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Longitudinal Empirical Analysis on the Consumption Structure of Rural Residents

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Abstract: **The paper uses longitudinal empirical analysis to grasp the trend of rural residents' consumption structure in Hubei Province of China comprehensively from 1996 to 2014. Longitudinal empirical analysis deals with the trend of the consumption structure as the time goes on in Hubei Province of China. We establish the linear regression model of the food consumption structure of the rural residents and time (years) from 1996 to 2014 in Hubei province of China.**

Keywords: Longitudinal empirical analysis; Consumption structure; Rural resident

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1. Introduction

When a country's economy is studied, consumption, investment and net exports are called for "Three driving carriage" of stimulating economic growth. Consumption is the most fundamental factor in driving economic growth. Investment is caused by the demand of consumer demand. Net exports are the difference between the amount of exports and imports, and come from consumer demand of foreign countries. Therefore, consumption is the driving force of economic growth. Developing a country's economy, the most fundamental measure is to expand consumption.

Keynes put forward Absolute Income Hypothesis in 1936[1-4]. The relationship between consumption and income was firstly studied on the level of total amount. After Keynes put forward Absolute Income Hypothesis in 1936, American economist Duesenbei Ty put forward Relative Income Hypothesis in 1949, Modigliani put forward Life Cycle Hypothesis in 1954, Friedman put forward Persistent Income Hypothesis in 1957, Hall put forward Rational Expectation-Permanent Income Hypothesis in 1978 and so on [5-7].

Chinese economic development should rely more on expanding domestic demand rather than exports to sustain economic growth in the future. As a rising economic power, China should increase domestic consumption, let the public enjoy the fruits of economic growth and promote the development of the national economy. Many scholars have made unremitting exploration to the above problems, and have achieved fruitful results. But a comprehensive and systematic study of the consumption of rural residents in Hubei Province in the literature is scanty, and did not form a complete theoretical system.

2. Methods

According to the statistical yearbook on the definition of consumption structure, consumption expenditures are divided into eight items of Food, Clothing, Residence, Facilities Articals Service, Medicine Medical Service, Transportation Communication, Recreation Education ultural Service, and Miscellaneous-Commodities Service.

The specific data of the consumption structure is obtained in Table 1 and Table 2 from 1996 to 2014 [8].

As the data of Table 1 and Table 2 can be known, the change and upgrade of consumption structure about rural residents in Hubei province is obvious. From 1996 to 2004, the Engel coefficient of rural residents is in 50%-60%, and rural resident is in the state of food and clothing. After 2004, the Engel coefficient began below 50%, and rural resident is into well-off level. But the Engel coefficient is more than 46%, and rural resident is at low well-off level. After 2011, the Engel coefficient began below 40%, and rural resident reach rich level. Consumption share of Medicine-Medical-Service, Transportation Communication and Recreation Education Cultural Services improves further. The trend shows that the consumption of rural residents in Hubei is from the survival to the enjoyment and the development. With the share of traffic and communication consumption increasing, the mobility of rural residents increases. Since 2004, the share of Recreation-Education-Cultural-Services consumption drops considerably. The reason is that public finance invests in cultural education. In particular, the results are that rural cultural education increase significantly. The ratio of rural residents' consumption is relatively high. Since 2004, the central government attaches great importance to the three agricultural issues, the "first document" for eight consecutive years focuses on the three agricultural issues, the farmer's burden is significantly reduced, and the farmers' income is significantly improved. Under such a policy background, the rapid development of rural economy in Hubei Province of China, rural residents' income growth increases speed again, consumption structure is further optimized.

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Table 1 Consumption structure (Food, Clothing, Facilitie-Artical-Service, Medicine-Medical-Service) of rural residents in Hubei Province of China from 1996 to 2014(%)

year	Food	Clothing	Facilities-Articals-Services	Medicine-Medical- Service
1996	59.54	6.36	4.65	3.18
1997	55.96	6.08	5.24	3.43
1998	54.09	5.24	4.94	3.41
1999	54.86	4.70	4.77	3.50
2000	53.15	4.82	4.43	4.50
2001	51.91	4.67	4.49	5.34
2002	49.94	4.64	4.12	5.21
2003	51.66	4.44	4.05	5.33
2004	51.51	4.50	3.59	5.31
2005	49.05	5.14	4.53	5.56
2006	46.82	5.38	4.98	6.30
2007	47.86	5.47	5.37	5.79
2008	46.84	5.12	6.43	5.75
2009	44.79	5.25	6.16	6.34
2010	43.10	5.32	6.41	7.22
2011	39.01	5.43	7.18	8.75
2012	37.61	5.53	6.95	10.34
2013	36.76	5.54	6.77	9.94
2014	31.38	5.71	6.62	10.45

