STRUCTURAL CHANGE OF THE ECONOMY
AND WOMEN'S LABOUR FORCE PARTICIPATION
IN GREECE, 1961, 1971

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I. INTRODUCTION

The labour force participation rate of women in Greece has shown a decline between 1961 and 1971 which is at odds with the trend in most European countries and North America (See Table. 1).

This period coincides with the rapid transformation of the Greek economy, the massive exodus from the rural areas to the urban ones and abroad, industrialization, growth of the service sector and the decline of agriculture. These chan changes are evident in the number of women employed in sector (See Table2).

The decline in the absolute number of active women and in their participation rate from 33.5% in 1961 to 24.1 % in 1971, is at variance with the steady rise of female labour force participation in most developed countries but perhaps not incosistent with trends in many developing countries in which traditional economic activities are loosing ground to modern sector activities where wage opportunities for women are scarce. (The size of the category of unpaid family helpers, 57 % of the female economically active population in Greece in 1961 and 45 % in 1971, is an indication of the extent of non-wage work in some developing countries).

The question, therefore, of the determinants of the labour force participation of women in Greece deserves to be studied systematically. Also an economet

391

tric analysis of the Greek case might serve as an empirical test of the recen.
theories of household decision-making, known as «the new home economics»,[1]
in a country in a middle stage of development.

II. THE MODEL*

Two models have been tested empirically. The more straightforward one
is a single equation model of a linear type, solved by ordinary least squares reg-
ression. In conformity with the newer theories about the simultaneity of de-
cisions within the household and the interdependence of labour market respon-

TABLE 1

Labour Force Participation of Greek Women. 1961 – 1981

Year	Women in Labour Force	Participation Rate
1961 (census)	1,193,823	33.5 %
1971 (census)	905,408	24.1 %
1981 (survey)	1,172,700	29.8 %*

* The Employment Survey counts as economically active those 14 years and over while the
population census includes those 10–13 years old. S o u r c e : Greek National Statistical Ser-
vice, Results o f t h e P o p u l a t i o n C e n s u s 1961 and 1971 ; E m p l o y m e n t
S u r v e y, 1981.

1. See among others G.C. Cain and M.D. Dooley : «Estimation of a model of labor supply
        fertility, and wages of married women», in J o u r n a l o f P o l i t i c a l E c o n o m y,
        Vol. 84 No, 4, pt. 2, 1976 pp. S179- 199 ; R. J. Willis : «A new approach to the econo-
        mic theory of fertility behavior», in J o u r n a l o f P o l i t i c a l E c o n o m y, Vol.
        81, No, 2, pt. 2 1973 pp. S14-64 ; G.B. Ghez and G. S. Becker : T h e a l l o c a t i o n
        of time and goods over the life-cycle, (New York, National Bureau
        of Economic Research, Colubia University Press, 1975).

    * The models have been formulated and tested in X. Petrinioti, Οι προσδιοριστικοί
παράγοντες της γυναικείας συμμετοχής στο εργατικό δυναμικό
στην Ελλάδα. 1961, 1971. Οικονομετρική διερεύνηση. (Determining fac-
tors of female labour force participation in Greece. 1961,1971. An econometric analysis), (Docto-
ral dissertation, Panteios School of Political Sciences, 1982).

ses, a three - equation model has been specified «edogenizing» three crucial variables. Thus female labour supply (L), is considered to be deternined by the average female wage rate, household income, the number of children in the household and education. The female wage is expected to be influenced by the supply of female labour, the industry structure, female education. Fertility s the third endogenous variable and is considered to be influenced mainly by the average female wage, the female education level and the occuSpational status

TABLE 2

Employed Women by Sector of Economic Activity. 1961 – 1981

Year	Agriculture	%	Industry	%	Services	%
1961 (census)	783 484	65.82	157,878	13.87	197,098	17.31
1971 (census)	479,744	56.10	154,282	18,04	221,093	25.86
1981 (survey)	461,500	41,68	201,100	18,16	444,700	40,16

Source : Greek National Statistical Service, R e s u l t s o f t h e P o p u l a t i o n C e n s u s

of females. The implicit assumption is that child raising and market activity are «alternative options» for women given the sexual division of labour. The model is presented below with expected relations in parentheses.

