
NOTES D'ÉTUDES

ET DE RECHERCHE

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FINANCIAL CONSTRAINTS AND FERTILITY**

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Opportunity Costs of Having a Child, Financial Constraints and Fertility

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Résumé :

La théorie économique suppose souvent l'influence simultanée sur la fécondité d'effets de coûts d'opportunité de l'enfant et d'effets de contrainte financière. La présente analyse vise à tester l'existence simultanée de ces deux types d'effets à partir des réponses à une enquête originale réalisée en 2003 auprès d'environ 1000 salariés français et renseignant sur leur renoncement à un ou des enfants supplémentaire(s). L'analyse statistique est réalisée avec une approche « toutes choses égales par ailleurs » via l'estimation de modèles logistiques. Les résultats des estimations apportent une forte confirmation à la présence simultanée de ces deux types d'effets.

Mots clés : Taille de Famille, Fécondité, Conciliation Travail-Famille

Classification JEL : D10, J13, J22

Abstract:

Economic theory often assumes that the opportunity costs of having a child and financial constraints have a simultaneous but opposite influence on fertility. This empirical paper aims to test the concomitance of these effects using the answers to an original survey carried out in 2003 amongst nearly 1,000 French employees, giving information about the impact of their working schedule on the number of children they intend to have. The statistical analysis, based on a "ceteris paribus" approach using Logit estimates, strongly confirms the simultaneous presence of these two explanatory dimensions.

Keywords: Family Size, Fertility, Work-Life Balance

JEL Classification: D10, J13, J22

1. Introduction

The question of fertility determinants has been abundantly addressed in the literature. Apart from the personal satisfaction derived from having children, numerous factors are usually stressed, in particular (i) the direct cost of a child, in other words a financial constraint that would justify appropriate measures being taken in terms of family policy, and (ii) the opportunity cost of having a child, that is, the discounted cost associated with professional career gaps, themselves brought about by the presence of children and time spent bringing them up (cf. Becker, 1991, and, for a survey of literature, Laroque and Salanié, 2005).

A recent survey on quality of life and family life carried out by the European Foundation for the Improvement of Living and Working Conditions in 28 European countries pointed out that one third of the women interviewed had not attained their desired number of children (cf. Fahey and Spéder, 2004), and that this was especially true for well-qualified women. This observation, already highlighted in previous works (cf. for instance Quesnel-Vallée and Morgan, 2004), seems to confirm the existence of opportunity costs. Financial constraints stem from high-income households' ability to more easily delegate part of childcare and education to service providers (childminders, day nurseries, etc.). Opportunity costs increase with socio-economic status and income, while financial constraints decrease with them. The simultaneous and opposite influence of these two variables on fertility has been frequently modelled in a theoretical context (cf. for instance Apps and Rees, 2004), but rarely corroborated by empirical studies. In industrialized countries, the strong rise over the last few decades in women's average level of education has inflated opportunity costs, thereby giving an incentive to implement family policies aimed at maintaining or raising fertility rates (Cf. Iyigun, 1996).

Interactions between fertility and female labour supply are complex (cf. Angrist and Evans, 1998, Chiappori, Blundell and Meghir, 2004, and Laroque and Salanié, 2005):

- The analyses on individual data seem to rely particularly on specifications and data sources. On the basis of French data, Laroque and Salanié (2005) point out that family policies consisting of financial transfers would have a significant impact on fertility, but also report that their previous evaluations based on cruder specifications led to different conclusions (a very weak, or conversely, a greater impact). Using US data, Angrist and Evans (1998) demonstrated that the higher the socio-economic status, the less women leave the labour market after having a child, which indirectly confirms the existence of opportunity costs. Other papers, like Powell (1998) or Connely and Kimmel (2003) on Canadian and US data respectively, have shown that the labour market participation of women that have at least one child increases with their potential wage (associated with level of education and professional experience, among other variables), thereby bearing out opportunity costs, but decreases with the cost of childcare, corroborating the presence of financial constraints. An important study by Chun and Oh (2002) on Korean data finds that fertility appears to be influenced positively by income (financial constraint), but negatively by level of education (opportunity costs).
- Using macroeconomic data, Brewster and Rindfuss (2000) have shown that the correlation between fertility rates and female participation rates, which used to be negative, has become strongly positive in recent years: since the 1990s, OECD countries (and in particular European Union-15 countries) that have the lowest fertility rates are also those that display the lowest female participation rates (e.g. Spain, Greece and Italy). By contrast, among industrialised countries, the United States is the one in which adult women are both the most fertile and the most economically active. With these macroeconomic data, the average financial constraint is very indirectly assessed by GDP per capita, an

approach which is open to criticism. In less developed countries with low GDP per capita, the means and culture of contraception are less widespread. Moreover, children may be substituted for non-existent retirement insurance, which can lead to a negative correlation between GDP per capita and fertility. However, within a cross-country framework, Panopoulou and Tsakoglou (1999) indicated that fertility appears to increase with GDP per capita but to decrease with women's average level of education, corroborating the opposite effects of financial constraint and opportunity costs. Lorgelly, Knowles and Owen (2001) found quadratic relations between these variables, thus signifying a more complex relation.

