

# Perception of Income Satisfaction

## *An Analysis of Slovenian Households*

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## **Abstract**

Three comparable cross-section household datasets, relating to 1988, 1993 and 1997-1999 are used to analyse income satisfaction in Slovenian households. The ordered probit model is used to estimate the effects of ‘objective’ variables, such as actual disposable household income and household size on the perceived (subjective) economic well-being of the household. Variables that tend to capture income aspirations are also included, such as variables describing the socioeconomic structure of the household (share of children, share of elderly persons) as well as a variable denoting household wealth (homeownership). The estimated effects of these variables are all of the expected sign. Though unemployment results mostly in high non-pecuniary costs, it also has a strong negative influence on subjective economic well-being. Our results are in fine agreement with similar - but quite rare - studies on subjective economic well-being in other countries in transition.

**JEL classification:** D60, I31, P2.

**Keywords:** economic well-being, income satisfaction, transition, Slovenia.

# Perception of Income Satisfaction

## *An Analysis of Slovenian Households*

Tine Stanovnik and Miroslav Verbič

### 1. Introduction

Economic well-being is – quite understandably – a research area of continued interest. In particular, subjective perceptions of economic well-being have been extensively explored. The research varies not only in scope, but also in theoretical underpinning. For example, a fairly straightforward approach is to analyse one particular (economic) welfare level of the household, i.e. level at which households perceive themselves as being ‘poor’. The approach is simply to ask respondents what would be the minimum monthly amount of income they consider necessary to make ends meet; this is the answer to the so-called minimum income question (MIQ). Answers to this type of questions were analysed and applied in Kilpatrick (1973), Goedhart *et al.* (1977), Danziger *et al.* (1984), Kapteyn *et al.* (1988), Stanovnik (1992), and Garner and de Vos (1995) – to quote a selection of the rather extensive literature on the subject. Based on answers to the MIQ, one could construct national poverty lines as a function of family size and other household characteristics. However, a criticism of this approach is that the MIQ is ‘too’ subjective, in the sense that ‘minimum income’ does not represent the same feeling of welfare for each respondent. As Van Praag *et al.* (1980, p. 462) put it, ‘some may identify it with the margin of starvation while others may define their minimum income on a less austere basis’. A more coherent theoretical approach, which is also subject to empirical verification is the one developed by Van Praag and his associates at the Leyden University, first presented in Van Praag (1968) and since then applied in many European countries; in particular, we refer to Van Praag (1991), and Kapteyn (1994).

The methodology presented in their works is based on certain theoretical notions, which lead to the formulation and construction of the individual welfare function of income, which is actually an operationalization of the cardinal utility function of income. The empirical welfare function of income is obtained by asking the respondent to state the amount of income he associates with various welfare levels (‘very bad’, ‘bad’, ‘insufficient’, ‘sufficient’, ‘good’, ‘very good’). Based on the equal quantile assumption, a curve can be fitted to these points; furthermore, a lognormal distribution function is assumed. This approach was subject to criticism regarding its theoretical foundations by Hartog (1988), and especially Seidl (1994). One must note that there are problems with the lognormal specification, in that it implies increasing marginal utility of income (albeit only in a certain income range). We also note that, while modelling one parameter of the lognormal curve ( $\mu$ ) did produce meaningful results, a satisfactory modelling of the other parameter ( $\sigma$ ) proved to be quite elusive.

The approach we follow is not based on any assumptions regarding the shape of the individual welfare function of income, but is simply concerned with one point of this individual welfare function: the respondents are asked to assess their current income

position, using an ordinal scale, such as ‘income very insufficient’, ‘income insufficient’, ‘income sufficient’ and ‘income very sufficient’. Obviously, the analysis based on this subjective economic welfare question depends on the richness of the survey data. Thus, the subjective perception of one’s income very much depends on relative income, both relative to one’s reference group or relative to one’s past experience (McBride, 2001), and it might be quite sensible to include a relevant variable – provided of course that it is at hand. Furthermore, health, education, employment, wealth and other socio-economic characteristics of the household are important, as well as attitudinal variables. Needless to say, surveys which contain a long list of such ‘desirable’ data are rare, particularly in Central and Eastern European countries. Among those that stand out is the Russian longitudinal monitoring survey, and the subjective economic well-being using this survey has been extensively analysed by Ravallion and Lokshin (2002). Compared to their analysis, ours’ is more modest, as the available survey data pose the real constraints.

