or daughter. The number is higher for men; 89% of men were working prior to the arrival of a boy and 92% prior to the arrival of a daughter. Women worked about 160 days per year while men worked over 230 days on average.

Health status is self-reported on a scale of 1 to 5 where 1 corresponds to the best health and 5 the poorest health. Men report being very slightly healthier than women prior to the birth of a child. The average age prior to birth is 27.7 years for women and 29 years for men. Women have slightly less than 8 years of education whereas men in the sample have an average of 8.4 years of schooling. There is also a question of whether the individual is currently enrolled in school. Just over 2% of women are enrolled in school prior to the arrival of an infant, and the corresponding number for men is slightly lower.

Temporary migration is common in the data. Women are living at home about 283 days of the year prior to the birth of a child. Men are away from home slightly more than women; their average number of days at home is about 242. Corresponding to being away from home more, men also earn more away from home. Men earn about 5000 yuan per year in work away from while women earn about one-third of that amount.[13] The survey does not ask about total individual earnings while at home; this is because most of the survey respondents are engaged in household agricultural production and it would be hard to assign joint agricultural profits to individuals. As a measure of more permanent migration, we examine whether the individual attrites from the survey (i.e. is not surveyed in the subsequent year).[14] Individual level attrition is fairly low at less than 4% for women and slightly lower for men.

The survey asks questions about the primary industry of each individual. About 50% of women report agriculture as their primary industry, while the corresponding number for men is much lower at around 30%. There is also information about whether the primary occupation of the individual

[13]This amount is converted into real 2002 RMB using a consumer price index from the Regional Economy Database.

[14]This is only measured in years 2003 to 2009 as we don't know whether they will attrite in the subsequent year for the last period (2010) for which we have data.

is in a family-based enterprise, including agriculture. About 59% of women and 46% of men work in an occupation in a family enterprise.

We next examine household-level variables in the NFP in Table 2.[15] Prior to the birth of a boy, households report an average total income of 34,000 RMB. Prior to the birth of a girl, households report an average income of 36,000 RMB, but the difference between the two is not statistically significant at the standard levels. Total expenditures are slightly lower than income, implying that the average household is saving. We examine several categories of consumption: cigarettes, alcohol, milk and meat. Cigarettes are measured as expenditures while alcohol, milk and meat are measured in kilograms. Given that the survey questions on cigarette and alcohol consumption changed in 2009, we limit the analysis on cigarette and alcohol consumption to the waves prior to 2009.[16] We aggregate the number of days of work for all other people in the household (excluding the parents of the baby). In total, people other than the parents work an average of 300 days. The average household size prior to the arrival of a baby is a little over 4. This is statistically different (at the 10% level) for households prior to a son and a daughter, but this difference is small in magnitude. The vast majority of households include the people who will become grandparents in the subsequent year. Over 10% of the households are minorities (non-Han ethnicity).

3.2 China Health and Nutrition Survey

To address some of the limitations of the NFP data, we supplement the main analysis with a panel survey of households in China called the China Health and Nutrition Survey (CHNS). There are 10 rounds of surveys in years 1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009, 2011 and 2015.[17] The sampling entailed a multistage, random cluster design where counties were stratified into three levels of income, and a weighted sampling technique selected four counties in each province plus the provincial capital and one low-income city. The sample size included about 3800 households in 1989 increasing to about 5900 in 2015.

[15] Most of the questions are household-level questions about detailed inputs and outputs into agricultural production broken down at the crop level. These are not useful for the purposes of this paper.

[16] In other words, we drop 2009 and 2010 because we cannot make those values comparable to the prior years.

[17] The provinces include Beijing, Chongqing, Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Liaoning, Shaanxi, Shandong, Shanghai, Yunnan, and Zhejiang.

Unlike the NFP data, we are able to link parents to children using direct birth history questions. There are also questions on time use, including time spent on child care and leisure activities. While there are several advantages of this data set over the NFP data, the smaller number of households means that there are relatively fewer births happening in the sample period. Thus, there will be issues with power in some of these analyses.

3.2.1 CHNS Variables and Statistics

As shown in Table 3, about 65% of women are working prior to the birth of either a son or daughter. This is slightly lower than in the NFP data. Women in the CHNS are substantially younger than women in the NFP prior to birth at 26 years old. They also have slightly less education, averaging over 7.3 years of schooling. About 70% of households in the CHNS have a smoker. None of these variables are statistically different for women prior to a boy as compared to a girl; however, the number of births in the CHNS sample is not large.

Individuals report the total number of child care hours that they provided in the last week. The question is specific in that this should include times where they are simultaneously watching their child and doing something else, like cooking. It is asked in every wave except 1989. Women are watching children for 18.5 hours per week prior to a boy and 19.1 hours per week prior to a girl, and this difference is not statistically significant.

Questions about time spent on leisure activities are asked in terms of minutes per day, separately for weekdays and weekends; we then calculate total leisure by aggregating across categories into total hours per week. These activities include TV, movies, video games, computer/smart phone surfing/games, reading/writing/drawing, chat rooms and board games.[18] These questions are available only in the waves 2004, 2006, 2009, 2011 and 2015. Prior to the arrival of an infant, women spent about 22 hours per week on leisure activities.

Another set of time use questions asks about the time the individual spends on chores in an average day. We sum together their responses to three questions about the amount of time spent on buying food, preparing food and washing and ironing clothing. These three questions are asked

[18]Note that some of these questions are re-worded over time. For example watching DVDs has become watching movies.

in all waves. Women spend an average of two hours per day on food purchases and preparation and cleaning clothing prior to the birth of a boy or a girl.

In every round of the survey, the CHNS also asks about the breastfeeding status of each child in the birth history questions to women. We construct a variable that equals 1 if the mother reports currently or ever having breastfed the child. Given the spacing of the survey of the CHNS of two to four year intervals, the fact that a fraction (14%) of women were breastfeeding in the survey wave prior to the birth of a son or daughter is likely to be driven by a prior child.

We also make use of a question in the CHNS about whether each child had any immunization shots in the past year. This question is asked of all children under the age of 12 in the seven waves prior to the 2009 round. We create a household-level variable for the total number of immunizations received by children under the age of 12 in the past year. This is the only variable that is statistically different (at the 10% level or lower) for CHNS households in the survey wave prior to the birth of a son versus daughter with households who will subsequently have a son having a higher rate of immunizations (58% versus 48%).

Finally, we construct a variable regarding the wife's participation in the decision-making process for durable goods. This is based on questions that first ask the household about whether they own the good.[19] Most goods are asked about in each of the four waves between 1989 and 1997, but some are only asked in a subset of the waves. Conditional on the household owning the good, they are asked who made the decision to purchase it where the options are: husband, wife, husband and wife together, and other. We generate an index representing the share of goods that the wife participates in the decision of purchasing.[20] Women participate in purchasing decisions (either by themselves or jointly with their husbands) for 69% of durable goods purchases prior to the birth of a boy and for 64% prior to the arrival of a girl. This difference is not statistically significant.

[19]The 17 goods that the CHNS asks about are: stereo, VCR, black and white TV, color TV, washer, refrigerator, air conditioning, sewing machine, fan, clock, camera, microwave, electric pot, pressure cooker, cooking tools.

[20]In other words, among the goods that the household reports owning, we add up the number where the response is wife or husband and wife together and divided by the total number of goods owned.

4 Empirical Specification

To look at an event study analysis around the birth of a child, we begin by estimating the following equation:

$$y_{it} = \alpha + \sum_{j=-3}^{7} \beta_j Birth_{it,j} \times Son_i + \sum_{j=-3}^{7} \delta_j Birth_{it,j} + \tau_t + \gamma_i + \epsilon_{it} \quad (1)$$

where i denotes individual and t denotes calendar time. The variables denoted by $Birth_{it,j}$ are indicator variables that equal one in the period relative to the birth of a child. For example, $Birth_{it,-2}$ indicates two years prior to the birth year while $Birth_{it,2}$ indicates two years after the birth year. Son_i is an indicator for whether the birth is a male child. Thus, the coefficients δ_j provide information on how the outcome moves around the birth of a girl while the coefficients β_j provide information on whether the effects of a birth of male are different from the effects of a birth of a female. The regression is restricted to the three periods prior and seven periods after to birth.[21] The omitted category is the year prior to birth ($j = -1$). The regression includes a constant term and fixed effects for calendar year. We also exploit the panel nature of the data and include individual fixed effects to absorb any time-invariant characteristics of the individual or household. The standard errors are clustered at the individual level.

The estimates of the years prior to the birth allow us to examine whether households who will have a boy are systematically different from households who will have a girl, and provide a way to test the identification assumption that these households are not systematically different prior to the birth of a child. The estimates of the years after birth allow us to examine whether any outcomes that change after birth are temporary or long lasting.

Given the large number of coefficients associated with the event study equation, we also present some estimates using the following more parsimonious difference-in-difference equation:

$$y_{it} = \alpha + \beta_1 PostBirth_{it,j} \times Son_i + \beta_2 BirthYear_{it,j} \times MaleChild_i + \delta_1 PostBirth_{it,j} + \delta_2 BirthYear_{it,j} + \tau_t + \gamma_i + \epsilon_{it} \quad (2)$$

[21] Women often marry into an existing household (and enter into a household in the data) and give birth to their first child shortly after marriage, so we usually observe women in more periods after the birth than prior to the birth.

where $PostBirth_{it,j}$ indicates all years *after* (and not including) the year of birth and $BirthYear_{it,j}$ equals one in the year of birth. As discussed in describing the data, for many births, $BirthYear_{it,j}$ may actually indicate the year prior to birth, so it is important to treat it separately from the periods that we are certain are after the arrival of the child.

5 Results on Labor Supply Outcomes

We present the event study estimates of equation 1 where the outcomes are mothers' labor supply outcomes in Figure 3. The first row shows the coefficient estimates where the dependent variable is the labor force participation of women. The figure on the left shows the estimates of δ_j around the birth of a daughter, while the figure on the right shows the estimates of β_j (the *differential* effect of a son). There are no significant trends in labor force participation of women prior to the birth of a child and no differential effects of a boy versus a daughter. In the year immediately following birth ($t = 1$), there is a 5 percent decline in the probability of worker among mothers who gave birth to daughters, and this estimate is significant at the 5% level. However, these effects are quite transitory as there are no significant differences in the probability of working 2 to 7 years after the birth of the daughter relative to the year prior to birth.

