

*The Determinants of the Probability of Tourism
Consumption: An Analysis with a Family
Expenditure Survey*

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**THE DETERMINANTS OF THE
PROBABILITY OF TOURISM
CONSUMPTION: AN ANALYSIS WITH A
FAMILY EXPENDITURE SURVEY***

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Abstract

This paper analyses the household demand for tourism services, studying the determining factors involved in the decision to consume them. To do so, a discrete choice logit model (based on a random utility approximation) is used, with data drawn from the Spanish Family Expenditure Survey for the period 1985-1996. The results suggest that limitations on free time, cultural factors, income (with an income elasticity below the unit), age and the generational effect are all crucial determining factors in the probability of travel. The use of micro data leads to the detection of a high degree of heterogeneity, both in the behaviour patterns of households and in the different degree to which the aforementioned variables affect travel decisions.

Keywords: tourism consumption, tourist participation model, discrete choice analysis, national family expenditure survey.

JEL Classification: C25, D12.

Resumen

En este artículo se analiza la demanda de servicios turísticos por parte de las familias, estudiando los determinantes de la decisión de consumir este tipo de servicios. Se emplea para ello un modelo logit de elección discreta, basado en la aproximación de utilidad aleatoria, con datos de la Encuesta Continua de Presupuestos Familiares del periodo 1985-1996. Los resultados apuntan que las restricciones de tiempo libre, los factores culturales, los ingresos (con una elasticidad renta inferior a la unidad), la edad y el efecto generacional son determinantes esenciales en la decisión de viajar. El empleo de micro datos ha permitido detectar una importante heterogeneidad tanto en el comportamiento de las familias, como en la desigual intensidad con que las anteriores variables influyen en la decisión de consumo.

Palabras claves: consumo turístico, modelo de participación turístico, análisis de elección discreta, encuestas de gasto de hogares nacionales.

Clasificación JEL: C25, D12.

1. INTRODUCTION

Traditionally, economic analysis of household consumption has followed two different approaches. The first makes use of aggregate data, assuming that models from microeconomic theory are valid when applied to time series data. The second approach analyses microeconomic data from family expenditure surveys, with empirical applications which are therefore closer to theoretical models of consumption. Microeconometric models have two big advantages: firstly, they associate economic consumer models with data on individual behaviour and, secondly, they include the diversity and heterogeneity of consumer behaviour that is cancelled out when aggregate information is used (Heckman, 2001). In addition, in the case of those goods or services, as in the case of tourism, in which the best option for some households is not to consume them (i.e. corner solutions), analyses based on aggregate data introduce a participation bias that can only be controlled with microeconomic data. Furthermore, the availability of microeconomic data allows the sociodemographic characteristics of households to be included among the factors that determine consumption. Within a framework of deep social change (greater female participation in the labour market, an increase in life expectancy, a decrease in the average number of children, an increase in one-person households, a greater level of education etc), taking into account the heterogeneity of consumers not only enhances the explanatory capacity of the models, but it also improves their forecasting ability.

Analysis of the demand for tourism has tended to focus on aggregate data¹, with a less frequent use of microeconomic data. Concerning micro data, it is common for surveys to be carried out in the holiday destination when the aim is to analyse tourist satisfaction levels, expenditure, repetition rates or the reasons for choosing a particular destination. However, analyses of the demand for tourism based on surveys carried out in the households' place of origin are not so abundant. Specific surveys have been examined by Zimmermann (1982), Bojanic (1992), Oppermann (1995 a, b) and Collins and Tisdell (2001), among others, to test the suitability of the family lifecycle concept to forecast factors such as the propensity to travel for holiday purposes, the distance of the trip or the tourism expenditure made.

The other source of micro data available are the family expenditure surveys carried out by national statistics offices. The benefits of using national surveys on household expenditure are fourfold. Firstly, they are designed to be representative of the population as a whole. Secondly, opposite to the specific surveys mentioned above, they are run in a continuous way over time. Thirdly, they facilitate the identification of the characteristics of both households who purchase

¹ see Crouch and Shaw (1992) and Song and Witt (2000) for a review.

tourism services and those that do not. Finally, they not only incorporate information on the households' sociodemographic features, but also on household spending and income. The demand for tourism with family expenditure surveys has been analysed by Dardis *et al.* (1981), Cai *et al.* (1995) and Cai (1998), with data from the North-American Consumer Expenditure Survey, and by Davies and Mangan (1992), using data from the British Family Expenditure Survey. Nevertheless, none has analysed neither the longitudinal dimension of these surveys nor the incidence of heterogeneity among households.

In this paper, by applying a microeconomic analysis of the demand for tourism, an examination is made of the factors determining the probability of tourism consumption by households. In order to do this, data from the Spanish Family Expenditure Survey (*Encuesta Continua de Presupuestos Familiares*, henceforth the ECPF) conducted by the Spanish Bureau of Statistics is used. The ECPF is a quarterly survey, whose system of rotation (each quarter 12.5% of the households are replaced) allows households to be monitored for several consecutive quarters. The data used covers the 48 quarterly periods between 1985 and 1996, involving a total of 18,038 households. The ECPF provides information on household spending, income and sociodemographic characteristics. The survey reports whether a member of the household has spent money on tourist trips, staying at a hotel or purchasing a package holiday. Although this does not include all tourist travel (for example it excludes stays at second homes or at homes owned by relatives or friends), in this study a household is considered to have made a tourist trip if expenditure is recorded for either of the two aforementioned categories. Once it has been determined whether a household has made this type of expenditure during a particular year, the factors that determine the decision behind it can be analysed and their importance can be quantified.

The data supplied by the ECPF and the considerable number of households that it covers have made it possible to estimate a participation model whose most relevant features are: firstly, the use of a large number of sociodemographic and cultural variables that were not available in previous analyses, secondly the availability of information throughout more than a decade (that allows to study the demographic effect including not only the age effect but also the generational effect), and thirdly the analysis of the relevance of the heterogeneous behaviour of households.

The paper is organised as follows: in the second section we present the motivation and the descriptive evidence of the paper. In the third section, the discrete choice model is discussed. In the fourth section the variables included in the model are explained. The statistic results are commented in the fifth section, meanwhile the discussion and policy implications of the results

are presented in the sixth section. The paper concludes with a discussion of the main conclusions.

2. MOTIVATION & DESCRIPTIVE EVIDENCE

In this section, some of the characteristics of household behaviour are discussed, justifying the reasons behind the subsequent microeconomic analysis. If household expenditure on tourism is considered to be a two-stage process (firstly, the decision to purchase some kind of tourist service and, secondly, the decision how much to spend on it), the factors determining both decisions need not necessarily be identical and, even if they are, they need not have the same effect. Graham (2001) assumes that, due to family or work circumstances, there may well be a maximum proportion of the population prepared to carry out a tourist trip. Once a country reaches this limit, the proportion of people who travel will remain constant, even if their income increases or prices are reduced. In this case, the growth of the market will depend on an increase in the number of annual holidays or on the holidays' greater length. The empirical evidence presented by Graham (2001) for certain European countries reflects a growing propensity for travel (defined as the percentage of the population that makes some kind of tourist trip), although different values are given (with a value of around 60% for the British and French markets in the 90s; 70-80% for the German market and 70% for the Dutch market). As far as the Spanish market is concerned, in the year 2000, 47% of Spaniards made some kind of tourist trip, a figure corresponding to 58.7% of all Spanish households (Spanish Institute for Tourism Studies, 2001). Compared to the values presented by Graham (2001), these figures are well below the European markets and the maximum values indicated by Schimdhauser (1975), Pearce (1989) or Cooper and Boniface (1994). This gives priority to a study of the influence of both household sociodemographic factors and income on the future evolution of the propensity to travel. If we limit tourist trips to hotel stays or package holidays, 23% of the households from the 1985 ECPF survey reported positive expenditure on tourist travel, rising to 29.20% in 1996 (see Figure 1).

