



# Dynamic Female Labor Supply: Applications in China

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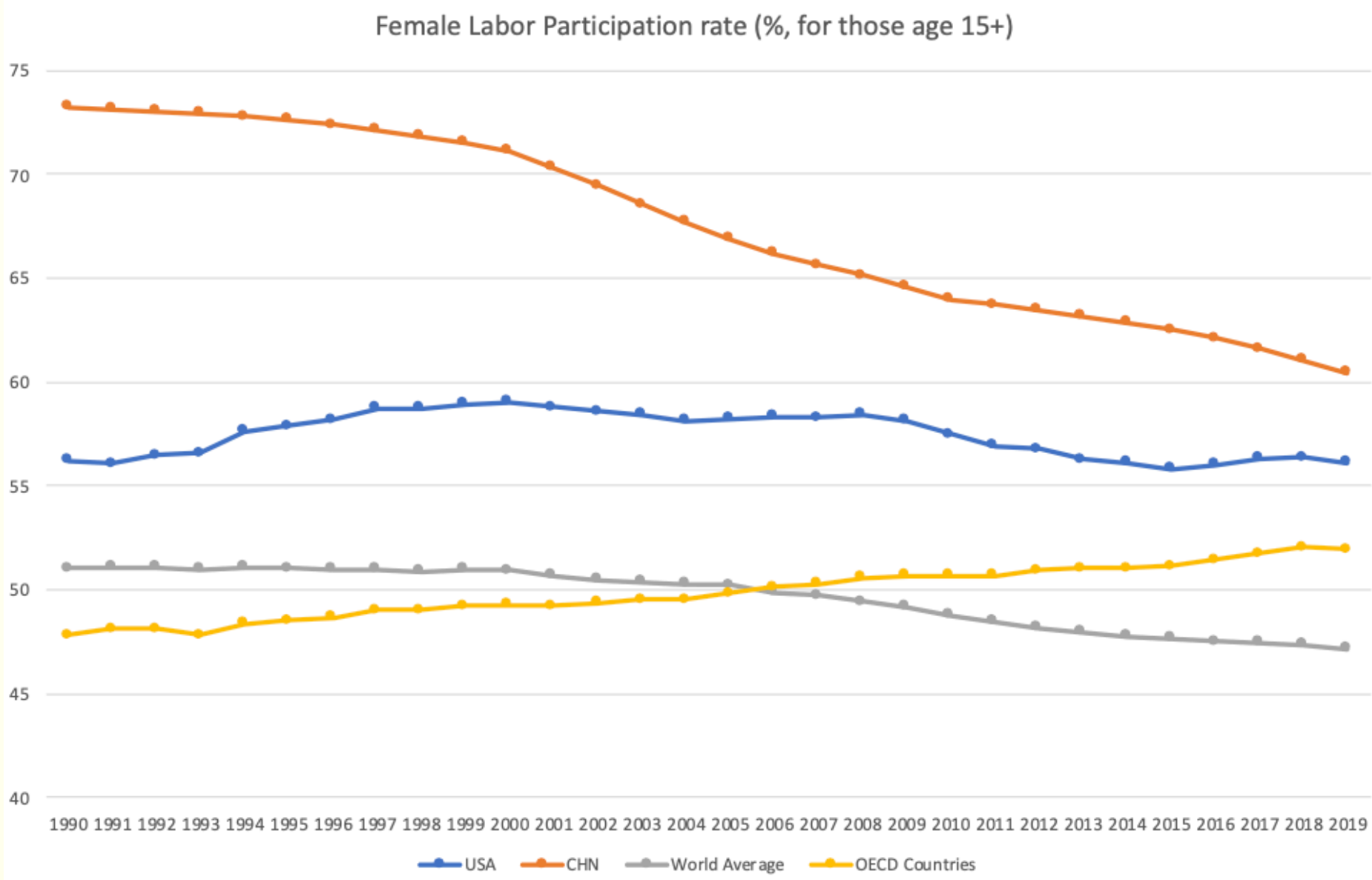


## Background

China experienced similar progress in female rights as other countries in the world since 1980s. For example,

- Increased female education levels
- A rise in the wage of females and narrowed gender wage gap
- Decreased marriage rates and a boom in divorce rates
- A decline in fertility (might mostly due to the implementation of One Child Policy)

However, China experienced decreased female labor participation rate since 1990s.



