

**Choice Between Roles: Factors Influencing Chinese Married Females'
Work Participation
and A Prediction After Three-Child Policy**

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Abstract

This study analyzes the market wage, reservation wage, and unearned income on the probability of work participation of married women by using the longitudinal data of the China Health and Nutrition Survey from 1989 to 2015 by probit models. It is found Imputed income negatively affects the probability of work participation of married women; the reservation wage positively impacts the probability of work participation; though insignificant, unearned income positively affects the probability of work participation of married women. Females who were working in 2015 were not willing to have an additional child, leading to the prediction that Three-Child Policy would not drastically increase the birthrate if policies and laws are not fully constructed to protect females' rights. It is also predictable that unmarried women will still struggle to find jobs because of the gender gap that still exists in workplaces and job markets.

Introduction

According to LiePin Big Data's 2022 "Gender Gap Between Women and Men in the Workplace Report(猎聘大数据：2022 职场女性与男性性别差异数据报告)", more than 80% of Chinese females think that the Chinese job market still has not reached gender equality, because they are easy to suffer from questions about their marriage and childbearing status. Many recruitments are specifically open to males only. Or females are employed conditionally: Can't give birth in at least 3 or 5 years. Most Chinese females, especially those who just graduated from college, face this awkward problem: hard to find jobs because they are unmarried or have no child.

In fact, China does have a law "Notice of Nine Departments including the Ministry of Human Resources and Social Security and the Ministry of Education on Further Regulating Recruitment Behaviors and Promoting Women's Employment", which clearly states that all kinds of employers and human resources service agencies shall not restrict gender (except for the scope of work that female employees are prohibited from engaging in by the state) or give priority to gender in the process of formulating recruitment plans, publishing recruitment information, and recruiting personnel. Women must not be restricted or refused to be hired on the grounds of gender, they must not inquire about women's marriage and childbearing status, they must not use pregnancy testing as an entry medical examination item, must not use birth control as an employment condition for entry medical examination items, and must not discriminately raise female recruitment standards. However, when discriminated females engage in lawsuits, the compensation comes slowly and is usually far less than what they have lost: time, money, and job opportunities. etc. This discourages females to fight for their rights to gender equality.

China implemented the Three-Child policy on May. 31st, 2021, which strengthens unmarried or have-no-child females' job-seeking problem and gives married women a new question: will you have one more child? In addition, the Three-Child policy also asks all kinds of employers and human resources service agencies: Will you soften your attitudes towards females' marriage and childbearing status? How would you deal with your employees who now want to have one more child, which makes them have to take maternity leave?

Chinese females' situation in the job market and workplaces has been a long-discussing topic. It is worth predicting what will happen after the Three-Child policy and drawing policymakers' attention to lawsuits that can truly help with females' rights on gender equality.

This study aims to replicate the analysis from Xinxin Ma (2021) of the imputed income, reservation wage, and unearned income on the probability of work participation of married women by using the longitudinal data from China Health and Nutrition Survey from 1989 to 2015. As for predictions, I add data from the same source asking females the number of additional children they want.

It is found Imputed income negatively affects the probability of work participation of married women; the reservation wage positively impacts the probability of work participation; though insignificant, unearned income positively affects the probability of work participation of married women. Females who were working in 2015 were not willing to have an additional child, leading to the prediction that Three-Child Policy would not drastically increase the birthrate if policies and laws are not fully constructed to protect females' rights. It is also predictable that unmarried women will still struggle to find jobs because of the gender gap that still exists in workplaces and job markets.

This paper is organized into eight parts: Introduction, literature review, methodology and data, data and variable setting, empirical results and discussion, conclusion, acknowledgment, and an appendix of tables and graphs, and acknowledgment.

Literature Review

In this part, I mostly sum up the findings related to how the market pay, reservation wage (i.e. childcare), and unearned income (i.e. the husband's income) affect married women's labor supply.

To start with the effects of the market wage, the results of empirical studies are mixed. For instance, Layard et al. (1980) discovered that the market salary has a favorable impact on married women's employment, but Nakamura and Nakamura (1981) showed that the market wage has a negative impact on married women aged 35–39's employment. When adjusting for the husband's work hours, Blundell and Walker (1982) observed that the market pay negatively affects the employment of spouses with two children. Dooley (1982) corroborated the negative effect for black married women aged 35–39 and 40–44.

