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The Time-Varying Impact of Economic Policy Uncertainty on China's Financial Stress: Evidence from a TVP-VAR Model

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Abstract: *This paper examines the time-varying impact of economic policy uncertainty on China's financial stress using monthly data from March 2000 to March 2025. China's Financial Stress Index (FSI) is constructed from six financial market indicators, while the Economic Policy Uncertainty (EPU) index is taken from the China EPU database developed by Baker, Bloom, and Davis. After conducting unit root tests and lag order selection, this paper employs a Time-Varying Parameter Vector Autoregression (TVP-VAR) model to analyze the dynamic relationship between EPU and FSI. The results show that the effect of economic policy uncertainty on China's financial stress is clearly time-varying. During the 2015 stock market turbulence and the later sample period around 2024, EPU exerts a relatively strong positive effect on financial stress, while during the global financial crisis and the initial stage of COVID-19, the response is weaker or even negative. Robustness analysis based on a TVP-VAR(1) specification confirms the main findings. Overall, the results suggest that China's financial system has become more sensitive to policy uncertainty in recent years. This paper provides empirical evidence for understanding the dynamic relationship between policy uncertainty and financial stability, and offers implications for financial risk monitoring and policy coordination.*

Keywords: *Economic Policy Uncertainty; Financial Stress; TVP-VAR; Time-Varying Effect*

1. Introduction

With the increasing instability of the global economic and financial environment, uncertainty has become a defining feature of macroeconomic operations. Recurrent external shocks, including financial turbulence, public health crises, and geopolitical conflicts, have continuously reshaped market expectations and financial conditions. As the world's second-largest economy, China is also facing growing uncertainty during its economic transformation, financial adjustment, and policy coordination process. In this context, economic policy uncertainty (EPU) may influence the financial system through multiple channels such as asset price fluctuations, liquidity changes, and shifts in risk appetite, thereby affecting overall financial stability.

Meanwhile, financial stress serves as an important indicator of instability and vulnerability in the financial system. Compared with single financial variables, the financial stress index (FSI) can more comprehensively reflect tensions in financial markets, risk accumulation, and systemic fragility. In recent years, under the combined influence of external shocks and domestic structural adjustment, China's financial stress has shown more obvious stage-specific and dynamic characteristics. This suggests that the impact of economic policy uncertainty on financial stress may not be constant, but instead vary across different periods and market conditions.

Existing studies have widely examined the macroeconomic and financial effects of EPU, showing that rising uncertainty may suppress investment, intensify market volatility, and increase financial risks. However, there is still limited consensus on how EPU affects financial stress, especially in the case of China. More importantly, traditional fixed-parameter models are often unable to capture the time-varying nature of this relationship. Therefore, it is necessary to adopt a dynamic framework to further examine whether, and how, the impact of EPU on China's financial stress changes over time.

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2. Literature Review

2.1. A Review of the Literature on Economic Policy Uncertainty

Economic policy uncertainty (EPU) refers to the difficulty faced by market participants in forming clear expectations about future economic policies. Baker, Bloom, and Davis (2016) [1] construct the widely used EPU index and show that policy uncertainty is closely related to declines in investment, output, and employment.

In the financial field, existing studies suggest that rising EPU can weaken confidence, increase risk aversion, and intensify financial market volatility. For China, Li, Zhong, and Huang (2020) [2] find that EPU shocks have significant effects on financial conditions, especially during turbulent periods. Related research also shows that uncertainty is dynamically connected with broader measures of financial instability, implying that its impact is not constant over time.(Yang et al.,2024) [3]

Overall, the literature has confirmed that EPU is an important source of macro-financial fluctuations. However, compared with studies on investment, stock markets, or financial conditions, fewer papers directly examine the relationship between EPU and financial stress, particularly in the case of China.

2.2. A Review of the Literature on Financial Stress Determinants

Financial stress generally refers to the tension, fragility, and risk accumulation within the financial system caused by market volatility, liquidity shortages, and credit deterioration. Cardarelli et al.(2011) [4] show that financial stress becomes especially harmful when financial intermediation is disrupted and the banking sector is strongly affected.

The existing literature suggests that financial stress is shaped by both domestic and external factors. Domestic macroeconomic slowdown, asset price adjustments, leverage accumulation, and credit tightening may all intensify financial stress. At the same time, external shocks such as global financial turmoil and cross-border spillovers can also raise financial vulnerability. Balakrishnan et al. (2011) [5] show that financial stress in advanced economies can be rapidly transmitted to emerging markets.

