

DOES CHINA'S "SECOND-CHILD" POLICY INCREASE THE DISCRIMINATION
AGAINST WOMEN IN THE LABOR MARKET?

A Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Public Policy
in Public Policy

By

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Washington, D.C.
April 8, 2021

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ABSTRACT

In 2016, every Chinese couple is allowed to have at most two children, which abolished the historical "one-child" policy. However, there are reports saying that the sex discrimination in labor market is getting worse due to second-child policy. This thesis uses data from China General Social Survey to find empirical evidence on whether Chinese women's situation in the labor market is affected by this policy.

ACKNOWLEDGEMENTS

I must express my deeply appreciation to Professor Eliane Catilina. Without her patience and help, this thesis can't be done. Also, I have to thank my parents and other family members. Their selfless love has supported me to get through my Master Degree. Finally, I shall recognize the help from my friends who are also striving in this field of economics and public policy, such as Dr.Jin. They have always been great inspiration to me!

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INTRODUCTION

In the November of 2015, one-child policy, which might be the most controversially policy in the last 30 years, is officially abolished, and every couple in China is allowed to have at most two children. However, after this policy, there is a rumor that the sexual discrimination in labor market, especially in the private sector of China's economy, is deteriorating. Many companies unofficially reveal that they prefer female employees who are less expected to fertility, for the reason that the employer is not willing to afford the maternity leave.

Using the data of the labor market in China's private sector, this research investigates whether the second child-policy affects the working return of female employees. We will be looking into the relationship between income and sex after this policy, along with other controlling variables in our model.

This thesis is organized as follows: in the next chapter we will discuss the background of "second-child" policy. And then we will review the literature in such fields. Next, we will discuss our conceptual model and methodology. The most important part will be descriptive & regression analysis. Finally, we will give policy implication & discussion based on what we have discovered.

BACKGROUND

The background of one-child policy, or family planning, can be traced back to 1950s, when People's Republic of China was just established. The demographer, Ma Yinchu, expressed his concern about the Chinese population explosion in China (Peking University). His theory on population control was later adopted by central policymakers.

In the beginning of 1970s, Chinese authority has become aware of the accelerating of population growth, and began the discussion and introduction of relevant policies. In 1982, the family planning was written into China's Constitution as a basic national policy. This policy, in the first place, was intended to control the birth rate of universal Chinese family, and fundamentally every family was allowed to have only one child (Mei, 2008). Therefore, this policy was also called "one child policy", and it succeeded in bringing down the total fertility rate, from 5.72 in 1970 to 1.63 in 2010 (World Bank, 2018). Besides the significant decrease in indicators, the also policymakers believed this policy could bring benefits to the country, including abolishment of traditional gender discrimination, higher living standards, better development environment and etc. (The State Council Information Office, 2002).

However, one-child policy was also controversial in several ways, especially in terms of its negative effect on Chinese population structure as a whole. As mentioned above, the total fertility rate is below 2 in 2010, which is startlingly below "replacement level" (Craig, 1994). In 2015, data shows that the population over 60 years old are 15.5% and 210 million; population over 65 years old are 10.1% and 138 million. This alarming percentage suggests that China has entered into a aging society, with low expectation of economic growth (Xinhua Net, 2016). Also, the translation idea of patriarchal didn't fade away. Instead, it caused more serious male-to-

female rate under the context of one-child policy (Bloomberg News, 2020). Also, there are other questions, such as cruel enforcement, but they happened in the initial stage and wasn't the driving force to abolish the policy

Considering all the negative effects, the central policymakers were starting to modify the one-child policy since 2013. In the period of 2013 and 2015, Zhejiang province were carrying "partial second-child policy", which means that if any of the parent is from a one-child family, they are allowed to have at most two children. It was considered as a pilot or policy experiment of universal second-child policy. As expected, after 2 years of Zhejiang pilot, the central government announced the abolishment of "one-child policy" with 30 years' history in October 2016. China has officially entered the era of "two-child policy" (F. Wang, 2016), which means all families, under any conditions, are allowed to have at most two children. Although it is still in doubt how much the fertility desire will be, the information of higher and wider fertility is conveyed to every China's citizen, especially those employers. In this background, old social problems may be solved, but many new ones will also arise, such as our research question.

LITERATURE REVIEW

There has been a large quantity of study on labor market and gender equality, or other minorities. Generally, the research can be divided into two parts: China and outside China. In international academia, we will focus our review on US and other countries' labor market as it is more extensive and comprehensive.

To begin with, we must clearly define “discrimination”, which is the opposite of equality. In other words, we must know how someone is discriminated. There are two stages where discrimination can happen: one is in the acquisition of human capital and the other is in the labor market (Rycroft, 2009). The first stage is how one obtains human capital investment and transform it into his abstract ability. In general, it refers to the procedure of education and entering into the labor market. In his view, the discrimination in the first stage is hard to investigate from the perspective of labor economics, since the discriminated ones will disappear eventually in the market. What we should focus is discrimination in the second stage, the competition and negotiation between employers and employees in the labor market.

In terms of discrimination in this stage, there are two leading approaches: Phelps' approach of statistical discrimination and Becker's taste-based approach. In the first approach, employers use some traits, like race or gender, more as a proxy to measure the productivity (Phelps, 1972). In Becker's study, he supposes every employer has a utility level of every employee, corresponding to their productivity level and the marginal cost of employer's company, and some traits will influence the level, even if the candidates are totally the same in terms of productivity level (Gary S. Becker, 1971). Most of the research in this area are mainly combining these two approaches, and we will be closer to Becker approach.