Second, regarding the impact of the reservation wage (particularly childcare) on the employment of married women, in developed countries, Hofferth (1984), Waite et al. (1985), O'Connell and Bloom (1987), Wenk and Garrett (1992), Del Boca et al. (2004), Buckles (2008), and Miller (2011) reported that the number of children has a negative impact on mothers' employment. China's outcomes are inconsistent. For instance, studies by Jia et al. (2013) and Yu and Xie (2014) discovered that the employment of women altered after having children. According to Zhang (2011), Yang and Bai (2017), and Bai and Bai (2017), having children has a detrimental impact on women's engagement in the workforce. Ma (2009a) discovered that the youngest child's age had no statistically significant impact.

Third, the outcomes of empirical research on the impacts of unearned income are conflicting. According to Heckman (1976, 1980), Cogan (1980a, b), Schulz (1980), Hanoch (1980), Zabalza (1983), and Franz and Kawasaki (1981), married women are more likely to work when their husbands' income rises. The wife's work supply does, however, decline when her husband's income increases, according to studies by Nakamura and Nakamura (1981); the elasticity of the husband's income to the wife's labor supply is negative.

As for the factors influencing additional birth intention, according to Zhang, et al (2021), there is still a low intention of the childbearing-age population to have three children in mainland China. Zhang, et al also pointed out factors influencing females' intention to have more children: social, economic, and political factors.

Methodology

From the labor supply perspective, according to the general equilibrium model (individual utility maximum model), an individual's choice to participate in work is determined by economic factors—the market wage, the reservation wage (e.g., childcare), and unearned income (e.g., husband's income). In this study market wage is the imputed income calculated from the predicted value of the natural log of one individual's hourly wage, reservation wage is the number of children, and unearned income is one's husband's income.

Before running the probit model, I ran the Heckman two-step model to correct the biases and yield more unbiased estimates. The model is the following:

$$\Pr(Y_i^* > 0) = \Pr(\alpha + \beta_1 H_i + \mu_i > 0)$$

$$\ln Wage_i = b + \gamma_1 X_i' + \gamma_2 \lambda_i + \epsilon_i$$

where i indicates the individual, $\Pr(Y^* > 0)$ is the probability of participation in work, and $\ln Wage$ is a logarithmic value of the hourly wage. H , X expresses the variables, β , γ is the coefficient of each variable, a , b is a constant item, and μ , ϵ is an error item. The adjusted item (λ) is calculated based on the density function and the distribution function of the probit regression model. The variables in the first step estimation (the function of the probability of work participation) include the wife's highest level of education, age and age squared, minority ethnicity, husband's income and squared, number of children, urban/rural region, and survey year; the variables in the second-step estimation (the wage function) include the wife's highest education level, minority ethnicity, urban/rural region, and survey year.

Next, the main probit regression model using imputed income, reservation wage, and unearned income is shown as follow:

$$\Pr(Y_i^* > 0) = \Pr(c + \beta_1 Imputed_i + \beta_2 ReservationW_i + \beta_3 Husband_i + \beta_4 Edu_i + \beta_5 X_i + \epsilon_i > 0)$$

where i indicates the individual, c is the constant, *Imputed* is the imputed wage of married women, *ReservationW* is the reservation wage (here, the number of children), *Husband* is unearned income (here, the husband's income), *Edu* is the highest level of education, and X is another variable that is different in two probit models respectively, which are region and ethnic group (Region = 0 if the individual lives in the urban area; Ethnicity = 0 if the individual belongs to Han). β are the coefficients of variables, and ϵ is the error term.

Lastly, with the less biased model generated from the Heckman two-step model, I can use the predicted value of whether a female is working as the dependent variable and run my OLS model to see in 2015 (when the Two-Child policy had been implemented for four years) females' opinion on the number of additional children they desired.

$$Y_i = c + \beta_1 ProbWork_i + \beta_2 Imputed_i + \beta_3 Edu_i + \beta_4 Region_i + \beta_5 ReservationW_i + \beta_6 Age_i + \beta_7 Age_i^2 + \epsilon_i$$

where i indicates the individual, c is the constant, Y is number of additional children that an individual desired, *ProbWork* is the predicted value of whether an individual is presently working from the previous model, *Imputed* is the imputed income, *Edu* is the highest level of education, *Region* is a dummy variable whether an individual lives in an urban or rural area, *ReservationW* is the reservation wage of an individual, *Age* is the age of an individual, and ϵ is the error term.

