

Empirical Study on the Relationship between Urbanization Process and Insurance Industry Development

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Abstract: Based on the macro statistical data of China from 1998 to 2017, the article establishes the VAR model by selecting the urbanization rate and premium income as endogenous variables. Through the impulse response function and variance decomposition analysis of the variables, the article studies the dynamic relationship between the urbanization process and the development of the insurance industry empirically. The results show that the urbanization process and the development of insurance industry in China promote each other and there is a long-term equilibrium relationship. But they mainly depend on their own development. Therefore, the article puts forward some suggestions, such as vigorously promoting the urbanization process, improving the infrastructure construction and increasing the publicity of insurance knowledge.

Keywords: Urbanization; Insurance development; The VAR model

1. Introduction

Since the reform and opening up, China's urbanization process has made great progress, with the urbanization rate increasing from 17.9% in 1978 to 58.52% in 2017. In his report to the 19th National Congress of the Communist Party of China, President Xi Jinping proposed to build a coordinated urban pattern with urban agglomeration as the main body and put forward higher requirements for the new urbanization process. With the continuous improvement of urbanization level, China's urban infrastructure construction has been constantly improved, and the urban-rural dual structure has also changed. The continuous improvement of urbanization level also provides a good opportunity for the development of the insurance industry. Since the 21st century, China's premium income has increased from 2,112.28 billion yuan in 2001 to 3,658.101 billion yuan in 2017, and the insurance industry has developed by leaps and bounds.

Urbanization and the development of the insurance industry promote each other. The improvement of urbanization provides a broader market for the development of the insurance industry, and the development of the insurance industry provides more risk guarantees for the promotion of urbanization. For the relationship between the two, scholars have made a lot of research. In the research on the role of urbanization in the development of the insurance industry, by establishing the ECM model, Yang Huichao and Jiang Shengzhong (2014) find that there is a long-term co-integration positive correlation between the urbanization rate and the development of the insurance

industry, and the higher the urbanization rate is, the stronger the promoting effect on the development of the insurance industry is[1]; Liu Dan (2014) selects panel data of 30 provinces and cities in China from 2002 to 2012 and conducted regression analysis from the four regions of east, west, central and northeast. The results show that there is a significant positive relationship between the urbanization level and the development of insurance industry, and the impact is the largest in the west and the smallest in the northeast[2]; Wang Jun (2014) uses data from 1985 to 2011 in China as the research samples, does empirical research on the relationship of China's insurance industry development, urbanization and economic growth, the results show that there is one-way granger causality between the three relationships, raising the level of urbanization promotes the development of the insurance industry, and put forward to accelerate the urbanization construction Suggestions to promote the development of the insurance industry.[3]Liu Shufeng and Xu Tingting (2015) explore the relationship between urbanization and the development of life insurance industry by establishing the VEC model, and the research results show that the improvement of urbanization rate has a long lag effect on the promotion of the development of insurance industry[4]. Yao Liang, Cheng kai (2016) analyze the change of property insurance demand in China from the non-linear perspective by establishing the panel smooth transition regression model, and find that different levels of urbanization led to different economic growth in each province, which results in un-

balanced development of insurance demand in each province.[5]

In the research on the influence of insurance industry development on urbanization level, Lin Zhisheng (2013) analyse the development of the insurance industry of our country from the rural population, the risk consciousness and the concept of wealth in advancing urbanization background firstly. Then the article explains the social management of the insurance industry boost the urbanization path from the power of economic development and improving the social security and auxiliary , and puts forward some suggestions in the end.[6] Liu Qiong et al. (2015) introduce the development status of urbanization and insurance industry in Anhui province, and point out problems such as imperfect insurance security system and insufficient government support for the insurance industry, and innovate the application mode of insurance funds in the process of new-type urbanization construction;[7]Guo Dandan, Li Zheng (2016) argue that it exists lack of infrastructure construction of social security funding problems in the process of urbanization in our country, and commercial insurance can play the role of the financing, provide risk guarantee for urbanization. It can carry on the reasonable configuration, rural capital to help promote local residents in the urbanization.[8] Min Hong (2017) believes that the development of insurance industry can support infrastructure investment and financing of small and medium-size enterprises in the process of urbanization[9].