To find whether some traits are really discriminated in the labor market, there are two major types of studies, different in experiment and model design. Some economists have been using field experiments, which are more direct and convincing in uncovering the existence of discrimination in the labor market. One interesting and profound research on the labor market discrimination in US is a field research using fake names in job recruitment (Bertrand, Marianne, Mullainathan, & Sendhil, 2004). They sent almost the same resumes with white-sounding or African-sounding names to employers, and they found that the callbacks differed a lot. This research is a good example to circumvent the difficulty of obtaining employment data. Similar method is also applied in Arceo-Gomez's designed experiment in Mexico, and they also prove the discrimination against indigenous people and married women (Arceo-Gomez & Campos-Vázquez, 2013). However, these studies are hard to tell whether these traits studied are proxies or tastes, and their experiment approaches are unrealistic for us.

Another branch of literature uses statistical data to study the existence and extent of discrimination. According to Becker, money or salary is a best term used to measure discrimination: if someone is discriminated, he or she is given less or more salary, when producing same number of commodities (Gary S. Becker, 1971). The mechanic is explicit in Borowczyk-Martins's article: discriminated workers will have lower reservation value in the labor market and thus they are offered with lower salaries (Borowczyk-Martins, Bradley, & Tarasonis, 2014). They have matched different types of workers with different types of firms, with the help of simulated method of moments. In his research, it is found that racial discrimination (between whites and blacks) is milder among employees with some college than those without. The Borowczyk-Martins model is compelling itself, but we don't have similarly

detailed data and this project is more in a cross-sectional context. We want to focus on the change before and after a certain policy shock. One research uses a set of longitudinal data to investigate into the income gap between genders among US obstetricians and gynecologists (Reyes, 2007). The researcher focuses on this special market because it has comprehensive and continuous data of both supply and demand sides, since it's a particularly small and specialized market. He discovers the dropping trends of coefficients of female on income gap. Another similar research studies how female employees are discriminated in science and engineering industry (Graham & Smith, 2005). It considers the self-choice effect, comparing the income data of other industries requiring similar educational backgrounds. These researchers provide a sample using gender indicators to study the discrimination in a certain market, and it controls the conditions well by particularizing their scope of analysis. Ideally speaking, our research should also focus on one certain market, but we don't have access to such intensive data.

The literature above is about methodology and economic empirical evidence of different types of discrimination. If we investigate into how fertility policy in a broader sense, affects the labor market, it is an intersection field of economics, political science and demography. The core issue here is the conflict between child-caring (unpaid) work and paid work. In most countries, despite the different culture, men or fathers are taking the latter one while mothers are taking the former one (Lewis, 2009). But the trends of working mothers keep rising, so the main goal of relevant policy is to help women reconcile between work and child-care. Sweden is unique in the way that it once kept highest female fertility rate and labor participation at the same time (Sundström & Stafford, 1992). After studying the differences between Sweden and other similar countries, the demographers conclude that the combination of equal fertility benefits to parents,

proper tax policies and public-provided child-care resources associated with full-time working hours length are the key. Inversely, the missing of any policy above will possibly lead to low fertility rates or low female labor participation.

Then we narrow our scope to the context of second-child policy and China's gender discrimination in labor market. Although many have put forward the concern of potential problems of the ground-breaking policy, only a few of the articles focus on the empirical evidence. What we can see now is mainly forecast and theoretical analysis. One article on *the lancet* discusses several possible outcomes of this policy. The ones related with our research question is that the fertility rate will rise slightly, which meets people's common projection (Zeng & Hesketh, 2016). We expect this projection will influence employment of women. One research conducts a direct survey with firms to show their willingness to hire women after second-child policy, which drops sharply in their data (A. Wang, Chen, & Wang, 2016). As early as "partial second-child" policy was introduced, some scholars have anticipated that increasing fertility will negatively affect female employees' chance of promotion (Yang, 2014). Then after the official introduction of universal "second-child", Yang has conducted a survey among the women living in China's highly developed cities. This research underscores the subjective feelings of women in the labor market under the new policy, and as expected, the result indeed shows the policy's negative effect. Other related researches include Chen and Zhang's using China Household Income Project Survey (CHIPS) in their decomposition method and they manage to find the discrimination between urban and rural residents in labor market (Chen & Zhang, 2018). In Luo's early study in 2004, he refers to China Labor Statistics Yearbook (Luo, 2004), and he points to the differences of mean wages between two genders. This research is one

of the earliest trails of quantitative research on gender discrimination in China's labor market, but it is short in specification in different industries and it is too general. Another interesting research uses the requirements on job advertising as data for analysis (Li, Kong, & Qi, 2016), and they also find the discrimination against women in the labor market during that time period.

To conclude, the literature at this time provides with rich experience in modelling and theoretical guide on discrimination in labor market. As for the context of gender in China, the literature is not so enough and it is exactly what this article is trying to enrich.

CONCEPTUAL MODEL

According to the existing literature, the factors influencing the wages provided to employees depends on the demand and supply in the labor market. It is actually the result of negotiating and bargaining. Generally speaking, any change from either side, supply (employees) or demand (employers), will result in the final wages. However, the supply side is out of our discussion range. We will mainly focus how employers' choice makes difference.

Let's suppose an efficient labor market has a following figure, representing the demand and supply curves. In this figure, we have an important assumption: all employees are the same to employers (Zhao & Peng, 2016), except their expected maternity leave and other kinds of legalized fertility benefits. In the first stage, we will ignore such difference for now.