In panel B, we see the labor supply decisions of women are quite different following the birth of a son. There is a significant decline in labor force participation in the year of birth ($t = 0$), suggesting that women are 5.7% more likely to stop working when they are pregnant with a son but not a daughter. Women are also more likely to leave the labor force for 4 years after the birth of a son relative to the birth of a daughter. The magnitude of the additional effect is 6.6 to 8.8% and these estimates are all significant at the 5% level. Starting when the child is around 5 years old, the probability of the mother working is no longer statistically different for a boy relative to a daughter. The *total* impact of having a son on work (given by adding together δ_j and β_j) is largest in the year immediately following birth with a 14% reduction.

The bottom row of Figure 3 shows the same estimates on the inverse hyperbolic sine (IHS) function of the number of days that the mother spent working in the past year.[22] This captures

[22]The IHS function is similar to the logarithmic function but is well defined for zero values.

both the extensive margin given by the indicator for work as well as the intensive margin where women who work can change the amount that they work. The pattern of results is similar to those for labor force participation. For the birth of a daughter, there is only a significant decline in the number of days of work in the year immediately following birth when we see a very large 46% decline in days of work. These large effects for boys persist for the following four years where mothers of boys are working 28% to 48% fewer days than mothers of daughters, and these four estimates are significant at the 10% level or higher.

Figure 4 shows the corresponding estimates for fathers. As we saw with mothers, prior to birth, there are no significant trends in anticipation of the birth of a daughter or a son. However, the labor supply response of fathers after birth is quite different from mothers. First, if anything, it appears that fathers are *more* likely to work around the time of arrival of a child and for a few years afterwards (relative to the year prior to birth). This positive effect on work is significant at the 5% level when the child is two years old and the magnitude corresponds with a 2.6% increase in the probability of working for fathers. There are no significant differences in the labor supply response of fathers of boys as compared with daughters. The results for the number of days of work in the bottom row are similar to the labor force participation estimates.

Next, we present the parsimonious estimates of equation 2 using the NFP data in Table 4.[23] The estimates for women are shown in panel A and men in Panel B. The estimates that use the full sample are presented in columns 1 and 5, where the dependent variables are an indicator for work and the IHS function of the days of work, respectively. We begin by discussing the results for women in Panel A. In the full sample, the estimate indicates that women are 4% less likely to work in the year of birth of a daughter and 6% less likely to work afterwards. These estimates are significant at the 5% and 1% levels, respectively. The impacts of a son are significantly larger with mothers 5% less likely to work in the year of birth of a son relative to a daughter and 6% less likely to work in the years after the birth of a son relative to a daughter. This implies that women are twice as likely to leave the labor force following the birth of a son as compared to daughter.

[23]Column 1 of Table 8 also shows the estimates using the CHNS. While the coefficient on whether the woman works is negative, it is not significant at the standard levels. This may be driven by the relative lack of power given the small sample size in the CHNS.

Column 5 shows the corresponding estimate where the dependent variable is the IHS function of the days of work. We observe a large 42% decline in work days in the birth year for women with daughters and a 56% decline in the years thereafter. These estimates are significant at the 1% level. The effects are even larger for mothers of boys. Following the birth year, mothers of boys work an additional 33% fewer days than mother of girls for a total reduction in days of work for mothers of boys of 89%.

We address concerns about sample selection by examining the estimates where the sample is limited to individuals who appear for each of the 6 periods around the birth. For example, given prior research (Dahl and Moretti 2008), we may be concerned that parents are more likely to permanently leave the household following the birth of a daughter; a permanent migration would imply that we would no longer observe them in the data and this could bias the estimates. This reduces the sample substantially as there are some years that either the household or an individual is not present in data. The key estimate for labor force participation, the post-birth effects of a son relative to a daughter, remains significant at the 5% level and the magnitude increases to 9.1%. Similarly, the estimates on the number of days worked are also slightly larger in magnitude.

In order to address the potential concern that sex selection is driving the results, we draw upon the prior research that demonstrates that the sex ratio in China is not very skewed for the first birth but the distortion increases for higher order births (Ebenstein 2010). Thus, we look at a sample where the estimates are limited to the first birth.[24] The estimates on labor force participation are similar to those using the full sample but slightly larger in magnitude, and the estimates are significant at the standard level. With this sample restriction, the estimates are no longer significant at the standard levels when the dependent variable is work days.

Finally, in columns 4 and 8, we include indicators for each age. This allows for very flexible life-cycle patterns in labor force participation. The magnitude and significance of the estimates are very similar to the baseline estimates. This provides reassurance that the post-birth estimates are not simply picking up life-cycle patterns in labor supply outcomes.

[24]We limit the analysis to the first birth in the sample where the parents have no older children residing in the household. If the parents have older children who are not residing in the household, we would not be able to identify that the birth in the sample is not their first child because the MOA does not ask a full birth history.

The estimates in Panel B show that there are no significant differences in the labor supply behavior of men following a son as compared with a daughter. None of the estimates of the interaction between son and post birth are significant. The magnitudes of the coefficients for labor force participation are close to economically zero.

5.1 Bounding Exercise for Sex Selection

The sex ratio in China is quite skewed, suggesting that households are choosing to have boys rather than girls. Consistent with aggregate statistics for rural areas in China, in the MOA data used in this analysis, 57% of births in the sample period are males. The main concern for the identification strategy is that households with strong son preferences are also households that prefer for women to reduce their labor supply after *any* child. In other words, we might over-estimate the impact of having a boy on female labor supply if households who actively choose to have a boy rather than a girl would have reduced the amount that a mother works substantially even if they had a girl.

We have already shown that the observable characteristics of individuals and households prior to the birth of a son or daughter are similar. In addition, we have shown the results are robust in the sample limited to first-born children, where the gender bias at birth is less pronounced.[25] To further support the idea that selection in gender is not driving the results, we do a bounding exercise where we re-assign some male births to female births such that we achieve the gender ratio at birth that is considered the natural sex ratio. More specifically, to test specifically for the idea that preferences for women working post-baby are correlated with sex selective behavior, we identify the pool of households for which the women gave birth to a son and were working prior to the birth and stop working after birth. Then, among those households, we randomly select one-third to re-assign those births from boys to girls.[26] This bounding exercise is very conservative in that we are maximizing the impact of sex selective abortion on the estimates of labor supply effects.

The results are presented in Table 5. Mechanically, we must (and do) see smaller differences

[25] However, in this data, unlike in Ebenstein (2010), the skewed sex ratio is more muted but does still exist among first births.

[26] The number one-third is chosen to achieve the natural gender ratio at birth in the sample for the bounding exercise.

in the effects of having a son as compared with having a daughter. However, the magnitudes are not trivial; women are 8% less likely to work after the birth of a daughter and 11.2% less likely to work after the birth of a son. The difference, 3.2%, is significant at the 10% level. In terms of the number of work days, women work 65.2% fewer days after the birth of a daughter and 83% fewer days after the birth of a son. The difference between having a boy or girl on the number of work days is also significant at the 10% level.

5.2 Permanent Control Group Robustness Check

Our main estimates include a sample of households that either give birth to a son or daughter in the sample period. We examine whether the event study results are robust to the inclusion of a "permanent" control that does not experience any births in the sample period. This control group solves a potential under-identification problem by helping to identify the time effects in the event study regression (Borusyak and Jaravel 2017). More specifically, the permanent control group is restricted to women in households where there are no births happening in the sample period and whose age is restricted to the range 12 to 50 to be comparable to the women who give birth (and the 10 years around birth). The estimates are presented in Appendix Figure A.3 and show that the magnitudes of the coefficients and their significance remain very similar to the estimates without this additional control group.

6 Impacts on Other Outcomes

6.1 Consumption

In order to better understand the mechanisms of the different labor supply responses that we observe of mothers following the birth of sons versus daughters, we examine other outcomes of interest. To test whether the birth of a son represents a wealth effect that allows women to work less and consume more leisure, we look at household consumption (as measured by expenditures). Total expenditure is presented in column 2 of Table 6. Following the birth of a son, a household consumes 2.4% *less* relative to household consumption following the arrival of a girl, but this estimate is not

statistically different from zero.[27] Similarly, we do not observe *positive* changes in the consumption of cigarettes, alcohol, milk or meat following the birth of a boy. Overall, the results on consumption are not consistent with the idea of the household behaving like there is a positive wealth effect following the birth of a son. Furthermore, if milk and meat are investments in children, we don't see support for the idea of more investment in boys than girls in these consumption outcomes.[28]

The only significant estimate for the interaction terms are *negative* effects on cigarette consumption where the arrival of a son corresponds to a large 32% decline in cigarette expenditure. This is significant at the 5% level.[29] Similar to the NFP results, in the CHNS data in column 2 of Table 8, we see a significant 11% decline in the probability that someone in the household smokes following the birth a son relative to a daughter. The decline in cigarette consumption is consistent with a couple of the mechanisms. First, given the negative health consequences to children of second hand smoke, the result is consistent with the investment story where households invest more in the health of sons than daughters because they expect higher returns to investments in boys than in girls. Second, if mothers dislike people in the household smoking, it is also potentially consistent with the mechanism where household rewards mothers for producing a son. Smoking is a male-favored good in China; over half of Chinese men in 2010 were current smokers with only 3.4% of Chinese women reporting ever smoking (Liu et al 2017). Moreover, ethnographic studies with Chinese women suggest that they strongly dislike male smoking for a variety of reasons, including the health consequences and the associated dirtiness that falls on women to clean (Mao, Bristow and Robinson 2012).

6.2 Migration

We next consider the impact of the birth of son or daughter on migration outcomes. In columns 1 and 2 of Table 7, the outcome variable is the IHS function of the number of days that the person spent at home in the past year. The birth of a daughter corresponds to a significant increase in

[27] The magnitude of the effects on total income in column 1 are similar. This may be surprising, given that women's labor force participation has dropped substantially and we will return to this in Section 6.2.

[28] Milk consumption in the household increases after birth but not differently for boys versus girls.

