

The Impact of Economic Uncertainty on the Cash Flow of Listed Real Estate Companies in China

Hu Chenyao^{1,a,*}, Yu Jie^{1,b}, Chen Jiaxin^{2,c}

¹Department of Management Science and Engineering, Chongqing University of Posts and Telecommunications, Chongqing, China

²Department of Accounting, Macau University of Science and Technology, Macau, China

^a1259790571@qq.com, ^b554798641@qq.com, ^c1205473277@qq.com

*Corresponding author

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Abstract: After the policies of "no speculation in housing" and "three red lines" have been introduced one after another, more real estate enterprises have heard the news of "thunder explosion" one after another. Based on this, it is particularly important to explore how real estate companies can develop under the influence of increasing economic policy uncertainty. Among them, cash flow is very important for real estate enterprises. Based on this, this paper uses TVP-VAR model to simulate the impact of economic policy uncertainty on the cash flow of listed real estate companies in the important regulatory period and time point of national policies. It is found that the cash flow of operating activities is most affected by economic policy uncertainty, while the cash flow of financing activities is relatively less affected by economic policy uncertainty. Cash flow from short-term operating activities is more sensitive to impact performance, and cash flow from investment activities is more intense in the long run; At the same time, it explains the conclusion that the government is making efforts to end the "barbaric era" of capital power. Based on the conclusion, this paper puts forward some enlightenment, such as strengthening cost management and strategic adjustment, and for high-risk real estate enterprises, we can consider looking for positioning transformation.

1. Introduction

From 2003 to 2021, the uncertainty index of China's economic policy showed an upward trend as a whole. Affected by the financial crisis, EPU exceeded 204 in 2008. In recent years, due to many influences such as trade friction, EPU exceeded 284 after 2016, the growth rate accelerated, and the uncertainty of economic policy was significantly higher than that of previous years. For the current development of real estate enterprises, it is greatly affected, and cash flow is the focus of real estate enterprises. In view of this, this paper focuses on the impact of economic policy uncertainty on real estate listed companies directly from the perspective of cash flow, uses TVP-VAR model with random volatility to systematically measure its impact, and simulates the impact of economic policy uncertainty on real estate listed companies' cash flow in a specific period. The innovations of this paper are as follows: Firstly, focusing on the current development status of the real estate industry

will help to reveal the influence of economic policy uncertainty on specific industries. Secondly, the existing literature mainly studies the influence of economic policy uncertainty on real estate industry from the aspects of cash holding, investment and financing, while this paper directly analyzes business activities and investment and financing activities from the perspective of real estate cash flow. Two ideas are used to comprehensively analyze the influence of economic policy uncertainty and enrich this literature library. Thirdly, compared with the VAR and SVAR models in the existing literature, this paper uses TVP-VAR model to consider the stochastic volatility and time-varying parameters of economic problems, which is more convincing.

2. Literature Review

The domestic and foreign literatures about the impact of economic policy uncertainty on enterprises are mainly studied by scholars from the perspectives of investment, financing, housing prices, capital costs, etc., but there are few researches on sub-industries.

As far as financing is concerned, for example, Rodin and Li Zhiqian (2019) empirically analyzed that the increase of economic policy uncertainty will significantly reduce the amount of corporate financing, and found that it mainly affects corporate financing through debt financing, but has no significant impact on equity financing^[1]. Yu Chuanrong and Fang Junxiong (2018) empirically analyzed that the level of corporate debt financing and equity financing is inversely related to the uncertainty of economic policy, and the short-term reduction of debt financing is more significant than the long-term, which leads to the change of corporate debt maturity structure^[2]. As far as the impact of investment is concerned, Zhao Fengjun and Luo Zuchun (2019) think that the long-term impact of economic policy uncertainty on real estate investment is positive, and the fluctuation of policy uncertainty will have a negative impact on the growth of real estate investment in the short term^[3]. As far as cash holding, financial leverage and house price are concerned, Zhang Guangli and Qian Xianhang (2017) empirically analyzed that the uncertainty of economic policy will affect the cash holding behavior of enterprises, and the uncertainty of economic policy has a positive impact on the level and speed of cash holding^[4]. El-Montasser et al. (2016) found that the relationship between real house price and policy uncertainty is bidirectional, and the period of high economic policy uncertainty will aggravate the fluctuation of house price^[5]. Huang and Luk(2020) also found that the economic policy uncertainty index was negatively correlated with housing prices^[6].

