

Effects of Vietnam's Two-Child Policy on Fertility, Son Preference, and Female Labor Supply

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Abstract

In 1988, facing a total fertility rate of over four births per woman, the Vietnamese government introduced a new policy that required parents to have no more than 2 children. Using data from the Vietnam Population and Housing Censuses from 1989, 1999, and 2009, I apply a differences-in-differences framework to assess the effects of this policy on family size, son preference, and maternal labor supply. There are three main findings. First, the policy decreased the probability that a woman has more than two children by 15 percentage points (50%) for women aged less than 30 in 1989 and by 7 percentage points (11.5%) for women aged 30-39 in 1989. The policy reduced the average number of living children by 0.2 births per woman (10%). Low-educated women and women in rural areas were more affected by the policy. The policy had no effects on mothers' age at first birth. Second, the policy decreased the proportion of sons in each family by 1.2 percentage points (2.4%). Third, the policy increased women's labor force participation by 1.3 percentage points (1.5%).

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1. INTRODUCTION

High fertility rates and low economic growth are prevalent problems in developing countries. Family planning policies are considered a solution to these problems. In both China and India, the two most populous countries in the world, the governments have relied on family planning policies to limit family size¹. Despite a body of literature that evaluates the effect of the one-child policy in China, we know little about the effect of the more common two-child policy, which is less extreme and has been promoted in several countries such as Vietnam, Indonesia, Iran, Singapore, Hong Kong, United Kingdom, and currently China². Understanding the effect of this policy on family size facilitates evaluating the effects of the policy on other substantive issues such as child quality, parental labor supply, and ultimately economic prosperity. Studying the consequences of the two-child policy also has relevance to understanding central issues in economics such as the tradeoff between child quality and quantity, and the causal relationship between fertility and labor supply. In addition, in developing countries where there is a strong preference for sons and where sons act as social security for parents in their old age, this policy may affect gender balance as well.

In 1988, facing a total fertility rate of over four births per woman, the Vietnamese government introduced a new policy that required parents to have no more than two children. The motivation for the policy was that with fewer children per woman, population growth would be reduced and women would potentially spend less time on home production and more time in the labor force, which would potentially promote economic growth (Council of Ministers, 1989). With

¹ In 1979, China formally introduced its dramatic one-child policy that limited family size to one child per couple.

² As of the start of 2016, China relaxed its one-child policy and expanded it to the two-child policy in the hope to bring back its fertility rates to the replacement level.

fewer children, women also have lower ability to achieve their desired number of sons and thus may obtain lower proportions of sons in the family. The evidence on the effect of this policy is limited to two small studies. Goodkind (1995) undertook a field survey in two provinces in Vietnam and found that the policy was enforced more in the North than in the South. Hoa et al. (1996) conducted a cross-sectional survey in Tien Hai, which is a district in one of the most densely populated provinces in Vietnam. These authors reported that most families did not seem to follow the policy. The limited geographic coverage of these two studies limits the external validity of their findings. In addition, these studies do not account for other factors, such as social and economic changes that may affect parental preferences and the cost of raising children. Thus, the findings from these studies are at best descriptive and may be misleading in terms of identifying the causal effect of the policy on fertility.

In this article, I examine the effects of Vietnam's two-child policy on family size, son preference, and maternal labor supply³. I also use the two-child policy as an instrumental variable to investigate the causal effect of fertility on maternal employment in Vietnam. To measure the effects of the policy, I use data from the Vietnam Population and Housing Censuses from 1989, 1999, and 2009 with a differences-in-differences framework. The exposure of a woman to the policy is determined by both her ethnicity and her age in 1989. Because the policy does not apply to ethnic minorities, I treat ethnic minorities as the control group and ethnic majorities as the treatment group. Women's age in 1989 identifies the length of the exposure to the policy. A woman who was 25 in 1989 would be affected more by the policy than a woman who was 40 or older at that time. The fundamental assumption underlying the differences-in-differences research design

³ In this study, I will not examine the effect of the policy on child quality. In the future, using the Demographic Health Surveys for Vietnam, I will examine the effect of the policy on child quality (education, child mortality) as well as the tradeoff between child quality and quantity.

is that, in the absence of the policy, changes over time (birth year) in fertility and employment are the same for both ethnic groups. Under the assumption that fertility is the only channel through which the policy could affect maternal employment, exogenous variations in family size caused by the two-child policy can be used to construct instrumental variables (IV) estimates of the effect of the number of children on maternal labor supply. Below, I provide evidence that these assumptions are likely to hold in this context.

The results of my analysis suggest that the policy decreased the probability that a woman has more than two children by 15 percentage points (50%) for women aged less than 30 in 1989 and by 7 percentage points (11.5%) for women aged 30-39 in 1989. The policy reduced the average number of living children by 0.2 births per woman (10%). Low-educated women and women in rural areas were more affected by the policy. The policy had no significant effects on mothers' age at first birth. In contrast, the policy decreased the proportion of sons in each family by 1.2 percentage points (2.4%). The policy also increased maternal employment by 1.3 percentage points (1.5%). The IV estimates of the causal effect of family size on maternal employment indicate that having an additional child decreased maternal employment by 15 percentage points (17.4%).

In addition to providing estimates of the causal effects of Vietnam's family planning policy, my paper also contributes to the literature in a few other ways. First, my paper presents new evidence on the effectiveness of family planning policies at reducing fertility. My paper is the first one to examine the effect of the policy on other outcomes, such as maternal labor supply. In addition, I show that reductions in fertility caused by the two-child policy are associated with a decline in the proportion of sons in each family. Second, my paper identifies a new instrumental variable—the two-child policy—that can be used to examine the tradeoff between child quality and quantity, and the causal relationship between fertility and labor supply. The policy provides a

natural experiment to examine whether with fewer children, parents will have “higher” quality children and whether women will work more. Third, my findings have important policy implications for developing countries where the governments rely on family planning policies to curb population growth and promote economic development. My results suggest that while the policy was effective at reducing family size, it had smaller effects on female labor supply. Thus, family planning policies may not promote economic growth through the labor supply channel as the governments expect.

2. THE TWO-CHILD POLICY IN VIETNAM

The two-child policy was recommended by the Vietnamese government in 1981 and made law in 1988. The goal of the policy is to maintain national population growth at 2 percent (Council of Ministers, 1989). The policy applied to every family except for families of ethnic minorities. Families of ethnic minorities could have a third child if they desire (Council of Ministers, 1989). Couples who already have one child, but have twins or triplets in the second birth are not considered to violate the policy. The specific guidelines of the policy also included requirements on the minimum childbearing age and the birth spacing (Council of Ministers, 1989). For state employees and government officials, childbearing age should be 22 or older for women and 24 or older for men. For others, the childbearing age should be 19 or older for women and 21 or older for men. The second child, if desired, should be spaced 3 to 5 years apart from the first one, except for women aged 30 and older (Council of Ministers, 1989)⁴.

To promote the two-child policy, the Vietnamese government imposed fines and punishments on families that violated the policy. The government denied a third child a birth

⁴ These features of the policy were not equally enforced as the restriction to have no more than two children since the government did not impose punishments or fines on violating these requirements.

certificate (PRI Review, 1995). If families violated the policy, they would be fined about \$80, which was equivalent to 10 months of income in 1995 (PRI Review, 1995). State employees and government officials would not get promoted or would be relegated to lower status jobs in smaller cities, or in some cases, would lose their jobs if they violated the policy (Nikkei Asian Review, 2017). The government subsidized the fees of housing, healthcare, and education for the first two children, but not for the third child. Families with more than two children had to pay extra fees for housing, education, and health care of the third child (Council of Ministers, 1989). With these fines and punishments, the policy imposed real costs on families that have a third child and there is a plausible expectation that the policy reduced fertility.

Besides imposing fines, the government also engaged in public health strategies, such as posters and billboards that depicted happier families with fewer children. Television programs that provided information on family planning were shown several times per week and at prime time (Goodkin, 1995). The government offered a reward of \$20 to women who had a hysterectomy, “a procedure that approximately half of all village women were subjected” (PRI Review, 1995). The government also supplied birth control devices and birth control pills at free of charge to eligible people and poor families that registered to practice family planning (Council of Ministers, 1989).

3. CONCEPTUAL FRAMEWORK

In this section, I discuss economic theories on demand for children, son preference, and the effect of children on labor supply to highlight mechanisms through which the two-child policy could affect family size, son preference, and maternal employment.

3.1. Demand for Children

In developing countries where agriculture plays important role in the economy and people are poor, parents demand children as children act as parents’ retirement investment. People in

developing countries cannot rely on social security or retirement plans in their old age and have to depend on their children for future support (Priebe, 2010). Thus, having more children increases the probability that one of them may be successful (high quality) and take care of parents in their old age. Especially in rural areas where most economic activities are farm work, having more children implies that families have more labor to work in the farm in the future. However, with harsh punishments that the government imposed on families that violated the two-child policy, families face a higher cost of having a third child and thus would not want to have more than two children as they did before. In other words, the policy is likely to cause a reduction in family size. The policy may affect mothers' age at first birth as well. Women growing up under the two-child policy know that they will have only two children. As a result, they may delay having their first birth at a later age. In addition, the policy requires the minimum childbearing age of 22 for women who are state employees and government officials, and of 19 for others. Thus, it is plausible to expect that the policy increases mothers' age at first birth.

In the standard quantity and quality model of fertility, parents derive utility from both the quantity and quality of children (Becker and Lewis, 1973; Becker and Tomes, 1976; Rosenzweig and Wolpin, 1980). This theory predicts that when child quantity decreases exogenously, child quality increases. Thus, if the two-child policy decreases family size, then it is expected to increase child quality as well. In sum, the basic theory of the demand for children predicts that the two-child policy of Vietnam has the potential to not only decrease family size, but also raise the human capital of children.⁵

⁵ In future research, I plan to examine whether the two-child policy affected children's outcomes. In this paper, I focus on fertility and maternal outcomes.

The effect of the two-child policy on family size may vary across mothers' schooling and by urban/rural areas. In theory, it is ambiguous whether low- or high-educated women will be affected more by the policy. Well-educated women tend to have a higher wage and thus face a higher cost of having a third child (Ebenstein, 2009). Low-educated women, in contrast, may live with elderly in laws and thus face a lower marginal cost of having an additional child (Ebenstein, 2009; Caceres-Delpiano, 2012). With a relatively higher marginal cost of having an additional child, well-educated women tend to prefer a smaller family size. Thus, it is likely to observe a bigger effect of the policy on them. On the other hand, high-educated women are likely to have higher income. The fines and punishments imposed for having a third child may account for a relatively smaller portion of their income than for less-educated, poorer women. Thus, it is also plausible to expect that high-educated women are less responsive to the policy. Due to these confounding factors, it is theoretically ambiguous whether the effect of the policy will be larger for more or less educated women.

Similarly, it is difficult to determine whether the policy will be more effective in urban or rural areas. In urban areas, women tend to work on paid jobs rather than on farm work or housework. Thus, they face a higher marginal cost of having an addition child (i.e. higher foregone earning of the childbearing time). In addition, it is more expensive to raise children in urban areas (i.e. higher childcare costs, higher education fees). On the other hand, women in rural areas are in need of having more children to work in the farm and at least one son to support them in their old age (Priebe, 2010). Thus, they may keep having births despite of the fines and punishments imposed by the policy. As a result, it is likely to observe a bigger effect of the policy on women in urban areas. It is also plausible to expect that women in urban areas are less responsive to the policy. Women in urban areas tend to have higher income, and the fines and punishments imposed

by the policy may be a small proportion of their income. In contrast, women in rural areas are poorer, and the fines and punishments may account for a big share of their income. Thus, these women may stop at two children. Because of the above-mentioned factors, it is also theoretically ambiguous whether the policy will have a larger effect on women in urban or rural areas.

3.2. Son Preference and Son Targeting Fertility Behavior

In many developing countries in East, South, and Southeast Asia, parents have a strong preference for sons (Arnold et al., 1998; Clark, 2000; Jensen, 2002, unpublished document). One of the reasons that parents prefer boys to girls in these countries is because sons act as social security for parents in their old age (Larsen et al., 1998). Due to social and culture norms, sons will live and support their parents in the future (Larsen et al., 1998). This strong son preference has been documented as differential stopping behavior (DSB) or male-preferring stopping rules in the literature (Clark, 2000). Under these rules, women will continue having births until they achieve their desired number of sons or hit their maximum number of children given their budget constraint (Clark, 2000). The gender composition of current living children also identifies their mothers' decisions to have more children (Basu and Jong, 2010). If a woman desires for two sons and already has both of them at the first two attempts, she will stop at two children. However, if she has achieved only one son, she may continue to three children to obtain the second son.