[29] Appendix Figure A.4 shows the event study estimates around birth. The relative decline in cigarette consumption for boys (given by the interaction term) persists for about four years, which is similar to the timing of the labor effects for mothers.

the number of days at home for both mothers and fathers. Following the arrival of a girl, mothers spend 37% more days at home and fathers 27%. These estimates are significant at the 1% level. There is no significant difference in the number of days the mother spends at home following a son as compared with a daughter. In contrast, the number of days that the father is at home is different for a son versus daughter. More specifically, fathers are more likely to be away from home following the birth of a son than a daughter.

We examine whether an individual attrites from the survey as a measure of migration that would capture permanent migration. In contrast, the number of days at home versus away captures seasonal or temporary migration of household members. As shown in columns 5 and 6, there are no significant differences in the rates of attrition from the sample following sons or daughters. There is a significant increase in the attrition of 1.6% of fathers following birth of either a son or daughter.

Corresponding to the increase in temporary migration, we see an increase in the amount that fathers earn away from home (by 1634 RMB) following the birth of their sons relative to daughters. This estimate is significant at the 10% level. This helps to explain how the results can tie together: following the arrival of a son, mothers work less and fathers don't work much more (in terms of total days), but household consumption and income do not fall because the composition of men's work has changed.[30] Men are more likely to migrate temporarily for work in order to maintain the households' standard of living while the mothers work less.

There is no direct way to compare the increased earnings associated with men's temporary migration with the loss of earnings associated with the decline in women's labor supply because household agricultural profits are not assigned to individuals in the NFP survey. However, as a back of the envelope calculation, we calculate the average amount paid to a hired female laborer among the households in the sample of analysis. This corresponds to an average of 41.3 RMB per day. Assuming that women work an average of 160 days per year, the 33% reduction in days worked corresponds to 52.8 fewer days of work of the women. This translates into an average loss in household income of 2180 RMB following the birth of a son relative to a daughter. Thus, the increase in earnings from male migration makes up for three-quarters of the loss in earnings

[30] As shown in column 1 if Table 9, the labor supply of other people in the household (not including the parents) doesn't change significantly following the birth of a boy relative to a girl in the household.

associated with women reducing their labor supply following a boy's birth.

6.3 Time Use

We next turn to time use outcomes available in the CHNS, including time spent on child care, shown in column 3 of Table 8. Not surprisingly, the number of hours that women spend on child care increases dramatically (and significantly) post-birth by 32 hours per week. However, there is no significant difference in the time spent on caring for a male or female child. In fact, the coefficient estimate on the interaction between a son and post-birth is negative (-2 hours).

In terms of time spent on leisure (column 4), the birth of a girl leads to an insignificant decline on average in women's leisure. Interestingly, women's total leisure actually increases following the birth of a son by 16 hours in the birth year and 10 hours per week thereafter. The difference between the effect of a girl versus boy on leisure is statistically significant at the 10% level. After the birth of a child, a woman spends about 23 minutes more per day on food preparation and washing clothes. This estimate is significant at the 1% level. However, there are no significant differences in the time she spends on chores by the gender of the child.

As expected, we see a 58% increase in the probability of breastfeeding in the year that an infant is born and a 53% increase after the birth year (in column 6). These estimates are significant at the 1% level. However, there are no significant differences in breastfeeding by gender.

We also consider whether households spend time and money investing in the health of their children. In column 7, we see that the number of immunizations that children under 12 receive in the household increases by 0.55 in the year of birth and by 1.1 in the year following the birth. Both of the estimates are significant at the 1% level. However, as with breastfeeding, there are no significant differences by the gender of the child.

Finally, the CHNS allows us to consider whether women participate in household decisions to purchase durable goods in column 8. There is no effect of the birth of a daughter on her decision-making power, but there is a 26.5% increase in the mothers' probability of participating in these household decisions following the birth of a son. This estimate is significant at the 10% level.

Overall, the results from the CHNS are most consistent with the idea that women are being

rewarded for having a boy with less work, more leisure and more power in household decision-mkaing. Despite working less following sons than daughters, they are not spending more time taking care of their sons or breastfeeding them more. While the results on leisure are also potentially consistent with the investment mechanism where women exert more effort (but not time) with their sons than their daughters; under the investment story, the additional effort is exhausting, so women may need more leisure to be able to maintain this high level of interaction and investment for sons. However, the results on breastfeeding, immunizations and female decision-making are not supportive of the idea that households are generally making more investments in boys than girls.

Unfortunately, there are no questions about child care, leisure or female participation in household decision-making in the NFP data. However, we can get some limited information about time use by looking at a variable in the NFP about current enrollment in school. In Table 9, we see a drop in school enrollment of 1.8% (significant at the 1% level) following the birth of a daughter. Given that only 2% of women were enrolled in school prior to birth, this means that essentially all women who were in school dropped out following the birth of their daughters. However, the coefficient on the interaction between birth and a son is 1.3% suggesting that women are more likely to be in school following the birth of a son than a daughter. Consistent with the child care results from the CHNS, the results on school enrollment using the NFP data indicate that the shift away from work following the birth of a son is not entirely about shifting into child care. Mothers of sons shift into other activities beyond child care, including remaining in school and leisure. Thus, these results are consistent with the mechanism whereby women are rewarded for producing a son. However, the results are also consistent with the investment mechanism if households believe that having educated mothers represent an investment in the children.[31]

6.4 Health

We consider the possibility that the observed labor outcomes are driven by physical differences in the health of mothers following the birth of a son or daughter. In the first row of Figure 5, we show the estimates using the NFP data where the dependent variable is mothers' health broken down

[31]There is a large literature in economics linking mothers' education outcomes with the outcomes of children. See for example Thomas, Strauss and Henriques (1991) and Currie and Moretti (2003).

by each year around birth given that this mechanism seems likely to be concentrated around the time of birth. In Panel B, we see that there are no significant differences in the health status of the mother around the time of birth associated with a son as compared with a daughter. Interestingly, there does seem to be a trend in the mother's health prior to birth, suggesting that worsening health may trigger people to try to have children. There is also a strong trend in health outcomes after birth, where self-reported health status is worse after the birth of a child; this may not be surprising if parents are sleeping less or have more stress. These trends are not merely driven by life-cycle effects; they persist even with the inclusion of indicators for every age (Appendix Figure A.5). Overall, the results do not support the idea that having a son has substantially different consequences for the health of mothers than having a daughter.

Another related mechanism is that boys require more care to achieve the same level of outcomes as girls because they are born less physically robust.[32] To consider this idea, we look at the reported health status of boys and girls following their births in the NFP data in Panels C and D of Figure 5. There are no significant differences in the health status of boys and girls, suggesting that this mechanism is not driving the gender differences in the labor supply of mothers following birth.

6.5 Fertility and Household Size

To consider whether the gender differences in the labor supply response of mothers is driven by the information that a son versus daughter provides about total fertility, we look at the impact of the birth of a girl versus boy on the number of children and total household size. In Table 9, we see that there are no significant differences in the total number of children that a couple has after the birth of a son or a daughter (column 4). The magnitude of the coefficient is also quite small. This suggests that having a boy or girl doesn't strongly affect total fertility in our sample. This is perhaps not surprising in the Chinese context where the number of total children is small, and households then prefer to practice sex selective abortion rather than gender-based stopping rules. Similarly, column 5 shows that the total household size after a birth doesn't change significantly for a boy or a girl. In addition to providing information about subsequent fertility, household size

[32] Note that this mechanism isn't consistent with the finding that women are more likely to be enrolled in school following the birth of a boy relative to a girl.

tells us that the probability of co-residence of other individuals, such as grandparents, doesn't vary by the gender of the child. It is interesting to note that the number of children increases by 0.822 after birth, but the total household size only increases by 0.671; this indicates that some other adults are likely to leave the household after the arrival of a child.[33] Overall, these results tell us that the changes in the labor market outcomes of women are not driven by what the arrival of a son or daughter signals about her total fertility or the composition of the household.

7 Heterogeneity

Rural parents in China are much more likely to co-reside with an adult son than with an adult daughter. We consider the idea that the expectation of future co-residence and care drives parental investment decisions in sons and daughters. Prior research shows that rural parents are more likely to co-reside with their youngest son relative to other children (Lei, Strauss, Tian, Zhao 2015). Thus, we use the NFP data to examine whether birth order matters for the labor supply response to sons and daughters.

In Table 10, we look at a sub-sample of mothers who already have a son. Thus, these estimates give us the labor supply impact of having a son versus daughter among women who already have one son. Women are 6% more likely to not work after the birth of a son than a daughter when they already have a son; this estimate is only significant at the 11% level. For the number of days worked, in households that already have a son, the birth of an additional son leads the mother to work 47% less than the birth of a daughter. This estimate is significant at the 5% level. Comparing these estimates to those for first-born children shown in columns 3 and 7 of Table 4, the coefficient on the interaction between post-birth and son are similar in magnitude. The estimate for first-born children is slightly larger when the outcome is female labor force participation and slightly smaller for days of work. Thus, the gender differences in the labor market effects of birth exist for both first-born and higher order births and are not concentrated in one type of son.[34]

[33] In other words, the arrival of a child drives other members out rather than attracting the co-residence of grandparents.

[34] However, the results may still be consistent with investment in the son with whom they plan to co-reside given that there is uncertainty when the first son is born in whether they will have another son or not.

Next, we focus on the type of work that the woman was engaged in prior to birth in order to consider whether discrimination by firms or rigidities in the formal labor market can explain the results. For this mechanism to explain the results, firms would discriminate against mothers of sons differently than mothers of daughters. We examine heterogeneity in the labor market effects by whether the women's primary occupation prior to birth was in a family enterprise and whether her primary industry was agriculture.

The results are presented in columns 1 and 2 of Table 11.[35] There are no significant differences in the impact of a son on women who were in family enterprises or agricultural work and those women who were in other enterprises and non-agricultural work. However, it is important to note that the magnitudes of the estimates as well as the standard errors on the triple interaction between son, post birth and the woman's work type are large.

Next, we look at heterogeneity by the presence of a co-resident grandparent prior to the birth. A grandparent may be able to provide care for young children and allow women to continue to work following birth.[36] In column 3, we see that there are no significant differences in the gender differences in the labor response of mothers to the arrival of a baby based on the presence of grandparents in the household. However, these are not precisely estimated.

