

## Regression Analysis Research on the Impact of Urbanization on Farmers' Consumption Structure

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### Abstract

The status of research on the impact of urbanization on farmers' consumption structure conducted by the domestic and international scholars is described in the paper; and the argument is supported by exploration and analysis that the urbanization has exerted an influence on farmers' consumption structure. Furthermore, by concretely exploring the related data model constructed in the research, the following achievements are made: along with the advancement of urbanization, the proportion of three categories including food and clothing in farmers' consumption structure turns on a downward trend, while the proportion of housing, transportation, and other five categories are in an upward trend; in the farmers' consumption expenditure, the medical and health expenditure is significantly affected by urbanization, while urbanization only has a little influence on food expenditure. On the basis of the conclusion in this paper, suggestions are put forward which include promoting the urbanization rate, creating a better condition for the development of the rural residents, improving the basic social security system and perfecting a series of policies that stimulate rural consumption including the "home appliances going to the countryside", "mobile phones going to the countryside", and "cars going to the countryside" etc..

**Key words:** Urbanization; Farmers' consumption structure; Regression analysis; Suggestions

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### INTRODUCTION

It is proposed in 18<sup>th</sup> CPC National Congress to stick with the way of industrial informatization, and agricultural development of urbanization with Chinese characteristics, thus prompting steady progress of the industry along with agriculture. And by speeding up the effective integration of industry and informatization, the combination and coordination of agriculture and urbanization, common development is to be finally realized (Hou, 2014). After 2000, issues concerning agriculture, rural areas and farmers have been attached increasingly more importance by the government, and the three issues have been mentioned in No.1 Central Document for years. Rural urbanization in China is on a steady development, and the urbanization rate is increasing progressively with about 1% improvement per year, leading a possibility that the urbanization rate may exceed 60% in 2020.

With continuing improvement of the living standards of rural residents, their consumption level has also improved, the consumption structure has changed in compared with before, and population, resources, and other basic living demand from urban areas are growing faster. Exploring the rural urbanization process has a crucial significance in instructing not only the cultivation of new rural consumer products and coordination of new industrial construction, but also the promotion of rural economy by developing rural consumption strategy.

### 1. LITERARY REVIEW AND THEORETICAL ANALYSIS

#### 1.1 Literary Review

Consumption structure refers to that in certain social economic conditions, the quantitative proportion and mutual relations of all kinds of consumer goods and services consumers consumed in the process of consumption, which can be indicated by the proportion

of various consumption expenditures in the living consumption expenditure. It reflects the state of the residents' life consumption quality and signifies the level of rationalization of internal constitution (Gong, 2005). On the subject of the residents' consumption structure experts from different countries have carried out enormous exploration in theory and experiment. Modern concept of consumption begins with Keynes, who put forward a hypothesis of absolute income, insisting the amount of income and marginal consumption propensity significantly affects the size of the consumption. Duesenberry and Modigliani found through investigation and analysis that a person's income determines his consumption concept and tendency, which also interfered by some external factors (Li, 2014). Friedman, however, proposed a different viewpoint. He acclaims that permanent income and instantaneous income are two main aspects of income, and consumption is determined by permanent income, with little impact of instantaneous income. The change of consumption is smoother than income (Li & Liou, 2012). R. Stone and Luch proposed the Extended Linear Expenditure System (ELES) Model, which supposes people's demand for a commodity depends on people's income and the prices of the goods, and this system can be used in the analysis of the consumption structure (Peng, Wang, Chen, Lei & Wu, 2014). Matyas and Sevester put forward the Pannal Data model on the basis of past research models, which leads the research of the consumption structure into a new research phase (Yang & Zheng, 2005). In the studies of Barnett & Brooks it was mentioned that, to a great extent, the relevant government fiscal expenditure promotes the residents' consumption as well as the evolution of the consumption structure (Lin, 2010).

