

# Does public spending on the family in Sweden compensate the higher opportunity costs of children for the high educated?

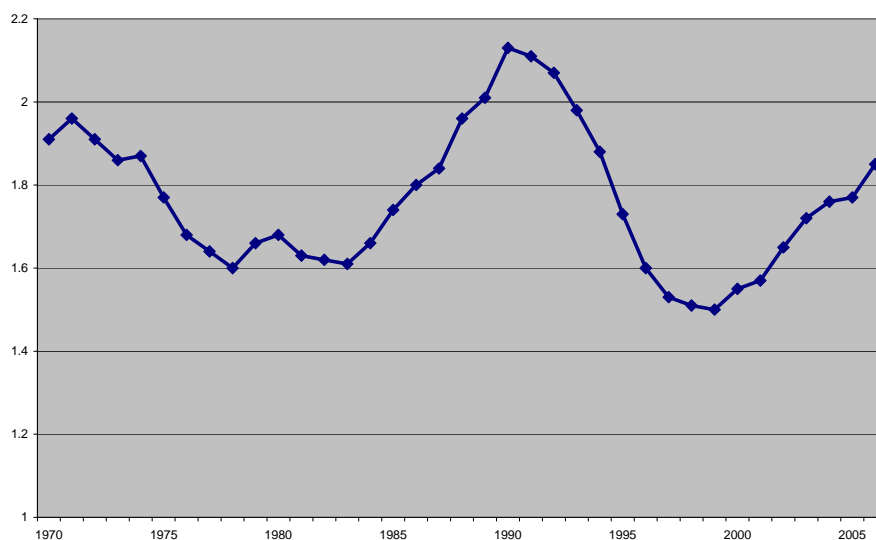
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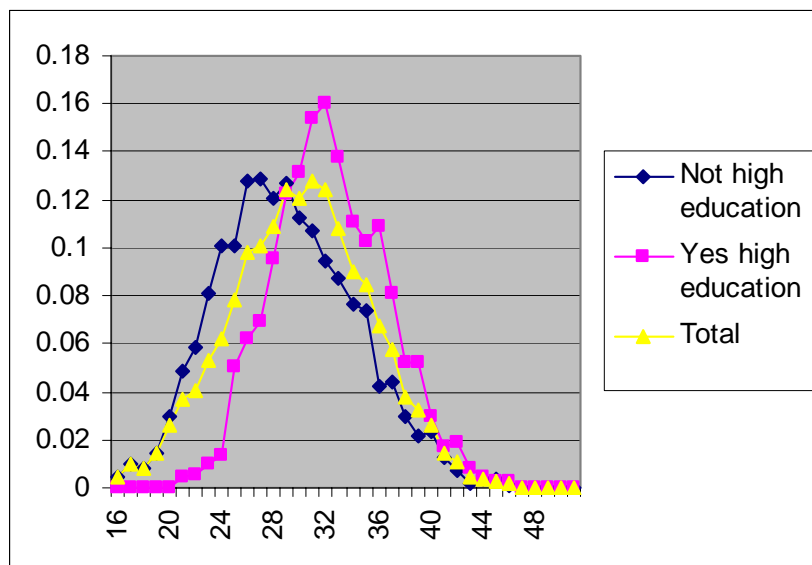
## The Swedish roller-coaster TFR Though cohort fertility almost constant at 2