Many empirical analysis have utilized dynamic life-cycle model proposed by Weiss (1972) and Heckman (1976) to investigate into the determinants of female labor participation. The most influencing ones include the paper by Eckstein and Wolpin in 1989 and the one by Eckstein and Lifshitz in 2011.

## Contributions

Though a wide range of studies has been carried out in discovering the reasons behind increased female labor participation, the blank in literature based on Chinses data still remains unfilled. Therefore, the aim of this study is trying to employ dynamic life-cycle model to tell the Chinese story of dynamic female labor supply. The study will contribute to current literature in the following three ways:

- It is the first study that attempt to apply a dynamic life-cycle model on Chinese micro-level longitudinal data. Its results will provide a new perspective in interpreting the reversed female labor participation trend in China.
- The study modifies the classic life-cycle female labor supply model to fit into the Chinese context.
- It yields comprehensive policy implications. For example, how to encourage Chinese married female in working full-time more effectively.

## Methods

The models in this paper are mainly based on Eckstein and Wolpin (1989). This simplified model only takes the subsample of married women and considers their labor market participation decision in the post child-bearing period.

The model has the following key features:

- The household maximizes a unitary expected value function depending on working status, the number of children, former experience and schooling.

$$E_t \left[ \sum_{k=0}^{T-t} \delta^k U(p_{t+k}, N_{t+k,j}, x_{t+k}, K_{t+k-1}, S) \right]$$

Assuming linear utility function, a women's labor market participation choice at any period t (excluding the final period) can be expressed as:

$$p_t = 1 \iff s_t \geq \ln \left[ -\alpha_1 - \alpha_2 \bar{G}_t^H - \sum_{j=1}^J c_j N_{t,j} + b(1 + \alpha_2) - \alpha_3 K_{t-1} - \sum_{j=1}^J \alpha_{4,j} N_{t,j} - \alpha_5 S + \delta(EV_{t+1}(K_{t+1}) - EV_{t+1}(K_{t-1} + p_t)) - (\beta_1 + \beta_2 + \beta_3 K_{t-1}^2 + \beta_4 S + \beta_5 R_t) \right] \quad (14)$$
$$p_t = 0 \text{ otherwise} \quad (15)$$

## Data

In this paper, we utilize 10 waves of data from China Health and Nutrition Survey (CHNS) in 1989, 1991, 1993, 1997, 2000, 2004, 2006, 2009, 2011, and 2015.

From the data we know that, women in rural areas works more often, thus have more working experience than urban women. However, their income, including their own annual income and husbands' income, are significantly lower than those of urban women. Also, from the data regarding to children we can see that, urban women give birth to children relatively later than rural women, thus making them have more children age under 6 years old and less children age between 6 to 18 years old. Most of the women have a degree of junior high school.

## Results

Parameter estimation results are presented in the table below. The relative number of these estimated parameters are not of our interest and also do not have explicit meanings.

