

**MOTHERHOOD PENALTY AND FATHERHOOD PREMIUM: ANALYSIS ON  
GENDER DISPARITY IN THE POST ONE-CHILD POLICY ERA IN CHINA**

**Yahan Sun and Yuetong Zhou**  
Shenzhen College of International Education, China

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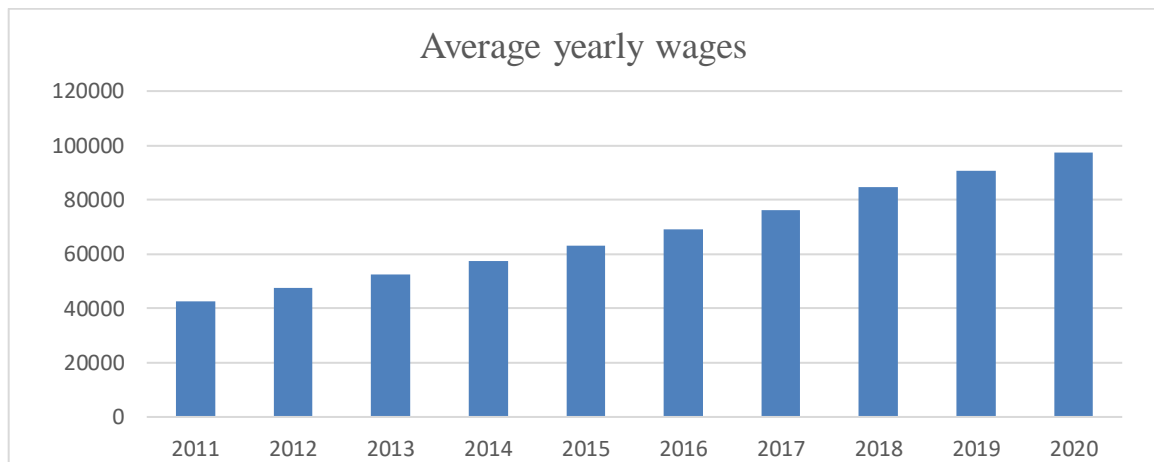
**ABSTRACT**

The Motherhood penalty and fatherhood premium have long been a popular topic among the research that focuses on gender inequality. In the post-reform era in China, a rapidly growing economy generates more opportunities for both mothers and fathers but with the potential to enlarge the existing income gaps. In particular, the Chinese government adopted the Two-Child Policy in 2016 and Three-Child Policy in 2021. Whether these recent changes in the population program have different impacts on mothers and fathers are yet to be fully explored. Therefore, this study aims to explore the relationship between the number of children and the income of the said household. Employing the data from China Household Finance Survey (CHFS) in 2011, 2013, 2015 and 2017, we make use of both the multivariate linear model and the fixed effect model to examine the existence of motherhood penalty and fatherhood premium. In general, the relationship between household income and the number of children is significantly negative. However, when the time-variant changes are taken into consideration, fathers' incomes increase with more children in the family. The relationship between mothers' incomes and the number of children is ambiguous. The findings have multiple implications in the Chinese context and the relevant academic research.

**Key Words:** Fertility policy, Motherhood penalty, Fatherhood premium, Gender-roles, Inequality, Income and labor market.