Data and Variable Settings

Data from the China Health and Nutrition Survey (CHNS) from 1989 to 2015 are used in this study. CHNS is a nationwide longitudinal survey data conducted by the Carolina Population Center of the University of North Carolina and the National Institute for Nutrition and Health (NINH, formerly the National Institute of Nutrition and Food Safety) at the Chinese Center for Disease Control and Prevention (CCDC). The survey took place over a 7-day period using a multistage, random cluster process to draw samples from 15 provinces and municipal cities (Liaoning, Heilongjiang, Jiangsu, Shandong, Henan, Hubei, Hunan, Guangxi, Guizhou, Beijing, Shanghai, Chongqing, Shaanxi, Yunnan, Zhejiang). Three provinces were added in CHNS 2011, and another three provinces joined in 2015. In 1989, the initial survey year, the CHNS surveyed 3,795 households and 15,907 individuals. This study uses data from 1989 to 2015. The CHNS provides extensive information about fertility and pregnancy history as well as basic social demographic and employment information that facilitate the empirical analysis in this study.

This study investigates the determinants of the employment of married women and a prediction of females' job-seeking situation after the implementation of the Three-Child policy. The marriage of very young females is regulated by law, and the mandatory retirement age of female workers in the public sector (e.g., government organizations, SOEs) ranges from 45 to 55. Therefore, this study is limited to samples of married women aged 20–44 years, which includes the period of struggling between roles of a mother of a family and a work at the workplace.

Empirical Results and Discussion

The results of the wage function are shown in Appendix Table 1.1. The coefficient of the adjusted item (λ) is a negative value and statistically significant at a 0.1% level, indicating that a sample selection bias problem remains in the results. However, using estimates generated after Heckman two-step model definitely is less biased than it was.

The results of the probit model are shown in Appendix Table 1.2. Through the results, the imputed income in both models is negative and significant at 0.1% level, meaning that as the imputed wage goes up, it is less likely for females to participate in work. This is an unexpected result. There are several explanations. First, because of the working burden and insufficient payment for over-time work, females are less likely to work given that they receive less than they deserve, so they'd rather return home; second, the imputed income also indicates the non-cash income or benefits brought by reasons such as a person's highest level of education, as non-cash income or benefits increase, the participation of work decreases. Also, if we control for the husband's income and assume that high-income female tends to marry high-income male, there might be a backward effect that female will stay at home even though they could earn.

The reservation wage (number of children) is also significant and positive in both models. This means the more children one has, the more likely she will participate at work for affording daily consumption and childcare. The highest level of education of a married woman is also significant in both models, expressing that the more educated a female is, the more likely she would find a job and participate at work.

The reasons for controlling region and ethnic groups are that in China, there is a considerable disparity in culture, lifestyle, and social policies between rural and urban areas as related to family size, gender role consciousness, etc. Also, the culture and willingness to work may differ between ethnic groups, and the Chinese government provides incentives and benefits for minorities. In China, 91.11% people of the entire population belong to Han, and the rest belong to “minorities.” Region is significant at the 0.1% level and tells that people living in the rural area are more likely to work. Family size in rural areas is usually larger than those in urban areas, and because of family size and consciousness of roles in the family, females have to start to work very early. Also, rural areas have less population density, providing less job competition. Ethnicity is positive and significant at 0.1% level, meaning females from minority groups are more likely to work. The Chinese government provides benefits to the minorities such as extra points on college entrance exams (GaoKao) and government official tests (a test that one has to take in order to work at government institutions).

The results of the OLS model are shown in Appendix Table 1.3. and Graph 1.1. *Region* is significant and positive, meaning that females living in rural areas are willing to have additional children. This may be because of less work burden and more leisure time that could be freely distributed. *ProbWork* is negative and almost significant at the 10% level. The coefficient tells that a working female is not willing to have additional children in China in 2015, because if they take maternity leave, they might be fired or replaced by other people. Thus, this leads to my prediction that gender discrimination still exists in workplaces, and for those unmarried women, they might still face difficulties while seeking jobs.

