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# The effect of motherhood on the labour force participation of married women in China

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## ABSTRACT

This paper explores the impact the number of child(ren) and the age of child(ren) on the participation in the labour force by married women in China. Using logistic regression models with the latest Chinese Family Panel Studies data, results show that: (1) the odds of LFP (Labour Force Participation) has decreased by 20.7 per cent for married women with one child and 37.7 per cent for women with two or more children compared with those without any child; (2) the impact of childbearing on LFP is stronger for women who are highly educated or aged 30–39; (3) the age of child(ren) is positively correlated with the mother's labour participation, with a bigger effect for women coming from rural areas (i.e. those with an agricultural *hukou*), for women aged below 30, and for highly educated women.

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## Introduction

Over the past three decades, Female Labour Force Participation (FLFP) has been on a gradual decline in China. Although China's FLFP is still relatively high compared with the world average, the figure has actually declined from 73.24 per cent in 1990 to 60.57 per cent in 2019. More importantly, China's FLFP has been falling faster than its male labour force participation (World Bank, 2022). In consequence, the gender gap in China's overall Labour Force Participation Rate (LFPR) is gradually increasing. Hare (2016) has examined the decline in China's FLPR and concluded that such phenomenon was most present among well-educated married women with children. Undoubtedly, China's FLFP has been affected by many factors, including women's personal and family characteristics, as well as China's macroeconomic environment, among which childbearing and childrearing are particularly significant.

Researchers have produced a fairly extensive body of literature on the nexus between work and family (Barling & Sorensen, 1997; Greenhaus et al., 1999; Greenhaus & Powell, 2006). Fertility and employment are two major events in women's lives and China is an

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important place to study the relationship between these two seemingly contradictory factors, given its rapid pace of economic development, the enormous size of its population and the ever-changing birth policies.

As an indispensable part of the labour market and the main undertaker of childbearing and care, most women are faced with a dilemma between work and family (Ji & Zheng, 2018). Scholars have reached a general consensus on the adverse impact of having a child on the participation in labour force, mainly in the form of a slowdown of career development or even an interruption in the pursuit of higher occupational goals. Sometimes this is even phrased as *motherhood penalty* (Li, 2019).

At present, the gradually decreasing FLPR in China coexists with the constant decline in fertility rate. Many studies point out that the dual burden of motherhood and employment on women is the crux of the difficulty in keeping birth policies updated and ensuring the adequate supply of labour force in the market (Song & Zhou, 2015; Yang & Guo, 2017).

Therefore, this paper tries to explore the heterogeneous impact of childbearing and childrearing on women's labour force participation. Our objective is to fathom the extent to which these two factors influence the Female Labour Force Participation (FLFP) in China and how such influence, if any, varies across different population subgroups. By using statistical analyses with the Chinese Family Panel Studies, we investigate such influence of both the number of child(ren) under 16 and the age(s) of child(ren) on married women's labour participation.

For theoretical significance, this paper enriches and develops the role theory and the division of labour theory in the field of female child bearing/rearing and female labour force participation by exploring the dynamism in between. Moreover, this study refines the measures of female fertility by including both the number of child(ren) and the child(ren)'s age in all cases. In addition, the heterogeneous influences by child-bearing/rearing on labour force participation by women with different *hukou* (the Chinese household registration system putting people mainly in the categories of *urban* and *rural*, or *non-farming* and *farming*), ages, and educational attainment are also analysed, which enriches the research on the impact of child-bearing/rearing on female labour participation from a micro-perspective.

For practical significance, this paper assumes that increasing female labour force participation has positive contributions to promoting gender equality and empowering economic development. In each family, i.e. a micro-perspective, participation in the labour market helps to emancipate women, particularly as women's occupational attainments increase their say in family decision-making. From a national macro-perspective, women's participation in labour force can also alleviate China's economic burden by addressing labour shortage resulting from an aging population, protect women's legitimate labour rights and interests, and promote the healthy operation of the labour market.

## Literature review

### *Theoretical framework*

In sociology, *the social role theory* explains people's behaviour according to the social roles they play. Such a role corresponds to the sum of attitudes and behavioural patterns displayed by individuals based on their occupation of a specific position in society (Eagly &

Wood, 2012). People with a particular social status usually play not only one but simultaneously multiple roles, determined by characteristics of such social status and the plurality of the corresponding social life. When these roles are incompatible with each other under certain conditions, a *role conflict* occurs, either in the form of an inter-role conflict or an intra-role conflict. The *intra-role conflict* in particular refers to the contradiction that arises within a person due to having multiple social positions and multi-faceted social roles. The *social role theory* holds that individuals need to adjust their behaviour when there is a conflict between roles. For women, in particular, the dilemma between work and family arises when conflicting work roles and family roles cannot be reconciled (Greenhaus & Beutell, 1985). Women may then take decisions, such as opting out of the labour market or choosing to have fewer children (Hall, 1972).