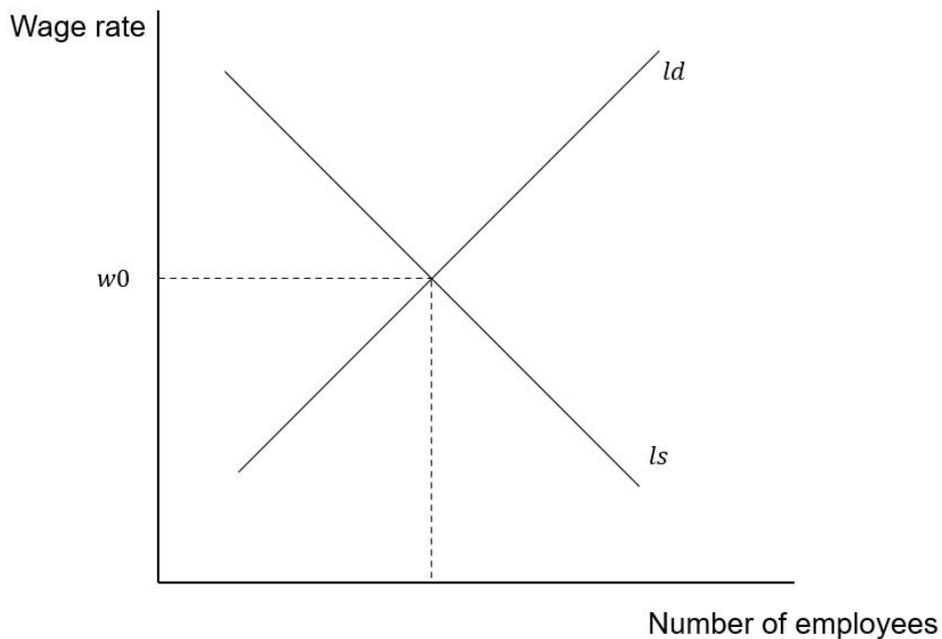


Figure 1

Demand and Supply Curve of Labor Market, at first stage

The employers as the demander in this market have their reservation prices, which is represented in Figure 1 by the ls curve, also supply curve. Correspondingly, the ls curve represents the supply curve and the point of w_0 represents the initial efficient wage rate. Any factors influencing their reservation price will lead to the change of the efficient point, and then the final salaries. To study the reservation price, we must know how employees value hiring someone. Generally, the income of someone should equal the marginal productivity brought by the employees. The employers will look into some of the job-seekers' background to ensure they can keep at the productivity level. These backgrounds are associated with a certain level of pay in the market. However, there are some other issues which will drop employees' productivity level, such as poor health, disabilities and others. Therefore, we will mainly study the two kinds of factors influencing the productivity in the context of "second-child" policy.

As for the factors that keep and rise productivity level, we estimate that employees' education, age / professional experience and others are the most important ones. Education represents the investment transformed to one's abstract abilities (G. S. Becker, 1962). We estimate the educated years in the following regression. The relationship between age factor and the return of work is more complicated, and studies show that it has a concave curve and has a top point, which differs in industries. Also, we estimate that the overall economic situation is one influencing factor. In a descending economic situation, the companies are unable to afford as high salaries as those in other years (Wilkinson, 1988). Then we need to adjust the wage data based on the economic situation, which we will discuss later.

In the part of hinders to productivity, there are mainly two factors. Different industries have different preference of gender. It is due to some natural features of different professions. For example, nursery and building construction have definitely different preferences. Unfortunately, due to the deficiency of the dataset, it is hard for us to investigate into this factor (we will discuss this later). The most important one in the context of “second-child” policy, and also the topic is employer’s opportunity cost of maintaining a vacancy while their employee is on maternity leave. The maternity leave and other fertility benefits have been made mandatory for a long time in China. This cost of hiring a female employee will be considered by the employers. Their reservation price will naturally include it into account. This is the core study of this article, and we estimate that before “second-child policy”, the expectation of this opportunity cost is much lower than that after the policy. In other words, this expected cost has been existing for some time, and it is much higher after the policy introduction. Note that this is an “expected” cost, not an actual one. A female worker will endure this expectation even she doesn’t have any fertility plan in the future, which corresponds to the definition of discrimination by Becker (Gary S. Becker, 1971). This change in expectation is reflected in the final reservation price, which means that controlling every other condition (education, age and etc.), female employees or other people with higher expectation of maternity leave will receive lower reservation price from their employers. This type of cost cannot be reimbursed by any sorts of mandatory leave without cash benefits (Baum II, 2003). In other words, maternity leave will finally result in the negotiated price. Considering this cost, the Figure 1 will develop into the second stage.

