The time-varying correlation between policy uncertainty and stock returns: Evidence from China

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HIGHLIGHTS

- The news-based proxy of economic policy uncertainty (EPU) is investigated.
- The DCC-GARCH model is employed.
- The correlation between EPU and stock return has large fluctuations.
- The correlation drops dramatically during financial crisis and Chinese stock market crash.
- The impact of EPU on Shanghai stock market is greater than that of Shenzhen stock market.

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ABSTRACT

In this paper, we use a new policy uncertainty index to investigate the time-varying correlation between economic policy uncertainty (EPU) and Chinese stock market returns. The correlation is examined in the period from January 1995 to December 2016. We show that absolute changes in EPU have a significant impact on stock market returns. Specifically, empirical results based on the DCC-GARCH model reveal that the correlation between EPU and stock returns has large fluctuations, especially during a financial crisis; in addition, the impact of EPU on the Shanghai stock market is greater than on the Shenzhen stock market. Robustness results reveal that the impact of EPU on state-owned enterprises is larger than on non-state enterprises. All of these results highlight the important role of EPU in the Chinese stock market, and shed light on such issues for future research.

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1. Introduction

Following the 2008 global financial crisis, governments around the world increased their level of intervention to avoid future economic recessions. The economic policy uncertainty (EPU) caused by frequent government intervention has received wide attention from academia [1,2]. A number of empirical studies have focused on examining the effect of policy shocks on financial markets [3,4]. Because the stock market plays an important role in financial markets, empirical evidence also exists for the relationship between policy uncertainty and the stock market [5–8]. In particular, Pastor and Veronesi found that frequently introducing new policies increased the volatility of the stochastic discount factor, which could then lead to a risk premium increase and in turn to higher stock market volatility [5]. Scholars have endeavored to prove this intuitive relationship between EPU and the stock market to investigate it further. Antonakakis et al. proved that a rise in

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EPU increased stock market return uncertainty, and that economic policy uncertainty played a significant role in predicting market realized volatility [6]. Karnizova and Li similarly reached the conclusion that EPU indexes predicted economic recessions [7].

The key issue in investigating the relationship between EPU and stock market returns is to use an appropriate proxy for EPU. Bernanke and Kuttner constructed a dummy variable to measure surprise elements of policy changes (such as monetary policy announcements) to further account for policy uncertainty [9]. Worthington instead used ruling party tenure, minister tenure, and election-related information to measure policy uncertainty [10]. Other studies have constructed composite indexes to proxy for policy changes. For example, Kim et al. constructed the political alignment index (PAI) to quantify national politics [11], and Baker et al. developed an index to measure policy uncertainty by constructing a scaled frequency count of articles about policy-related economic uncertainty in the *South Chinese Morning Post* (*SCMP*), Hong Kong's leading English-language newspaper [12]. In this paper, we use the Baker index because of its comprehensive consideration of political events and balanced quantification of the announcement of these events. For instance, the Baker index reflects more volatility than the Kim et al. index [11] due to its reliance on more representative event resources. A strand of empirical studies has found the Baker index to be a useful proxy for EPU. Brogaard and Detzel used this proxy to study the asset pricing implications of EPU, and concluded that EPU was positively correlated with general market uncertainty proxied by the volatility of market returns [8]. Antonakakis et al. studied dynamic spillovers in the United States and concluded that in the wake of the global financial crisis, spillovers were exceptionally high in historical perspective [13].

Many scholars regard the Chinese stock market as a "policy-driven market", and it is thus necessary to investigate the influence of Chinese EPU on stock market returns. The Chinese stock market is dominated by A shares (mainly for domestic investors), which are thus more representative than B shares (mainly for foreign investors). Therefore, we focus on the returns of A shares in the Shanghai and Shenzhen stock markets. In this paper, we examine the relationship between Chinese policy uncertainty and monthly stock returns in the Chinese A share market. To measure the dynamic relationship, we use the dynamic conditional correlation (DCC) model of Engle [14] to consider time variation in policy uncertainty and Chinese stock market returns. Given the existence of conditional heterogeneity, the DCC model has a great advantage over static models in measuring correlations.

The main contributions of our paper are as follows. First, we use the Baker index and dynamic conditional correlation (DCC) model to examine the relationship. Compared with other studies [7,15], this combination accounts better for policy news announcements and the dynamic changes of correlations. Second, the sample period of our paper is longer than that of Yang and Jiang [16], and includes both the global financial crisis (January 2007~December 2008) and the Chinese stock market crash (January 2015.01~December 2015). Third, the news-based proxy of EPU provides evidence that media information is closely related to the financial markets [17–32].

The remainder of the paper is organized as follows. Section 2 explains the models. Section 3 describes the data. Section 4 exhibits the empirical findings. Section 5 talks about the robustness, and Section 6 concludes the paper.

2. Model setup

To examine the evolution of co-movement between Chinese policy uncertainty and Chinese A share monthly stock returns, we obtain a time-varying measurement of correlation based on Engle's dynamic conditional correlation (DCC) model [14].

Let $y_t = [y_{1t}, y_{2t}]'$ be a $2 \times T$ vector containing the data series. The conditional mean equations are represented by the following reduced-form VAR:

$$A(L) y_t = \varepsilon_t, \ \varepsilon_t \sim N(0, H_t), \ t = 1, \ldots, T \tag{1}$$

where $A(L)$ is a matrix in the lag operator L and $\varepsilon_t = [\varepsilon_{1t}, \varepsilon_{2t}]$ is a vector of innovations. The ε_t vector has the following conditional variance–covariance matrix:

$$H_t = D_t R_t D_t \tag{2}$$

where $D_t = diag\left\{\sqrt{h_{it}}\right\}$ is a 2×2 matrix containing the time-varying standard deviation from univariate GARCH models and $R_t = \left\{\rho_{ij}\right\}_t$ for $i, j = 1, 2$ is a correlation matrix containing conditional correlation coefficients. The standard deviations in D_t are governed by the following univariate GARCH(P, Q) process:

$$h_{it} = \gamma_i + \sum_{p=1}^{P_i} \alpha_{ip} \varepsilon_{it-p}^2 + \sum_{q=1}^{Q_i} \beta_{iq} h_{iq-q}, \quad \forall i = 1, 2 \tag{3}$$

Engle's framework consists of the following DCC(M, N) structure:

$$R_t = Q_t^{*-1} Q_t Q_t^{*-1} \tag{4}$$

where

$$Q_t = \left(1 - \sum_{m=1}^{M} a_m - \sum_{n=1}^{N} b_n\right) \overline{Q} + \sum_{m=1}^{M} a_m \left(\varepsilon_{t-m} \varepsilon_{t-m}\right) + \sum_{n=1}^{N} b_n Q_{t-n} \tag{5}$$