The *new family economics* (Becker, 1976) emphasises the role of the family in decision-making, believing that family members negotiate with each other on issues such as the number of children, division of labour and distribution of property so as to maximise the interests of the family. Men usually have a comparative advantage in material production, while women are perceived as more skilled and efficient at daily household chores and child-rearing. Moreover, the division of labour between paid and unpaid work among members of the household maximises the household's utility (Becker, 1981, 1985). Therefore, women who have already given birth are believed to have lower economic returns in the labour market and thus be more likely to opt out of the labour market (Zhou & Kan, 2019).

### ***The influence of the number of child(ren) on married women's labour participation***

Researchers generally believe that there is a negative correlation between fertility and labour participation in the vast majority of countries (Budig & England, 2001; Dalit & Erez, 2015; Molina & Montuenga, 2009). While research results by foreign scholars about fertility are readily sufficient, things cannot be directly or hastily copied for China's reality, with its unique policymaking and traditional culture.

With the continuous adjustment of China's family planning, research exploring fertility and FLFP has also been progressively updated and gone deeper into the issues. From the one-child policy introduced decades ago to the newly-published three-child policy, this research topic has attracted the attention of countless scholars who, through research results and academic discussion, want to better promote fertility, optimise women's employment policies as well as help women better balance the dual pressure from work and family.

In China, most studies have focused on the impact of the number of child(ren) on women's employment status. Zhang and Zhang (2019) have found out that while inter-generational care helps to alleviate the conflict between childbearing and labour participation of young women to some extent, giving birth to and raising up each additional child still decrease the LFPR of a young woman by 11 per cent. Zhang and Wang (2021) have noted that an increase in the average number of young children aged 0–6 significantly reduces the employment rate of married women and the following adverse impact of childbearing on employment is long-lasting.

However, Sun and Zhang (2010) have concluded that having two children poses no significant impact on women's employment, while having one, three or more children

significantly increases women's employment levels. Similarly, Yue and Zhang (2019) believe that the number of children is correlated with the labour participation rate of married women by an inverted U-curve, with its peak at around 2.48 children. For married women in urban areas, Gan and Yang (2018) have suggested that women with low educational attainment and from lower-income households are more likely to drop out of the labour market after giving birth. Liu (2020) have argued that having one child would result in a 39 per cent drop in employment odds for urban women, while having two children will result in a 63 per cent drop.

There are significant differences between urban and rural areas in terms of the impact of child-bearing and child-rearing on female employment. The negative impact of the number of children on FLFP is clearly significant in urban area, while it is much smaller and even possibly positive in rural places (Chen, 2019; Song & Zhou, 2015).

In addition to the urban-rural differences mentioned above, the influence of fertility on female employment is also heterogeneous in terms of women's educational attainment and age. In this regard, however, there are only a few relevant studies. Gu (2021) has proposed that the negative impact of having a second child on female labour participation for women with lower educational attainment is significantly greater than for females with higher educational attainment. On a similar note, Zhang and Gu (2020) have also shown that fertility poses a greater negative impact on women with higher education levels and those aged 30-39.

### ***The influence of children's age on women's labour participation***

Even fewer literature has covered the correlation between the age of children and FLFP. It is generally believed that having infants or pre-schoolers at home reduces the employment rate of married women (Drobnič, 2000; Nan & Li, 2014). Further, Cheng and Nwachukwu (1997) even argue that women's participation in the labour market is even more negatively impacted by the presence of a young child at home than by fertility.

Children aged 5 or below are indeed in greater need of their mothers' care-giving due to their physical and psychological characteristics, which explains why the odds of women with young children participating in the labour market are much lower than those with no children under five (Cui, 2013). Accordingly, Du (2008) have indicated that the FLFP rate in China would increase by 0.4 per cent to 2 per cent for each additional year of the youngest child's age but the correlation is probably not linear. Last but not least, having pre-school children poses a particularly obstructive impact on women's labour market participation but this would gradually disappear once the children go to school (Zhang, 2020).

### ***Research gap and hypothesis***

Together, these studies provide important insights into the correlations between child-bearing/rearing and women's labour market participation. Thanks to scholars around the world studying this globally prevalent issue, some generally universal conclusions can be drawn: (1) the number of children affects women's work and, in general, an increase in the number of children reduces female labour market participation; (2) the younger the child(ren), the lower the likelihood for data differences across specific age

groups; (3) such heterogeneity exists across different categories such as age, occupation, educational background and, most significantly, urban/rural identity.