## **2. Data**

The analysis of income satisfaction is based on the Household Expenditure Survey, which is being carried out annually by the Statistical Office of the Republic of Slovenia. Up to 1997, the Statistical Office was carrying out annual Household Expenditure Surveys and also Household Expenditure Surveys with larger number of observations in five-year intervals, the last such ‘large’ survey being carried out in 1993. In 1997 some methodological changes were introduced and only annual surveys are carried out; the Statistical Office then merges three annual surveys in order to obtain a larger sample.

## **3. Analysis of Income Satisfaction**

Analysis of income satisfaction is based on the following question from the Household Expenditure Survey: ‘In relation to your costs of living, your family income is: (1) very insufficient, (2) insufficient, (3) sufficient, (4) amply sufficient?’ We analysed the data samples for the years 1988 and 1993. With the implementation of the methodological changes in 1997 the question changed as well. It was posed as: ‘Considering your monthly disposable income, is your household able to make ends meet: (1) with great difficulty, (2) with difficulty, (3) with some difficulty, (4) without difficulty, (5) with ease, (6) with great ease?’ Due to small number of observations in the sixth rank (‘ends meet with great ease’) ranks 5 and 6 were merged under the common name ‘ends meet with ease’. The data sample for the years 1997–1999 is therefore being analysed using this modification. Table 1 presents information on the values of some selected variables from the sample.

<TABLE 1>

As can be seen from Table 1, satisfaction with one’s income rises with rising disposable income. Home ownership is also important for the perception of income satisfaction; lower shares of home-owners is characteristic of households that express greater dissatisfaction with their income and higher shares of home-owners is

characteristic of households which express greater satisfaction with their income. This is of course just a casual observation, preceding a more formal analysis. It is also interesting to observe that the share of households declaring their income to be 'very insufficient', 'insufficient', 'sufficient' and 'amply sufficient' in 1993 is quite similar to the corresponding shares in 1988. This might seem remarkable, considering the political, social and economic changes which have occurred in the years between 1988 and 1993. In this tumultuous period wages experienced a large drop and bottomed-out in 1992, when they amounted to only 71% of their 1988 value (Statistical Yearbook of the Republic of Slovenia, 2003, p. 242). Following this, they increased in 1993 to reached 79% of their 1988 value. There is an explanation for these stable shares which occurred in a period of decreasing incomes. Quite possibly, aspirations might have decreased, caused not only by falling incomes but also by increases in unemployment, job insecurity etc<sup>1</sup>.

Table 1 also provides some other revealing information. Very low unemployment in the socialist era dramatically increased in the first years of transition. It is evident from the Table 1 that households which expressed greater dissatisfaction with their income also had a higher share of unemployed persons. One also observes a very large increase in homeownership between the 1988 and 1993 survey. This is due to the housing privatisation which was carried out in 1991 when the social housing stock was offered for sale to sitting tenants under very favourable conditions. Most sitting tenants opted for purchase, and the share of owner-occupied housing increased by some twenty percentage points after the privatisation was completed.

Before proceeding to a more rigorous analysis, we present one more 'descriptive' Table (2), showing the distribution of income with regard to the perceived income sufficiency. As seen from this table, actual income obviously does matter, and most persons who have declared that their income is amply sufficient live in households whose income is greater than median household income plus 1/3 of the standard deviation of household income. Similarly, households who have declared that their income is very insufficient mostly have household income less than median household income minus 1/3 of the standard deviation of household income.