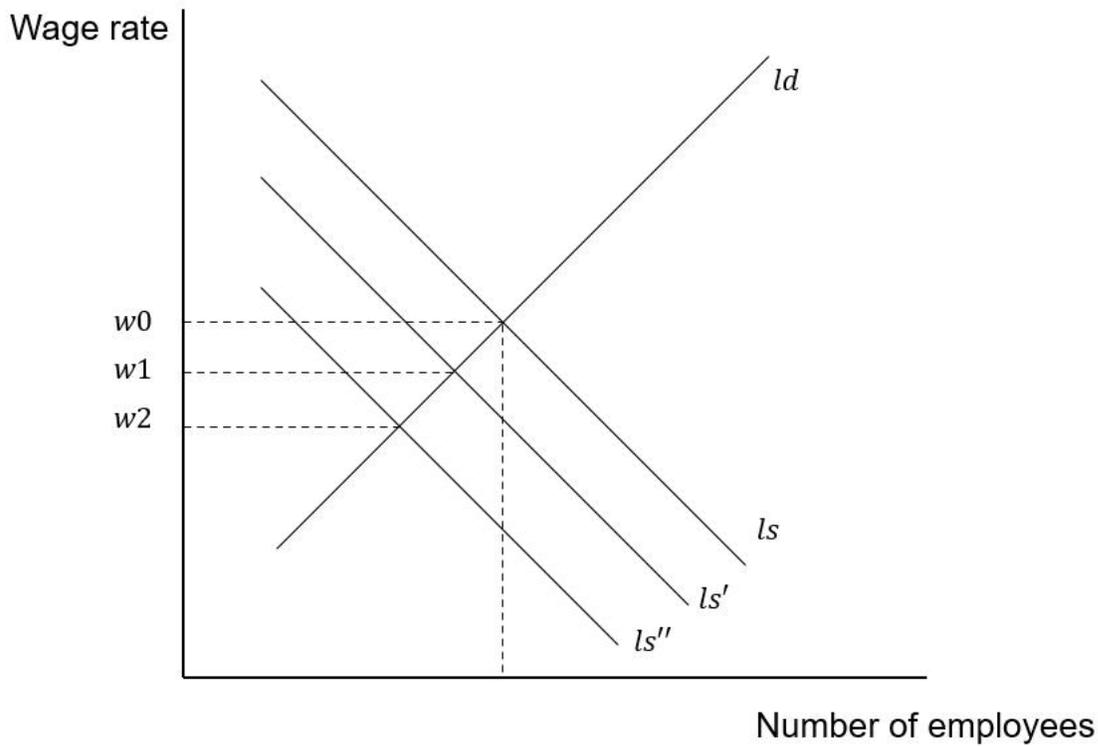


Figure 2

Demand and Supply Curve of Labor Market, at second stage

The curve, ls' , represents the reservation price taking cost of maternity leave before policy and ls'' represents that after “second-child” policy. The corresponding wage rate at efficient point is marked as w_1 and w_2 . Therefore, the gap of $w_1 - w_2$ represents the discrimination deteriorated after the policy, which we want to measure. If we write the reservation price into an equation form, it will be:

$$\begin{aligned}
 & \text{reservation price (wage)} \\
 & = f(\text{expectation of maternity leave} - , \text{education} + , \text{age} \\
 & \quad \pm , \text{industrial differences} \pm , \text{regional differences} \pm , \text{and etc.})
 \end{aligned}$$

The minus and plus symbols after the factors suggest how they affect the reservation price. However, some of them will not be covered due to the dataset issues, which will be made clear later.

DATA AND METHODS

The data we use will generally come from Chinese General Social Survey in the last 2 samples. This database is collected nationally by Renmin University of China every two years. As the names suggests, it is an open and general dataset, including almost every aspect of Chinese society (Renmin University of China, 2021). In terms of professions, the observations of this data consist of mainly two types: agricultural and non-agricultural. The agricultural observations are eliminated in our dataset because their labor market is quite mixed with employment and self-employment (Tian, Zhou, Kwan, Wu, & Zhuo, 2013). The ongoing retirement age in China now is 60 for men and 55 for female. To keep conditions the same, we are using population range from 18 to 60 for both genders. The dependent variable will be each employees' wages income, taking into the account of inflation.

The method we are using is diff-in-diff model, which are often used in the literature of policy effect study. The structure suitable for this method is two groups before and after the policy introduction, with one being affected as treatment group and other one as control group. In our study, there are three pairs of groups as mentioned above: women versus men, women without any child versus women with at least one child and women not married versus women married (the former ones are treatment groups). Unlike most of the similar study, who are using panel data and the individuals before and after are fixed, we will use pooled cross-sectional data, due to the fact that there is conversion between the two groups. For example, a woman not married in 2014 is very possible to get married in 2016. This fact will bias the regression result, and pooled data model is also viable in terms of diff-in-diff (Wooldridge, 2007). The key independent variable we want to see is a DID indicator. We construct this DID indicator by

multiplying indicator of after policy and indicator of belonging to treatment group. Therefore, the DID factor will equal 1 only if the observation are in both groups above; otherwise, it will equal 0. Then we follow the regular way of diff-in-diff modelling, to include the treatment group indicator, time indicator and other controlling variables as well.

In the part of controlling variables, we incorporate three individual fixed effects: age, education and regions. These conditions are often linked to the return of work in other study, so we include them in our model. There is another important controlling variable not included here, which is professions. This is because of the settings of CGSS questionnaire. The answers to the question “which profession are you working in” are not coded into general categories, which makes it difficult to be included here. We will refer to another dataset, China Family Panel Studies for comparison next.

In conclusion, we construct a diff-in-diff model to study the discrimination against the 3 treatment groups. The model approximately meets relevant specifications, despite the deficiency in the original dataset. The specific model and hypothesis will be presented in the part of regression analysis, and the following table includes all the variables used in our model.

Table 1. Variable Definitions

Concept	Operational Definition	Variable
Dependent Variable		
Wage in natural logarithm form	The reported wage income of every sample. The 2016 data is adjusted to the level of 2014 based on official inflation data. The unit is in RMB yuan	<i>lnwage</i>
Key Independent Variable		
Time indicator	A set of dummy variables. It equals 1 if the observation is sampled in 2016, suggesting this individual has been affected by the policy. It equals 0 if the observation is sampled in 2014. This variable is used in all three models.	<i>after_policy</i>
Gender indicator	A set of dummy variables. It equals 1 if the observation is female and equals 0 if the observation is male. This variable is used in the first model	<i>female</i>
DID indicator for female	The product of gender indicator and time indicator. It equals 1 only if the observations is female and sampled in 2016 dataset. This variable is used in the first model	<i>female_after_policy</i>
Unmarried women indicator	A set of dummy variables. It equals 1 if the observation is a woman unmarried and equals 0 if the observation is a woman married. This variable is used in the second model	<i>not_married</i>
DID indicator for unmarried women	The product of unmarried women indicator and time indicator. It equals 1 only if the observations are unmarried women and sampled in 2016 dataset. This variable is used in the second model	<i>Not_married_after_policy</i>
Women without any child indicator	A set of dummy variables. It equals 1 if the observation is a woman without any child and equals 0 if the observation is a woman with at least 1 child. This variable is used in the third model	<i>without_children</i>
DID indicator for unmarried women	The product of women without any child indicator and time indicator. It equals 1 only if the observations are women without any child and sampled in 2016 dataset. This variable is used in the third model	<i>without_children_after_policy</i>

Table 1. (cont.)