In columns 4 through 6, we also look at heterogeneity along demographic characteristics of the mother. More specifically, we look at whether the age of the mother at the time of birth was above the average age, whether the woman had above average education and whether the household is an ethnic minority (not ethnic Han Chinese). The one child policy was generally less restrictive for minority households, who were allowed to have more children without penalties than Han Chinese households. There are no significant differences in the impact of a birth of son along any of these characteristics.

Finally, it may be interesting to consider whether the labor supply response of mothers is stronger in areas where there is a stronger preference for sons. We examine heterogeneity by the provincial sex ratio. If the sex ratio is less skewed than average, the variable equals zero and if the

[35]The results with the days of work are presented in Appendix Table A.1.

[36]Alternatively, a co-resident grandparent may be able to substitute into women's labor activities in agriculture or a family enterprise, which may then work in the opposite direction.

sex ratio in the province is more skewed than average, then the variable equals one.[37] We don't see any significant differences in the participation response of mothers to sons by the provincial sex ratio.

8 Conclusion

This paper provides new evidence on the gender differences in the impact of a birth on the labor supply of rural women in China. Women reduce their probability of working and the number of work days for one year following the birth of a daughter before returning to their pre-birth levels of work. For the birth of a son, the magnitude of the decline is larger and persists for four years after birth. There are no declines in the labor supply of men for either a daughter or son, though the composition of where the man works does change in order to maintain household consumption while his wife works less.

The results of the paper also suggest that smoking in the household declines more for boys than girls, and mothers have more time for leisure and for schooling after the arrival of a son than a daughter. Interestingly, women do not report more time spent on child care for boys than for girls, but they do spend more time on leisure activities and in school. Women have more bargaining power in decision-making over household durable goods following a boy relative to a girl.

We consider several reasons that female labor supply may respond differently following the birth of a son than a daughter. There is no support for the idea that the observed labor supply responses are driven by physical differences in boys versus girls or in mothers after giving birth to boys versus girls. We are also able to reject the possibility that there are different wealth effects or fertility effects associated with boys and girls. Given the large increase in leisure of mothers following a son's birth, the increased participation in decision-making and the lack of increase in time inputs into boys relative to girls, the results are most consistent with the idea that mothers are being rewarded by households with less work and more leisure for producing sons. Another leading mechanism is that households are simply investing more in sons than daughters because the returns to investment in boys are higher. Under the investment mechanism, mothers spend more

[37] The provincial sex ratio used here is calculated within the MOA sample.

effort per unit of time on their sons and this effort is tiring and leads them to need more leisure. However, we don't observe any evidence that there are other increases in investment in boys over girls in terms of immunizations, breastfeeding and consumption of milk and meat. The results are consistent with Anderson and Ray (2010) who show that there is a skewed sex ratio at birth in China, but no evidence of household discrimination against girls and in favor of boys after birth.

The micro-level estimates in this paper suggest a potential linkage in the macro-level trends in falling female labor force participation rates and the rise in sex ratios over time in China. Given that we find that rural women work less following the birth of sons relative to daughters, this may explain part of the overall fall in women working in China. Furthermore, this suggests that policies that affect the sex ratio, including changes to the one child policy, may then have unintended consequences on female labor force participation.

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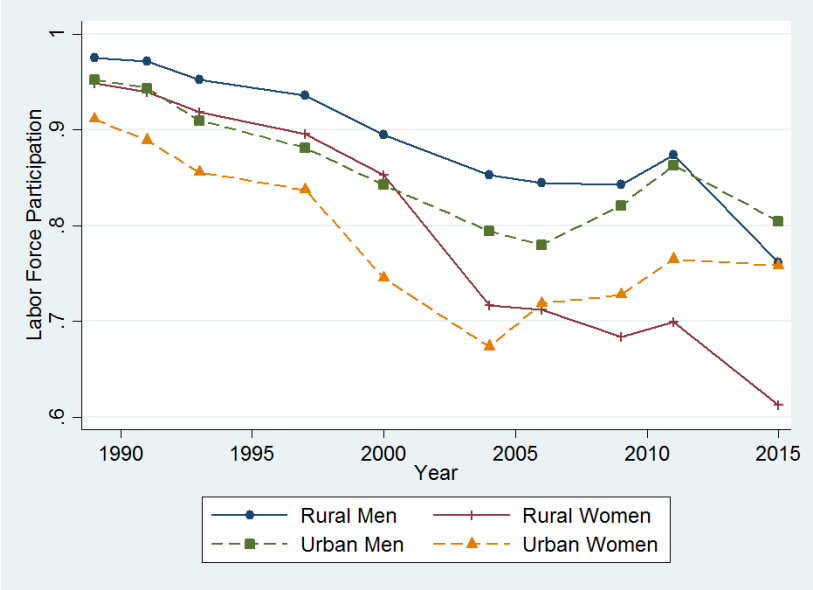
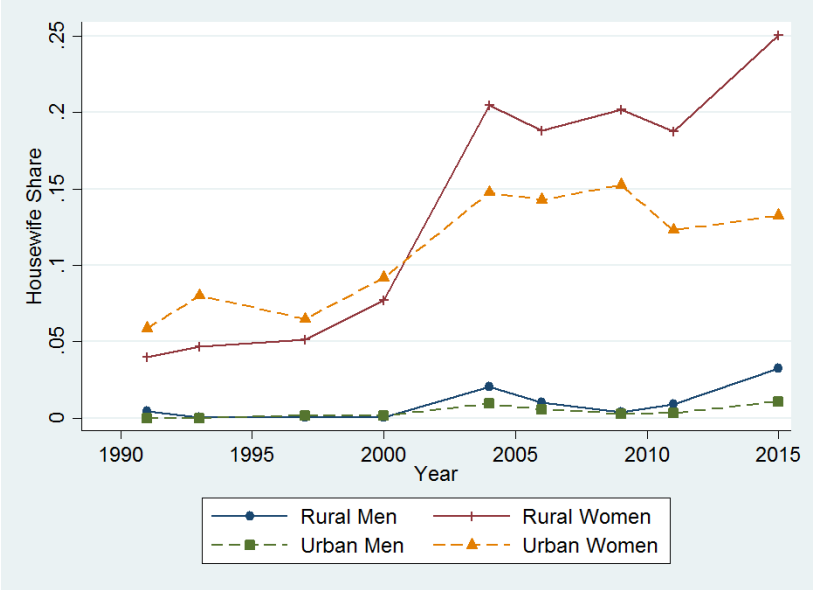
Figure 1: Trends in Labor Status by Gender and Location

(a) Labor Force Participation

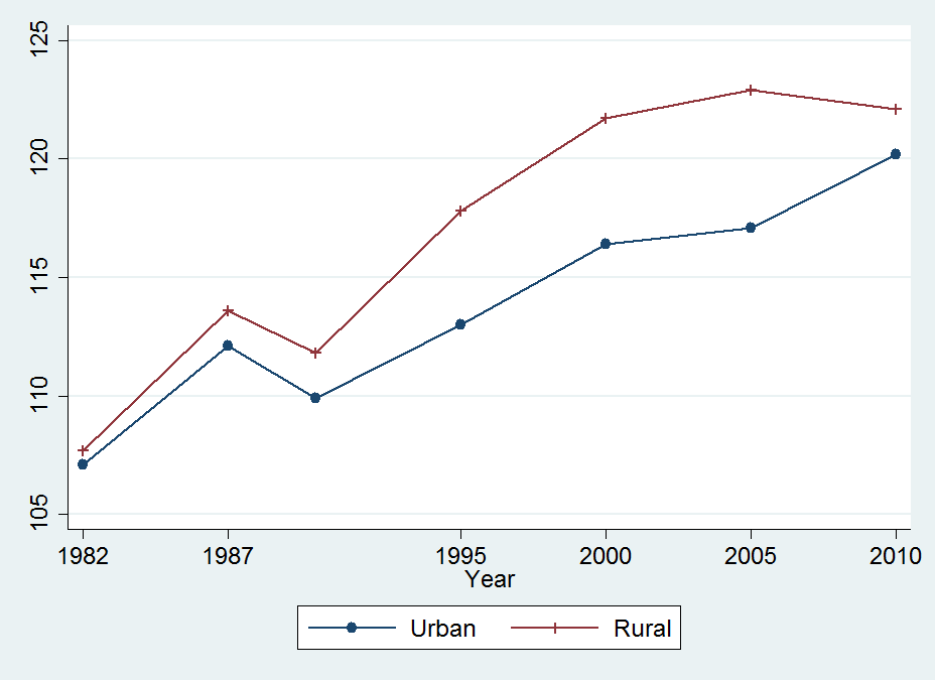


(b) Housewife Share



Notes: Panel A shows labor force participation rates by gender and location (urban versus rural). Panel B shows the share of individuals who report being a housewife. These trends are calculated using data from the CHNS over a sample of individuals aged 20 to 40. The sample size is 41,417 for labor force participation and 35,540 for housewife status.

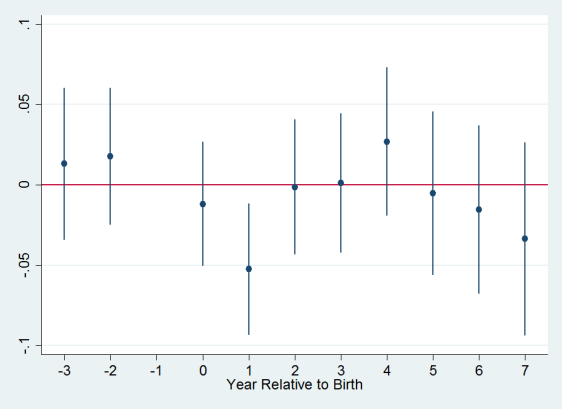
Figure 2: Trends in Sex Ratio (Males per 100 Females) at Birth



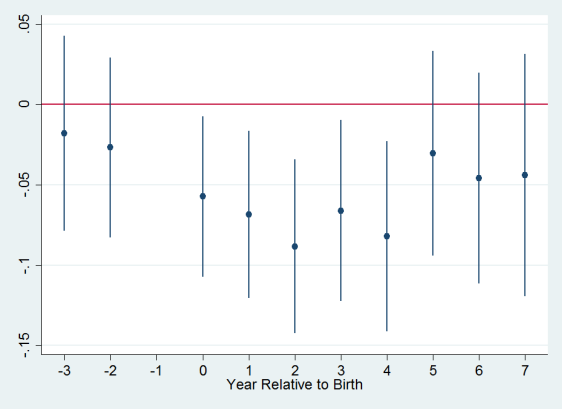
Data sources: National Bureau of Statistics, 1982, 1990, 2000, and 2010 Population Censuses, (respectively published in 1985, 1993, 2002 and 2012); 1987, 1995 and 2005 One Percent Population Sample Surveys (respectively published in 1988, 1997 and 2007). Summarized in UNICEF's Children in China: An Atlas of Social Indicators, 2014.

