Discerning the Effects of Employment and Education on the Fertility Decisions of Greek Women born over 1950-59: an Analysis based on Census Individual-Level Data

Georgia Verropoulou[1,2] and Christos Bagavos[3]

[1]Department of Statistics & Insurance Science
University of Piraeus

[2]Centre for Longitudinal Studies
Institute of Education, University of London

[3]Department of Social Policy
Panteion University, Athens

Correspondence address:
Dr. Georgia Verropoulou
Dpt. of Statistics and Insurance Science
University of Piraeus
80, Karaoli & Dimitriou str,
Piraeus 185 34, Greece
gverrop@unipi.gr

Abstract

The paper uses individual-level data from the 2001 census of Greece on the native women born in the period 1950-59 to discern the effects of female employment and educational attainment on the propensity to have at least one, at least two or at least three children. In addition, whether effects differentiate for different cohorts of women is examined. The analysis is based on logistic regression models. The dependent variable is constructed using the available information on the numbers of children ever born. The estimated odds ratios indicate that educational level and employment status of the mother have an independent effect on the chances of a woman to have one or more children but effects differentiate according to parity. Housewife status is associated with substantially higher chances of proceeding from childlessness to a first birth compared to employed women but its importance is very much reduced when progression form first to second and from second to third birth are considered. More years in education have an adverse effect on the chances of a woman having at least one child, at least two or at least three children. The impact seems greater for higher parities but had age of mother at first birth been controlled for that effect would be much reduced. Hence, postponement of fertility among better educated women and, in particular, among those with tertiary educational qualifications also results in a reduction in family size.

Introduction

Fertility declines occurring in the 1960s and in the 1970s in Western Europe, resulting in sub-replacement levels, have been attributed to changes consistent with the theory termed "the Second Demographic Transition" (Van de Kaa 1987). More specifically, these trends have been linked to a postponement in childbearing which, eventually, resulted not only in a delayed fertility schedule but also in a reduction in the completed family size (Frejka et al. 2008). At the same time societal and profound life style changes were observed; marriage rates decreased while cohabitation, divorce and extra-marital fertility increased. Key factors related to these changes include, among others, female education and employment (De Rose et al. 2008).

Period fertility in Greece stood slightly above replacement level in the 1970s, at about 2.3 children per woman, but followed a sharp downward trend in the early 1980s, reaching 1.7 children per women in 1985, stabilising at about 1.3-1.4 since the 1990s (Eurostat, 2009). This marked drop in fertility levels, however, was accompanied by changes in family life that were less important than presumed by the Second Demographic Transition theory. For instance, extra-marital births, which in 1965 represented about 1% of the total -a level very similar to other southern European countries (Spain, Italy, Malta) and only slightly lower compared to Western European countries such as Belgium, the Netherlands and Ireland-, had increased only moderately by 2002 reaching 3.5%. In contrast, increases among Western European countries were very substantial while they were quite important also in other Southern European countries; the proportion of extra marital births reached 31% in Ireland, 25% in Belgium, 22% in the Netherlands, 10% in Italy and Malta and 16% in Spain in 2002 (Eurostat, 2009). Hence, Greece in the early 21st century remains essentially a traditional society, still in the initial stages of the Second Demographic Transition, where childbearing still occurs predominantly within marriage.

The present analysis is an attempt to relate changes in fertility quantum among Greek women born over 1950-59 to their educational attainment and employment status. To accomplish our objective, individual-level data from the 2001 census of Greece have been used.

Data and methods

The 2001 census of Greece included a question on the numbers of children ever born, which allows us to analyse fertility levels for different cohorts of women. The available information includes numbers of children ever born, year of birth of the mother, her educational attainment and her employment status in 2001. The individual-level data used in the analysis were kindly provided by the National Statistical Service of Greece.

The analysis was performed using logistic regression models. Three different models are considered; firstly, as dependent, a variable indicating whether a woman has at least one child is used. The second model distinguishes between women who have only one child and those who proceed to have at least two, while the third compares women with three or more children to those who have only two children. As explanatory variables, the educational attainment of the mother and her employment status in 2001 have been used. Regarding education, women who have completed lower secondary, upper secondary or tertiary education are compared to those who have at the most completed primary education. With respect to employment, women who are housewives, unemployed or retired in 2001 are

compared to employed women. All models control for mother's age and, among mothers, for age at first birth. The models were run using STATA 10.1.

