An Empirical Study on the Relationship between Household Consumption and Economic Growth

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Abstract

VAR model is used in this paper to discuss the relationship between household consumption and economic growth in China from 2001 to 2017. The results of empirical research show that: (1) economic growth is mainly dependent on its own factors, the impact of consumption expenditure on economic growth is relatively weak, and economic growth has a significant impact on consumption expenditure; (2) the influence of the consumption expenditure of urban residents on economic growth is both negative and positive. The influence of the consumption expenditure of rural residents on economic growth is weak, so to increase consumption expenditure of rural residents' is important. (3) the consumption of urban residents has a certain demonstration effect on the consumption of rural residents, but the consumption of rural residents has little impact on the consumption of urban residents, so to optimize the consumption structure of rural residents is important.

Keywords

Consumption expenditure of urban residents; Consumption expenditures of rural residents; Economic growth; Impulse response.

1. Introduction

According to economic theory, demand is the motive force for economic growth, aggregate demand is mainly made up of investment demand, consumption demand and export demand, for internal demand, consumption demand is the final demand, investment demand is intermediate demand, in this sense, consumer demand is more important than investment demand to economic growth, only the terminal demand can truly start up the economy, consumer demand includes household consumer demand, government consumer demand and export demand, this paper analyze the relationship between household consumer demand and economic growth.

According to the national bureau of statistics, as for gross consumption expenditure, the current consumption expenditure of rural residents is significantly lower than that of urban residents in China, urban residents consumption expenditure is three to four times to that of rural residents on an average, as for consumption structure, consumer demand of rural residents is still on the stage of Subsistence Consumption, Developmental consumption such as consumption of education and culture service is relatively small, on the other hand, consumption expenditure of urban residents is much larger, generally speaking, in china with the continuous growth of residents' consumption, the expenditure of subsistence consumption reduce gradually, the expenditure of development consumption such as education consumption expenditure and cultural service consumption expenditure increase gradually, The expenditure structure of residents consumption is also being optimized and upgraded.

Domestic research on relationship between consumer demand and economic growth show that there are mainly three kinds of views: (1) consumer demand putting larger effect on economic growth than investment demand, consumer demand derives investment demand. Ding Zhaoqing[1]argue that consumer demand is a motive force of the economic growth, Chinese consumer demand makes obviously low contribution rate of economic growth compared to other countries, but they are still an important factor of economic growth. To establish a development strategy based on consumer

demand, China must appropriately decrease the proportion of capital to GDP, reverse the passive situation where economic growth is heavily dependent on investment and export, pay attention to the role of consumer demand as the primary driving force for economic growth, and promote sustainable development of the national economy.

(2)The driving force of the economic development in china has changed from investment demand to consumer demand. Hong Yinxing[2] proposed that the engine of China's economic development has shifted from external to internal, especially from investment-driven to consumption demand-driven economic growth. There are two main reasons for China's economic growth turning to consumption-driven. First, China's economic development level has surpassed the shortage economy and possessed the productive capacity of consumption-driven economic growth; second, China's economic system has turned to market economy and consumer sovereignty has formed in the market. After the economic development turning to the coordinated pull of consumption, investment and export, consumer economy becomes a new driving force and growth point of economic growth. To cultivate consumer economy is to cultivate new growth points and to promote the transformation of the mode of economic growth. Ji Ming [3] believes that consumer demand is the initial driving force of economic growth, and the driving force of economic growth changes from strong to weak and then to strong, while the driving force of investment demand to economic growth changes from weak to strong and then to weak. Yang Guizhong [4] used the non-competitive input-output table to measure the pulling effect of consumption on China's economy. The results show that consumer demand has a low pulling effect on China's economy, so consumer demand is a great potential factor for China's economic growth. To enhance the pulling effect of consumer demand on the economy, the consumer demand of residents must be increased.

(3)Economic growth needs to be driven by the coordination of consumption, investment and export. Han Yongwen[5] estimated that China's consumption rate is significantly lower than the world level, while the investment rate is higher than that of other Asian countries at the same stage of development, and the net export rate is higher than the international level. Over-high investment rate will bring about imbalances in economic structure, especially in industrial structure, which will bring about long-term economic no-coordination. Therefore, China should reduce its investment rate, increase its consumption rate and promote the coordinated promotion of consumption, investment and export.

2. Empirical Research

In this paper rgdp represents the growth rate of per capita GDP, UC and RC to represents the per capita consumption expenditure of urban residents and rural residents respectively. The data of per capita Gross domestic product (GDP) and per capita consumption expenditure of urban residents and rural residents from 2000 to 2017 are derived from the websites of Zhonghong and the National Bureau of Statistics.