## Labor Market Participation Using CNHS Data

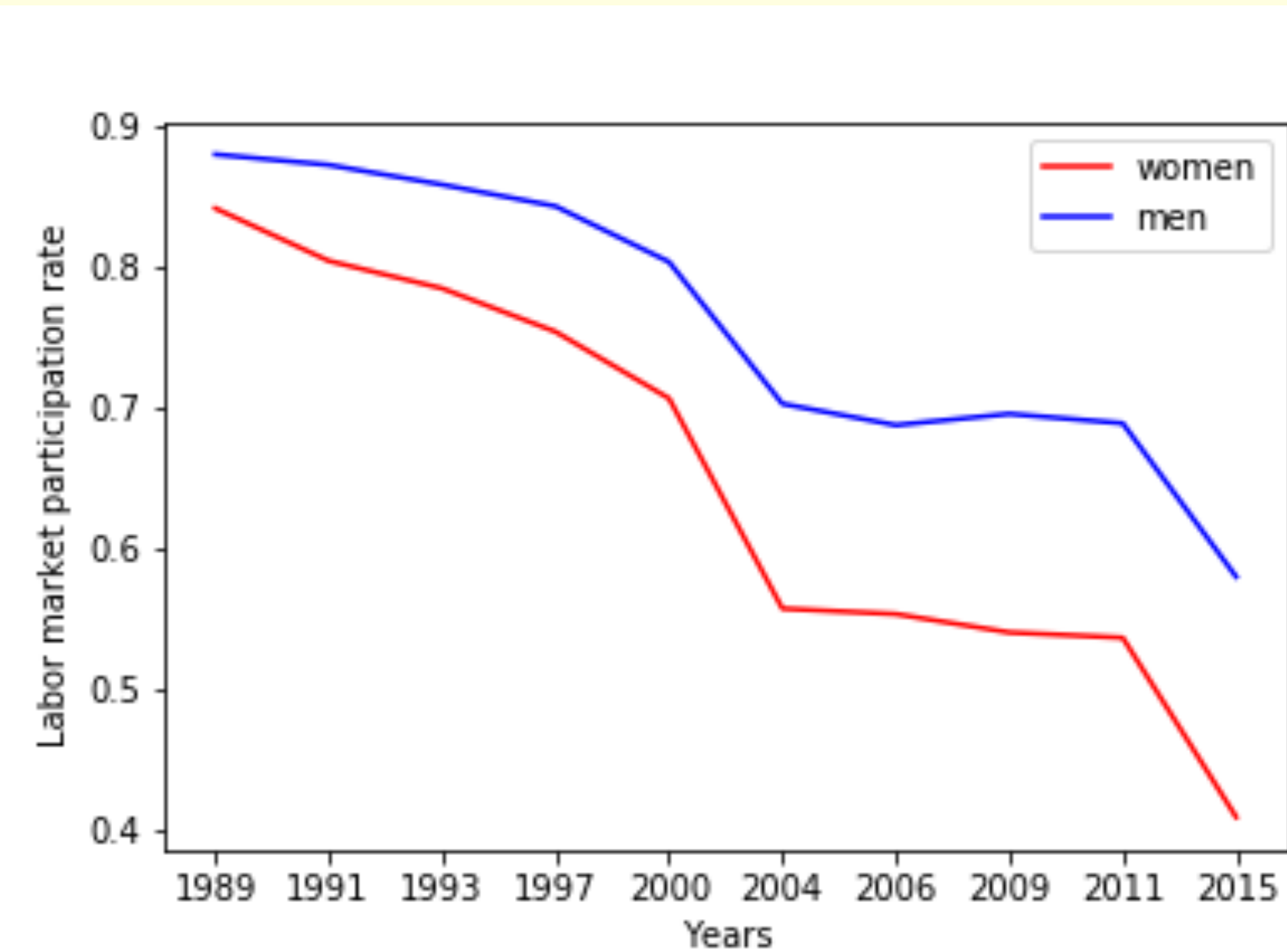
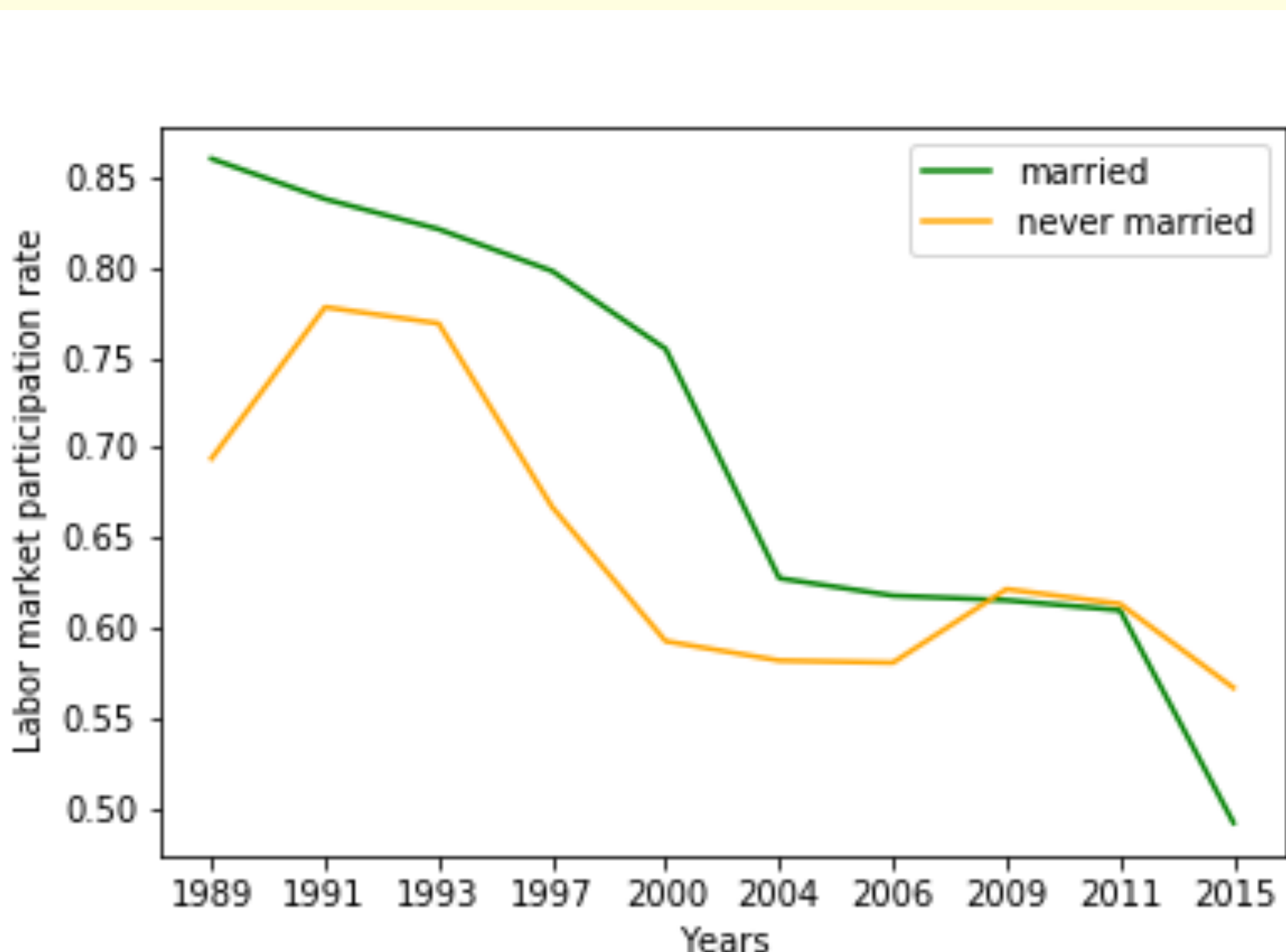