<TABLE 2>

Answers to the income sufficiency question are analysed using the ordered probit model. For the years 1988 and 1993, the dependent variable is simply the answer to the income satisfaction question. It takes four values; without any loss in generality, the value '0' is taken if the respondent encircles the first option (income very insufficient), the value '1' responds to 'income insufficient', '2' to 'income sufficient' and value '3' to 'income amply sufficient'. In the 1997-1999 survey the dependent variable is the answer to the question on the difficulty of making ends meet: the value '0' is taken if the respondent encircles 'ends meet with great difficulty', the value '1' is taken if the respondent encircles 'ends meet with difficulty' etc. These (four and, respectively, five)

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<sup>1</sup> In order to explain why experienced happiness – admittedly a broader concept than economic well-being – is fairly constant over an individuals' life-cycle, Easterlin (2001, p. 473) put forward the conjecture that 'material aspirations change over the life cycle roughly in proportion to income ... (so that) both aspirations and income rise, with roughly offsetting effects on well-being'. There is of course no reason why one could also not assume the reverse, i.e. that a fall in income and aspirations will also have a 'roughly offsetting effect on well-being'.

values of the dependent variable can be viewed as the outcome of a continuous process, defined by a latent (unobservable) variable. This latent variable can be named ‘Index of income sufficiency’, denoted  $I$  and defined as:

$$I_i = \alpha_0 + \alpha_1 \ln y_i + \alpha_2 \ln fs_i + \alpha_3 S60_i + \alpha_4 SCH_i + \alpha_5 SUN_i + \alpha_6 DAH_i + \alpha_7 DPH_i + u_i, \quad (1)$$

where  $y$  is disposable household monthly income;  $fs$  is family size, measured in equivalent adults by the standard OECD equivalence scale;  $S60$  is share of persons aged over 60 in household;  $SCH$  is share of children (members under 19 years of age) in household;  $SUN$  is share of unemployed members in household;  $DAH$  is a dummy variable taking the value of ‘1’ if family lives in owner occupied apartment; whilst  $DPH$  is a dummy variable taking the value of ‘1’ if the household is a pensioner household (with one or two members). Without any loss in generality, we can assume that the error term is distributed as  $u \sim N(0, 1)$ .

Equation (1) can also be written in the following form:

$$I_i = \boldsymbol{\alpha}'\mathbf{x} + u_i \quad (2)$$

where  $\mathbf{x}$  is the vector of explanatory variables. Denoting our dependent variable by  $ISAT$ , we can formulate the decision-making process (i.e. response to the income satisfaction question) of family  $i$  as:

$$ISAT_i = \begin{cases} 0 & \text{if } I_i < \mu_0 \\ 1 & \text{if } \mu_0 \leq I_i < \mu_1 \\ 2 & \text{if } \mu_1 \leq I_i < \mu_2 \\ 3 & \text{if } \mu_2 \leq I_i \end{cases} \quad (3)$$

where the  $\mu$ 's are unknown constants. We can now write:

$$\begin{aligned} P(ISAT_i = 0) &= P(I_i < \mu_0) \\ P(ISAT_i = 1) &= P(\mu_0 \leq I_i < \mu_1) = P(I_i < \mu_1) - P(I_i < \mu_0) \\ P(ISAT_i = 2) &= P(\mu_1 \leq I_i < \mu_2) = P(I_i < \mu_2) - P(I_i < \mu_1) \\ P(ISAT_i = 3) &= P(\mu_2 \leq I_i) = 1 - P(I_i < \mu_2) \end{aligned}$$

thus

$$\begin{aligned} P(ISAT = 0) &= \Phi(\mu_0 - \boldsymbol{\alpha}'\mathbf{x}) \\ P(ISAT = 1) &= \Phi(\mu_1 - \boldsymbol{\alpha}'\mathbf{x}) - \Phi(\mu_0 - \boldsymbol{\alpha}'\mathbf{x}) \\ P(ISAT = 2) &= \Phi(\mu_2 - \boldsymbol{\alpha}'\mathbf{x}) - \Phi(\mu_1 - \boldsymbol{\alpha}'\mathbf{x}) \\ P(ISAT = 3) &= 1 - \Phi(\mu_2 - \boldsymbol{\alpha}'\mathbf{x}) \end{aligned} \quad (4)$$

where  $\Phi(\cdot)$  denotes the cumulative standard normal function. The model defined in (4) is an ordered probit model and the coefficients  $\boldsymbol{\alpha}$  are estimated through the

maximization of the log likelihood function. These estimates of the coefficients are presented in Table 2.