Besides, scholars also study the interaction between the two. Zang Zhiyi et al. (2015) selects data from 30 provinces of China from 2001 to 2012 and empirically study the coupling and coordination relationship between them from the perspective of space and time. The results show that the coupling and coordination status of the two is not good, and there are differences in the coordination status in different regions[10]. Xu Xian et al. (2016) take the data of 35 cities in China from 2001 to 2013 as the research object, construct a simultaneous equation model to study the interaction mechanism between them, and the results show that there is a two-way positive influence mechanism between the development of insurance industry and the urbanization process[11].

To sum up, insurance development and urbanization process promote each other on the whole. But the research results of different scholars are slightly different. The article selects the data of China from 1998 to 2017 and empirically studies the interaction between insurance development and urbanization process through the establishment of the VAR model.

2. Current Situation of Urbanization and Insurance Industry in China

An important indicator of urbanization level is the urbanization rate, which reflects not only the proportion of

China's non-agricultural household registration in the national population, but also the proportion of urban permanent residents. Therefore, the improvement of urbanization rate can reflect the development level of China's economy to some extent. In 1998, China's urbanization rate was only 33.35%, and in 2017, it reached 58.52%. The level of urbanization has been significantly improved. In recent years, the rate of urbanization has gradually slowed down, China's infrastructure construction has gradually improved, the economy has begun to pursue high-quality development, and people's living standards have gradually improved.

Although China's insurance industry is in its infancy, with the continuous improvement of economic level, the insurance industry has also developed rapidly in recent years. In 2001, China's premium income was only 211.228 billion yuan, and exceeded 1 trillion yuan for the first time in 2009. In 2017, the premium income has reached 3658.101 billion yuan, 17 times of that in 2001. Although the increase of premium income is significant in China, residents' awareness of insurance is not strong, which reflects that Chinese residents' risk management mode is relatively simple. People tend to deposit money to prevent risks. In terms of insurance demand, economically developed regions have more insurance demand than economically backward regions. The reason may be that economically developed regions have higher per capita income and higher education level, so they have higher acceptance of insurance products. At present, our country have a large number of insurance practitioners, but mostly concentrated in the high school level of education, college degree, etc, high-quality, highly educated insurance personnel less, thus it can be seen that the entry threshold of the insurance industry in China is relatively low, resulting in overall insurance practitioners lack of insurance knowledge. It is hard to meet the professional requirements of the customers, which leads to the acceptance of the residents for commercial insurance is low. In addition, the mobility of insurance practitioners is relatively large, which makes it difficult to provide customers with long-term effective insurance services and brings great trouble to customers.

With the continuous progress of urbanization, people's income level will continue to increase, and car ownership will gradually increase, which to some extent increases people's demand for insurance products and provides more opportunities for the development of the insurance industry. At the same time, insurance funds will also be invested in the construction of urbanization to provide financial support for the construction of urbanization. Therefore, they promote each other to achieve a double win situation.

3. Model Establishment, Variable Selection and Data Source

3.1. Model establishment

The VAR model is usually used to examine the dynamic relationship between time series, and its expression is: $y_t = b_1 y_{t-1} + b_2 y_{t-2} + L + b_p y_{t-p} + f x_t + e_t$. Where, y_t is an n-dimensional endogenous variable vector, x_t is an m-dimensional exogenous variable vector, b_1, b_2, \dots, b_p and f are coefficient matrices, and e_t is a random perturbation term.

3.2. Variable selection

Urbanization (CZ) : The most direct indicator to measure the process of urbanization is the urbanization rate, that is the proportion of urban population in the total population. Insurance industry development (BF) : The development level of the insurance industry is most directly reflected by the amount of premium income.

