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The Empirical Analysis of Difference of Urban-rural Residents' Marginal Propensity to Consume

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Abstract According to the data concerning consumption and income in 55 *Years of Statistics Chronicle of New China*, *China Statistical Yearbook*, by using econometric model, this paper expounds the reason of shortage of residents' consumption demand in China and tests the difference of marginal propensity to consume of China's urban-rural residents. The results show that the urban residents' marginal propensity to consume is greater than rural residents' marginal propensity to consume in China, but the urban residents' marginal propensity to consume tends to decline, while the rural residents' marginal propensity to consume tends to rise. In terms of urban-rural income structure, consumption structure and consumption of consumer durables, this paper analyzes the reason of the change of urban-rural residents' marginal propensity to consume, and it can be described from following 3 aspects: first, urban residents' income is mainly wage and salary, while urban residents' income is mainly operating net income. The urban residents are conservative towards the expected income, while rural residents are relatively optimistic towards the expected income; second, in comparison with rural residents' consumption structure, the urban residents' consumption structure has big proportion of unessential expenditure, so the income elasticity of consumption is big; third, the urban residents' traditional consumer durables approach saturation, while the rural residents' traditional consumer durables are still at the period of increase, and the urban residents' purchase of emerging consumer durables is inhibited, with great fluctuation. Based on research results and actual situation, this paper puts forward that the key of spurring increase of China's consumption demand is to expand consumption demand of rural residents.

Key words Marginal Propensity to Consume, Consumption demand, Consumption structure, China

Since the reform and opening in 1978, China has achieved remarkable economic development. Amid three driving factors of economic growth, the driving role of investment factors and net export factors is increasingly strengthened, but the driving role of consumption factors is increasingly weakened. In particular, since the reform of exchange rate of RMB in 1994, China's export grows rapidly at nominal growth rate 19.3% on average, higher than the average level from 1978 to 1993 by 3 percentage points.

With the spread of the global financial crisis in 2009, the global economic growth slows down, and the external demand of China's economic growth bears enormous brunt, therefore, economic growth is facing difficulties.

When the domestic consumption demand cannot be initiated quickly, the government mainly adopts expansionary fiscal policy and monetary policy, increases government investment, and stimulates private investment, in order to ensure high growth rate of economy. Although these policies of investment stimulation can stabilize the economy in the short term, the economic growth still lacks force in the long term if it is devoid of support of consumption demand. Only by the expansion of consumption demand can we ensure steady economic growth in the long term. On the whole, it is still devoid of comprehensive investigations on residents' propensity to consume at present in China. In the perspective of urban residents and rural residents, this paper probes into the characteristics of marginal propensity to consume of the Chinese residents. By in-depth study on marginal propensity to consume of the Chinese residents, this paper aims at unraveling the characteristics of residents' consumption in China, and providing useful reference for initiation of consumption demand.

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1 The reason of residents' insufficient consumer spending

The shortage of domestic consumption demand, especially the shortage of residents' consumption, has been generally recognized by theorists. Theorists propose constructive views, regarding the reason of shortage of residents' consumption demand in China. To sum up, theorists think that reasons of lack of residents' consumption demand in China are mainly as follows.

First, Chinese residents' income grows slowly, and especially the rural residents' income grows slowly, which restricts the expansion of consumption demand[1-2].

Second, the uncertainty of residents' expected income increases arising from the factors of economic system reform and mounting employment pressure, and China's social security system is not sound, which increases residents' motive of precautionary saving and restricts the expansion of consumption[3-4].

Third, the reform of education and health care increases the expenses of residents' education and medical care, makes real estate market prices climb increasingly, and increases residents' expenses of purchasing house. With further advance of the reform, the uncertainty of future spending of residents increases, which strengthens residents' motive of saving and restricts consumption. The liquidity constraints faced by the residents further restricts the consumption demand[5].

Fourth, China's consumption finance is underdeveloped,

and in face of a large amount of consumption spending, residents find it difficult to achieve the equalization of consumption level in their lifetime through financial instruments.

Fifth, the inequality of Chinese residents' income distribution sharpens. According to Keynesian absolute income hypothesis, the marginal propensity to consume decreases progressively along with the increase of income, thus the aggravation of the inequality of Chinese residents' income distribution is bound to lead to decline of the average propensity to consume in whole society, and simultaneous decrease of the level of residents' consumption[6].

