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The Ohio State University

Childbearing and Saving Decisions with Incomplete Financial Markets and Sex Selection

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INTRODUCTION

In many developing countries children are treated as an illiquid asset that provides returns to parents in their old age.

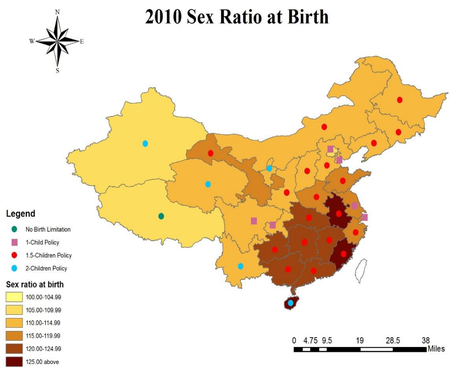
Bearing children to provide financial support in old age is essential due to incomplete financial markets:

1. Transitory income shocks are uninsurable.
2. Borrowing constraint is strict.
3. Lack of old-age security.

Factors childbearing choices:

1. Optimal number of children.
   -- Value diminishes with number of children.
2. Optimal sex composition.
   -- Return at retirement varies across gender.
3. Optimal childbearing time.
   -- Return at retirement varies with child's age

Figure 1. China's Male-Female Birth Ratio (2010)



AIM

To explain childbearing and sex selection decisions in a developing country where

- financial markets are incomplete
- old-age pension and entitlement benefit systems are inadequate or non-existent
- social norms place expectations on children to financially support their parents in old age
- male children are expected to provide greater support than female children.

METHODS

Discrete-time stochastic life-cycle model

- Parents face income risk and are able to borrow and save in the form a liquid asset "cash" and an illiquid asset "children".
- Parents each period observe the size and gender composition of their family, their non-child asset holdings, and their stage in the life-cycle
- Parents must then decide how much cash to hold and whether to have a child and, if so, whether to test for the sex of the resulting fetus and abort if it is female.
- The model lacks closed form solution, solved numerically using orthogonal polynomial collocation and Gaussian quadrature methods.

Simulations for agents with heterogeneous initial wealth, income and sex of fetus.

NOVELTY

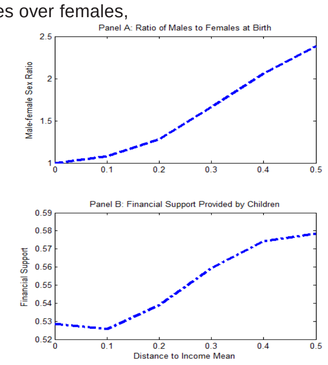
This is the first paper to…

- analyze household childbearing decisions in a dynamic framework that explicitly incorporates number, timing and gender composition of births with incomplete financial markets.
- treat children as illiquid financial assets whose return at retirement varies by date of birth and gender.

RESULTS (One-Child Birth Control)

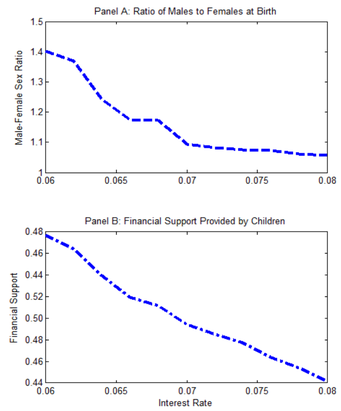
1. Effect of Income Risk on Births

Higher uninsurable income risk will lead to greater number of births and severe sex selection, favoring males over females,



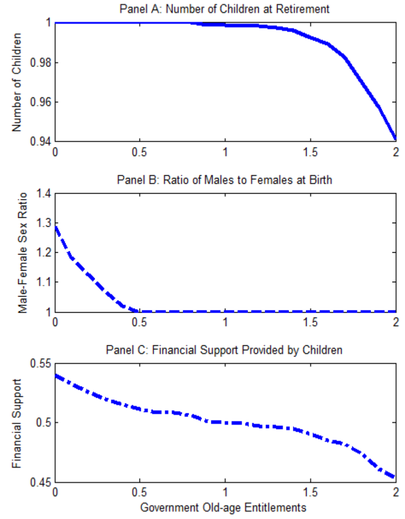
2. Effect of Savings Interest Rate on Childbearing Decisions

Given higher return on cash savings, parents will save more in cash and invest less in children --- they will have fewer children and lessen gender, bringing greater balance to male-female sex ratio



3. The Effect of Old-age entitlements on Births

Adequate old-age entitlements will reduce the number of births, sex ratio at birth and delay the childbearing time.



4. The Effect of Birth Control Scheme on Births

Given incomplete financial market, a more relaxed birth control scheme will reduce the incidence of sex selection.

Maximum allowable number of births	1	2	3	4	5
Number of children at retirement	1	2	2.97	3.77	4.21
Male-Female birth ratio	1.28	1.00	1.00	1.00	1.00
Financial support provided by children	0.54	1.01	1.46	1.81	1.98

5. The Effect of Birth Control Scheme on Savings

Parents save more liquid wealth than they would if they were facing a less-restricted birth constraint.

CONCLUSIONS

1. Greater income risk results in a higher financial support provided by children and, if sex selection is an option, a greater proportion of male births.
2. A higher return on savings reduces the demand for children and the frequency of sex selection.
3. More generous government old-age entitlements reduce number of children and incidence of selective abortion.
4. Parents subject to limits in number of children they may have save more liquid cash than if they were not so restricted.
5. Incomplete financial markets and the One-Child birth control policy **jointly** drive sex selection – relax either, and selection will diminish.

BIBLIOGRAPHY

1. Ahn, N., 1995. Measuring the value of children by sex and age using a dynamic programming model, Review of Economic Studies, 62, 361-379.

2. Becker, G., S., Tomes, N., 1976. Child endowments and the quantity and quality of children, Journal of Political Economy, 84, 143-S162.

3. Choukhmane, T., Coeurdacier, N., and Jin, K., 2014. The One Child Policy and household savings, NBER working paper.

4. Cigno, A., and Rosati, F.C., 1992, The effects of financial markets and social security on saving and fertility behavior in Italy, Journal of Population Economics, 5 (4), 319-341.

5. ---------- 1996, Jointly determined saving and fertility behavior: Theory, and estimates for Germany, Italy, UK and USA, European Economic Review, 40, 1561-1589.

6. Ebenstein, A., 2010, The "missing girls" of China and the unintended consequences of the One Child Policy, Journal of Human Resources, 45 (1), 87-115.

7. Ebenstein, A., and Leung, Steven, 2010, Son preference and access to social insurance: evidence from China's Rural Pension Program, Population and Development Review, 36 (1), 47-70.

8. Miranda, M.J. and Fackler, P.L., 2002. Applied Computational Economics and Finance. Boston, MA: MIT Press.

9. Portner, C.,C., 2001. Children as insurance. Journal of Population Economics, 14, 119-136.