Taking as a reference the age of the household head, Figures 2 to 5 highlight the importance of both the lifecycle stage and income on the demand for tourism, together with the uniformity through all age intervals of the mean expenditure of those households that make a tourist trip. In Figure 2, the mean tourism expenditure (calculated for the whole sample) is plotted against age; Figure 3 shows the rate of participation against age; Figure 4 displays the mean tourism expenditure calculated only for those households with positive expenditure. Finally, in Figure 5, the mean family income pattern is shown. The life cycle clearly determines the income curve, and both are evident in the percentage of households that make some kind of expenditure on

tourism. For the total sample, 26.05% of households reports positive expenditure (i.e. the rate of participation), but it is not evenly distributed across the life cycle: the probability of travelling increases for the first age intervals, from an average of 25.20% for the first age interval (between 25 and 29 years old), rising to a maximum of 33.54% (from 40 to 45 years old), followed by a gentle but steady decrease to 21.84% for the 65-69 year-old age interval, and finally, with a big decrease in the last stages of life. The inverted U shape of the income curve (Figure 5) can be observed in the pattern of the rate of participation (Figure 3), but not in the expenditure curve of Figure 4, which shows the mean spending on tourism by households with positive expenditure. This remains fairly uniform for the entire age axis. In line with the results obtained by Cai (1998) for food expenditure during holidays, these confirm the fact that the first objective of an analysis of the demand for tourism should be the identification and evaluation of the importance of the variables that determine the participation rate.

One of the aims of this paper is to assess the importance of income on the consumer decision to participate in the market, calculating the corresponding income elasticity. Figure 6, which plots the rate of participation for the four income quartiles, emphasizes the importance of this factor in a descriptive way. The rate of participation increases radically across the income intervals: with 11.64% for the lowest income interval, 19.09% (low-medium incomes), 29.73% (medium-high incomes) and 43.73% (high incomes). Although the income effect seems to limit the influence of the lifecycle upon those households with low incomes, the relevance of sociodemographic variables can not be neglected, as will be shown below. The use of microdata will allow the real influence of income to be assessed for the different population segments.

Many sociodemographic variables are associated with the use of time (Ghez and Becker, 1975) and, more generally, with the family lifecycle concept. This concept was first used by Wells and Gubar (1966), Reynolds and Wells (1977) and Stampfl (1978), and has been applied to the field of leisure and tourism by Rapoport and Rapoport (1975), Cosenza and David (1981), Lawson (1989, 1991), Bojanic (1992), Opperman (1995 a, b) and Collins and Tisdell (2001). The family lifecycle establishes that households' behaviour as consumers depends on their evolution in terms of age, marital status, the number of children, their employment situation, the number of earners etc. Some of the future trends in the demand for tourism are defined in terms of these variables (Moutinho, 2000). As an example of the importance of this type of variable, Figure 7 shows the rate of participation for (a) one-person homes or a childless couple and (b) a couple living with children or with other adults (over the age of 14). Figure 7 clearly shows that, between the ages of 25 and 40, the behaviour of Spanish households with one member or without children is radically different from that of Spanish households with more than two

members: although their participation rate converges from the age of 40, they maintain clearly different rates until almost 65 years of age.

An additional group of sociodemographic variables, some of which could also be associated with the family lifecycle concept, can be included as factors that determine the demand: the household head's level of education, the housing tenure or the rural/urban characteristic of the area where the household lives (Dardis *et al.*, 1981; Cai *et al.*, 1995; Cai, 1998). One of the variables in the descriptive analysis that shows variations as clear as those observed for income is the household head's level of education. The mean rates of participation according to educational levels are: 13.24% (the illiterate), 25.84% (primary-school studies), 42.45% (secondary-school studies) and 52.10% (higher education or university level). Figure 8 shows the mean rate of participation for each age group according to their level of education. The existence of a cyclical pattern throughout the lifecycle is more evident for those with higher levels of studies but it is almost inexistent when the household head is illiterate, following a similar pattern to the lowest income bracket.

Regardless of the stage reached in the lifecycle, there is another demographic factor that affects the household demand for tourism: the generational or cohort effect. This effect is associated with social or economic events that have a homogenous influence on a generation (normally defined by its year of birth), conditioning decision-making (Deaton, 1998). The cohort effect reflects the different experiences, attitudes and behaviour of each generation. One example is the greater importance lent to leisure by the younger generations. In a context of an aging population, younger generations' greater tendency towards tourism consumption may offset the fall in the overall rate of participation produced by an increase in the proportion of aged people, whose lifecycle stage is characterised by a low participation rate (see the simulations by Sakai *et al.* (2000) as an example, based on the Japanese population). From an empirical perspective, to distinguish between generational and lifecycle effects, combined cross-section and time series data is needed (Deaton, 1998). The use of the ECPF allows effects attributable to age, cohorts and temporal influences to be distinguished. As indicated by Sakai *et al.* (2000), the age effect refers to the behaviour patterns of the consumer at different stages in the lifecycle, the cohort effect is specific to all people born at a certain period in time and the temporal effect shows the influence on people of the general economic situation at a certain point in time. All of them can affect the demand for tourism services in different ways.

McFadden's discrete choice microeconomic model (1974) permits the isolation of variables that might play a prior role in determining the decision to make a tourist trip, together with an assessment of their importance. In the next section, the discrete choice random utility

model is shown and a presentation is made of the main concepts associated with this theoretical model.

3. THE DISCRETE CHOICE MODEL

From the point of view of the theory of consumption, the decision to purchase a certain type of goods or service depends mainly on the consumer's preferences. The consumer is faced with a certain level of income and prices for goods and services that are fixed and these define his/her budget limitations. From among the different combinations of goods available, the consumer will choose the combination that provides the greater utility to him/her (McFadden, 1974; Manski, 1977). If there are only two alternatives to choose from, this is a binary choice model. The consumer can choose between combination of goods i or combination of goods l . The probability of a consumer choosing option i is $P(i) = P(U_i \geq U_l)$ and the probability of option l is $P(l) = 1 - P(i)$. If it is assumed that the consumer's indirect utility functions are random and can be expressed as the sum of one deterministic part and one random part, the probability of option i can be written as:

$$P(i) = P(U_i \geq U_l) = P(V_i + e_i \geq V_l + e_l) = P(V_i - V_l + e_i - e_l \geq 0)$$

And, expressing the deterministic part as a linear function of a group of variables:

$$P(i) = P(\mathbf{b}'_i x - \mathbf{b}'_l x + e_i - e_l \geq 0 | x) = P(\mathbf{b}' x + e \geq 0 | x)$$

The probability of choosing option i therefore depends on the value of variables x , which define the deterministic part of the indirect utility function, and on the specification of the random term. Choosing a logistic distribution for the random term leads to the specification of a discrete choice *logit* model:

$$P(i) = \frac{e^{\mathbf{b}'_i x}}{1 + e^{\mathbf{b}'_i x}}$$

In the tourist participation model, the consumer chooses whether or not to consume tourism services. It is assumed that the consumer who chooses to spend money on tourism does this because he/she believes that it is more beneficial to do so whilst, on the other hand, it must be more useful not to make this kind of expenditure in the case of consumers who decide not to

travel. The non-random component that determines the decision is composed of variables that reflect the characteristics of the household. The basic hypothesis behind the model presented in this paper is that the decision to consume tourism services (i.e. to participate) depends on the following variables: the variables correlated with the household's lifecycle, the level of income, the household's social and cultural features and the generational effect.