Based on the viewpoints of domestic and foreign literatures, it can be summarized as follows: First, the research on economic policy uncertainty in existing literatures focuses on financial policies such as investment and financing, but there are no sub-industries, especially the real estate industry which is greatly influenced by its policies. Second, there are few literatures about direct research on real estate cash flow, which is very important for special industries such as real estate.

3. Model and Data

3.1. Model

In order to measure the impact of economic policy uncertainty on the cash flow of listed real estate companies in China, explore its internal mechanism, and consider eliminating the endogenous problem of structure, this paper adopts TVP-VAR (Time-Varying Parameter-VAR). Model. TVP-VAR model is a multivariate time series model proposed by scholar Jouchi Nakajima(2011) Based on the traditional VAR model and SVAR model^[7], it introduces the characteristics of random fluctuations and time-varying parameters, which can explain the dynamic relationship between endogenous variables in economy.

3.2. Data Source and Description

The cash flow data of A-share listed real estate companies comes from CSMAR database in Guotai 'an. The selected sample is the quarterly data of net cash flows from operation, investment and financing activities in the cash flow statement of A-share listed real estate companies from January 2003 to June 2021, hereinafter referred to as ocf, icf and fcf. Excluding the data of ST-type companies and companies with missing data, 5,328 sample data of 72 real estate companies are finally obtained. The uncertainty of economic policy studied in this paper is that the decision makers of real estate enterprises can't accurately predict and analyze the changing direction of national economic policies and when to issue new economic policies, and can't make more accurate enterprise decisions in advance. In this paper, EPU index compiled by Scott R. Baker and other scholars is used to measure the uncertainty of economic policy. From the website www.policyuncertainty.com, selected from January 2003 to 2021 6Monthly data of months, quarterly data after arithmetic average. In order to eliminate the influence of dimensions, this paper takes logarithmic treatment for each index.

4. Empirical Analysis

4.1. Data Inspection and Model Selection

In this paper, Eviews7.0 software and Matlab mathematical tools are used for empirical analysis. First, unit root test is needed to judge the stationarity of each variable sequence. As shown in Table 1, after ADF unit root test, it is found that there is no unit root in $dlnepu$, $dlnocf$, $dlnicf$ and $DLNCF$ series at 5% significance level, that is, stationary series, indicating that economic policy uncertainty, net cash flow from operating activities, net cash flow from investment activities and net cash flow from financing activities are all stationary series, which lays the foundation for TVP-VAR model analysis in this paper.

Table 1: Test results of stationarity of variable series.

variable	ADF test value	Critical value (significance level 5%)	Test result
$lnepu$	0.193629	-1.945324	Nonstationary
$lnocf$	0.295695	-1.945669	Nonstationary
$lnicf$	-0.420735	-1.945596	Nonstationary
$lnfcf$	-0.431694	-1.945324	Nonstationary
$dlnepu$	-8.815332	-2.904198	Nonstationary
$dlnocf$	-20.88316	-2.904198	Nonstationary
$dlnicf$	-8.575471	-2.905519	Nonstationary
$dlnfcf$	-6.27349	-2.906923	Nonstationary

4.2. Model Parameter Estimation

Gibbs sampling method in Markov Monte Carlo simulation (MCMC) is used to estimate the parameters. According to the diagnosis results in Table 2, the posterior mean values of TVP-VAR model parameters are all located in the 95% confidence interval, and Geweke values are all lower than the critical value (1.96) at the level of 5%, which indicates that the parameter estimation results can't reject the hypothesis that it converges to posterior distribution. From the point of view of invalid factors, the invalid factor values of all parameters are less than 100, which indicates that at least 100 valid samples were sampled in 10000 MCMC samples, the posterior distribution sampling effect is good, and the estimation results of model parameters are stable.

