

# Research on the Impact of Economic Policy Uncertainty on Short Term Interest Rate Fluctuations

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Received: November 25, 2024; Accepted: December 29, 2024; Published: December 30, 2024

## Abstract

Research has shown that economic policy uncertainty is widespread. This article selects the Economic Policy Uncertainty Index, SHIBOR, and CHIBOR as proxy indicators for China's economic policy uncertainty and short-term interest rates. From 2006 to 2023, the MS-VAR model is used to explore the dynamic impact mechanism of economic policy uncertainty on short-term interest rate fluctuations. Research has found that the impact of economic policy uncertainty on short-term interest rate fluctuations is "widespread" and may have an impact on several major short-term interest rate fluctuations; When economic policy uncertainty increases, several major short-term interest rates may decline, and the magnitude of the decline in interest rates with longer maturities is relatively greater. The phenomenon of positive feedback effects is also more evident in times of crisis; In the stage where the national economic development tends to be stable and economic policy expectations are relatively clear, the impact of economic policy uncertainty on short-term interest rate fluctuations is more easily absorbed by economic entities.

**Keywords:** economic policy uncertainty, short term interest rate fluctuations, MS-VAR

## 1. Introduction

Economic policy uncertainty refers to the phenomenon where market entities have different expectations for a country's macroeconomic policies within a certain time frame, or there are deviations or even deviations from the original direction of economic policies in the process of formulation and implementation. From historical experience, economic policy uncertainty can occur in both developed and developing countries. Generally speaking, the occurrence of economic policy uncertainty may be due to the following reasons: firstly, the operation of macroeconomics is complex, and it is difficult to ensure that policy direction is completely correct when designing policies at the national level. Therefore, there may be a process of policy "trial and error" in many cases, and the decision-making level mostly considers the economic issues of policies based on different research mechanisms and operational logic. The acting mechanisms, logic, etc. themselves have differences, and the expectations of policy implementation results are even more subjective; Secondly, the various economic policies formulated by the economy are not completely "harmonious" internally, and there may be phenomena of mutual restraint or even deviation between each other. For example, the Phillips curve indicates that the goals of stable prices and full employment cannot be achieved simultaneously, and the objective existence of "antagonistic" problems may also lead to differentiation within the decision-making level, resulting in increased economic policy uncertainty; Thirdly, the formulation and promulgation of each economic policy at the national level involve multiple interest groups, and policies can even be said to be the result of multi-party power games and compromises. In multi-party countries, economic policies are easily deviated or even deviated from their original policy intentions due to competition between parties and resource competition among interest groups. Even in one party countries, the formulation of each economic policy also involves games between different departments, and changes between departments or within a department may lead to deviations in the formulation and implementation of economic policies, resulting in increased uncertainty in economic policies. It is evident that an increase in economic policy uncertainty can disrupt the expectations of economic entities for the future, leading to potential economic consequences such as increased economic volatility. However, unfortunately, from the perspective of the formation mechanism of economic policy uncertainty, although it may bring many negative impacts, it is inevitable to some extent.

In recent years, due to the combined effects of multiple factors, China's economic policy uncertainty has increased significantly. The systematic deleveraging policy has gradually shifted from increasing the weight of equity to reducing pressure on the liability side due to various reasons, indirectly leading to the acceleration of the bear bull market transition in the A-share market. Channel policies such as new asset management regulations have also been formulated and implemented accordingly; There has been a fundamental change in foreign investment management policies, shifting from encouraging domestic capital to compete internationally for investment to restricting capital outflows with stricter conditions. Many companies that originally planned to expand their industries globally have also fallen into the vortex of "increasing control" and are unable to extricate themselves; After the rapid expansion of the real estate market that local governments originally relied on, it entered a period of strict control, and then the entire industry fell into a huge crisis of multiple leading enterprises exploding one after another. After years of accumulation, the debt of local governments has gradually become a potential crisis that may transform into an impact on the national economic construction process. At the same time, China's financial structural adjustment and financial reform have gradually entered deeper waters that are more difficult to promote. Reforms such as anchor replacement of LPR and the construction of interest rate corridors have also pushed the domestic interest rate market into a new historical period. In this context, exploring the impact of economic policy uncertainty on short-term interest rates, which are important macroeconomic indicators, has great practical significance. Based on this, this article explores the mechanism of economic policy instability and empirically studies the impact and mechanism of economic policy uncertainty on short-term interest rates using methods such as MS-VAR model. The aim is to provide some possible references for the development of theories related to interest rate influencing factors, the formulation of economic policies, and investors' decision-making.