The simultaneous influence on fertility of opportunity costs and financial constraint is here tackled through an empirical analysis of the determinants of the number of children people intend to have (if any). This paper investigates the answers of nearly 1,000 French employees to a survey carried out in 2003 by the *IPSOS Institute for Chronopost*. The survey consists of specific questions related to the number of children people choose to have. To capture these factors effectively, numerous variables of this database are taken into account simultaneously, evaluating their *ceteris paribus* influence by means of estimates of logistic models. Although interesting results can be drawn from this approach, a complete analysis is seemingly difficult to provide. Indeed, this survey only deals with employees, and consequently ignores those (women, in particular) who have given up paid employment because of the difficulty of reconciling work and family life. Moreover, a number of cultural factors that are central to this kind of issue are left out (e.g. sharing of domestic tasks). A detailed presentation of this survey and its main outcomes is provided in Cette, Dromel and Méda (2005).

2. Data and the “ceteris paribus” approach

The IPSOS–Chronopost survey on reconciling work and family life, carried out between June and July 2003, interviewed 999 employees, out of 2,009 representative individuals of the French population over the age of 15. The representative nature of the sample was guaranteed by the quota method, based on gender, age, head of household and interviewee's occupations, following stratification by region and size of agglomeration. Employees were interviewed at home by telephone. The survey's questionnaire was drawn up by a team of experts. After eliminating “non-replies”, the sample was reduced to 955 employees. The question about the number of children people choose to have is formulated as follows:

“According to you, overall, the effect of your working schedule on the number of children you intend to have is: very significant, quite significant, not very significant, or not significant at all?”

Estimating logistic models makes it possible to characterise the “ceteris paribus” statistical relationship between binary explanatory variables and a variable of interest, in this case the answer to the question about choices regarding children. As the four possible answer modalities can clearly be ranked in order, the polytomous ordered Logit specification was chosen. A Score test for the “proportional odds assumption” confirmed this choice. In logistic estimates, for each explanatory variable, one modality is selected as the reference category, and is opposed to other item(s). For regressors that can take several modalities (e.g. number of children), one of the extreme modalities (no child) is selected as the reference category and is opposed to each other modality. Lastly, for continuous modalities (e.g. monthly household income) brackets of possible answers were constructed. Household financial constraints are taken into account by means of variables of monthly income. The opportunity cost of having a child in terms of a professional career can be captured by socio-economic status or education variables.

Estimates of five models are presented, distinguished by the nature and the number of selected explanatory dimensions: monthly household income in model 1; socio-economic status in model 2; level of education in model 3; household income and socio-economic status in model 4; and all selected state variables except for level of education in model 5.

Education variables, which proved to be non-significant both for model 3 and preliminary estimates of model 5, were neglected. Furthermore, the specific nature of the French education system (in which study continues at “Grandes Ecoles”, universities and vocational training institutions for the same number of years after the *baccalauréat*), can make the identification of opportunity costs extremely complex. The at first sight possible colinearity between household income and socio-economic status modifies neither the stability of the results nor their robustness. Previous estimates of Model 5, which did not include household income or socio-economic status, showed that taking both dimensions in the list of regressors only marginally affects the estimate coefficients, without distorting good-fitting (LR, Wald, Score), good-specification and predictive capacity (percent concordant) tests. In addition, some explanatory variables initially used were excluded from final estimates, either because of a lack of significance, or to minimize risks of endogeneity and mechanical redundancies with respect to other dimensions (economic sector, company size, spouse’s socio-economic status etc.). Lastly, the first estimates of Model 5 showed the value of crossing gender and age variables, rather than juxtaposing them. Thus, while men and women aged between 15 and 30 appear not to feel differently about the impact of their working schedule on their desired number of children, this similarity does not seem to hold true for older people.

3. The Results

Estimate outcomes tend to show that (Cf. Table):

- The lower the monthly household income, the greater the impact of working schedules on the desired number of children (Model 1). The assumption according to which financial constraints influence fertility is corroborated;
- The higher the employee’s socio-economic status, the stronger the influence of his/her working schedule on the desired number of children (Model 2). The assumption according to which the opportunity costs of having a child influences fertility is also corroborated;
- The two previous results are slightly reinforced when both explanatory dimensions are taken into account simultaneously (Model 4 compared with Models 1 and 2). This result suggests that, in view of the negative correlation between the two, financial constraint effects on fertility can be underestimated if opportunity cost effects are not studied simultaneously;
- Young people (irrespective of their gender) report more frequently than other employees a strong impact of their working schedule on their desired number of children (Model 5). Note that women over 40 still report this impact, though less significantly;
- Employees without children report more frequently than others a strong impact of their working schedule on their desired number of children (Model 5);
- Full-time employees report more frequently than others (those in part-time employment, and even more so if this part-time employment is not a choice) a strong impact of their working schedule on their desired number of children (Model 5);
- Employees that have spouse who works report more frequently than others a strong impact of their working schedule on their desired number of children (Model 5).

