

Analysis of consumption characteristics of urban and rural residents in Chongqing from the perspective of epidemic

Xiao Chen *

Chongqing University-University of Cincinnati Joint Co-op Institute, Chongqing University,
Chongqing, China

* Corresponding Author Email: chen3x6@mail.uc.edu

Abstract. The outbreak of COVID-19 at the end of 2019, which spread to the whole world, has had a significant impact on the Chinese and even the global economy, and the lack of effective domestic demand has become a real problem for China's economic development. In this paper, the ELES model is constructed, and the consumption data of urban and rural residents are obtained from the Chongqing Statistical yearbook using multiple linear regression fitting. According to the data, descriptive analysis is made on the consumption of urban and rural residents, and the development rules and characteristics are analyzed. The consumption characteristics and differences between urban and rural residents are analyzed in the aspects of transportation, communication, education, entertainment and medical care. The results can provide some theoretical basis for the government's future economic measures.

Keywords: Chongqing; Consumption characteristics of urban and rural residents; ELES model; Marginal consumption coefficient; Coefficient of income elasticity

1. Introduction

Under the impact of COVID-19, economic development has slowed down or even stalled to a large extent [1]. As one of the three wagons that drive economic growth, consumption significantly impacts current economic development. However, the lack of effective demand is a major problem facing China today. It is of extraordinary practical significance to explore how to effectively stimulate domestic demand and build a large domestic cycle in the epidemic era [2-3].

According to urban and rural residents' consumption characteristics and differences, the consumption structure and consumption intention (average consumption propensity) can be analyzed [4]. The consumption structure can reflect the differences in consumption behaviours of urban and rural residents in detail, and the consumption characteristics of urban and rural residents can be further obtained through comparative analysis [5-6]. Average consumption propensity can reflect residents' consumption willingness to a certain extent, that is, whether residents are willing to spend money [7]. Finally, through the construction of the ELES model, the former two are combined to comprehensively analyze the consumption characteristics and differences between urban and rural residents [8]. The research results can provide a theoretical basis for the government to promote domestic economic development under the impact of the epidemic in recent years.

2. Model building and solving

2.1. Analysis of average propensity to consume

Firstly, the average propensity to consume of urban and rural residents is analyzed by combining relevant data. The average propensity to consume (APC) refers to the proportion of consumption expenditure in income, and its mathematical expression is as follows:

$$APC = \frac{C}{DPI} \quad (1)$$

Where: C refers to consumption expenditure and DPI refers to per capita disposable income. The average propensity to consume in urban and rural areas of Chongqing is calculated by data, as shown in the figure below:

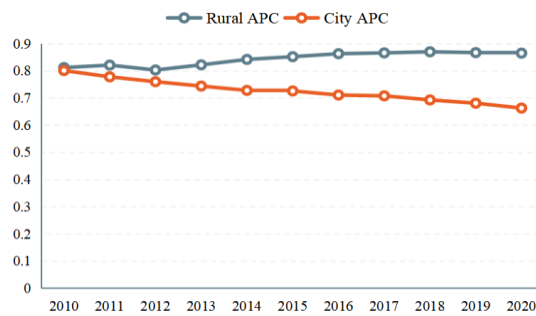


Figure 1. Average propensity to consume of urban and rural residents in Chongqing

The figure shows that the average propensity to consume is at a high level for both urban and rural residents. Generally speaking, when the income level of residents is low, most of the income will be used to pay for their needs in life, so that the value of APC is large. With the increase in income, the proportion of residents' residual wealth accumulation will rise, making the APC decline. From 2010 to 2020, the APC of urban residents was on a downward trend, which indicates that the income level of urban residents has steadily improved over the past decade. The APC of rural residents is higher than that of urban residents from 2010 to 2020 because the income level of rural residents is relatively low and there is a certain gap with urban residents.

2.2. Analysis of consumption structure

Combined with the consumption data of urban and rural residents in Chongqing, it is visualized, as shown in the figure below:

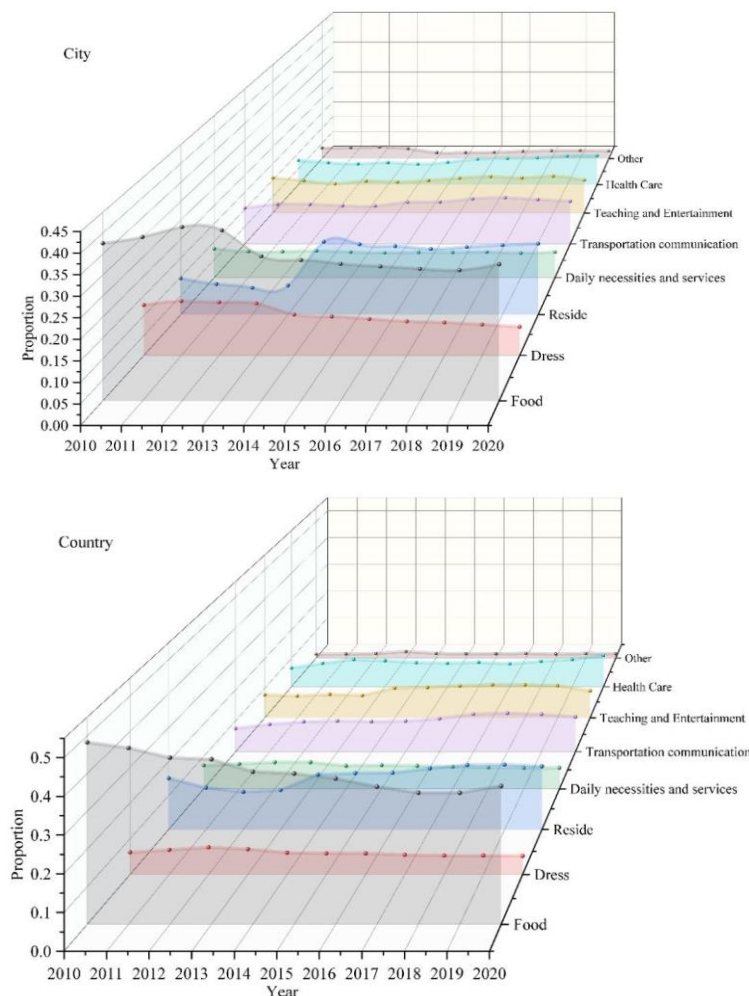


Figure 2. Consumption ratio of city and rural residents in Chongqing

From the perspective of food consumption, the proportion of food consumption by rural residents is always higher than that of urban residents, which indicates that the Engel coefficient of urban residents is low. According to the relevant knowledge of the Engel coefficient, the higher the income level, the lower the proportion of food consumption expenditure. Therefore, the income level of urban residents is higher than that of rural residents. Secondly, the proportion of food consumption by urban and rural residents shows a stable trend and is at a medium level. From the aspect of clothing consumption, with the economic development and the improvement of people's material level, people's demand for clothing tends to be diversified, fashionable and aestheticized, rather than limited to the most basic requirements. Therefore, the proportion of clothing consumption can reflect people's consumption demand at a higher stage to a certain extent. The figure shows that the proportion of clothing consumption by urban residents is higher than that of rural residents, and urban residents have a greater preference for clothing and other consumption. From the aspect of residential consumption, the consumption of housing has been high, which is related to the traditional concept of residents in the city. Rural residents, in particular, spend the second most on housing after food. From the aspect of transportation and communication consumption, the residents' consumption of transportation and communication continues to increase, which can be attributed to the development of the economy and science and technology. From the perspective of education, culture and entertainment consumption, the proportion of expenditure of urban and rural residents in this aspect is relatively close, indicating that the consumption preference of the two is consistent. The proportion of investment of urban and rural residents in this aspect is at a high level, and the consumption of education, culture and entertainment is increasing day by day. From the aspect of health care, Chongqing residents spend more on health care, which is attributed to the increase in income, the ageing of the population, the policy of benefiting the people and other factors. Among them, the growth rate of urban residents is slower, indicating that urban residents pay more attention to medical treatment, while rural residents increase more significantly.

Combined with the above analysis results, the ELES model of the consumption structure of Chongqing urban and rural residents was constructed to conduct further quantitative analysis and research on the above variables. This model is based on the household consumption data from 2000 to 2016 in Chongqing Statistical Yearbook. The marginal propensity to consume can be known through the model parameters, and the basic consumption demand and income elasticity can be obtained by combining the formula. The Extended linear expenditure system model (ELES model) was proposed by economist C Liuch and is mostly used to study the consumption structure. Its meaning is as follows: People's income and the price of each commodity determine people's demand for commodities, and the demand is divided into basic demand and demand beyond basic demand, and it is believed that residents will arrange various non-basic demand expenditures with a certain proportion of other income after meeting their survival needs. The formula is expressed as:

$$V_i = P_i Q_i + \beta_i (Y - \sum_{i=1}^k P_i Q_i) + \mu_i \quad (2)$$

Where: V_i represents the consumption expenditure of people on i good and service, P_i represents the price of i good and service, Q_i represents the total demand for i good and service. β_i represents the marginal propensity to consume i good and service, and Y represents per capita disposable income, $P_i Q_i$ represents the basic demand for the i goods and services. After processing the above equation, we can get:

$$\alpha_i = P_i Q_i - \beta_i (\sum_{i=1}^k P_i Q_i) \quad (3)$$

$$P_i Q_i = \alpha_i + \beta_i \sum \alpha_i / (1 - \sum \beta_i) \quad (4)$$

$$\eta_i = \beta_i * Y / (V_i) \quad (5)$$

Where: α_i is the intermediate process parameter, its specific values are shown in Table 1 below; η_i is the income elasticity of consumption demand for goods.