Vietnam's two-child policy may decrease the ability of parents to achieve son preference. The policy would decrease the proportion of sons in each family because it lowers the number of children that a woman may have and places an additional constraint on her ability to achieve the desired number of sons. In addition, due to the former low quality of ultrasounds in the country, sex-selective abortions did not start after 2003 (Bélanger et al. (2003); Becquet et al. (2013);

Guilmoto et al. (2018)). Thus, in the 1990s, parents could not turn to sex-selective abortions as an alternative to have at least one son.

3.3. The Effect of Children on Female Labor Supply

In the standard labor leisure model augmented to include a desire for children, women decide their fertility and their labor supply at the same time. Children require mothers' time and increase the value of household work. Therefore, the more children a woman has, the less likely she is going to work. Vietnam's two-child policy is an exogenous change in fertility. With the presence of the policy, women are less likely to have more than two children. For those affected, the desired number of children is above the realized number. With fewer children, the demands of child bearing and rearing on women's time may fall, which potentially gives them more time for increased market work. In addition, with fewer children, mothers' productivity at home may decline, thus lowering the value of non-market time. Therefore, the two-child policy is expected to increase maternal employment.

The effect of fertility on labor supply may vary with mothers' schooling (Angrist and Evans, 1998) and across urban and rural areas. Gronau (1986) pointed out a number of empirical studies, which found that more educated women were more responsive to a fertility shock than less educated women. Gronau (1973) also documented that as mothers obtain more education, children have a stronger effect on their mothers' value of time. Therefore, I expect that changes in family size due to the two-child policy will have a larger effect on more educated women. Women in urban areas may be more responsive to a shock in family size than women in rural areas. Women in urban areas tend to have more job opportunities and thus face a higher marginal cost of having a third child (Ebenstein, 2009). On the other hand, women in rural areas work at home and have a relatively lower marginal cost of having an additional child (Ebenstein, 2009). These

considerations suggest that the effect of Vietnam's two-child policy on maternal labor supply may be heterogeneous and differ by rural/urban residence (Priebe, 2010⁶; Caceres-Delpiano, 2012⁷). In this circumstance, it is plausible to expect that the policy have a larger effect on maternal employment of high-educated women and women in urban areas. As discussed above, these women face higher opportunity costs of childbearing and thus they would be more responsive to the fertility shock caused by the two-child policy.

4. DATA

4.1. The Vietnam Population and Housing Censuses

The data used in this study are from the Vietnam Population and Housing Censuses from 1989, 1999, and 2009⁸. The data are from the 5-percent, 3-percent, and 15-percent nationally representative samples of the population (Minnesota Population Center, 2017, published data). The surveys include information on the number of children ever born and the number of surviving children of women at the time of survey. The surveys also contain other relevant information on individuals' characteristics such as age, ethnicity, marital status, educational attainment, work, and current place of residency (at provincial levels).

The analyses are conducted using two samples drawn from these three surveys. To examine the effect of the policy on women's fertility and maternal labor supply, I use what I refer to as sample 1, which includes women aged 10-49 in 1989. Since the surveys ask fertility questions for women at the childbearing age and the key measure of treatment (exposure) is age in 1989, I do

⁶ Priebe (2010) examined the effect of fertility on maternal employment in Indonesia and documented that less educated women and women in rural areas were more responsive to the presence of children.

⁷ Caceres-Delpiano (2012) investigated the impact of children on maternal employment in 40 developing countries and found that the impact of children is stronger among high-educated mothers and mothers in urban areas.

⁸ Access to the Vietnam Population and Housing Census from 1979 is not publicly available. Thus, I did not use the 1979 census in this study.

not observe every birth cohort (age in 1989) in all of the three Censuses. Specifically, I only observe fertility of women aged 40-49 in 1989 in the survey year 1989. Similarly, I only observe fertility of women aged 30-39 in 1989 in the survey years 1989 and 1999 (aged 40-49) and fertility of women aged less than 15 in 1989 in the survey years 1999 and 2009. Finally, for women aged 15 to 29 in 1989, I observe their fertility in 1989, 1999 (aged 25 to 39), and 2009 (aged 35 to 49).

To investigate the impact of the policy on the proportion of sons in each family, I use a different sample -what I refer to as subsample 2- because this analysis requires that I know the gender of the children. Although the data asks every woman at the childbearing age about the number of children ever born and surviving, they do not ask any further information about these children for these women. Subsample 2 includes women aged 10-49 in 1989 who are household heads or wives of household heads and have all of their children living home⁹. For women who are household heads or wives of the household head, the surveys ask questions about the gender of all children who are currently living with them. Since the surveys have no information on children living outside home, the gender of children who already left the household is unknown. By imposing these two restrictions, there is a chance that I have selected the sample non-randomly with respect to the number and gender of the child. However, this is unlikely to bias my estimates. I show that when I use this subsample to estimate the effect of the policy on family size, I obtain very similar estimates to those that I get from sample 1¹⁰. This indicates that the potential sample selection problem is not likely to be problematic. In addition, subsample 2 represents 80% of sample 1.

⁹ Table XI, Appendix shows the fraction of mothers that still have all of their children living at home across three survey years.

¹⁰ The estimates of the effect of the policy on family size for subsample 2 are shown in Figure 9, Appendix.

4.2. Measures of family size, son preference, and maternal labor supply

Family size is measured as the probability that a woman has more than two children and the number of living children. More than two children equals 1 if a woman has more than two children at the time of survey and 0 otherwise. Son preference is measured as the proportion of sons in each family. Proportion of sons in each family is derived as the ratio of the number of sons to the number of living children in the family. Maternal employment is measured based on the activities in the last 12 months. The dummy variable of the maternal employment is coded as 1 if the mother reports that she was employed in the last 12 months and 0 otherwise.

4.3. Summary Statistics

Table I presents summary statistics for women in sample 1 and subsample 2¹¹. As Table I indicates, women in sample 1 are slightly older than are women in subsample 2. The average age of women is 35.95 for sample 1 and 33.62 for subsample 2. Women in sample 1 also have a higher number of living children and a higher probability of having more than two children than women in subsample 2. The average number of living children is 2.17 for women in sample 1 and 2.08 for women in subsample 2. While 34% of women in sample 1 have more than two children, 28% of women in subsample 2 have three children or more. About 85%-87% of women in two samples are employed. The average age at first birth of mothers in subsample 2 is 23.07. The proportion of sons in each family in subsample 2 is 0.51. Approximately 65% of women in sample 1 and 69% of women in subsample 2 live in rural areas. In terms of educational levels, 33%-34% of women in the samples have less than primary education.

¹¹ I also show summary statistics for women of both ethnic groups and by education and urban/rural status separately in Tables XII-XVII, Appendix.

5. RESEARCH DESIGN

5.1. The First Stage – The Effect of the Two-child Policy on Family Size and Son Preference

To examine the effect of the two-child policy on family size, I use a differences-in-differences framework. The analysis is performed using sample 1. Since the policy does not apply to ethnic minorities, I treat ethnic minorities as the control group and ethnic majorities as the treatment group. The length of the exposure to the policy is determined by the age of women in 1989. Younger (e.g., <30) women in 1989 should be affected more by the policy than older (e.g., >39) women who are closer to have completed fertility by that age. In practice, I use women's age in 1989 as a continuous variable to determine the length of the exposure to the policy. As an alternative specification, I also group women in three different age groups (less than 30, 30-39, and 40+ in 1989).

The average probabilities of having more than two children and the average number of living children for four groups (Y_i) are derived as below:

	Ethnic majority women	Ethnic minority women
Younger women in 1989	$E(Y_i \text{Majority}=1, \text{Younger} = 1)$	$E(Y_i \text{Majority}=0, \text{Younger} =1)$
Older women in 1989	$E(Y_i \text{Majority}= 1, \text{Younger} = 0)$	$E(Y_i \text{Majority}= 0, \text{Younger}=0)$

The change in family size for ethnic majorities is

$$[E(Y_i | \text{Majority} = 1, \text{Younger} = 1) - E(Y_i | \text{Majority} = 1, \text{Younger} = 0)]$$

= cohort effects_{majority} + policy effects

Similarly, the change in family size for ethnic minorities is

$$[E(Y_i | \text{Majority} = 0, \text{Younger} = 1) - E(Y_i | \text{Majority} = 0, \text{Younger} = 0)]$$

= cohort effects_{minority}

My differences-in-differences (DID) estimates are as follows:

$$\begin{aligned}
 \text{DID} &= [E(Y_i | \text{Majority} = 1, \text{Younger} = 1) - E(Y_i | \text{Majority} = 1, \text{Younger} = 0)] \\
 &\quad - [E(Y_i | \text{Majority} = 0, \text{Younger} = 1) - E(Y_i | \text{Majority} = 0, \text{Younger} = 0)] \\
 &= (\text{cohort effects}_{\text{majority}} + \text{policy effects}) - (\text{cohort effects}_{\text{minority}}) \\
 &= (\text{cohort effects}_{\text{majority}} - \text{cohort effects}_{\text{minority}}) + \text{policy effects} \quad (1)
 \end{aligned}$$

Under the assumption that $\text{cohort effects}_{\text{majority}} = \text{cohort effects}_{\text{minority}}$, my DID estimates will capture the causal effect of the two-child policy on family size.

In practice, I use the following regression model to apply my differences-in-differences framework:

$$\begin{aligned}
 Y_{(ijt)} &= b_0 + b_1 \text{age}_{(it)} + b_2 \text{age}^2_{(it)} + b_3 \text{age}_{(it)} \times \text{majority}_{(i)} + b_4 \text{age}^2_{(it)} \times \text{majority}_{(i)} + \\
 &\quad \sum_{j=10}^{48} b_{5j} \text{age in 1989}_{(ij)} + b_6 \text{majority}_{(i)} + \sum_{j=10}^{48} b_{7j} \text{age in 1989}_{(ij)} \times \text{majority}_{(i)} + \text{province}_{(ijt)} + \\
 &\quad V_{(ijt)} \quad (2)
 \end{aligned}$$

in which $i = 1, \dots, N$ (index of person)

$j = 10, \dots, 49$ (index of age in 1989)

$t = \text{survey years } 1989, 1999, 2009$

$Y_{(ijt)}$ is the probability of having more than two children, the number of living children, mothers' age at first birth, and the proportion of sons in each family. The omitted group is women aged 49 in 1989. To account for differences in parental preferences and the costs of raising children across provinces, I also include provincial dummies in equation (2).

The dummy variables indicating women's age in 1989 measure the length of the exposure to the policy and an individual's birth cohort. The indicator of the ethnic majority defines the treatment and control groups. The coefficients of interest are thus on the interaction terms between

dummy variables of women's age in 1989 and the ethnic majority (b_{7j}). Here, b_{7j} captures the relative effect of the two-child policy on family size and the proportion of sons of each cohort.

To interpret b_{7j} as the causal effect of the policy, I need to assume that in the absence of the policy, cohort effects would have been the same for both ethnic groups. While this assumption is untestable, I indirectly test it by examining cohort effects of women aged 40 and older in 1989 and cohort effects of women aged less than 20 in 1989. Since women aged 40 and older in 1989 are too old to be affected by the policy, the estimates of these women will capture only the differences in cohort effects of both ethnic groups. Thus, if these estimates are close to zero, they imply that in the pre-policy period, changes in family size by birth year cohort are the same for both ethnic groups. On the other hand, women aged less than 20 in 1989 are fully affected by the policy. Thus, if I observe no differences in cohort effects of these women, it implies that cohort effects are likely to be the same for both ethnic groups in the post policy period.

Figure 1 illustrates the coefficients of the interactions in equation (2) and provides the first piece of evidence that cohort effects are the same for both ethnic groups. As seen from Figure 1, the estimates of women aged 40 and older in 1989 (relative to the omitted group – women aged 49 in 1989) are close to zero and not statistically significant. Since these estimates capture differences in cohort effects of both ethnic groups, this implies that changes in family size are the same for both groups in the pre-policy period. As Figure 1 further indicates, the estimates of women aged less than 20 in 1989 are constant across age. This suggests that cohort effects are likely to be the same for both groups in the post-policy period.

Although the evidence above suggests that the required common trend (birth year cohort) assumption holds, my estimates may be biased if the policy has spillover effects on ethnic minorities. If ethnic minorities follow the fertility behavior of ethnic majorities and stop at two

children as well, then my estimates would be biased downward. Since the policy does not apply to ethnic minorities, ethnic majorities may have an incentive to marry ethnic minorities, which would also lead to spillover effects on ethnic minorities. Even though there are inter-ethnic marriages, they may not be a big concern here. The number of these marriages is very small. In 2009, the inter-ethnic marriages accounted for just 1.9% of all marriages (General Statistics Office of Vietnam, 2010).