<TABLE 3>

As can be seen from expression (1), a positive value of the estimated coefficient means that an increase in the explanatory variable increases the ‘index of income sufficiency’ and thus increases the probability of the individual to express higher income satisfaction. All estimated regression coefficients from Table 3 are of the expected sign, and have fairly stable values for the three estimated cross-sections (somewhat different values of the respective regression coefficient for the 1997-1999 data sample are to some extent also due to aforementioned methodological changes). Let us examine the effects of these variables in more detail.

The probability of a family to be satisfied with its income, *ceteris paribus*, increases with rising disposable income, as has already been observed on the basis of descriptive statistics from Tables 1 and 2. The probability of a family to be satisfied with its income, *ceteris paribus*, decreases with the family size. Older households, i.e. households where members are older than 60 years, are, *ceteris paribus*, more likely to be satisfied with their income than younger households. Similar statement can be applied for pensioner households. According to Katona *et al.* (1971) age is a proxy for reality; the possibilities of the young become the constraints of the elderly and they are also perceived as such. The older households have not only lower aspirations, but also lower real needs as their wealth, accumulated during the life cycle, is substantially greater than that of younger households. The most important form of wealth is ownership of a dwelling. Households living in their own apartment or house are, *ceteris paribus*, more likely to be satisfied with their income than households living in rented apartments. This is not surprising, considering that the possession of an apartment or a house is something that most households in Slovenia strive to achieve. Thus, families that live in rented apartments or houses perceive much greater income needs, as they must accumulate sufficient savings for the initial investment in housing construction or purchase. Households with unemployed members and households with children are less likely, *ceteris paribus*, to be satisfied with their income, with regard to other households. These findings are in broad agreement with other studies of economic well-being in transition countries. For example, the very strong negative effect of unemployment on subjective economic well-being has been shown in Hayo and Seifert (2002); they estimate an ordered logit model, using pooled cross-section and time series data, based on several transition economies. Ravallion and Lokshin (2002), using the Russian Longitudinal Monitoring Survey show that household income (positive sign), household size (negative sign) and the share of unemployed (negative sign) are all statistically highly significant; their results are thus quite similar to ours. However, the share of children exhibits different sign and in their analysis does not appear to be a significant predictor.

Based on the results presented in Table 3, we can also compute the marginal effect of each variable; these are computed as the conditional probability at means of all other variables<sup>2</sup>:

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<sup>2</sup> As was already mentioned, the dependent variable for the 1997–1999 data sample takes on five distinct values due to aforementioned methodological changes and merger of the latter two ranks.

$$\begin{aligned}
\frac{\partial P(ISAT = 0)}{\partial \mathbf{x}} &= -\phi(\mu_0 - \boldsymbol{\alpha}'\mathbf{x})\boldsymbol{\alpha} \\
\frac{\partial P(ISAT = 1)}{\partial \mathbf{x}} &= [\phi(\mu_0 - \boldsymbol{\alpha}'\mathbf{x}) - \phi(\mu_1 - \boldsymbol{\alpha}'\mathbf{x})]\boldsymbol{\alpha} \\
\frac{\partial P(ISAT = 2)}{\partial \mathbf{x}} &= [\phi(\mu_1 - \boldsymbol{\alpha}'\mathbf{x}) - \phi(\mu_2 - \boldsymbol{\alpha}'\mathbf{x})]\boldsymbol{\alpha} \\
\frac{\partial P(ISAT = 3)}{\partial \mathbf{x}} &= \phi(\mu_2 - \boldsymbol{\alpha}'\mathbf{x})\boldsymbol{\alpha}
\end{aligned} \tag{5}$$

where  $\phi(\cdot)$  denotes the standard normal density function. On the basis of marginal effects we are then able to make conclusions about the size of influences of different variables and the respective changes in time. These results are presented in Table 4.