However, there is still room for further improvement. First, the change of times and the difference in national contexts make some studies too outdated or too country-specific for explaining China's realities. European and American studies on FLFP have long started, with mature assumptions and full-fledged models established in 1962. However, the overall increase in women's educational attainment, the labour market reforms as well as policy and cultural changes in the following 60 years have made previous research obsolete.

Second, although there exist certain similarities in FLFP across countries, the conclusions by foreign studies based on their policy-making and cultural background do not fit into the national context of China. In addition to its unique fertility and welfare policies, China's traditional gender perceptions and the urban-rural division make its female labour participation exclusive.

In terms of content, most scholars only use the number of children to investigate the impact of child-bearing/rearing on FLFP, while few studies take the age of children into account. However, the extent to which children need to be taken care of varies at different stages of their childhood because the younger the children are, the more time and energy they require from their mothers. Hence, the age of children should be a significant factor affecting women's participation in the labour market.

Last but not least, most of the existing literature on the impact of fertility on women's labour participation pays little attention to the differences across different groups of women. The lack of heterogeneity of the impact of child-bearing/rearing on female labour participation does not allow for targeted making of public policies.

Considering the theoretical background and literature review, the following hypotheses are postulated and will be tested in our study.

- (1) Childbearing and childrearing discourage women from engaging in the labour force;
- (2) The younger the children are, the less likely the women will be to participate in the workforce;
- (3) There exists heterogeneity in the impact of the number of children and the age of children on FLFP.

## **Data and methodology**

### ***Data source***

This study and all its analyses are based on the most recent wave (2018) of the Chinese Family Panel Studies (CFPS). The CFPS, starting from 2010 and administered by Peking University, is a constant, nearly nationwide and fairly comprehensive social tracking survey designed to reflect the social, economic, demographic, educational and health changes in contemporary China by tracking and collecting data at individual, family and community levels. The CFPS provides three clear advantages when it comes to research subjects in this paper: (1) its questionnaire covers a broad range of topics, including occupation, income, education, family details, grandparental child care and so on; (2) the sample pool is large and nationally representative; (3) CFPS provides high data quality using computer interview (computer assisted personal interviewing, CAPI).

**Table 1.** Descriptive statistics of the sample (unweighted).

Variables		All women (n = 3785)	Women with children (n = 3369)
LFP	Active	70.99%	71.80%
	Inactive	29.01%	28.20%
Number of children	0	10.20%	–
	1 child	56.49%	63.34%
	2/2+ children	33.32%	36.66%
Children's age	0–3 years	–	38.29%
	4–7 years	–	26.89%
	8–16 years	–	34.82%
Age (average)		33.36 (6.80)	33.78 (6.67)
Hukou	Agricultural	69.96%	70.38%
	Non-agricultural	30.04%	29.62%
Education attainment	Low	73.05%	75.42%
	High	26.95%	24.58%
Health status	Ill	5.79%	5.91%
	Healthy	94.21%	94.09%
Husband's education attainment	Low	79.84%	79.88%
	High	20.16%	20.12%
Husband's employment status	Unemployed	11.70%	12.56%
	Employed	88.30%	87.44%
Grandparental care	Yes	–	38.59%
	No	–	61.41%
Region	East	44.78%	43.90%
	Central	31.97%	32.92%
	West	23.25%	23.18%

According to the *Interim Measures of the State Council on Workers' Retirement and Resignation*, ordinary female employees should reach the age of 50 for retirement while this figure is 55 for female cadres and officials. Additionally, the *Marriage Law of the People's Republic of China* states that women can get married at the minimum age of 20. Combined with the purpose of this study, analyses under this research are to be based on a sample of married women aged 20–54.

Given the unique realities of single, divorced and widowed women, the groups of unmarried, divorced, and widowed women are removed from the analyses to facilitate the control of some household characteristics in the regression. In addition, this paper excludes women who work in the agricultural sector, for two reasons: (1) due to mobility and seasonality, agricultural occupations have longer idle time compared with non-agricultural ones; and (2) this study examines women's participation in the labour market, while agricultural labour is not subject to the rules of the organisational system and labour market (L. Zhang, 2020). However, this does not mean that women with agricultural household registration (*hukou*) are not included.

Considering those sample restrictions, the remaining sample pool contains 3,785 valid cases, among whom 3363 have child-bearing experience. Table 1 shows the descriptive characteristics of the samples.

## Variables

### Outcome variables

*Labour force participation* (LFP): The CFPS surveyed respondents on their current working status, with options '0' = unemployed, '1' = working and '3' = out of the labour force. *Working* in the questionnaire means working at least one hour in the past week, and

*unemployed* is defined as an individual who has been looking for a job in the past month and could start working within two weeks if a job offer is available. According to the standard definition of labour force of the *International Labour Organization*, employees plus the unemployed population are considered to *participate* in the labour force, while other are considered as *out of* the labour force.