Figure 3: Effects of the Birth on Mothers' Labor Outcomes

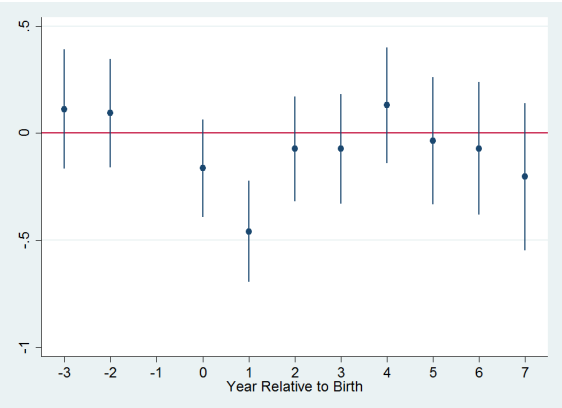
(a) Work Indicator - Daughter



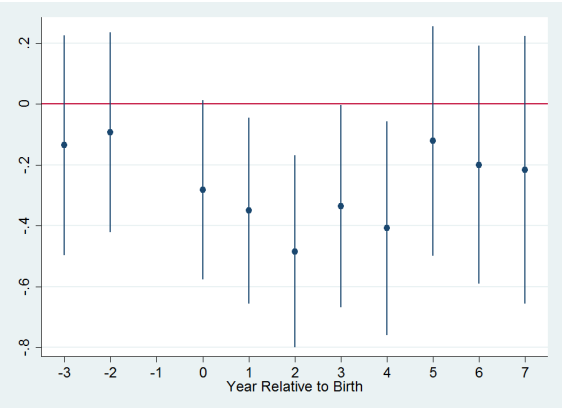
(b) Work Indicator - Son Interaction



(c) IHS Days of Work - Daughter



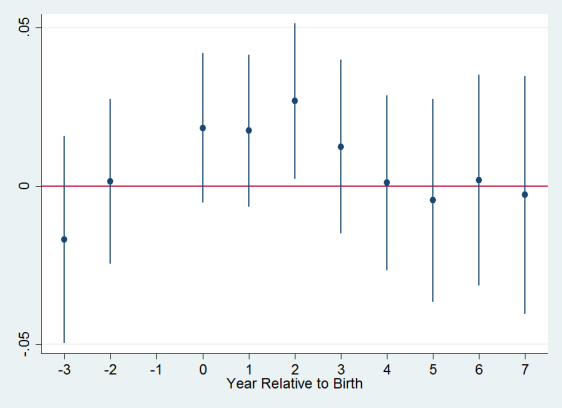
(d) IHS Days of Work - Son Interaction



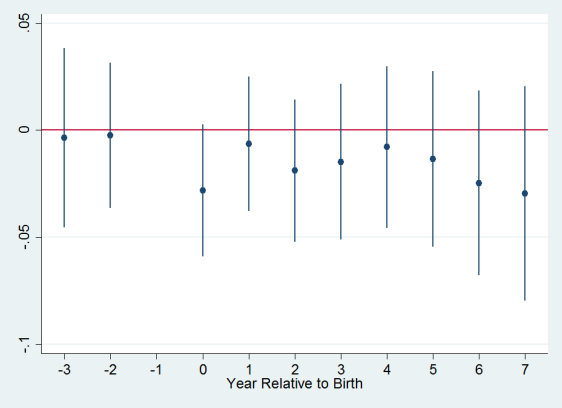
Notes: Each row corresponds with one regression. The dependent variable in the first row is an indicator for work over the year and the IHS of days of work over the year in the second row. The dots give the coefficient estimates for years around the birth (δ_j) in the left column and for the interaction between the years around the birth and the birth of a son (β_j) in the right column. The line denotes the 95% confidence interval where the standard errors are clustered at the household level. The regressions also include a constant term and fixed effects for household and year. The sample size is 18,144.

Figure 4: Effects of the Birth on Fathers' Labor Outcomes

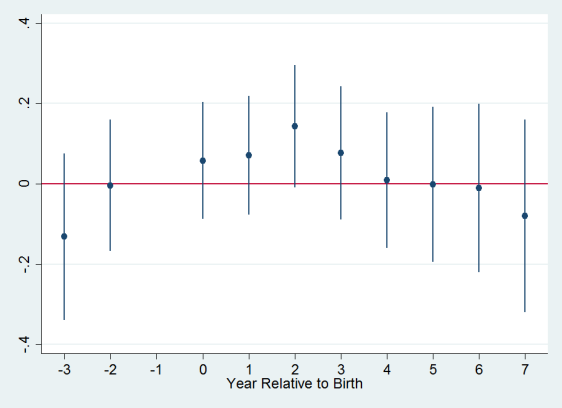
(a) Work Indicator - Daughter



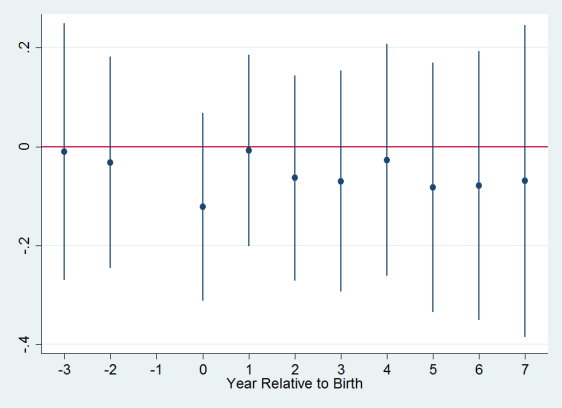
(b) Work Indicator - Son Interaction



(c) IHS Days of Work - Daughter



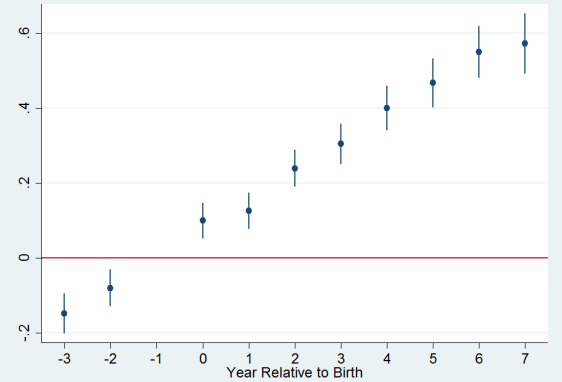
(d) IHS Days of Work - Son Interaction



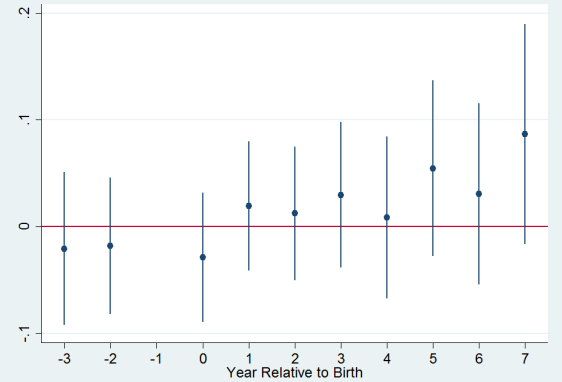
Notes: This figure replicates Figure 3 except the sample is fathers rather than mothers. The sample size is 20,131.

Figure 5: Mothers' and Children's Health Around Birth by Gender

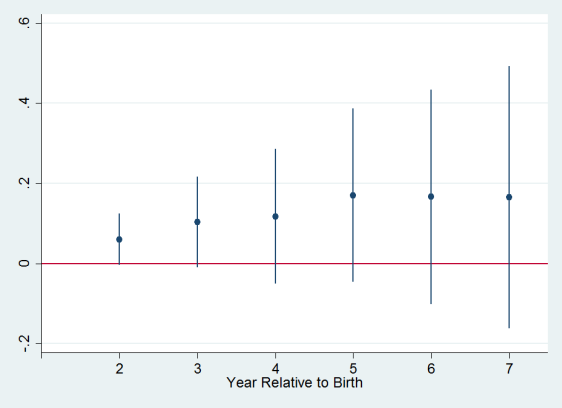
(a) Mothers' Health Status - Daughter



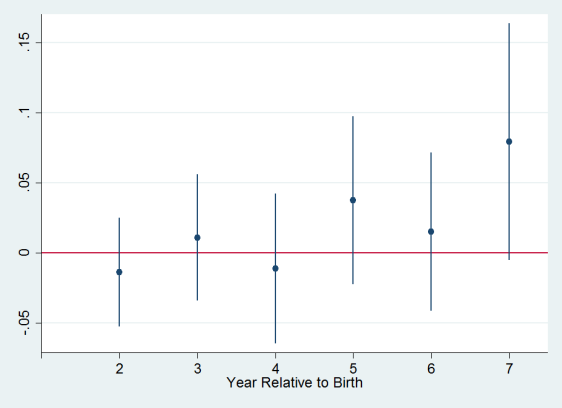
(b) Health Status - Son Interaction



(c) Daughters' Health Status



(d) Son Interaction



Notes: Each row corresponds with one regression. The dependent variable in the first row is mother's health status, and in the second row is children's health status. In row 1, the dots give the coefficient estimates for years around the birth (δ_j) in the left column and for the interaction between the years around the birth and the birth of a son (β_j) in the right column. In row 2, the dots give the coefficient estimates for the years following birth in the left column and the interaction between the years following the birth and the birth of a son in the right column. The line denotes the 95% confidence interval where the standard errors are clustered at the household level. The regressions also include a constant term and fixed effects for household and year.