Preliminary Findings

Mean numbers of CEB by educational attainment and employment status in 2001 are shown for women born over 1950-54 and 1955-59 in Table 1. Overall, the mean has decreased only very slightly between these two cohort-groups, by 0.05 children. However, within each cohort group, marked differences can be observed by educational attainment and employment status. Regarding employment, housewives seem to have substantially higher chances of having on average more children. Chances are lowest among retired women. More years on education are adversely related to numbers of children ever born; the difference between highest and lower levels are 0.53 and 0.62 children for women born over 1950-54 and 1955-59, respectively.

Table 1: Mean numbers of CEB by educational attainment and employment status in 2001 among Greek women born over 1950-54 and 1955-59 (Census complete data)

	1950-54		**1955-59**	
	Mean	**St. dev**	**Mean**	**St. dev**
Employment status in 2001				
Employed	1.88	1.03	1.81	1.01
Housewife	2.06	1.09	2.06	1.07
Unemployed	1.80	1.11	1.73	1.14
Retired	1.53	1.53	1.36	1.20
Educational attainment				
Primary	2.12	1.15	2.14	1.14
Lower Secondary	1.89	1.01	1.91	0.99
Upper Secondary	1.74	0.94	1.73	0.94
Tertiary	1.59	0.97	1.52	0.99
Total	**1.93**	**1.08**	**1.88**	**1.06**

Odds ratios estimated using logistic regression for women born over 1950-54 are shown in Table 2. The results for Model 1, where women who have at least one child are compared to childless women, indicate that housewives have a 31% higher chance of having at least one child compared to employed women while for unemployed and retired women chances are substantially lower, by 37% and 60%, respectively. Educational attainment also plays an important role, with women who have completed upper secondary education having 20% lower chances to have at least one child compared to women who have at the most completed primary education while chances for women with tertiary educational qualifications are reduced by 42%. The respective results for Model 2, where mothers with at least 2 children are compared to mothers with only one child, indicate that housewife status, though still associated with higher chances of proceeding to a next birth compared to employed women, has now a smaller effect. Unemployed and retired women have again lower chances than employed women to have a second child but divergence is much

narrower compared with Model 1. By contrast, more educational qualifications have more severe effects limiting chances of a second birth compared to Model 1. However, inclusion of age of mother at first birth in the models mitigates effects of educational attainment. More specifically, chances for women with secondary education are now lower only by about 15% while for women with tertiary educational qualifications they are higher by 4% compared to women in primary education. At the same time the importance of housewife status decreases further. Regarding chances of having a third child (Model 3), the odds ratios indicate that current employment in 2001 is of no great importance, while more years in education are related to significantly lower chances of a third or higher order birth, irrespectively of the inclusion of age at first birth in the model.

Table 2: Odds ratios showing associations of employment and educational qualifications with the number of CEB for Greek women born over 1950-54

Predictors	**Dependent Variable**				
	1 child or more vs no child (Model 1)	**2 children or more vs 1 child (Model 2)**		**3 children or more vs 2 children (Model 3)**	
Year of birth of mother	1.010***	1.004	0.972*	1.001	0.982*
Age at 1st birth	-	-	0.846*	-	0.912*
Employment status in 2001					
Employed (ref cat)					
Housewife	1.305*	1.076*	1.033**	1.027**	1.017
Unemployed	0.671*	0.759*	0.755*	1.025	1.016
Retired	0.405*	0.690*	0.740*	0.941**	0.960
Educational attainment					
Primary (ref cat)					
Lower Secondary	0.827*	0.706*	0.833*	0.648*	0.687*
Upper Secondary	0.795*	0.549*	0.852*	0.429*	0.536*
Tertiary (13 or more)	0.576*	0.449*	1.028*	0.363*	0.571*
N	317,114	280,346		235,942	

* p<0.001 ** p<0.01 *** p<0.05

These conclusions are more or less strengthened when the 1955-59 cohort of women is considered (Table 3). Progression from childlessness to first birth seems more severely affected in a negative way in this instance by unemployment or retirement of the mother and by more years in education. That also holds regarding progression from first to second birth and educational level. However, progression from first to second birth and from second to third and higher order births do not seem more affected by employment status among women born over 1955-59 than over 1950-54. Finally, inclusion of age of mother at first birth again alleviates effects of educational attainment.