2 The econometric analysis of the difference of marginal propensity to consume of China's urban-rural residents

2.1 Data source and theoretical model

2.1.1 Data source. The research data are mainly from 55 *Years of Statistics Chronicle of New China* and *China Statistical Yearbook*, and time span of data is from 1978 to 2008. As for urban residents, we use the income variable of "per capita disposable income of urban households" and as for rural residents, we use the income variable of "per capita net income of rural households". As for urban residents, we use the consumption variable of "per capita consumption expenditure of urban households" and as for rural residents, we use the consumption variable of "per capita consumption expenditure of rural households". All variables are calculated in constant prices, apart from price factors.

2.1.2 Theoretical model. According to Keynes's absolute income hypothesis, current income is determined by current consumption, and the mathematical expression is as follows:

$$C_t = C_0 + cY_t + \mu_t,\ t = 1,\ \cdots,\ T \qquad (1)$$

In the above expression, t represents time; μ_t is the classical assumed disturbance term; C_t represents current consumption; Y_t represents current income; c is marginal propensity to consume.

But this model can not reveal the characteristics of change of the marginal propensity to consume, so this paper primarily uses the relevant data estimated model (1) of Chinese urban residents and rural residents, to test whether Chinese urban residents' propensity to consume is equal to that of Chinese rural residents.

Further, we use Chow test to judge whether the marginal propensity to consume has structural changes at main time points, and then we find out the characteristics of change of the marginal propensity to consume by using models at different stages, and the model of structural change is as follows:

$$C_{t1} = C_0 + c_1 Y_{t1} + \mu_{t1} \qquad (2)$$

$$C_{t2} = C_0 + c_2 Y_{t2} + \mu_{t2} \qquad (3)$$

We construct F statistic via model (1), (2) and (3), in order to judge whether Chinese residents' marginal propensity to consume has changes.

2.2 Econometric analysis

2.2.1 Estimated result of model. We use the data concerning urban residents and the data concerning rural residents respectively to conduct estimation on model (1), and impose corresponding restriction conditions. The estimated result can be seen in Table 1 and 2.

Table 1 The estimated result of Model (1) of urban residents and rural residents

Research object	Intercept term	Marginal propensity to consume	R^2
Urban residents	145.50***	0.93***	0.966
Rural residents	4.63	0.75***	0.991

Note: *** means significant at 1% level of significance.

Table 2 The estimated result of Model (1) of urban residents and rural residents which is imposed with constraint

Constraint condition	F value	Critical value (5% significance level)	Critical value (1% significance level)
Marginal propensity to consume is equal	6.74	4.01	4.99
Marginal propensity to consume and intercept are both equal	51.74	3.16	4.99

From the regression results, two constraint conditions are rejected at 1% significance level. Urban residents' consumption function and rural residents' consumption function are significant but different statistically. Not only the marginal propensity to consume is different, but also the intercept term is different, so we should estimate the urban residents' marginal propensity to consume and the rural residents' marginal propensity to consume respectively. In light of the regression results from Table 1, China's urban residents' marginal propensity to consume is greater than rural residents' marginal propensity to consume. However, the income level of urban residents is higher than the income level of rural residents, which seems that it doesn't mesh with the law of "marginal propensity to consume declining along with increased income level".

2.2.2 Chow test. Given that the objective of China' economic system reform established in 1992 is to establish socialist market economic system, and in view of reform of the RMB exchange rate in 1994, deepened reform of state-owned enterprises in the late 1990s and other factors, we select the year 1994 as point of structural change, and conduct Chow test on urban residents' consumption function and rural residents' consumption function, and the test results can be seen in Table 3, 4.

From test results in Table 3, we can clearly find that the constraint conditions are all rejected. The consumption function of urban residents has significant structural change in 1994, not only a change in the marginal propensity to consume, but also a change in the intercept term. So we should conduct segmented estimation on the consumption function of urban residents, so as to determine more appropriate marginal propensity to consume.