Given the non-linear specification of the probability in terms of the explanatory variables, to analyse the results of the estimation, the effects on the odds of probability are discussed when one of the explanatory variables is modified. The odds are defined as the ratio of the probability of the occurrence of an event when compared with the probability of the opposite occurring:

$$odds_i = \frac{P(i)}{[1 - P(i)]}$$

Logarithms are used to obtain the *logits* or *log-odds*, which are specified as a linear function of the predictors:

$$\log \frac{P(i)}{[1 - P(i)]} = \mathbf{b}'x$$

Given the specification of the *logit*, the equation can also be re-written in terms of the odds:

$$\frac{P(i)}{[1 - P(i)]} = e^{\mathbf{b}'x}$$

For explanatory variable j , term e^{b_j} is the factor by which the *odds* are increased when independent variable j goes up by one unit. If b_j is positive, factor e^{b_j} will be above the unit, implying an increase in the odds. If b_j is negative, the factor will be below the unit, implying a decrease in the odds.

In order to discuss the results obtained by the model, together with an analysis of elements e^{b_j} , an examination is also made of the marginal effects (and in the case of the income variable, the elasticities). The marginal effect of a variable is defined as a variation in the probability, due to a one-unit increase in the said variable, whilst the other variables remain constant. It can be specified as:

$$\frac{\partial P(i)}{\partial x_j} = \mathbf{b}_j P(i)[1 - P(i)]$$

In other words, the effect of a change in variable j on the probability of option i is dependent on coefficient \mathbf{b}_j and on the value of the probability. The marginal effects can be calculated for each observation, later obtaining the mean value of each individual effect (Ben-Akiva and Lerman, 1989; Greene, 1998).

To measure the effect of the *income* variable on the odds, the following elasticity measure is also used:

$$\frac{\partial P(i)/P(i)}{\partial x_j/x_j} = [1 - P(i)]x_j \mathbf{b}_j$$

or, if the variable takes the form of a logarithm:

$$\frac{\partial P(i)/P(i)}{\partial x_j/x_j} = [1 - P(i)]\mathbf{b}_j$$

Like the marginal effects, the elasticity depends on the values of the explanatory variables. Thus it can be calculated for each observation and then a mean value obtained for each different stratum, so that the heterogeneity among households can be checked.

4. VARIABLES IN THE MODEL

The ECPF is a quarterly survey that reports the household's expenditure on hotel stays and package holidays. Given the panel-type structure of the ECPF, it is possible to monitor the same household for four consecutive quarters. Therefore, each household from our database is observed for a year, thus avoiding the distorting effect of the seasonal component of tourism expenditure. In this way, the dependent variable used in the econometric estimation is a dichotomous variable with a value of one if tourism expenditure has taken place at some time during the year and zero if not.

The following explanatory variables were incorporated into the model:

(1) Household income, defined as the after-tax income of all the household members, was incorporated in logarithmic form, where nominal quantities were converted to real terms with

the 1985 base-year general CPI deflator. Likewise an additional approximation representing the household's overall financial level was introduced, by including the income quartile the household belonged to. Introduced as dummy variables, these variables were only significant in as much as they distinguished the two income groups defined by the median.

(2) The age of the household head, defined as his or her age in years, and its square were introduced to allow for a non-linear effect.

(3) As regards the number of adults and children in the family, the option was chosen of defining the family size according to the classification system of the ECPF: one-person households, childless couples, couples with children and couples with adults (over the age of fourteen). The variables were introduced as dummies, taking one-person households as the reference group.

(4) The level of education (of the household head) was summarized by the creation of four groups: illiterate or without studies, primary-school studies, secondary-school studies and higher education studies (university). The dummy variables used for this purpose took the group without studies as the reference.

(5) Several variables were initially used for the household's employment status. Firstly, a continuous variable with the number of earners was incorporated. Secondly, dummies were introduced to reflect whether the household head was self-employed, a salaried worker or retired. Among these, only the retirement dummy proved statistically significant for our model. Likewise, a dichotomic variable was used for unemployed household heads.

(6) As for the households' geographic location, the size of the municipality in which the household is situated was known. Dummy variables were created to show whether the municipality was a mainly rural area (with less than 10,000 inhabitants), a medium-sized urban area (between 10,000 and 500,000 inhabitants) or whether it was a big city (with over 500,000 inhabitants). Finally, with our model, the only statistically significant dummy variable was the one for the big cities.

(7) Information was also included on the housing tenure (owned or rented) and, if it was owned, whether there was a mortgage on the property. The existence of a mortgage on the property was not, however, significant.

(8) As an indicator of mobility and, therefore, a possible determining factor in the decision to make a tourist trip, a variable reflecting whether the household had one or more cars was included. It must be taken into account, for example, that 39% of all European trips by international tourists were made by car in 1995 (OECD 2002).

(9) Dummy variables were created to assign each household to a specific cohort. Each cohort was created according to the year of birth of the household head on the basis of five-year intervals. Twelve cohorts were formed for the following intervals: 1906-1910, 1911-1915, ..., 1961-1965 and 1966-1970.

(10) Lastly, yearly dummy variables were introduced to control the business cycle effects. The first year, 1985, was taken as the reference year.

The explanatory capacity of the gender of the household head was also tested, because earlier studies of consumer behaviour indicated that this variable might be significant. Finally, however, it was discarded in the final estimation of the model, due to its lack of statistical significance.

5. STATISTIC RESULTS

The discrete choice logit model shows an acceptable level of adjustment, with a percentage of correct forecasts of 75.3%, with a 95.1% degree of precision when tourism consumption has not taken place and 19%, when it has. The statistical significance of the variables included in the model (likelihood ratio tests) and some statistics for the goodness of fit are shown in Table 1. Table 2 shows the estimations and significance of the model's coefficients as well as the odds ratios. Table 3 reports the mean, minimum and maximum probabilities, estimated for each category of the variable, and the estimation of the mean marginal effects. In continuation, the statistical results of the model's main variables are commented. The order by which the variables are commented is directly related to their explanatory capacity (see table 1).