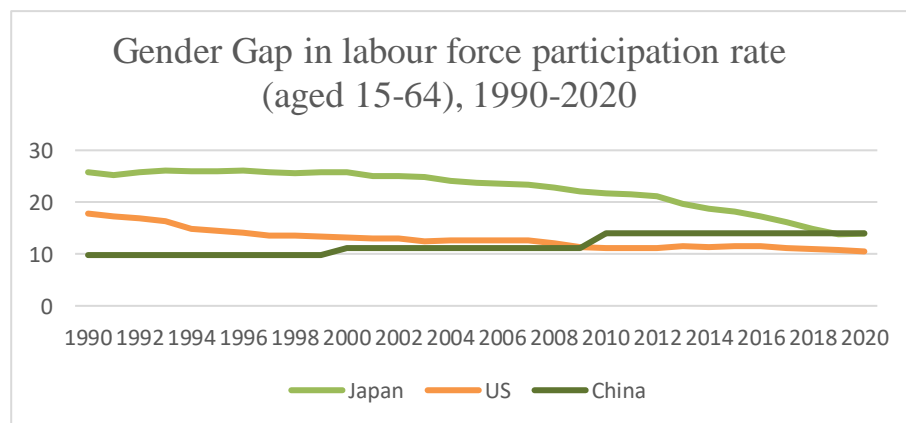
**1. INTRODUCTION**

In the past three decades since the implementation of the Reform and Opening-up, the Chinese economy has improved dramatically, prompting a rapid increase in the average annual wages in the labor market (Fig 1). The improving economy of China has provided fertile ground for greater educational opportunities and occupational mobility for women, which significantly contributes to the observed upward trend in the average income of women.



**Fig 1:** Chinese average yearly wages from 2010 to 2020  
(Source: National Bureau of Statistics of China)

Despite the expanding opportunities and the increasingly tolerant working environment, a substantial wage gap persists between men and women, demonstrated in Fig 2. In the Figure, the vertical axis demonstrates the difference in labor force participation rate between males and females, and the horizontal axis illustrates the change in the gap throughout the three decades. The reasons behind such a wage gap have been an active field for research. While some scholars explore the underlying structural discrimination within the workplace (Donna, 2011; Catherine and Jorge, 2018; Cailin and Leanne, 2015; Tristin, 2003), others (Wang and Raymond, 2021; Jia and Dong, 2012; Yu and Xie, 2018; He and Wu, 2016; Zhao, 2018, etc.) shift their attention towards the familial influence. Among these familial influence studies, how fertility rate impacts women's workplace performance, or whether "motherhood penalty" and "fatherhood premium" exists and serves as a driving engine for income inequality, has been a trendy area.



**Fig 2:** Gender Gap in labor force participation rate from 1990 to 2020, different countries  
(Source: International Labor Organization)

While much research on fertility and economic outcomes is based on western societies, there is little research on the Chinese context. China adopted the “one-child policy” in the 1970s as part of a population program to control the boom of the population. However, it has been gradually loosened and ultimately replaced by the two-child” policy since 2011, implemented regionally, after which the Chinese government adopted the universal “two-child policy” in 2016. Further, in 2021, the government announced the “three-child policy” to facilitate population growth. Whether these recent changes in population policies will affect birth rates and eventually economic outcomes are under-researched. Therefore, it is crucial to investigate the associations between birth rates and economic outcomes using updated survey data collected after 2011.

This study explores the motherhood penalty and fatherhood premium using income data in the current Chinese society. Specifically, this study attempts to answer the question: whether having more children will affect men and women differently in current China.

## **2. THEORETICAL FRAMEWORK**

### **2.1 Motherhood penalty and fatherhood premium in China**

Existing evidence is more than sufficient to prove the existence of the motherhood penalty in Chinese society. Entering motherhood is highly likely to decrease income for mothers (Jia and Dong, 2012; Yu and Xie, 2018; Zhao, 2018). Having children also impacts women and men distinctively. Chinese women in the workforce are more adversely affected by dependent children than their husbands and more likely to withdraw from the labor market to fulfill their roles as mothers, while less likely to move up the career ladder (He and Wu, 2016). This trend also appears within urban migrants. (Zhao 2019).

The mechanism of the motherhood penalty entails the gender difference theory, which provides three primary reasons that cause the motherhood penalty:

Firstly, employers and firms may hold prejudicial views towards mothers, assuming mothers to be less productive after pregnancy (Wang and Raymond, 2021). This is further demonstrated in a laboratory experiment, in which researchers find that employers tend to treat mothers unequally regarding perceived competence and recommended starting salary (Correll, Bernard and Paik, 2007). In China, the childbearing has been largely guided and influenced by the population programming. Chinese government has loosened the fertility control since 2011, when the “one-child” policy was gradually replaced by the “two-child” policy. It is crucial to investigate the associations between childbearing and economic outcomes in China using updated survey data collected after 2011.