$$W_i = \alpha_0 + \alpha_1 \quad S_i + a_2 Y_\iota + a_3 I.M._\iota + \alpha_4 ED.F._\iota + U_\iota \qquad (1)$$
$$\mathbf{B} \quad (+) \quad (+) \qquad (+)$$

$$S_\iota = \beta_0 + \beta_1 W_\iota + \beta_2 F_\iota + \beta_3 \quad F.S._\iota + \beta_4 ED.F._\iota + \beta_5 I._\iota + u_2 \qquad (2)$$
$$(+) \quad (-) \qquad (+) \quad (-) \quad (-)$$

$$F_\iota = \gamma_0 + \gamma_1 W_\iota + \gamma_2 ED.F._\iota + \gamma_3 FAM.HELP._\iota + \gamma_4 I.i + u_3 \qquad (3)$$
$$(?) \qquad (-) \qquad (+) \qquad (-)$$

393

where :

S_ι = the percentage of economically active women in the female population 10 years and over (supply variable) in prefecture ι

W_i = predicted female wage reflecting the influence of age, job status, and industry mix in each prefecture (wage variable).

F_ι = children 0-9 years old to women 15-44 years old (fertility variable).

$ED.F.i$ = the percentage of female high school graduates to all women 20 years and over (education variable).

$F.S.i$ = the percentage of unmarried, divorced, separated and widowed women in the total female population of 10 years and over (family status)

$I.M.i$ = this variable shows what would be the percentage of economically active women in each prefecture if this were dependent only on the percentage of women employed in each industry and the industry mix in each prefecture (industry mix variable).

$Y.i.$ = private domestic product of prefecture ι (income variable)

$1.1.$ = private domestic product per household (household income variable)

$FAM.HELP.i$ = the percentage of unpaid family helpers in the total female population, 10 years and over, who reported being economically active (family helpers variable).

In addition to these variables a number of others were used in the single equation regression. The are defined as follows :

$AGRI/W\ \iota$ = agricultural land to women employed in agriculture

$URBPERC\ \iota$ = The percentage of population living in urban centres of 10,000 inhabitants or more

$POPDISP\ \iota$ = the percentage of population living in settlements of less than 1,000 inhabitants.

$A_1 \iota$ = the percentage of women 20 - 24 years old in the female population of 10 years and over

$A_2 \iota$ = the percentage of women 25 - 44 years old in the total female population of 10 years and over

The basic hypothesis of the simultaneous equation model is that the independent variables do not have a one-way causal relationship with the dependent variable. However because the model is overidentified, i.e. the three structural equations have more than one, unique solution, two-stage - leastsquares regressions were used.

III. THE DATA

The data used in the estimation of the models are cross-sectional taking as the unit of observation the 50 (in 1961) and 51 (in 1971) prefectures (administrative units) of Greece. The data are derived from the decennial population census of 1961 and 1971. Longditudinal data would have been more suitable for the systematic analysis of the trends in female labour force participation and its correlation to the cyclical turns and structural changes of the economy. However the non-continuity of the available annual sample surveys render the construction of a reliable time series impossible.

On the other hand, the use of cross-section data allows the statistical manipulation necessary for bringing into focus the relationship between the l o c a l labour market conditions and female labour force participation. In the case of Greece this is especially important as the various regions vary a great deal in terms of economic structure. The availability of data from the two consecutive censuses allows a gross time comparison.

IV THE EMPIRICAL RESULTS

The results of the single equation model for 1961 are presented below.

Constant	Independent variables							
	W	I	F	I.M.	Al	EDF.	POPDISP	AGRI/W
20,906	− 0,462	− 0,064	− 25,427	1,366	1,640	1,181	− 0,013	− 0,381
(0,830)	(3,257)**	(0,783)	(2,369)**	(2,427)**	(2,527)**	(1,943)*	(0,149)	(2,276)**

$\overline{R}^2$	SEE	F*
0,731	6,270	17,563

t values in parentheses

* = 5 % significance level (one tail test)

** = 1 % significance level (one tail test)

The signs of the «explanatory» variables are as expected with the exception of the wage variable. There is the negative effect of the presence of children on the labour participation of women ; the positive effect of a «favourable - to women industry mix» and of the age group 20 - 24 years old. Education also has a positive effect on labour activity. The dispersion of the population in small settlements of less than 1,000 inhabitants also has a negative though statistically insignificant effect. The relationship between agricultural land and female participation is puzzling. One would expect that the greater the extent of agricultural land the more hands needed to till it. However, agricultural land might mean an adequate farm income and women may not have to work on the farms. For example extensive agricultural land may mean greater size per average land holding, possibilities for mechanization and land improvement and realization of economies of scale.