More recent studies increasingly incorporate uncertainty into the analysis of financial stress. Existing evidence indicates that policy uncertainty is closely linked to changes in financial conditions and financial instability.(Apostolakis et al.,2021)[6] For China, this suggests that financial stress may also respond sensitively to changes in economic policy uncertainty.

In sum, financial stress is not determined by a single factor, but by the interaction of domestic vulnerabilities, external shocks, and uncertainty. This provides the basis for examining whether economic policy uncertainty has a time-varying impact on China's financial stress.

3. Empirical Research

3.1. Sample Selection and Data Sources

This paper collects monthly data for China from March 2000 to March 2025 from the DataStream database and the IMF database, including the stock market index, banking sector index, 10-year government bond yield, 3-month government bond yield, risk-free interest rate, and real effective exchange rate index, which are used to construct the Financial Stress Index (FSI). The Economic Policy Uncertainty (EPU) index is obtained from the China EPU index developed by Baker, Bloom, and Davis (2016)[1].

3.2. Construction of the Financial Stress Index

This paper follows the approach of Balakrishnan et al.(2011)[5] and constructs the Financial Stress Index (FSI) using the equal-variance weighting method. This method assumes that different financial market segments contribute similarly to overall financial stress, and therefore assigns equal weights to each component indicator. Compared with statistical weighting methods such as principal component analysis, the equal-variance approach provides better interpretability and comparability across samples.

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Specifically, six indicators are used to capture different dimensions of financial stress: beta, term spread, stock returns, stock return volatility, yield spread, and exchange rate volatility. The index is constructed as follows:

$$FSI_t = beta_t - termspread_t - return_t + returnvol_t + yieldspread_t + exvol_t \quad (1)$$

where t denotes month t.

In terms of economic interpretation, increases in beta, stock return volatility, yield spread, and exchange rate volatility usually indicate rising financial risk and instability, and therefore enter the index positively. Higher term spreads and stock returns generally reflect improved market conditions and therefore enter the index negatively.

When $FSI_t > 0$, the financial system is considered to be under elevated stress, characterized by rising volatility, higher risk premia, and greater sensitivity to uncertainty and external shocks. When $FSI_t < 0$, the financial system is regarded as relatively stable, with lower market volatility, more ample liquidity, and weaker systemic risk accumulation.

3.3. Unit Root Test

To ensure the validity of the time-series analysis, the Augmented Dickey–Fuller (ADF) test is employed to examine the stationarity of the variables. The results are presented in Table 1.

Table 1: Unit Root Test Result

Series	ADF Statistic	p-value	Conclusion
FSI	-2.6858	0.0765	Stationary at 10%
EPU	-0.7389	0.8364	Non-stationary
ΔFSI	-9.4781	0	Stationary
ΔEPU	-6.6715	0	Stationary

The results show that the original FSI series is only weakly stationary at the 10% significance level, but not at the 5% level, while the original EPU series is clearly non-stationary. After taking first differences, both variables become stationary at the 1% significance level. Therefore, the empirical analysis in this paper is based on the first-differenced series, denoted as ΔFSI and ΔEPU.

3.4. Lag Order Selection

Before estimating the TVP-VAR model, a standard VAR model is first used to determine the appropriate lag order. The lag selection results based on AIC, BIC, HQIC, and FPE are reported in Table 2.

Table 2: Lag Order Result

Lag	AIC	BIC	HQIC	FPE
0	7.6685	7.6932	7.6783	2139.7926
1	7.5574	7.6317	7.5871	1914.8734
2	7.5426	7.6667	7.5923	1886.8226
3	7.5343	7.7084	7.604	1871.0973
4	7.5533	7.7777	7.6432	1907.1557

The results indicate that AIC and FPE suggest a lag length of 3, while BIC and HQIC favor a lag length of 1. This difference is common in empirical studies, as AIC tends to prefer richer dynamic structures, whereas BIC usually selects more parsimonious models.

Considering that this study uses monthly data and that the transmission of policy uncertainty to financial stress may involve certain lagged effects, this paper adopts TVP-VAR(3) as the benchmark specification. At the same time, TVP-VAR(1) is used as a robustness check to verify whether the main conclusions remain stable under a more parsimonious lag structure.

3.5. Model Specification

To capture the time-varying relationship between economic policy uncertainty and financial stress, this paper employs a Time-Varying Parameter Vector Autoregression (TVP-VAR) model. Let

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$$y_t = \begin{bmatrix} \Delta FSI_t \\ \Delta EPU_t \end{bmatrix} \tag{2}$$

Then the benchmark TVP-VAR(3) model can be written as:

$$y_t = A_{0,t} + A_{1,t} y_{t-1} + A_{2,t} y_{t-2} + A_{3,t} y_{t-3} + \varepsilon_t \tag{3}$$

where $A_{0,t}$ is the time-varying intercept, $A_{i,t}$ are time-varying coefficient matrices, and ε_t is the disturbance term.