3.3. Data source

In order to study the relationship between urbanization and insurance industry in China, the article selects 1998-2017 macro statistical data from China statistical year-

book and China insurance yearbook for empirical research. In order to eliminate the influence of heteroscedasticity on the result, logarithmic transformation is performed on the original data.

4. The Empirical Test

4.1. Stationarity test

The VAR model requires that all the selected variables are stationary sequences, so the unit root test is first used to determine whether LNCZ and LNBF are stationary. The test results are shown in Tab. 1. We can see from the results that the P values of LNCZ and LNBF at the significance level of 5% are 0.8833 and 0.8491 respectively, both of which passed the significance test. So the original sequence is non-stationary. After first-order difference of LNCZ and LNBF, D(LNCZ) and D(LNBF) are obtained. The ADF test is performed on the transformed sequence. At the significance level of 5%, the P value of D(LNCZ) is 0.0124 and the P value of D(LNBF) is 0.0000, both of which passed the significance test. In other words, D(LNCZ) and D(LNBF) are first-order stationary sequences.

Table 1. ADF test results

| Variable | ADF value | 5% critical value | P values | Stationarity |
|----------|-----------|-------------------|----------|----------------|
| LNCZ | 0.8448 | -1.9644 | 0.8833 | non-stationary |
| D(LNCZ) | -2.6213 | -1.9644 | 0.0124 | stationary |
| LNBF | -0.5934 | -3.0403 | 0.8491 | non-stationary |
| D(LNBF) | -7.0067 | -3.0404 | 0.0000 | stationary |

4.2. Determine the optimal lag order

After verifying the stationarity of the first-order difference sequence, it is necessary to determine the lag order of the model. In the article, the optimal lag order is de-

termined according to *AIC*, *SC*, *FPE*, *LR* and *HQ* criteria, and the results are shown in Tab. 2. According to the results, the optimal lag order of the model is 1.

Table 2. Optimal lag order

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|---------|-----------|-----------|----------|----------|----------|
| 0 | 4.6371 | NA | 0.0025 | -0.2930 | -0.1941 | -0.2793 |
| 1 | 79.6434 | 125.0106* | 9.64e-07* | -8.1826* | -7.8858* | -8.1416* |
| 2 | 81.0601 | 2.0462 | 1.32e-06 | -7.8955 | -7.4009 | -7.8273 |

4.3. Granger causality test

In order to further test the relationship between urbanization and the development of insurance industry, Granger Causality Test is conducted on them. The results are shown in Tab. 3. It can be seen from the results that the P value of "LNBF is not the granger cause of LNCZ" is

0.1531, and the P value of "LNCZ is not the granger cause of LNBF" through the null hypothesis at the significance level of 5% is 0.0010. The null hypothesis is rejected at the significance level of 5%, that is, LNCZ is the granger cause of LNBF. In conclusion, there is a one-way granger causality between LNCZ and LNBF.

Table 3. Granger causality test results

| Causal hypothesis | Target number | F statistic | P values |
|---------------------------------------|---------------|-------------|----------|
| LNBF is not the granger cause of LNCZ | 19 | 2.2504 | 0.1531 |
| LNCZ is not the granger cause of LNBF | 19 | 16.1215 | 0.0010 |

4.4. Impulse response function and variance decomposition analysis

In order to further examine the dynamic relationship between the two variables, the impulse response function and variance decomposition analysis are carried out for

the selected variables. Before testing, the stability of the model is first tested. Through AR root test, it can be known that the modulus of all solutions is less than 1, which is located inside the unit root, that is, the whole model is stable. The results are shown in Fig. 1.