Since entering the new century, with the promotion of China's rural consumption level, the relevant exploration of domestic rural residents' consumption has been increasing. By learning from the western consumption theory and in-depth exploration, Chinese scholars have carried on thorough researches on the consumption structure of rural residents and its influencing factors. Duan Xiaojiang did longitudinal and transverse comparison with two methods of cluster analysis and factor analysis according to the consumption structure of Chinese audience, concluding that the residents' consumption is in the period of transformation and upgrading and gave some advice of promoting residents' consumption structure to be more reasonable (Yin, 2004). On the basis of improvements of the Extended Linear Expenditure System (ELES) model, Ye Zongyu analyzed the marginal consumption propensity of various kinds of consumer products in different income groups using the Pannal Data (Lü, Gong, & Zhao, 2014). Li Liqing and Li Yanling presented that "active consumption" and "passive consumption" are two significant categories in Chinese farmers' consumption based on the multilayered grey

association analysis of the rural residents' consumption (Ibid.). Zhou Faming compared the difference of the consumption structure between China's urban and rural residents and analyzed the main reasons for these different aspects (Guo, 2015). By analyzing and exploring the Chinese rural consumption structure and its changing trend, Liu Xiaonan confirmed that along with China's urbanization, the economic income is higher, cost level has been improved at the same time and even the consumption structure has been taking on a diversified change (Liu, 2013). Cai Rifang proposed that the fast developing urbanization can promote the market development to some extent, and also the pay level and consumption structure of rural residents (Li, 2005). On the basis of the specific data of China in the year 1978 to 2004, Hu Ridong etc. showed the positive effects of urbanization on consumption growth by establishing vector autoregressive model (mainly presents the dynamic correlation between urbanization level and consumption growth) (Zhou, 2013). By using VAR model and cointegration analysis method, and adopting the data of China's urbanization rate in many years and farmers' consumption in time-series, Sun Hongqiao etc concluded that the Chinese urbanization process has a stimulating effect on the increase of rural consumption, and they also analyzed the correlation between them (Chen, 2014). Jiangsu rural socio-economic survey team summarized the influence of the urbanization on farmers' consumption as follows: First, the food consumption structure has improved, and garment consumption has increased; second, the farmers' consumption is on a change from a type of meeting basic survival demand to that of pursuing the quality of life; third, the residents' housing conditions has improved; fourth, durable consumer goods have been leveled up; fifth, the consumption has changed from the domination of real objects to equal stress on both matter and service; sixth, the consumption has changed from the type of self-sufficiency to monetization (Pu, 2015).

## 1.2 Theoretical Analysis

### 1.2.1 The Impact of Urbanization on Farmers' Income

Suppose the agricultural output and the total number of farmers does not change, and represent them with  $W$  and  $N$  respectively. When the urbanization rate is  $K_0$ , the farmer's economic income from agriculture is  $\frac{W}{N(1-k_0)}$ ; when the urbanization rate increases to  $K_1$ , the farmer's economic income from agriculture is  $\frac{W}{N(1-k_1)}$ . Therefore, when the urbanization rate increases from  $K_0$  to  $K_1$ , the per capita income of rural residents will increase  $(1 - \frac{1-k_0}{1-k_1})$  times.

According to this conclusion, if China's urbanization rate increases from the current 43.90% to 60% of the world's average level, the per capita income of rural residents will increase 28% than it currently is, and when China's

urbanization rate is up to that of the developed countries in the current world, the farmers' income will soar.

The above is just the conclusion drawn on the premise of the assumption that the agricultural income has been unchanged. If other factors are considered including the progress in agricultural technology, structure adjustment, the promotion of agricultural modernization, the income increase due to more employment chances brought by relative policies in rural areas and urbanization, and the income growth due to the development of secondary and tertiary industries, the growth rate of income of rural residents will speed up faster when the urbanization accelerates.

### 1.2.2 The Influence of Urbanization on Farmers' Consumption

When rural residents turn into urban population, the consumption will change as well. The consumption will have a more obvious emphasis and the consumption quantity will increase accordingly, so that market scale in the urban areas is expanding fast. The reasons for this phenomenon are:

On the one hand, urbanization let the farmers have a clear knowledge of the urban consumption and infected to some extent. According to the relative income supposition, one's purchasing inclination of goods is influenced by the payment environment around him or her. The living environment of rural residents has changed because of urbanization, and this to some extent has caused the

change in the consumption structure, and the improvement of consumption expenditure.