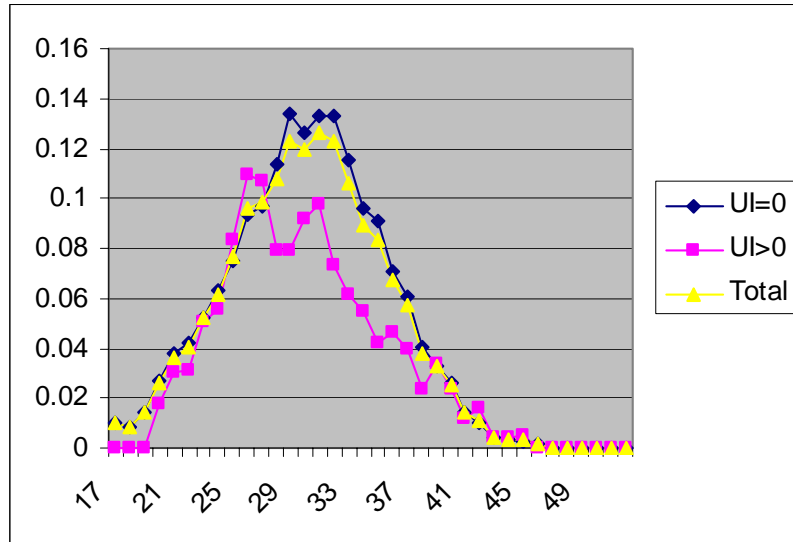
## Family size and public transfers

- *Does public intergenerational transfers compensate higher opportunity costs of children for high educated women?*
- *Not as far we can see but family size increases generally when transfers are increased*

## Probability of new child for women



## Probability of new child for unemployed women



## Subsidy systems 1 Education

- *Entitlement daycare/pre-school (1-12) low fee high subsidies, 80% of pre-school children,*
- *Compulsory school (7-16) Pre-school 6 years added. Public financing (even if private operation)*
- *Upper secondary school (3-4 years) >90% enrolment.*
- *Tertiary education free (but rationed) 50% enrollment (also vocational education)*

## **Subsidy systems 2**

### **Transfers**

- *Universal child allowance 100 EUR a month up to 16-19 years.*
- *Parental leave insurance (80% or more regular income) 390 days (another 3 months at low flat rate) flexible uptake*
- *Until child 12 years parents can stay home for care of sick child at the same replacement rate*
- *Means tested housing allowance mainly supports single parents.*
- *Students get an extra allowance if they have children.*
- *One of the parents, generally the mother also gets extra pension rights for each child.*
- *There are a number of other supports in case of divorce, military service etc., which are of minor importance.*

## **Assumptions**

### **1. The female decides:**

a new child or not

### **2. Child care subsidies complement to labor supply only**

No further effect on budget constraints or objective function

## Hypotheses

1. *Difference in tax rates (TR) with (c) and without (nc) a new child will be decisive*
2. *If children in childcare the mother already has higher tax rates ceteris paribus*
3. *Females having a new child will have higher future tax rates ceteris paribus.*
4. *Females paying state tax will ceteris paribus be less likely to have a child*

## Estimation model

- *Number of children explained by tax rate and control variables:*

$$N_{it} = \alpha + \beta X_{it} + \gamma TR_{it} + \varepsilon_{it}$$

- *TR(labor supply) endogenous both*
  - Because family size jointly determined
  - And because the expected difference in tax rates contingent on new child adds to family size

## Instrument model

- **Month of child birth instrument for tax rate,  $D$**
- **For subgroup who have new child:**

$$[N_{it} | NEW_{it} = 1] = \alpha_1 + \beta_1 X_{it} + \gamma TR_{it} + \varepsilon_{1it}$$

$$TR_{it} = \alpha_2 + \beta_2 X_{it} + \sum_{m=1}^{12} \lambda_m D_{it}^m + \varepsilon_{2it}$$

## Data

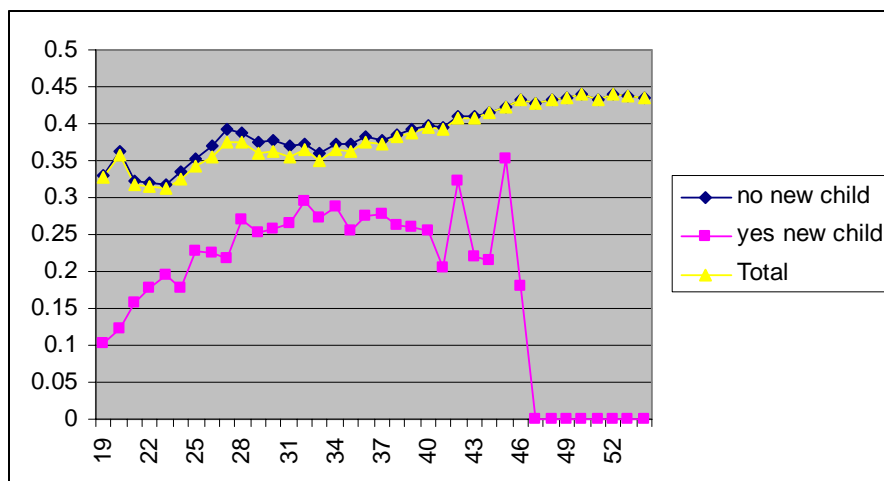
- **LINDA, 3% sample of Swedish population register data, 2000-2003**
- **Only employed females 25-45, final sample 107 679 observations**