Given the patterns shown in Figure 1, in the next step, I estimate the following regression equation to examine the effect of the policy on women's fertility at different ages in 1989 and to capture the main trends in the effects of the policy.

$$Y_{(ijt)} = c_0 + c_1 \text{age}_{(it)} + c_2 \text{age}_{(it)}^2 + c_3 \text{age}_{(it)} \times \text{majority}_{(i)} + c_4 \text{age}_{(it)}^2 \times \text{majority}_{(i)} + c_5 d(\text{age in 1989} < 30)_{(i)} + c_6 d(\text{age in 1989} < 30)_{(i)} \times \text{majority}_{(i)} + c_7 d(30 \leq \text{age in 1989} \leq 39)_{(i)} + c_8 d(30 \leq \text{age in 1989} \leq 39)_{(i)} \times \text{majority}_{(i)} + c_9 \text{year}_{(it)} + c_{10} \text{province}_{(it)} + \eta_{(ijt)} \quad (3)$$

Instead of including dummy variables of each age in 1989 as in equation (2), I include indicators for each age group in 1989 in equation (3). The coefficients of interest are on the interactions between these dummy variables and the ethnic majority (c_6 and c_7). Here, c_6 and c_7 capture the average effect of the policy on fertility and the proportion of sons of women aged less than 30 and aged 30-39 in 1989 (relative to the omitted group – women who were 40 and older in 1989). With this specification, I can include year effects in the regression. As I show below (Table II), estimates of coefficients of the interaction terms in equation (3) with and without the inclusion of year effects are similar.

Ethnic minorities tend to be less educated and more likely to live in rural areas than are ethnic majorities. Thus, to account for these differences, I also include dummy variables of educational attainment and rural areas in equation (3). Table XXII, Appendix shows robustness

results with and without the inclusion of these controls. These results indicate that these differences do not drive my estimates.

5.2. The Reduced Form – The Effect of the Two-child Policy on Maternal Labor Supply

To examine the effect of the two-child policy on maternal labor supply, I use the same econometric framework as I do for family size. The regression model of my reduced form is thus as follows:

$$\begin{aligned} \text{Mother's employment}_{(ijt)} = & \alpha_0 + \alpha_1 \text{age}_{(it)} + \alpha_2 \text{age}^2_{(it)} + \alpha_3 \text{age}_{(it)} \times \text{majority}_{(i)} + \alpha_4 \text{age}^2_{(it)} \times \\ & \text{majority}_{(i)} + \sum_{j=10}^{48} \alpha_{5j} \text{age in 1989}_{(ij)} + \alpha_6 \text{majority}_{(i)} + \sum_{j=10}^{48} \alpha_{7j} \text{age in 1989}_{(ij)} \times \text{majority}_{(i)} \\ & + \text{province}_{(it)} + \eta_{(ijt)} \quad (4) \end{aligned}$$

The coefficients of interest are on the interaction terms between dummy variables of women's age in 1989 and the ethnic majority (α_{7j}). To interpret α_{7j} as the causal effect of the two-child policy on maternal labor supply, I assume that changes in the maternal employment would be the same for both ethnic groups in the absence of the policy. Figure 4 presents the coefficients of the interaction terms in equation (4) and provides the evidence that cohort effects are the same for both ethnic groups in the pre-policy period. The estimates of women aged 40 and older in 1989 capture the differences in cohort effects of both ethnic groups and they are indistinguishable from zero. On the other hand, the estimates of women aged less than 30 in 1989 are positive and constant across women's ages, suggesting a constant effect of the policy on maternal employment of these women. Together, these results indicate that changes in maternal employment are the same for both ethnic groups in the pre and post-policy period.

To control for differences in education and rural residency between both ethnic groups, I further control for rural indicators and educational dummies in equation (4). Table XXIII,

Appendix shows the estimates of interest with and without the inclusion of these controls and suggests the robustness of my results.

5.3. Instrumental Variables Estimates of the Effect of Fertility on Maternal Employment in Vietnam

To obtain the instrumental variables estimates of the effect of the number of children on maternal labor supply, I use estimates from the first stage regression of the two-child policy on the number of children to construct the predicted number of children, which is the instrument. The regression model used for the instrumental variables procedure is as follows:

$$\text{Mother's employment}_{(ijt)} = e_0 + e_1 \text{age}_{(it)} + e_2 \text{age}^2_{(it)} + e_3 \text{age}_{(it)} \times \text{majority}_{(i)} + e_4 \text{age}^2_{(it)} \times \text{majority}_{(i)} + \sum_{j=10}^{48} e_{5j} \text{age in 1989}_{(ij)} + e_6 \text{majority}_{(i)} + e_7 \widehat{\text{Number of children}}_{(ijt)} + e_8 \text{province}_{(ijt)} + \varepsilon_{ijt} \quad (5)$$

Equation (5) uses the predicted number of children from equation (2) instead of the actual number of children. As I show later, the two-child policy is a significant predictor of the number of children and therefore the instrument has good explanatory power in the first stage.

The exclusion restriction of the instrumental variables approach is that fertility should be the only channel through which the policy could affect maternal employment. Although the policy can affect maternal employment through other channels (e.g. delayed marriage, increase in education), these effects operate through the fertility channel. Thus, the exclusion restriction is still likely to hold in this context.

6. RESULTS

6.1. The Effect of Vietnam's Two-child Policy on Family Size

Figure 1 shows the coefficients of the interaction terms between dummy variables of women's age in 1989 and the ethnic majority in the probability of having more than 2 children for women's birth cohorts 1941-1979¹². As seen from Figure 1, the estimates of women aged 40 and older in 1989 are close to zero and not statistically significant, indicating that there are no differences in cohort effects of both ethnic groups in the pre-policy period. Women aged 30 to 39 in 1989 are partially affected by the policy. There is a monotonic increasing effect of the policy for them. The estimates of these women range from -0.05 to -0.13, suggesting an average effect of a 9-percentage point decrease in the probability of having more than two children. As Figure 1 further indicates, women aged less than 30 in 1989 are the most affected group. The estimates of these women are constant across age, indicating a 15-percentage point decrease in the probability of having more than two children, equivalent to a 50% reduction at means.

Table II contains the estimates of the effect of Vietnam's two-child policy on the probability of having more than two children and the number of living children for women of different age groups in 1989. In Column (1) and (3), instead of including dummy variables for each age in 1989, I include indicators of three age groups as mentioned above. As Table II indicates, the policy was more effective at reducing fertility of younger women in 1989. The policy decreased the probability that a woman has more than two children by 15 percentage points (50%) for women aged less than 30 in 1989 and by 7 percentage points (11.5%) for women aged 30-39 in 1989. This result is in line with my expectation. Since most women in Vietnam have children in their 20s, the

¹² The coefficients of the interaction terms in Figure 1 are also shown in Table XVIII, Appendix.

policy should have a bigger effect on fertility of these women. On average, the policy decreased the number of living children by 0.2 births per woman (10%). The estimates are very similar with the inclusion of year effects.

As discussed in section 3.1, there might be different effects of the two-child policy by education and urban/rural status. Table III presents estimates of the effect of the two-child policy on women's fertility by mothers' schooling^{13,14}. As Table III indicates, low-educated women were more affected by the policy. The policy decreased the probability of having more than two children for these women by 16 percentage points (37%) and reduced their average number of living children by 0.58 births per woman (24%). The policy, on the other hand, had a small effect on more-educated women. It reduced the probability of having more than two children of these women by 5 percentage points (20%) but had no effect on the number of living children.

Table IV shows heterogeneity in the effect of the policy on family size by urban and rural areas¹⁵. As Table IV indicates, the policy was more effective at reducing fertility in rural areas. Since women in rural areas tend to be less educated than women in urban areas, this finding is in line with the results shown in Table III, which finds that less-educated women are more affected by the policy. The policy decreased the probability of having more than two children of women in rural areas by 13 percentage points (35%) for women aged less than 30 and by 5 percentage points (7%) for women aged 30-39. The policy reduced the average number of living children of both age groups by 0.2 births per woman (a 9-percentage decrease for younger women and a 5.6-

¹³ I also show the coefficients of the interaction terms between dummy variables of women's age in 1989 and the ethnic majority in the fertility equation for women with less than primary education in Figure 5, Appendix and for women with at least primary education in Figure 6, Appendix.

¹⁴ If the policy has an impact on educational attainment, then women with less than primary education may obtain more education and thus have at least primary education.

¹⁵ I show the coefficients of the interaction terms in the fertility equation for women in rural areas in Figure 7, Appendix and for women in urban areas in Figure 8, Appendix.

percentage decrease for middle-aged women). The estimates are very similar with the inclusion of year effects.

Figure 2 shows the coefficients of the interaction terms between dummy variables of women's age in 1989 and the ethnic majority in the mothers' age at first birth equation¹⁶. As Figure 2 indicates, the estimates of women aged 40 and older in 1989 (relative to the omitted group – women aged 49 in 1989) are indistinguishable from zero, suggesting that there are no differences in women's age at first birth between both ethnic groups in the pre-policy period. The estimates of women aged less than 30 in 1989 are -0.05 and constant across ages. However, none of them are significantly different from zero.

Table V shows the estimates of the effect of Vietnam's two-child policy on mothers' age at first birth for women of different ages in 1989 and suggests the same results. The estimates of younger women in 1989 are positive but not statistically significant. Together, these results imply that these women did not alter the timing of their first birth to achieve the reduction in fertility as observed above. One explanation is that they must have stopped fertility earlier or spaced children out more as directed by policy.

6.2. The Effect of Vietnam's Two-child Policy on Son Preference

Figure 3 presents the coefficients of the interaction terms between dummy variables of women's age in 1989 and the ethnic majority in the proportion of sons in each family equation¹⁷. For this analysis, I use subsample 2. The estimates of women aged 40 and older in 1989 indicate that ethnic majorities have a lower proportion of sons in the pre-policy period, which is consistent

¹⁶ I also show the coefficients of the interactions in the mothers' age at first birth equation in Table XIX, Appendix.

¹⁷ The coefficients of the interactions in the proportion of sons in each family equation are also shown in Table XX, Appendix.

with ethnic majorities having fewer children than ethnic minorities in this period. However, these estimates are not significantly different from zero and thus they are unlikely to impose a threat to the validity of my identification assumption. As Figure 3 further indicates, the policy had no effect on the proportion of sons of women aged 30-39 in 1989. However, the policy decreased slightly the proportion of sons of women aged less than 30 in 1989. This is consistent with my expectation that younger women in 1989 should be affected more by the policy.

Table VI shows the average effect of the policy on the proportion of sons in each family for women of different age groups in 1989. The results are in line with the estimates in Figure 3. The estimates indicate that the policy decreased the proportion of sons in each family for younger women in 1989 by 1.2 percentage points (2.4%) and had no significant effect on those aged 30-39 in 1989. Overall, these results suggest that the policy decreased slightly the ability that parents achieve son preference.

6.3. The Effect of Vietnam's Two-child Policy on Maternal Labor Supply

Figure 4 shows the coefficients of the interaction terms between dummy variables of women's age in 1989 and the ethnic majority in the maternal employment equation¹⁸. As seen from Figure 4, the policy had no effect on the labor supply of women aged 40 and older in 1989. The estimates of these women are indistinguishable from zero, suggesting that changes in employment rates are the same for both ethnic groups in the pre-policy period. As Figure 4 further indicates, the policy increased the labor supply of women aged less than 39 in 1989 by 1.1 percentage points (1.3%).

Table VII presents estimates of the causal effect of Vietnam's two-child policy on maternal labor supply for women of different age groups in 1989. As Table VII indicates, the policy

¹⁸ The coefficients of the interaction terms in Figure 4 are also presented in Table XXI, Appendix.

increased the labor supply of women aged less than 30 in 1989 by 1.3 percentage points (1.5%). The estimates are similar with the inclusion of year effects. In contrast, the policy had no effect on the labor supply of women aged 30-39 in 1989.

Table VIII shows estimates of the effect of the policy on maternal labor supply by mothers' schooling. The estimates suggest that the policy increased the labor supply of low-educated women aged less than 30 in 1989 by 3 percentage points (1.7%). The policy had no effects on the labor supply of low-educated women aged 30-39 in 1989. On the other hand, the policy decreased the labor supply of more-educated women by 4 percentage points (3.5%). The estimates are similar with the inclusion of year effects.