Secondly, entering motherhood creates an extra physical and emotional burden, distracting women from being completely devoted to work (Zhang, Hannum and Wang, 2015; Jacqui Gabb, 2018; Arlie Hochschild, 2003). This is explained by a “second shift” or “dual burden” that women are experiencing from housework, especially after childbearing (Zhang, Hannum and Wang, 2015). Women working two jobs -- paid work and unpaid housework -- have less energy and time to spend on the paid job when the workload of the unpaid job drastically increases during motherhood.

Thirdly, marketization accelerates the extent of the motherhood penalty in China (Jia and Dong, 2012; Zhang and Hannum, 2015). The contemporary productivity-and-efficiency-driven market in China, combined with the withdrawal of socialist welfare and gender-equality propaganda, poses a more significant challenge to women in the workplace (Ying, Wu, Sun, 2016). The extra burden on mothers is also attributed to emotional distress, which comes in two folds: the

triple shift and the rigid gender roles. First, women's role in the family is pragmatic and symbolic of constructing a sense of belonging and family unity. This means that mothers shoulder another responsibility, one that is emotional and urges mothers to please all parties in the family, which is detrimental to the mother's physical and psychological well-being (Jacqui Gabb, 2018; Arlie Hochschild, 2003). Furthermore, the rigid gender roles in Chinese culture often means that family members can take mothers' work at home for granted as gendered duty and rarely express gratitude for mothers whose unpaid house contributions bind the family together (Arlie Hochschild, 2003).

Emotional distress is a topic worth studying because it largely influences mothers' motivation and the eventual outcome at work while providing another parameter to measure the impact of the birth rate on Chinese mothers. However, documented research in China hardly ever shed light on how birth rates influence Chinese mothers' subjective well-being. Therefore, to fill this research gap, this paper includes "self-reported health" as a controlled variable to explore the economic dimension of childbearing's impact and the psychological dimension, incorporating a comprehensive understanding of Chinese mothers' living conditions.

e, 2017). This trend is also obvious in other newly industrialized countries, like South Africa and India (Magadla, Leibbrandt and Mlatsheni, 2019; Das and Zumbyte, 2017). As a result, after China became the second-largest economy in the world in 2010 (World Bank, 2021), the motherhood penalty using Chinese data after 2010 is worth analyzing.

Despite the mass evidence supporting the motherhood penalty in China, much research suggests opposing views, claiming that women's economic outcomes are positively correlated with motherhood (Zhao, 2017, Mu and Xie, 2016; Marta, 2019). Therefore, it is also crucial to continuously contribute newly analyzed data to the literature to further study a much-needed research area with controversial results.

## **2.2 Chinese context of population programming**

Chinese society and its demographic structure have been impacted tremendously since the introduction of population programming in 1979. In response to the population surge since the industrialization period with 680 million births from 1949 to 1982 (Jowett, 1984), the socialist state intervened by introducing the One-child Policy. The child programming achieved its purpose by lowering the fertility rate from 6.5 to 2.75 (Malcolm, 2006), but also provided grounds for another social problem: an aging population and a substantial economic burden on the shrinking proportion of the economically active population (Chen and Liu, 2009; Banister, Attané, 2012). To keep the economy growing constantly, China adopted the Two-Child Policy in 2015 (Louise 2015). However, as the cost of raising a child increases from extremely low due to the national provision of social welfare to up to around 70% of the family expense (Ma, 2020), 40% of the population of childbearing age would not even consider having a second child (Yang, 2016). As the new policy's effect on the overall birth rate is lower than expected, in 2021, the Chinese government tried to motivate the people further to have children by lifting the children quota from two to three children per family (BBC, 2021). The newly introduced policy demonstrates a need for an in-depth study on the relationship between the number of children and women's income to evaluate the possible impacts and provide insights into future policies and legislations.

## **2.3 Research question and hypotheses**

Based on current literature, this research attempts to answer the question "whether having more children will affect men and women differently in current China". To do this, we set up the

following hypotheses (hypothesis 2 is examined using a multivariate linear model, whereas hypotheses 1, 3 and 4 are tested by using a fixed-effect model):

1. Males and females differ in their income, *ceteris paribus*.
2. Having more children will influence the level of income, *ceteris paribus*.
3. For women, having more children is associated with less advantageous socio-economic status, *ceteris paribus*.
4. For men, having more children is associated with a more advantageous socio-economic status, *ceteris paribus*.