<TABLE 4>

Let us briefly comment some of the observed marginal effects for the 1993 Household Expenditure Survey data sample. It can be seen that, when the share of household members aged over 60 increases by one percentage point, the probability of household perceiving its income as completely insufficient and insufficient on average, *ceteris paribus*, decreases by 0.04 and 0.05 percentage points, respectively, whilst the probability of a household perceiving its income as sufficient and completely sufficient on average, *ceteris paribus*, increases by 0.07 and 0.01 percentage points, respectively. When the share of children per household increases by one percentage point, the probability of household perceiving its income as completely insufficient and insufficient on average, *ceteris paribus*, increases by 0.08 and 0.11 percentage points, respectively, whilst the probability of a household perceiving its income as sufficient and completely sufficient on average, *ceteris paribus*, decreases by 0.16 and 0.03 percentage points, respectively. Similarly, when the share of unemployed members per household increases by one percentage point, the probability of household perceiving its income as completely insufficient and insufficient on average, *ceteris paribus*, increases by 0.24 and 0.33 percentage points, respectively, whilst the probability of a household perceiving its income as sufficient and completely sufficient on average, *ceteris paribus*, decreases by 0.48 and 0.08 percentage points, respectively. If the household lives in an owner-occupied dwelling, the probability of perceiving its income as completely insufficient and insufficient on average, *ceteris paribus*, decreases by 5.8 and 8.1 percentage points, respectively, whilst the probability of a household perceiving its income as sufficient and completely sufficient on average, *ceteris paribus*, increases by 11.8 and 2.0 percentage points, respectively. Similarly, if the household is a pensioner household, the probability of perceiving its income as completely insufficient and insufficient on average, *ceteris paribus*, decreases by 3.6 and 4.5 percentage points, respectively, whilst the probability of a household perceiving its income as sufficient and completely sufficient on average, *ceteris paribus*, increases by 6.9 and 1.2 percentage points, respectively.

#### 4. Concluding remarks

Our analysis of subjective economic well-being includes among explanatory variables not only the so called ‘objective’ variables such as family income and family size but also variables that purported to capture the income aspirations of the respondent. This was necessary because respondents with higher income aspirations are more likely to be less satisfied with their income than respondents with low income aspirations. Thus, variables denoting share of members aged over 60 in household, share of children in household and dummy variables for pensioner household and home ownership were included in our analysis, as proxies for income aspirations. The coefficients of these variables were all of the expected sign, meaning that household composition and household wealth do exert an influence on the formation of aspirations. The negative effect of share of unemployed members in household on the subjective (economic) well-being could be explained by the fact that, while unemployment has strong non-pecuniary costs and strong effects on overall well-being, it also has a negative spill-over effect on economic well-being.

We are aware that our treatment of income aspirations and its relation to income satisfaction is rather partial, as one would have preferred more direct measures of aspirations and expectations. Thus, according to Curtin (1977, p. 81), income satisfaction can be conceptualised as the psychological distance between the level of income aspirations and current accomplishment. Consequently, the greater the margin of aspirations over current income the greater the sense of dissatisfaction. Increased dissatisfaction with one’s income cannot be shrugged off simply by stating that the ‘aspiration gap’ has increased. Namely, in a number of transition countries it is not that aspirations of the population are high, but the actual incomes of large segments of the population are so low as to approach absolute deprivation. In this sense it is worth quoting a study by Frey and Stutzer (2002) which shows that average life satisfaction (which also encompassed the dimension of economic well-being) is significantly higher in developed Western European countries as compared to Central and Eastern European countries, which typically have much lower average income. The fact that subjective economic well-being in Slovenia has not deteriorated in the first years of transition, despite a fairly large drop in income also shows that ‘the context’ is important; high incomes in an highly inflationary environment, with the imminent collapse of Yugoslavia looming large probably count for less than somewhat smaller (though increasing) incomes, but in a stable and optimistic environment.

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**Table 1.** Some descriptive statistics of the respective data samples