On the other hand, urbanization has also changed the farmers' consumption structure. Education and health care, both have become the main content of consumption expenditure. Meanwhile, urbanization has changed every family into a small family, provided with more employment opportunities, thus increasing the consumption expenditure on housing, household facilities and entertainment, etc..

## 2. DATA DEMONSTRATION AND MODEL ANALYSIS

### 2.1 Data Demonstration

In this paper, the data mainly comes from *China Statistical Yearbook (1990-2011)* and the website of National Bureau Of Statistics. In order to obtain perceptual knowledge, trend analysis of the data is done first.

From 1990 to 2011, the various proportions of different kinds of consumption expenditure in the overall consumption of Chinese rural population had changed greatly. According to the analysis of trends, the proportion of food and clothing began to decline, while that of housing, household facilities, entertainment services, health care and transportation increased significantly.

**Table 1**  
**China's Urbanization and the Consumption Structure in 1990-2011** (unit: Yuan/people %)

Year	Urbanization rate	Consumption	Food	Clothing	Housing	Household facilities	Health care and insurance	Culture, education and entertainment	Transportation and communication	Other commodities
1990	26.41	584.63	58.81	7.77	17.34	5.29	1.44	5.37	3.25	0.74
1991	26.37	619.79	57.62	8.24	16.51	5.70	1.66	5.87	3.60	0.81
1992	27.63	659.01	57.56	7.97	15.92	5.57	1.85	6.65	3.67	0.83
1993	28.10	769.65	58.05	7.19	13.88	5.81	2.26	7.59	3.53	1.70
1994	28.71	1016.81	58.86	6.91	13.99	5.46	2.36	7.39	3.16	1.87
1995	29.04	1310.36	58.63	6.85	13.90	5.23	2.58	7.81	3.24	1.76
1996	29.37	1572.08	56.33	7.24	13.94	5.36	3.00	8.43	3.71	2.02
1997	29.92	1617.15	55.05	6.76	14.42	5.28	3.33	9.16	3.86	2.12
1998	30.40	1590.33	53.42	6.17	15.07	5.15	3.82	10.02	4.28	2.07
1999	30.89	1577.42	52.55	5.83	14.75	5.22	4.36	10.67	4.44	2.17
2000	36.22	1670.1	49.13	5.75	15.47	4.52	5.57	11.18	5.25	3.14
2001	37.66	1741.1	47.71	5.67	16.03	4.42	6.32	11.06	5.55	3.24
2002	39.09	1834.3	46.25	5.72	16.37	4.38	7.01	11.46	5.66	3.15
2003	40.53	1943.3	45.59	5.68	15.87	4.20	8.36	12.13	5.96	2.21
2004	41.76	2184.7	47.23	5.50	14.84	4.08	8.82	11.33	5.98	2.21
2005	42.99	2555.4	45.48	5.82	14.49	4.36	9.59	11.56	6.58	2.13
2006	43.90	2829	43.02	5.94	16.58	4.48	10.21	10.78	6.77	2.23
2007	44.94	3223.9	43.08	6.00	17.80	4.62	10.19	9.48	6.52	2.30
2008	45.68	3660.7	43.67	5.79	18.54	4.75	9.84	8.59	6.72	2.10
2009	46.59	3993.5	40.97	5.82	20.16	5.13	10.09	8.53	7.20	2.11
2010	49.70	4381.8	41.09	6.02	19.06	5.34	10.52	8.37	7.44	2.15
2011	51.27	5221.1	40.36	6.54	18.42	5.92	10.48	7.59	8.37	2.34

### 2.1.1 Food Expenditure

In 1990, the food expenditure of China's rural residents was 343.8 yuan, and it increased by 5.12 times to 2,107.3 yuan in 2011. According to Engel's law, the proportion of food expenditure in consumption expenditure will turn on a downward trend with the income increasing. Table 1 presents the proportion of food expenditure of China's rural residents in their overall living consumption expenditure had been a volatile change. Not until after 1995, the Engel's coefficient began to be steadily less than 0.586, presenting a downward trend; in 2000, the coefficient began to break through 50% to 49.13%; in 2011, the coefficient has been reduced to 40.36%. It indicates that in general the consumption of China's rural residents has begun to enter the basic well-off phase from 1995 and is heading to the depth of the well-off life stage, even a richer one.