### 3. DATA AND METHODS

#### 3.1 Data

Our empirical analysis is based on panel data from the China Household Finance Survey (CHFS), a longitudinal study in households that began in 2009. Capitalizing on the panel nature of the CHFS, we apply the fixed-effects model to eliminate time-variant and selection biases by estimating within-variation for each subject. The CHFS collects a wide range of information on individuals' family backgrounds, social and economic activities, and subjective outcomes. Four waves have thus far been conducted in 2011, 2013, 2015 and 2017, respectively, and random sampling was used. The sample of the 2011 survey has a size of 8,438 households and covers 25 provinces, 82 counties and 320 village committees across China.

The analysis was structured in two steps to better track the effects that the changes in policies on fertility rates and socioeconomic status have on income earned. First, we conducted two multivariate linear models using cross-sectional data from waves 2011 and 2017, respectively, to estimate the different effects that specific variables have on income earned at these two time periods.

Then we constructed a fixed-effect analysis with two sub-sets for men and women, respectively, to better capture the impact of the changes in the number of children and subjective well-being status on fathers' and mothers' economic outcomes. Panel data was formed based on individual ID in 2011, and the change in income throughout these four waves was analyzed. We deleted observations made with insufficient (or sporadically missing data) to ensure reproducibility and accuracy of the result. We confined our sample to men and women aged between 16 and 65 years old. We further imputed the variables of income and working hours by multiple imputation

#### 3.2 Measurements

Our primary research interest in this article is to find the different effects that the number of children has on the income earned by fathers and mothers. To analyze this, we set the dependent variable as an individual's disposable income (income remaining after deduction of taxes and other mandatory charges, expressed in monetary value). The primary time-varying independent variable is an individual's total number of children (including those that have reached the age of 18) in 2011, 2013, 2015 and 2017. Other time-varying variables are included in the model measuring the effects of parents' subjective well-being, such as self-reported health and daily working hours. Self-reported health is a scale variable where 1 indicates the best health status while 5 indicates the worst. We also include hukou (household registration identity) to account for an individual's household contexts, which provides insights into the influence of rural or urban residency on income. Previous studies suggest that economic development does not uniformly increase gender inequalities within households in rural China (Matthews and Nee 2000). As such, including hukou

in our time-varying variables allows us to explore the effects of the number of children on the economic and subjective outcomes of men and women from different economic structures.

In addition to analyzing panel data and estimating how income had changed under the influence of the aforementioned time-variant determinants, we also employed cross-sectional datasets from 2011 and 2017, respectively, and included time-invariant variables such as ethnicity and political party membership in our analysis and estimated their effects on income earned.

### 3.3 Multivariate linear model

We first employed multivariate linear regression models using cross-sectional data from 2011 and 2017, respectively, to estimate and compared the effects that time-invariant variables have on income.

The multivariate linear regression model is as follows. For an individual with income  $y$ , we have:

$$y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_sX_s + e$$

where:

$b_0$  is the intercept and  $b_1 \sim b_8$  capture the effects of the number of children, hukou, gender, health status, Chinese Communist Party membership, ethnicity, hours worked per day and age on income. The term  $e$  is the error term.

Gender, hukou status and party membership are estimated in binary values. For the variable gender, 0 represents male and 1 represents female; for the variable hukou status, 0 represents rural residency and 1 represents urban residency; for the variable party membership, 0 represents membership in the Chinese Communist Party and 1 represents non-membership in the Chinese Communist Party.

