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Economic policy uncertainty and firm-level stock returns: Further evidence from China

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Abstract. This study investigates the effects of Global economic policy uncertainty (EPU) and Chinese EPU on yearly firm-level stock returns of 823 Chinese firms. The data is collected from www.policyuncertainty.com and the Thomson Reuters Eikon database. The findings indicate that increases in Chinese EPU have a negative effect on firm-level stock returns, while Global EPU has a positive

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impact. Interestingly, the negative effect is more pronounced in high-debt capitalized and high-profit firms and less evident in firms with high market-to-book ratios and significant assets. Moreover, while the impact of Global/Chinese EPU on firm-level stock returns exhibited variability during the period 2002–2007, it was found to be strongly significant in the period 2008–2022. Finally, the effect of Global/Chinese EPU on Chinese firm-level stock returns is more significant and consistent in the Shanghai market than in the Shenzhen market, suggesting a difference in diversification capability between these two markets.

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1. INTRODUCTION

In recent years, the macroeconomic effects of economic policy uncertainty (EPU) have attracted considerable attention from theoretical researchers and practitioners (Bach et al., 2021; Canh et al., 2020; Nguyen, 2022). Many empirical studies have investigated the influence of EPU on financial markets (Mbanyele, 2023; Pham & Nguyen, 2022; Xu et al., 2023). Hu et al. (2018) found that shocks in US EPU significantly and negatively affect the dynamics of Chinese A-shares with a lag of one week. However, studies conducted to date have mostly focused on time series analysis between the EPU index and stock market indices (see Phan et al. (2018); Xiong et al. (2018); Ko and Lee (2015)). Meanwhile, variations in firm-level stock returns do not always align with the dynamics of market returns (Fama & French, 1993, 2012, 2015), particularly in emerging markets (Nartea et al., 2017). In this context, this article aims to investigate the influence of Global and Chinese EPU on firm-level stock returns in China. The research framework of this study is based on the Fama-French five-factor model (Fama & French, 2015), with Chinese EPU and Global EPU as additional drivers that explain the dynamics of firm-level stock returns in the Shanghai and Shenzhen markets over the period 2002–2022.

Our findings contribute significantly to the finance literature since they demonstrate the empirical effects of Chinese/Global EPU on firm-level stock returns in China. In particular, it is established that the effects are not homogeneous in the period 2002–2007 (pre-crisis period), yet they are strongly significant in the period 2008–2022 (crisis and post-crisis period). Evidence also suggests the presence of heteroscedasticity in China's two main stock markets, which has implications for investors in China in terms of diversification.

The paper is structured as follows: the next section reviews the literature; the methodology and data are presented in Section 3; the research results are discussed in Section 4; and, finally, Section 5 concludes the article with implications and recommendations.

2. LITERATURE REVIEW

The macroeconomic news is a part of our everyday economic life, and it informs us about the economic situation and uncertainty in the economy, society, and also the environment (Nguyen et al., 2023; Nguyen & Schinckus, 2023; Nguyen et al., 2022d). The financial markets, at the aggregated level, are sensitive to uncertainty simply due to the negative influences of uncertainty on macroeconomic fundamentals, such as output and unemployment (Colombo, 2013; Nguyen & Lee, 2021; Nguyen et al., 2022a; Nguyen et al., 2022b). The effect of uncertainty on macroeconomic factors also influences the prospect of future cash flows across the corporate sector, making stock market investors particularly sensitive agents (Baker & Wurgler, 2007; Nguyen et al., 2022c).

In this line of literature, numerous studies show the influence of a country's EPU on its own stock markets (Su et al., 2019; Yu & Song, 2018). Dakhlaoui and Aloui (2016) find strong evidence of a time-varying correlation between US EPU and stock market volatility in BRIC countries (Brazil, Russia, India, and China). Evidence of the negative effects of EPU on stock returns is also documented in a study by Kang and Ratti (2013). Recently, Guo et al. (2018) show that EPU reduces stock market returns in G7 and BRIC countries (except for France and the UK). In the same vein, Phan et al. (2018) conclude that the ability of EPU to forecast stock returns depends not only on the country but mainly on sectors; Phan et al. used a sample of 16 countries (Australia, Brazil, Canada, China, France, Germany, India, Ireland, Italy, Japan, Korea, Netherlands, Russia, Spain, UK, and the US).