Table IX presents estimates of the effect of the policy on maternal employment by urban and rural areas. The estimates suggest that the policy had opposite effects on the labor supply of women in urban and rural areas. The policy increased the labor supply of younger women in rural areas by 4 percentage points (4.4%) and it had no effects on the labor supply of women aged 30-39 in 1989. In contrast, the policy decreased the labor supply of younger women in urban areas by 12 percentage points (17%) and reduced the labor supply of middle-aged women by 7 percentage points (9.3%).

Even though the estimates in Tables VIII and IX suggest an effect of the policy on the labor supply of women with at least primary education and women in urban areas, the results shown in Tables III and IV indicate no significant effects of the policy on the number of living children of these women. Since the mechanism through which the policy can affect maternal employment is through a reduction in fertility, it is hard to conclude that the policy affected maternal employment of these women if it had no effects on their fertility.

6.4. Instrumental Variables Estimates of the Effect of Fertility on Maternal Employment in Vietnam

Table X shows the OLS and 2SLS estimates of the causal effect of fertility on maternal employment in Vietnam. As mentioned above, the interactions between dummy variables of women's age in 1989 and ethnic majorities serve as instruments for the number of living children in the maternal employment equation. The exclusion restriction would be violated if the policy can affect maternal employment through other channels such as education and marriage. Although the policy may facilitate women to obtain more education, delay marriage, and thus participate more in the labor force, the effects of the policy on these outcomes operate through the effect of the policy on fertility. Thus, despite the potential effects of the policy on women's education and marriage, the exclusion restriction is still likely to hold in this context.

The upper panel presents the OLS estimates of the impact of children on maternal employment. The point estimate is -0.008 and statistically significant. The estimate indicates a small negative effect of children on mothers' labor supply, which is in line with the findings of a recent study (Aaronson et al., 2017, unpublished document). The lower panel shows the instrumental variables estimates in equation (5). The point estimate suggests that having an additional child decreased maternal employment by 15 percentage points (17.4%).

Compared to the estimates of other studies, my estimates are larger. The US estimates of fertility on maternal employment reported by (Angrist and Evans, 1998) are -10.4 percentage points for 1980 and -8.4 percentage points for 1990. The estimates reported by (Cruces and Galiani, 2007) also range from 8.1 to 9.6 percentage points for Argentina and from 6.3 to 8.6 percentage points for Mexico. However, my estimates capture the average effect of children on the labor supply of women who comply with the two-child policy. In contrast, the estimates of other studies

capture the average effect of fertility on the labor supply of women who either have multiple births or prefer a mixed-sibling gender composition. Thus, it is possible that my estimates are larger than the estimates of others.

7. FALSIFICATION TESTS

In this section, I present the results of falsification tests in which I use the probability of having at least one child and the probability of getting married as alternative outcomes. The two-child policy should have no effects on the probability that women have at least one child since it only imposes fines and punishments on parents who have more than two children. Similarly, the policy should not affect the probability of getting married of women aged 30 and over in 1989. Most of these women should have gotten married by the time that the policy was in place. The policy may have a small effect on the probability of getting married of women aged less than 30 in 1989. Since these women know that they will have only two children, they may adjust their age of marriage accordingly.

Table XXIV, Appendix shows the coefficients of interest of alternative outcomes. As the table indicates, the policy had no effect on the probability that a woman has at least one child. The policy also did not affect the probability of getting married of women aged 30 and over in 1989. The policy had a small feedback effect on the probability of getting married of women aged less than 30 in 1989. The point estimate is 0.007 and statistically significant. These results are consistent with my expectations and together they suggest the validity of my research design.

8. DISCUSSION & CONCLUSION

This article provides estimates of the causal effects of Vietnam's two-child policy on family size, son preference and maternal employment. Notably, the policy remains one of the most controversial policies that the Vietnamese government has implemented. The government is still

debating whether to abandon the policy and to allow its people to have as many children as they desire. This paper explores differences in how the policy affected women of different ages and ethnicities to provide the estimates of the causal effects of the policy on family size, son preference, and maternal employment.

Using data from the Vietnam Population and Housing Censuses from 1989, 1999, and 2009, I use a differences-in-differences framework and reach three main findings. First, the policy decreased the probability that a woman has more than two children by 15 percentage points (50%) for women aged less than 30 in 1989 and by 7 percentage points (11.5%) for women aged 30-39 in 1989. The policy reduced the average number of living children by 0.2 births per woman (10%). Low-educated women and women in rural areas are affected more by the policy. This result is similar to the findings of the study on China's one-child policy, which found that the one-child policy reduced the likelihood that mothers in China have a second child by 11 percentage points (50%) (Li et al., 2005, unpublished document). The policy had no significant effects on mothers' age at first birth. Second, the policy decreased the proportion of sons in each family by 1.2 percentage points (2.4 %).

Third, the policy increased the labor supply of women aged less than 30 in 1989 by 1.3 percentage points (1.5%). The instrumental variables estimates of the causal effect of fertility on maternal labor supply indicate that having an additional child decreased maternal employment by 15 percentage points (17.4%). This result is in line with the results of previous studies that examined the causal relationship of fertility on maternal employment in other developing countries. Caceres-Delpiano (2012) used the event of multiple births as an instrumental variable for family size and found that children negatively affect maternal employment in over 40 developing countries. Similarly, Cruces and Galiani (2007) used parental preferences for a mixed-

sibling gender composition as instrumental variables and documented that having an additional child led to a 6-10 percentage point decrease in maternal employment in Argentina and Mexico.

Overall, my paper contributes to the literature by providing new evidence on the effectiveness of family planning policies at reducing fertility. My results suggest that while Vietnam's two-child policy was effective at decreasing family size, it had smaller effects on female labor supply. These findings have important policy implications for developing countries where the governments rely on family planning policies to curb population growth and promote economic development.

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FIGURES

Figure 1: Coefficients of the interactions between dummy variables of women's age in 1989 and the ethnic majority in the probability of having more than two children equation– Results from Sample 1

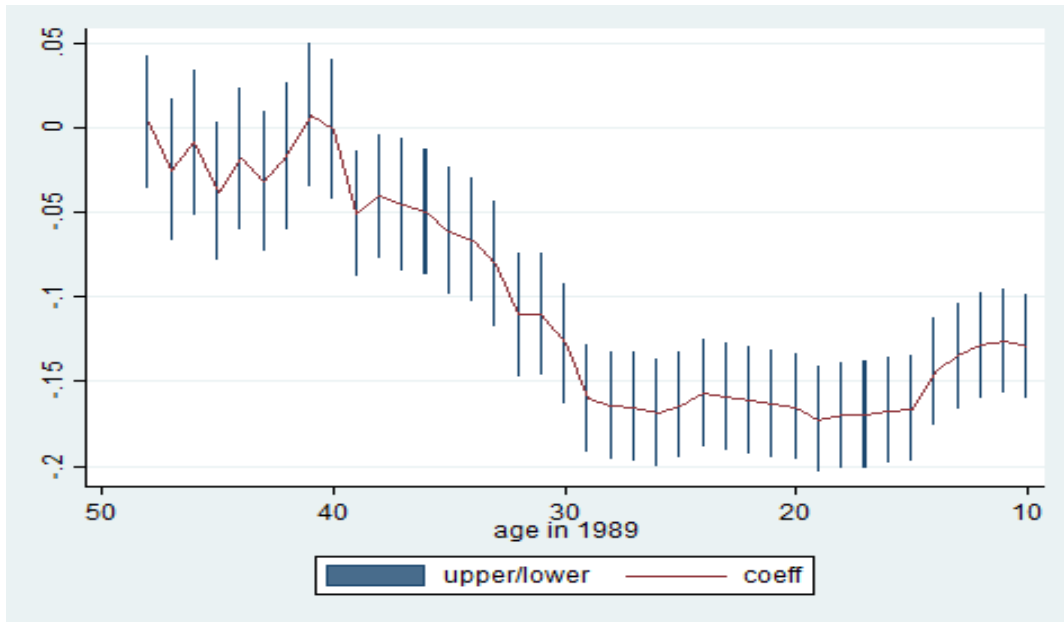


Figure 2: Coefficients of the interactions between dummy variables of women’s age in 1989 and the ethnic majority in the mothers’ age at first birth equation – Results from subsample 2

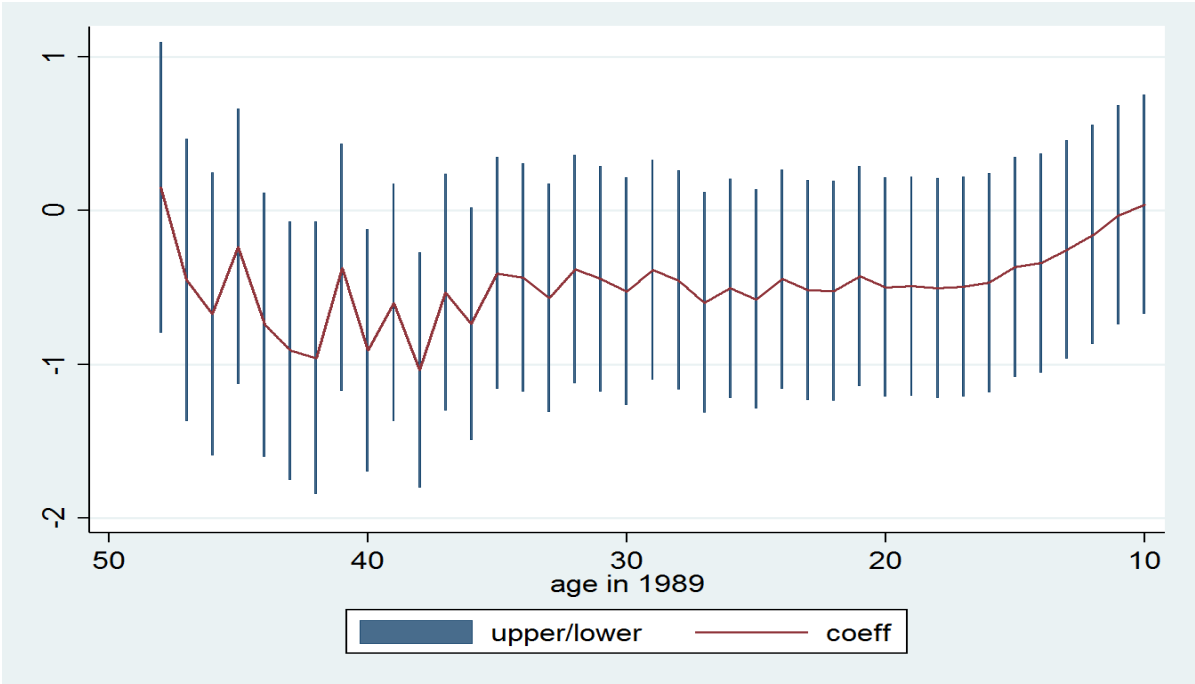


Figure 3: Coefficients of the interactions between dummy variables of women's age in 1989 and the ethnic majority in the proportion of sons in each family equation - Results from subsample 2