Table 1. Dataset of 2000-2017.

year	gdp	uc	Rc
2000	7942	6999	1917
2001	8717	7324	2032
2002	9506	7745	2157
2003	10666	8104	2292
2004	12487	8880	2521
2005	14368	9832	2784
2006	16738	10739	3066
2007	20505	12480	3538
2008	24121	14061	4065
2009	26222	15127	4402
2010	30876	17104	4941
2011	36403	19912	6187

2012	40007	21861	6964
2013	43852	23609	7773
2014	47203	25424	8711
2015	50251	27210	9679
2016	53935	29295	10783
2017	59660	31032	11704

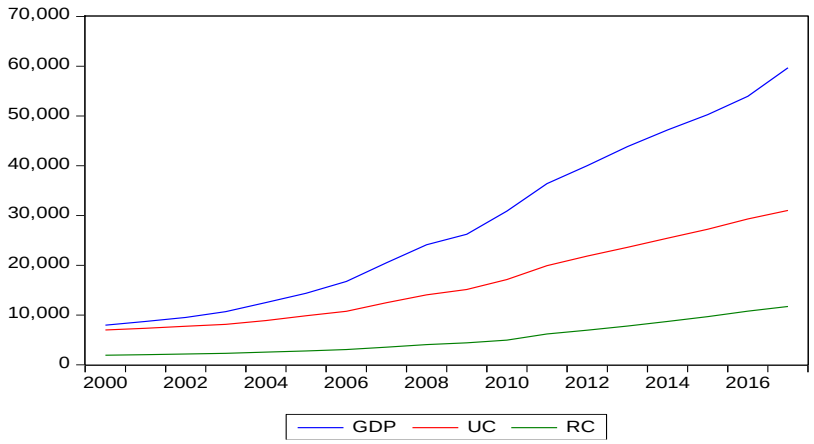

Fig.1 per capita GDP、per capita consumption expenditure of urban residents and rural residents

From the trend chart of Figure 1, it can be seen that all the GDP, the consumption expenditure of urban and rural residents' show an obvious upward trend with the change of time, with trend and intercept. it can be judged basically that the time series of per capita GDP, per capita consumption expenditure of urban and rural residents has non-stationary characteristics. in order to examine the relationship between GDP and consumption and consumption structure, this paper uses VAR model to analyze the relationship. Therefore, taking the growth rate of per capita GDP, growth rate of per capita consumption expenditure of urban residents and rural residents as the original sequence, this paper makes an empirical analysis of the relationship between them.

The basic assumption of Var model is the stability of time series. In order to ensure the validity of regression and avoid the occurrence of pseudo-regression, time series data first need to pass the stationarity test. In this paper, the ADF method is used to test the stability of the sequence.

Table 2. Results of Stationarity Test

	rgdp	Ruc	rrc	Drgdp	druc	drrc
adf	-2.933268	-2.201551	-2.781391	-5.127529	-4.543371	-5.027204
1%	-4.728363	-4.667883	-4.667883	-2.740613	-2.728252	-2.728252
5%	-3.759743	-3.733200	-3.733200	-1.968430	-1.966270	-1.966270
10%	-3.324976	-3.310349	-3.310349	-1.604392	-1.605026	-1.605026
p	0.1805	0.4573	0.2226	0.0001	0.0002	0.0001
Check Type	c,t,0	c,t,0	c,t,0	0,0,1	0,0,1	0,0,1
	Nonstationary	Nonstationary	Nonstationary	Stationary	Stationary	Stationary

As can be seen from Table 2, the ADF test values of the growth rate of per capita GDP、growth rate of consumption expenditure of urban residents and rural residents , are all greater than the critical values at the significant levels of 1%, 5% and 10%, and there are unit roots, all the time series of rgdp, ruc and rrc are unstable. However, the first-order difference is stable at the significant level of 10%, and all the time series of growth rate of per capita GDP, rate of per capita consumption expenditure

of urban residents and rural residents are one-order single integral at the significant level of 1%. So, there may be a long-term equilibrium relationship among them, that is, cointegration relationship.

Table 3. Results of Cointegration Test.

Trace Test	Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
	None *	0.920404	50.43942	29.79707	0.0001
	At most 1	0.587584	15.00839	15.49471	0.0591
	At most 2	0.169979	2.608263	3.841466	0.1063
Maximum Eigenvalue	Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
	None *	0.920404	35.43103	21.13162	0.0003
	At most 1	0.587584	12.40013	14.26460	0.0965
	At most 2	0.169979	2.608263	3.841466	0.1063

Table 3 shows that the trajectory test results reject the original hypothesis that there is no co-integration relationship, which indicates that there is one co-integration relationship among economic growth rate, rate growth of per capita consumption expenditure of urban residents and rural residents and at the 5% significant level. At the same time, the maximum eigenvalue test supports the result of trajectory test.