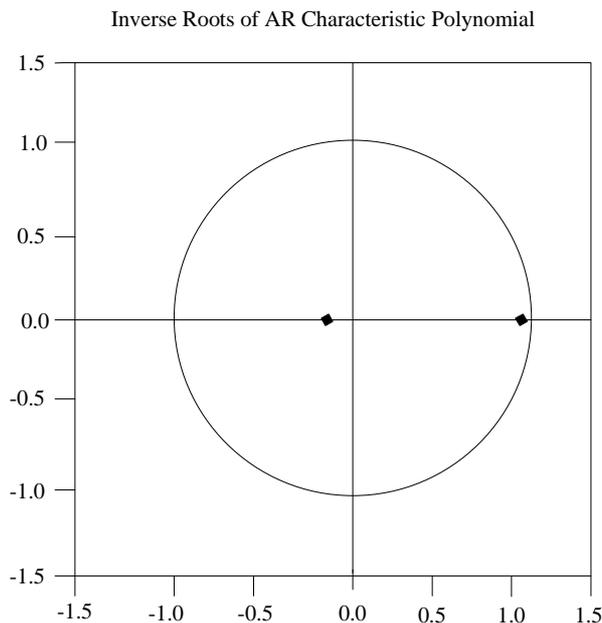


Figure 1. Results of AR root test

The impulse response function is used to analyze the impact of an external shock on one variable on another. Therefore, an external shock is given to LNCZ and

LNBF respectively, and another variable is studied to obtain the dynamic change process.

Response of LNCZ to Cholesky One S.D. LNBF Innovation

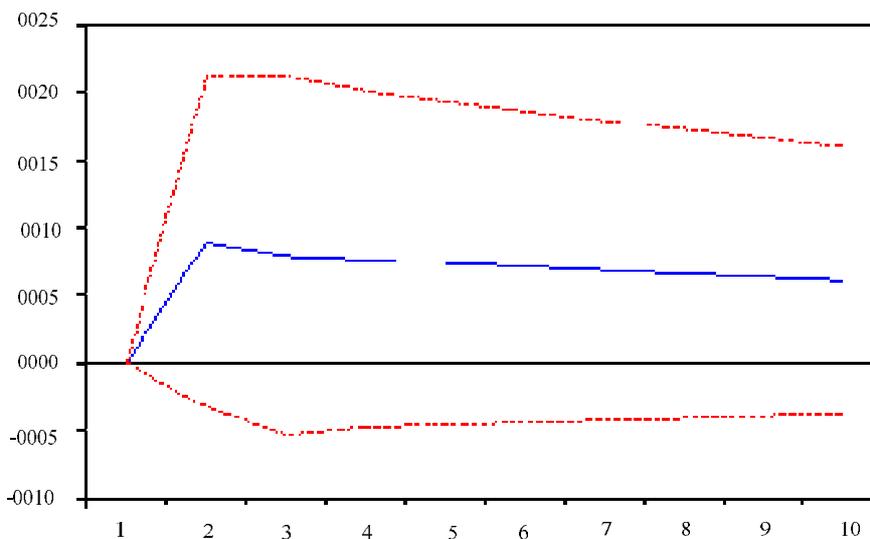


Figure 2. Impulse response of LNBF to LNCZ

It can be seen from Fig. 2 that the impact of a standard new interest on LNBF in the current period has no effect on LNCZ in the first period. After the first period, a positive impact occurs and the maximum positive effect is

reached in the second period. It shows that the development of insurance industry has a promoting effect on the urbanization, but there is a certain lag effect.