Table 1. ELES model parameters of Chongqing urban and rural residents

	City		Country	
	α_i	β_i	α_i	β_i
Food	834.31	0.235	649.084	0.291
Dress	158.108	0.078	115.61	0.058
Reside	-374.07	0.111	272.856	0.133
Daily necessities and services	138.17	0.047	-156.86	0.07
Transportation communication	-55.67	0.088	-206.867	0.093
Teaching and Entertainment	275.39	0.124	-117.13	0.079
Health Care	56.5	0.052	-172.02	0.078
Other	102.02	0.016	-20.5	0.014
Total	1134.758	0.751	364.173	0.816

It can be seen from the above table that the marginal propensity to consume all kinds of consumer goods of urban residents in Chongqing is positive. The marginal propensity to consume food was 0.235, ranking first, followed by education, entertainment and housing, 0.124 and 0.111, respectively. Living is ranked lower in the basic consumption demand, indicating that once the income exceeds the consumption required for survival, people tend to increase their consumption on living. This also indicates that people have paid more attention to living comfort in recent years, and a series of housing policies have been issued, stimulating people's consumption. And the willingness to spend on household equipment, and health care is not strong. Among all kinds of the marginal propensity to consume of rural residents in Chongqing, food, housing, transportation and communication rank first, which are 0.291, 0.133 and 0.093 respectively. It shows that rural residents attach great importance to the problem of housing. After meeting the food consumption, the money earned is given priority to building houses or buying houses. The data on transportation and communication show that the information road is rapidly connected and transportation develops rapidly, and people's marginal propensity to consume clothing is only 0.058, which also reflects that clothing is enough for rural residents.

According to Equation (5), the income elasticity coefficient is calculated, which means that the consumption of commodity increases (decreases) x yuan in proportion to the increase (decrease) of 1 yuan in income. The calculation results are as follows:

Table 2. Income elasticity coefficient of urban and rural residents in Chongqing

	Food	Dress	Reside	Daily necessities and services	Transportation and communication	Teaching and Entertainment	Health Care	Other
City	0.836	0.914	1.306	0.859	1.075	0.970	0.963	0.731
Country	0.846	0.866	1.288	1.362	1.352	0.993	1.308	0.973

The above table shows that the income elasticity coefficients of Chongqing urban residents in food, clothing, education, culture, entertainment, and medical care are all less than 1, indicating that these consumer goods are necessities of life for urban residents and lack elasticity. If you want to stimulate these kinds of consumption, can be through innovation or small profits and quick sales and other methods. The income elasticities of transportation, communication and housing are 1.075 and 1.306 respectively, both greater than 1, indicating that these two kinds of consumer goods are high-grade goods for urban residents with high elasticity. When people's income is good, their consumption of these two kinds of goods will increase significantly. Among them, the income elasticity of residence is the highest, indicating that nowadays people buy a house not only to meet survival but also for a certain investment purpose. For rural residents in Chongqing, housing, household equipment, transportation and communication, and medical care are all luxuries, and the demand for these goods will increase dramatically when people's income increases. Increasing rural residents' consumption

expenditure on these commodities is conducive to improving people's lives and building a more reasonable consumption structure.

3. Conclusions

To sum up, the following conclusions can be drawn: (1) Food accounts for urban and rural residents in Chongqing in general is reduced, the clothes consumer spending is rising, but the clothes consumption accounted for growth are relatively obvious, especially the rural residents, 2020 consumer spending on clothing and urban residents in 2010, the consumption of rural residents about clothing enthusiasm is not high. (2) The proportion of consumption of education, culture and entertainment among urban and rural residents in Chongqing is high, while the proportion of consumption on medical care is increasing. The reasons are related to the change in income, people's attention to health, and population ageing. (3) Through the empirical study of the ELES model, it is found that the residents of this city have little demand for transportation and communication, medical care, and household equipment, but more enthusiasm for food, housing, education, culture and entertainment. (4) The income elasticities of Chongqing urban residents in transportation, communication and housing are 1.075 and 1.306 respectively, which are both greater than 1, indicating that these two kinds of consumer goods are luxuries for urban and rural residents. For rural residents in Chongqing, housing, household equipment, transportation and communication, and medical care are luxuries. Stimulating people's spending on these commodities is conducive to improving people's lives and building a more reasonable consumption structure.

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