On the Chinese stock markets, Christou et al. (2017) suggest that stock returns were negatively affected by increasing policy uncertainty levels in Australia, Canada, Japan, Korea, the US, and also China over the period January 1998 to December 2014. Hu et al. (2018) find that shocks in US EPU significantly and negatively explain the returns of Chinese A-shares with a lag of one week. Li (2017) observes that Chinese stocks with higher EPU betas earn higher average returns, and an EPU factor-mimicking portfolio earns significant abnormal returns. You et al. (2017) indicate that the effects of oil price shocks and EPU are asymmetric and highly related to China's stock market conditions, from January 1995 to March 2016. In the same vein, Xiong et al. (2018) add that absolute changes in EPU have a significant impact on stock market returns in China over the period January 1995 to December 2016. In light of these studies, our study proposes including the Chinese/Global EPU as an additional factor to explain firm-level stock returns, along with other factors for firm characteristics derived from the Fama-French five-factor model.

China, as the largest emerging market, gets considerable attention in investigations of its asset pricing model (Liu & Gao, 2019; Luo & Schinckus, 2015). Guo et al. (2017) indicate that size, value, and profitability have strong relations with average returns but that the influence of investment is quite weak in China. Lin (2017) confirms this trend, while Huang (2019) shows that the Fama-French five-factor model needs some adjustments to describe the Chinese market meaningfully. Thus, this study aims to integrate the issue of EPU, including both Global EPU and Chinese EPU, into the firm-level stock returns model to characterize the situation in China better. This extension of the model is in line with Das and Kumar (2018), who show that the combined effect of domestic EPU and US EPU is more significant in developed market stock prices, while emerging markets stock prices are more sensitive to domestic EPU. The following section explains in detail our methodology and offers an overview of our data.

3. METHODOLOGY

This article is based on the theoretical framework developed by Fama and French (2015) as the baseline model to explain firm-level stock returns in China. The basic model includes the risk-free rate, market returns, and firm characteristics (size, market-to-book ratio, profitability, and financial leverage) as follows:

$$Return_{it} = \sigma_0 + \beta_1 MR_t + \sum_{k=1}^{4} \alpha_k F_{kt} + \varepsilon_{it} \quad (1)$$

in which i and t refer to stock i in year t; $Return_{it}$ is the difference between the annual returns of a stock and the free-risk rate; MR_t is the difference in market returns and the free-risk rate; and F_{kt} is a vector of firm characteristics including firm size (*Size*), financial leverage (*Lev*), and profitability (*ROA*), and the lag of the

market-to-book ratio (*PB*),[1] derived from the five-factor model. *σ, β* and *a* are the estimated coefficients, while ε is the error term. This study adds annual changes in the Chinese/Global EPU to explain the dynamics of firm-level stock returns. The final version of the equation takes the following form:

$$Return_{it} = \sigma_0 + \beta_1 MR_t + \sum_{k=1}^{4} \alpha_k F_{kt} + \partial_1 EPU_t + \varepsilon'_{it} \quad (2)$$

where *EPU* is annual changes in Chinese/Global EPU. ∂ is the estimated coefficient. The interaction terms between EPU and each factor are then included in equation [2] to form equation [3].

$$Return_{it} = \sigma_0 + \beta_1 MR_t + \sum_{k=1}^{4} \alpha_k F_{kt} + \partial_1 EPU_t + \sum_{k=1}^{4} \theta_k (EPU_t * F_{kt}) + \varepsilon''_{it} \quad (3)$$

All firm characteristics, stock prices, market index, and the free-risk rate are collected from the Thomson Reuters Eikon database and include all listed firms on the Shanghai and Shenzhen markets. The Chinese and Global EPU indexes are collected from www.PolicyUncertainty.com and are provided by Baker et al. (2016). Our first data sample comprises 3680 firms. After dropping firms with incomplete information or outlying data (such as a negative equity value), our final sample has 823 firms with strong, balanced panel data for the period 2002–2022. This sample has 501 firms from the Shanghai market and 322 from the Shenzhen market. *Table 1* presents variables, definitions, calculations, sources, and data descriptions.