Response of LNBF to Cholesky One S.D. LNCZ Innovation

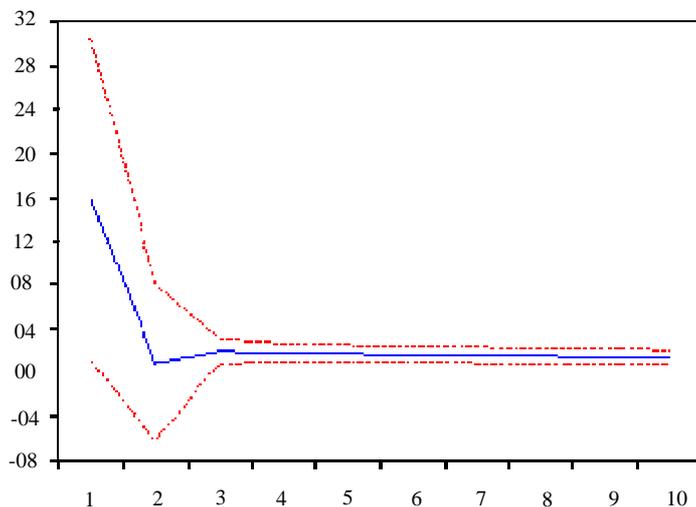


Figure 3. Impulse response of LNCZ to LNBF

It can be seen from Fig. 3 that a standard new interest in the current period to give LNCZ shocks, LNBF in the first phase will have significant positive effect, and the biggest positive effect, swiftly after positive effect, meet minimum when No. 2, No. 2 after slightly increased but not obvious positive effect, and always keep a stable low positive effect. It shows that the promotion of urbaniza-

tion is conducive to the development of China's insurance industry.

In order to study the contribution of the two variables in their respective change process, variance decomposition analysis is carried out for the two variables, and the results are shown in Tab. 4.

Table 4. Variance decomposition table

| Time | LNCZ variance decomposition | | LNBF variance decomposition | |
|------|-----------------------------|---------|-----------------------------|---------|
| | LNCZ(%) | LNBF(%) | LNCZ(%) | LNBF(%) |
| 1 | 100.0000 | 0.0000 | 21.7679 | 78.2320 |
| 2 | 95.3187 | 4.6812 | 21.7660 | 78.2340 |
| 3 | 94.4796 | 5.5203 | 21.9979 | 78.0020 |
| 4 | 94.0718 | 5.9281 | 22.1957 | 78.8042 |
| 5 | 93.8383 | 6.1616 | 22.3787 | 77.6212 |
| 6 | 93.6869 | 6.3130 | 22.5470 | 77.4529 |
| 7 | 93.5811 | 6.4188 | 22.7018 | 77.2981 |
| 8 | 93.5032 | 6.4967 | 22.8444 | 77.1556 |
| 9 | 93.4436 | 6.5563 | 22.9756 | 77.0243 |
| 10 | 93.3967 | 6.6032 | 22.0965 | 76.9034 |

As can be seen from Tab. 4, LNCZ is completely affected by itself in the first phase, and the contribution of LNBF is 0. From the second phase, LNCZ gradually decreases under its own influence, but it remains at a high level, and finally maintains around 93%. The con-

tribution of LNBF to LNCZ gradually increases from the second phase, but the increase is small, and the final contribution is only maintained at about 6%. LNBF contributes 78.2320% and LNCZ contributes 21.7679% to LNBF in the first phase, mainly due to its own influ-

ence. After that, the contribution of LNBF decreases, while that of LNCZ increases gradually, but the change range is small. To sum up, in the process of urbanization and the development of the insurance industry, they are mainly affected by their own.

5. Conclusions and Suggestions

5.1. Conclusions

This article selects the urbanization rate and premium income two variables to establish the VAR model, research the dynamic relationship between urbanization and development of insurance industry. The results show that there is a one-way granger relation between urbanization and the development of insurance industry, the improvement of urbanization rate can promote the development of the insurance industry, the improvement of the insurance industry development level also can promote the advancement of urbanization. However, in their own development, they mainly depend on their own conditions.

5.2. Suggestions

5.2.1. Vigorously promote urbanization and improve infrastructure

The continuous improvement of urbanization is one of the important conditions to guarantee the improvement of residents' living standards. Urbanization should not only focus on the digital level of urbanization rate, but also focus on the connotation construction of urbanization. The government should make efforts to improve the urban and rural infrastructure construction so as to meet the hardware requirements of residents' life. At the same time, the continuous improvement of infrastructure can better drive economic growth and attract more investors to invest, which also expands the demand of the insurance market and promotes the continuous development of the insurance market.