Concept	Operational Definition	Variable
Controlling Variable		
Age	The numerical value of age. It is calculated by using the sample year to minus the observations' year of birth.	<i>age</i>
Educational years	The numerical value of the observations' total years of educated. The answers in the questionnaire are the highest degree the observations have completed. It is calculated based on China's system of education. For example, a degree of technical secondary school is calculated as 11 years of education and a master or doctoral degree is calculated as 19 years of education	<i>edu</i>
Regional dummies	These are sets of dummies indicating the observations' region, based on the sampled answers. These variables are used to control the difference in regional salaries. There are 28 regions in total, including provinces and municipalities. One of them is automatically ignored in case of multicollinearity	<i>dummy_region</i> <i>1~28</i>

DESCRIPTIVE DATA ANALYSIS

This study will use “Chinese General Social Survey” (CGSS) as its data sources.. We are using 2 sets: 2014 and 2016. These datasets are randomly sampled every time, and considering the two-child policy was introduced in the end of 2015, these 2 datasets fulfill the preliminary assumption of diff-in-diff study with pooled data. After combining the 2-year’s dataset together, we have kept following variables in our dataset: three groups of indicators: gender (0 men and 1 for women), whether married and whether having at least one child (both 1 for “yes” and 0 for “no”); three types of controlling variables: educational years, age and dummies of regions; and one policy indicator, 1 for after second-child policy and 0 for before it.

Firstly, we are defining the age of population we are using for our research. According to the model, the age group from 18 to 60 is that who have been working in the job market. The age group under 18 and over 60 are preliminarily eliminated from our dataset. After this step, we have 8,371 observations left, 3,826 for the year of 2014 and 4,545 for the year of 2016. The following chart is the age distribution by year.

Table 2. Age Distribution

Age group	Frequency of 2014 / 2016	Percentage of 2014 / 2016
18-30	984 / 1127	25.72 / 24.80
31-40	1034 / 1291	27.03 / 28.41
41-50	1190 / 1320	31.13 / 29.05
51-60	618 / 807	16.15 / 17.76

From the chart we can see the most of the observations are distributed among the age group of 31-50, which consist of more than 50% of the total dataset.

Then we want to see how the treatment group and controlling group are constructed in our model. We have three pairs of groups: women versus men, women married versus women not

married and women with at least one child versus women without any child. The construction of these three groups by year are as follows.

Table 3. Treatment Groups

Type	Observations of 2014 (percentage)	Observations of 2016 (percentage)
Women	1721 (44.98)	2032 (44.71)
Women not married	247 (14.35)	349 (17.12)
Women with at least one child	332 (19.29)	420 (20.67)

Note: the percentage of last two categories is based on total number of female observations

The percentage of women is the same each year, roughly around 44, which suggests this survey keeps randomly sampling. But it is a little lower than the current China's gender distribution. Possibly it is due to the sampling process bias. Moreover, we can find that the women not married and with at least one child (the treatment groups) are comparably few in the whole dataset, which we will discuss later in regression analysis.

Then we look into our dependent variables, wage. We choose the data of "wages income" from the CGSS survey to eliminate the effect of capital income. This income is inflation-adjusted according to the CPI data from China's National Bureau of Statistics, so that all income data is on the 2014 level and the unit number is RMB yuan. In our model, we take the natural logarithm form of the observations. The descriptive data of income is as follows:

Table 4. Income

Variable	Observations	Mean	Std. Dev	Min	Max
income	7,723	10.51864	.9049396	6.214608	16.08169

As the chart suggests, the income data varies a lot among our observations, probably due to the large scale of this dataset. The scale of missing value of wage is small, and hopefully it won't affect our regression result.

As for educational years, which is another important controlled variable in our model, the original dataset only provides interviewees' general background, and corresponding years are calculated according to the school system in China, with a max of 9 indicating the level of post-graduate education. The mean is 11.47 years, which means that on average, our observations are on junior high school level. It meets the national phenomenon that 9-year mandatory education is popularized and people's educational choice differs after junior high school. The differentiation between senior high school education and professional education is presented here.

Table 5. Education

Variable	Observations	Mean	Std. Dev	Min	Max
Education (women)	3,746	11.47317	5.746333	0	19
Education (men)	4,613	11.6654	3.545648	0	19

From the chart we can see that the average educational years are about the same for both genders. Therefore, education is possibly not an issue in our model.

In the last, we will see how our core independent variables, the interaction term of treatment group and after-policy indicator are correlated with the income. The interaction term is 1 if the observation is in a treatment group and it is observed after 2015. Here is the correlation chart for three pairs of groups:

Table 6. DID Coefficient

Indicator	Correlation Coefficient
Women & policy	0.0941
Women without any child & policy	0.0395
Women not married & policy	0.0523

As the chart suggests, they are positively correlated, which is against as our initial conceptual hypothesis. But it is possible that the positive correlation is biased by other controlling variables at this step. We need further research to dig deeper. To conclude, the data is roughly suitable for our research.

REGRESSION ANALYSIS

To estimate whether and how exactly the discrimination exists, we use three groups arranged in pairs to see the policy effect. The first groups are male people and female people, the second groups are women with at least one child and women without any child and the third groups are married women and unmarried women. Basically, if the policy really leads to discrimination discussed above, the female people, the women without any child and the unmarried women will have lower wage in our data. To do this, we construct three diff-in-diff models with pooled data from 2014 and 2016:

The basic model is

$$Y = \alpha_0 + \alpha_1 du \cdot dt + \gamma_i + vt + \varepsilon$$

The dependent variable, Y , represents the wage earned by each individual. α_0 and ε are constant terms and error terms. γ_i represents individual fixed effect and other control variables, such as educational years, age and regional dummies. vt is the indicator of being after the policy, in other words, observations sampled in 2016. If the discrimination exists, the coefficient α_1 should be negatively significant. We have three sets of hypotheses for three pairs of groups correspondingly:

For first pairs:

H0: $\alpha_1 = 0$, which means the policy didn't lead to discrimination against women.