### **Key explanatory variables**

*Number of children*: since CFPS defines adults as those over 16 years old, *the number of minor children* in this paper refers to the number of children aged 0–15. In the main regression models, this paper puts *the number of children* into three categories, coding *having no child* as '0' (reference), *one child* as '1', and *two or more children* as '2'.

*Age of the child*: the age of the child is used as a proxy variable for parenting because children require different levels of care-giving from their mothers at different growth stages, which in turn affects FLP. For families with two or more children, the age of the youngest child is selected. The children are divided into three age groups, 0–3 years old, 4–7 years old and 8–15 years old respectively according to the school-age of Chinese children.

### **Control variables**

Based on the literature discussed above, individual features, family characteristics and regional location of married women are controlled. Individual-level control variables include the respondent's age, *hukou*,<sup>1</sup> educational attainment and health. Family features include the husband's educational attainment, the husband's employment status, and grandparental childcare.

### **Group variables**

The heterogeneity analysis in the impact of key explanatory variables is made on three different variables, either the *educational attainment* simplified in two categories: college and above (high) as well as high school and below (low), *the hukou status*, and *the age of respondents* (simplified in three categories: 20–29, 30–39 and 40–54).

### **Analytic strategies**

For binary variables such as the labour force participation, most scholars use logistic or Probit models. In the social sciences, scholars usually prefer logistic models, because the concept of odds can better explain the influence. Accordingly, this paper examines the influence of child-rearing on married women's labour participation through binary logistic regression with other control variables included in the model. Basic model equations are as follows:

$$\text{Log}(Y_{FLP1}) = \alpha_0 + \alpha_1 X_{num\_child} + \alpha_2 X_{control} + \varepsilon_{1i} \quad (1)$$

$$\text{Log}(Y_{FLP2}) = \beta_0 + \beta_1 X_{age\_child} + \beta_2 X_{control} + \varepsilon_{2i} \quad (2)$$

$Y_{FLP}$  represents whether married women engage in non-farming labour force participation;  $X$  involves key explanatory variables including the number of children (in Equation 1) and the age of children (in equation 2);  $X_{control}$  represents the control variables that



influence whether women participate in the labour force, including personal characteristics, family factors and region control variable;  $\alpha_1$  and  $\beta_1$  represent the coefficient of key explanatory variables;  $\alpha_2$  and  $\beta_2$  represent the coefficient of the corresponding control variables;  $\beta_0/\alpha_0$  and  $\varepsilon_{1i}/\varepsilon_{2i}$  represent the constant term and the random disturbance term respectively. Control variables are introduced gradually in the model to test the robustness of coefficients explanatory variables.

The heterogeneity of the impact of explanatory variables is tested by introducing to Equation 1 and Equation 2 an interaction term between this explanatory variable and each of the group variable subsequently, as shown in Equation 3 and Equation 4.

$$\text{Log}(Y_{FLP1}) = \alpha_0 + \alpha_1 X_{\text{num\_child}} + \alpha_2 X_{\text{control}} + \alpha_3 X_{\text{num\_child}} * X_{\text{group}} + \varepsilon_{1i} \quad (3)$$

$$\text{Log}(Y_{FLP2}) = \beta_0 + \beta_1 X_{\text{age\_child}} + \beta_2 X_{\text{control}} + \beta_3 X_{\text{age\_child}} * X_{\text{group}} + \varepsilon_{2i} \quad (4)$$

In these two equations,  $\alpha_3$  and  $\beta_3$  then indicates whether the effect of the explanatory variables *number of children* and *age of the child* respectively varies among the categories of the variable  $X_{\text{group}}$ .

## Results

### *The impact of the number of children on married women's LFP*

First presented are the results of regression models on the influence of the number of children for female labour participation. Multicollinearity had been tested for independent variables before all models were run, while the variance inflation factor (VIF) and tolerance of the models ruled out the possibility of multicollinearity issues.

#### *Basic regression*

To ensure the credibility and robustness of the regression results, factors affecting married women's non-farming employment are sequentially added, one by one through different dimensions to perform multiple fitting regressions (Table 2). In Model 1, only the key explanatory variable *number of children* is introduced; in Model 2, married women's *personal characteristics* are added based on Model 1; in Model 3, characteristics of their *spouse* are added; and in Model 4, the control variable *region* is further added to obtain the full model. In these four models, the effect direction of the key explanatory variable *number of children* remained unchanged, indicating that the model has good robustness.

In model 1, the odds of LFP is much lower for women with two or more children, but there is no significant difference between women without any child and women with one child. However, when women's personal characteristics are controlled (Model 2), the labour participation gap between women without any child and women with one child is about the same as that between women who have one child and women who have two or more children. From model 2 to model 4, this negative association between *the number of children* and *women's non-farming LFP* is persistent.