Table 1: Individual-Level Summary Statistics (NFP)

	Women				Men			
	Pre-Boy	Pre-Girl	N	p-value	Pre-Boy	Pre-Girl	N	p-value
Work Indicator	.7521	.7546	2285	.8911	.8885	.9218	2660	.0040
	(.4319)	(.4305)			(.3147)	(.2684)		
Days of Work	159.1	160.1	2285	.8572	234.5	239.3	2660	.2811
	(133.2)	(133.2)			(114.6)	(110.6)		
Health Status	1.428	1.460	2264	.1863	1.384	1.381	2638	.8878
	(.5566)	(.6071)			(.5474)	(.5688)		
Age	27.72	27.75	2279	.9329	29.10	29.04	2652	.8349
	(7.334)	(7.650)			(7.507)	(7.830)		
Education	7.950	7.900	2221	.6310	8.439	8.437	2617	.9824
	(2.418)	(2.440)			(2.302)	(2.442)		
In School	.0218	.0208	2240	.8613	.0183	.0159	2604	.6394
	(.1463)	(.1428)			(.1341)	(.1252)		
Days at Home	283.7	282.6	2225	.8470	241.9	243.9	2569	.7208
	(125.6)	(126.9)			(141.4)	(140.9)		
Earnings Away	1769.4	1742.3	2285	.8862	4884.1	5064.8	2660	.6774
	(4543.7)	(4375.5)			(12673)	(8618.8)		
Attrite	.0382	.0363	2243	.8176	.0249	.0308	2618	.3650
	(.1918)	(.1873)			(.1560)	(.1728)		
Agriculture Industry	.4763	.4915	2222	.4776	.2849	.3090	2600	.1817
	(.4996)	(.5001)			(.4515)	(.4623)		
Family Occupation	.5948	.5872	2238	.7177	.4522	.4616	2619	.6329
	(.4911)	(.4925)			(.4978)	(.4987)		

Notes: The first four columns show summary statistics for women and the last four for men. The mean of each variable is shown for the year immediately prior to the birth of a boy or a girl with standard deviations below in parentheses. The p-value refers to whether the difference between the pre-boy mean is statistically different from the pre-girl mean.

Table 2: Household-Level Summary Statistics (NFP)

	Pre-Boy	Pre-Girl	N	p-value
Total Income	33987	36179	2584	.4897
	(59743)	(10037)		
Total Expenditures	29115	32754	2568	.2445
	(55813)	(10072)		
Cigarettes	626.1	629.5	2588	.9540
	(1476.0)	(1555.8)		
Alcohol	13.77	9.437	2588	.0497
	(67.89)	(33.70)		
Milk	7.328	8.802	2588	.3173
	(29.83)	(44.95)		
Meat	153.5	155.4	2608	.7667
	(152.6)	(169.1)		
Others' Days of Work	300.0	306.7	2608	.4905
	(242.3)	(248.7)		
Household Size	4.253	4.170	2608	.0749
	(1.158)	(1.212)		
Grandparents	.8465	.8361	2608	.4684
	(.3605)	(.3703)		
Minority	.1303	.1124	2529	.1744
	(.3367)	(.3160)		

Notes: The mean of each variable is shown for the year immediately prior to the birth of a boy or a girl with standard deviations below in parentheses. The p-value refers to whether the difference between the pre-boy mean is statistically different from the pre-girl mean.

Table 3: Summary Statistics for Rural Women (CHNS)

	Pre-Boy	Pre-Girl	N	p-value
Work Indicator	.6483	.6432	357	.9208
	(.4788)	(.4804)		
Age	26.57	26.13	617	.2710
	(5.119)	(4.967)		
Education	7.318	7.315	540	.9929
	(3.588)	(3.543)		
Household Smoking	.6943	.7011	517	.8657
	(.4615)	(.4586)		
Childcare (Hours/week)	18.50	19.11	371	.8529
	(31.07)	(32.58)		
Leisure (Hours/week)	22.15	21.85	179	.8915
	(15.65)	(13.28)		
Chores (Hours/day)	2.166	1.933	583	.1246
	(1.965)	(1.651)		
Breastfeeding Indicator	.1479	.1441	668	.8912
	(.3555)	(.3518)		
Household Immunizations	.5809	.4754	551	.0699
	(.7111)	(.6457)		
Female Share in Household Decisions	.6945	.6437	221	.3878
	(.4346)	(.4328)		

Notes: The mean of each variable is shown for the first year prior to the birth of a boy or a girl with standard deviations below in parentheses. The p-value refers to whether the difference between the pre-boy mean is statistically different from the pre-girl mean.

Table 4: Effects of Birth on Individual Labor Outcomes

	Indicator for Work				IHS Days of Work			
	Full Sample (1)	Balanced Sample (2)	First Birth Sample (3)	Additional Controls (4)	Full Sample (5)	Balanced Sample (6)	First Birth Sample (7)	Additional Controls (8)
Panel A: Mothers								
Son × Post Birth	-0.0630***	-0.0914**	-0.0757**	-0.0627***	-0.329***	-0.401*	-0.308	-0.324***
	(0.0214)	(0.0383)	(0.0339)	(0.0210)	(0.127)	(0.225)	(0.200)	(0.125)
Son × Birth Year	-0.0504**	-0.00807	-0.0836**	-0.0507**	-0.248*	0.0376	-0.342	-0.249*
	(0.0236)	(0.0434)	(0.0381)	(0.0234)	(0.139)	(0.257)	(0.225)	(0.139)
Post Birth	-0.0609***	-0.0629	-0.0882***	-0.0749***	-0.557***	-0.542*	-0.813***	-0.637***
	(0.0187)	(0.0516)	(0.0284)	(0.0184)	(0.110)	(0.306)	(0.166)	(0.108)
Birth Year	-0.0435**	-0.0717*	-0.0639**	-0.0573***	-0.419***	-0.527**	-0.630***	-0.495***
	(0.0180)	(0.0397)	(0.0278)	(0.0179)	(0.106)	(0.230)	(0.163)	(0.106)
Observations	19954	2947	10710	19928	19954	2947	10710	19928
Panel B: Fathers								
Son × Post Birth	-0.00733	-0.00508	0.00408	-0.00533	-0.0138	0.0161	0.0827	0.00119
	(0.0130)	(0.0214)	(0.0180)	(0.0122)	(0.0806)	(0.133)	(0.111)	(0.0752)
Son × Birth Year	-0.0204	-0.0103	-0.0158	-0.0215	-0.0795	-0.00503	-0.00308	-0.0821
	(0.0149)	(0.0237)	(0.0210)	(0.0140)	(0.0919)	(0.145)	(0.129)	(0.0864)
Post Birth	0.0279**	0.0525*	0.0417***	0.00685	0.143**	0.222	0.211**	0.00268
	(0.0113)	(0.0278)	(0.0154)	(0.0110)	(0.0696)	(0.173)	(0.0947)	(0.0675)
Birth Year	0.0338***	0.0244	0.0394**	0.0110	0.161**	0.0638	0.148	0.0108
	(0.0112)	(0.0216)	(0.0157)	(0.0109)	(0.0693)	(0.131)	(0.0965)	(0.0674)
Observations	22440	4949	12839	22414	22440	4949	12839	22414

Notes: The dependent variable in the first 4 columns is an indicator for work status over the year, and the IHS function of the days of work over the year in the last 4 columns. Columns 1 and 5 include the full sample. Columns 2 and 6 restrict the sample to individuals who appear in every wave for 6 waves around the birth. Columns 3 and 7 restrict the sample to the first birth. Columns 4 and 8 include indicators for age as controls. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 5: Bounding Effects of Sex Selection on Mothers' Labor Outcomes

	Work Indicator	IHS Work Days
	(1)	(2)
Son Imputed × Post Birth	-0.0319*	-0.178*
	(0.0177)	(0.104)
Son Imputed × Birth Year	-0.0419*	-0.197
	(0.0217)	(0.127)
Post Birth	-0.0801***	-0.652***
	(0.0172)	(0.100)
Birth Year	-0.0507***	-0.459***
	(0.0168)	(0.0992)
Observations	19954	19954

Notes: The indicator for the birth of a son is imputed to bound the effect of sex selection on the estimates. The regressions include fixed effects for year and household, and a constant term. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 6: Effects of Birth on Household Income and Consumption

	Total Income	Total Expenses	Cigarattes (yuan)	Alcohol (kg)	Milk (kg)	Meat (kg)
	(1)	(2)	(3)	(4)	(5)	(6)
Son × Post Birth	-0.0225	-0.0242	-0.321**	-0.000932	0.00317	0.0146
	(0.0271)	(0.0329)	(0.134)	(0.0371)	(0.0831)	(0.0347)
Son × Birth Year	0.0194	-0.00403	-0.372***	-0.00922	-0.0639	0.0446
	(0.0270)	(0.0365)	(0.139)	(0.0325)	(0.0836)	(0.0391)
Post Birth	-0.0359	-0.0193	0.00508	-0.0233	0.434***	0.0487
	(0.0233)	(0.0278)	(0.116)	(0.0291)	(0.0736)	(0.0311)
Birth Year	-0.0267	0.0239	0.204*	-0.0252	0.157**	0.0589*
	(0.0214)	(0.0282)	(0.112)	(0.0243)	(0.0687)	(0.0311)
Observations	19779	19683	14604	12344	19835	19954

Notes: The regressions include fixed effects for year and household, and a constant term. The dependent variables are transformed using the inverse hyperbolic sine function. Cigarette expenditures are transformed into real 2002 yuan. To maintain consistency in the survey question, the regression for cigarettes and alcohol exclude the waves 2009 and 2010, and the regression for alcohol further excludes 2003. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 7: Effects of Birth on Individual Migration and Earnings Away

	Days at Home		Earnings Away		Attrition	
	Mothers	Fathers	Mothers	Fathers	Mothers	Fathers
	(1)	(2)	(3)	(4)	(5)	(6)
Son × Post Birth	-0.0359	-0.120**	-58.93	1633.6*	0.0114	0.000746
	(0.0540)	(0.0478)	(246.7)	(955.8)	(0.0108)	(0.00869)
Son × Birth Year	-0.0539	-0.0791	-109.6	785.9	0.00553	0.00645
	(0.0576)	(0.0542)	(239.0)	(581.7)	(0.00829)	(0.00547)
Post Birth	0.366***	0.272***	-1107.7***	-208.5	-0.00297	0.0161**
	(0.0445)	(0.0420)	(200.2)	(333.9)	(0.00960)	(0.00751)
Birth Year	0.289***	0.179***	-677.4***	-6.113	-0.0334***	-0.0296***
	(0.0423)	(0.0432)	(193.4)	(301.8)	(0.00692)	(0.00510)
Observations	19315	21544	19954	22439	17394	19836