Table 1

Data definitions, calculations, and sources

Variable		Definitions	Calculations	Sources	Obs	Mean	S.D.	Min	Max
Dependent variables	Return	Stock returns	=[Log(Pt/Pt-1)]*100 - Rf P is the year-end price of stock, and Rf is the 1-year government bond bid yield (%)	Thomson Reuters Eikon database	16,460	1.041	52.057	-241.648	236.662
Control variables	MR	Market return	=[Log(It/It-1)]*100 – Rf I is the year-end market index (including Shanghai Composite Index and Shenzhen Composite Index), and Rf is the 1-year government bond bid yield (%)	Thomson Reuters Eikon database	16,460	3.092	40.934	-107.205	92.876
	PB	Market value / Book value	=Pt*Qt/Et P is the year-end price of stock, Q is the total common shares outstanding, and E is the total equity	Thomson Reuters Eikon database	17,283	3.493	5.393	-39.051	302.423
	Size	Firm size	=Log(At) A is total assets	Thomson Reuters Eikon database	17,283	22.334	1.426	18.541	28.299
	ROA	Return on Assets	=(NIt/At)*100 NI is the income after tax, A is total assets	Thomson Reuters Eikon database	17,283	3.021	6.806	-207.098	52.985
	Lev	Financial leverage	=(Lt/At)*100 L is the total liabilities, A is the total assets	Thomson Reuters Eikon database	17,283	53.548	19.470	0.708	235.455
Explanatory variables:	CEPU	Chinese Economic Policy	Percentage change in the value in December of the Chinese EPU Index for each year	Baker, Bloom and Davis (2016)	16,460	0.105	0.671	-1.134	1.451

[1] Because the market-to-book ratio includes the stock price in the calculation, we took a 1-year lag in our estimation to avoid all risk of endogeneity, as proposed by Huang, R., & Ritter, J. R. (2009). Testing theories of capital structure and estimating the speed of adjustment. *Journal of Financial and Quantitative analysis*, *44*(2), 237-271. and Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of financial economics*, *105*(3), 581-606.. This methodological solution is quite common in the literature dealing with such an issue.

Chinese EPU		Uncertainty							
	CEPUm	Yearly average of CEPU	Percentage change in Average of 12 months in a year of EPU Index	Author's calculated base of GEPU1	16,460	0.088	0.392	-0.764	0.778
Explanatory variables: Global EPU	GEPU1	Global Economic Policy Uncertainty 1	Percentage change in the value in December of the Global EPU Index (based on current-price GDP measures) for each year	Baker, Bloom and Davis (2016)	16,460	0.039	0.329	-0.517	0.668
	GEPU2	Global Economic Policy Uncertainty 2	Percentage change in the value in December of the Global EPU Index (based on PPP-adjusted GDP) for each year	Baker, Bloom and Davis (2016)	16,460	0.044	0.329	-0.482	0.679
	GEPU1m	Yearly average of GEPU 1	Percentage change in Average of 12 months in a year of EPU Index (based on current-price GDP measures)	Author's calculated base of GEPU1	16,460	0.050	0.225	-0.394	0.553
	GEPU2m	Yearly average of GEPU 2	Percentage change in Average of 12 months in a year of EPU Index (based on PPP-adjusted GDP)	Author's calculated base of GEPU2	16,460	0.053	0.226	-0.393	0.581

Note: the data on EPU is collected from www.PolicyUncertainty.com

Econometrically speaking, the cross-sectional dependence of each variable is estimated through Pesaran's CD test (Pesaran, 2021). Our results indicate that all variables have a cross-sectional dependence in the full sample and all sub-samples. The Im-Pesaran-Shin unit root test (Im et al., 2003) and Fisher unit root test based on the Phillips-Perron type (Inverse chi-squared P) unit root test (Choi, 2001) are applied to examine the stationarity of all variables. The results confirm the stationarity of all the variables (see *Table A1*, Appendix, for the results of CD and stationarity tests). In the context of panel models, the covariance matrix encompasses many parameters. The feasible generalized least squares (FGLS) estimation uses a high-dimensional error covariance matrix estimator to address problems of serial correlation and cross-sectional dependence. Thus, we recruit FGLS estimation as the primary econometric technique (Bai et al., 2021; Hansen, 2007).