Income: the explanatory capacity of the income variable is high, showing the expected positive relation. First of all, if a division of the sample is considered based on its median income level, belonging to the income group that is above the median modifies the odds ratio in comparison with the income group below the median by 1.268². The mean marginal effect has a value of 0.0512, i.e. households with an income above the median have a 5.12% higher

² See the last column of table 2.

probability of participation. However, in spite of income's considerable explanatory capacity, variations in income do not have a big impact on the probability of consumption. The mean marginal effect (calculated for annual increases of 150,000 pesetas, when the mean household income is 1,239,020 pesetas) is equivalent to 1.62%, with a decreasing pattern for the four income intervals: from 2.12% for households with the lowest incomes (first quartile) to 1.08% for families with the highest incomes (see Table 3). The mean income elasticity calculated using the whole sample is below the unit, with a value of 0.748. The mean elasticities for all the income groups are below the unit, descending from 0.895 for the lowest income interval, to estimated values of 0.818 and 0.707 for the intermediate intervals and 0.572 for the highest income interval (fourth quartile). The income elasticities estimated with the model therefore have two characteristics: they are positive and below the unit, and decreasing in terms of income.

The level of education: the probability of tourism consumption as opposed to the probability of no tourism consumption is always greater when the level of education of the household head is higher. Calculated in relation to the group without studies, there is an odds ratio of 1.58 for households with primary studies, 2.26 for households with secondary-school studies and 2.41 for those with higher-education studies. The marginal effects calculated in relation to the category without studies indicate that having primary-school studies leads to a 8.18% increase in the probability of tourism consumption, whilst secondary-school studies leads to an increase of 18.47% and, finally, higher-education studies lead to a rise of 20.39% in the probability of consumption.

Family size: the mean estimated probability of tourism consumption for one-person households is very similar to that of couples living alone (0.208 and 0.205, respectively), with a greater probability for couples with children (0.291) and for couples who live with adults of over 14 years old (0.273). However, if the values of the odds ratios are analysed, calculated in comparison with one-person households (see Table 2), the probability of positive expenditure on tourism is greater for the latter group. More specifically, for the estimations of the model, it can be concluded that the probability of tourism consumption as opposed to no consumption is greater for people who live alone, in comparison with couples with children (odds ratio = 0.417), couples without (odds ratio = 0.534) or couples living with other adults (odds ratio = 0.454). The mean marginal effects for the whole sample, in relation to one-person households, show a decrease in the probability of consumption of 8.85% for childless couples, of 15.93% for couples with children and of 13.91% for couples living with other adults. The model's results therefore indicate that controlling the effect of other variables, one-person households have a greater probability of tourism consumption.

The number of earners: increases of one extra earner lead to a 3.4% decrease in the probability of tourism consumption. Household decisions regarding the distribution of their work and leisure time have a characteristic effect here (see Browning and Meghir, 1991). Although when the number of earners increases, the family income also increases³, time constraints on members' joint enjoyment of their leisure time also increase.

Age: as Figure 3 showed, age has a non-linear relation with the probability of tourism consumption, defining a clear inverted U lifecycle profile. From the age of 25 (with a mean probability of 0.15), the probability of consumption increases to a mean value of about 0.30 between the ages of 35 and 45. From then on, the probability of consumption decreases until it reaches a value below 0.10 for the last years of life. Table 3 shows the marginal effects (corresponding to increases of one year in the age of the household head), calculated for the different age intervals. The mean marginal effects maintain the pattern of the probability of consumption, with a continuous decrease from the youngest age interval onwards.

Cohorts: all the odds ratio values are above the unit, increasing in value as the cohorts move away from the reference cohort, which is the oldest one (i.e. those born between 1906-1910 or, in other words, those aged between 75 and 79 in 1985). When compared with the reference cohort, the results of the estimations indicate that the odds ratio for the next cohort (those born between 1911 and 1914) is about 1.327 and for the youngest cohort (those born between 1966 and 1970) it is 3.485, with increasing values for practically all the intermediate cohorts. The probability of tourism consumption, as opposed to no consumption, therefore increases for successive generations. However, some of the cohorts could be considered to be statistically equivalent. As can be seen in Figure 9, the marginal effect is the same for cohorts aged between 70-74 and 65-69 in 1985. The cohorts aged 60-64, 55-59, 50-54 and 45-49 also reflect a similar marginal effect, with the younger cohorts (those born after 1945) on a third level. If these cohorts are grouped, the intermediate generations have an 11% higher probability of tourism consumption when compared with the oldest generation, whilst there is a 20% increase in the probability of consumption for the younger generations.

The size of the municipality: on average, the inhabitants of big cities have a greater probability of tourism consumption (0.33 as opposed to 0.22 for cities with less than 500,000 inhabitants). When big cities were compared with small ones, an odds ratio of 1.293 was obtained, with a mean marginal effect of 4.97%.

The employment status of the household head: an odds ratio of 1.185 and a mean marginal effect of 2.35%, indicate that being retired increases the probability of tourism consumption, reflecting less rigid time constraints. As regards the difference between unemployed household heads and working ones, the probability of consumption for our sample is lower for the former (0.170 as opposed to 0.268): an image that was confirmed with the estimation of the model, with an odds ratio below the unit and a marginal effect of -2.95% .

Housing tenure: households with rented homes have a slightly lower probability of consumption than households with owned properties (0.232 and 0.265 respectively). There is an estimated odds ratio of 0.832, with a marginal effect of -2.86% .

Owning a car: owning at least one car means a probability of consumption of 0.304, whilst the probability for households without a car is almost half (0.161). The estimated odds ratio is above the unit, 1.317, with a marginal effect of 5.19% when compared with the non-ownership of a car.

6. DISCUSSION AND POLICY IMPLICATIONS OF THE RESULTS

The results indicate the importance of cultural influences, related to households' different perspectives of their leisure time. After income, the level of education is the variable that has the greatest explanatory capacity. Figure 8 above showed the different rates of participation according to levels of education. In that figure, the characteristic inverted U shape of the participation rate during the lifecycle, was only less evident for the lowest level of education. In this sense, the participation rate during the household lifecycle is similar to the usual profile for households' total consumption (Deaton, 1998). Since Mincer's study (1974), the high degree of association between the level of education and the level of income has been tested repeatedly. Therefore, the extent to which the microeconomic model used has managed to disassociate both effects must be assessed. Figure 10 shows the mean probabilities of participating estimated with the model, when calculated for the income percentiles, distinguishing three levels of education (illiterate, primary-level, secondary-level or higher). The higher the income level, the greater the probability of tourist travel. However, within the same income bracket, the level of education has a high influence on the value of the probability. This result therefore suggests the existence of a high degree of segmentation among the population, according to their level of education, and this acts as a type of cultural barrier in terms of access to tourism consumption.

³ For example, by moving from one to two earners the household income rises by about 50% for the

The model also reveals the influence that constraints on leisure time have on travel decisions. Both the positive marginal effect involved in being retired and the negative effects of family size (in comparison with one-person households) or of an increase in the number of earners indicate that an increase in the amount of free time available or the flexibility of its distribution would lead to a rise in the overall percentage of households with positive tourism expenditure⁴. The importance of the time constraints can be observed if, for example, the probabilities for one or two earners are compared in the case of couples with children. In Figure 11, the profiles are shown for households with different levels of income, revealing how, even for the highest income levels, the probability of making a trip is several points ahead if there is one single earner.

Although the importance of the household lifecycle in influencing the probability of tourism consumption is confirmed, the age effect must be qualified for certain groups of the sample. For instance, if the sample is segmented according to income quartiles, the households in the lowest interval scarcely experience any change in the probability of participating during the family lifecycle. Therefore, as long as part of the sample shows a flat participation rate during its lifecycle, the effect of an aging population may be lower than expected.

