

Background

- Research Question:** Does having higher fertility probability harm the employment outcomes of female workers?

- Context: The Selective Two-child Policy (STP) in China**

1979: The first One-child Policy

- The Chinese government introduced its very first version of One-child Policy -- a family policy that only allowed one child per household. The policy was strictly enforced for urban residents, who in 1980 accounted for 20% of population but nearly half by 2010.

1984: Relaxation for Rural Couples

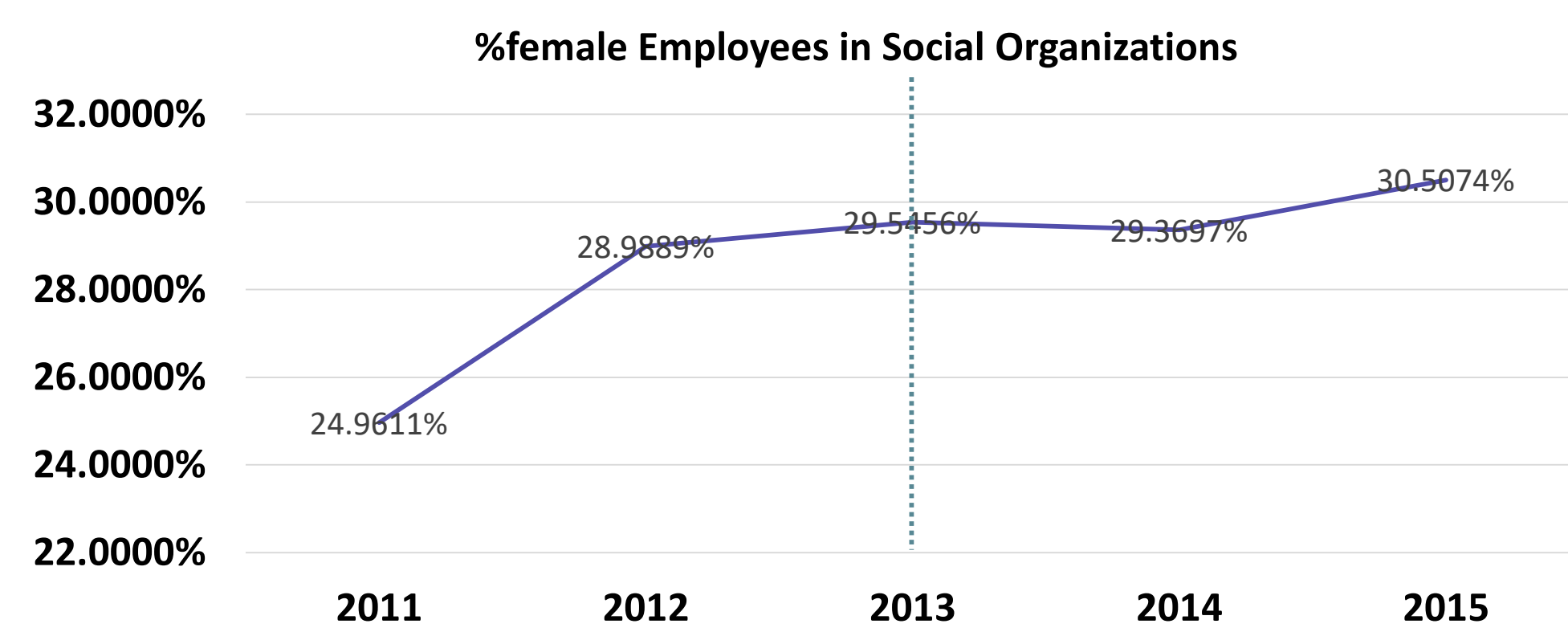
- Rural couples in most provinces were allowed to have more than one child due to the high female *infanticide* rate in some regions.

2013: The Selective Two-child Policy

- China passed the Selective Two-child Policy (STP) that allows at least one of the marital parents was only-child to have two children. The policy is said to mainly target on couples in urban areas.

- Hukou (Chinese Household Registration System):**

- Hukou is the legal right to permanently reside in a Chinese province or city. The system divided the population into two categories—agricultural (rural) and non-agricultural (urban), with the variety of purposes such as allocating social resources and restricting internal migrations. Hukou is inherited from a parent and can only be permanently changed through few ways such as marriage, military services, or long-term employment.



Note: The plot uses the data from the National Bureau of Statistics of China.