Table 2: Model parameter estimation and diagnosis results.

parameter	mean	sd	95% upper limit
sb1	0.0023	0.0003	0.0018
sb2	0.0023	0.0003	0.0018
sa1	0.0058	0.0015	0.0035
sa2	0.0054	0.0111	0.0032
sh1	0.0056	0.0017	0.0034
sh2	0.0058	0.0018	0.0034
sb1	0.0029	0.271	4.62
sb2	0.0029	0.033	5.03
sa1	0.0094	0.787	15.88
sa2	0.0075	0.228	15.81
sh1	0.0097	0.028	24.64
sh2	0.0103	0.782	21.64

4.3. Impulse Response Analysis

4.3.1. Equispaced Impulse Response Analysis of Cash Flow of Real Estate Listed Companies

TVP-VAR model can simulate the impulse response with different lag periods. As shown in Figure 1, the equi-interval impulse response of three types of cash flows to the uncertainty of economic policy in lag periods 4, 8 and 12. It is mainly divided into three periods of policy regulation, namely, the SARS outbreak period from 2003 to 2007, the global financial crisis period from 2008 to 2011, and the deep regulation period of real estate from 2012 to 2021. As cash flow is an important basis to reflect the operating conditions, solvency and payment ability of real estate enterprises, the impact of economic policy uncertainty on three types of cash flows of real estate enterprises is equivalent to its impact on the real estate market.

As can be seen from the figure 1, the impact of economic policy uncertainty on the cash flow of listed real estate companies shows the following characteristics: firstly, the cash flow of listed real estate companies was greatly affected by economic policy uncertainty around 2008, but the response of net cash flow from operating activities to the impact in this period was one year earlier than that from investment and financing activities. The main reason is that in 2008, the subprime mortgage crisis in the United States led to the global financial crisis, and the transaction volume of the real estate industry dropped rapidly, which directly affected the cash flow of operating activities. In 2009, the government implemented the "4 trillion" plan, which reduced the minimum down payment ratio and increased the demand of buyers, which stimulated the investment in real estate development, and then affected the cash flow of investment activities and financing activities. Secondly, the net cash flow from operating activities is most affected by the uncertainty of economic policies, followed by the net cash flow from investment activities and the net cash flow from financing activities. Thirdly, the impact of different cash flows in different periods is different. After 2012, the net cash flow from operating activities changed from negative impact to continuous positive impact, and the net cash flow from investment activities changed from positive impact to continuous negative impact. The main reason is that different regulatory policies in different periods have different effects on different cash flows.

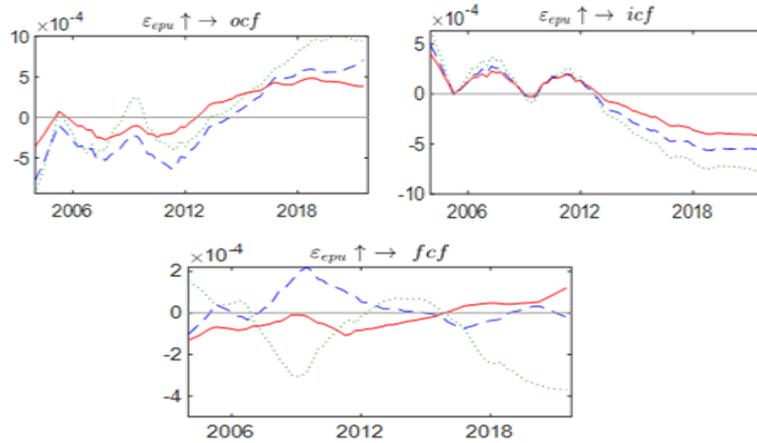


Figure 1: The equispaced impulse responses of three cash flows to economic policy uncertainty.

4.3.2. Time-point Impulse Response Analysis of Cash Flow of Listed Real Estate Companies

This paper selects three important time points to represent the time periods with high economic policy uncertainty, namely, September 2008, December 2016 and September 2020, which respectively represent the US subprime mortgage crisis, the policy of "housing without speculation" and the policy of "three red lines". Figure 2 shows the impulse response results of the impact of economic policy uncertainty on the cash flow of listed real estate companies at three time points.