3.6. Main Results

The estimation results show that the effect of economic policy uncertainty on China's financial stress is clearly time-varying. The coefficients in the financial stress equation change considerably over the sample period, suggesting that the transmission mechanism from EPU to FSI is not stable.As shown in Figure 1, the coefficients in the FSI equation fluctuate significantly over time.

The time-varying impulse response results further confirm this pattern. Figure 2 further illustrates the cumulative impulse responses of financial stress to EPU shocks at different time points.During the 2015 stock market turbulence, EPU shocks generate a positive short-run response in financial stress. In the later sample period, especially around 2024, the cumulative response becomes much stronger, indicating that China's financial system has become more sensitive to policy uncertainty in recent years.

By contrast, during the global financial crisis and the initial COVID-19 shock, the responses are weaker or even negative. This suggests that under exceptional external shocks, the role of domestic policy uncertainty may be partly offset or reshaped by other dominant factors.

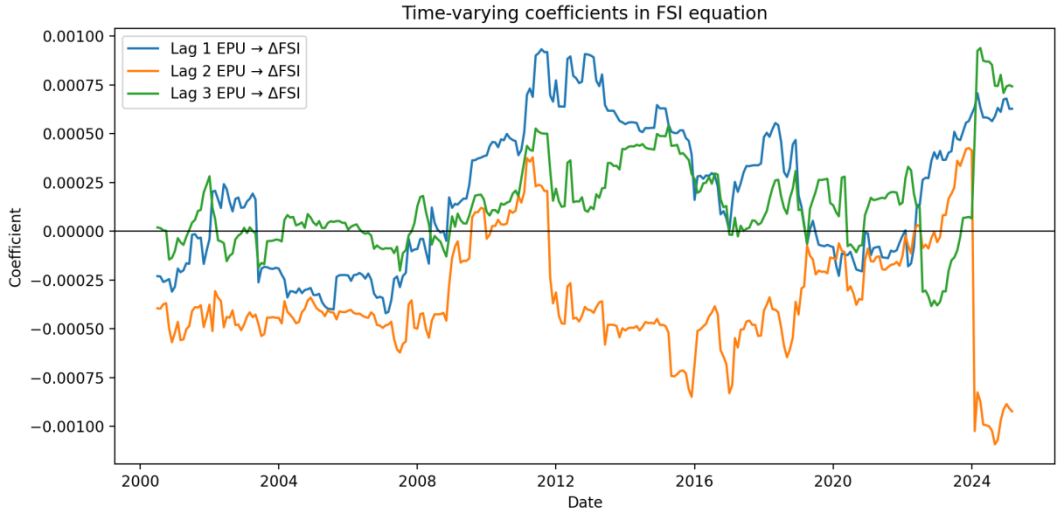

Figure 1: Time-Varying(3) Coefficient Estimates

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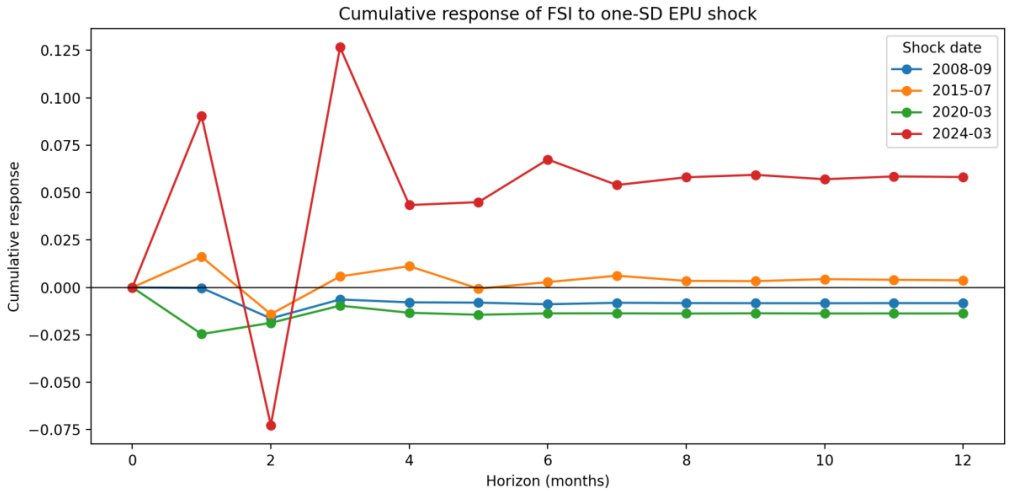

Figure 2: Cumulative Impulse Responses at Time Points

3.7. Robustness Check

To test the robustness of the benchmark results, this paper re-estimates the model using TVP-VAR(1) (Wu et al.,2023)[7]. The results show that the main conclusion remains unchanged. As shown in Figure 3, the TVP-VAR(1) results are broadly consistent with the benchmark specification.The relationship between EPU and FSI still displays strong time variation, and the positive effect of EPU on financial stress in the later sample period remains evident.