4. Concluding remarks

After Chun and Oh (2002) analysis on Korean data the present paper brings, on original individual French data, a new direct empirical confirmation of simultaneous opportunity costs and financial constraints effects on fertility. These results may feed discussions on government policies aimed at raising fertility, the cornerstone of which is improving the balance between work and family life. But these policies should not be restricted to financial aspects: some complementary estimates (cf. Cette, Dromel and Méda, 2005) have also shown an impact on fertility of difficulties reconciling work and family life associated with school/preschool schedules.

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Table: Polytomous Logit Estimates

Impact of working schedules on the number of children (if any) people intend to have

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff.	Wald	Coeff.	Wald	Coeff.	Wald	Coeff.	Wald	Coeff.	Wald
Monthly household income, in euro										
<i>Less than 1 143</i>	<i>Ref.</i>	<i>Ref.</i>					<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
From 1 143 to 1 982	-0.374	4.12**					-0.424	5.16**	-0.353	3.34*
From 1 982 to 3 048	-0.613	10.21***					-0.708	12.78***	-0.665	9.82***
3 048 and more	-0.487	6.18**					-0.630	9.11***	-0.581	6.56**
Socio-economic status										
Farmer, craftsman, tradesman, company manager							0.264	0.22		
Senior executive			0.292	2.13			0.483	5.15**	0.328	2.21
Middle ranking executive			0.355	4.32**			0.493	7.77***	0.411	4.73**
Clerk			0.410	5.78**			0.449	6.81***	0.346	3.31*
<i>Worker</i>			<i>Ref.</i>	<i>Ref.</i>			<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
Level of education										
<i>Less than French "baccalauréat"</i>					<i>Ref.</i>	<i>Ref.</i>				
Baccalauréat and Bac + 2 years					0.402	5.08**				
University Undergraduate Degree										
M.A., Ph.D., French "Grandes Ecoles"										
Gender and Age										
Men aged between 15 and 29									0.884	12.79***
<i>Men aged between 30 and 39</i>									<i>Ref.</i>	<i>Ref.</i>
Men aged between 40 and 49										
Men aged 50 and older										
Women aged between 15 and 29									1.021	16.11***
Women aged between 30 and 39									0.539	6.08**
Women aged between 40 and 49									0.399	2.68
Women aged 50 and older									0.430	2.09
Number of children										
<i>No children</i>									<i>Ref.</i>	<i>Ref.</i>
1 children									-0.416	5.55**
2 children									-0.287	2.38
3 or more children										
Working Time										
<i>Full Time</i>									<i>Ref.</i>	<i>Ref.</i>
Voluntary part-time									-0.355	2.45
Involuntary part-time										
Presence of a Spouse and his/her Occupation										
<i>No spouse, or spouse without a job</i>									<i>Ref.</i>	<i>Ref.</i>
Spouse working part-time									0.398	6.52**
Spouse working full-time									0.394	2.27
Intercepts										
<i>"this impact is not at all significant"</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>	<i>Ref.</i>
"this impact is not very significant"	-1.530	85.16***	-2.217	209.10***	-2.023	250.03***	-1.830	89.06***	-2.291	79.55***
"this impact is quite significant"	-0.309	4.01**	-1.001	54.74***	-0.808	56.96***	-0.602	10.88***	-1.026	17.38***
"this impact is very significant"	0.379	6.04**	-0.314	5.69**	-0.121	1.37	0.093	0.260	-0.294	1.45
Number of observations	955		955		955		955		955	
LR P-value	0.0143		0.1659		0.1123		0.0050		<.0001	
Score P-value	0.0148		0.1812		0.1051		0.0052		<.0001	
Wald P-value	0.0129		0.1635		0.1138		0.0058		<.0001	
Score Test for the Proportional Odds Assumption	0.03623		0.0453		0.1077		0.0728		<.0001	
P-value										
Percent Concordant	41.2		40.5		37.6		53.0		66.0	

- Reference categories in the estimates are indicated by "Ref."

- The different estimates are distinguished by chosen regressors. Selected explanatory dimensions are, apart from the constant terms: in model 1, monthly household income; in model 2, socio-economic status; in model 3, the level of education; in model 4, monthly household income and the socio-economic status; in model 5, all selected state variables except the level of education.

- The Wald statistic is the square of the Student statistic. If its value is higher than 4, it means that the estimate coefficient is significant at the 5% level. Estimate coefficients are significant at the 1% level if ***, 5% if **, 10% if * and 20% otherwise. Estimate coefficients that are non-significant at the 20% level are not reported.

- **Interpretation example:** According to models 1, 4 and 5, an increase in monthly household income would make the decision not to have (additional) children - *ceteris paribus* - less likely.

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