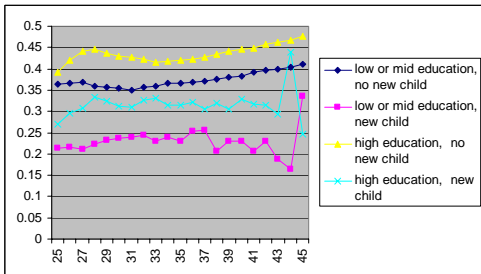
## Some descriptive stats

Variable	Mean	Std. Dev.	Min	Max
Tax_rate	0.421888	0.145929	0	0.995339
Number of children	1.233347	1.101337	0	9
newchild	0.062439	0.2419523	0	1
private	0.503340	0.4999912	0	1
State	0.051689	0.221399	0	1
Local_gov	0.404804	0.490856	0	1
self_empl	0.009598	0.097499	0	1
non_profit_org	0.030569	0.172148	0	1
low_educ	0.081738	0.273966	0	1
mid_educ	0.569970	0.4950823	0	1
High_educ	0.348293	0.476432	0	1
Income (t-1)	209 811.8	154 606.6	0	3.02E+07
if previous child	0.437677	0.496103	0	1

About 2 100 Euro a year

## Net tax rates adjusted for transfer taxation

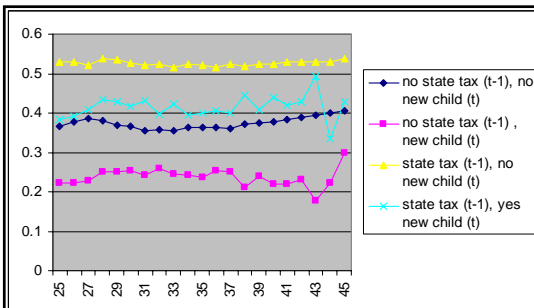
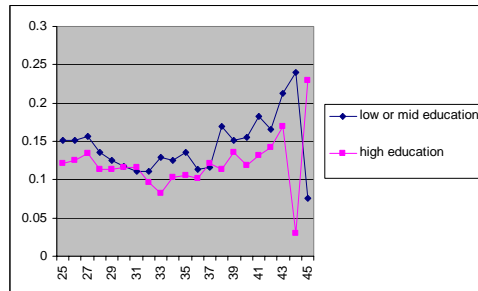




Average net tax rates at different ages

Education level and contingent on new child

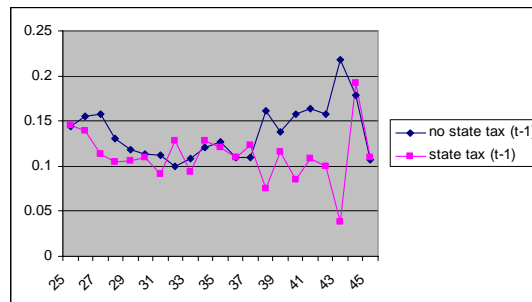
Difference in tax rate  
No new child and new child resp



Average net tax rates at different ages

State tax paid or not and contingent on new child

Difference in tax rate  
No new child and new child resp





## Child care subsidy (NTA estimate) annual average for children of age 0-12

Age	0	1	2	3	4	5	6
SEK	1 618	38 161	72 878	76 310	80 319	80 919	23 549
Age	7	8	9	10	11	12	
SEK	21 900	20 423	16 623	5 893	2 493	1 326	

1 000 SEK is approximately \$155 or Euro 108, so for 2-5 years old children the subsidy amounts to around 7 000-8 000 a year and more if there are siblings.