Table 2 Consumption structure (Transportation Communication, Recreation Education Cultural Service, Residence, Miscellaneous Commodities Service) of rural residents in Hubei Province of China from 1996 to 2014(%)

year	Transportation-Communication	Recreation-Education-Cultural-Service	Residence	Miscellaneous-Commodities-Service
1998	2.77	12.12	16.19	1.24
1999	4.39	13.54	12.59	1.65
2000	4.69	13.50	11.50	3.41
2001	5.34	12.98	11.22	4.05
2002	5.67	13.34	13.52	3.56
2003	6.77	12.43	12.38	2.94
2004	7.80	11.78	13.12	2.39
2005	9.18	11.19	12.76	2.59
2006	9.00	10.69	13.80	3.03
2007	9.09	9.19	14.08	3.14
2008	7.94	7.31	17.82	2.73
2009	8.25	7.56	18.86	2.80
2010	8.10	7.04	19.96	2.85
2011	8.27	6.82	21.69	2.86
2012	8.66	6.89	21.06	2.96
2013	9.65	6.49	22.55	2.31
2014	9.40	11.64	22.40	2.40

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3. Results and Discussion

According to Engel's law, the income of a family is the less, the proportion of the consumption about purchasing food is the greater. But when we use Engel's law to study the consumption structure, we need to pay attention to making a qualitative judgment on consumption changes, otherwise you might have an error determination. The Engel coefficient can be improved with the increase of living standard. For example:

(1) When the income of the poor are raised, they will give priority to improve their living standards and the Engel coefficient will rise.

(2) When farmers become urban populations, they may increase their food consumption. At the same time, most of the food is produced by their own production, but the food is bought from the market more and more now. Then the Engel coefficient may rise.

(3) Urban population will consume more quality food after their incomes increase, such as increasing the number of meals, and increasing the purchase of processed foods, etc. These are likely to increase the Engel coefficient.

Although Engel's law has some limitations, it is still a powerful tool to analyze the consumption level and consumption structure. Engel coefficient is the proportion of food expenditure in the total consumption expenditure. The corresponding Engel coefficient can be expressed as the following.

Engel coefficient = Food Consumption/Consumption Expenditure

Food and Agriculture Organization of the United Nations had determined the standards of the division of the rich and the poor in the 1970's, as shown in Table 3.

Table 3 The corresponding Table of Engel coefficient and residents living condition

Engel coefficient (EC)	Residents living condition
EC>60%	Absolute poverty
50%<EC≤60%	Level of food and clothing
40%<EC≤50%	Well-off level
30%<EC≤40%	Relative affluence
20%<EC≤30%	Affluent
EC <20%	Extremely affluence

Through analyzing the trend of food consumption in Hubei rural areas, we can know that the food consumption structure has a certain correlation with the time (years). Then we may establish a linear regression model according to Table 1 and Table 2.

To suppose the linear equation is

$$y = a + bx \quad (1)$$

To suppose

$$\varphi = (y_i - a - bx_i)^2 \quad (2)$$

When $\varphi = (y_i - a - bx_i)^2$ is minimum,

$$\begin{cases} \varphi'_a = 0 \\ \varphi'_b = 0 \end{cases} \quad (3)$$

Then

$$a = \frac{1}{n}\sum y_i - b \cdot \frac{1}{n} \cdot \sum x_i \quad (4)$$

$$b = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{n\sum x_i^2 - \left(\sum x_i\right)^2} \quad (5)$$

In order to determine the relevance of the good or bad, we use correlation coefficient r_{xy} [9].

$$r_{xy} = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{\sqrt{\left[n\sum x_i^2 - \left(\sum x_i\right)^2\right]\left[n\sum y_i^2 - \left(\sum y_i\right)^2\right]}} \quad (6)$$

Then we can obtain the linear regression model of the food consumption structure of the rural residents and time (years) from 1996 to 2014 in Hubei province of China in Table 4.

Table 4 The linear regression model of the food consumption structure of the rural residents and time (years) from 1996 to 2014 in Hubei province of China

Time	from 1996 to 2014
the linear regression model	Y=2572.639-1.25933X
correlation coefficient r_{xy}	-0.96068

As the data of Table 4 can be known, the food consumption structure is negatively related to time (years) from 1996 to 2014, and the correlation is high, reaching 96.07%. It shows that the food consumption structure is getting smaller and smaller as time goes on. Thus we can clearly analyze the change law of Engel coefficient.

4. Conclusion

We may obtain trend analysis of the other consumption of rural residents in Hubei Province of China in the same way. Longitudinal development trend of consumption structure of rural residents in Hubei Province of China is mainly that the proportion of survival consumption declines constantly and the proportion of enjoying consumption rises constantly. The proportion of survival consumption of Food and Clothing falls sharply. On the other hand, the proportion of enjoying consumption rise rapidly. Except for Food consumption and Clothing consumption, the other consumptions are enjoying consumption.

The consumption structure of rural residents in Hubei Province of China has been upgraded and optimized. Hubei is in the consumption structure of

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Food and Clothing in 1997. And Hubei has entered the stage of enjoy consumption structure currently. The consumption structure of rural residents in Hubei Province of China has a reasonable development trend.

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