**Table 1: Summary Statistics of cross-sectional data from 2011 and 2017**

Variables	2011					2017				
	Observations	Mean	Std. Dev.	Min	Max	Observations	Mean	Std. Dev.	Min	Max
Income	4349	26578.94	33522.95	0.00	1000000	19206	42463.49	51224.45	0.00	3000000
Number of children	10603	1.11	0.86	0.00	7	49176	0.90	0.82	0.00	7
Gender	10603	1.47	0.50	1.00	2	49176	1.52	0.50	1.00	2
Age	10603	46.14	10.59	18.00	65	49176	49.51	10.39	18.00	65
Hukou status	10603	1.43	0.50	1.00	2	49176	1.45	0.50	1.00	2
Party membership	10603	0.14	0.35	0.00	1					
Working hours	4481	8.65	2.57	0.00	24	49176	0.56	0.50	0.00	1
Health status	10603	2.61	0.95	1.00	5	19766	8.81	2.47	0.00	24
Minority ethnic group	10603	0.03	0.17	0.00	1	49176	2.57	1.00	1.00	5

### 3.4 Fixed-Effects Model

We then applied a fixed-effects regression model to estimate the effects of time-variant variables on income, which allows us to capture the effects of changes in the number of children during the four waves on the economic outcomes.

For the *i*th individual at time *t*, we specify:

$$y_{it} = at + bX_{it} + cX_{it} + dX_{it} + eX_{it} + fX_i + \alpha_i + u_{it}$$

where *y<sub>it</sub>* denotes the continuous dependent variable income per year, and *bX<sub>it</sub>*, *cX<sub>it</sub>*, *dX<sub>it</sub>* and *eX<sub>it</sub>* denote the time-varying features, which are, the total number of children, hours worked per day, health status and age, respectively. *a* is the intercept, and *fX<sub>i</sub>* is the person-specific time constant, in this case, hukou.  $\alpha_i$  is the error term of *fX<sub>i</sub>*, which is time constant (between variation), and *u<sub>it</sub>* is the idiosyncratic error term of *X<sub>it</sub>*, which is time-varying (with variation)..

## 4. RESULTS

Table 4, as attached below, presents estimated coefficients from multivariate linear regression models of 2011 and 2017, respectively. In the baseline, we include the number of children, gender, hukou, party member status, the number of working hours per day, health status and age as the independent variables.

Table 5, as attached below, presents results from the fixed-effects models and shows differences in the effects of the changes in five endogenous variables on the outcome variable (income), separately for fathers and mothers.

### 4.1 Results from the multivariate linear regression model

The 2011 multivariate linear model shows gender-earning gaps: annually, each woman



tends to earn 5072 yuan on average less than a man, and this coefficient is statistically significant. In addition, it is also suggested that individuals who hold rural hukou are disadvantaged, earning 8242 yuan less than their urban counterparts annually. Members of the Chinese Communist Party tend to earn considerably more than non-members, each earning 12007 yuan more each year. It is also interesting to see a negative relationship between age and income, which underscores the focus on productivity and efficiency in the labor market during the era of marketization, defining features of younger people. Other factors such as the number of children, ethnicity and the number of hours worked per day remain insignificant in affecting income.

However, based on data in 2017, the number of children becomes statistically significant in determining parents' annual income, with each additional child lowering parents' annual income by 1060 yuan. Such adverse effects that the number of children has on income earned are consistent with previous studies (Duan 2016). Apart from that, women continue to face increased biases in the workplace, evidenced by the more significant gender earning gaps: on average, women tended to earn 14179 yuan less than men annually in 2017, whereas, in 2011, women earned only 5072 less annual income than men. Hukou also affected people's income significantly in 2017, as urban residents tend to earn 18572 yuan more than their rural counterparts annually.

#### 4.2 “Fatherhood Premium”?

Table 5 model 3 presents the effects of the fertility rate, age, area of residency (hukou), subjective well-being (self-reported health status) and working hours per day on the income outcome for fathers using fixed-effects estimation. The relationship between the number of children and the income earned is significantly positive. Specifically, with each increase in the number of children, the annual income of a father tends to increase by 3293 yuan. For the effects of working hours on income, extending working hours per day by one hour can significantly lead to an annual increase of 447 yuan. It is also significant that with an increase in age, fathers tend to earn more, evidenced by the estimation that an increase of one year in age would lead to an increase of 1956 yuan in income. None of the effects of other independent variables on the economic outcome is significant.