The relationship between household income and female labour force participation is a negative one though the parameter estimated is not statistically significant, a not susrprising result given that this variable has been defined in a very general manner.* The predicted female wage displays a strong nega-

* Perhaps a less ambiguous relationship would result if the private disposable income was used. This would include emmigrants' remittances and transfer payments from the government, both important sources of income. However these data were not available at the prefecture level for 1961.

tive relationship with participation, a result which is contrary to most empirical findings in the developed countries, and deserves further testing through the simultaneous equation model. The results of this model are presented below (structural equation estimates).

$$R^2$$

$$W_i = 23,331 - 1,628 \text{ S} + 1,040 \text{ Y} + 1,889 \text{ I.M.} + 1,229 \text{ EDF} \quad 0,463$$
$$\quad (0,572) \quad (3,683) \quad (1,441) \quad (1,243) \quad (0,857) \quad \quad (4)$$

$$S_i = 64,882 - 0,655 \text{ W} - 0,006 \text{ I} - 27,181 \text{ F} + 0,445 \text{ F.S.}$$
$$\quad (1,571) \quad (5,960) \quad (0,048) \quad (0,951) \quad (1,014 \quad 0,647 \quad (5)$$

$$F_i = -0,430 + 0,011 \text{ W} - 0,014 \text{ A2} - 0,015 \text{ FAMHEL} \quad \quad (6)$$
$$\quad (0,358) \quad (1,381) \quad (0,866) \quad (1,787) \quad \quad 0,349$$

t values in parentheses (since these are simultaneous equation estimates the t distribution is not normal. However large values indicate statistical significance).

The demand equation (4) has four explanatory variables : labour supply, domestic product of the prefecture, the female - demanding industry structure and the education level of women. These variables display the expected signs even though only one is statistically significant.

The supply of female labour (5) has a negative relationship with household income, fertility and a positive one with women's family status, i.e. with non-married women. The wage variable displays a strong negative relationship with female labour supply in this structural equation as in the sigle equation model. The conventional explanation would be that there is a backward bending supply of labour as leisure or domestic work is prized more than market activity. However, given the circumstances prevailhng in Greece in 1961 is it likely that such an effect would occur?

It has been documented that during this period there was a growing need for income, especially felt in the rural householdsas their consumption patterns approached those of the urban households[2]. This development is usually asso-

2. See V. Karapostolis, Η καταναλωτική συμπεριφορά στην ελληνική κοινωνία 1960-1975 (Consumption behavior in Greek society 1960-1975), (Athens, National Centre for Social Research, 1983), pp. 154- 156.

dated with the drawing of «surplus» labour from agriculture into wage employment as the household requires cash income in order to finance a higher level of consumption 3.

However the situation in Greece was complicated by the fact that the rising demand for income was met by other sources while income from greater labour force participation played a lesser role. One of the sources of income was the remittances from Greek emmigrants working abroad. It has been estimated that 1.1 million people, out of approximately 8 million, left Greece in search of employment abroad between 1958 and 1975[4]. Emmigrants' remittences totaled $ 2,600 million for the period 1961 - 71. It has been estimated that in 1961 3.26 % of the disposable personal income originated abroad ; in 1971 it was 5.18 %. Furthermore it has been estimated that remittances from abroad accounted for 11.4 % of agricultural income in 1958 - 60 and 28,6 % in 1971 - 73 5.

Transfer payments from the public sector tot he agricultural population via grants and loans increased from 4.6 % of agricultural income in 1958 - 60 to 11.1 % in 1971-73[6].

Receipts from the sale of land, primarily by farmers, was another source of income. These receipts accounted for 5.3% of agricultural income in 1958 to 16.8% in 1971-73[7].

3. See G. Standing : Labour force participation and development; 2nd Ed. (Geneva, International Labour Office, 1981), p. 60ss.