H1: $\alpha_1 \neq 0$, which means the policy led to discrimination against women.

For second pairs:

H0: $\alpha_1 = 0$, which means the policy didn't lead to discrimination against women without a child.

H1: $\alpha_1 \neq 0$, which means the policy led to discrimination against women without a child.

For third pairs:

H0: $\alpha_1 = 0$, which means the policy didn't lead to discrimination against women not married yet.

H1: $\alpha_1 \neq 0$, which means the policy led to discrimination against women not married yet.

The regression result is as follows:

Table 7. Regression Result

Variables	(1) Women	(2) Women with children	(3) Women married
Female	-0.293*** (0.0406)		
Female * after policy indicator (DID)	0.0879 (0.0541)		
Not have any child		-0.0559 (0.0538)	
Not have children * after policy indicator (DID)		-0.01385 (0.0644)	
Not Married			-0.0883 (0.0598)
Not Married * after policy indicator (DID)			-0.0531 (0.0723)
After policy indicator	0.368*** (0.0361)	0.476*** (0.0963)	0.469*** (0.0461)
Education years	.0775671*** (.0038877)	0.0648*** (0.00585)	0.0648*** (0.00585)
age	0.00164 (0.00138)	-0.00269 (0.00279)	-0.00185 (0.00270)
dummy for region1	0.856*** (0.261)	1.032*** (0.250)	1.025*** (0.250)
dummy for region2	-0.0474 (0.275)	0.231 (0.285)	0.231 (0.286)
dummy for region4	0.740*** (0.259)	0.0624 (0.595)	0.0362 (0.597)
dummy for region5	-0.00907 (0.266)	0.986*** (0.246)	0.976*** (0.246)

Table 7. (cont.)

Variables	(1) Women	(2) Women with children	(3) Women married
dummy for region6	-0.0510 (0.266)	0.107 (0.263)	0.100 (0.263)
dummy for region7	0.375 (0.267)	-0.0546 (0.262)	-0.00238 (0.263)
dummy for region8	-0.176 (0.301)	0.603** (0.266)	0.598** (0.267)
dummy for region9	0.164 (0.267)	0.300 (0.267)	0.298 (0.267)
dummy for region10	0.227 (0.261)	0.288 (0.251)	0.286 (0.252)
dummy for region11	0.422 (0.266)	0.588** (0.266)	0.583** (0.266)
dummy for region12	0.739*** (0.261)	0.796*** (0.249)	0.792*** (0.249)
dummy for region13	-0.218 (0.268)	-0.0650 (0.270)	-0.0672 (0.270)
dummy for region14	0.340 (0.262)	0.504** (0.254)	0.506** (0.255)
dummy for region15	0.418 (0.265)	0.477* (0.258)	0.482* (0.259)
dummy for region16	-0.0321 (0.269)	0.159 (0.268)	0.161 (0.269)
dummy for region17	-0.126 (0.267)	0.0170 (0.265)	0.0140 (0.266)
dummy for region18	0.724*** (0.261)	0.823*** (0.251)	0.818*** (0.252)
dummy for region19	0.0247 (0.263)	0.143 (0.258)	0.145 (0.259)
dummy for region20	0.685*** (0.265)	0.860*** (0.259)	0.859*** (0.260)
dummy for region21	0.0300 (0.286)	0.475 (0.299)	0.484 (0.300)
dummy for region22	0.416 (0.266)	0.508* (0.263)	0.505* (0.263)
dummy for region23	0.161 (0.267)	0.466* (0.267)	0.460* (0.268)
dummy for region24	0.455* (0.263)	0.646** (0.255)	0.644** (0.255)
dummy for region25	0.160 (0.281)	0.177 (0.300)	0.175 (0.301)

Table 7. (cont.)

Variables	(1) Women	(2) Women with children	(3) Women married
dummy for region26	-0.0281 (0.271)	0.208 (0.271)	0.209 (0.272)
dummy for region27	-0.0185 (0.284)	0.157 (0.320)	0.158 (0.321)
dummy for region28	-0.00574 (0.265)	0.201 (0.261)	0.203 (0.262)
Constant	9.259*** (0.267)	9.085*** (0.268)	9.100*** (0.269)
Observations	7,716	3,404	3,408
R-squared	0.185	0.171	0.169

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As the result suggests, none of the key coefficients are significant at 5% confidence level. Therefore, we accept the H0 for three groups that is, the second-child policy didn't result in the discrimination against women, and those women unmarried or without any child. In the next chapter, we will dig deeper into this phenomenon and try to find the underlying reasons with other supplementary materials and analysis.

DISCUSSION AND IMPLICATION

The regression result shows that none of the three DID indicators are negatively significant. Therefore, we didn't find any evidence that the two-child policy negatively affect women in the job market. This chapter will discuss some possible reasons of this result.

Firstly, it is possible that without controlling the profession variables, some underlying relationship is covered. As mentioned above, CGSS doesn't code the answers to question of profession, and it brings great difficulty on incorporating this variable into our model. If we refer to another similar sample, China Family Panel Study, we can find the professional distribution of China's population. Considering this survey is also conducted nationally, it can be used as a comparison. Below is the chart.