### 2.1.2 Clothing Expenditure

Since 1990s, there has also been a big change in the clothing expenditure of China's rural residents. After their basic demand of keeping warm was met, a higher-level need began to render out and the rural residents have begun to pursue for clothing with higher quality in the new era. Although the clothing expenditure has increased because of the promotion of farmers' income and consumption level, the overall consumption has been increasing at the same time, so the proportion of clothing consumption in the whole consumption expenditure still declined. In 1990, per capita clothing consumption of China's rural residents was 45.4 yuan and it increased 6.52 times to 341.3 yuan in 2011, while the overall consumption growth of rural residents is 7.93 times from 1990 to 2011, significantly higher than that of clothing consumption. Therefore, along with the increase in income and consumption level of China's rural residents, the proportion of clothing consumption will be on a downward trend.

### 2.1.3 Housing Expenditure

Houses belong to the basic means of livelihood, and it is a place for family and person living normally. Along with economic development, and the upgrading of consumption level and consumption quality in rural areas, the residential area is also increasing, housing facilities have improved, and housing quality has improved as well. In 2011 China's rural per capita housing expenditure accounted for 18.41% in China's per capita housing expenditure, increasing 1.08% than the proportion of 1990.

### 2.1.4 Expenditure in Household Appliances and Services

Because of the consistent social and economic development and the promotion of rural economy, rural residents' consumption ability has improved, and their expenditure on home supplies has also increased, especially in household facilities and services. China's

rural per capita expenditure on various home supplies in 1990 was 30.9 yuan, and it increased 10 times to 308.9 yuan in 2011. It is not hard to infer that the rural household articles for daily use are becoming more and more diversified, and all kinds of durable goods have also entered the rural households quickly. In the 21<sup>st</sup> century, since the expectation of the increase of farmers' income has increased due to the changes of the government's rural policies, and the new technology has developed, some consumer goods farmers had no access to before such as televisions, computers, mobile phones began to enter farmers' life and pulled a new surge in the relative expenditure.

### 2.1.5 Expenditure on Cultural, Educational and Entertaining Products and Services

In 1990, China's farmers' expenditure on cultural, educational and entertaining products and services per capita was 31.4 yuan, while in 2011 it reached to 396.4 Yuan, and its proportion in their overall expenditure increased from 5.73% in 1990 to 7.59% in 2011. It highlights the farmers' demand in terms of cultural quality, science and technology and the improvement of the quality of life on one hand, and on the other, it also reflects the effectiveness of the great increase in the farmers' educational consumption due to the guide of relative policy system.

### 2.1.6 Expenditure on Health Care, Transportation and Communication

With the promotion of income and life quality, the proportion of rural residents' health care expenditure in the total consumption expenditure rose from 1.44% in 1990 to 10.48% in 2011, and the steady increase reflects that rural residents are attaching more and more attention to physical and mental health. The rural residents' consumption on transportation and communication has increased steadily, and its proportion rose from 3.25% in 1990 to 8.37% in 2011. Although the increase on transportation and communication expenditure is related to technology development and social mobility, it also has a close association with the government policy of subsidizing for purchasing agricultural implements, which has brought an investment boom on the agricultural investments from rural residents. This shows that the government policies have a great inducing impact on the rural residents' consumption, and thus in order to promote the increase and the structure optimization of rural residents' consumption, effective policies should be adopted.