As for consumption function of the rural residents, the situation appears more complicated. According to the data in Table

4, we can get conclusions as follows: first, the models with equal single constraint marginal propensity to consume or equal single constraint intercept term are all accepted, but the models which are imposed with equal constraint on marginal propensity to consume and intercept term are rejected. That is, the consumption function of rural residents has structural changes in 1994, and as for these structural changes, we can use "single marginal propensity to consume changes, but the intercept term doesn't change" or "the intercept term changes, but the marginal propensity to consume doesn't change" to describe model. Because this paper is to examine the characteristics of the marginal propensity to consume, so we adopt the model with changed marginal propensity to consume and unchanged intercept term.

Table 3 Chow test of structural change of urban residents' consumption function in 1994

Constraint condition	*F* value	Critical value (5% significance level)	Critical value (1% significance level)
Marginal propensity to consume is equal	57.13	4.18	7.60
Marginal propensity to consume and intercept are both equal	81.38	3.28	5.42

Table 4 Chow test of structural change of rural residents' consumption function in 1994

Constraint condition	*F* value	Critical value (5% significance level)	Critical value (1% significance level)
Marginal propensity to consume is equal	2.91	4.18	7.6
Intercept term is equal	0.043	4.18	7.6
Marginal propensity to consume and intercept are both equal	9.63	3.28	5.42

2.2.3 Segmented estimation. The segmented estimated results of China's urban-rural residents' consumption function can be seen in Table 5. From the estimated results, the coefficients of equation are very significant, and the degree of fitting of equation is satisfactory. Through the analysis of the marginal propensity to consume of urban residents, the marginal propensity to consume of urban residents tends to decline, and the marginal propensity to consume of urban residents is bigger than 1 prior to 1993, which arises from that the urban residents enjoyed more state-subsidized consumption at the time. With the decline of this part of state-subsidized consumption, and monetization and marketization of consumption, the marginal propensity to consume of urban residents gradually reverts within 1. The marginal propensity to consume of urban residents has a downward trend.

The marginal propensity to consume of rural residents shows a rising trend, in sharp contrast to the marginal propensity to consume of urban residents. Although the marginal propensity to consume of rural residents is smaller than the marginal propensity to consume of urban residents, the gap is narrowing.

Table 5 The segmented estimated consumption function of China's urban-rural residents

The consumption function of China's urban residents	Intercept term	Marginal propensity to consume	R^2
From 1978 to 1993	−160.71***	1.37***	0.944
From 1994 to 2008	524.24***	0.74***	0.992
The consumption function of China's rural residents	**Intercept term**	**Marginal propensity to consume**	**R^2**
From 1978 to 1993	34.70***	0.65***	0.995
From 1994 to 2008		0.72***	

Note: *** means significant at 1% level of significance.

3 Analysis of the reason of the change of urban-rural residents' marginal propensity to consume in China

3.1 Income structure By comparing the income structure of urban residents with the income structure of rural residents, we can find that the income of urban residents is mainly wage and salary. Although in recent years, the proportion of net operating income increases, the wage income still holds the major part; as for income of rural residents, the family operating income predominates, followed by the wage income.

Since operating income of rural residents has a large proportion, and there is high correlativity between operating income and economic growth, in the context of rapid economic growth of China, rural residents have high income expectation. Meanwhile, the government attaches importance to issues concerning agriculture, countryside and farmers, actively promotes agricultural development, and promotes famers to increase income. These measures have strengthened rural residents' expectation on the growth of future income. According to inter-period optimal consumption function model, the residents optimize their consumption amount in their life, then the growth of rural residents' expectation on the growth of future income is bound to make the marginal propensity to consume of rural residents increase.

For urban residents, the income of wage and salary is not directly sync with economic growth. In fact, the proportion of China's total wage in GDP is decreasing. Meanwhile, being that the pressure of urban employment mounts, the state-owned enterprise reform and other factors strengthen urban residents' conservative attitude towards their future income, so the marginal propensity to consume of urban residents declines.

3.2 Consumption structure From the consumption structure, the urban residents and rural residents are different or the same in some aspects. First of all, from the common point, the proportion of four types of consumption expenditure, namely food, clothing, household appliance and services and other commodities and services, in consumption structure of urban residents and rural residents all decline, while the proportion of consumption expenditure of housing in consumption structure rises increasingly; secondly, from differences, the proportion of three types of consumption expenditure, namely health care, transportation and telecommunication and services of education, culture and entertainment, in consumption structure of urban residents tends to rise rapidly, while the proportion of three types of consumption expenditure, namely health care, transportation and telecommunication and services of education, culture and entertainment, in consumption structure of rural residents rises, but the amplitude is small, and even there is trend of hover.