Table 8. Occupational Distribution

Profession	Percentage
Manufacturing industry	17.0
Retail business	9.5
Construction	5.2
Environmental industry	0.3
Science industry	0.3
Other	0.03

The division is based on Chinese national standard of professions and around 41% don't tell their profession or they don't fit into any one. Because of the large number of professions, only the 3 largest and the 3 smallest are presented here. We can see that the largest profession in today's China is still manufacturing industry. Another similar industry, construction, takes the 3rd largest place. One important feature of this industry in China is that many of the employees are informal workers(Liang, Appleton, & Song, 2016). It is also reasonable to believe many of them are so-called migrant workers, who occupy 60% of the industrial workers in China (Hou, Gelb,

& Calabrese, 2017). In other words, these workers are taking short-term contracts with a high rate of turnover. Under this setting, the employers will not take into account of the expected maternity leave. Instead, the women during maternity period will not stay employed at all. Especially, our model only counts those women who have jobs and are receiving salaries. This can possibly and partially explain why the DID factor is not significant. Also, studies show that the return of age in manufacturing industry reaches highest among the group of 35-40, dropping after 40 (Aubert & Crépon, 2003). If we run a quadratic regression on age in our dataset on women, controlling for educational years, we can find the return is highest in the age of 39, which is similar to above result. This can also confirm, to some extent, our guessing of the majority of women labor force in our dataset.

Table 9. Age Analysis

VARIABLES	(1) lnwage
age	0.0856*** (0.0109)
age_squared	-0.00108*** (0.000140)
edu	0.102*** (0.00355)
Constant	7.581*** (0.211)
Observations	3,298
R-squared	0.236
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Secondly, it is possible that the second-child policy's effect on labor market is yet to uncover. Although we have the survey sampled in the year 2016, many of the workers' contracts are pre-determined, especially in formal industry. Then employers may not take the future policy

into account when negotiating and signing contracts with workers. In other words, the gender discrimination resulted by second-child policy, if any, takes a gradual process to make presence. Ideally speaking, the survey objects which fit our research question best are those young job-seekers who get their first job in the year of 2014 and 2016. But unfortunately, we are not accessible to such dataset, and the size of this age group is relatively too small in CGSS for regression analysis.

Although the regression result is insignificant with currently available data, the risk of discrimination is still potentially existent theoretically. As discussed above, the key is the expected cost of maternity benefit. There are two ways of preventing discrimination based on this: to reduce the actual cost of hiring a woman with expectation of maternity benefit, or to increase the relevant expected cost of male workers to the same level. The logic can be presented by the figure below.

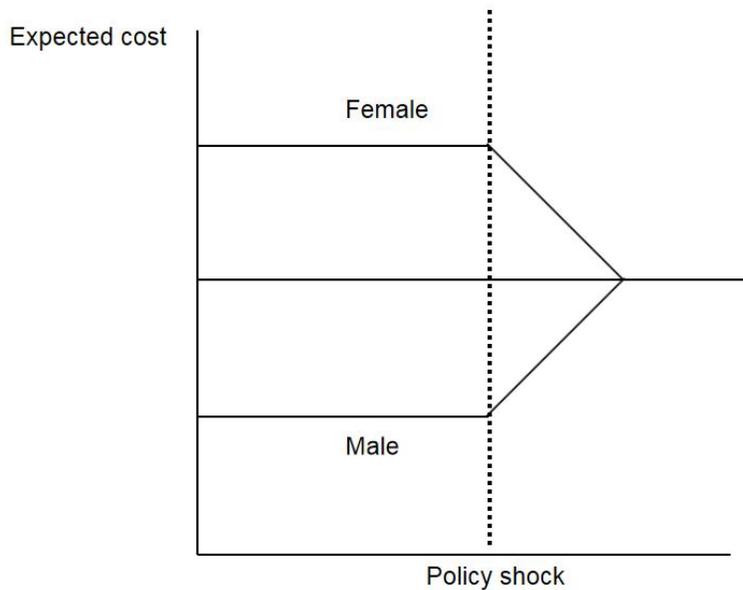


Figure 3

Expected Cost of Two Genders

From the first perspective we can raise some policy alternatives. Suggested by some researchers, the Chinese government can afford some percentage of the female workers wage during their maternity leave (Song, Qu, & Zhang, 2016) Japan, for example, is facing the risk of low fertility rate. Its government has been paying 40% of the wage as cash benefit during maternity and childcare leave (Suzuki, 2005). Also, the punishment system on the happening events of gender discrimination should be built as soon as possible. Such system increases the cost of not hiring a female worker, so it reduces the cost of hiring them in a disguised way.

From another perspective we can increase the male workers' expected cost of maternity benefit. When the cost is the same of two genders, there is no room of discrimination for employers. This is a new alternative appearing these days. In a report early in 2021, Shanghai Women Federation is urging for a new policy making each father a 30-day leave for maternity, which leads to heated discussion.

CONCLUSION

This thesis has looked into the question of whether the gender discrimination is deteriorating after the second-child policy in the late 2015. Firstly, we trace the background of China's fertility policy process since its foundation. Then we have reviewed the rich literature of how discrimination in the labor market is defined, and many scholars have forecast the potential one after the second-child policy. Our goal is to fill the blank of such empirical evidence. In the next step, we have clarified our conceptual model and we make use of diff-in-diff model to see the effect of the policy shock. The dataset we are using is China General Social Survey and the regression result didn't show any significant result. Finally, based on this, we have put forward our estimation and discussion of the insignificance. Also, we have referred to other countries' relevant policies and suggested several policy alternatives under this context.