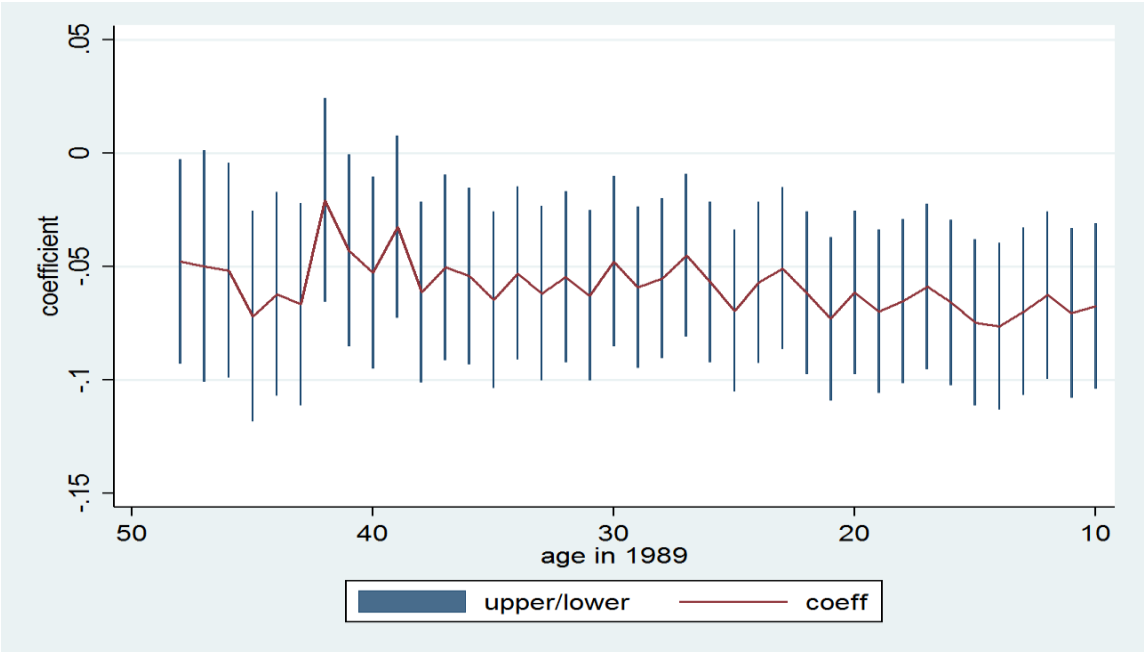
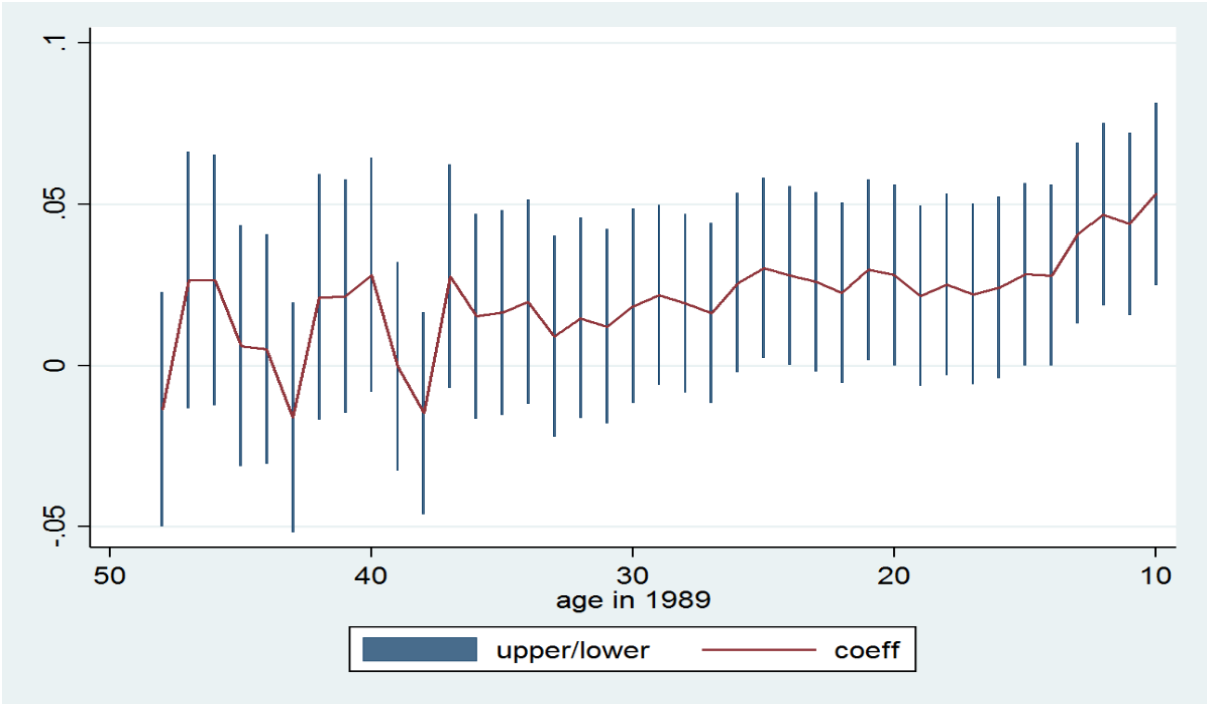


Figure 4: Coefficients of the interactions between dummy variables of women's age in 1989 and the ethnic majority in the maternal employment equation - Results from sample 1



TABLES

TABLE I: SUMMARY STATISTICS OF WOMEN’S BIRTH COHORTS 1940-1979

Variables	Sample 1		Subsample 2	
	Mean or %	SD	Mean or %	SD
Number of living children	2.173	1.570	2.079	1.248
% Having				
No child	15.70		7.23	
One child	15.04		23	
2 children	34.91		42.31	
>3 children	34.35		27.46	
Probability (having more than 2 children)	0.344	0.475	0.275	0.446
Proportion of sons in the family			0.506	0.394
Probability (being employed)	0.856	0.351	0.872	0.334
Age	35.948	8.193	33.615	7.458
Mothers’ age at first birth			23.067	3.914
Rural	0.654	0.476	0.690	0.462
Less than primary education	0.340	0.474	0.327	0.469
Number of Obs.	3,197,622		1,852,725	

Note: Sample 1 includes all women aged 10-49 in 1989 in three survey years. Subsample 2 includes women aged 10-19 in 1989 who satisfies the two following conditions: (1) they are household heads or wives of household heads and (2) they have all children living with them.

TABLE II: THE EFFECT OF THE TWO-CHILD POLICY ON THE PROBABILITY OF HAVING MORE THAN TWO CHILDREN AND THE NUMBER OF LIVING CHILDREN

Dependent Variables	Probability (more than 2 children)		Number of living children	
Mean for women <30 in 1989 (SD)	0.30 (0.46)		2.01 (1.41)	
Mean for women 30-39 in 1989 (SD)	0.61 (0.49)		3.14 (1.90)	
	(1)	(2)	(3)	(4)
age 89<30 × majority	-0.149*** (0.005)	-0.152*** (0.005)	-0.183*** (0.031)	-0.192*** (0.031)
age in 1989 (30-39) × majority	-0.067*** (0.006)	-0.067*** (0.006)	-0.195*** (0.035)	-0.196*** (0.035)
year 1999	N	Y	N	Y
year 2009	N	Y	N	Y
Province FE	Y	Y	Y	Y
N	3,197,622	3,197,622	3,197,622	3,197,622

Note: The numbers in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the regressions are the dummy variables of women aged less than 30 in 1989, women aged 30-39 in 1989, the ethnic majority, age at the time of survey, age squared, age × majority, and age squared × majority.

*p<0.05. **p<0.01, ***p<0.001.

TABLE III: HETEROGENEITY IN THE EFFECT OF THE TWO-CHILD POLICY ON FAMILY SIZE ACROSS MOTHERS' SCHOOLING

Dependent Variables	Probability (more than 2 children)		Number of living children					
			< Primary		> Primary			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mean for women < 30 in 1989 (SD)	0.43(0.50)		0.24 (0.43)		2.39 (1.68)		1.84 (1.22)	
Mean for women 30-39 in 1989 (SD)	0.72 (0.45)		0.54 (0.50)		3.74 (2.16)		2.71 (1.57)	
age 89<30 × majority	-0.150*** (0.006)	-0.158*** (0.006)	-0.052*** (0.014)	-0.051*** (0.014)	-0.539*** (0.035)	-0.578*** (0.035)	0.069 (0.064)	0.071 (0.064)
age 89 (30-39) × majority	-0.048*** (0.007)	-0.04*** (0.01)	-0.051*** (0.015)	-0.053*** (0.015)	-0.294*** (0.041)	-0.282*** (0.041)	-0.077 (0.069)	-0.083 (0.069)
year 1999	N	Y	N	Y	N	Y	N	Y
year 2009	N	Y	N	Y	N	Y	N	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y
N	1,083,490		2,105,403		1,083,490		2,105,403	
% of the sample	35.27%		64.73%		35.27%		64.73%	
% Minority	32.72%		9.93%		32.72%		9.93%	

Note: The numbers in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, and the ethnic majority, age, age squared, age × majority, and age squared × majority.

* p<0.05, ** p<0.01 *** p<0.001.

TABLE IV: HETEROGENEITY IN THE EFFECT OF THE TWO CHILD POLICY ON FAMILY SIZE ACROSS URBAN AND RURAL AREAS

Dependent Variables	Probability (more than 2 children)				Number of living children			
	Rural		Urban		Rural		Urban	
Mean for women < 30 in 1989	0.37 (0.48)		0.17 (0.38)		2.23 (1.45)		1.57 (1.21)	
Mean for women 30-39 in 1989	0.71 (0.45)		0.51 (0.50)		3.56 (1.98)		2.69 (1.72)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
age 89<30 × majority	-0.124*** (0.005)	-0.128*** (0.005)	-0.107*** (0.018)	-0.105*** (0.02)	-0.167*** (0.031)	-0.185*** (0.031)	-0.081 (0.010)	-0.077 (0.10)
age 89 (30-39) × majority	-0.048*** (0.006)	-0.046*** (0.006)	-0.059** (0.021)	-0.06** (0.02)	-0.217*** (0.036)	-0.214*** (0.033)	0.03 (0.108)	0.027 (0.108)
year 1999	N	Y	N	Y	N	Y	N	Y
year 2009	N	Y	N	Y	N	Y	N	Y
Province FE	Y	Y	Y	Y	Y	Y	Y	Y
N	2,090,432		1,107,190		2,090,432		1,107,190	
% of the sample	66.62%		33.38%		66.62%		33.38%	
% Minority	22.76%		8.02%		22.76%		8.02%	

Note: The numbers in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, and the ethnic majority, age, age squared, age × majority, and age squared × majority.

*p<0.05, ** p<0.01 *** p<0.001.

**TABLE V: THE EFFECT OF VIETNAM'S TWO CHILD POLICY ON
MOTHERS' AGE AT FIRST BIRTH**

Dependent Variable	Mothers' age at first birth	
Mean – for women < 30 in 1989 (SD)	23.283 (3.943)	
Mean – for women 30-39 in 1989 (SD)	24.223 (4.086)	
age less than 30 in 1989 × majority	0.132 (0.086)	0.130 (0.086)
age 30-39 in 1989 × majority	0.0283 (0.094)	0.031 (0.094)
year 1999	N	Y
year 2009	N	Y
Province FE	Y	Y
N	1,768,536	1,768,536

Note: The numbers in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, the ethnic majority, age, age squared, age × majority, and age squared × majority.

*p<0.05, **p<0.01, ***p<0.001.

TABLE VI: THE EFFECT OF VIETNAM'S TWO CHILD POLICY ON THE PROPORTION OF SONS IN EACH FAMILY

Dependent Variable	Proportion of sons in each family	
Mean –for women < 30 (SD)	0.499 (0.386)	
Mean - for women 30-39 in 1989 (SD)	0.506 (0.322)	
age in 1989 <30 × majority	-0.0123* (0.005)	-0.0124* (0.005)
age in 1989 (30-39) × majority	-0.0051 (0.006)	-0.0052 (0.006)
year 1999	N	Y
year 2009	N	N
Province FE	Y	Y
N	1,852,725	1,852,725

Note: The numbers in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the models are the dummy variables of women aged less than 30 in 1989, women aged 30-39 in 1989, and the ethnic majority, age, age squared, age × majority, and age squared × majority.

*p<0.05, ** p<0.01, *** p<0.001.

**TABLE VII: THE EFFECT OF VIETNAM'S TWO CHILD POLICY ON
MATERNAL EMPLOYMENT**

Dependent Variable	Probability (being employed)	
Mean for women < 30 in 1989 (SD)	0.86 (0.34)	
Mean for women 30-39 in 1989 (SD)	0.80 (0.40)	
	(1)	(2)
age 89<30 × majority	0.012** (0.004)	0.013** (0.004)
age 89 (30-39) × majority	-0.002 (0.005)	-0.001 (0.005)
year 1999	N	Y
year 2009	N	Y
Province FE	Y	Y
N	3,126,106	3,126,106

Note: The number in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, and the ethnic majority, age, age squared, age × majority, and age squared × majority.

* p<0.05, ** p<0.01 *** p<0.001.

TABLE VIII: HETEROGENEITY IN THE EFFECT OF THE TWO CHILD POLICY ON MATERNAL EMPLOYMENT ACROSS MOTHERS' SCHOOLING

Dependent Variable	Probability (employed)			
	< Primary Education		> Primary Education	
Mean for women <30 in 1989 (SD)	0.84 (0.37)		0.87 (0.33)	
Mean for women 30-39 in 1989 (SD)	0.76 (0.43)		0.84 (0.37)	
	(1)	(2)	(3)	(4)
age 89 <30 × majority	0.021*** (0.005)	0.026*** (0.005)	-0.039*** (0.012)	-0.039*** (0.012)
age 89 (30-39) × majority	-0.005 (0.006)	-0.004 (0.006)	-0.039** (0.013)	-0.039** (0.013)
year 1999	N	Y	N	Y
year 2009	N	Y	N	Y
Province FE	Y	Y	Y	Y
N	1,066,675	1,066,675	2,056,651	2,056,651
% of the sample	35.27%		64.73%	
% Minority	32.95%		9.93%	

Note: The numbers in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, the ethnic majority, age, age squared, age × majority, and age squared × majority.