Notes: The regressions include fixed effects for year and household, and a constant term. Days at home is transformed using the IHS function. Earnings Away refer to earnings outside of county of residence and are transformed into real 2002 yuan. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 8: Effects of a Birth on Mother's and Household Outcomes (CHNS)

	Work Indicator	Household Smoking	Childcare Hours	Leisure Hours	Chores Hours	Breastfeed Indicator	Household Immun.	Female Decision
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Son × Post Birth	-0.0270	-0.109**	-2.028	9.982*	0.0784	0.0494	-0.0634	0.265*
	(0.0591)	(0.0537)	(4.002)	(5.390)	(0.147)	(0.0557)	(0.0863)	(0.155)
Son × Birth Year	-0.0327	-0.250**	-0.744	15.73*	0.652	0.0338	-0.128	0.233
	(0.177)	(0.110)	(10.90)	(8.842)	(0.532)	(0.0755)	(0.160)	(0.253)
Post Birth	-0.0568	0.0471	32.17***	-3.509	0.388***	0.533***	1.147***	-0.135
	(0.0562)	(0.0438)	(3.365)	(5.093)	(0.123)	(0.0380)	(0.0787)	(0.119)
Birth Year	-0.266**	0.254***	41.30***	-6.999	-0.0276	0.577***	0.554***	-0.253
	(0.125)	(0.0802)	(8.028)	(7.579)	(0.232)	(0.0568)	(0.122)	(0.213)
Observations	1306	1890	1292	1030	1806	2389	1435	432

Notes: The sample is restricted to rural women who have data both before and after a birth. The regressions include fixed effects for year and individual, and a constant term. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 9: Effects of a Birth on Others' Work, School Enrollment of Parents, and Household Size

	Others' Days of Work	Mother In School	Father In School	Number of Children	Household Size
	(1)	(2)	(3)	(4)	(5)
Son × Post Birth	-0.0522	0.0133*	-0.0117*	-0.00515	-0.0706
	(0.115)	(0.00804)	(0.00706)	(0.0346)	(0.0544)
Son × Birth Year	-0.0196	0.00378	-0.00989	0.0520	-0.0481
	(0.119)	(0.00855)	(0.00820)	(0.0343)	(0.0572)
Post Birth	-0.0968	-0.0181***	0.00548	0.822***	0.671***
	(0.102)	(0.00678)	(0.00549)	(0.0282)	(0.0447)
Birth Year	-0.0445	-0.00986	0.00292	0.0119	0.0296
	(0.0971)	(0.00643)	(0.00568)	(0.0255)	(0.0433)
Observations	19954	19568	21956	19954	19954

Notes: The dependent variable is an IHS function of the number of days worked of people in the household excluding the mother and father in column 1. It is an indicator for whether the mother and father is currently enrolled in school in columns 2 and 3, respectively. The dependent variable is the number of children in column 4 and total household size in column 5. The regressions include fixed effects for year and household, and a constant term. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 10: Effects in a Sample of Mothers Who Have a Son

	Work Indicator	IHS Work Days
	(1)	(2)
Son × Post Birth	-0.0612	-0.466**
	(0.0379)	(0.224)
Son × Birth Year	-0.0847**	-0.609***
	(0.0364)	(0.219)
Post Birth	-0.0388	-0.159
	(0.0357)	(0.209)
Birth Year	0.00469	0.0511
	(0.0271)	(0.165)
Observations	4200	4200

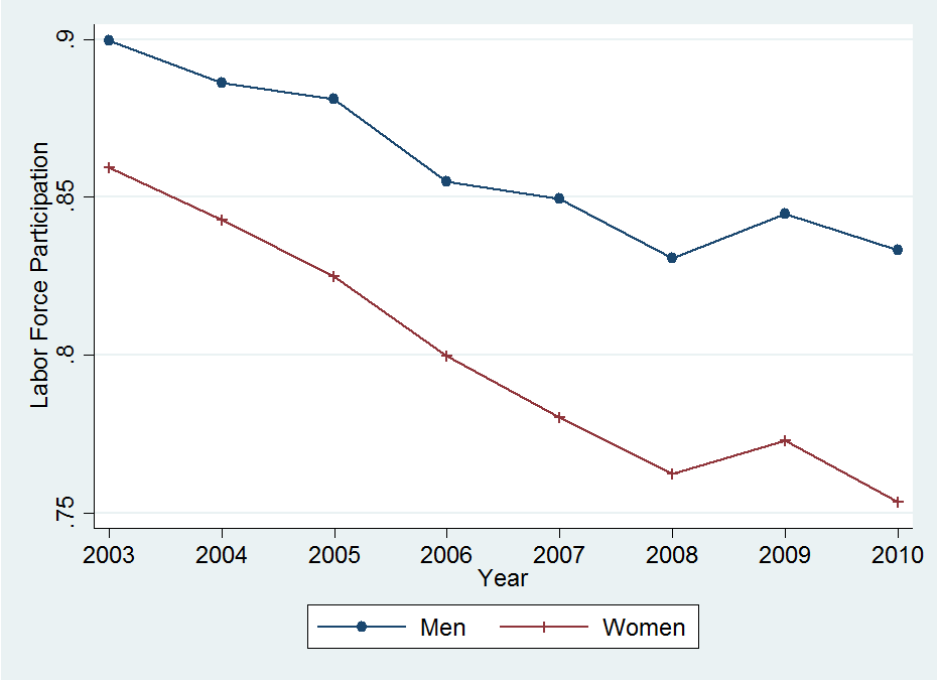
Notes: The sample is limited to mothers who already have at least one son. The regressions include fixed effects for year and household, and a constant term. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table 11: Heterogeneity in the Impact of a Birth on Labor Force Participation

Var:	Agric Ind	Family Occ	Grandpar Present	Young Mom	High Edu	Minority	Skewed Sex Ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Son × PostBirth × Var	0.0631	0.0142	0.0439	-0.0334	0.0374	0.0678	-0.0175
	(0.0500)	(0.0536)	(0.0513)	(0.0429)	(0.0511)	(0.0554)	(0.0429)
Son × BirthYear × Var	0.0480	0.0166	0.0585	-0.0352	0.0561	0.105*	0.0243
	(0.0493)	(0.0525)	(0.0499)	(0.0471)	(0.0512)	(0.0553)	(0.0471)
Son × Post Birth	-0.0664*	-0.0462	-0.0997**	-0.0472*	-0.0611*	-0.0722***	-0.0544*
	(0.0403)	(0.0455)	(0.0452)	(0.0278)	(0.0321)	(0.0232)	(0.0281)
Son × Birth Year	-0.0472	-0.0425	-0.0992**	-0.0352	-0.0687**	-0.0628**	-0.0637**
	(0.0388)	(0.0435)	(0.0419)	(0.0296)	(0.0325)	(0.0258)	(0.0320)
Post Birth	-0.0652*	-0.0683*	-0.0321	-0.0911***	-0.0606**	-0.0613***	-0.0547**
	(0.0341)	(0.0379)	(0.0342)	(0.0227)	(0.0281)	(0.0200)	(0.0237)
Birth Year	-0.0892***	-0.0950***	0.0353	-0.0273	-0.0198	-0.0403**	-0.0417*
	(0.0304)	(0.0332)	(0.0332)	(0.0226)	(0.0247)	(0.0195)	(0.0243)
Post Birth × Var	0.00106	0.00958	-0.0440	0.0593*	-0.00723	0.00362	-0.0126
	(0.0389)	(0.0413)	(0.0372)	(0.0325)	(0.0395)	(0.0385)	(0.0328)
Birth Year × Var	0.0629*	0.0693*	-0.0992***	-0.0256	-0.0536	-0.0300	-0.00224
	(0.0364)	(0.0387)	(0.0383)	(0.0345)	(0.0377)	(0.0398)	(0.0349)
Observations	10336	10386	16012	19818	10594	19328	19954

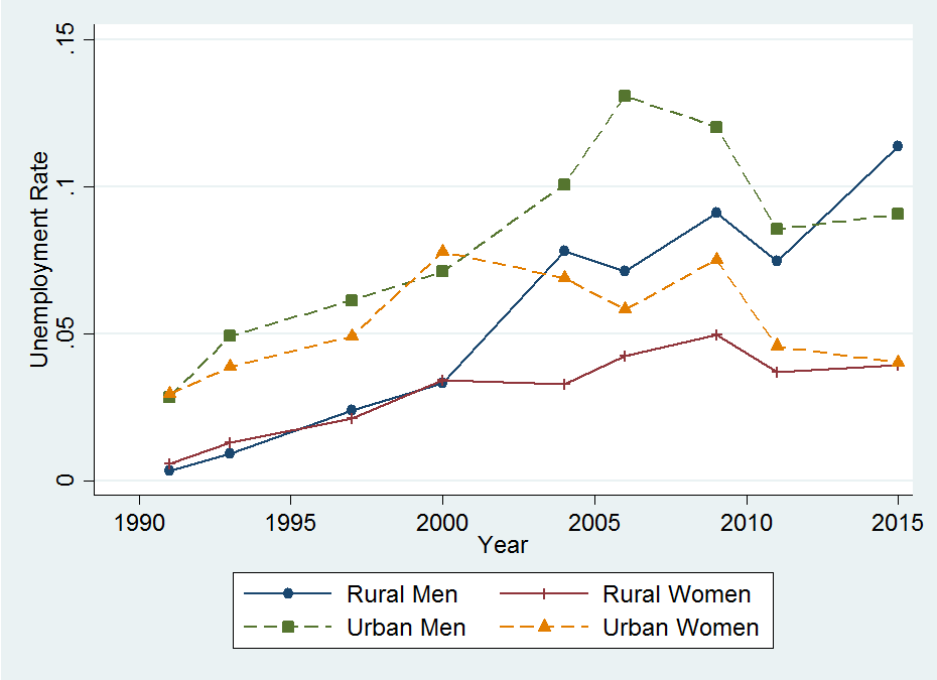
Notes: The dependent variable is female labor force participation. Each column is a regression where the column label indicates the variable that is interacted with the regressors. The regressions include fixed effects for year and household, and a constant term. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Figure A.1: Trends in Rural Labor Force Participation by Gender



Notes: These trends are calculated using data on rural households from the Ministry of Agriculture over a sample of individuals aged 20 to 40.