Research on the impact of economic policy uncertainty on financial markets. The theory of economic policy uncertainty appeared earlier in the field of capital market research. Merton (1973) proposed the capital pricing model, which theoretically explains the relationship between macroeconomic fundamentals and asset prices. He believes that economic policy uncertainty is an important state variable related to consumption and investment. Most current research focuses on the interaction between economic policy uncertainty and capital markets, and suggests that economic policy uncertainty has a significant negative impact on the correlation between the stock and bond markets (Connolly and etl, 2005). However, after the government announces policy changes, stock prices will decline, and the magnitude of policy changes is strongly correlated with stock prices (Pastor and Veronesi, 2012). Some scholars consider economic policy uncertainty as an important pricing factor in the options market (Kelly and etl, 2016), or in the stock market, thus incorporating economic policy uncertainty into pricing models for consideration. The study also shows that economic policy uncertainty has a significant impact on the credit market, and there is a positive correlation between economic policy uncertainty and the return on risk assets. In an environment of economic policy uncertainty, banks will tighten their credit investment in households and enterprises due to prudent considerations (Gilchrist and etl, 2013), and the proportion of loans in bank asset allocation will decrease, and they will adopt a conservative attitude towards new credit loans, which will have a negative impact on corporate R&D investment through the tightening of credit channels by banks. In addition, economic policy uncertainty also has an impact on interest rates. The higher the economic policy uncertainty, the more investors prefer safe assets. At this time, the price of safe assets increases and interest rates decrease. In other words, economic uncertainty has a negative impact on interest rates, causing a decrease in interest rates. Moreover, economic policy uncertainty will also bring about financial risk spillover effects, and the spillover effects caused by economic policy uncertainty in countries with large economic volumes are relatively stronger (Dakhlaoui and Aloui, 2016).

## 2. Method

Krolzig proposed in 1997 to combine Markov regime transformation with vector autoregression model (VAR) to obtain the design of Markov regime transformation vector autoregression model (MS-VAR). Unlike traditional models, this model has a relatively ideal fitting effect on nonlinear problems. In traditional VAR models, there is an implicit assumption that the model parameters remain constant in different economic environments at different times. However, in the Markov regime transition vector autoregression model (MS-VAR), the parameters are assumed to change with changes in the economic environment (regime transition) at different times, which is more in line with the reality of economic operation. This article introduces the Markov chain method based on VAR (p) to capture the transformation characteristics of the impulse response relationship between economic policy uncertainty and short-term interest rate fluctuations. After introducing Markov chains into the model, the original VAR (p) model can be transformed into an MS-VAR model with p-order M regions:

$$y_t = v(s_t) + A_1(s_t)y_{t-1} + \dots + A_s(s_t)y_{t-s} + u_t \quad (1)$$

The purpose of this article is to explore the impact of economic policy uncertainty on short-term interest rate changes. The core variables are economic policy uncertainty and short-term interest rate indicators, among which the proxy indicator of economic policy uncertainty (EPU) refers to the China EPU index compiled by BAKER et al. (2016). The short-term interest rate indicator selects the Shanghai Interbank Offered Rate (SHIBOR) covering three maturities: overnight, one week, and one month, as well as the China Interbank Offered Rate Weighted (CHIBOR) covering three maturities: one day, one week, and one month, as proxy variables. All indicators have a time range set from 2006 to 2023, which covers a complete cycle of economic fluctuations in China and ensures high representativeness of the data. The data on economic policy uncertainty indicators comes from the Economic Policy Uncertainty website ([www.policyuncertainty.com](http://www.policyuncertainty.com)), and short-term interest rate data is sourced from the Wind database or Guotai An database