In the analysis of the demographic effects, a big generational effect has also been detected, via which the youngest cohorts have a greater probability of travelling. This result also limits the relevance that the aging of the population may have on the demand for tourism. For instance, a person from the sample in the 55-59 age interval belongs to one of the following four cohorts, born between 1926-1930, 1931-1935, 1936-1940 and 1941-1945, which have the following probabilities of consumption: 0.22, 0.25, 0.29 and 0.35, respectively. Figure 12 shows the importance of the cohort effect for the entire lifecycle. In general, holding age constant the youngest cohorts have a greater tendency to travel. The global aging effect of the population is therefore ambiguous. Whilst a population with a greater proportion of aged people may reduce the global demand for tourism, the cohort effect could clearly compensate for this negative effect.

The value estimated for the income elasticity is positive, below the unit and decreasing as the income level rises. From this result it can be derived that, on the one hand, in a situation of economic growth participation in the tourist market will be higher, although this increase will be

ECPF sample.

⁴ In the case of the number of earners, the opportunity cost of leisure might also be relevant.

less than proportional. On the other hand, given the reduced sensitivity to income, under the hypothesis of a constant income distribution, the effect of the economic growth will gradually decrease.

The impact of variations in income can be analysed further in detail, taking into account the heterogeneity of the answers given for the different sample groups. Figure 13 shows the mean income elasticity values against the age of the household head, calculated for the four income quartiles. The mean income elasticities decrease in an almost uniform way across the income quartiles. Nevertheless, their values do not follow the same lifecycle profile across the income quartiles: meanwhile they remain almost constant for the lowest income interval, they follow a U shape for the medium and high intervals. From Figure 13, it can be derived that increases in income for the poorest Spanish households would lead to an almost proportionate increase in their propensity to travel, whatever the age group. If the increase in income were mainly to affect the richest families, there would be a much lower increase in the percentage of households that travel and the pattern would be more dependent on the lifecycle. In general terms, for the Spanish population as a whole, it can therefore be considered that economic growth will only be essential in determining an increase in the overall propensity to travel if this growth benefits the incomes of households in the lower income intervals.

If education is introduced as a means of differentiation, it can be seen that the income elasticities are lower as the level of education increases, whatever the income level may be. Figure 14 shows the mean elasticity values for each income percentile and level of education. The income elasticities of families whose household head does not have studies are systematically higher than the elasticities of families whose household head has studies. The elasticities range from values close to 0.9 for the lowest income levels, to means of 0.56 (for the group without studies), 0.42 (primary-school studies), 0.31 (secondary-school studies) and 0.28 (higher education studies). In consequence, as the level of education goes up, the sensitivity to variations in income decreases, although regardless of the level of education concerned, the income elasticity falls as the household's income rises. It can once again be concluded that the effect of income on the evolution of the propensity to travel will not be uniform across the population and that the most inelastic households will be those whose household head has higher education studies. Given the fact that an improvement in the Spanish population's level of education can be anticipated, it must be expected that increases in income will have a moderate effect on the proportion of households that travel.

7. CONCLUSIONS

The consumption of tourism services can be analysed as the result of a dual decision: the first regarding whether to make the trip or not and the second regarding how much to spend. The variables that determine both decisions need not be the same. It might be considered *a priori* that variables related to the availability of leisure time or to barriers of a cultural or demographic type may be more influential in the case of the first decision, although the level of household income may also be an essential determining factor.

In this study, priority has been given to an analysis of the factors that determine a household's decision to make a tourist trip. For this analysis, the Spanish Family Expenditure Survey has been used, from which data was compiled on 18,038 households for the period 1985-1996. Given the relatively low rate of participation of Spanish households (construed in this study in a limited sense as referring to positive expenditure on hotels or package holidays), the possibility of this being a mature market can be discarded, thus making an analysis of the factors determining its evolution even more valuable.

The main contributions of this paper are twofold. First, this paper offers new evidence to what extent income and the sociodemographic and cultural variables determine the decision to consume tourism services. Second, an analysis of the heterogeneity of the income elasticity and of some variables that affect it is also made.

The estimation of the discrete choice model has led to the following conclusions:

(a) The characteristics of the household correlated with the availability and distribution of its members' free time (i.e. a retired household head, the family size or the number of earners) are all crucial factors that determine the decision to make a tourist trip. Although these variables affect the household's level of income, among their immediate effects is the greater or lesser availability of leisure time. In the case of households whose household head is retired, with just one member or with one single earner, the probability of tourism consumption increases, whilst it decreases when the household head still works, the household has more than one member or there are two or more earners.

(b) Cultural factors play a prime role in travel decisions. The role of the household head's level of education is fundamental, not only directly, but even due to its interrelation with other variables. The level of education is particularly influential on the final effect of variations in

income, since the greater the level of education, the less influence variations in income have on this type of consumer decision. The household's location in a big city and the availability of a car, which have a positive consumer effect, can also be construed as expressions of the Spanish household's cultural characteristics.

(c) In line with previous literature on the household lifecycle, it has been confirmed that household preferences display an inverted U profile according to age. However, the importance of the lifecycle stage should be qualified for certain segments of the population, above all for the segment corresponding to households with the lowest incomes, whose probability of tourism consumption remains almost constant for the whole of the lifecycle. Furthermore, a significant generational effect has also been detected, via which the youngest cohorts have a greater probability of travelling. The existence of this important generational effect might offset the negative impact of the aging of the Spanish population.

(d) The most significant variable in determining the probability of tourism consumption is household income. However, an income elasticity below the unit indicates that big increases in the tendency to travel in a scenario of moderate economic growth cannot be expected. The segmentation of the sample, however, shows that not all households respond in the same way to variations in income.

In terms of policy implications, the high degree of heterogeneity detected in this paper therefore indicates the necessity not only of determining the mean income elasticity, but also of assessing its dispersion among the population and the variables that affect it the most. In this paper it has been shown that the future influence of changes in income on the probability of travel of Spanish households will depend on the distribution of economic growth, and the evolution of the level of education and age distribution.

To sum up, the sociodemographic tendencies of Spanish households, and in general of households of the OECD countries, are characterized by an increase in one-person households and childless couples, an increase in the overall level of education, a higher proportion of older people and an increase in the number of retired people. This paper has shown that these variables will significantly increase the propensity to travel, to the extent that they might be more important than economic growth.

The estimation of the model has shown the existence of a high degree of heterogeneity in the behaviour of households, due to their diversity. The use of aggregate models, although useful in certain contexts, conceals the relevance of this diversity and can therefore lead to

unreliable generalizations. Microeconomic analyses of national surveys on expenditure not only make it possible to identify which households are the consumers of tourism services, but also what factors determine this type of consumption. Finally, given the heterogeneity among households, it is advisable to examine in depth the two different stages in the demand for tourism: the decision to take a trip and the expenditure made, which might be motivated by different factors.