Further focus is put on the full model 4 in Table 2. With things being equal, compared with women who have no child, the odds of women with one child to participate in the labour force is decreased by 20.7 per cent ( $1 - e^{-0.232} \approx 0.232n$ ), while the odds of women with two and more children to participate in the labour force is decreased by 37.7 per

**Table 2.** Effects of the number of children on married women's LFP.

Variable	Model 1		Model2		Model 3		Model 4	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<i>Number of children(0 = ref.)</i>								
1	-0.073	0.127	-0.279**	0.140	-0.250*	0.140	-0.232*	0.141
2/2+	-0.447***	0.131	-0.528***	0.149	-0.493***	0.150	-0.473***	0.150
Women's age	-	-	0.084***	0.006	0.084***	0.006	0.084***	0.006
Age square	-	-	-0.004***	0.0007	-0.004***	0.0007	-0.004***	0.0007
<i>Hukou(0 = agricultural)</i>								
Non-agricultural	-	-	0.039	0.095	0.012	0.097	0.015	0.097
<i>Education attainment (Low education level = ref.)</i>								
High education level	-	-	1.171***	0.11	1.062***	0.120	1.054***	0.120
<i>Health status (Ill = ref.)</i>								
Healthy	-	-	0.360**	0.156	0.363***	0.156	0.366**	0.157
<i>Husband's education attainment (Low education level = ref.)</i>								
High education level	-	-	-	-	0.194	0.126	0.186	0.126
<i>Husband's employment status (Unemployed = ref.)</i>								
Employed	-	-	-	-	0.483***	0.110	0.473***	0.111
<i>Region(East = ref.)</i>								
Central	-	-	-	-	-	-	-0.256***	0.088
West	-	-	-	-	-	-	-0.152	0.097
Constant	1.092***	0.374	-1.960***	0.276	-2.424***	0.298	-2.302***	0.303
Pseudo R-squared	0.0059		0.0803		0.0853		0.0872	
Log likelihood	-2266		-2096		-2084		-2080	
LR chi <sup>2</sup>	26.77		366.02		388.94		397.59	
Observations			3785					

Note: \*\*\* $P < 0.01$ , \*\* $P < 0.05$ , \* $P < 0.1$ .

cent ( $1 - e^{-0.473} \approx 0.473n$ ). When the *number of children* increases, women may respond by dropping out of the labour market or even not get engaged in the first place.

The gender division of labour theory for households assumes that women are the primary caregivers, while men are generally responsible for earning money to support the family (Becker, 1981). Therefore, the higher *the number of children*, the more time and energy women have to spend on this front, resulting a scarcity of time and energy that forces women to give up their work.

The effects of control variables are generally consistent with other relevant studies and broadly in line with expectations. The relationship between *age* and married women's LFP has shown an inverted U-shape curve. The *educational attainment* reflects the human capital and positively affects the LFP. The odds of highly-educated women to participate in the labour market is 2.869 times ( $e^{1.054} \approx 2.869$ ) the odds of women with low education attainment.

Women who are in general health or in good health have higher odds of participating in the labour market than women in poor health odds increase by 44.2 per cent,  $e^{0.366} - 1366$ entnc Women's participation odds in the labour force increases when their husbands are employed (increase by 60.5 per cent). Compared with women in eastern provinces, the odds of participating in the labour market for women in central regions is reduced by 22.6 per cent ( $1 - e^{-0.256} \approx 0.256$ ntb).

### Heterogeneity analysis

It is observable that an increase in *the number of children* reduces FLFP. However, there are differences in women's reproductive and labour involvement due to their age, educational attainment and living conditions. Therefore, further research has been done to

**Table 3.** Estimation results of interaction coefficient between female individual characteristics and number of children.

Variables	Model 5	Model 6	Model 7
Number of children	-0.184*** (0.059)	-0.153*** (0.058)	-0.064 (0.082)
Hukou	0.182 (0.190)	-	-
Educational attainment	-	1.492*** (0.205)	-
Age group 30–39	-	-	0.992*** (0.173)
Age group 40–54	-	-	0.84*** (0.262)
<i>Interactions</i>			
Number of Children × Hukou	-0.143 (0.134)	-	-
Number of Children × Education attainment	-	-0.416*** (0.152)	-
Number of Children × Age group 30–39	-	-	-0.214* (0.110)
Number of Children × Age group 40–54	-	-	0.04* (0.211)
Other control variables	√	√	√
Constant	-2.353*** (0.296)	-2.457*** (0.299)	-0.473*** (0.221)
Pseudo R <sup>2</sup>	0.0879	0.0892	0.0813
Log likelihood	-2079	-2076	-2094
LR chi <sup>2</sup>	400.54	406.85	370.66