The above estimates help conclude that, with an increase in the number of children and working hours per day, fathers are expected to witness improvements in their income outcomes. This supports the “fatherhood premium” in economic performance, which reflects that in response to the rising costs of children's education or other needs as children grow up, fathers are motivated to work harder and be more engaged in money-making activities to increase income. It is also consistent with findings from previous studies that parents employ adaptive strategies to support their children's education and well-being (Chen and Korinek 2010).

#### 4.3 “Motherhood penalty”?

Table 5 model 4 shows the effects of the fertility rate, age, area of residency (hukou), subjective well-being (health status), and working hours per day on the income outcome for mothers. In contrast to men, the results show a somewhat different picture for women. It is interesting to find that for women, the only significant indicator is age. The relationship between age and income earned for women is significantly positive, with each increase in age leading to a 2037 yuan rise in annual income. The number of children is not significant, although the coefficient is positive. However, it is also interesting that, although we found that mothers with more children tend to produce better economic outcomes, which is indicated by the positive relationship between



income earned by females and the number of children, each increase in the number of children only increases mothers' annual income by 2069 yuan for this sample of data. When compared to the fertility effects on the income outcomes of fathers, to whom the number is 3293 yuan and is significant, we can infer that mother tend to face worse economic outcomes than fathers with an increase in the number of children.

As such, whereas better economic outcome supports “fatherhood premium”, in that fathers' highly developed career orientations and motivations to work may emanate from an increase in the number of children, mothers are expected to take the primary responsibility of childbearing and household chores, which may prevent them from pursuing further career goals.

**Table 2: Multivariate linear regression estimates of economic outcome model, 2011 and 2017 cross-sectional sample**

	Model 1 Income2011		Model 2 Income2017	
	B	SE	B	SE
Number of Children	-663.46	443.49	-1059.98*	418.310
Gender	-5072.23***	938.990	-14179.33***	812.77
Age	-158.96**	46.37	-951.48***	56.61
Hukou status	8241.95***	1161.310	18571.89***	702.39
Party membership	12006.94***	1390.27	-533.40	569.84
Working hours	65.87	177.07	-403.68***	112.58
Health status	-2061.73*	683.04	-5351.14***	311.94
Minority ethnic group	-1401.27	3178.70		
_cons	33035.34***	2798.56	98066.42***	2567.220

Notes: The sample is restricted to the CHFS 2011 and 2017 data of individuals aged from 16 to 65. Missing values of the outcome variable were imputed using multiple imputations. Subjective well-being is measured as the score of health status based on cardinal values assigned to qualitative assessments as follows: very good=1; good=2; so-so=3; not so good=4; not good at all=5. \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

**Table 3: Fixed-effects estimates of economic outcome model, panel data of male and female from 2011, 2013, 2015 and 2017**

	Model 3: Male's Income		Model 4: Female's Income	
	B	SE	B	SE
Number of children	3293.17*	1234.264	2069.12	1032.69
Age	1956.54***	253.014	2037.05***	367.722
Hukou status	346.16	2594.47	-1519.12	2460.06
Health status	-784.69	654.91	-488.47	457.34
Working hours	447.03*	194.122	388.92	296.69
_cons	-78522.36***	13013.76	-86716.37***	19024.95

Notes: The sample is restricted to individuals aged from 16 to 65. Missing values of the outcome variable were imputed using multiple imputations. Subjective well-being is measured as the score of health status based on cardinal values assigned to qualitative assessments as follows: very good=1; good=2; so-so=3; not so good=4; not good at all=5. \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

## 5. CONCLUSION AND DISCUSSION

This research contributes to the literature on the burden on mothers and fathers resulting from increased fertility rates by focusing on the cross-sectional and longitudinal comparison between mothers and fathers. By employing both the OLS regression model and the fixed-effects model to the China Household Finance Survey (CHFS) panel data, we obtained two kinds of results: one that eliminates time-variant bias by focusing on the same samples through different years, and another that compares at the same time differences across samples.

### 5.1 Multivariate linear regression Model

The multivariate linear model shows a significantly negative relationship between the number of children and income if taking the panel data in 2017 into account, confirming our second hypothesis (having more children will influence the level of income, *ceteris paribus*). The result conforms to the existing research discovering the negative relationship between the number of children and income (Yu and Xie, 2018; Li 2015; Duan 2016). The phenomena can be explained by two factors: time and energy. Having more children means a relatively more significant proportion of time will be spent on children, and less can be devoted to working. Meanwhile, dealing with the children's issues may also consume more energy for both parents; thereby, they may be less able to concentrate on jobs.