Although the exact response path differs in some special periods, the overall finding is robust: economic policy uncertainty has a time-varying impact on China's financial stress, and this effect becomes more pronounced in recent years.

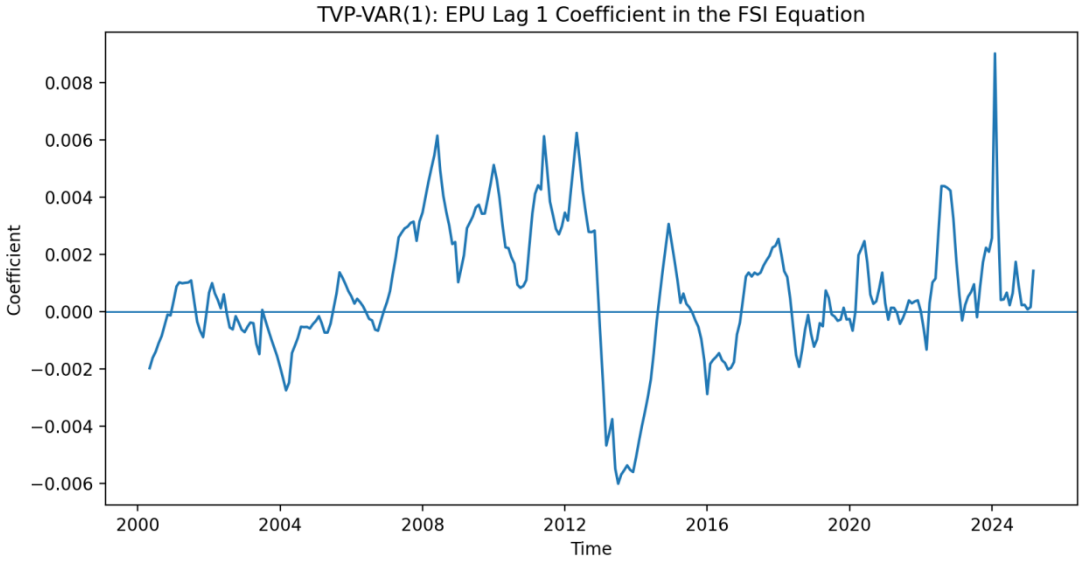

Figure 3: Time-Varying(1) Coefficient Estimates

4. Conclusion and Policy Recommendations

4.1. Research Findings

Using monthly data on China's Economic Policy Uncertainty (EPU) index and Financial Stress Index (FSI) from March 2000 to March 2025, this paper applies a TVP-VAR model to examine the

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time-varying impact of economic policy uncertainty on financial stress. The main findings are as follows.

(1) Economic policy uncertainty has a significant time-varying effect on China's financial stress. The relationship between EPU and FSI is not constant, but changes across different periods.

(2) The impact of EPU on financial stress shows clear heterogeneity across major events. During the 2015 stock market turbulence and the later sample period around 2024, EPU exerts a relatively strong positive effect on financial stress, while during the global financial crisis and the early stage of COVID-19 the response is weaker or even negative.

(3) The cumulative response results suggest that China's financial system has become more sensitive to policy uncertainty in recent years, implying that uncertainty shocks are more likely to be transmitted into financial stress under the current macro-financial environment.

This paper contributes to the literature by examining the EPU–FSI nexus in China from a time-varying perspective and provides empirical evidence for understanding the dynamic link between policy uncertainty and financial stability.

4.2. Policy Recommendations

This study offers several implications for policy and financial regulation. First, policymakers should further improve policy transparency and predictability in order to reduce unnecessary fluctuations in market expectations. Second, financial regulators should incorporate uncertainty indicators into the financial risk monitoring framework and strengthen early-warning mechanisms for financial stress. Third, greater coordination among fiscal, monetary, and regulatory policies is needed to prevent policy inconsistency from amplifying financial fragility. Finally, during periods of heightened uncertainty, macroprudential and countercyclical measures should be used more flexibly to stabilize market confidence and contain risk accumulation.

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