



Factors influencing housing consumption of urban residents in China

based on principal component analysis

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Abstract. With the completion of a moderately prosperous society in China, the 14th Five-Year Plan of China and the proposal of the 2035 vision highlight the need to solidly promote common prosperity, while housing consumption is a fundamental requirement for achieving common prosperity. Therefore, it is of practical significance to study the influencing factors of housing consumption in China for the harmonious development of the whole society and economy. This paper uses principal component analysis to identify the main influencing factors and outstanding problems affecting housing consumption of urban residents in China by using relevant data from various cities in the National Statistical Yearbook, so as to propose countermeasures and suggestions for the conclusion and enable the healthy development of housing consumption in China.

Keywords: Housing consumption of urban residents; influencing factors; principal component analysis method

1 Introduction

In China's 14th Five-Year Plan, the initiative to promote comprehensive consumption and the healthy development of housing consumption has been put forward, which means that housing consumption has received national attention. It is thus clear that housing consumption is not only a personal issue ^[1], but also an important part of the national economy, and at the same time it affects every aspect of China's social life, so the study of the factors influencing the housing consumption of urban residents in China is of great significance to the harmonious socio-economic development of the whole society. It is therefore important to study the factors influencing the housing consumption of Chinese urban residents for the harmonious development of the whole society and economy ^[2].

2 Analysis of the factors influencing housing consumption of urban residents in China based on principal component analysis

In the study of this paper, the data collected from people in different regions on some factors affecting housing consumption were analyzed by the principal component method using SPSS software based on data such as the per capita income of urban residents in major cities in China's National Statistical Yearbook 2020 [3].

Table 1. KMO and Bartlett's test [Self-drawn]

The KMO metric of sampling adequacy.		0.754
Approximate cardinality		185.164
Bartlett's test for sphericity	df	105
	Sig.	0.000

As can be seen from Table 1, the value of the KMO obtained is 0.754, and using the KMO measure, the validity is considered good as the KMO value is greater than 0.6 and the Bartlett's sphericity test test statistic has a value of 185.164, with a matching p-value of almost 0. At a significance level of 0.05, the original hypothesis is rejected and the unit array is considered to be significantly different from the correlation array. It can be seen that the analysis using principal component analysis is appropriate [4].

Table 2. Extraction of factors and calculation of common factor variance [Self-drawn]

	Initial	Extraction
Disposable income per urban resident	1	0.954
Number of people aged 65 and over	1	0.897
National property tax levy	1	0.911
Number of residential units completed	1	0.853
Number of residential units sold	1	0.936
Average residential sales price	1	0.953

The SPSS software was used to obtain the public factor variance profile as above. From Table 2 it can be seen that all of the six variables studied in this paper have an extracted proportion of 0.8 or more. From this it can be concluded that all these variables can be explained by the factors [5].

Table 3. Component matrix analysis [Self-drawn]

Component Matrixa	Ingredients	
	1	2
National property tax levy	0.847	0.439
Number of residential units completed	0.832	-0.401

Number of residential units sold	0.817	-0.519
Number of people aged 65 and over	0.806	-0.498
Average residential sales price	0.380	0.900
Disposable income per urban resident	0.552	0.806

From Table 4, it can be seen that in this paper, the national property tax levy, the number of completed residential units, the number of residential units sold and the number of elderly people aged 65 and above have high loadings on Component 1, indicating that Component 1 responds to information on these four factors, while the average sales price of residential units and the per capita disposable income of urban residents have high loadings on Component 2, indicating that Component 2 responds to information on these two factors. Therefore, two components are basically the response to the original six variables, which means that extracting two components is sufficient ^[6].

Table 4. Component score coefficient matrix [Self-drawn]

Component score coefficient matrix		
	Ingredients	
	1	2
Disposable income per urban resident	0.174	0.346
Number of people aged 65 and over	0.254	-0.214
National property tax levy	0.267	0.189
Number of residential units completed	0.262	-0.172
Number of residential units sold	0.257	-0.223
Average residential sales price	0.120	0.386

In turn, X1 is taken as the per capita disposable income of urban residents; X2 is the number of elderly people aged 65 and above; X3 is the state levy on property tax; X4 is the number of residential units completed; X5 is the number of residential units sold; and X6 is the average sales price of residential units, which can be obtained from Table 5 that:

$$F1=0.174X_1+0.254X_2+0.267X_3+0.262X_4+0.257X_5+0.120X_6 \quad (1)$$

$$F2=0.346X_1-0.214X_2+0.189X_3-0.172X_4-0.223X_5+0.386X_6 \quad (2)$$

Table 5. Score and ranking by province [Self-drawn]

Province	Principal Component Score 1	Principal Component Score 2	Overall score	Combined score ranking
Tianjin	6.318	-0.447	3.169	1
Yunnan	6.146	-0.238	3.160	2
Liaoning	5.784	-0.899	2.711	3
Hubei	4.815	-0.713	2.271	4
Hunan	2.857	0.544	1.723	5