* p<0.05, ** p<0.01 *** p<0.001.

TABLE IX: HETEROGENEITY IN THE EFFECT OF THE TWO CHILD POLICY ON MATERNAL EMPLOYMENT ACROSS URBAN AND RURAL AREAS

Dependent Variable	Probability (employed)			
	Rural		Urban	
Mean for women < 30 in 1989	0.91		0.77	
	(0.29)		(0.42)	
Mean for women 30-39 in 1989	0.86		0.75	
	(0.35)		(0.43)	
age 89 <30 × majority	0.037***	0.039***	-0.121***	-0.122***
	(0.004)	(0.004)	(0.019)	(0.019)
age 89 (30-39) × majority	0.007	0.007	-0.074***	-0.072***
	(0.004)	(0.004)	(0.021)	(0.021)
year 1999	N	Y	N	Y
year 2009	N	Y	N	Y
Province FE	Y	Y	Y	Y
N	2,059,290	2,059,290	1,066,816	1,066,816
% of the sample	65.87%		34.13%	
% Minority	22.89%		7.95%	

Note: The numbers in parentheses are standard errors.

The omitted group is those aged 40 and older in 1989.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, the ethnic majority, age, age squared, age × majority, and age squared × majority.

*p<0.05, **p<0.01 ***p<0.001.

TABLE X: THE EFFECT OF FERTILITY ON MATERNAL EMPLOYMENT IN VIETNAM

Dependent variable: Probability of being employed	
	Coefficient
OLS	
Number of living children	-0.008* (0.0003)
2SLS	
Number of living children (Year of birth dummies \times the ethnic majority)	-0.15* (0.013)
Number of Obs.	3,126,106

Note: The numbers in parentheses are standard errors.

Year of birth dummies, province indicators, the ethnic majority indicator, age, age squared, age \times majority, and age squared \times majority are included in the regressions.

* $p < 0.05$.

Appendix A

Figure 5: Coefficients of the interactions between dummy variables of women's age in 1989 and the ethnic majority in the probability of having more than two children equation – Results from the subsample of women with less than primary education

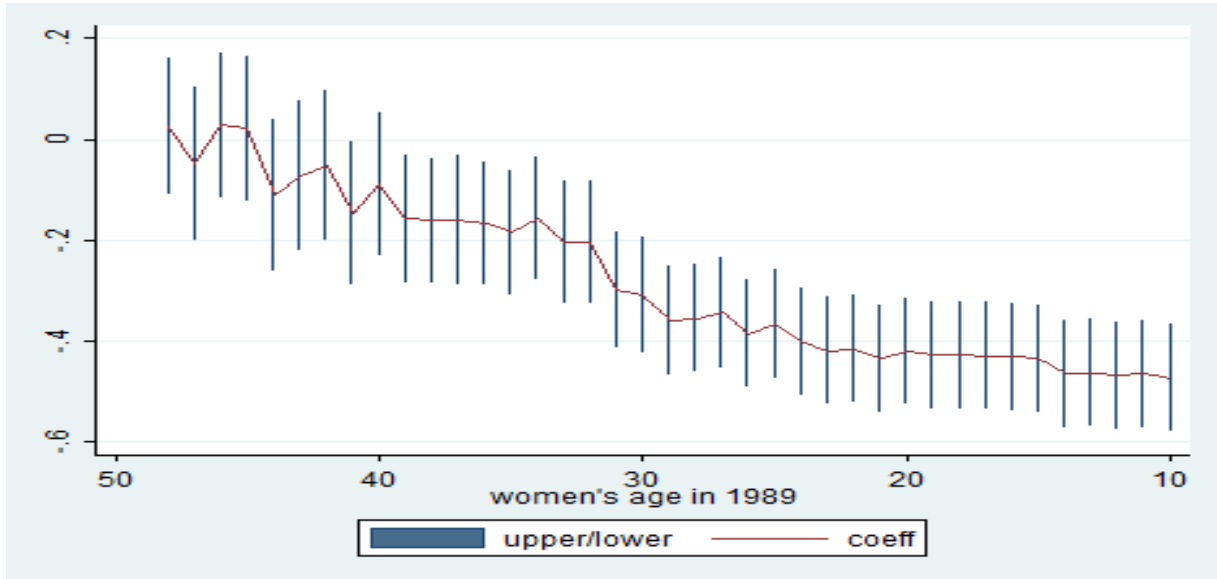


Figure 6: Coefficients of the interactions between dummy variables of women's age in 1989 and the ethnic majority in the probability of having more than two children equation – Results from the subsample of women with at least primary education

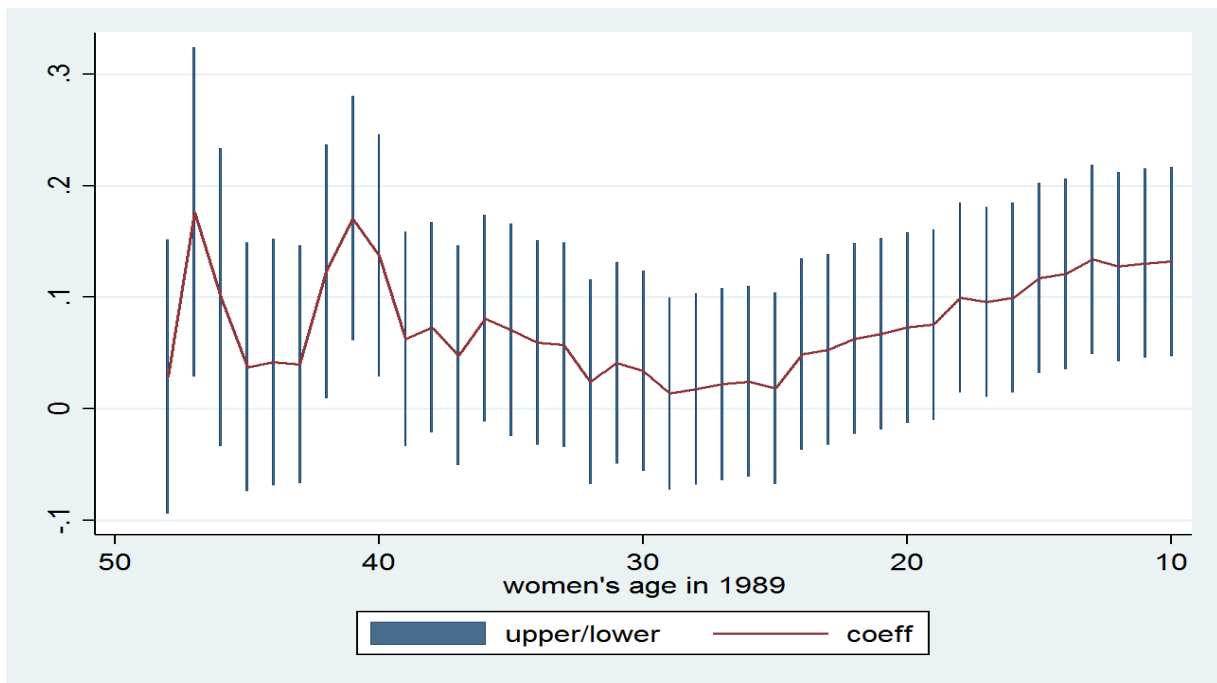


Figure 7: Coefficients of the interactions between dummy variables of women's age in 1989 and the ethnic majority in the probability of having more than two children equation – Results from the subsample of women in rural areas

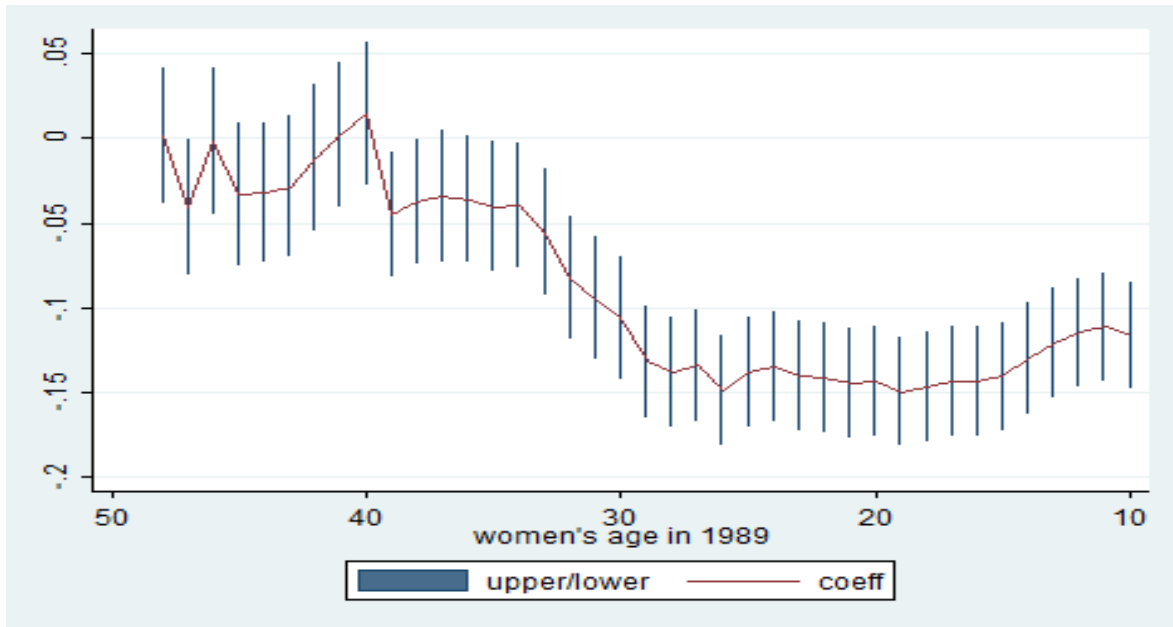


Figure 8: Coefficients of the interactions between dummy variables of women's age in 1989 and the ethnic majority in the probability of having more than two children equation – Results from the subsample of women in urban areas

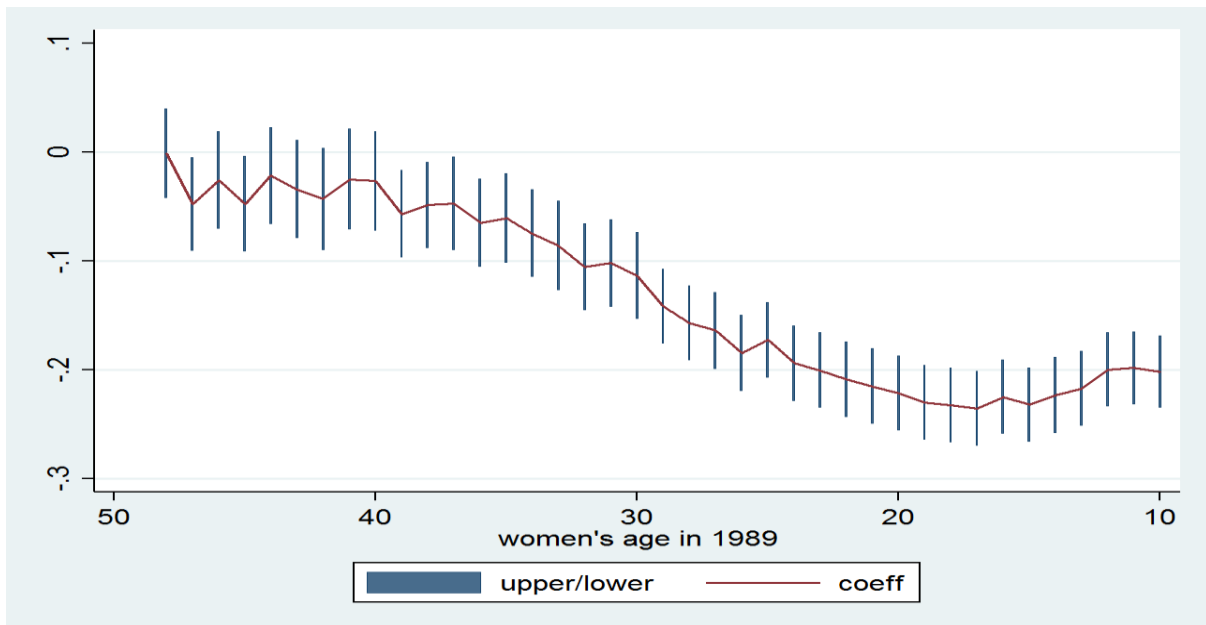


Figure 9: Coefficients of the interactions between dummy variables of women’s age in 1989 and the ethnic majority in the probability of having more than two children equation– Results from subsample 2

