



Analysis on the Relationship among Industrial Structure, Structure of Migrant Population and Real Estate Prices

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Abstract: With the urban development, the industrial structure and the structure of population show a mutually influential and very complicated relationship, and the industrial structure and the structure of population show an evident relationship with the real estate. The structure of population will have an influence on the industrial structure, and the industrial structure will have an effect on housing prices. So changes in the population structure will also have an indirect effect on the changes of real estate prices. This paper analyzes the relationship among industrial structure, structure of migrant population and real estate prices.

Keywords: Migrant population; Urban industrial structure; Real estate prices

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1 Introduction

With the continuous and rapid acceleration of the current urbanization, the increase in migrant population has also changed the urban population structure, and the supply of labour in the city has also increased, which will definitely leads to a decline in the employees' educated level. Such demographic characteristics will not only affect the industrial structure in the city, but also indirectly affect the urban real estate prices. However, since the industrial structure can adjust the population structure, real estate prices will rise under the increase of the migrant population only when the industrial structure is similar.

2 Test the intermediary effect among the urban population structure, industrial structure and real estate prices

With the changes in both urban industrial structure and real estate prices, a more likely intermediary is the population structure. The increase in the urban migrant population will affect the development of different industries and will also affect the resident in the city^[1-3]. That is to say, the urban industrial structure will affect the changes of population, which will affect the permanent population, and have an impact on real estate prices. So this paper proposes the following assumptions:

Hypothesis 1: The population structure plays the role of an intermediary variable between the industrial structure and real estate prices:

(1) The age structure of the population plays the role of an intermediary variable between the value ratio of the secondary industry and the value of real estate in a city;

(2) The education structure of the population plays the role of an intermediary variable between the value ratio of the secondary industrial and the value of real estate in a city;

(3) The age structure of the population plays the role of an intermediary variable between the value ratio of the tertiary industrial and the value of real estate in a city;

(4) The educational structure of the population plays the role of an intermediary variable between the value ratio of the tertiary industry and the value of real estate in a city.

At the same time, the population structure can also have an impact on the industrial structure. With the

increase in the uneducated labour force in the city, the value-added industries will be further developed, but the advanced and rationalized industrial structure will affect the urban real estate prices. Therefore, industrial structure can also be regarded as an intermediate variable^[4-5]. So this paper proposes the following assumptions:

Hypothesis 2: Industrial structure plays the role of an intermediary variable between population structure and real estate prices:

(1)The output value of the secondary industry plays the role of an intermediary variable between the age structure of population and urban real estate prices;

(2)The output value of the secondary industry plays the role of an intermediary variable between the educated structure of population and urban real estate prices;

(3)The output value of the tertiary industry plays the role of an intermediary variable between the age structure of population and urban real estate prices;

(4)The output value of the tertiary industry plays the role of an intermediary variable between the educated structure of population and urban real estate prices;

Studies have shown that the scale of a city has an effect on the accumulative effect caused by changes of the population. Therefore, the control variable in this study is the scale of the city. Taking the average commercial housing prices in seventy large and medium-sized cities in China as the explanatory variables. Among them, the population of resident, per capita disposable income, and per capita GDP are used as control variables. The above eight hypotheses are verified and tested by calculating the following three equations. The specific testing formula is as follows:

$$Y = \alpha_1 + CX + \sum f_i \times K_i + e_1$$

$$M = \alpha_2 + \alpha X + \sum f_i \times K_i + e_2$$

$$Y = \alpha_3 + C \cdot X + bM + \sum f_i \times K_i + e_2$$

In the above formula, the independent variable is X, the dependent variable is Y, the intermediary variable is M, the control variable is K_i , the coefficient is f_i , the constant term of each model is α , and the error of each model is e. Before specific analysis, the data of each variable should be processed logarithm analysis. In this test, the specific results are shown in Table 1 and Table 2:

Table 1. The intermediary effect among age structure, educated structure and the proportion of tertiary industry

	Proportion of tertiary industry	Proportion of tertiary industry	Proportion of population with over associate degree	Proportion of working-age population	Average real estate prices	Average real estate prices	Average real estate prices	Average real estate prices
Proportion of output value of tertiary industry			0.605	0.216		0.353	0.362	
Proportion of working-age population		0.627						0.509
Proportion of population with over associate degree	0.647				0.210		-0.014	
GDP per capita	0.126	-0.139	0.315	0.944	0.121	0.071	0.076	-0.282
Permanent residents	-0.333	-0.095	0.405	-0.036	-0.098	0.016	0.022	0.002
Per capita disposable income	0.265	0.151	-0.420	-0.228	0.621	0.531	0.525	0.649
ΔR^2	0.520	0.321	0.510	0.766	0.572	0.635	0.629	0.607

Table 2. The intermediary effect among age structure, educated structure and the proportion of secondary industry

	Proportion of secondary industry	Proportion of secondary industry	Proportion of population with over associate degree	Proportion of working-age population	Average real estate prices	Average real estate prices	Average real estate prices	Average real estate prices
Proportion of output value of tertiary industry			0.906	-0.149		-0.401	-0.410	
Proportion of working-age population		-0.551						0.509
Proportion of population with over associate degree	0.0497				0.210		-0.002	
GDP per capita	0.312	0.573	0.657	1.070	0.121	0.302	0.317	-0.282
Permanent residents	0.449	0.254	0.433	-0.026	-0.098	0.069	0.079	0.002
Per capita disposable income	-0.331	-0.247	-0.482	-0.0258	0.621	0.463	0.452	0.649
ΔR^2	0.211	0.093	0.359	0.753	0.572	0.725	0.721	0.607