Note: (1) \*\*\* $P < 0.01$ , \*\* $P < 0.05$ , \* $P < 0.1$ ; (2) Standard errors in parentheses; (3) Reference category: Hukou (non-agricultural), educational attainment (low education), age group (age group 20–29). The same applies to section 5.2.3.

consider whether there exists heterogeneity in the impact of *the number of children* on married women's non-farming labour participation. To test whether the effect of *the number of minor children* on married women's LFP varies by women's age, household registration (*hukou*) and educational attainment, interaction terms are included between *the number of children* and different personal characteristics of women (Table 3). To simplify the model, *the number of children* is taken as a continuous variable and ages of women are divided into three groups: 20–29, 30–39 and 40–54.

Model 5 tests the interaction between *the number of children* and household registration (*hukou*), revealing no statistical significance between women with an agricultural *hukou* and those with a non-agricultural *hukou* (probably because this study only looks at non-farming labour participation for married women with an agricultural *hukou*). Indeed, many people registered as agricultural actually live in cities and towns but retain their agricultural household registration, so as to enjoy rural collective property rights and interests (Zhu & Pei, 2021). These factors may bias the impact of *the number of children* on FLFP in terms of *hukou*.

Model 6 includes the interaction term between *the number of children* and female educational attainment, for which the coefficient is significantly negative (–0.416) and significant. Consistent with findings by Yu and Xie (2014), this study also suggests that the adverse effect of *the number of children* on married women's LFP is amplified for highly-educated women who suffer from a greater *motherhood penalty*. This finding also helps to understand why more and more women with higher educational attainment and better performance in the labour market are postponing childbirth or even choosing not to have a child.

Model 7 adds the interaction term between *the number of children* and *age*. The coefficient (–0.214) shows that *the number of children* has a stronger negative impact on LFP for women aged 30–39 compared to those aged 20–29. This age group of women often bear a heavier burden of care-giving for both young children on one hand, and the aging elderly on the other. This dilemma of *having old and young at home* makes the negative impact of *the number of children* on FLFP even greater.

## The effect of children's age on married women's LFP

### Basic regression

From the results presented above, it can be confirmed that there exists a negative correlation between *the number of children* and mothers' labour participation. However, the influence of fertility on FLFP is not transient but an ongoing process. In addition to pregnancy and childbirth, children also need to be taken good care of throughout their childhood, which can affect women's LFP. For this reason, it is also necessary to explore the influence of *children's age* on married women's LFP. As a reminder, models presented below only looks at women who have child(ren).

In Table 4, Model 8 incorporates only the key explanatory variable of *children's age*. On the basis of Model 8, women's own characteristics, family factors and regional control are sequentially added to obtain respectively Model 9, Model 10 and Model 11.

The effect of *children's age* on married women's LFP stays consistent across all models. From Model 11, the odds for women with children aged 0–3 to participate in the labour force are about 5 times lower than for those with children aged 8–15 ( $e^{-1.531} \approx 1.53$ ), with all other things being equal.

Compared with women with children aged 8–15, the odds for mothers with children aged 4–7 to get involved in the labour force decrease by about 20 per cent ( $e^{-0.232} \approx 0.79$ ). In short, the younger the child(ren), the more the mother is unlikely to be in the workforce. In short, parenting and daily care for pre-school children seriously hinder mothers' participation in the labour force.

**Table 4.** Effects of the age of the youngest child on married women's LFP.

Variable	Model 8		Model 9		Model 10		Model 11	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Age of the youngest child (8–15 = ref.)								
4–7 years	–0.209*	0.113	–0.187	0.137	–0.229	0.140	–0.232*	0.140
0–3 years	–1.327***	0.096	–1.385***	0.143	–1.526***	0.147	–1.531***	0.148
Number of children	–	–	0.013	0.078	0.019	0.080	0.018	0.080
Women's age	–	–	0.030***	0.009	0.038***	0.009	0.038***	0.009
Age square	–	–	–0.002**	0.001	–0.001	0.001	–0.001	0.001
<i>Hukou</i> (0 = agricultural)								
Non-agricultural	–	–	0.139	0.106	0.038	0.109	0.043	0.109
Education attainment (Low education level = ref.)								
High education level	–	–	1.401***	0.126	1.174***	0.139	1.166***	0.140
Health status (0 = III)								
Healthy	–	–	0.505***	0.170	0.497***	0.174	0.508***	0.175
Husband's education attainment (Low education level = ref.)								
High education level	–	–	–	–	0.289**	0.141	0.282**	0.141
Husband's employment status (Unemployed = 0)								
Employed	–	–	–	–	0.409***	0.121	0.399***	0.121
Grandparental care (0 = no)								
Yes	–	–	–	–	0.958***	0.095	0.965***	0.095
Region (East = ref.)								
Central	–	–	–	–	–	–	–0.30***	0.098
West	–	–	–	–	–	–	–0.181*	0.108
Constant	1.576***	0.077	–0.127	0.393	–1.040**	0.420	–0.892**	0.425
Pseudo R <sup>2</sup>	0.0625		0.1196		0.1504		0.1528	
Log likelihood	–1878		–1764		–1702		–1697	
LR chi <sup>2</sup>	250.47		479.24		602.85		612.44	
Observations			3369					