Table 6 Urban residents' income structure %

Year	Wage and salary	Net operating income	Income of property	Income of transference
1990	75.83	1.48	1.03	21.66
1995	79.23	1.70	2.11	16.96
2000	71.17	3.91	2.04	22.88
2007	68.65	6.31	2.34	22.70
2008	66.20	8.52	2.27	23.02

Table 7 Rural residents' income structure %

Year	Wage and salary	Net operating income of family	Income of property	Income of transference
1981	52.01	37.83	0.00	10.17
1990	20.22	75.56	4.22	0.00
1995	22.42	71.35	2.60	3.63
2000	31.17	63.34	2.00	3.50
2007	38.55	52.98	3.10	5.37
2008	38.94	51.16	3.11	6.79

Table 8 Urban residents' consumption structure

Year	Food	Clothing	Housing	Household appliance and service	Healthcare	Transportation and telecommunication	Services of education, culture and entertainment	Miscellaneous commodities and services
1982	56.06	14.79	1.39	9.56	0.60	1.45	8.43	7.72
1990	54.25	13.36	4.76	8.48	2.01	3.17	8.78	5.21
1995	50.09	13.55	8.02	7.44	3.11	5.18	9.36	3.25
2000	39.44	10.01	11.31	7.49	6.36	8.54	13.40	3.44
2007	37.89	10.37	10.19	6.15	6.99	12.60	12.08	3.72
2008	37.89	10.37	10.19	6.15	6.99	12.60	12.08	3.72

Table 9 Rural residents' consumption structure

Year	Food	Clothing	Housing	Household appliance and service	Healthcare	Transportation and telecommunication	Services of education, culture and entertainment	Other commodities and services
1981	59.66	12.35	9.79				2.43	
1990	58.80	7.77	17.34	5.29	3.25	1.44	5.37	0.74
1995	58.62	6.85	13.91	5.23	3.24	2.58	7.81	1.76
2000	49.13	5.75	15.47	4.52	5.24	5.58	11.18	3.14
2005	45.48	5.81	14.49	4.36	6.58	9.59	11.56	2.13
2006	43.02	5.94	16.58	4.47	6.77	10.21	10.79	2.23
2007	43.08	6.00	17.80	4.63	6.52	10.19	9.48	2.30
2008	43.67	5.79	18.54	4.75	6.72	9.84	8.59	2.09

Certainly, directly from the food consumption, the proportion of the food consumption of rural residents in total consumption expenditure is clearly larger than the proportion of the food consumption of urban residents in total consumption expenditure, namely the Engel coefficient of rural residents is bigger than the Engel coefficient of urban residents. With the increase of the Engel coefficient, the flexibility of consumption expenditure increases, therefore, the consumption of urban residents shows greater flexibility than the consumption of rural residents. The consumption of rural residents shows greater rigidity. From the proportion of consumption expenditure of transportation and telecommunication and services of education, culture and entertainment in total consumption expenditure, we can find that rural residents' consumption obviously have greater rigidity. Because the proportion of rigidity consumption expenditure of rural residents is large, so the marginal propensity to consume of rural residents takes on the trend of rise.

3.3 Consumption of consumer durables Because of the high income level, the update of consumption structure and other factors, the urban residents usually consume more durable consumer goods than rural residents. But the marginal propensity to consume of urban residents drops due to the following factors.

First, in the field of traditional durable consumer goods, urban residents have already showed a saturated state, and the high-speed growth period has already passed. Although their consumption amount increases, it grows with slight amplitude. From Fig. 1, 2 and 3, we can find, the traditional durable consumer goods (washing machine, refrigerator, TV set) which the urban residents consume are nearly saturated, while such

consumption in rural areas still increases. In Fig. 3, the number of TV sets ownership among rural residents includes both the color TV sets and the black and white sets, so the saturated condition of TV sets shown in the figure is just the saturated condition of the black and white sets. Because urban residents' consumption of durable consumer goods has already showed a saturated state, so the marginal propensity to consume of urban residents tends to decline, but the marginal propensity to consume of rural residents tends to rise.