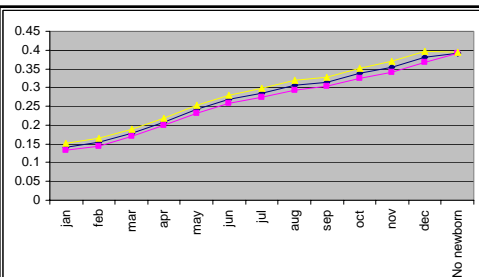
In general pre-school fees will be less than a third of the subsidy

## Family size

Variable	OLS	Fixed effects
pays state tax	-0.261***	-0.120***
low_educ	0.053***	0.056*
high_educ	-0.174***	-0.083***
state	-0.062***	-0.028*
local_gov	0.156***	-0.016*
self_empl	0.006	0.018
Income (t-1)*10 <sup>-6</sup>	0.134*	-0.055***
student	-0.051***	0.002
General_educ	-0.047	0.013
Pedagogics~c	0.072*	-0.014
Arts_subje~c	-0.309***	-0.010
Social_sci~c	-0.087**	-0.003
Natural_sc~c	-0.130***	-0.010
Engineerin~c	-0.064*	0.027
Agricultur~c	ref	ref
Health_educ	0.059*	0.001

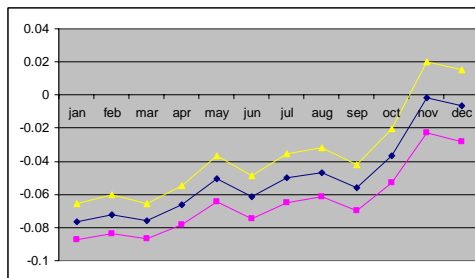
**Tax rate(paying state tax, childcare subsidy)  
(inversely related to labor supply)**

Variable	OLS	OLS	OLS	Fixed eff	Fixed eff	Fixed eff
CC*10 <sup>-6</sup>	-0.491***	-0.492***	-0.491***	0.020	0.020	0.017
Pays state tax*new child		0.054***	0.046***		0.036***	0.031***
Low educ *new child			-0.013			-0.019*
high educ *new child			0.027***			0.017***
Pays state tax	0.074***	0.072***	0.073***	0.064***	0.062***	0.063***
Newchild	-0.120***	-0.126***	-0.135***	-0.057***	-0.060***	-0.066***
low educ	-0.029***	-0.030***	-0.029***	-0.051***	-0.051***	-0.051***
mid educ (ref)						
high educ	0.023***	0.023***	0.021***	0.009*	0.009*	0.008*
income(t-1) *10 <sup>-6</sup>	0.109*	0.109*	0.109*	0.006	0.005	0.005
two children or more	-0.026***	-0.026***	-0.026***	-0.046***	-0.046***	-0.046***



Average tax rate by month of birth of new child

Probability of paying state tax by month of birth of new child



## Family size

Variable	IV1	OLS1	IV2	OLS2	IV3	OLS3
Tax rate	-1.853***	-1.443***	-1.613***	-1.408***	-1.600***	-1.399***
	-21.34	-22.69	-15.82	-21.04	-15.33	-20.79
If paying state tax			-0.377***	-0.070		
			-4.53	-1.72		
tax rate * If paying state tax					-0.752***	-0.164*
					-4.39	-2.00
high_educ	-0.105***	-0.129***	-0.096***	-0.127***	-0.096***	-0.126***
	-5.07	-6.35	-4.63	-6.24	-4.63	-6.22
low_educ	0.264***	0.283***	0.268***	0.283***	0.269***	0.284***
	5.95	6.41	6.02	6.42	6.03	6.42
N	6706	6706	6706	6706	6706	6706

## Conclusions

- ***We find no evidence that high educated are compensated relative to low educated***
- ***...but it may be due to insufficient measurement precision***
- ***There is evidence that subsidies does raise TFR moderately***
- ***... but we can't say if that is just a tempo effect***