Through the above results, we can learn:

(1) Among the seventy permanent residents in the large and medium-sized cities studied in this study, the proportion of working-age population, the proportion of tertiary and proportion of population with over associate degree and the proportion of output value in tertiary industry have a positive effect on the average real estate prices, which is very significant;

(2) Among the permanent population of the seventy large and medium-sized cities studied in this study, there is a positive interaction between the educated structure, age structure and the output value of the tertiary industry;

(3) Among the permanent population of the seventy large and medium-sized cities studied in this study, the proportion of the output value of the tertiary industry has a complete intermediary effect between the educated structure and real estate prices;

(4) Of the seventy large and medium-sized cities

studied, the impact of the output value in secondary industry and the output value in tertiary industry on real estate prices plays an intermediary role independent on the impact of age structure and education^[6-7].

3 Analysis on the impact of migrant population on urban population structure and industrial structure

Because the structure of the permanent population in the city can affect the price of urban real estate under the impact on the industrial structure, but the population structure will be affected by the natural changes of the urban population and social changes. With the acceleration of urbanization, the number of migrant population has a direct impact on the urban population structure^[8]. The following is an analysis of the impact of the proportion of non-resident population on the urban industrial structure and population structure:

Table 3. Analysis of the impact of urban migrant population on industrial structure and permanent resident structure

	Proportion of secondary industry	Proportion of tertiary industry	Proportion of population with over associate degree	Proportion of population with over associate degree	Proportion of population with over associate degree	Proportion of working-age population	Proportion of working-age population	Proportion of working-age population
Proportion of output value of tertiary industry	0.819	-0.470	0.408	0.589	0.567	0.449	0.521	0.872
Proportion of working-age population	0.362	-0.246	0.318	0.438	0.374	-0.002	0.013	-0.027
Proportion of population with over associate degree	-0.302	0.328	-0.442	-0.482	-0.447	-0.253	-0.260	-0.220
GDP per capita			0.336	-0.391		0.048	-0.043	
Permanent residents			1.058		0.736	0.133		0.186
Per capita disposable income	0.051	0.202						
Proportion of output value of tertiary industry	0.432	0.575						
Proportion of working-age population	0.554	0.472	0.0*313	0.007	0.358	0.566	0.615	0.103
ΔR^2	0.263	0.633	0.568	0.350	0.549	0.828	0.827	0.766

As can be seen from the table above, after controlling the proportion of the output value of the secondary industry and the tertiary industry, when the larger the number of urban migrants is, the higher the proportion of the working population will be, but the population with over associate degree has not been significantly affected. So it can be seen that compared with the resident population, the educated level of the migrant population does not take a significant advantage^[9-10]. If only the proportion of the output value of the secondary industry is controlled, the proportion of the migrant population affected by the working-age population will be influenced in a positive way, but the population with over associate degree will not be affected a lot; If we only control the output value of the population, the impact of the migrant population on the working-age population is not significant, but the population with over associate degree be influenced in a negative way.

4 Analysis of the impact of migrant

population on real estate prices

To analyze the impact of migrant population on real estate prices in cities, the above method is still used, and the calculation is performed by the step-wise method.

$$p = 0.335 \div \text{immigratio} + 0.504 \times \text{incpercop} - 0.322 \times \text{sec perGDP}$$

In this study, the following assumptions were made:

Hypothesis 3: The industrial structure can play the role of an intermediate variable between the urban migrant population and housing prices:

(1) The proportion of the output value of the secondary industry will play an intermediate role between the ratio of urban migrants to permanent residents and real estate prices;

(2) The proportion of the output value of the tertiary industry will play an intermediate role between the ratio of urban migrants to permanent residents and real estate prices;

The following table is the specific results of the test:

Table 4. The intermediary effect between the urban industrial structure, migrant population and real estate prices

	Average real estate prices	Average real estate prices	Average real estate prices	Proportion of secondary industry	Proportion of tertiary industry
GDP per capita	-0.222	-0.073	-0.007	0.819	-0.470
Permanent residents	90.061	0.110	0.051	0.362	-0.246
Per capita disposable income	0.690	0.470	0.540	-0.302	0.328
Proportion of secondary industry		-0.346			
Proportion of tertiary industry			0.457		
Proportion of working-age population	0.495	0.107	0.402	-0.051	0.202
Proportion of population with over associate degree	0.134	-0.039	-0.126	-0.132	0.575
Proportion of migrant population	-0.513	0.322	-0.372	-0.554	0.477
ΔR^2	0.619	0.754	0.691	0.263	0.633

From the above results, it can be seen that if the proportion of the output value of the second and tertiary industries is not controlled, the proportion of non-resident population among the urban permanent population will not have a significant impact on real estate prices; Adjustment between the secondary industry and the tertiary industry can have different effects on urban real estate prices.

Conclusion

In conclusion, through various hypotheses and tests, this paper studies the relationship among the migrant population structure, industrial structure and real estate prices in cities. With the results in this research, we can learn that the migrant population may change the demographic structure in the city. The demographic change may promote the change of industrial structure. Similar industrial structure can affect real estate prices and can also adjust the demographic structure. Therefore, population structure can also have an indirect effect on the real estate prices.

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