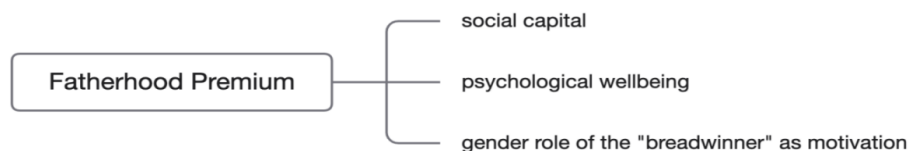
Meanwhile, the OLS results read a significant positive relationship between subjective well-being and income. Maintaining an optimistic and healthy psychological status means higher devotion to and passion for work and a higher possibility for promotion and higher income. In order to sustain economic growth in the long run, the government should incentivize the companies to cater to employees' subjective well-being by providing an assessment of subjective well-being,

improvement of the working environment, or designing relaxation periods. Lastly, being a member of the Chinese Communist Party or having an urban hukou is also significantly related to higher income. The result reflects the Chinese society’s feature that having an urban hukou or being a member of the Chinese Communist Party reflects better socioeconomic status.

**5.2 Fatherhood premium and motherhood penalty**

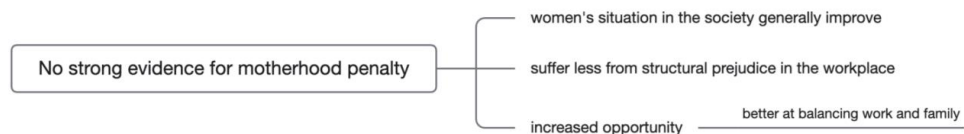
Results from our fixed effect model confirms the existence of fatherhood premium, as fathers’ income is significantly positively related to the number of children, confirming our hypothesis 4 (for men, having more children is associated with more advantageous socioeconomic status, ceteris paribus).

There might be several reasons (Fig 4). First, being a father is a social capital in the workplace associated with higher prestige, which can then transfer into economic capital. In traditional social norms, fathers are deemed more responsible and trustworthy than younger men without a child. It may generate more opportunities in the workplace, such as promotion. Furthermore, higher recognition in society and the workplace of being a father can be associated with better subjective well-being. Therefore, it will contribute to productivity in the workplace and, eventually, higher income. Lastly, fathers’ gender role as the ‘breadwinner’ within the family will motivate them to pursue higher earnings. In contemporary China, intensive competitions regarding housing, living and especially children’s development are a challenging financial burden to most families in China. Consequently, Chinese fathers must work harder and earn more money.



**Fig 3:** Reasons causing fatherhood premium

The fixed-effect model does not find strong evidence for the motherhood penalty since the positive relationship between income and the number of children is insignificant. Hypothesis 3 is not supported nor denied (for women, having more children is associated with less advantageous socioeconomic status, ceteris paribus). This may be because women nowadays in China suffer less from the structural prejudices in the workplace and that the increased opportunities for women make it easier to balance family and work, and may suggest that women’s circumstance in the society is generally improved (Fig 5).



**Fig 4:** Reasons for no strong evidence for motherhood penalty

However, there are still clues of the influence of gender disparity on labor market outcomes. In the multivariate linear model, the relationship between gender and income is significant: women's income is lower than men's, *ceteris paribus*, confirming our hypothesis 1 (Males and females differ in their income, *ceteris paribus*.) Meanwhile, when comparing the multivariate linear model in 2011 and 2017, the results show that the earning gap widened in 2017, meaning that women's socioeconomic status worsens over time. The rapid marketization process could even enlarge existing structural pressure on women in the workplace, which are typically come in the forms of prejudicial stereotypes and the glass ceiling. This process with robust neoliberalism justifies the labour market's prejudices that emphasize efficiency, productivity, and competition. This finding reveals a fundamental problem of structural gender discrimination in the workplace, as the gender gap has been widening rapidly in recent years.