Comparison to Ma's Paper and Reflection

Though this paper aims to replicate the results from Ma's paper, it is not an exact replication, and I got some results that are quite different from the prototype. There are several reasons: first, Ma includes people aged from 20 to 60 and above, that means our sample population are not exactly the same. Second, there is an omitted variable in the main probit regression, which is the youngest age of the child of a female. Due to the update and changes to datasets from the website of CHNS, the variable of the youngest age of the child does not exist anymore, and even I tried to use Wayback Machine (A website that could trace back the history of any website), I still could not acquire this variable.

However, this does not mean the result is uninterpretable as many prior empirical studies found mixed results. Though I didn't completely replicate the results from the paper, I have a next-step direction: more data of females aged from 20 to 60+, age of the youngest child, etc. I also plan to split the age group and reach Muranaka and Muranaka's (1981) results. After assessing the impact of rural and urban areas, provinces could also be specified through applying fixed effect.

Conclusions

Using the longitudinal survey data of CHNS from 1989 to 2015, this study analyzes the impact of the market wage, the reservation wage, and unearned income on the probability married

women will work. The Heckman two-step model is used to address the bias problem. The main policy implications are as follows.

The results of the number of children in the main probit model indicate that childcare positively affects the employment of married women, particularly for women aged 20–44 who are in an important period of career development and the role of being a mother. Women have to make choices between work and family. This suggests that as the economic system transitions from a planned economy to a market-oriented economy, the problem of family–work conflict increased, particularly for regular female workers. This may be due to the decrease in childcare support from firms and the government (Connelly et al. 2018). A childcare support policy should be implemented by the Chinese government. The childcare support policy can be expected to increase both the total fertility rate and the female labor force participation rate, which contributes to long-term economic growth.

The prediction and the regression results are all based on data from the past, which causes biases in the final results. However, data from the period of the Two-Child policy, literature, and recent news imply that China still has a long way to go to address and solve the problem of gender equality, specifically, the government needs to supervise companies to truly implement the rules and help females to protect their rights in workplaces and receive enough and equivalent compensation while they engage in lawsuits.

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Appendix

Tables

Summary of Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Presently Working	41,525	.8169536	.3867092	0	1
Highest Level of Education	41,568	2.174581	1.323456	0	6
Age	41,568	32.95355	7.178128	20	44
Age^2	41,568	1137.46	466.9798	400	1936
Husband's Income	41,568	1.106522	1.530016	0	91.699
Husband's Income^2	41,568	3.565283	93.55512	0	8408.706
Number of Children	41,568	3.528652	1.036374	0	5
Region	41,568	1.649394	.4771656	1	2
Year	41,568	2003.095	8.606144	1989	2015
Ethnicity	41,568	.1267562	.3327036	0	1
ln(Wage)	22,281	1.335334	1.382713	-3.43245	8.632122
Imputed Income	41,568	7.115409	6.810608	.4249855	30.30637
#of Additional Child Wanted	41,568	.003801	.0749334	0	3
Pr(Work)	41,568	.8169537	.0457939	.6486103	.9506525

Table (1.1)

	Probability of Work		Wage Function	
	Coef.	Std. err.	Coef.	Std. err.
Highest Level of Education	.1190733***	.0058176	.0697404***	.0056805
Age	.0440323***	.0103727	.0146205*	.0074315
Age^2	-.0004576**	.0001597	-.0001712	.000114
Husband's income	.0141641	.0096908		
Husband's income^2	-.0001613	.0001452		
# of Child	.0616111***	.0071887		
Region	.2187576***	.0155817		
YEAR	-.0128967***	.00093	.1375418***	.0007571
Ethnicity	.1952741***	.0230532	-.0431254*	.0186419
lambda			-.4860181***	.1013812
_cons	24.95122***	1.844331	-274.3972***	1.477402
R-squared			.6927623	
Observations	41525		22281	

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

Table (1.2)

	Probability of Work		Probability of Work	
	Coef.	Std. err.	Coef.	Std. err.
Imputed Income	-.016475***	.0011293	-.0147434***	.0011244
# of Child	.0422709***	.007005	.0472668***	.0069818
Husband's Income	.0085178	.0051704	.0076745	.0052903
Highest Level of Education	.1320249***	.0059101	.1138987***	.0057383
Region	.221318***	.0155009		
Ethnicity			.2081796***	.0229252
_cons	.2266677***	.0378985	.5735039***	.0275779
R-squared				
Observations	41525		41525	