4. Greek National Statistical Service, Yearbook of Statistics 1975 ; In a survey on the reasons for emmigration undertaken by the Statistical Service, 83.6 % of the male-and 83.1 % of the female respondents cited the «lack of employment opportunities». See Έκθεσις δοκιμαστικής ερεύνης επί των κινήτρων και των συνθηκών μεταναστεύσεως του πληθυσμού των αγροτικών περιοχών. (Report on the test survey on the motives and conditions of emmigation of rural areas) (Athens, Greek National Statistical Service, 1962), pp. 21 -22. See also the results of an econometric study by P. Reppas, Η μετανάστευση από τις αγροτικές και ημιαστικές περιοχές της Ελλάδος (1961 - 1971) (Athens, Doct. Dissertation, 1978), p. 99 and elsewhere.

5. See J. Papantoniou, Διανομή του εισοδήματος και συσσώρευση κεφαλαίου. Η ελληνική εκβιομηχάνιση: 1958-1973 (Income distribution and capital accumulation. Greek industrialization : 1958-1973), (Athens, Papazisis Publishers, 1979), p. 166.

6. Ibid

7. Ibid

The extension of consumer credit was another source of financing the purchase of certain goods, especially durables.

The dowry system, fairly much in use at the time, provided some income and some basic goods needed by the new household and was considerd as the main contribution by the wife to the economic burdens of marriage.

Thus it would appear that higher consumption during the period under study was financed by the differentiation of income sources[8] and did not lead to a massive influx of farm labour into wage employment. Indeed, if one looks at the data on the economically active population not only is there a decrease in the absolute number of persons in the labour force (403.6 thousand fewer in 1971) but there is also a decrease in the labour force participation rate (from 54 % in 1961 to 44.5% in 1971). However because the definition of «economically active population» includes entrepreneurs, wage and salary earners and unpaid family helpers, it would be useful to examine how these categories fared during these crucial ten years.

The wage and salary earners increased from 1,219.9 thousand in 1961 to 1,369.8 thousand in 1971, i.e. by 150 thousand or 12.3 %. Employers increased by 15.2 thousand or 13 %, those working on their own account (traders, shopkeepers etc) declined by 1.1 thousand or 3.7% and family helpers declined by 448 thousand or 43 %[9]. It would appear that the decline in the labour force was due primarily to the decrease in the number of unpain family helpers and the inability of the wage sector to provide enough job opportunities in order to offset or at least to balance this decline.

The fact that 31.8 % of the labour force in 1961 and 34.8 % in 1971 are «own account workers» and 28.6% of the labour force in 1961 and 18.4% in 1971 are unpaid family helpers is an indication of the scarcity of wage employment opportunities.

Within wage employment the differentials between male and female wages are sizeable. In the manufacturing sector (where reliable data are available) and

8. SeeV. Karapostolis, op. cit., pp. 221 - 229 and elsewhere.

9. According to D. Fraggos the number of unpaid family helpers has been underestimated by the 1971 census by some 260,000 women. See D. Fraggos, Οικονομικά ενεργός πληθυσμός της Ελλάδος (The economically active population of Greece), (Athens, National Centre of Social Research, 1980), pp. 36-39.

in establishments employing 10 or more persons, the average female weekly wage was 60% of the male wage (1962). During the same time, the average female monthly salary in the manufacturing sector was 58 % of the male salary. In 1971 the weekly wage of women in manufacturing was 62 % of the male wage and the female average monthly salary was down to 56 % of the male salary[10].

The income differentials are a disincentive to women's labour market committment. The expectation that a woman's sortie into the labour market would be occasioned by acute need and that it would be brief was common and was enshrined in social security regulations, first in the civil service and later in modified form, in the state - run pension plan (IKA). Thus in the civil service a mother whose children were under the legal age (i. e. 21 years old), could be pensioned off after only 15 years of work compared to a minimum of 25 years required of her male colleagues. (Naturally on a reduced pension.)

The wage differentials, the lack of social acceptance of women's work, the expectation of a short work life all contributed to the adoption by many women, of the attitude of work «instrumentality».

In the light of the above it is not surprising that the results of the empirical model show the female wage having an inverse relationship with female participation. * The positive substitution effect which rising wages are supposed to trigger seems not to have occured in the period under study[11]. The same holds for the results of the single and multiple equation model for 1971 shown below :

10. See Η ελληνική οικονομία Ερευνητικά δοκίμια και στατιστικές σειρές. (The Greek economy Research essays and statistical series), (Athens, Directorate of Economic Studies, The Bank of Greece, 1980), pp. 178 - 179.