Second, urban residents' consumption of durable consumer goods grows mainly on emerging durable consumer goods, such as automobile, PC, fitness equipment, video camera and so on. The income flexibility of this kind of durable consumer goods is often big, and residents have big flexibility to delay purchase, so their marginal propensity to consume is relatively small; meanwhile, usually, the price of this kind of goods is high, so purchasing these goods has a close relationship with consumption finance, while the consumption finance is underdeveloped in China, which restricts the consumption of these goods.

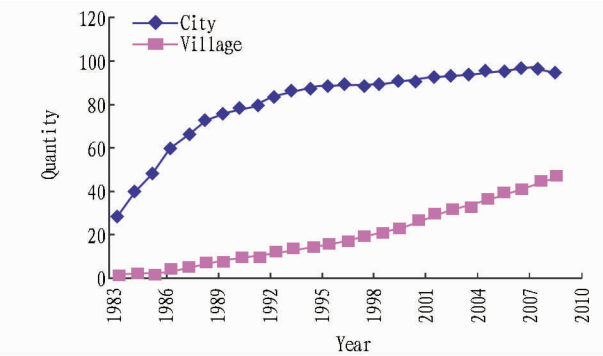

Fig. 1 Quantity of washing machine per 100 urban-rural households own

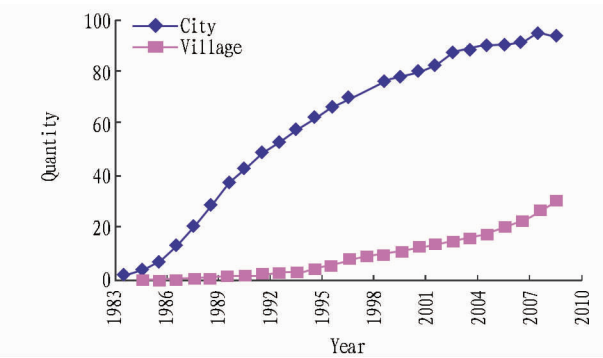

Fig. 2 Quantity of refrigerator per 100 urban-rural households own

4 Conclusion and discussion

In a nutshell, the urban residents' marginal propensity to consume is greater than rural residents' marginal propensity to consume in China, but the urban residents' marginal propensity to consume tends to decline, while the rural residents' marginal propensity to consume tends to rise. This gap is narrowing increasingly.

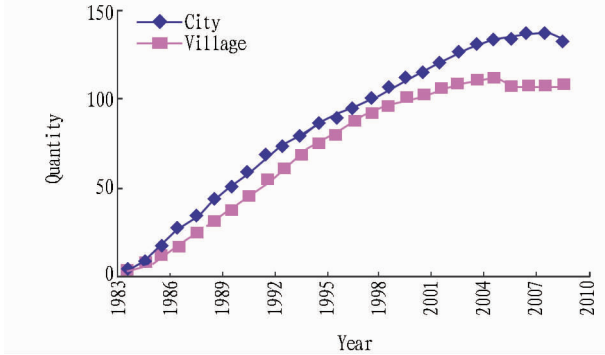

Fig. 3 Quantity of television per 100 urban-rural households own

The reason of the variation of the marginal propensity to consume of the urban-rural residents in China mainly has three factors, namely income structure, consumption structure and the consumption of consumer durables. It can be described from following 3 aspects: first, urban residents' income is mainly wage and salary, while urban residents' income is mainly operating net income. The urban residents are conservative towards the expected income, while rural residents are relatively optimistic towards the expected income; second, in comparison with rural residents' consumption structure, the urban residents' consumption structure has big proportion of unessential expenditure, so the income elasticity of consumption is big; third, the urban residents' traditional consumer durables approach saturation, while the rural residents' traditional consumer durables are still at the period of increase, and the urban residents' purchase of emerging consumer durables is inhibited, with great fluctuation.

Based on the research results and the background of expanding consumption demand currently in China, stimulating rural residents' consumption may achieve better results. The government should promote the income level of rural residents, promote upgrade of consumption structure of rural residents, and strengthen construction of the rural consumer durables market, in order to promote expansion of rural residents' consumption demand, and finally reverse the situation that China's economic growth excessively relies on exports and investment.

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