Henan	1.962	1.613	1.664	6
Beijing	1.901	1.650	1.647	7
Hebei	2.789	0.072	1.504	8
Guizhou	1.793	-0.041	0.933	9
Inner Mongolia	0.688	-0.128	0.314	10
Jiangxi	0.471	-0.126	0.200	11
Shaanxi	-0.107	0.158	0.005	12
Anhui	-0.371	0.464	-0.016	13
Guangdong	-0.122	-0.436	-0.234	14
Shanghai	-0.984	0.416	-0.359	15
Shandong	-0.663	-0.271	-0.456	16
Chongqing	-1.203	0.138	-0.583	17
Guangxi	-1.375	0.137	-0.674	18
Hainan	-1.737	0.331	-0.790	19
Jilin	-1.461	-0.048	-0.792	20
Zhejiang	-1.390	-0.481	-0.923	21
Shanxi	-1.744	-0.013	-0.928	22
Xinjiang	-2.364	0.035	-1.237	23
Jiangsu	-2.270	-0.152	-1.260	24
Sichuan	-2.027	-0.489	-1.262	25
Fujian	-2.211	-0.266	-1.273	26
Qinghai	-2.437	-0.334	-1.419	27
Gansu	-2.920	-0.282	-1.655	28
Heilongjiang	-3.019	-0.210	-1.679	29
Tibet	-3.557	0.057	-1.860	30
Ningxia	-3.563	-0.040	-1.901	31

As can be seen from Table 6, the principal component scores show that the top five cities in the two principal components are Tianjin, Yunnan, Liaoning, Hubei and Hunan. For principal component 1, the cities ranked in descending order are Tianjin, Yunnan, Liaoning, Hubei and Hunan, which shows that these five cities are more heavily represented by principal component 1; while for principal component 2, the cities ranked in descending order are Tianjin, Guizhou, Jiangxi, Anhui and Yunnan, which shows that these five cities are more heavily represented by principal component 2.

3 Suggestions for countermeasures to promote the healthy development of housing consumption

Through the conclusion of the above related analysis we can know that the main factor affecting people's housing consumption is per capita disposable income, while the growth of residents' income depends on the level of China's economic development, then the solution to the problem of income inequality in the context of China's stable economic development level must rely on the power of the government^[7]. The government should improve the provident fund system to support the housing consumption of low and middle income families. According to the study of targeted housing provident fund policies for urban self-employed entrepreneurs, freelancers and migrant workers employed in urban areas for a long period of time^[8], more low- and middle-income workers should be included in the coverage of the housing provident fund system. And develop individual housing loan business to further reduce housing provident fund loan fees and provide efficiency in the use of funds, while improving the housing provident fund supervision system to ensure the safety of funds and play an active role in the process of promoting the healthy development of housing consumption.

4 Conclusion

Given that the current real estate industry is a very active market, in order to promote the healthy development of housing consumption in China not only the government should do something, real estate developers should also do something. In order to solve the contradiction between supply and demand in the real estate market, I think real estate developers should make reasonable planning for the houses they build, provide different types of houses, and accelerate the construction of low-cost small and medium-sized ordinary commercial houses. And focus on clarifying the difference between low and medium-priced small and medium-sized ordinary commercial housing and limited-priced commercial housing, public rental housing and affordable housing, and reasonably planning the proportion of land supply for construction. At the same time to rectify the real estate market order, and actively create a good division of public opinion to promote residents to carry out reasonable housing consumption, must create a good market environment for the majority of consumers, regulate the transaction behavior, and effectively safeguard the legitimate rights and interests of consumers. For real estate development enterprises to adjust housing sales prices in the process of disputes, to guide the parties concerned according to contractual agreements through legal channels to receive bacteria issues. Adhere to the correct guidance of public opinion and strengthen the propaganda and education of risk awareness under the conditions of market economy in order to better implement the healthy development of housing consumption in China.

References

1. Chen, Shuyun, Zhang, Chongfu. Improvement of the principal component analysis method for the comprehensive evaluation of multiple indicators[J]. *Statistical Research*, 1995, (01):35-39.
2. Du Hongwu. Factors affecting residents' satisfaction with the quality of living environment in the community: an example of some communities in the Pearl River Delta region[J]. *Journal of Urban Planning*, 2002, (05):48-54+80.
3. Ge Huaizhi, Zhang Jinlong. Model and empirical evidence of housing demand forecasting for urban residents in Hubei Province[J]. *Statistics and Decision Making*, 2013, (10):69-71.
4. Li Guo. Research on the impact of housing provident fund loans on China's real estate market--a perspective based on regional differences[J]. *Finance and Economics*, 2016, (04):15-20.
5. LI Wenbin, YANG Chunzhi, SHI Hong, HAO Libo. A study on housing price model based on submarkets [J]. *Urban Issues*, 2010, (10):61-66+75.
6. Sun Peishan, Zhang Fengrui, Miao Zhuang. An empirical study on the impact of the real estate industry on the economy and tax revenue of Liaoning[J]. *Local Finance Research*, 2012, (12):63-69.
7. Wang Xiaoyun, Zhang Xuemei, Wang Shengqiang. Analysis of the equilibrium relationship between supply and demand in real estate and development strategies[J]. *Business Times*, 2010, (26):126-127.
8. Zhu Junming. Analysis of the socio-spatial structure of the population in Shanghai[J]. *China Population Science*, 1995, (04):21-30.

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