

# Impact of Having Children on Women's Careers



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# Outline

- ❑ **Introduction:** research on the impact of having children on women's income, motivated by gender gap in workplace
- ❑ **Literature Review:** previous research on careers of women having children; negative effects of motherhood; different IV strategies
- ❑ **Data:** China Family Panel Studies, CFPS
- ❑ **Methodology:** challenge of endogeneity; our strategy of instrumental variable (IV)
- ❑ **Results:** key findings and preliminary analysis results
- ❑ **Conclusion:** discuss limitations and next steps

1.

# Introduction

Big Idea, Motivation, Research Question, Summary

# Introduction

- ▷ **BIG IDEA: How to reduce motherhood penalty in women's career in China?**
- ▷ **Motivation:**
  - Gender bias is one of the most popular topics people concerned about in recent years
  - Few studies on developing countries have been conducted
  - Uniqueness of Women labour force participation rate in China

# Introduction

- ▷ **Research Question:** How does having a second child affect women's income?
- ▷ **Why ask this question?**
  - Explores causal effect of having children on income growth
  - Second-child effect may help complement research on first-time mothers
  - The one-and-half child policy in China makes the gender of first child an appropriate IV to solve the endogeneity problem

# 2.

## Literature Review

Previous research on careers of women having children

# Literature Review

- ▶ **Lundborg, Petter; Plug, Erik; Rasmussen, Astrid W. (2017)**
  - “Women with children work and earn less than women without children” can be explained by causation and adverse selection;
  - new IV strategy based on IVF (in vitro fertilization);
  - negative, large, long-lasting fertility effects on careers;
  - decrease in earnings estimated for having children is much more than that for having additional children among women who already have children.

# Literature Review

- ▷ **Markussen, Simen; Strøm, Marte (2015)**
  - Endogeneity of fertility decisions make it complicated to study the causal relationship between motherhood and labor market outcomes;
  - Used biological shocks to estimate the effect of fertility variables;
  - Multiple instruments.



# 3. Data

Data Source, Overview

# Data Overview

- ▷ **Data source:** China Family Panel Studies, CFPS
- ▷ **Time Period:** 2010 - 2016 (Biannual)
- ▷ Annual longitudinal survey of 15,000 families and 30,000 individuals on education, economic activities, and family relationships
- ▷ **Filter:**
  - Female in rural households
  - Select provinces
  - Ethnically Han
  - First Child Alive & Biological
  - Aged between 20 - 40 at time of survey

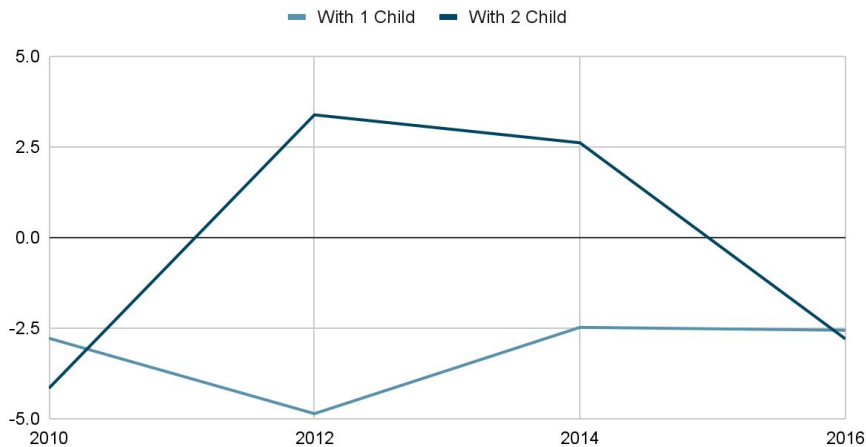
# Data Overview

Observations	8,253
Individuals	4,242
Provinces	22/31
% with Second Child	45.33%
Income Range (Truncated)	0 - 300000

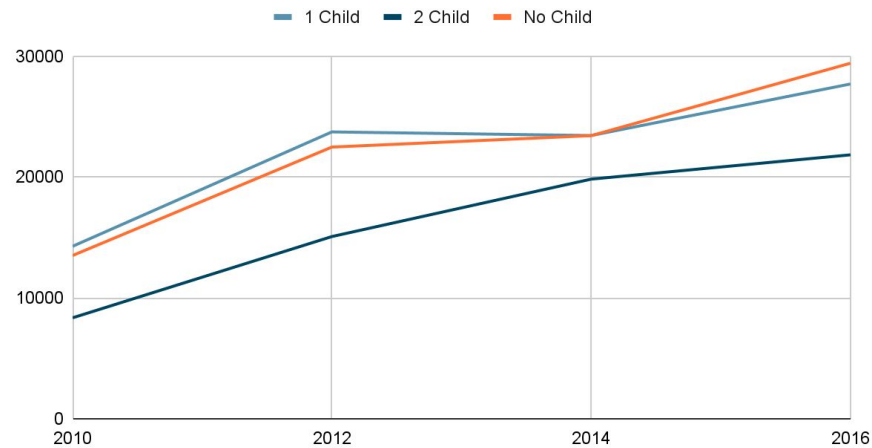
# Exploratory Data Analysis

Quick results by survey year:

% Employed (relative to population)