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Table 1. The Overall Significance of the Variables and Goodness-of-Fit Measures

	χ^2	df	p-value
Income	569,862	2	0.000
Education	147,163	3	0.000
Family size	87,095	3	0.000
Number of earners	49,901	1	0.000
Size of the municipality	45,496	1	0.000
Cohorts	17,937	11	0.083
Car	29,007	1	0.000
Years	22,146	11	0.023
Housing tenure (rented)	10,708	1	0.001
Age	7,598	1	0.022
Retired	7,854	1	0.005
Unemployed	7,227	1	0.007
Model	2239,177	38	0.000
<i>Cox & Snell</i> $R^2 = 0.12$ <i>Nagelkerke</i> $R^2 = 0.17$			
Significance of the <i>Hosmer & Lemeshow</i> test = 0.344			

Table 2. Statistic Results of the Variables in the Equation

Variables	B	Wald	p-vaule	Exp(B)
Constant	-17,747	170,08	0.000	0.000
Income below the median *	-	-	-	-
Income above the median	0,238	16,08	0.000	1.268
log (income)	1,011	250,34	0.000	2.749
Illiterate *	-	-	-	-
Primary-school studies	0,457	74,55	0.000	1.580
Medium-level studies	0,816	111,92	0.000	2.261
Higher-education studies	0,881	111,45	0.000	2.413
One-person home *	-	-	-	-
Childless couple	-0,627	49,66	0.000	0.534
Couple with children	-0,874	78,87	0.000	0.417
Couple with adults (over 14 years old)	-0,789	81,20	0.000	0.454
Number of earners	-0,202	49,06	0.000	0.817
Age	0,067	7,53	0.006	1.069
Age squared	-0,0005	5,80	0.016	1.000
Cohort aged 75 - 79 in 1985 *	-	-	-	-
Cohort aged 25 - 29 in 1990	1,178	2,56	0.110	3.249
Cohort aged 25 - 29 in 1985	1,249	3,39	0.065	3.485
Cohort aged 30 - 34 in 1985	1,096	3,11	0.078	2.991
Cohort aged 35 - 39 in 1985	0,973	2,95	0.086	2.645
Cohort aged 40 - 44 in 1985	0,896	3,06	0.080	2.450
Cohort aged 45 - 49 in 1985	0,668	2,15	0.143	1.950
Cohort aged 50 - 54 in 1985	0,681	2,88	0.090	1.976
Cohort aged 55 - 59 in 1985	0,620	3,21	0.073	1.860
Cohort aged 60 - 64 in 1985	0,653	4,95	0.026	1.922
Cohort aged 65 - 69 in 1985	0,323	1,69	0.193	1.382
Cohort aged 70 - 74 in 1985	0,283	1,55	0.214	1.327
Municipality with less than 500,000 inhabitants *	-	-	-	-
Municipality with more than 500,000 inhabitants	0,257	45,76	0.000	1.293
Active *	-	-	-	-
Retired	0,169	7,87	0.005	1.185
Household head working *	-	-	-	-
Household head unemployed	-0,227	7,04	0.008	0.797
Owned home *	-	-	-	-
Rented home	-0,183	10,52	0.001	0.832
No car *	-	-	-	-
At least one car	0,276	28,54	0.000	1.317
Year 1985 *	-	-	-	-
Year 1986	-0,078	0,68	0.411	0.925
Year 1987	-0,105	1,07	0.302	0.900
Year 1988	-0,286	7,43	0.006	0.751
Year 1989	-0,208	3,64	0.057	0.812
Year 1990	-0,266	5,29	0.021	0.766
Year 1991	-0,060	0,25	0.618	0.942
Year 1992	-0,068	0,28	0.600	0.934
Year 1993	-0,013	0,01	0.926	0.987
Year 1994	-0,097	0,42	0.518	0.908
Year 1995	-0,191	1,43	0.232	0.826
Year 1996	-0,137	0,68	0.410	0.872

Note: * indicates the reference group.

Table 3. Estimated Probabilities and Mean Marginal Effects

Variables	Probability			Mean marginal effect
	Mean	Minimum	Maximum	
Income below the median *	0.150	0.007	0.584	-
Income above the median	0.371	0.068	0.945	0.0512
Low income interval	0.114	0.008	0.485	0.0212
Low-medium income interval	0.186	0.042	0.584	0.0170
Medium-high income interval	0.304	0.068	0.740	0.0157
High income interval	0.438	0.081	0.945	0.0108
Without studies *	0.132	0.008	0.574	-
Primary-school studies	0.258	0.026	0.902	0.0818
Medium-level studies	0.424	0.021	0.841	0.1847
Higher-education studies	0.521	0.095	0.945	0.2039
One-person home	0.208	0.031	0.945	-
Childless couple	0.205	0.008	0.902	-0.0885
Couple with children	0.291	0.019	0.801	-0.1593
Couple with adults (over 14 years old)	0.273	0.013	0.843	-0.1391
One earner *	0.237	0.019	0.945	-
Two earners	0.277	0.025	0.843	-0.0353
Three earners	0.278	0.026	0.812	-0.0366
Four or more earners	0.282	0.026	0.757	-0.0377
Aged 25 – 34	0.281	0.019	0.839	0.0085
Aged 35 – 44	0.314	0.019	0.814	0.0071
Aged 45 – 54	0.295	0.019	0.841	0.0055
Aged 55 – 64	0.253	0.022	0.945	0.0041
Aged 65 – 74	0.203	0.021	0.815	0.0031
Aged 75 – 84	0.129	0.008	0.742	0.0020
Cohort aged 75 - 79 in 1985 *	0.087	0.008	0.672	-
Cohort aged 25 - 29 in 1990	0.291	0.027	0.839	0.3603
Cohort aged 25 - 29 in 1985	0.307	0.019	0.793	0.3718
Cohort aged 30 - 34 in 1985	0.321	0.024	0.801	0.3480
Cohort aged 35 a 39 in 1985	0.316	0.019	0.841	0.3112
Cohort aged 40 a 44 in 1985	0.307	0.024	0.835	0.2820
Cohort aged 45 - 49 in 1985	0.270	0.025	0.843	0.2156
Cohort aged 50 - 54 in 1985	0.253	0.019	0.945	0.1979
Cohort aged 55 - 59 in 1985	0.236	0.022	0.902	0.1670
Cohort aged 60 - 64 in 1985	0.223	0.021	0.815	0.1525
Cohort aged 65 - 69 in 1985	0.158	0.025	0.742	0.0675
Cohort aged 70 - 74 in 1985	0.138	0.022	0.618	0.0449
Municipality with less than 500,000 inhabitants *	0.216	0.008	0.841	-
Municipality with over 500,000 inhabitants	0.330	0.025	0.945	0.0497
Household head active *	0.308	0.019	0.843	-
Household head retired	0.193	0.008	0.945	0.0235
Household head working *	0.268	0.013	0.945	-
Household head unemployed	0.170	0.008	0.812	-0.0295
Owned home*	0.265	0.013	0.945	-
Rented home	0.232	0.008	0.794	-0.0286
No car *	0.161	0.008	0.832	-
At least one car	0.304	0.019	0.945	0.0519
Year 1985 *	0.230	0.027	0.902	-
Year 1986	0.223	0.019	0.775	-0.0141
Year 1987	0.222	0.008	0.801	-0.0189
Year 1988	0.217	0.021	0.718	-0.0462
Year 1989	0.234	0.019	0.815	-0.0363
Year 1990	0.244	0.018	0.801	-0.0474
Year 1991	0.271	0.022	0.835	-0.0155
Year 1992	0.293	0.032	0.772	-0.0182
Year 1993	0.304	0.023	0.814	-0.0116
Year 1994	0.299	0.021	0.843	-0.0288
Year 1995	0.273	0.013	0.945	-0.0463
Year 1996	0.292	0.026	0.841	-0.0395

Note: * indicates the reference group. For the income variable, the marginal effect has been calculated using increases of 100,000 ptas.