Table 3: Odds ratios showing associations of employment and educational qualifications with the number of CEB for Greek women born over 1955-59

Predictors	Dependent Variable				
	1 child or more vs no child (Model 1)	2 children or more vs 1 child (Model 2)		3 children or more vs 2 children (Model 3)	
Year of birth of mother	0.966*	0.985*	0.974*	1.002	0.993***
Age at 1st birth	-	-	0.850*	-	0.914*
Employment status in 2001					
Employed (ref cat)					
Housewife	1.411*	1.137*	1.102**	1.111*	1.106*
Unemployed	0.593*	0.796*	0.784*	1.045	1.036
Retired	0.263*	0.654*	0.649*	1.124*	1.131*
Educational attainment					
Primary (ref cat)					
Lower Secondary	0.874*	0.680*	0.782*	0.634*	0.664*
Upper Secondary	0.714*	0.501*	0.824*	0.422*	0.533*
Tertiary (13 or more)	0.452*	0.378*	1.039*	0.365*	0.607*
N	336,207	295,124		245,639	

* p<0.001 ** p<0.01 *** p<0.05

Discussion

Previous analysis of fertility levels based on the 2001 census data has shown a decrease in completed family size between the 1950-54 and 1955-59 cohorts of Greek women. The decline is slight (of about 0.05 children per woman) and seems related to a decrease in the proportions having a third child, while there is also a slight increase in the proportions of childless women (Bagavos et al. 2008; Verropoulou et al. 2007). The present analysis shows that housewife status and more years in education are associated with a lower mean number of children ever born; this holds for both cohorts though differences are slightly accentuated among younger women. Regarding parity, the present findings indicate that housewife status is associated with substantially higher chances of proceeding from childlessness to a first birth compared to employed women but its importance is very much reduced when progression form first to second and from second to third birth are considered. In addition, importance of that variable seems greater for women in younger cohorts (born over 1955-59). More years in education have an adverse effect on the chances of having at least one child, more prominent among younger women. However, progression from first to second birth is not affected if age at first birth is taken into account. It seems that though having more educational qualifications actually reduces chances of having a first, a second and a third birth, propensity of a second birth would not be affected if age at first birth were constant across educational levels. Hence, postponement of fertility among better educated women and, in particular, among those with tertiary educational qualifications also results in a reduction of family size.

Some limitations of the study should be mentioned. The available information on education and employment status of mother are cross-sectional and refer to 2001 obscuring thus causal associations. However, educational attainment tends to be

completed before the beginning of the family formation process and causal relationships can still be inferred.

It is intended to further explore differentials, considering additionally the 1960-64 cohorts of women as well as more detailed census information derived from the IPUMS micro-database.

References

Bagavos, C., Tsimbos, C. & Verropoulou, G. (2008) Native and Migrant Fertility Patterns in Greece: A Cohort Approach. *European Journal of Population*, 24(4), 245-263.

De Rose A., Racioppi F. Zanatta A. L. (2008) Italy: Delayed adaptation of social institutions to changes in family behaviour. Demographic Research 19: 665-704

Eurostat (2009) Population Database, Accessed on 5 December 2009. Online http://epp.eurostat.ec.europa.eu/portal/page/portal/population/data/database.

Frejka, T., Sobotka, T., Hoem, J.M & Toulemon, L. (2008) Summary and general conclusions: Cildbearing trends and policies in Europe. *Demographic Research*, 19:5-14

Van de Kaa, D.J. (1987) Europe's Second Demographic Transition. *Population Bulletin*, 42, 1

Verropoulou, G., Bagavos, C. & Tsimbos, C. (2007) Migrant and Non-Migrant Fertility in Greece: Results Based on the 2001 Population Census. *Migration Letters,* 4(2), 147-158