## 2.2 Urbanization Rate and the Regression Analysis of Rural Residents Per Capita Consumption Expenditure

By observing the time-series data of China's urbanization, the regression analysis is carried out on the rural residents' per capita consumption expenditure since 1990 and the influence of urbanization on the rural residents'

consumption is explored. The regression results are as follows:

$$\begin{aligned} \text{Ln}C &= -1.91 + 2.62\text{Ln}K \\ & \quad (-7.40) \quad (11.78) \\ R^2 &= 0.87, F=138.87, p=0.0000, DW=1.93. \end{aligned}$$

It is not difficult to draw the conclusion from the model of the regression results that the economic meaning of model is reasonable, and with the improvement of urbanization rate, the rural residents' consumption has also improved. Goodness of fit of the model reached 87%, which prove that the fitting degree of the model to the sample data is very high. The obviousness of the F statistic, illustrates that in general there is an obvious linear relationship. The statistic of variable *T* is greater than the critical value under a significant level of 95%, the explained variable of residents' consumption is significantly influenced by the explanatory variable of urbanization rate. The model has passed the econometric test, there is no heteroscedasticity and autocorrelation sequence, and the nature of the model is good, so it can be used as a tool of

analysis. The residents' consumption expenditure and the urbanization rate have a significant positive correlation, namely the higher the urbanization level, the more the residents' per capita consumption expenditure, and the faster the consumption structure upgrade accordingly. When the farmers' consumption increases by 2.62%, the urbanization rate will increase by 1%.

### 2.3 Urbanization Rate and the Regression Analysis of Rural Residents Consumption Structure

In the paper, the rural residents' consumption expenditure is classified into food, clothing, housing, household facilities and services, transportation and communication, cultural, educational and entertaining products and services, health care and other commodities and services. With the urbanization rate and the proportions of 8 categories represented with  $Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7, Y_8$ , respectively, regression model is established. The calculation results are shown in Table 2.

**Table 2**  
**The Urbanization and the Regression Structure of Each Composing Part of the Rural Resident's Consumption**

The structure of consumption expenditure	$\alpha$	$\beta$	$R^2$	$F$	$P$ value
Food	9.97	-1.64	0.97	670.97	0
Clothing	6.08	-1.35	0.55	24.09	0
Housing	0.01	1.28	0.41	13.64	0.001
Household facilities	5.08	-0.94	0.22	5.52	0.029
Transportation and communication	2.45	0.72	0.96	497.42	0
Culture, education and entertainment	2.51	0.49	0.25	6.57	0.019
Health care	3.08	0.31	0.94	306.09	0
Others	3.36	0.34	0.36	11.05	0.003

It is shown in Table 2 that the goodness of fit of the expenditure on household facilities and culture, education and entertainment to the regression model of the urbanization rate is poor, only 0.22 and 0.25, respectively. However, they are both significant when  $\alpha=0.05$ . In addition, the goodness of fit of expenditure on other categories of the regression model of the urbanization is all good with each to be significant when  $\alpha=0.01$ . Therefore, the goodness of fit of the main compositions' proportions in consumption structure to the linear regression function of the urbanization rate *X* is somewhat good.

By observing the regression coefficient of the explanatory variable *X* of each consumption structure, it is obvious that with the increase of the urbanization rate, the proportions of consumption of food (the Engel coefficient), clothing and household appliances are on the decline. Namely, when the urbanization rate increases by 1%, the proportions of consumption of food (the Engel coefficient), clothing and household appliances will decrease by 1.64%, 1.35% and 0.94%, respectively, with the biggest drop in the proportion of food consumption (the

Engel coefficient). With the increase of the urbanization rate *X*, the proportions of 5 categories including housing turn an upward trend. Namely, when the urbanization rate increases by 1%, the proportions of consumption of housing, transportation and communication, cultural, educational and entertaining products and services, health care and other commodities and services will increase by 1.28%, 0.72%, 0.49%, 0.31% and 0.34% respectively, with the greatest increase in the proportion of housing consumption.

## 3. THE RESEARCH CONCLUSIONS AND SUGGESTIONS ON POLICY

### 3.1 The Research Conclusions

Through the analysis of this paper, the main conclusions are as follows: First, due to the advancement of urbanization, rural per capita consumption expenditure has increased steadily. Second, along with China's urbanization, the proportions of consumption of housing, transportation and communication, cultural, educational

and entertaining products and services, health care and other commodities and services have all turned an upward trend, with the greatest increase in the proportion of housing consumption; the proportions of consumption of food (the Engel coefficient), clothing and household appliances have all turned a downward trend, with the biggest drop in the proportion of food consumption (the Engel coefficient). Third, in the nowadays farmers' consumption, health care consumption has the most obvious correlation with the urbanization rate, and the lesser obvious, the consumption of, cultural, educational and entertaining products and services, while the least, food consumption.