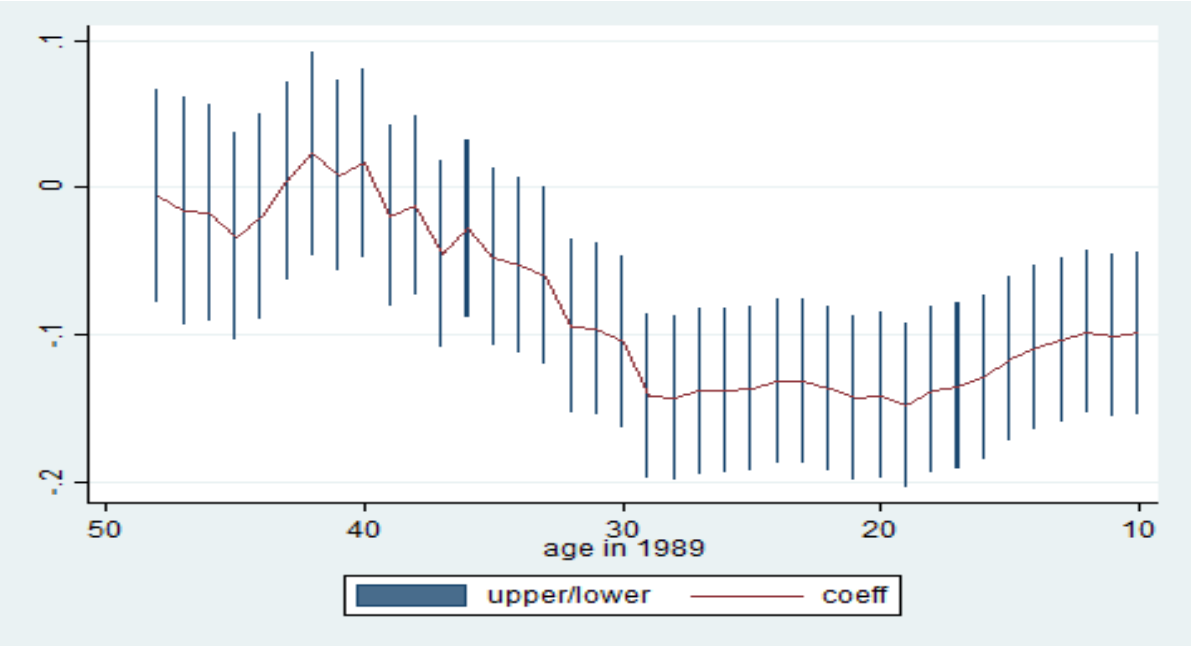


TABLE XI: FRACTIONS OF MOTHERS THAT STILL HAVE ALL OF THEIR CHILDREN LIVING AT HOME

	Census 1989	Census 1999	Census 2009
Ethnic Minority	80.73%	84.98%	79.29%
Ethnic Majority	84.09%	84.18%	78.01%
Mothers' age at the time of survey			
Age <30	96.58%	98.32%	97.15%
Age 30-39	83.63%	84.29%	78.31%
Age 40 ⁺	54.02%	60%	52.34%
Age < 30			
Ethnic minority	94.68%	98.03%	97.53%
Ethnic majority	96.91%	98.38%	96.99%
Age 30-39			
Ethnic minority	80.73%	84.98%	79.29%
Ethnic majority	84.09%	84.18%	78.01%
Age 40 ⁺			
Ethnic minority	52.30%	58.03%	50.50%
Ethnic majority	58.03%	60.27%	52.79%

**TABLE XII: SUMMARY STATISTICS FOR SAMPLE 1 OF WOMEN'S BIRTH COHORTS
1940-1979: ETHNIC MAJORITY VERSUS ETHNIC MINORITY**

	Census 1989		Census 1999		Census 2009	
	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority
Number of children	1.83 (2.05)	2.23 (2.31)	1.93 (1.63)	2.40 (1.93)	2.19 (1.19)	2.8 (1.60)
% Having						
No child	38.62	33.69	22.2	18.31	7.79	5.41
One child	14.65	13.2	20.45	16.36	15.01	9.74
2 children	15.87	14.37	27.25	24.31	45.04	34.81
>3 children	30.86	38.74	30.1	41.02	32.16	50.04
Probability (≥ 2children)	0.31 (0.46)	0.39 (0.49)	0.3 (0.46)	0.41 (0.50)	0.32 (0.47)	0.5 (0.5)
Percent employed	0.76 (0.42)	0.91 (0.29)	0.79 (0.41)	0.91 (0.29)	0.867 (0.33)	0.96 (0.20)
Mothers' age	25.35 (10.42)	24.69 (10.58)	35.36 (10.40)	34.86 (10.55)	45.12 (10.25)	44.41 (10.41)
Rural	0.55 (0.5)	0.8 (0.4)	0.45 (0.5)	0.69 (0.46)	0.68 (0.47)	0.88 (0.33)
< Primary Education	0.36 (0.48)	0.66 (0.47)	0.26 (0.44)	0.54 (0.50)	0.28 (0.45)	0.62 (0.48)
N of Obs.	706,134	119,591	517,049	82,362	2,436,388	575,442

Note: The numbers in parentheses are standard deviations.

TABLE XIII: SUMMARY STATISTICS FOR SUBSAMPLE 2 OF WOMEN'S BIRTH COHORTS 1940-1979: ETHNIC MAJORITY VERSUS ETHNIC MINORITY

Censuses	Census 1989		Census 1999		Census 2009	
	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority
Number of children	2.66 (1.69)	3.15 (1.89)	2.24 (1.33)	2.66 (1.59)	1.85 (1.00)	2.25 (1.30)
% Having						
No Child	5.93	4.60	5.79	5.07	8.54	4.98
One Child	19.92	14.88	22.56	17.40	24.53	21.32
2 Children	26.98	22.07	37.75	31.40	47.21	40.81
>=3 Children	47.17	58.45	33.90	46.13	19.72	32.89
Probability (>=2 children)	0.47 (0.50)	0.58 (0.49)	0.34 (0.47)	0.46 (0.50)	0.20 (0.40)	0.33 (0.47)
Proportion of sons	0.487 (0.357)	0.489 (0.333)	0.498 (0.373)	0.497 (0.351)	0.493 (0.46)	0.509 (0.333)
% employed	0.82 (0.39)	0.93 (0.25)	0.79 (0.41)	0.92 (0.26)	0.87 (0.34)	0.96 (0.19)
Mothers' age	32.21 (6.93)	31.90 (7.39)	33.94 (7.13)	32.60 (7.23)	34.24 (7.47)	32.44 (7.65)
Mothers' age of first birth	23.288 (3.744)	22.659 (4.076)	23.315 (3.806)	22.528 (3.779)	23.748 (4.102)	22.868 (3.977)
Rural	0.58 (0.49)	0.82 (0.38)	0.47 (0.50)	0.72 (0.45)	0.68 (0.47)	0.90 (0.29)
< Primary Education	0.36 (0.48)	0.67 (0.47)	0.25 (0.43)	0.54 (0.50)	0.23 (0.42)	0.63 (0.48)
N of Obs.	248,858	38,044	262,071	45,423	1,411,727	424,808

Note: The numbers in parentheses are standard deviations.

**TABLE XIV: SUMMARY STATISTICS FOR THE SUBSAMPLE OF WOMEN
WITH LESS THAN PRIMARY EDUCATION OF BIRTH COHORTS 1940-1979:
ETHNIC MAJORITY VERSUS ETHNIC MINORITY**

	Census 1989		Census 1999		Census 2009	
	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority
Number of children	2.63 (2.47)	2.66 (2.50)	2.51 (2.04)	2.82 (2.14)	2.39 (1.44)	3.13 (1.72)
Percent Having						
No child	29.07	28.35	19.43	16.22	9.57	5.21
One child	11.35	12.01	16.15	13.54	13.91	6.99
2 children	12.8	12.84	19.57	19.22	34.49	27.45
≥ 3 children	46.78	46.8	44.85	51.02	42.03	60.35
Probability (≥ 2 children)	0.47 (0.50)	0.47 (0.50)	0.45 (0.50)	0.51 (0.50)	0.42 (0.50)	0.60 (0.50)
Percent employed	0.69 (0.46)	0.91 (0.28)	0.68 (0.47)	0.88 (0.31)	0.74 (0.44)	0.90 (0.30)
Age	27.78 (11.47)	24.99 (10.39)	37.52 (11.42)	35.58 (11.37)	47.72 (11.21)	44.56 (10.86)
Rural	0.67 (0.47)	0.88 (0.33)	0.59 (0.49)	0.81 (0.39)	0.78 (0.41)	0.92 (0.27)
% of the sample	76.1	23.9	74.48	25.52	65.53	34.47
N of Obs.	484,806	152,288	251,931	86,343	1,328,975	699,169

Note: The number in parentheses are standard deviations.

**TABLE XV: SUMMARY STATISTICS FOR THE SUBSAMPLE OF WOMEN
WITH AT LEAST PRIMARY EDUCATION OF BIRTH COHORTS 1940-1979:
ETHNIC MAJORITY VERSUS ETHNIC MINORITY**

	Census 1989		Census 1999		Census 2009	
	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority
Number of children	1.38 (1.61)	1.43 (1.68)	1.76 (1.41)	1.91 (1.48)	2.11 (1.09)	2.22 (1.14)
Percent having no child	43.36	43.76	22.01	19.79	7.17	5.77
1 child	16.47	15.39	22.26	20.01	15.38	14.57
2 children	17.57	17.2	30.42	30.83	48.64	47.79
>=3 children	22.6	23.65	25.31	29.37	28.81	31.87
Probability (≥ 2 children)	0.226 (0.42)	0.236 (0.42)	0.25 (0.43)	0.29 (0.46)	0.29 (0.45)	0.32 (0.47)
Percent employed	0.79 (0.41)	0.88 (0.33)	0.80 (0.40)	0.88 (0.32)	0.84 (0.37)	0.92 (0.27)
Age	25.09 (8.93)	24.53 (8.29)	34.04 (9.48)	33.73 (9.13)	43.17 (9.14)	42.64 (8.71)
Rural	0.48 (0.50)	0.62 (0.49)	0.39 (0.49)	0.53 (0.50)	0.63 (0.48)	0.78 (0.41)
% of the sample	91.54	8.46	90.78	9.22	65.53	34.47
N of Obs.	426,080	37,178	357,225	34,366	1,623,833	185,979

Note: The numbers in parentheses are standard deviations.

TABLE XVI: SUMMARY STATISTICS FOR THE SUBSAMPLE OF WOMEN IN URBAN AREAS OF BIRTH COHORTS 1940-1970: ETHNIC MAJORITY VERSUS ETHNIC MINORITY

	Census 1989		Census 1999		Census 2009	
	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority
Number of children	1.63 (1.91)	1.51 (1.99)	1.72 (1.48)	1.83 (1.66)	1.88 (1.08)	2.03 (1.38)
Percent Having						
no child	40.2	47.15	24.18	25.13	10.6	12.65
1 child	16.41	13.22	22.58	20.81	20.3	18.54
2 children	16.92	14.64	29.33	27.38	48.97	42.5
>=3 children	26.47	24.99	23.91	26.68	20.13	26.31
Probability (≥ 2 children)	0.26 (0.44)	0.25 (0.43)	0.24 (0.43)	0.27 (0.44)	0.20 (0.40)	0.26 (0.44)
Percent employed	0.68 (0.47)	0.70 (0.46)	0.71 (0.45)	0.77 (0.42)	0.70 (0.46)	0.76 (0.43)
Age	25.57 (10.43)	25.30 (10.26)	35.57 (10.34)	35.50 (10.50)	44.99 (10.17)	45.09 (10.30)
Less than primary	0.27 (0.44)	0.41 (0.49)	0.22 (0.42)	0.35 (0.48)	0.23 (0.42)	0.42 (0.49)
% of the sample	92.65	7.35	91.6	8.4	91.63	8.37
N of Obs.	313,224	24,256	285,705	25,627	774,025	70,569

Note: The numbers in parentheses are standard deviations.