Note: \*\*\* $P < 0.01$ , \*\* $P < 0.05$ , \* $P < 0.1$ .

**Table 5.** Estimation results of interaction coefficient between female individual characteristics and number of children.

Variables	Model 12	Model 13	Model 14
Children's age	0.220*** (0.017)	0.184*** (0.015)	0.330*** (0.037)
<i>Hukou</i>	0.620*** (0.166)	–	–
Education attainment	–	0.963*** (0.185)	–
Age group 30–39	–	–	0.502*** (0.160)
Age group 40–54	–	–	1.462*** (0.338)
<i>Interactions</i>			
Children's age × <i>Hukou</i>	–0.10*** (0.022)	–	–
Children's age × Education attainment	–	0.071* (0.043)	–
Children's age × Age group 30–39	–	–	–0.137*** (0.041)
Children's age × Age group 40–54	–	–	–0.229*** (0.046)
Other control variables	√	√	√
Constant	–2.056*** (0.359)	–1.775*** (0.261)	–2.102*** (0.271)
Pseudo $R^2$	0.1548	0.1493	0.1549
Log likelihood	–1693	–1704	–1693
LR $\chi^2$	620.4	598.47	621.02

Note: (1) \*\*\* $P < 0.01$ , \*\* $P < 0.05$ , \* $P < 0.1$ ; (2) Standard errors in parentheses.

### Heterogeneity analysis

Models 8–11 have shown that there undoubtedly exists a positive correlation between the *age of children* and married women's LFP. Models 12–14 (Table 5 below) present the heterogeneity of this effect among different groups of women. To simplify the interpretation of interaction variables, *children's age* is implemented as a continuous type variable (0–16), while the *mother's age* is divided into three groups (20–29, 30–39 and 40–54).

Model 12 incorporates the interaction term of *children's age* and *household registration*. The coefficient of the main effect of children's age is 0.220, meaning that for each additional year of children's age, the odds of mothers' LFP will increase by 24.6 per cent ( $e^{0.22} - 1 = 24.6\%$ ). However, the negative coefficient of the interaction term (–0.1) indicates that the effect of the age of children on FLFP is weaker for women with a non-agricultural *hukou* than those with an agricultural one.

Model 13 includes the interaction term for children's age and education. Again, the odds of FLFP increase by about 20 per cent ( $e^{0.184} - 1 = 20\%$ ) for each additional year of children's age, while the odds of highly educated women to participate in the labour force are 2.62 ( $e^{0.963} \approx 2.62$ ) for highly educated women with low education. The positive coefficient (0.071) of the interaction term between children's age and mother's education level indicates that the effect of children's age on LFP is greater for highly educated women compared with lower-educated ones.

Model 14 incorporates the interaction between children's age and mother's age. It shows that the effect of children's age on FLFP is smaller for mothers aged 30–39 (–0.137) and 40–54 (–0.229) than that of mothers aged 20–29.

### Discussion

Using logistic regression models with data from the CFPS 2018, this paper has explored the impact of childbearing and childrearing on married women's non-farming labour participation in two aspects: childbirth (childbearing) and parenting (childrearing). Further, the study assesses whether and how this impact varies depending on women's characteristics.

In the first part of the empirical analysis, it has been found that the presence of one additional child reduces the odds for mother to participate in non-farming labour force by about 20 per cent. Specifically, compared with women who have no child, the odds for women with one child to participate in the labour force decreased by 20.7 per cent, and the odds for women with two and more children to participate in the labour force further decreased by 37.7 per cent. An increase in the number of children means mothers have to put more time and energy into care-giving, and they might have to reduce their time at work or even to quit the labour market.

The interaction analysis shows that the negative effect of the number of children on women's LFP is heterogeneous across different education and age groups of women. The effect of the number of children on LFP is more prominent for women with higher educational attainment and women aged 30-39.