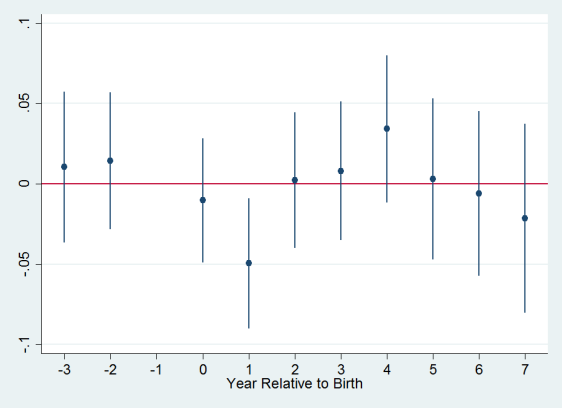
Figure A.2: Trends in Unemployment by Gender and Location



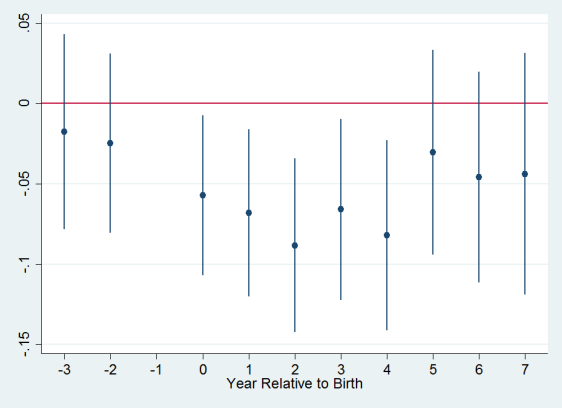
Notes: These trends are calculated using data from the CHNS over a sample of individuals aged 20 to 40.

Figure A.3: Effects of the Birth on Mothers' Labor Outcomes with a Permanent Control Group

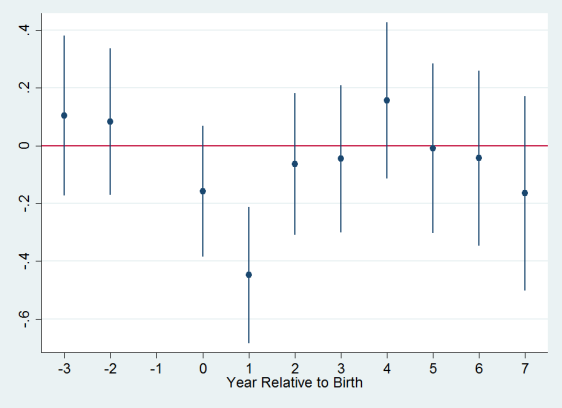
(a) Work Indicator - Daughter



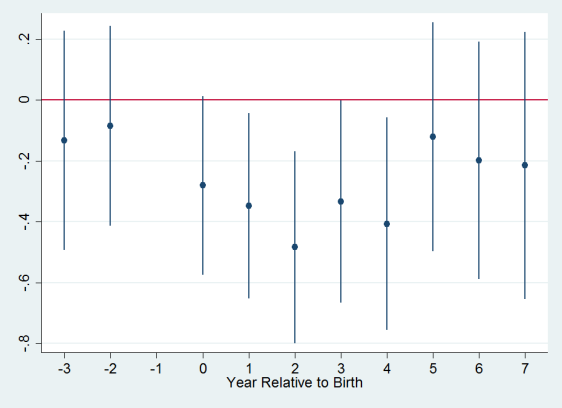
(b) Work Indicator - Son Interaction



(c) IHS Days of Work - Daughter



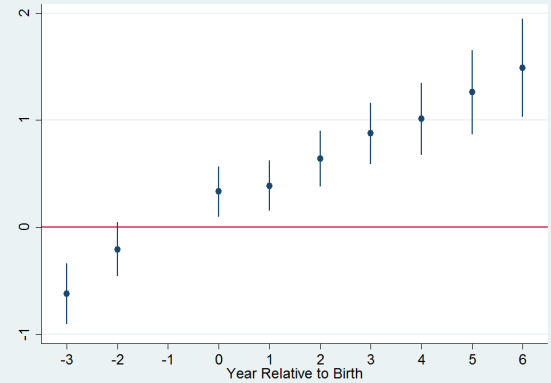
(d) IHS Days of Work - Son Interaction



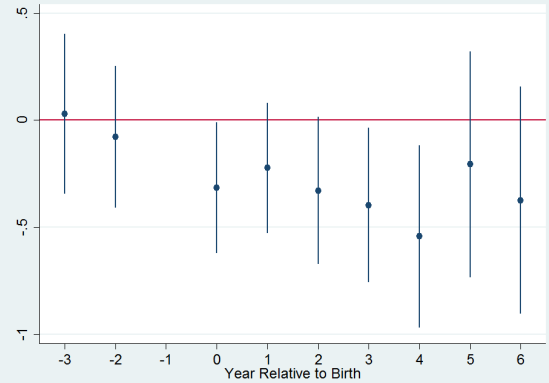
Notes: Each row corresponds with one regression. The dependent variable in the first row is an indicator for work over the year and the IHS of days of work over the year in the second row. The dots give the coefficient estimates for years around the birth (δ_j) in the left column and for the interaction between the years around the birth and the birth of a son (β_j) in the right column. The line denotes the 95% confidence interval where the standard errors are clustered at the household level. The regressions also include a constant term and fixed effects for household and year. The regressions include a permanent control group (who doesn't experience either the birth of a son or daughter). The sample size is 195,699.

Figure A.4: Effects of the Birth on Household Cigarette Consumption

(a) Daughter



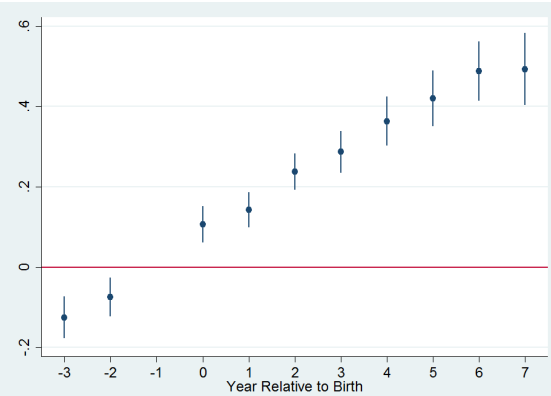
(b) Son Interaction



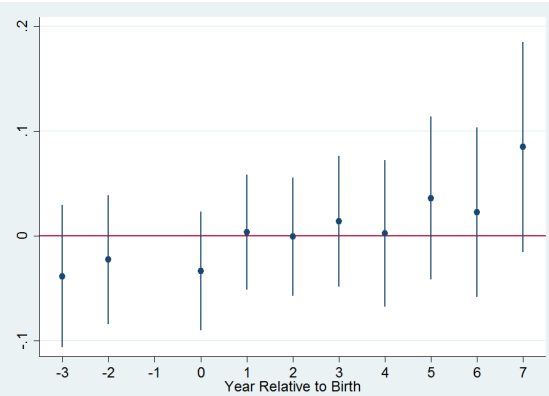
Notes: The dependent variable is the IHS function of household cigarette expenditures. The dots give the coefficient estimates for years around the birth (δ_j) in the left column and for the interaction between the years around the birth and the birth of a son (β_j) in the right column. The line denotes the 95% confidence interval where the standard errors are clustered at the household level. The regressions also include a constant term and fixed effects for household and year. The sample size is 13,125.

Figure A.5: Impact of Birth on Mothers' Health Outcomes Controlling for Age

(a) Mothers' Health Status - Daughter



(b) Health Status - Son Interaction



Notes: The dependent variable is mother's health status. In row 1, the dots give the coefficient estimates for years around the birth (δ_j) in the left column and for the interaction between the years around the birth and the birth of a son (β_j) in the right column. The line denotes the 95% confidence interval where the standard errors are clustered at the household level. The regressions also include a constant term and fixed effects for age, household and year.

Table A.1: Heterogeneity in the Impact of a Birth on Days Worked

Var:	Agric Ind (1)	Family Occ (2)	Grandpar Present (3)	Young Mom (4)	High Edu (5)	Minority (6)	Skewed Sex Ratio (7)
Son × PostBirth × Var	0.185	-0.0658	0.387	-0.116	0.232	0.273	-0.276
	(0.296)	(0.320)	(0.303)	(0.255)	(0.302)	(0.334)	(0.255)
Son × BirthYear × Var	0.154	-0.0101	0.391	-0.141	0.297	0.524	0.0874
	(0.291)	(0.316)	(0.295)	(0.278)	(0.305)	(0.327)	(0.280)
Son × Post Birth	-0.264	-0.140	-0.647**	-0.275*	-0.316*	-0.367***	-0.193
	(0.243)	(0.275)	(0.267)	(0.167)	(0.188)	(0.138)	(0.162)
Son × Birth Year	-0.184	-0.158	-0.573**	-0.192	-0.337*	-0.311**	-0.299
	(0.236)	(0.266)	(0.247)	(0.177)	(0.190)	(0.153)	(0.186)
Post Birth	-0.584***	-0.596***	-0.350*	-0.716***	-0.557***	-0.574***	-0.561***
	(0.204)	(0.227)	(0.199)	(0.135)	(0.163)	(0.117)	(0.135)
Birth Year	-0.634***	-0.658***	0.0343	-0.260*	-0.303**	-0.418***	-0.437***
	(0.183)	(0.202)	(0.191)	(0.134)	(0.144)	(0.115)	(0.139)
Post Birth × Var	0.0507	0.0995	-0.312	0.306	0.0146	0.130	0.00667
	(0.226)	(0.244)	(0.217)	(0.192)	(0.230)	(0.235)	(0.194)
Birth Year × Var	0.307	0.358	-0.575***	-0.274	-0.238	-0.0252	0.0430
	(0.213)	(0.231)	(0.222)	(0.203)	(0.223)	(0.236)	(0.207)
Observations	10336	10386	16012	19818	10594	19328	19954

Notes: The dependent variable is the IHS function of the women's days worked in the past year. Each column is a regression. The regressions include fixed effects for year and household, and a constant term. Standard errors are clustered at the household level. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.