MAJOR PROJECT
ELV781-ML For Econometrics

ANGRIST & EVANS: CHILDREN AND THEIR PARENTS' LABOR SUPPLY

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Contents

List of Figures

List of Tables

1 PROBLEM STATEMENT

Analysis related to the paper "Children and their Parents Labour Supply (Angrist and Evans, 1998)"

ML application in the paper GENERALIZED RANDOM FORESTS (Susan Athey, Julie Tibshirani and Stefan Wager, 2018)

Data : Use SAS dataset for the project

Variables for analysis using causal forests (Y , X , W)

1. Calculate means and standard deviations for Yi , Xi , Wi
   - Check if you have the right sample by comparing your descriptive statistics against those in Table 2 and 6 of Angrist and Evans
2. OLS estimation of Yi on X's and W
   - Results should line up with columns 1, 4 and 7 of Table 7.
   - OLS does not take into account endogenity of Wi (non-random treatment assignment of treatment i.e. fertility decision). So results cannot be interpreted as causal effects.
3. Run causal forest for each Yi
   - Causal tree helps us analyze heterogeneity in a parameter (the effect of a variable).
   - Causal trees do not take into account endogeneity of Wi (non-random treatment assignment of treatment i.e. fertility decision). So results cannot be interpreted as showing causal effects but the exercise will help you learn how to implement causal trees.
4. Optional: IV estimation of Yi on X's , W, Z
   - Zi = "same sex" is an indicator variable that takes on value 1 if the first two children have the same gender
   - Results should line up with columns 2, 5 and 8 of Table 7.

Analysis: Restrict analysis to 1980 data

2 RESULTS

Created the variables(Yi,Xi,Wi) for covariates, instruments, dependent variables using corresponding code in python. We calculated the descriptive statistics(means) for these variables as shown in table 1.

- The samples include women aged 21-35 with 2 or more children except for women whose second child is less than a year old.
- In the 1980 PUMS, the married women sample refers to women who were married at the time of their first birth, married at the time of the survey, and married once
- **Comparing our results (table 1) against those in table 2 of Angrist and Evans**

Table 1: **DESCRIPTIVE STATISTICS, WOMEN AGED 21-35 WITH 2 OR MORE CHILDREN**

Means			
		Married Women	
Variable	**All Womens**	**Wives**	**Husband**
Children ever born	**2.5526**	**2.5081**	–
More than 2 children (= 1 if mother had more than 2 children, =0 otherwise)	**0.4022**	**0.3806**	–
Boy 1st (S1) (= 1 if first child was a boy)	**0.5111**	**0.5144**	–
Boy 2nd (S2) if second child was a boy)	**0.5109**	**0.5124**	–
Two boys (= 1 if first two children were boys)	**0.2637**	**0.2660**	–
Two girls (= 1 if first two children were girls)	**0.2415**	**0.2391**	–
Same sex (= 1 if first two children were the same sex)	**0.5052**	**0.5052**	–
Twins-2 (= 1 if second birth was a twin)	**0.0085**	**0.0083**	–
Age	**30.123**	**30.391**	**33.034**
Age atfirst birth (parent's age in years when first child was born)	**20.137**	**20.829**	**23.977**
Worked for pay (= 1 if worked for pay in year prior to census)	**0.5654**	**0.5282**	**0.9768**
Weeks worked (weeks worked in year prior to census)	**20.833**	**19.019**	**47.951**
Hours/week (average hours worked per week)	**18.800**	**16.700**	**43.487**
Labor income (labor earnings in year prior to census, in 1995 dollars)	**7,161**	**6,252**	**38,910**
Family income (family income in year prior to census, in 1995 dollars)	**42,328**	**47,639**	–
Non-wife income (family income minus wife's labor income, in 1995 dollars)	–	**41,628**	–

- **Comparing our descriptive statistics against those in Table 6 of Angrist and Evans**

Table 2: **OLS ESTIMATES OF MORE THAN 2 CHILDREN EQUATIONS**

	All Women			Married Women		
Independent Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Boy 1st	–	**-0.0079**	–	–	**-0.0109**	**(6)**
Boy 2nd	–	**-0.00897**	–	–	**-0.0105**	–
Same sex	**0.0595**	**0.0610**	–	**0.0664**	**0.0682**	–
Two boys	–	–	–	–	–	–
Two girls	–	–	–	–	–	–
With other covariates	–	–	–	–	–	–

- **Our OLS estimation of Yi on X's and W are reported in table 3.** (Results also lined up with columns 1, 4 and 7 of Angrist & Evans paper Table 7)

Table 3: **OLS ESTIMATES OF LABOR-SUPPLY MODELS USING 1980 CENSUS DATA**

Estimates of the coefficient on the More than 2 children variable			
Dependent Variable	**All Women**	**Married Women**	**Husbands of married women**
Worked for pay	**-0.17366**	**-0.1627**	**-0.00905**
Weeks worked	**-8.7912**	**-7.8383**	**-0.9226**
Hours/week	**-6.4423**	**-5.7529**	**0.02859**
Labor income	**-3624.60**	**-3011.00**	**-1475.97**
ln(Family income)	**-0.1653**	**-0.1527**	–
ln(Non-wife income)	–	–	–

3 REFERENCES

1. Angrist and Evans (1998): Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size link here
2. SAS dataset Reference at click here
3. Linear models python models reference: linearmodels link
4. This is link for latex tutorial: LaTeX-Tutorial.