The second part of the empirical analysis has examined the effect of the age of children on FLFP. Compared with women with children aged 8-15, the odds for women with children aged 0-3 to participate in the labour market are divided by 5 (80 per cent lower) while the odds for mothers with children aged 4-7 to be involved in the labour force are decreased by about 20 per cent. This suggests that the presence of pre-schoolers does hinder women's participation in the labour market and such impact is stronger by the presence of older children. The negative influence of fertility on women's labour participation could be a long-term process that has different adverse effects over the life course of the child.

In addition to the effect of childbirth on women's labour participation, parenting and care-giving for children could also be serious impediments. The presence of young children at home might requires more time and energy from the mother, which means a negative impact upon their employment. The study also reflects that despite the current fertility rate in China is low, care-giving for infants and young children by married women continues to compel them to choose not to participate in the labour force.

The interaction analysis reveals that the effect of children's age on mother's LFP differs across different groups of women in terms of *hukou*, age and educational attainment. Compared with urban women, women with an agricultural household registration (*hukou*) are more sensitive to the impact of parenting and care-giving. They are more likely to be unable to participate in the labour market due to the presence of young children.

As children get older, more educated mothers will be more inclined to participate in the labour force. One of the main reasons for this result could be the sizeable urban-rural gap in child-care services in China due to regional differences in socio-economic development. Wu and Wang (2017) have found that 76.1 per cent of urban communities have kindergartens, while only 43.6 per cent of rural villages do. The scarcity of nursery care resources in rural areas might make the age of children a more prominent factor preventing women with an agricultural *hukou* to participate in the labour force.

The constraints by child-birth and parenting could force many women to return to their families. In the context of *the three-child era*, ensuring women's labour participation can not only make up for labour shortage and further release demographic dividend, but also increase women's economic empowerment and promote gender equality. To further promote female labour participation and advance a gender-equal employment

environment, it is necessary to explore and perfect the action strategy of female fertility support and labour market protection in China.

Public services in childcare should have a high priority, so as to promote FLFP. Public care services for young children can promote mothers' labour participation much more effectively than other family policies such as maternity leave and family allowances (Li, 2019). Since China's market transformation, the public nursery care system has gradually shrunk. While the government has increased its investment in compulsory education, it has significantly underinvested in early education and childcare services for infants and young children, therefore generating an imbalance between the supply of and demand for public care services for young children as well as a major barrier for mothers to return to work. Moreover, tax incentives and childbirth subsidies for women with multiple children might also ease the financial burden of raising children and promote full labour participation. In addition, it is possible to draw on the experience from developed countries to establish official law enforcement agencies to guarantee the re-employment of women after child-birth through government-backed employment.

A special case should be put among more vulnerable groups of women for whom childbearing has a bigger impact on labour force participation. Due to the resource imbalance between rural areas and urban regions, the government should unite social forces to establish more childcare institutions in rural areas, to guide rural women to accept public childcare services and to pay attention to early-child education.

Possibly because of their higher cost of childbirth, highly educated women tend to delay or even choose not to have children. Therefore, employers should be more tolerant and have more lenient employment policies with more flexible jobs positions and working hours. Besides, flexible maternity leave and vacation scheduling can ensure women's employment stability and help them mitigate or even avoid the conflict between work and family.

Last but not least, the benefits of childcare services should be promoted, in particular for women with lower educational attainment. The traditional *men outside and women inside* perspective must be changed so as to reduce the adverse effect of childbearing and childrearing on FLFP.

## Conclusion

This study has assessed the impact of the number of children and the age of children on female labour force participation in China. It has arrived at the conclusion that (1) the age of children is positively correlated with the mother's labour participation; (2) the odds of participating in the labour force are decreased by 20.7 per cent and 37.7 per cent for women with one child and women with two or more children respectively compared with women without any children.

However, this research contains some limitations. First, the influence of child-birth and care-giving on mothers' employment is manifested in *two* aspects: one is to make mothers quit the labour market (Herr & Wolfram, 2012) while the other is to impede women's professional advancement as they are more likely to engage in part-time or self-employment jobs with dimmer development prospects (Abendroth et al., 2014; Aisenbrey et al., 2009; Hook & Pettit, 2016). However, this paper only explores the first aspect, and more in-depth research is still needed. Second, the data used are cross-

sectional (one wave), so the causal relationship between child-bearing/rearing and LFP in the empirical analysis cannot be clearly demonstrated. For instance, women who have left their job because of pregnancy are still considered as having no child, thus introducing a bias in the studied population that might underestimate the impact of childbearing and childrearing on female labour force participation. Third, as the study is based on a survey with a limited number of variables, many mitigating factors might be missing, in particular those related to labour market opportunities and cultural values. Finally, given the unique context of agricultural labour in China, the study done this time has only focused only on the non-agricultural factor.

## Note

1. The population is divided into two groups based on its household registration. The *Hukou* dummy variable is coded '0' for respondents with agricultural households and '1' otherwise.

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