### 3.2 Suggestions on Policies

According to the above conclusion, this paper provides several suggestions: First, take effective measures to speed up the pace of urbanization, promote the development of rural economy, create good conditions that benefit the development of rural residents, and increase farmers' income, thus improving rural consumption structure. Second, since the rural residents' health care and insurance and transportation and communication, are greatly influenced by the urbanization, there is an urgent need to improve the basic social security system, for instance, a more complete system of rural medical treatment and pension should be constructed as soon as possible, thus creating an effective stimulus on farmers' consumption and improving their consumption level; in order to satisfy the farmers' consistently increasing demand on transportation and communication, modern, efficient and smooth circulating channels should be constructed quickly. Third, given the influence of urbanization on household appliances, culture, education and entertainment, housing and other commodities, a series of policies stimulating rural consumption should be further perfected including "home appliances going to the countryside", "mobile phones going to the countryside", and "cars going to the countryside" etc.. By leading the farmers' to change their consumption concept, constantly improving the facilities in the after-sales service system of rural consumer goods and cooperating with well-known large and medium-sized enterprises in rural aspects, supply high-quality products and services to farmers as far as possible, thus promoting the consumption level and structure of the rural residents. Fourth, although the food consumption accounted for lesser proportion in overall consumption and it has no great relevance with urbanization, as a basic consumption, food is still the biggest consumption in proportion, and thus should get enough attention.

## REFERENCES

- Chen, Z. (2014). *Influence of urbanization on rural residents' consumption*. Hunan Normal University.
- Gong, L. H. (2005). The path selection of the upgrading of the consumption structure and the promotion of the consumption competitiveness in Guangdong province. *Commercial Economics Review*, (2), 30-33.
- Guo, J. Y. (2015). Interrelationship research on urbanization and the rural residents' consumption structure of Rizhao city. *Quality of Goods: Consumption Research*, (3), 7-7.
- Hou, Y. L. (2014). Rapid urbanization and new urbanization: comparative study of promotion and restriction of the farmers' income. *Hubei Finance*, (3), 22-25.
- Li, J. (2005). Analysis of characteristics and tendency of China's residents' consumption structure. *Forum on Jiangsu Commerce*, (6), 3-4.
- Li, H., & Liu, K. H. (2012). Analysis of China's rural residents' consumption structure change. *Xinjiang State Farms Economy*, (4), 48-53.
- Li, S. B. (2014). Interaction and synchronized development of industrialization, informationization, urbanization and agricultural modernization. *Hubei Agricultural Science*, (7), 1695-1699.
- Lin, X. Q. (2010). Reflection on urbanization and rural inhabitants' consumption. *Science Technology and Industry*, 10(11), 83-87.
- Liu, X. (2013). *An empirical analysis of the impact of the rural consumer consumption demand by income, savings and urbanization rate*. Hebei University of Economics and Business.
- Lü, R. M., Gong, Q., & Zhao, R. F. (2014). Analysis of the urban elderly consumption structure. *Journal of Changchun Education Institute*, (14), 2-3.
- Peng, S. G., Wang, Y. H., Chen, C., Lei, G., & Wu, X. H. (2014). The effect of land price competition among cities on demographic urbanization—A case study of Shandong province. *Modern Urban Research*, (8), 14-19.
- Pu, L. (2015). *Urbanization on economic growth in China*. Yunnan University.
- Yang, D. M., & Zheng, Y. M. (2005). Analysis of characteristics and tendency of consumption structure change of urban residents in China's western region. *Journal of Xi'an Institute of Finance and Economics*, (4), 12-15.
- Yin, G. X. (2004). Analysis of China's urban residents' consumption structure. *Journal of Wuhan Jiaotong Polytechnic*, (4), 52-54.
- Zhou, D. C. (2013). *Analysis of welfare impacts of fluctuations in prices of goods on the rural households—Based on empirical research of AIDS model*. Yulin: Northwest A&F University.