Lag period must be designed to set VAR model . If the lag period K is too small, it will lead to inconsistent of parameters estimation. In VAR model, increasing lag variables properly can eliminate the existence of autocorrelation, but the larger lag period K will lead to reduced degrees of freedom, which affect the effectiveness of parameter estimation. In this paper, the AKaike information criterion AIC is used to select the lag period. The lag period k is designed to be 2 by testing, and the model is set to VAR (2). The result of parameter estimation is expressed in matrix form as follows:

$$\begin{pmatrix} GDP \\ UCG \\ CCG \end{pmatrix} = \begin{pmatrix} -0.002144 \\ 0.001754 \\ -0.001724 \end{pmatrix} + \begin{pmatrix} 0.137929 & -0.329853 & -0.066687 \\ 0.644686 & -0.898242 & 0.075273 \\ 0.321010 & 0.715054 & -0.482816 \end{pmatrix} \begin{pmatrix} GDP(-1) \\ UCG(-1) \\ CCG(-1) \end{pmatrix} + \begin{pmatrix} -0.538277 & -0.178091 & 0.250250 \\ -0.281804 & -0.360120 & 0.234564 \\ -1.297869 & 0.749186 & 0.068018 \end{pmatrix} \begin{pmatrix} GDP(-2) \\ UCG(-2) \\ CCG(-2) \end{pmatrix}$$

The test results of the VAR model show that the eigenvalues are all in the unit circle (see Fig. 1), and the residual sequence obeys normal distribution, and there is no hetero-scedasticity and autocorrelation, that is, there is no deviation in Var model.

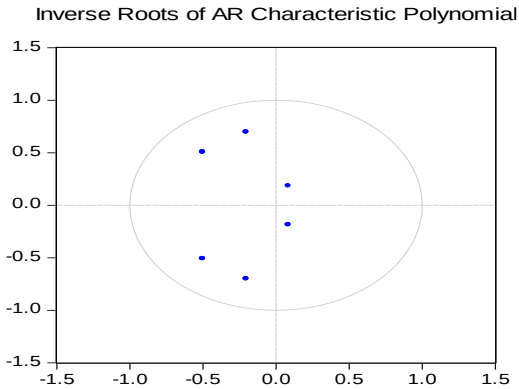

Fig. 2 Inverse Roots of AR Characteristic Polynomial

3. Impulse Response Analysis

Since the OLS parameters estimators of VAR model has only consistency, it is difficult to interpret the single parameter estimators economically, so it is necessary to analysis the impulse response of the system. Impulse response function (PRF) is the response of an endogenous variable to an random error shock. It describes the impact of a standard deviation shock on the current and future values of the endogenous variable, Figure 2 shows the results of inpluse response:

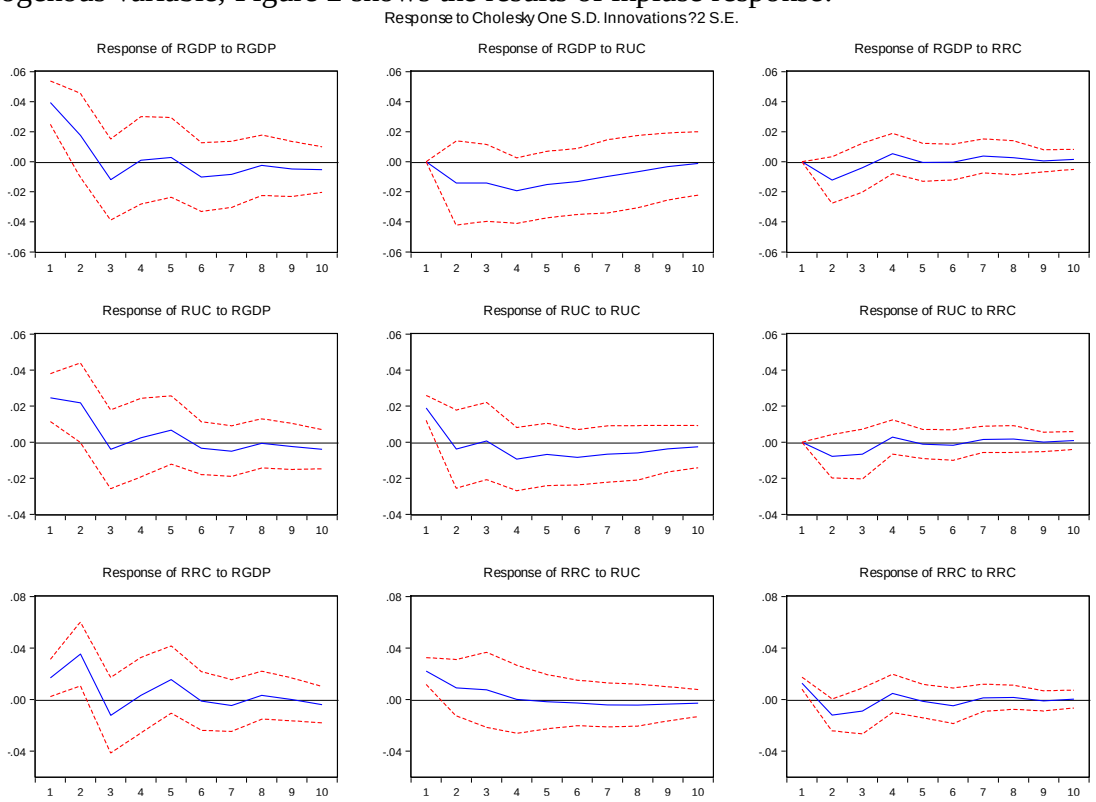

Fig. 3 Inpluse Response

Given a standard deviation shock to per capita consumption expenditure of urban resident, there is a negative impact on GDP in the 1-2 period, a positive impact in the 2-4 period, and again a negative impact in the 4-6 period, and a gradual weakening of the impact after the 7 periods. This means that the increase of consumption demand of urban residents may lead to insufficient supply and inflation, and then have a negative impact on GDP. With the gradual adjustment of production and the increase of supply, consumption demand of urban residents promote economic growth, the impact of rural residents' consumption on GDP is weak, probably due to the smaller consumption expenditure of rural residents.

given a standard deviation shock on GDP, there is a positive impact on the per capita consumption expenditure of urban residents in the period 1-2, a negative impact in the period 2-4, and again a positive impact in the period 4-6, and a gradual weakening of the impact after the period 7. This means that economic growth will promote the consumption expenditure of urban residents, but the growth of consumption expenditure of urban residents may lead to an increasing in investment demand, which in turn will have a crowding-out effect on consumption expenditure and lead to a decreasing in consumer demand. However, with the adjustment of production and the increase of supply, it will also promote the increase of consumer demand. The influence of the consumption expenditure of rural residents on consumption expenditure of urban residents is weak, and consumption expenditure of rural residents has no effect on urban residents' consumption expenditure.

given a standard deviation shock on GDP, there is a positive impact on the consumption expenditure of rural residents in the period 1-2, a negative impact in the period 2-4, and again a positive impact in the period 4-6, and a gradual weakening of the impact after the period 7. This means that economic growth will boost the consumption expenditure of rural residents, but consumption expenditure may

increase the demand for investment, which will have a crowding-out effect on consumption expenditure, resulting in less consumption expenditure of rural residents. But with the adjustment of production and the increase of supply, it will promote the increase the consumption expenditure of rural residents. The expenditure of Urban residents has a weak impact on rural residents, which indicates that the consumption expenditure of urban residents has a certain demonstration effect on rural residents.

4. Conclusion and Suggestion

Economic growth is mainly dependent of its own factors. consumption expenditure of Urban residents put both positive and negative effects on economic growth. consumption expenditure of Rural residents put weak effects, mainly because the total consumption expenditure of rural residents is small. This means that the relationship between economic growth and consumption demand must be correctly coordinated. When the relationship between them is balanced, economic growth has a positive impact on consumption expenditure. When the relationship between them is unbalanced, economic growth has a negative impact on consumption expenditure, and vice versa.

The impact of the consumption expenditure of urban residents on economic growth is obvious. The impact of consumption expenditure of rural residents on economic growth is weak. The main reason is that the gross of consumption expenditure of urban residents is much larger than that of rural residents, 3-4 times that of rural residents on the average. There is still great adjustment space to the gross consumption demand and its structure of rural residents.

The consumption demand of urban residents has a certain demonstration effect on the consumption demand of rural residents, but the consumption demand of rural residents has little influence on the consumption demand of urban residents. This means that urban market can expense to rural market, but rural market can not expense to urban market, which determines that the direction of the market is almost single. Therefore, in addition to improving the consumption capacity of rural residents, we should pay more attention to the optimization and upgrading of the consumption structure of the rural market.

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