* Since the data are cross - sectional what it amounts to is that in those prefectures where wages where high (prefectures with large urban areas and diversified economic activity) the percentage of employed women was smaller than in prefectures with lower wages but higher percentages of women active in the informal sector.

11. E.A. Panourgias has found the same inverse relationship between the wage rate (taken from the statistical service of the state social insurance foundation) and female labour force participation rates. See E.A. Panourgias, Factors affecting labour force participation rates and hours of work in Greece: a cross-sectional analysis 1961-1971 (Unpublished doctoral dissertation, University of Edinburg, 1978), p. 75.

Constant	Independent variables							
	W	I	F	I.M.	EDF	URBPERC	A2	A1
45,085	−1,637	−0,007	−7,701	0,644	2,454	−5,716	−0,015	−0,209
(2,429)**	(8,070)**	(0,156)	(1,071)	(1,600)	(4,075)**	(0,751)	(0,036)	(0,486)

R2	SEE	F*
0,673	4,591	13,842

t values in parentheses
* = 5 % significance level (one tail test)
** = 1 % significance level (one tail test)

$$W = 19,421 + 0,416 \, I.M. - 0,011 \, Y + 1,474 \, EDF - 0,596 \, S \qquad R^2 = 0,747 \qquad (7)$$
$$(0,948) \quad (0,351) \quad (0,102) \quad (3,427) \quad (0,901)$$

$$S = 62,623 - 2,697 \, W + 3,829 \, EDF + 0,010 \, I + 8,247 \, F \qquad R^2 = 0,500 \qquad (8)$$
$$(0,953) \quad (3,464) \quad (1,632) \quad (0,151) \quad (0,137)$$

$$F = 1,138 - 0,031 \, EDF - 0,0003 \, I - 0,005 \, A2 \qquad R^2 = 0,367 \qquad (9)$$
$$(12,728) \quad (4,546) \quad (0,362) \quad (0,605)$$

t values in parentheses

The scarcity of job opportunities for the uneduacated may explain the strong positive effect of education on female participation evident in both the 1961 and the 1971 model. The civil service, the banking sector, the management of «modern»

enterprises in industry and the service sector demand a diploma as a formal qualification, a sort of pre-requisite, useful for screening the applicants.

The presence of children in the household has a strong negative effect on participation in the single equation model for 1961 but is less strong in the simultaneous equation model. The lack of statistically significant variable in the fertility equation (6) adds to the difficulty of interpreting this relationship. One might fall back on the concept of the rising opportunity cost of labour activity with the presence of children in the household, a cost which may be high when compared to the low market wages. It is interesting to note that in 1971 the fertility variable, in the simultaneous equation model changed sign though it is statistically not significant. Fertility in both models in obviously not explained satisfactorily though the strong negative effect on fertility of female education (9) accurately reflects the rising standard of «child quality» among educated women which leads presumably to fewer bitrths because of the rising cost of child rearing [12].

V. CONCLUSIONS

The more conventional single equation model behaves as expected. The explanatory power of the simultaneous equation model seems to be limited by comparison. Some of this limitation is no doubt due to the constraints presented by the data. However, the basic explanatory variables do behave in similar ways between the two data sets and between single and multiple equation models. It is fitting to end this article with the customary urge for more research, better data sets and more theoretical work on the concept of household decision - making and labour force participation. In the meantime a historical perspective is always useful in helping to explain «unconventional» relationships «thrown up» by the computer. The newer theories regarding the segmentation of the labour market await their application and testing in this country, especially as

12. Compare with the results of C.G. Drakatos, «The determinants of birth rate in developing countries : an econometric study of Greece», E c o n o m i c D e v e l o p m e n t a n d C u l t u r a l Change, Vol. 17, No 4, 1968, pp. 596-603.

they relate to the differential labour force participation rates by various demographic groups [13].

13. See among others: P.B. Doeringer and M. J. Piore, Internal labor markets and manpower analysis, (Lexington, Mass. Heath, 1971); I.V. Sawhill, «The economics of discrimination against women : some new findings», Journal of Human Resources, Vol. 8 No. 3, Summer 1973, pp. 383-96 ; F. Weiskoff (Blau), « 'Women's place' in the labor market», American Economic Review.Vol. 62 No. 2,1972, pp. 161 - 66.