	Income				Entire Sample	
	Very insufficient	Insufficient	Sufficient	Amply sufficient		
<b>1988 Household Expenditure Survey Data (3250 observations)</b>						
Household income	132.22	157.88	207.94	306.94	194.99	
Age of head of household	50.2	49.1	49.1	47.8	49.1	
Family size	2.67	2.39	2.51	2.50	2.46	
Share of homeowners	53.6%	59.4%	66.1%	74.0%	63.8%	
Share of unemployed members per household	1.8%	1.1%	0.5%	0.8%	0.8%	
Number of households	321	751	1978	200	3250	
Share of households	9.9%	23.1%	60.9%	6.2%	100.0%	
<b>1993 Household Expenditure Survey Data (3270 observations)</b>						
Household income	113.08	143.19	187.70	294.57	178.82	
Age of head of household	48.5	49.8	49.6	49.8	49.6	
Family size	2.32	2.52	2.56	2.54	2.53	
Share of homeowners	72.0%	86.7%	90.9%	94.7%	88.6%	
Share of unemployed members per household	15.0%	7.3%	3.6%	1.1%	5.3%	
Number of households	261	849	1896	264	3270	
Share of households	8.0%	26.0%	58.0%	8.1%	100.0%	
	Making ends meet					Entire Sample
	With great difficulty	With difficulty	With some difficulty	Without difficulty	With ease	
<b>1997–1999 Household Expenditure Survey Data (3867 observations)</b>						
Household income	132.00	168.39	214.53	259.24	312.47	207.16
Age of head of household	49.4	49.6	49.1	50.9	52.3	49.7
Family size	2.46	2.52	2.51	2.36	2.25	2.47
Share of homeowners	77.3%	84.1%	87.4%	88.8%	92.6%	86.0%
Share of unemployed members per household	18.7%	9.9%	4.7%	1.7%	0.8%	7.4%
Number of households	449	973	1631	502	312	3867
Share of households	11.6%	25.2%	42.2%	13.0%	8.1%	100.0%

**Note:** Income refers to monthly disposable income in thousands of Slovenian tolar, calculated in fixed 1998 prices using the CPI. Family size is measured as number of equivalent adults according to the standard OECD equivalence scale.

**Table 2.** Distribution of income among different ranks of life satisfaction

	$ISAT_{[1988]} = 0$	$ISAT_{[1988]} = 1$	$ISAT_{[1988]} = 2$	$ISAT_{[1988]} = 3$	$\Sigma$
$Y_1$	0.0591	0.0982	0.1434	0.0040	0.3046
$Y_2$	0.0268	0.0908	0.2338	0.0102	0.3615
$Y_3$	0.0129	0.0422	0.2314	0.0474	0.3338
$\Sigma$	0.0988	0.2311	0.6086	0.0615	1.0000

  

	$ISAT_{[1993]} = 0$	$ISAT_{[1993]} = 1$	$ISAT_{[1993]} = 2$	$ISAT_{[1993]} = 3$	$\Sigma$
$Y_1$	0.0485	0.1067	0.1209	0.0040	0.2801
$Y_2$	0.0221	0.1110	0.2500	0.0135	0.3966
$Y_3$	0.0095	0.0396	0.2107	0.0635	0.3233
$\Sigma$	0.0801	0.2574	0.5816	0.0810	1.0000

  

	$ISAT_{[1997-9]} = 0$	$ISAT_{[1997-9]} = 1$	$ISAT_{[1997-9]} = 2$	$ISAT_{[1997-9]} = 3$	$ISAT_{[1997-9]} = 4$	$\Sigma$
$Y_1$	0.0848	0.1270	0.1058	0.0150	0.0041	0.3367
$Y_2$	0.0246	0.0861	0.1645	0.0285	0.0116	0.3152
$Y_3$	0.0067	0.0385	0.1515	0.0864	0.0649	0.3481
$\Sigma$	0.1161	0.2516	0.4218	0.1298	0.0807	1.0000

**Note:** Income refers to monthly disposable income in thousands of Slovenian tolar, calculated in fixed 1998 prices using the CPI, per equivalent adult according to the standard OECD equivalence scale. The three income groups are defined as follows:  $Y_1 < me(Y) - 1/3\sigma_Y$ ,  $me(Y) - 1/3\sigma_Y < Y_2 < me(Y) + 1/3\sigma_Y$  and  $Y_3 > me(Y) + 1/3\sigma_Y$ .