4. EMPIRICAL RESULTS AND DISCUSSION

This section is divided into three sub-sections: the first deals with the global sample, the second discusses our results pre- and post-financial crisis, and the third presents our results for the Shanghai and Shenzhen markets.

4.1. Influences of Global and Chinese EPU on Chinese companies

The estimates for the full sample are presented in *Tables 2* and *3*.

Table 2 reports the influence of Chinese EPU on stock returns, controlling for firm characteristics. Regarding control variables, the significant positive effects of market return (over the free-risk rate) on firm-level stock returns (over the free-risk rate) mean that stocks in China have a positive market beta and are almost market-cyclical stocks on average. This is because the Chinese stock market is an emerging market, so its stocks are mainly growth stocks. Our results are consistent with many previous studies (*e.g.*, Belimam et al. (2018) and Zada et al. (2018)). Firm size (proxied through the logarithm of total assets) has a negative effect on firm-level stock returns, implying that larger firms have lower expected returns. This result is consistent with financial theory and expectations of the Fama-French model (Belimam et al. (2018). The significant positive effect of return on assets (ROA) on stock returns means that firms with greater

profitability have higher returns. This result is significant and consistent with the theory and empirical literature on the topic. The result implies that investors in emerging markets focus on firm profitability as the major driver of their investment decisions. This implication is supported by the positive effect of financial leverage on stock returns since firm profitability for equity investors is captured through return on equity (ROE), which refers to their profits from the stock. Higher financial leverage is expected to boost ROE and then increase the expected returns. In addition, the lagged one-year price-to-book ratio (PB) has a significant negative coefficient, indicating that an overpriced stock would have a negative return. However, this result also implies risky behavior in investors' investment decisions in emerging markets since they focus too much on profitability and may ignore the risk from high financial leverage.[2]

Table 2

Chinese EPU and firm stock returns - full sample (FGLS estimations)

Dep. Var: **Return**	Chinese EPU and firm stock returns			
Explanatory var:	CEPU		CEPUm	
MR	0.940*** [0.007]	0.942*** [0.007]	0.940*** [0.007]	0.941*** [0.007]
Size	-1.008*** [0.210]	-0.986*** [0.212]	-0.916*** [0.212]	-0.929*** [0.216]
Lev	0.131*** [0.016]	0.141*** [0.016]	0.128*** [0.016]	0.139*** [0.016]
ROA	1.007*** [0.041]	1.019*** [0.041]	0.998*** [0.041]	1.084*** [0.043]
L1.PB	-0.385*** [0.053]	-0.468*** [0.059]	-0.378*** [0.053]	-0.399*** [0.056]
Chinese EPU	-1.246*** [0.438]	8.602 [7.086]	-3.106*** [0.709]	4.780 [12.110]
Chinese EPU*Size		-0.284 [0.333]		-0.064 [0.572]
Chinese EPU*Lev		-0.076*** [0.024]		-0.091** [0.040]
Chinese EPU*ROA		-0.120* [0.072]		-0.687*** [0.109]
Chinese EPU*L1.PB		0.289*** [0.094]		0.168 [0.149]
Constant	12.055*** [4.432]	11.150** [4.474]	10.283** [4.454]	9.753** [4.542]
N	16,460	16,460	16,460	16,460
Firms	823	823	823	823

Note: The standard errors are presented in []. *, **, *** are significant at 10%, 5%, 1%, respectively.
Source: own calculation

Now, we turn to the impact of EPU on stock returns. We use both kinds of Chinese EPU (the value of Chinese EPU in December and the yearly mean of Chinese EPU) in estimations, and all results are consistent. The model integrating interaction terms between Chinese EPU and firm characteristics is consistent with previous results. This means that our results are strongly consistent and unbiased. Chinese EPU has a significant negative effect on firm-level stock returns in China. This observation is consistent and provides new evidence of the influence of EPU on the stock returns of Chinese companies. Notably, the interaction terms between Chinese EPU and firm characteristics provide interesting findings. First, the significant negative relationship with firm financial leverage (and ROA) means that the negative influence of Chinese EPU on stock returns is stronger for firms with high financial leverage. The significant positive relationship between the market-to-book value and stock returns means that the negative effect of Chinese