### 3. Results

#### 3.1 VAR Model Analysis

Based on the results of the stationarity test, a VAR model is constructed for subsequent analysis. Therefore, a VAR model of economic policy uncertainty and short-term interest rates is constructed, and the optimal lag order is selected according to the AIC rule to test the stability of the model. Then, the fitting effect of the model on variable data is tested at this lag order, in order to preliminarily observe whether economic policy uncertainty has an impact on short-term interest rate fluctuations in the long-term equilibrium state and determine the direction of the impact. Based on this, VAR models were constructed for the Shanghai Interbank Offered Rate (SHIBOR) with multiple maturities and the China Interbank Offered Rate (CHIBOR) with multiple maturities under the Economic Policy Stability (EPU). The analysis results are shown in Table 1. Table 1 clearly shows that there is a positive correlation between economic policy uncertainty and SHIBOR and CHIBOR with a term of one week, but a negative correlation with SHIBOR and CHIBOR with other terms. This result indicates that when economic policy uncertainty increases, major short-term interest rates, including overnight SHIBOR, January SHIBOR, and one-day CHIBOR, will decrease in addition to 1-week SHIBOR and CHIBOR. This may be related to the relatively high risk avoidance function of the money market. When economic policy uncertainty increases and risks increase, funds enter the money market, leading to a decrease in short-term interest rates, which is also in line with the classic view of economics.

Table 1. VAR Model Analysis Results

	Index	EPU	Log Likelihood
SHIBOR	Overnight	-	-976.53
	One week	+	
	One month	-	
CHIBOR	One day	+	-1262.61
	One week	-	
	One month	+	

#### 3.2 MS-VAR Model Analysis

The mechanism of economic policy uncertainty has been analyzed before. The reason for the increase in economic policy uncertainty may be due to the uncertainty of the direction and goals of the economic policy itself. In addition, there is sometimes uncertainty in the timing of policy release and implementation. In addition, market entities generally make dynamic adjustments based on their psychological expectations of the policy, which makes the impact and process of economic policy uncertainty on short-term interest rate fluctuations much more complex than theoretical analysis in practice. Moreover, studies have shown that economic policy uncertainty largely exhibits regional characteristics, which means that the coefficient and even direction of the impact of economic policy uncertainty on short-term interest rate fluctuations may exhibit heterogeneity in different periods. Therefore, it is necessary to further explore the heterogeneity of the impact of economic policy uncertainty on short-term interest rates. Based on this, this article refers to Krolzig's (1997) combination of Markov regime transition and vector autoregression model (VAR) to obtain the design of Markov regime transition vector autoregression model (MS-VAR), and constructs an MS-VAR model with economic policy uncertainty and multiple terms SHIBOR and CHIBOR to examine the dynamic impact mechanism of economic policy uncertainty on short-term interest rates. Table 2 shows the results of likelihood ratio and Davies tests on the model. According to the test results, SHIBOR and CHIBOR both exhibit significant nonlinear characteristics, which are consistent with the above analysis and

empirical judgment. Moreover, whether judged according to AIC criteria, HQ criteria, or SC criteria, overall, the fitting effect of SHIBOR and CHIBOR's MS-VAR models on variables is significantly better than that of linear VAR models, indicating that the constructed MS-VAR model has good stability.

Table 2. MS-VAR Model Verification Results

Variables		MS-VAR model estimation	Linear VAR model estimation	likelihood ratio test	chi-square test	Davies test	conclusion
SHIBOR	Log Likelihood	-806.34	-987.66	358.71	Chi (28) = [0.000]***	[0.000]***	Nonlinear
	AIC	11.06	13.01		Chi (34) = [0.000]***		
	HQ	11.59	13.84				
	SC	13.04	13.08				
CHIBOR	Log Likelihood	-1136.74	-1294.31	226.73	Chi (14) = [0.000]*** Chi (16) = [0.000]***	[0.000]***	Nonlinear

Then, the impact of economic policy uncertainty on the number of short-term interest rate impact zones was tested, and the test results are shown in Table 3. The test results show that SHIBOR has three regimes, while CHIBOR only has two regimes, and it is difficult to distinguish the different volatility difference intervals between the two regimes. In other words, when economic policy uncertainty shocks, CHIBOR's fluctuation range and volatility between regimes are relatively stable. From the perspective of fluctuation duration, under the impact of economic policy uncertainty, the duration of SHIBOR's influence in Zone 2 and Zone 3 is relatively close, while the duration of Zone 1 is relatively short; From the perspective of model regime transition probability, SHIBOR and CHIBOR both exhibit relatively stable states in their respective regimes, and the regime transition probability is not high. From the regression results of the model, it can be seen that there is a certain degree of correspondence between the fluctuations of economic policy uncertainty and the fluctuations of short-term interest rates containing multiple maturities, based on the division of the range of economic policy uncertainty. This clearly indicates that changes in economic policy uncertainty have a certain spillover effect, that is, they can cause fluctuations in the level of short-term interest rates.