5.2.2. Increase employment support and improve the industrial structure

The promotion of urbanization and the development of the insurance industry have both expanded the demand for employment. The government should increase employment support for people entering cities, improve the employment mechanism, and increase employment satisfaction. Meanwhile, the insurance industry belongs to the tertiary industry. With the development of economy, the industrial structure should be gradually optimized. The government should issue relevant policies to encourage more people to participate in the employment of the tertiary industry, so as to gradually improve the quality of economic growth and make the industrial structure more suitable for the development of social economy.

5.2.3. Increase publicity of insurance knowledge and create new types of insurance

Chinese residents are lack of knowledge and awareness of insurance, so they are more willing to accept social insurance and less willing to accept commercial insurance. This is related to the development mode of China's current insurance industry. The insurance sales mode of promotion makes people have certain resistance to commercial insurance. Therefore, the insurance industry should improve the professional quality and cultural level of employees and improve the marketing mode of the insurance industry. At the same time, we should strengthen the publicity of the concept of insurance in the society, so that more people have access to insurance, understand insurance products and accept insurance services. In addition, insurance companies should combine with China's actual situation, launch insurance products suitable for Chinese residents, meet the market demand, and further promote the development of the insurance industry.

5.2.4. Improve the entry threshold of insurance industry and cultivate professional business personnel

In China, the educational requirements of the insurance industry practitioners are low, which leads to the low evaluation of the insurance industry from all walks of life. Insurance companies should increase the introduction of insurance talents, improve the overall educational level of insurance industry practitioners, and increase the induction training for new employees, increase the difficulty of entry into the insurance industry, so that practitioners can serve customers in a more professional way. Adhere to the integrity of business, firmly resist dishonest behavior, in the community to form a good atmosphere. In the insurance industry, the commission system is usually used to pay the insurance salary, which makes some insurance practitioners only pursue their own interests and do not consider for customers from a long-term perspective. As a result, some customers buy insurance products they do not need, which reduces their recognition of insurance products.

Reference

- [1] Yang Huichao, Jiang Shengzhong. Urbanization Promotes the Development of the Insurance Industry - An Empirical Research Based on Panel Data. *Insurance Research*. 2014, (08), 82-92.
- [2] Liu Dan. Analysis on the impact of urbanization on the development of regional insurance industry -- an empirical study based on panel data of 30 provinces and cities. *Journal of Insurance Vocational College*. 2014, 28(04), 5-10.
- [3] Wang Jun. Insurance Development , Urbanization and Economy Growth in China. *Xinjiang Finance and Economics*. 2014, (02), 19-23+80.

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- [4] Liu Shufeng, Xu Tingting. Empirical analysis of urbanization and life insurance industry development based on VEC model. *Journal of Insurance Vocational College*. 2015, 29(05), 5-11.
- [5] Yao Liang, Cheng Kai. The Non-linear Relationship among Economic Growth, Urbanization and Property Insurance Demand-Based on Panel Smooth Transitional Regression Model Testing. *Insurance Research*. 2016, (10), 48-62.
- [6] Lin Zhisheng. On the insurance industry to facilitate the construction of a new type of urbanization. *Fujian Financial*. 2013, (09), 23-26.
- [7] Liu Qiong, Lei Dongchang, He Jing, Wang Yanyan. Problems in Insurance Industry Serving New-pattern Urbanization Construction in Anhui Province and the Countermeasures. *Journal of Changsha University*. 2015, 29(06), 23-26.
- [8] Guo Dandan, Li Zheng. Research on the role of commercial insurance in new urbanization. *China Business Review*. 2016, (08), 117-119.
- [9] Min Hong. How does the insurance industry promote urbanization. *Journal of Insurance Vocational College*. 2017, 31(02), 57-60.
- [10] Zang Zhiyi, Jing Peng, Li Zheng. The Coupling Coordination and Its Spatiotemporal Representation between Urbanization and the Development of the Insurance Industry. 2015, (03), 3-12.
- [11] Xu Xian, Ding Mohai, Wang Danyang. Interaction Mechanism between the Insurance Industry and Urbanization. *Insurance Research*. 2016, (03), 18-31.