Figure 1. Households with Positive Expenditure on Tourist Travel (1985-1996).

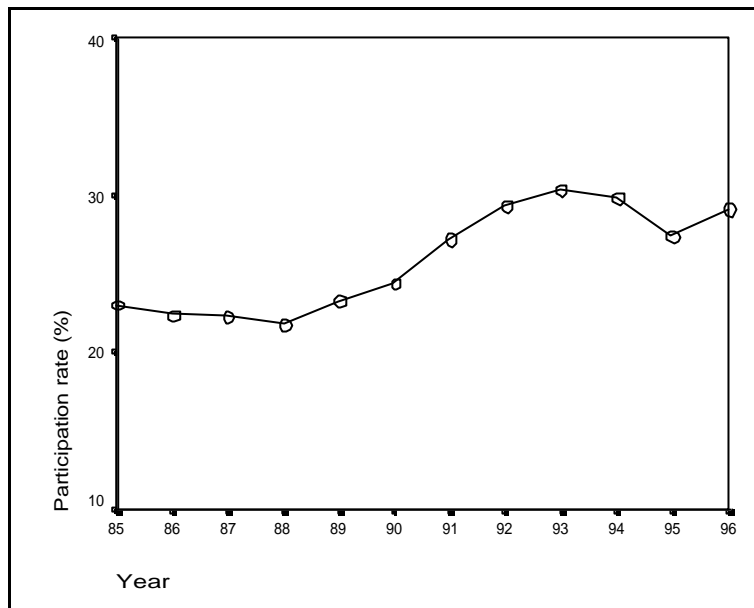


Figure 2. Mean Household Expenditure on Tourism by Age (Whole Sample).



Figure 3. Rate of Participation by Age.



Figure 4. Mean Tourism Expenditure by Age (Households With Positive Spending)

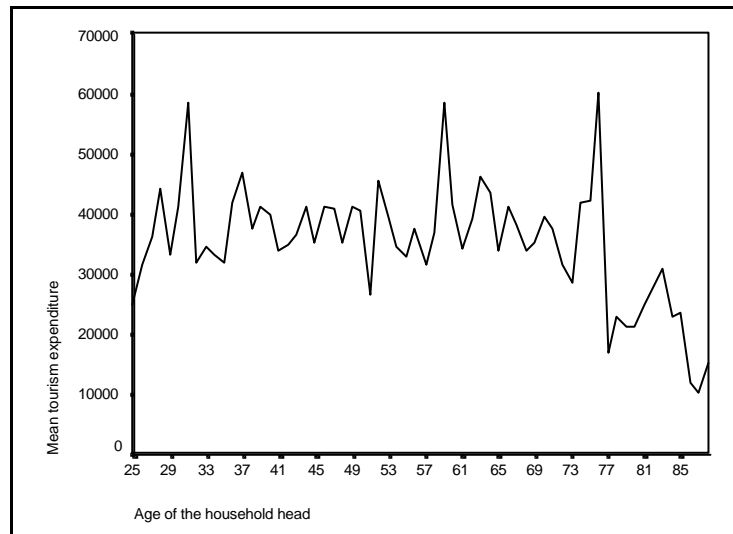


Figure 5. Mean Household Income by Age (Whole Sample).



Figure 6. Rate of Participation by Age Groups and Income.