Table 3. MS-VAR model partitioning and duration estimation

Variables	District system number	District system	Main time intervals and data characteristics	Prob	Average holding time
SHIBOR	3	1	2007.04-2009.01 (Medium) 2009.05-2011.09 (Low)	0.16	9.87
		2	2015.06-2020.03 (Medium)	0.38	22.34
		3	2012.05-2021.08 (High)	0.46	25.03
CHIBOR	2	1	-	0.66	10.35
		2	-	0.34	6.29

### 3.3 Robust Test

In order to compare the relative importance of the impact of geopolitical risks and investor risk panic on short-term cross-border capital flows in China, this article selects representative time points in the sample for research. The three time points are June 2010 (worsening of the European debt crisis), August 2015 (RMB exchange rate reform), and May 2018 (Trump announcing the US China trade war). June 2010 and May 2018 are the time points when geopolitical risks are high, and August 2015 is the time point when investors have irrational expectations.

In order to further test the robustness of the constructed model and make the empirical conclusions more convincing, this paper uses the method of replacing core variables to conduct model robustness testing. When the regression results of the model after replacing variables are consistent with the aforementioned empirical results,

it indicates that the model has good robustness and the credibility of the empirical results is high. Firstly, this article uses LPR to replace the multiple term SHIBOR and CHIBOR used in the empirical process for MS-VAR model regression. The regression results show that there is a significant nonlinear relationship between economic policy uncertainty and LPR, which is consistent with the previous empirical results, and the impact is also heterogeneous. Heterogeneity is manifested in the existence of two regimes, and in both regimes, the impact of economic policy uncertainty is manifested as a negative feedback process, that is, when economic policy uncertainty increases, LPR will have an increasing process, which is consistent with the above research results. Secondly, the Economic Policy Uncertainty Index (UNEPU) compiled by Huang and Luk (2020) was used to replace the Economic Policy Uncertainty Index (EPU) compiled by BAKER et al. in the empirical study for MS-VAR model regression. The regression results showed that the above empirical results still hold true. This indicates that the constructed MS-VAR model is stable and the conclusions are reliable.

#### 4. Discussion and Advice

This article examines the sources and mechanisms of economic policy uncertainty in the economic system, explores the impact that increased economic policy uncertainty may have on short-term interest rates, and uses the MS-VAR model to empirically study the dynamic and time-varying effects of economic policy uncertainty on SHIBOR and CHIBOR, which include multiple maturities. Based on empirical analysis, the following conclusions are drawn: Firstly, when economic policy uncertainty increases in an economy, short-term interest rates for SHIBOR and CHIBOR, which include multiple maturities, mostly decrease, which may be related to the countercyclical regulatory approach often adopted by the government when arranging monetary policy regulation; Secondly, although SHIBOR and CHIBOR are both important components of China's benchmark interest rate system, empirical results show that SHIBOR reflects market interest rate fluctuations more effectively than CHIBOR to some extent; Finally, among the three regimes that SHIBOR possesses, SHIBOR exhibits negative feedback characteristics when facing positive shocks from economic policy uncertainty. The longer the term of SHIBOR, the greater its response to economic policy uncertainty shocks, that is, the greater the reduction in interest rates, and the longer the time required for shock attenuation. Therefore, the impact of economic policy uncertainty on SHIBOR with longer terms is relatively greater. In summary, this article suggests that policy makers should try to avoid uncertainty in controllable economic policies, strengthen and stabilize market expectations, reduce the impact of shocks, and implement countercyclical regulation; In times of crisis, after uncontrollable economic policies are introduced, other policy measures should be considered to absorb, hedge, or mitigate the negative effects caused by previous uncontrollable economic policies, but explanations or reminders should be given to the market in advance.

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