Data Source

China Health and Nutrition Study (CHNS)

- A collaborative project between the *Carolina Population Centre* and the *Chinese Centre for Disease Control and Prevention*. It was designed to examine the effects of the health, nutrition, and family planning policies and programs implemented by national and local governments and to see how the social and economic transformation of Chinese society is affecting the health and nutritional status of its population.
- The longitudinal survey covers 11 provinces (in the darker green colour).
- The level of variations are individual, household, and community.
- The years of interest are 2011 and 2015, which are 2 years before and after the SPT respectively.



Methodology

Difference in Difference in Difference (DDD)

- Main regression

$$Empl_{it} = \alpha + \beta_1 \chi_{ijt} + \beta_2 AFTER_{it} + \beta_3 TREAT_{it} + \beta_4 \delta_j + \beta_5 (AFTER_{it} \times TREAT_{it}) + \beta_6 (\delta_j \times AFTER_{it}) + \beta_7 (\delta_j \times TREAT_{it}) + \beta_8 (\delta_j \times AFTER_{it} \times TREAT_{it})$$

- Key variables

- χ_{ijt} : control for unobservable characteristic
- $Empl_{ijt}$: binary variable, equals to 1 when the agent is employed
- $TREAT_{it}$: females of child-bearing age (20 – 50)
- δ_j : whether the agent has urban Hukou status

- β_8 : coefficient of interest

- Interpretation: when β_8 is negative, the policy change decreased the labour force participation for urban females of child-bearing ages.

The Effect of the Selective Two-child Policy on Female Employment in China

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Summary Statistics by Hukou Status

Table 1: Summary Statistics for Workers with Rural Hukou

| Variables | Before the Law | | | After the Law | | |
|--|----------------|----------|----------|---------------|----------|----------|
| | N | Mean | sd. | N | mean | sd. |
| Percentage females | 2026 | 0.477 | 0.5 | 2457 | 0.511 | 0.5 |
| Percentage working | 2018 | 0.943 | 0.232 | 2432 | 0.742 | 0.438 |
| Demographics | | | | | | |
| Highest Education Attainment | 2026 | 1.689 | 1.207 | 2138 | 2.29 | 1.109 |
| Primary School and Under | 821 | 0.405 | | 481 | 0.225 | |
| Middle School | 841 | 0.415 | | 1006 | 0.471 | |
| High School | 219 | 0.108 | | 353 | 0.165 | |
| Technical or Vocational Degree | 75 | 0.037 | | 143 | 0.067 | |
| College Degree | 69 | 0.034 | | 150 | 0.070 | |
| Master's Degree and Above | 1 | 0.001 | | 3 | 0.001 | |
| Average age | 2026 | 45.825 | 11.372 | 2457 | 45.912 | 12.038 |
| Percentage Married | 2026 | 0.905 | 0.294 | 2457 | 0.888 | 0.315 |
| Percentage of Han ethnicity | 2026 | 0.87 | 0.337 | 2457 | 0.87 | 0.336 |
| Employment | | | | | | |
| Average wage | 2026 | 16653.47 | 21867.67 | 2457 | 29399.64 | 52842.41 |
| Average #of hours worked last year | 1865 | 6.941 | 2.662 | 1764 | 7.412 | 2.667 |
| Percentage paid a regular wage last year | 1903 | 0.537 | 0.499 | 1804 | 0.753 | 0.432 |

Table 2: Summary statistics for workers with Urban Hukou

| Variables | Before the Law | | | After the Law | | |
|--|----------------|----------|----------|---------------|----------|--------|
| | N | mean | sd. | N | mean | sd. |
| Percentage females | 2847 | 0.484 | 0.5 | 2725 | 0.49 | 0.5 |
| Percentage working | 2847 | 0.847 | 0.36 | 2717 | 0.812 | 0.391 |
| Demographics | | | | | | |
| Highest Education Attainment | 2841 | 3.348 | 1.446 | 2648 | 3.62 | 1.362 |
| Primary School and Under | 247 | 0.087 | | 142 | 0.054 | |
| Middle School | 699 | 0.246 | | 575 | 0.218 | |
| High School | 555 | 0.195 | | 514 | 0.194 | |
| Technical or Vocational Degree | 446 | 0.157 | | 380 | 0.143 | |
| College Degree | 862 | 0.303 | | 980 | 0.371 | |
| Master's Degree and Above | 32 | 0.011 | | 53 | 0.020 | |
| Average age | 2847 | 44.546 | 10.879 | 2725 | 45.487 | 11.175 |
| Percentage Married | 2847 | 0.885 | 0.319 | 2725 | 0.875 | 0.331 |
| Percentage of Han ethnicity | 2847 | 0.945 | 0.228 | 2725 | 0.924 | 0.266 |
| Employment | | | | | | |
| Average wage | 2847 | 32768.33 | 36042.04 | 2725 | 53605.47 | 135000 |
| Average #of hours worked last year | 2364 | 7.945 | 1.565 | 2168 | 8.099 | 1.837 |
| Percentage paid a regular wage last year | 2412 | 0.96 | 0.196 | 2207 | 0.976 | 0.155 |

Subgroup Heterogeneity

- Since worker's marital status is normally known by the employer, the impact of the STP policy should be different across married and single groups.
- The table below shows a significant increase for single individuals (18.7%), compared with much smaller effect (14.8%) on their married counterpart.