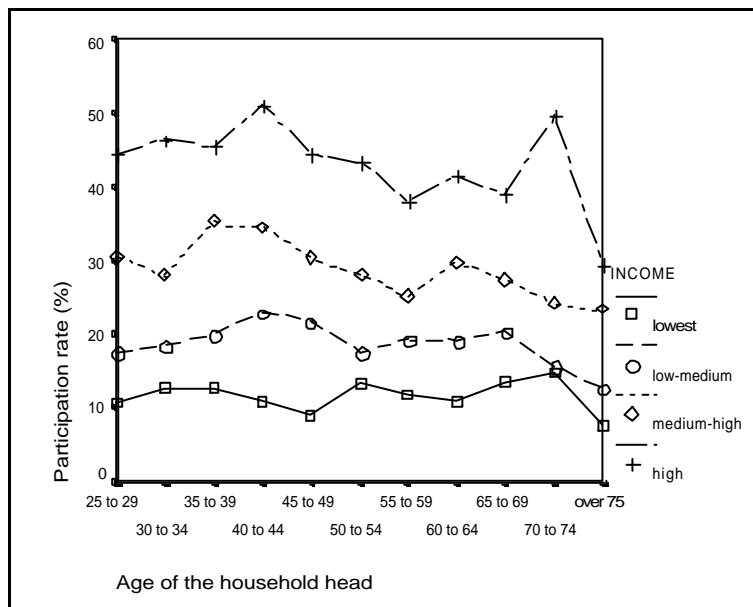


Figure 7. Rate of Participation by Age Groups and Family Size

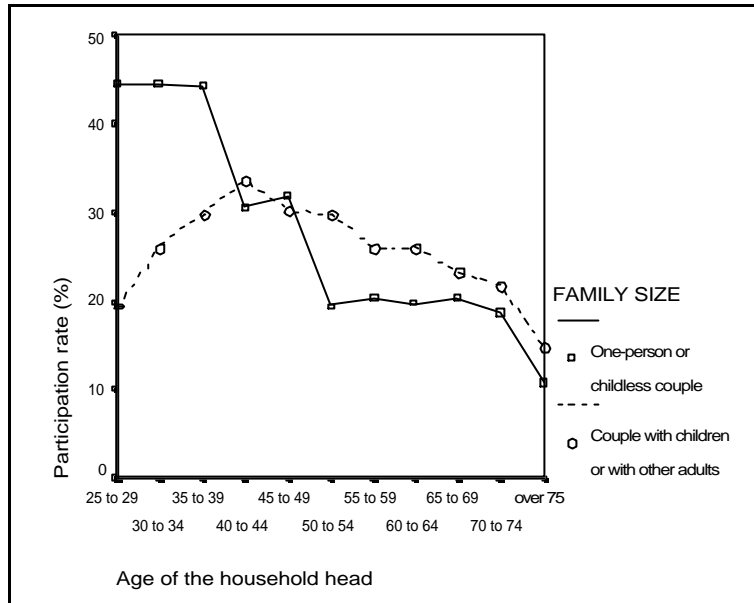


Figure 8. Participation Rate by Age Groups and Education

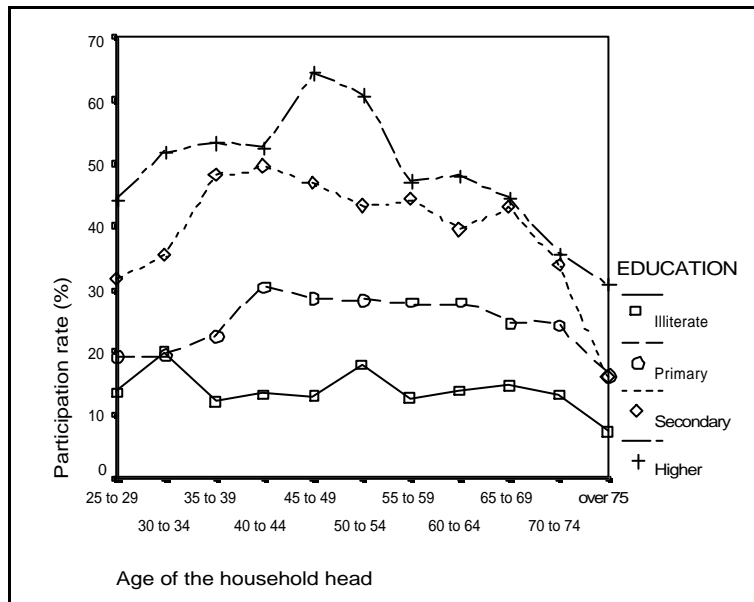


Figure 9. Mean Marginal Effect of the Cohorts

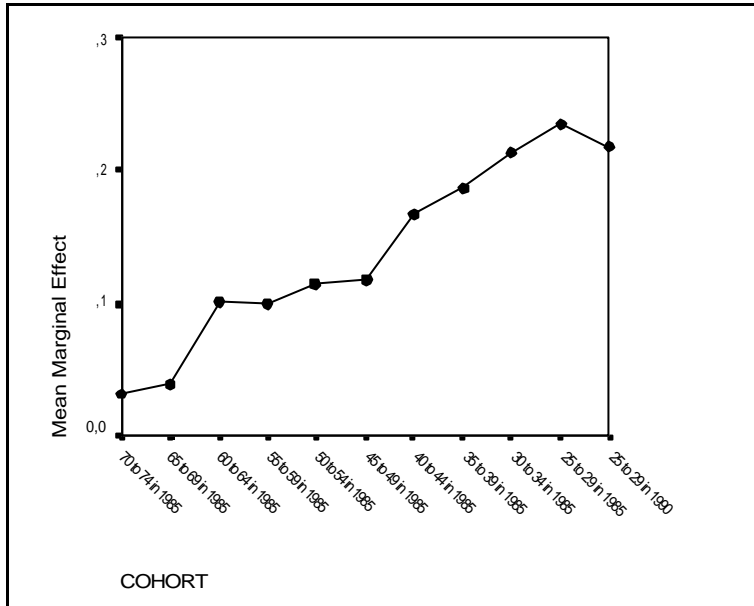


Figure 10. Probability of Participation by Income and Education.

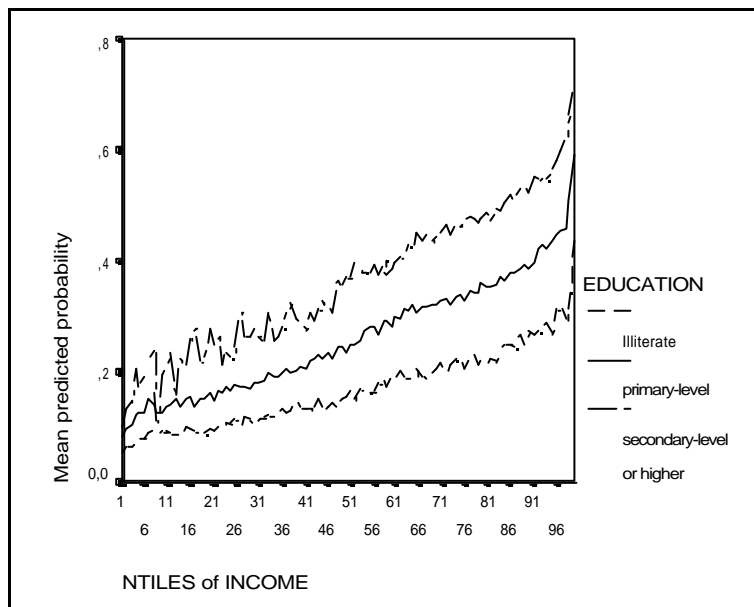


Figure 11. Probability of Participation by Earners and Income (couples with Children).

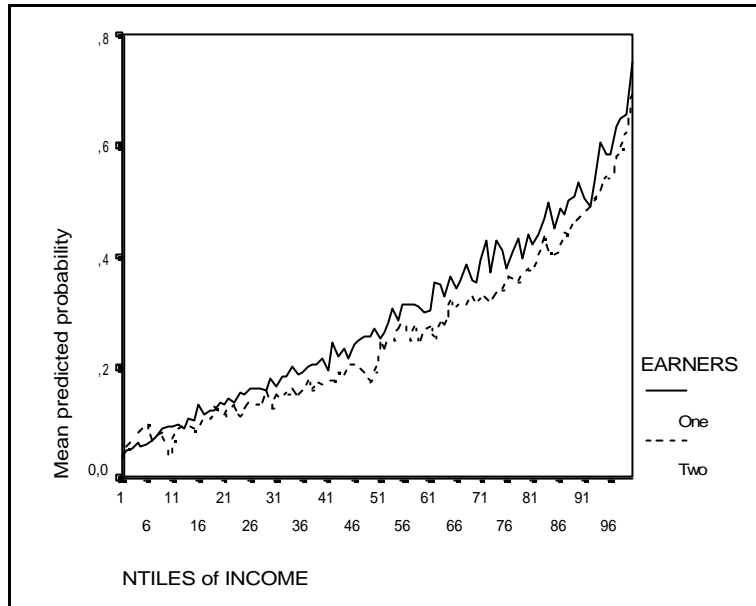
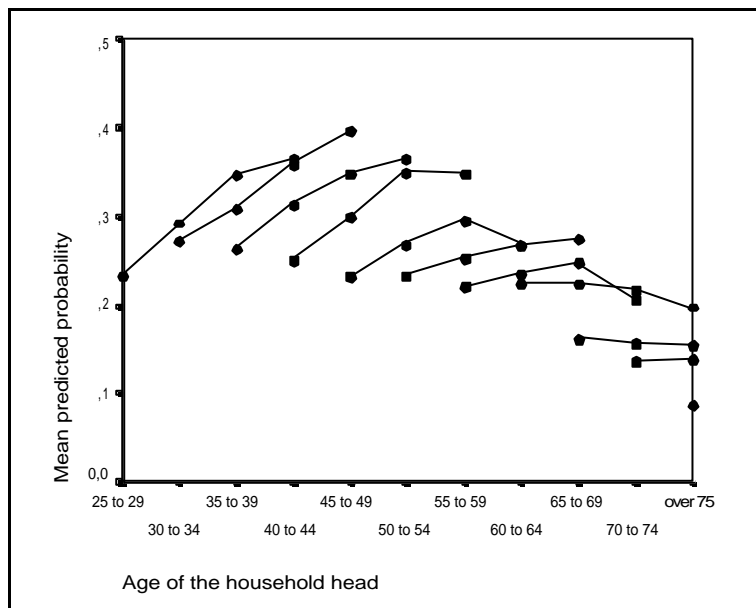


Figure 12. Probability of Cohort Participation by Age



Note: starting with the 1985 values, each line shows the cohort values for 1985, 1989, 1993 and 1996.

Figure 13. Income Elasticities by Age and Income Quartiles



Figure 14. Income Elasticities by Education and Income Percentiles

