TECHNIQUE OF CALCULATING THE GENDER AND AGE SCALES OF REAL CONSUMER EXPENDITURE

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Abstract

The article deals with approach to the construction of the gender and age scales of real consumer expenditure. We propose a regression model for calculating the numerical values of the equivalence scale and information base for the calculation. The results of testing technique are given.

Keywords: equivalence scale, consumer expenditure, household sample surveys, regression model

1 Introduction

The evaluation and comparison of household expenditure is necessary to solve the problems of social and economic policy. The comparison of expenditure of various groups of households basis reflect the economic stratification of society, including its aspects, as the distribution of the population in terms of income and consumption, and the boundaries of poverty.

Vast scientific and practical experience in the measurement of expenditure of households of different sizes and composition have accumulated abroad. The founder of this direction is the German statistician E. Engel, who proposed a method of estimating the welfare of households using such a statistical tool as the equivalence scale (see [1]). E. Rothbart (see [2]), M. Orsha (see [3]), J. Nicholson (see [4]), A Atkinson (see [5]) and others continued studies. At present, the equivalence scales are an integral part of the official methodology for poverty calculations and instrument of social policy. In the Republic of Belarus is used an expert scale which does not reflect real differences in consumption depending on gender and age.

2 Approach to the construction of the gender and age scales of real consumer expenditure

The author proposed a regression model for calculating the numerical values of the scale, where the resultant variable accepted consumption expenditure of the household, as well as signs of factors are used the number of household members in each age and gender group.

$$CE = \sum_{i=0}^{100} \sum_{j=1}^{2} \alpha_{ij} x_{ij} + \varepsilon, \tag{1}$$

where CE is consumption expenditure of the household (the total cost of food, the cost of food outside the home, pet food, drink, tobacco, clothing, footwear, textiles, goods cultural and household goods, fuels for home heating, utility costs, education services, early childhood education, health care, the costs of public transport services and associated with the operation of personal transport, expenditure on culture, recreation and sports, services, personal care items and other goods and services); i is the age of household member (0-4 years, 5-9 years, 10-14 years, 15-19 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49 years, 50-54 years, 55-59 years, 60-64 years, 65-69 years, 70-74 years, 75-79 years, 80+years); j is the gender of the household member (1 - male, 2 - female); x_{ij} is the number of representatives of different gender and age groups in the household.

Regression estimates are used to determine individual consumption expenditure for each member i of the household j:

$$IE_{ij} = \frac{\alpha_{ij}}{\sum_{i,j} \alpha_{ij}} \cdot CE, \tag{2}$$

where IE_{ij} is individual consumption expenditure household member.

Technique of calculation is based on actual consumer expenditure of households and takes into account the gender, the age structure and the size of the household.

The proposed model requires a combination of annual sample surveys files by members of households and households in general. To this end, the annual data on the members of households participated in the sample survey are grouped according to the serial number of the household (table rows) and selected age groups (table columns) to the layout depending on the gender. The data are transferred in the annual image for households as a whole, where the variable is created CE ($\sum_{i \in I} \text{EXPEND}_i$, $I = \{1, \ldots, 9, 11, 13, 14, 15, 21, 22, 23, 27, 28, 31, 32\}$).

The models are designed according to the household sample surveys, which include more than 5000 households, combining more than 14000 members, it is quite a large collection. Regression coefficients in the models are named number (rubles per person at age x), which is shown as the average change consumer expenditure is changing the age of the individual.

3   The results of testing technique

The author obtained estimates of age and gender ratios of consumption, taking into account the effect of cohabitation on the basis of sample surveys of households in the Republic of Belarus for 2008. The results give a non-significant regression coefficients in the age groups of men and women to 14 years, since the equation takes into account not only the age and composition, but also the number of members of the household. It is logical that the majority of consumer expenditure in the household is related adult persons. To obtain more reliable estimates of possible testing factors, specifying the age groups for equality between itself and the union of these age categories. However, in this study, the scale is calculated at five-year groups, which ensures equal age intervals. Quality assessment parameters confirmed the normal distribution model residues.

On the basis of the formula (2) regression estimates define individual consumer expenditure household member and find the average consumer expenditure in each gender and age group and population (see [6]).

4 Findings

The highest consumption rates in the household in both men and women of working age are marked. In addition, the need for women's consumption of almost all ages are superior to the consumption needs of men, which may be due to the need of women to spend more money on clothes, shoes, cosmetics. It is also no secret that women make up the majority of visitors to exhibitions, theaters and sports clubs. Higher food costs men in middle age are neutralized decrease in the proportion of expenditure on food in total. As already noted coefficients of consumption of persons under 14 years are underestimated. To overcome this drawback, in the framework of improving the techniques necessary to assess consumer groups spending data of the population only on set of households, having in its composition of this age, and refine the estimates obtained.

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