Table 4: Labour force participation by marriage status

| | (1) | (2) |
|-------------------------|---------------------|----------------------------|
| | Single group | Single group with control |
| Treat*After*Urban Hukou | 0.197** (0.088) | 0.187** (0.079) |
| Obs. | 1095 | 1056 |
| | | |
| | (3) | (4) |
| | Married group | Married group with control |
| Treat*After*Urban Hukou | 0.148*** (0.031) | 0.148*** (0.027) |
| Obs. | 8919 | 8552 |

Regression Result

Table 3: Regression results on labour force participation

| | (1) | (2) |
|-------------------------|----------------------|------------------------------------|
| | Change in Employment | Change in Employment with Controls |
| Treat*After*Urban Hukou | 0.154*** (0.029) | 0.156*** (0.025) |
| After | -0.149*** (0.015) | -0.127*** (0.013) |
| Treat | -0.151*** (0.015) | -0.110*** (0.014) |
| Urban Hukou | -0.068*** (0.026) | -0.180*** (0.022) |
| After*Treat | 0.099*** (0.022) | 0.096*** (0.019) |
| After*Urban Hukou | -0.088*** (0.020) | -0.073*** (0.017) |
| Treat*Urban Hukou | 0.116*** (0.021) | 0.154*** (0.018) |
| Obs. | 10014 | 9345 |
| R-squared | 0.064 | 0.211 |

Standard errors are in parenthesis

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

Interpretation

- The coefficient of the 3-way interaction term suggest an increase in labour force participation for treatment group with urban Hukou.
 - After adding demographic controls, the estimate became more precise.
- The result suggests that, after the policy relaxation, females of child-bearing ages are more likely (15.6% increase) to participate in labour force, which is opposite from my expectation.
- It is possible that families who plan to have more children chose to work more.

Placebo Test

Table 5 : Change in labour force participation between 2004 and 2009

| | (1) | (2) | (3) | (4) |
|-------------------------|------------------|----------------------------|----------------------------|-----------------------------|
| | Whole sample | Whole sample with controls | Single group with controls | Married group with controls |
| Treat*After*Urban Hukou | 0.028 (0.030) | 0.017 (0.028) | 0.085 (0.077) | 0.014 (0.030) |
| Obs. | 20842 | 20842 | 2571 | 18271 |

- The placebo test is done by using the same model on the year of 2004 and 2009.
- The result of the test shows a weakly increasing trend over time, however, the estimation is not precise for whole sample or single/married subgroups.

Who left the labour force?

Table 6 : Change in labour force composition by education and wealth levels

| | (1) | (2) | (3) | (4) |
|-------------------------|--------------------------------|---------------------------------|--------------------|------------------------------|
| | High education ¹ | High education with controls | Low education | Low education with controls |
| Treat*After*Urban Hukou | -0.142*** (0.037) | -0.123*** (0.035) | 0.096** (0.039) | 0.083** (0.037) |
| Obs. | 8326 | 8326 | 8326 | 8326 |
| | | | | |
| | (1) | (2) | (3) | (4) |
| | Wealthy household ¹ | Wealthy household with controls | Poor household | Poor household with controls |
| Treat*After*Urban Hukou | -0.053 (0.038) | -0.030 (0.036) | 0.078** (0.037) | 0.039 (0.036) |
| Obs. | 8326 | 8326 | 8326 | 8326 |

Note:

- High education: education level \geq College degree; Wealthy household: household net income \geq 75 percentile of the given year.
- Low education: education level \leq grade 9; Poor Household: household net income \leq 25 percentile of the given year.

Conclusion

- The result suggests that the labour force participation of the treated group increased after the STP.
 - Among them, single females seems to be affected the most.
 - On one hand, it is possible that firms choose to hire more single female workers; on the other hand, some of the married women might voluntarily drop out to have children.
- The STP also changes labour force composition for the treated group.
 - As it is shown in table 6, the proportion of highly educated and wealthier females decreased after the policy change.

To-dos

- The assumptions of DDD need to be verified by plotting the pre-trend graphs of labour force participation by treatment and control groups.
- Since it is still unclear whether the effect is caused by voluntary drop-out or firm' selective hiring, further work needs to be done.