Table 3: Generalized Method of Moments Estimation Results		
Parameters	Logistic Regression (1)	Bayes Logistic Regression (2)
$\alpha_1$	$1.266 \times 10^{15}$	$1.058 \times 10^{15}$
$\alpha_2$	$-3.896 \times 10^8$	$-3.065 \times 10^9$
$\alpha_3$	$2.154 \times 10^{13}$	$2.777 \times 10^{13}$
$\alpha_{41}$	$-1.305 \times 10^{13}$	$3.764 \times 10^{14}$
$\alpha_{42}$	$-3.980 \times 10^{14}$	$-9.879 \times 10^{13}$
$\alpha_5$	$3.871 \times 10^{13}$	$-3.730 \times 10^{13}$
$\beta_1$	8.758	-
$\beta_2$	-0.004	-
$\beta_3$	0.001	-
$\beta_4$	0.083	-
$\beta_5$	0.013	-

Parameter estimation results are presented in the table below. The relative number of these estimated parameters are not of our interest and also do not have explicit meanings.

$\alpha_1 > 0$ , which implies in China, labor market participation actually increases women's utility.  $\alpha_2 < 0$  indicates that the increase in husband's income (or household total consumption) generally discourage women from participating in the labor market. Then we have  $\alpha_3 > 0$ , another variable that is distinct from American data. Chinese woman's utility in working rises when she has more previous experience. Having children, regardless of their age, generally reduces mother's utility from work as  $\alpha_{41} < 0$  and  $\alpha_{42} < 0$ .



From the result we also have  $\alpha_5 > 0$ , woman with higher education are more willing to work, which correspond to the basic understanding.

## Conclusion

- Child are one of the main causes that let Chinese women dropping out of labor force.
- Different from women in western countries, women in China has are more willing to work, with their utility accumulated with previous working experience and current working status.
- As for the policy implications, the Chinese government should put a special emphasis on alleviating the childcare burden of working females, so as to encourage female labor participation more effectively.

## Limitations

There are two main limitations of this analysis:

- Data: CHNS data do not have annual working information. There is also relatively big survey gaps.
- The data suffers perfect separation issues. We try to alleviate this problem by using Bayes logistic regression, the results are presented in column (2) of results table.

## References

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