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Child care demand: the case of north-western part of Switzerland

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Contents

Introduction

- Parents face considerable challenges when they try to reconcile their work and family commitments.
- What does it means?
  - Changes in the fertility rate (lower).
  - Sacrifice in term of careers.
  - Sacrifice in term of time spent with their children.
  - Health and stress risks.
  - Difficulties to find a good work/family balance and a stronger parent-child and parent-parent relationships.
- From private to public (or non-profit). The supply is lower than the demand.

Introduction

- And the Government? What can Government do? How?
- There are many different reasons why Government invests in family-friendly policies:
  - Enhancing equity between different income groups, family types and men and women;
  - Promoting child development;
  - Ensuring future labor supply (economic growth and societal development).
- Government needs informations about preferences (demand).

Objective

- An empirical analysis about preferences of households, with respect to:
  - School lunch service;
  - After-school service.
- What does it mean?
  - Actual and hypothetical situation
  - Variables that influence the demand
  - WTP (Willingness to pay)

Review of literature

- 2 possibilities:
  - Child care and labor market
  - Demand for child care services (preferences)
- New topic of research!
- About child care and labor market:
  - Kreyenfeld e Hank (2000); Michalopoulus e Robins (2002); Del Boca et al. (2004)
  - Anderson e Levine (2000); Chevalier e Viitanen (2002); Connelly e Kimmel (2003); Del Boca et al. (2004)
  - Del Boca et al. (2004)

Mothodology and model

- Stated preferences approach.
- We want to model the choice of a hypothetical service.
- The analysis is based on the RUT (random utility theory).
  - Suppose that U_a is the utility of service A and U_b that of service B. The observed choice between the two reveals which one provides the greater utility, but not the unobservable utilities. A common formulation is the linear random utility model:
  - $U_a = x'\beta_a + \varepsilon_a$ and $U_b = x'\beta_b + \varepsilon_b$
- In our case we used the bivariate probit model.

The study

- Switzerland: 26 cantons with different solutions
- 4 Cantons (AG, BL, BS and SO) needed informations about:
  - School lunch
  - After-school
- 2007-2008

- Development of a questionnaire (who, interview by phone)
- Pre-test ➔ interview too long

Dataset

- 905 households:

Canton	Frequency	%
AG	226	24.97
BL	227	25.08
BS	227	25.08
SO	225	24.86
Total	**905**	**100**

Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MT	905	.5966851	.4908342	0	1
NM	905	.5878453	.4924949	0	1
Età	905	9.245304	2.721502	5	15
naz	905	.8298343	.3759861	0	1
Gemeindetyp	905	.8309392	.3750128	0	1
reddito	882	4.132653	1.342351	1	7
Lavoro_tot~d	882	112.6327	31.70138	63.27039	157.0339
dritte	905	.4718232	.4994815	0	1
Genitori	905	.841989	.3649531	0	1
Bambini	905	.2176796	.4128965	0	1
Form_uni	905	.0861878	.2807964	0	1

Problem

- Problem: endogeneity of "work".

- Solution: instrumental variable (IV).
  - We estimate the level of work with some variables, and then we used the results (predicted values) to estimate our model.

```
. reg Lavoro_tot  Genitori_lavorano Form_uni reddito
```

Source	SS	df	MS		
Model	885385.505	3	295128.502	Number of obs	= 882
Residual	683839.474	878	778.860449	F(3, 878)	= 378.92
				Prob > F	= 0.0000
Total	1569224.98	881	1781.18613	R-squared	= 0.5642
				Adj R-squared	= 0.5627
				Root MSE	= 27.908

Lavoro_tot	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Genitori_l~o	58.29486	1.956236	29.75	0.000	54.36541	62.0443
Form_uni	3.672724	3.590747	1.02	0.307	-3.374726	10.72017
reddito	5.314324	.7641669	6.95	0.000	3.814517	6.814132
_cons	57.95606	3.157542	18.35	0.000	51.75885	64.15327

Results

Bivariate probit regression — Number of obs = 882; Wald chi2(18) = 151.17; Prob > chi2 = 0.0000

Log likelihood = -1049.0186

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
MT						
Età	.0139805	.0100557	0.77	0.439	-.0214079	.049369
naz	-.1409083	.1215109	-1.16	0.246	-.3790654	.0972487
Gemeindetyp	.3263017	.118155	2.76	0.006	.0947223	.5578812
reddito	.0706954	.0389628	1.81	0.070	-.0056703	.1470611
Lavoro_tot~d	-.001116	.0018371	-0.61	0.544	-.0047167	.0024847
dritte	.5096415	.0978702	5.21	0.000	.3178195	.7014635
Genitori	-.3259755	.1523117	-2.14	0.032	-.6245009	-.0274501
Bambini	.1187903	.1175428	1.01	0.312	-.1115895	.34917
Form_uni	.14077	.1767398	0.80	0.426	-.2056336	.4871737
_cons	-.1784917	.2842278	-0.63	0.530	-.7355679	.3785845
NM						
Età	-.1086195	.0103972	-5.90	0.000	-.1446773	-.0725617
naz	-.1116136	.1225887	-0.91	0.363	-.351883	.1286558
Gemeindetyp	.095613	.1194246	0.80	0.423	-.1384549	.3296808
reddito	.0327116	.0393331	0.83	0.406	-.0443798	.1098031
Lavoro_tot~d	-.0008969	.0018726	-0.48	0.632	-.0045672	.0027734
dritte	.5179631	.0988764	5.24	0.000	.3241688	.7117573
Genitori	-.308574	.1548544	-1.99	0.046	-.6120829	-.005065
Bambini	.1439822	.1208551	1.19	0.234	-.0928895	.3808539
Form_uni	.2684422	.1833965	1.46	0.143	-.0910083	.6278927
_cons	1.212777	.291247	4.16	0.000	.641943	1.78361
/athrho	.5693239	.0629949	9.04	0.000	.4458562	.6927915
rho	.5148625	.046296			.4184868	.5997723

Likelihood-ratio test of rho=0: chi2(1) = 90.5404 Prob > chi2 = 0.0000

Comments

- Significancy:
  - School lunch: city/land, revenue, child cared by other person, both parents live with child.
  - After-school: age, child cared by other person, both parents live with child.
- Signs:
  - Age (+/-)
  - Predicted level of work (-)
  - Parents (-)
  - Other children (+)
- Rho-value:
  - 0 ➔ better to estimate with 2 separate models
  - 1 ➔ 100% correlation between error terms
  - In our case: 0.515

Next steps…

- Paper
- New model: count data
  - *Q = f(price, income, …, age, education, …)*
- New dataset: Lugano

Appendix - Model

- If we consider the choice to use the school lunch and the choice to use the after-school service like a simultaneous decision, we can use a bivariate probit model for the estimation. This kind of model is a natural extension of the probit model when we consider more than one equation, with correlated disturbances. The general specification for a two-equation model would be:
  - $y_1^* = x_1'\beta_1 + \varepsilon_1$, $y_1 = 1$ if $y_1^* > 0$, 0 otherwise
  - $y_2^* = x_2'\beta_2 + \varepsilon_2$, $y_2 = 1$ if $y_2^* > 0$, 0 otherwise
    - $E[\varepsilon_1 \mid x_1, x_2] = E[\varepsilon_2 \mid x_1, x_2] = 0$
    - $Var[\varepsilon_1 \mid x_1, x_2] = Var[\varepsilon_2 \mid x_1, x_2] = 1$
    - $Cov[\varepsilon_1, \varepsilon_2 \mid x_1, x_2] = \rho$