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

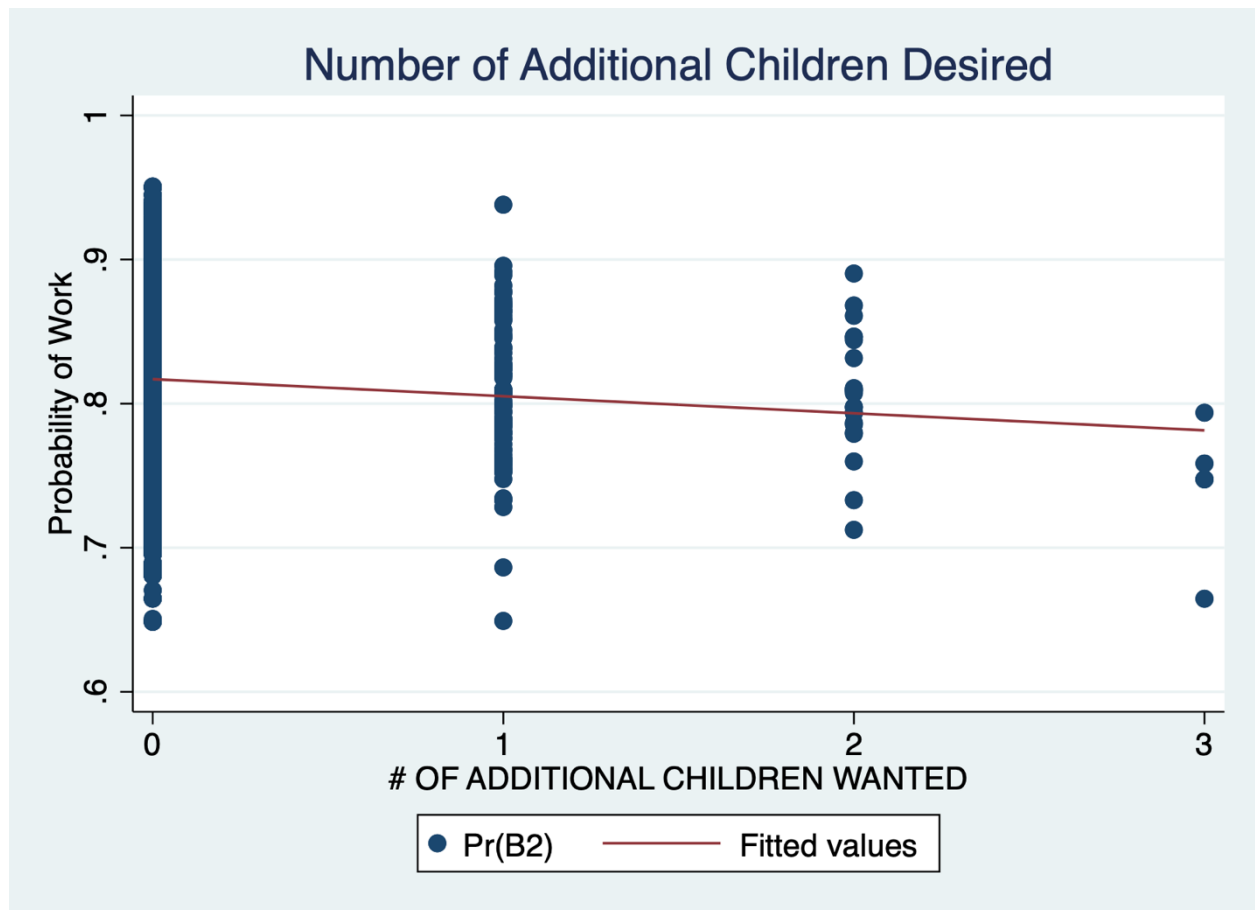
Table (1.3)

	Number of Additional Child Desired	
	Coef.	p-val
Pr(Work)	-.2341874	.1304923
Imputed Income	-.0158594	.2559546
Highest Level of Education	.0350183	.2349583
Region	.0278746*	.0383886
# of Child	.0082401	.1888951
Age	.0145191	.0618756
Age^2	-.0001886	.0532996
_cons	.0971469	.5185133
R-squared	.0058305	
Observations	2411	

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

Graph

Graph (1.1)



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