During the global financial crisis triggered by the subprime mortgage crisis in the United States in 2008, the impact on the net cash flow of China's listed real estate companies fluctuated little, and most of the impacts were positive. However, in 2016, the policy of "no speculation" and the policy of "three red lines" in September, 2020, the impact of economic policy uncertainty on the company's cash flow shows a similar trend, and the impact is much greater than that of the financial crisis in 2008. The impact of economic policy uncertainty on the net cash flow of listed real estate companies at three time points has the following characteristics. Firstly, the impact of economic policy uncertainty on the net cash flow of real estate listed companies is similar in two periods: the policy of "no speculation in housing" in 2016 and the policy of "three red lines" in September 2020. Secondly, the impact of economic policy uncertainty on December 2016 and September 2020 is greater than that of September 2008. Thirdly, under the three periods, the impact of economic policy uncertainty on the cash flow of listed real estate companies lasted for a long time, and did not tend to be stable within one year.

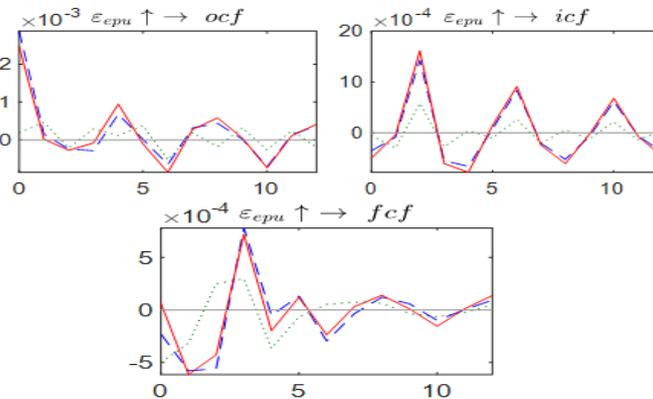


Figure 2: Time-point impulse response diagram of three cash flows to economic policy uncertainty.

5. Conclusions

In this paper, 72 real estate A-share listed companies are taken as research objects, and the quarterly data from 2003 to June 2021 are selected, with a total of 5,328 sample data. By using Eviews7.0 software to test the unit root, determine the optimal lag order, and using Matlab mathematical tools to estimate the parameters of the model and analyze the impulse response, the following research conclusions are obtained:

Firstly, the cash flow of its operating activities is most affected by the uncertainty of economic policies, followed by investment activities, and then financing activities; The short-term net cash flow from operating activities is more sensitive, and the long-term net cash flow from investment activities is more intense. Secondly, through the above analysis, it can be seen that the real estate industry is facing an inflection point at present, with investment contraction and limited financing, but the drastic fluctuation of the real estate industry affected by the uncertainty of economic policies is temporary. Third, the cash flow of financing activities in the real estate industry fluctuates little due to the uncertainty of economic policies, because the financing channels of real estate enterprises are diversified. Although banks have restricted loans in the three regulatory periods, the actual funds in place of real estate enterprises are still increasing year by year. Fourthly, through empirical analysis, this paper also shows that although the government's regulation of the real estate market has always existed, the demand for real estate has been strong and the real estate has expanded rapidly in the past few years. However, in recent years, the economy has been facing downward pressure, and strict financing and loan regulation has been introduced directly to the real estate, which has weakened the demand for real estate. This is a great risk for the real estate enterprises that adopt the high leverage-high debt operation mode, and may even face bankruptcy. It also shows that the government is making efforts to end the "barbaric era" of capital power.

6. Enlightenments

For real estate enterprises, first, in the face of high economic policy uncertainty, the decision-makers of real estate enterprises should not panic. First of all, they should build confidence. Economic policy uncertainty has advantages and disadvantages for enterprises. The main advantage is that enterprises can make more cautious decisions to reduce possible risks. In the face of unfavorable situations, they should strengthen capital withdrawal, increase cash holdings and reduce the risk of capital chain breakage. Second, in the face of the current policy regulation period, we should promote sales, increase cash holdings, and moderately reduce investment and financing to reduce liabilities and financial leverage. Adhere to prudent financial strategy, strengthen cost management and make corresponding strategic adjustments, implement balanced development strategy, adhere to long-term principle, adhere to financial soundness, strengthen cash management, carefully acquire land, shrink investment as much as possible, and reduce the bankruptcy risk of enterprises. Third, in the current real estate market situation, for high-risk real estate enterprises, we can consider looking for positioning transformation, such as integrating with comprehensive city service providers and production cities (Zhou, 2018) In the transformation of the developers in the new district, we will look for opportunities in the fields of urban renewal, old residential renovation, housing lease, property management and community pension.

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