TABLE XVII: SUMMARY STATISTICS FOR THE SUBSAMPLE OF WOMEN IN RURAL AREAS OF BIRTH COHORTS 1940-1979: ETHNIC MAJORITY VERSUS ETHNIC MINORITY

	Census 1989		Census 1999		Census 2009	
	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority	Ethnic Majority	Ethnic Minority
Number of children	2.0 (2.15)	2.43 (2.37)	2.20 (1.78)	2.66 (2.0)	2.33 (1.22)	2.90 (1.60)
Percent Having						
No child	36.66	30	19.77	15.24	6.47	4.45
1 child	13.2	13.19	17.83	14.35	12.53	8.57
2 children	15	14.29	24.71	22.92	43.20	33.79
>=3 children	35.14	42.52	37.69	47.49	37.80	53.19
Probability (≥2 children)	0.35 (0.48)	0.43 (0.50)	0.38 (0.48)	0.47 (0.50)	0.38 (0.48)	0.53 (0.50)
Percent employed	0.82 (0.38)	0.96 (0.20)	0.82 (0.38)	0.94 (0.24)	0.86 (0.35)	0.93 (0.26)
Age	24.98 (10.46)	24.31 (10.63)	35.10 (10.45)	34.57 (10.58)	45.17 (10.29)	44.31 (10.42)
Less than primary % of the sample	0.48 (0.50)	0.76 (0.43)	0.39 (0.49)	0.68 (0.47)	0.38 (0.49)	0.71 (0.45)
N of Obs.	391,849	95,335	231,344	56,735	1,662,459	504,801

Note: The numbers in parentheses are standard deviations.

TABLE XVIII: THE ESTIMATES OF THE EFFECT OF THE TWO CHILD POLICY ON THE PROBABILITY OF HAVING MORE THAN 2 CHILDREN - RESULTS FROM SAMPLE 1

Dependent Variable		Probability that a woman has more than 2 children			
Birth year × majority Age in 1989		Coefficient		95% CI	
1941	48	0	-0.04		0.04
1942	47	-0.02	-0.07		0.02
1943	46	-0.01	-0.05		0.04
1944	45	-0.04	-0.08		0.01
1945	44	-0.02	-0.06		0.03
1946	43	-0.03	-0.07		0.01
1947	42	-0.01	-0.06		0.03
1948	41	0.01	-0.03		0.05
1949	40	0	-0.04		0.04
1950	39	-0.05	-0.09		-0.02
1951	38	-0.04	-0.08		-0.01
1952	37	-0.05	-0.09		-0.01
1953	36	-0.05	-0.09		-0.01
1954	35	-0.06	-0.1		-0.02
1955	34	-0.07	-0.1		-0.03
1956	33	-0.08	-0.12		-0.04
1957	32	-0.11	-0.15		-0.08
1958	31	-0.11	-0.15		-0.08
1959	30	-0.13	-0.17		-0.09
1960	29	-0.16	-0.19		-0.13
1961	28	-0.17	-0.2		-0.13
1962	27	-0.17	-0.2		-0.13
1963	26	-0.17	-0.2		-0.14
1964	25	-0.16	-0.2		-0.13
1965	24	-0.16	-0.19		-0.13
1966	23	-0.16	-0.19		-0.13
1967	22	-0.16	-0.19		-0.13
1968	21	-0.16	-0.2		-0.13
1969	20	-0.16	-0.2		-0.13
1970	19	-0.17	-0.2		-0.14
1971	18	-0.17	-0.2		-0.14
1972	17	-0.17	-0.2		-0.14
1973	16	-0.17	-0.2		-0.14
1974	15	-0.17	-0.2		-0.13
1975	14	-0.14	-0.18		-0.11
1976	13	-0.14	-0.17		-0.1
1977	12	-0.13	-0.16		-0.1
1978	11	-0.13	-0.16		-0.1
1979	10	-0.13	-0.16		-0.1

TABLE XIX: THE ESTIMATES OF THE EFFECT OF THE TWO CHILD POLICY ON MOTHERS' AGE AT FIRST BIRTH FOR WOMEN'S BIRTH COHORTS 1940-1979 - RESULTS FROM SUBSAMPLE 2

Dependent Variable		Mothers' age at first birth		
Birth year × majority	age in 1989	Coefficient	95% CI	
1941	48	0.152	-0.795	1.099
1942	47	-0.451	-1.371	0.468
1943	46	-0.673	-1.593	0.247
1944	45	-0.233	-1.128	0.662
1945	44	-0.743	-1.602	0.116
1946	43	-0.912	-1.755	-0.069
1947	42	-0.959	-1.846	-0.072
1948	41	-0.371	-1.178	0.436
1949	40	-0.910	-1.699	-0.120
1950	39	-0.600	-1.373	0.174
1951	38	-1.037	-1.804	-0.270
1952	37	-0.533	-1.303	0.238
1953	36	-0.738	-1.496	0.020
1954	35	-0.407	-1.160	0.346
1955	34	-0.436	-1.181	0.309
1956	33	-0.569	-1.312	0.174
1957	32	-0.380	-1.125	0.364
1958	31	-0.446	-1.179	0.287
1959	30	-0.526	-1.269	0.217
1960	29	-0.386	-1.103	0.331
1961	28	-0.453	-1.168	0.263
1962	27	-0.600	-1.319	0.119
1963	26	-0.506	-1.220	0.208
1964	25	-0.576	-1.291	0.139
1965	24	-0.447	-1.162	0.268
1966	23	-0.517	-1.233	0.198
1967	22	-0.522	-1.238	0.193
1968	21	-0.426	-1.141	0.290
1969	20	-0.498	-1.214	0.217
1970	19	-0.493	-1.207	0.222
1971	18	-0.504	-1.219	0.212
1972	17	-0.496	-1.211	0.220
1973	16	-0.470	-1.185	0.246
1974	15	-0.368	-1.083	0.346
1975	14	-0.342	-1.057	0.372
1976	13	-0.254	-0.968	0.460
1977	12	-0.157	-0.871	0.556
1978	11	-0.028	-0.742	0.685
1979	10	0.040	-0.674	0.754

TABLE XX: THE ETIMATES OF THE EFFECT OF THE TWO CHILD POLICY ON PROPORTION OF SONS IN EACH FAMILY - RESULTS FROM SUBSAMPLE 2

Dependent variable: Proportion of son				
Birth year × majority	Age in 1989	Coefficient	95% CI	
1941	48	-0.048	-0.093	-0.00
1942	47	-0.050	-0.101	0.00
1943	46	-0.052	-0.099	-0.00
1944	45	-0.072	-0.119	-0.02
1945	44	-0.062	-0.107	-0.01
1946	43	-0.067	-0.111	-0.02
1947	42	-0.021	-0.066	0.02
1948	41	-0.043	-0.085	0.00
1949	40	-0.053	-0.095	-0.01
1950	39	-0.033	-0.073	0.00
1951	38	-0.061	-0.101	-0.02
1952	37	-0.050	-0.091	-0.00
1953	36	-0.054	-0.093	-0.01
1954	35	-0.065	-0.104	-0.02
1955	34	-0.053	-0.091	-0.01
1956	33	-0.062	-0.101	-0.02
1957	32	-0.055	-0.092	-0.01
1958	31	-0.063	-0.100	-0.02
1959	30	-0.048	-0.085	-0.01
1960	29	-0.059	-0.095	-0.02
1961	28	-0.055	-0.091	-0.02
1962	27	-0.045	-0.081	-0.00
1963	26	-0.057	-0.092	-0.02
1964	25	-0.070	-0.105	-0.03
1965	24	-0.057	-0.093	-0.02
1966	23	-0.051	-0.087	-0.01
1967	22	-0.062	-0.098	-0.02
1968	21	-0.073	-0.109	-0.03
1969	20	-0.061	-0.098	-0.02
1970	19	-0.070	-0.106	-0.03
1971	18	-0.065	-0.102	-0.02
1972	17	-0.059	-0.095	-0.02
1973	16	-0.066	-0.103	-0.02
1974	15	-0.075	-0.111	-0.03
1975	14	-0.076	-0.113	-0.03
1976	13	-0.070	-0.107	-0.03
1977	12	-0.063	-0.100	-0.02
1978	11	-0.071	-0.108	-0.03
1979	10	-0.067	-0.104	-0.03

**TABLE XXI: THE ESTIMATES OF THE EFFECT OF THE TWO CHILD POLICY
ON MATERNAL EMPLOYMENT - RESULTS FROM SUBSAMPLE 1**

Dependent variable		Probability (being employed)		
Birth year × majority Age in1989		Coefficient		95 % CI
1941	48	-0.009	-0.049	0.031
1942	47	0.025	-0.021	0.070
1943	46	0.027	-0.017	0.072
1944	45	-0.009	-0.050	0.033
1945	44	0.001	-0.039	0.041
1946	43	-0.008	-0.047	0.031
1947	42	0.025	-0.018	0.068
1948	41	0.036	-0.005	0.077
1949	40	0.043	0.002	0.083
1950	39	0.009	-0.028	0.045
1951	38	-0.010	-0.044	0.025
1952	37	0.038	-0.001	0.077
1953	36	0.022	-0.013	0.058
1954	35	0.021	-0.015	0.057
1955	34	0.029	-0.007	0.065
1956	33	0.011	-0.024	0.046
1957	32	0.013	-0.022	0.048
1958	31	0.012	-0.022	0.046
1959	30	0.019	-0.015	0.053
1960	29	0.016	-0.015	0.047
1961	28	0.013	-0.018	0.044
1962	27	0.008	-0.024	0.039
1963	26	0.014	-0.018	0.045
1964	25	0.017	-0.015	0.048
1965	24	0.007	-0.024	0.039
1966	23	0.003	-0.029	0.034
1967	22	-0.004	-0.035	0.028
1968	21	-0.001	-0.032	0.031
1969	20	0.002	-0.029	0.033
1970	19	-0.007	-0.038	0.024
1971	18	-0.001	-0.032	0.031
1972	17	-0.005	-0.036	0.026
1973	16	-0.009	-0.041	0.022
1974	15	-0.002	-0.034	0.029
1975	14	-0.007	-0.038	0.025
1976	13	0.005	-0.027	0.036
1977	12	0.012	-0.020	0.044
1978	11	0.001	-0.031	0.032
1979	10	0.009	-0.023	0.040

TABLE XXII: THE EFFECT OF THE TWO-CHILD POLICY ON FAMILY SIZE WITH FURTHER CONTROLS

	Probability (having more than 2 children)			Number of living children		
age in 1989<30× majority	-0.152*** (0.005)	-0.144*** (0.005)	-0.133*** (0.005)	-0.192*** (0.031)	-0.166*** (0.031)	-0.123*** (0.03)
age in 1989 (30-39) × majority	-0.067*** (0.006)	-0.067*** (0.006)	-0.063*** (0.006)	-0.196*** (0.035)	-0.196*** (0.035)	-0.180*** (0.035)
N	3,197,622	3,197,622	3,188,893	3,197,622	3,197,622	3,188,893
Controls						
Year indicators	Y	Y	Y	Y	Y	Y
Rural Indicators	N	Y	Y	N	Y	Y
Education indicators	N	N	Y	N	N	Y

Note: The numbers in parentheses are standard errors.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, the ethnic majority, age, age squared, age × majority, and age squared × majority, and province indicators.

*p<0.05. **p<0.01, ***p<0.001.

TABLE XXIII: THE EFFECT OF THE TWO-CHILD POLICY ON MATERNAL EMPLOYMENT WITH FURTHER CONTROLS

	Proportion of sons			Probability of being employed		
age in 1989<30 × majority	-0.013* (0.005)	-0.012* (0.006)	-0.011* (0.006)	0.013** (0.004)	0.019*** (0.004)	0.015*** (0.004)
age in 1989 (30-39) × majority	-0.0051 (0.006)	-0.005 (0.007)	-0.0048 (0.007)	-0.0008 (0.005)	-0.0008 (0.005)	-0.001 (0.005)
N	1,852,725	1,852,725	1,850,465	3,126,106	3,126,106	3,123,326
Controls						
Year indicators	Y	Y	Y	Y	Y	Y
Rural indicators	N	Y	Y	N	Y	Y
Education indicators	N	N	Y	N	N	Y

Note: The numbers in parentheses are standard errors.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, the ethnic majority, age, age squared, age × majority, age squared × majority, and province indicators.

* p<0.05**p<0.01, ***p<0.001.

TABLE XXIV: THE ESTIMATES OF THE EFFECT OF THE TWO CHILD POLICY ON OTHER HOUSEHOLD OUTCOMES

	Probability of having at least one child	Probability of getting married
age in 1989 <30 × majority	0.0001 (0.003)	0.007** (0.003)
age in 1989 (30-39) × majority	0.003 (0.004)	0.004 (0.004)
N	3,197,622	3,196,708

Note: The numbers in parentheses are standard errors.

Other covariates included in the models are the indicators of women aged less than 30 in 1989, women aged 30-39 in 1989, the ethnic majority, age, age squared, age × majority, age squared × majority, year indicators, and province indicators.

* p<0.05, **p<0.01.