**Table 3.** Results of estimation of ordered probit model

	<i>ISAT</i> <sub>[1988]</sub>	<i>ISAT</i> <sub>[1993]</sub>	<i>ISAT</i> <sub>[1997-1999]</sub>
<i>C</i>	-7.4661 <sup>a</sup> (-19.82)	-10.4816 <sup>a</sup> (-21.63)	-14.8003 <sup>a</sup> (-37.95)
<i>ln y</i>	0.9876 <sup>a</sup> (23.39)	1.0434 <sup>a</sup> (24.63)	1.4251 <sup>a</sup> (41.82)
<i>ln fs</i>	-0.5651 <sup>a</sup> (-7.171)	-0.7567 <sup>a</sup> (-7.879)	-1.3867 <sup>a</sup> (-20.05)
<i>S60</i>	0.2549 <sup>b</sup> (3.100)	0.2129 <sup>b</sup> (2.638)	0.2388 <sup>b</sup> (3.560)
<i>SCH</i>	-0.3889 <sup>b</sup> (-3.302)	-0.4627 <sup>a</sup> (-4.038)	-0.4358 <sup>a</sup> (-5.159)
<i>SUN</i>	-1.0885 <sup>b</sup> (-3.159)	-1.4351 <sup>a</sup> (-9.350)	-0.6566 <sup>a</sup> (-5.827)
<i>DAH</i>	0.2546 <sup>a</sup> (5.735)	-0.3507 <sup>a</sup> (5.509)	0.2234 <sup>a</sup> (4.440)
<i>DPH</i>	0.1863 <sup>b</sup> (2.607)	0.2044 <sup>b</sup> (2.673)	0.2525 <sup>a</sup> (3.793)
<i>n</i>	3250	3270	3867
<i>LogL</i>	-3088.6	-3079.2	-4872.4
$\chi^2$	589.1 <sup>a</sup>	846.5 <sup>a</sup>	1474.8 <sup>a</sup>
<i>Pseudo R</i> <sup>2</sup>	0.7747	0.8178	0.9070

**Note:** Each estimate includes the value of the regression coefficient and the respective z-statistic (in brackets). Notations <sup>a</sup> and <sup>b</sup> indicate statistical significance at 0.0001 and 0.01 level, respectively. The computation of the *pseudo R*<sup>2</sup> value is based on McKelvey and Zavoina's formula (1975).

**Table 4.** Marginal effects of predictors on dependent variable

	$\frac{\partial P(ISAT = 0)}{\partial \mathbf{x}}$	$\frac{\partial P(ISAT = 1)}{\partial \mathbf{x}}$	$\frac{\partial P(ISAT = 2)}{\partial \mathbf{x}}$	$\frac{\partial P(ISAT = 3)}{\partial \mathbf{x}}$	
<b>1988 Household Expenditure Survey Data</b>					
ln y	-0.1393	-0.2091	0.2613	0.0871	
ln fs	0.0797	0.1197	-0.1495	-0.0498	
S60	-0.0359	-0.0540	0.0675	0.0225	
SCH	0.0548	0.0824	-0.1029	-0.0343	
SUN	0.1535	0.2305	-0.2880	-0.0960	
DAH	-0.0359	-0.0539	0.0637	0.0224	
DPH	-0.0272	-0.0388	0.0487	0.0173	
<b>1993 Household Expenditure Survey Data</b>					
ln y	-0.1713	-0.2400	0.3514	0.0599	
ln fs	0.0947	0.1327	-0.1942	-0.0331	
S60	-0.0350	-0.0490	0.0717	0.0122	
SCH	0.0760	0.1064	-0.1558	-0.0266	
SUN	0.2356	0.3301	-0.4833	-0.0824	
DAH	-0.0576	-0.0807	0.1181	0.0201	
DPH	-0.0358	-0.0445	0.0687	0.0115	
	$\frac{\partial P(ISAT = 0)}{\partial \mathbf{x}}$	$\frac{\partial P(ISAT = 1)}{\partial \mathbf{x}}$	$\frac{\partial P(ISAT = 2)}{\partial \mathbf{x}}$	$\frac{\partial P(ISAT = 3)}{\partial \mathbf{x}}$	$\frac{\partial P(ISAT = 4)}{\partial \mathbf{x}}$
<b>1997–1999 Household Expenditure Survey Data</b>					
ln y	-0.3086	-0.2596	0.3474	0.1604	0.0604
ln fs	0.3003	0.2526	-0.3380	-0.1561	-0.0588
S60	-0.0517	-0.0435	0.0582	0.0229	0.0141
SCH	0.0848	0.0793	-0.0386	-0.0609	-0.0646
SUN	0.1422	0.1196	-0.1601	-0.0739	-0.0278
DAH	-0.0484	-0.0407	0.0545	0.0251	0.0095
DPH	-0.0543	-0.0463	0.0611	0.0286	0.0109