REFERENCES

- Arceo-Gomez, E. O., & Campos-Vázquez, R. (2013). Race and Marriage in the Labor Market: A Discrimination Correspondence Study in a Developing Country. *Mpra Paper*, 104(5), 376-380.
- Aubert, P., & Crépon, B. (2003). Age, wage and productivity: firm-level evidence. *Economie et Statistique*, 363, 95-119.
- Baum II, C. L. J. L. E. (2003). The effect of state maternity leave legislation and the 1993 Family and Medical Leave Act on employment and wages. *Labour Economics*, 10(5), 573-596.
- Becker, G. S. (1962). Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy*, 70(5), 9-49.
- Becker, G. S. (1971). *The Economics of Discrimination*: University of Chicago Press.
- Bertrand, Marianne, Mullainathan, & Sendhil. (2004). Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *American Economic Review*.
- Bloomberg News. (2020). China's Two-Child Policy. Retrieved from <https://www.bloomberg.com/quicktake/china-s-two-child-policy>
- Borowczyk-Martins, D., Bradley, J., & Tarasonis, L. (2014). Racial Discrimination in the U.S. Labor Market: Employment and Wage Differentials by Skill. *Labour Economics*, 49.
- Chen, Y. P., & Zhang, Y. (2018). A decomposition method on employment and wage discrimination and its application in urban China (2002–2013). *World Development*, 110, 1-12.
- Craig, J. (1994). Replacement level fertility and future population growth. *Popul Trends*(78), 20-22.
- Graham, J. W., & Smith, S. A. (2005). Gender Differences in Employment and Earnings in Science and Engineering in the US. *economics of education review*, 24(3), 341-354. doi:10.1016/J.ECONEDUREV.2004.06.005
- Hou, J., Gelb, S., & Calabrese, L. (2017). *The shift in manufacturing employment in China*. Retrieved from https://set.odi.org/wp-content/uploads/2017/08/SET-China_Shift-of-Manufacturing-Employment-1.pdf
- Lewis, J. (2009). *Work-Family Balance, Gender and Policy*: Edward Elgar Pub.
- Li, L., Kong, F., & Qi, Q. (2016). zhongguo laodongli shichang jiuye qishi qushi yanjiu —— jiyu dui zhaopin guanggao de neirong fenxi. [Research on the Trend of Employment Discrimination in China's Labor Market——Based on the Analysis of the Content of Job Advertisements]. *Journal of China University of Labor Relations*, 030(002), 48-53.
- Liang, Z., Appleton, S., & Song, L. (2016). *Informal employment in China: Trends, patterns and determinants of entry*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2826973#references-widget
- Luo, S. (2004). Woguo laodongli shichang xingbie qishi xianzhuang fenxi. [An analysis of the current situation of gender discrimination in China's labor market]. *She Ke Zong Heng*, 19(5), 47-49.
- Mei, Z. (2008). Woguo renkou he jihua shengyu gongzuo de lishi huigu he zhanwang. [The history and blueprint of our country's family planning]. *Zhongguo jihua shengyuxue zazhi*, 16(4), 197.

- Peking University. Ma Yinchu. Retrieved from <http://www.shehui.pku.edu.cn/wap/second/index.aspx?nodeid=1252&page=ContentPage&contentid=1829>
- Phelps, E. S. (1972). The Statistical Theory of Racism and Sexism. In (Vol. 62, pp. 659-661). Renmin University of China. (2021). Chinese General Social Survey. Retrieved from <http://cgss.ruc.edu.cn/>
- Reyes, J. W. (2007). Reaching Equilibrium in the Market for Obstetricians and Gynecologists. *the american economic review*, 97(2), 407-411. doi:10.1257/AER.97.2.407
- Rycroft, R. (2009). *The Economics of Inequality, Discrimination, Poverty, and Mobility* (1st ed.). New York: Routledge.
- Song, C., Qu, S., & Zhang, X. (2016). Yuce ertai zhengce dui Zhongguo nvxing zhiye yingxiang. [Anticipating the effect of second-child policy on Chinese female's career]. *Legality Vision*, 21.
- Sundström, M., & Stafford, F. P. (1992). Female labour force participation, fertility and public policy in Sweden. *European Journal of Population*, 8(3), 199-215. doi:10.1007/BF01797210
- Suzuki, T. (2005). Fertility decline and policy development in Japan. *The Japanese Journal of Population*, 4(1).
- The State Council Information Office. (2002). China's Family Planning. Retrieved from https://www.fmprc.gov.cn/web/ziliao_674904/zt_674979/ywzt_675099/wzwt_675579/22_96_675789/t10539.shtml
- Tian, W., Zhou, Z., Kwan, F., Wu, Y., & Zhuo, S. (2013). Re - examination of the surplus agricultural labour in China. *China Agricultural Economic Review*.
- Wang, A., Chen, X., & Wang, C. (2016). Shehui zhengce shiyu xia nvxing jiuye qishi de qianghua ji yingdui yanjiu - jiyu "quanmian ertai" zhengce dui nv daxuesheng jiuye de yingxiang diaocha. [Research on Strengthening and Coping with Female Employment Discrimination from the Perspective of Social Policy — Based on the Investigation of the Influence of "Comprehensive Second Child" Policy on Female College Students' Employment.]. *Chinese and Foreign Communication*, 000(028), 109-111.
- Wang, F. (2016). Dusheng zinv zhengce de zhongjie. Retrieved from <https://www.brookings.edu/zh-cn/articles/%E7%8B%AC%E7%94%9F%E5%AD%90%E5%A5%B3%E6%94%BF%E7%AD%96%E7%9A%84%E7%BB%88%E7%BB%93/>
- Wooldridge, J. (2007). What's new in econometrics? Lecture 10 difference-in-differences estimation. *NBER Summer Institute*, 9(2011), 85.
- World Bank. (2018). *Fertility rate, total (births per woman) - China*. Retrieved from: <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=CN>
- Xinhua Net. (2016). Zhongguo renkou jiegou ehua.
- Yang, J. (2014). Dandu lianghai zhengce dui nvxing jiuye de qianzai yingxiang ji yingdui sikao. [The potential impact of the "partial two-children" policy on female employment and its countermeasures]. *Collection of Women's Studies*(4), 49-51. doi:10.3969/j.issn.1004-2563.2014.04.007
- Zeng, Y., & Hesketh, T. (2016). The effects of China's universal two-child policy. *the lancet*, 388(10054), 1930-1938. doi:10.1016/S0140-6736(16)31405-2

Zhao, Q., & Peng, Z. (2016). *Economic analysis of the gender discrimination in employment under the background of universal two-child policy*. Paper presented at the 2016 International Conference on Industrial Economics System and Industrial Security Engineering (IEIS).