In addition, the result of the fixed-effect model suggests that fathers benefit from having more children both absolutely and comparatively and explains the conflicting results in the sphere of motherhood penalty research. The positive relationship between the number of children and income for fathers is significant, whereas, for mothers, it is not significant. This means the increase of income is significantly larger and more certain for the fathers than the mothers. Some research denied the motherhood penalty by showing that increased numbers of children contribute to a higher income of mothers (Zhao, 2017 and 2018). However, despite mothers gaining higher incomes after having more children, the increase in income of fathers can be much higher and more certain. Therefore, it is essential to evaluate not only the absolute increase but also the relative increase. The motherhood penalty should be analyzed from a comparative perspective, that is, by comparing the increase of income in males and females after having children. The fact that females benefit less from the marketization process may also illustrate the motherhood penalty mechanism: the prejudicial views in the workplace that associate unconsciously pregnancy with lower productivity and value (Wang and Wong, 2021; Cornell, Bernard and Paik, 2007).

When gauging the effects of population policies, similarly, the government should, instead of evaluating on mere absolute terms, evaluate the effects in a more comprehensive scope: absolute and relative terms, which would provide a more accurate picture of the effects of the intended policies. Also, our study may illustrate the structural gender inequality in the workplace, thereby urging the government to tackle the structural pressure by introducing policies like education or parental leave for both fathers and mothers to erase the prejudicial stereotypes on mothers and counter the structural pressure.

In conclusion, in our research, we confirm our hypothesis 1, 2 and 4 (males and females differ in their income, *ceteris paribus*; having more children will influence the level of income, *ceteris paribus*; for men, having more children is associated with more advantageous socioeconomic status, *ceteris paribus*), but provides insufficient evidence for hypothesis 3 (For women, having more children is associated with less advantageous socioeconomic status, *ceteris paribus*)

## 6. LIMITATION AND REFLECTION

### 6.1 Methodology limitation

This study shows inconsistent results regarding the relationship between the number of children and income while using two modelling methods. The multivariate linear model shows a significantly negative relationship between the number of children and income. However, the fixed effects model shows a significantly positive relationship in the father sub-sample and an

insignificantly positive relationship in the mother sub-sample. The methodology of the two models can explain this. Using only eight indicators, i.e. the number of children, hukou, gender, political party, ethnicity, hours worked per day, subjective well-being and age, the multivariate linear model may fail to control sufficient variables that are related to income, resulting in inaccuracy. On the other hand, the fixed-effects model controls for all the unmeasured and unchanging variables, the neglected factors in the OLS model will then be controlled. Therefore, the result of the fixed effect may be more reliable.

## 6.2 Confirmation bias and data set limitation

Although our results from the multivariate linear model demonstrate the significantly negative relationship between the number of children and the increase in income, the relationship may be inverse. Women with lower income are less likely to have children due to lower education and vice versa (Presser and Baldwin, 1980). The dominant effects are that fertility rate impacts employment in the short run, and employment status influences fertility rate in the long run (James and Cramer, 1980). Although this essay employs both the fixed effect model controlling for time-variant indicators and the multivariate linear model controlling for other constant variables, it does not solve confirmation bias.

In response to this confirmation bias, Yu Xie and Zheng Mu introduce using an instrumental variable. In the study of the motherhood penalty, specifically, Xie and Mu use “the gender of the second child” as the instrumental variable (Mu and Xie, 2016). However, in this study, as we attempt to imitate the method, we found that it is hard to measure the gender of the first child in the CHFS data. For further research, we believe that, with a more comprehensive data set, scholars can employ the instrumental variable method to better reduce the confirmation bias's impact.

## 6.3 Limited existing literatures

The limited literature on subjective well-being in China also constitutes a limitation for our research. The lack of study in China on subjective well-being means that our research may have ignored the possible relationship between subjective well-being and the number of children, thereby undermining the accuracy of the multivariate linear model. Hence, it is crucial to explore the relationship between subjective well-being with other data in the Chinese context. Furthermore, to continuously update the current literature on this topic, more recent survey data are necessary.

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