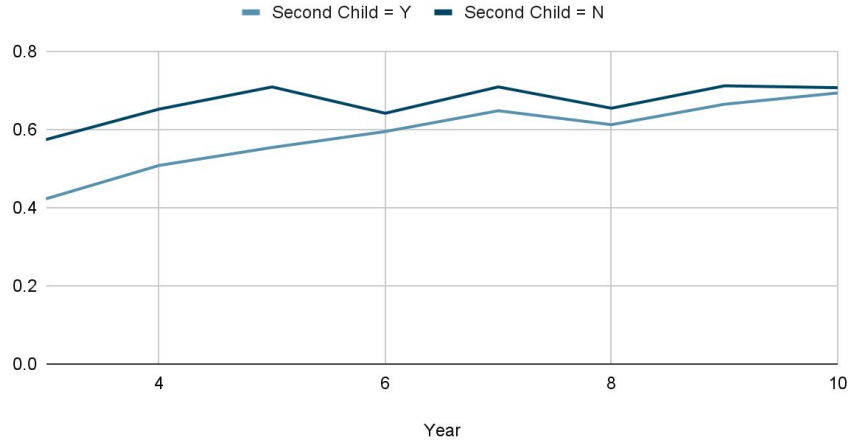
Income of Rural Woman (Employed)



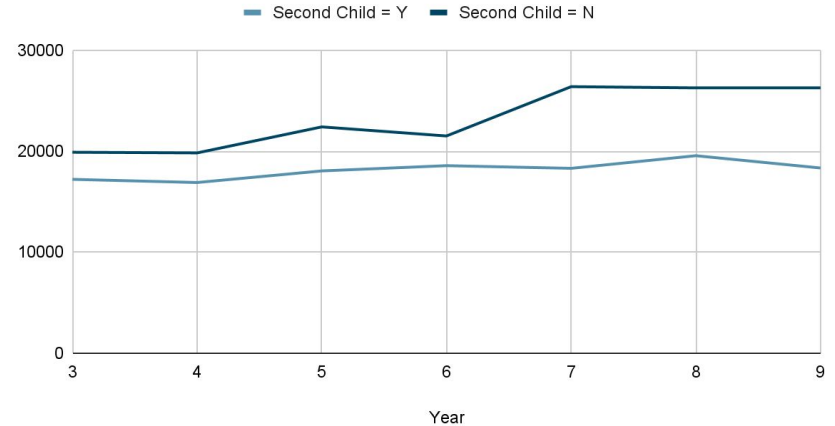
# Exploratory Data Analysis

Quick results by year since first child birth:

% Employed after First Child Birth



Employment Income after first birth



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# Methodology

Challenge, Strategy, Model

# Methodology

- ▶ **Major Challenge of our study:** Endogeneity of motherhood
  - Worker
    - Career-oriented
    - Child-oriented
  - Employer
    - Preference for non-mothers
    - Guess of mindset

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# Instrumental Variable

- ▷ **Our strategy to deal with the challenge:**
  - Consider China's one-and-half child policy (certain rural couples whose first child is a girl can have a second child)
  - Gender of the first child is a great candidate for IV

Household Registry	1st Child Sex	1st Child Sex %	% woman with 2nd child
Rural	Female	49.5%	52.35%
Rural	Male	50.5%	34.74%
Urban	Female	49.1%	18.62%
Urban	Male	50.9%	15.97%



# Baseline Model

Fixed Effect, IV (2SLS) Approach

$$\log(\text{annual\_income}) = \beta_0 + \beta_1 \hat{\text{has\_second\_child}} + \beta_2 \text{living\_at\_home} + \\ \beta_3 \text{highest\_education} + \beta_4 \text{province} + \beta_5 \text{age\_of\_first\_child} + \beta_6 \text{age} + \epsilon$$

$$\text{has\_second\_child} = \mu_0 + \mu_1 \text{first\_child\_sex} + v$$

$$\text{where } \hat{\text{has\_second\_child}} = \hat{\mu}_0 + \hat{\mu}_1 \text{first\_child\_sex}$$

# 5. Results

Key Findings, Preliminary Results

# Preliminary Results

Variable	Coef & Std Error	P-value
have_second_child	-0.069 (0.23)	0.766
highest_education	0.19 (0.02)	0.00
age	-0.0065 (0.006)	0.275
age_first_child	0.00012 (0.00007)	0.088
living_at_home	-0.88 (-0.04)	0.00
province_id (dummy)	NA	NA
constant	10.39 (0.242)	0.00

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# Conclusion

Discuss Limitation and Next Steps

# Limitation & Improvement

- ▷ Agricultural household
  - 1/0 indicator for farming-related occupations
- ▷ Large-scale internal migration
  - Granular variable that analyzes urban/rural status
- ▷ IV Causal effect
  - County level assessment of policy enforcement

# Next Steps

- ▷ Analysis on more variables
  - Human Capital
  - Wage Differentials
  - Work Effort
  - Spousal Condition
- ▷ Try other models
  - Extra IVs
  - Heckman's Selection
  - Mixed Approach

# References

- ❑ China Family Panel studies (cfps). Retrieved October 27, 2021, from <https://opendata.pku.edu.cn/dataverse/CFPS?language=en>.
- ❑ Lundborg, P., Plug, E., and Rasmussen, A. W. (2017). Can women have children and a career? iv evidence from ivf treatments. *American Economic Review*, 107(6):1611– 37.
- ❑ Markussen, Simen; Strøm, Marte (2015) : The effects of motherhood, Memorandum, No. 19/2015, University of Oslo, Department of Economics, Oslo
- ❑ Collings, D., Freeney, Y., and van der Werff, L. (2018). How companies can ensure maternity leave doesn't hurt women's careers.

Thank you!

**Any questions?**