[2] See Chiah, M., Chai, D., Zhong, A., & Li, S. (2016). A Better Model? An empirical investigation of the Fama–French five-factor model in Australia. *International Review of Finance*, *16*(4), 595-638. or Zada, H., Rehman, M. U., & Khwaja, M. G. (2018). Application of Fama and French Five Factor Model of Asset Pricing: Evidence From Pakistan Stock Market. *International Journal of Economics, Management and Accounting*, *26*(1), 1-23. for further information on this issue.

EPU on stock returns is less prominent for firms with a high market-to-book ratio. However, this result may not be robust since this relationship is not statistically significant for the link with the yearly mean EPU. This result may imply that a continuous increase in Chinese EPU (higher yearly mean of Chinese EPU) has a stronger negative effect on the stock returns of firms with higher market-to-book ratios, whereas a short-term increase (of Chinese EPU in December) would have a less prominent effect on the stock returns of firms with a high market-to-book ratio. This observation could be understood as follows: stocks with a high market-to-book value would have a higher risk than normal stocks, explaining why a continuous increase in the EPU (in a year) would induce a stronger negative effect on these stocks and, therefore, the negative effects of the EPU would then be more prominent.

In summary, an increase in Chinese EPU has a significant negative effect on firm-level stock returns in China, but this negative influence is more prominent for high profitability and highly debt-capitalized firms while it is less prominent for large firms. These findings confirm our argument that investors in China (or other emerging markets) mainly focus on firm profitability in their investment decisions even though these firms face higher risk at times of high EPU. As a result, investors withdraw their investments from firms with high financial leverage and firms with a greater prospect of profitability. Instead, investors invest in large firms as a safer place in times of uncertainty.

The next step is to replace Chinese EPU with Global EPU to investigate the effects of international EPU on firm-level stock returns in China. The results are shown in *Table 3*.

Table 3

Global EPU and Chinese firm-level stock returns - full sample (FGLS estimations)

Dep. Var: **Return**	Global EPU and firm stock returns (full market)							
Explanatory var:	GEPU1		GEPU1m		GEPU2		GEPU2m	
MR	0.967*** [0.007]	0.964*** [0.007]	0.955*** [0.007]	0.959*** [0.007]	0.969*** [0.007]	0.967*** [0.007]	0.950*** [0.007]	0.954*** [0.007]
Size	-1.175*** [0.210]	-0.873*** [0.210]	-1.087*** [0.211]	-0.784*** [0.215]	-1.156*** [0.210]	-0.828*** [0.211]	-1.036*** [0.211]	-0.768*** [0.216]
Lev	0.134*** [0.016]	0.129*** [0.016]	0.134*** [0.016]	0.136*** [0.016]	0.134*** [0.016]	0.130*** [0.016]	0.132*** [0.016]	0.135*** [0.016]
ROA	1.004*** [0.041]	0.978*** [0.041]	1.011*** [0.041]	1.022*** [0.043]	1.004*** [0.041]	0.982*** [0.042]	1.007*** [0.041]	1.029*** [0.043]
L1.PB	-0.433*** [0.053]	-0.454*** [0.055]	-0.410*** [0.053]	-0.420*** [0.056]	-0.431*** [0.053]	-0.456*** [0.056]	-0.399*** [0.053]	-0.404*** [0.056]
Global EPU	7.544*** [0.837]	200.471*** [13.567]	2.902** [1.259]	158.601*** [19.720]	7.154*** [0.847]	191.700*** [13.657]	0.366 [1.271]	135.179*** [19.865]
Global EPU*Size		-9.099*** [0.647]		-6.940*** [0.929]		-8.634*** [0.651]		-5.927*** [0.935]
Global EPU*Lev		0.161*** [0.048]		0.029 [0.069]		0.130*** [0.048]		0.003 [0.069]
Global EPU*ROA		0.443*** [0.148]		-0.134 [0.167]		0.340** [0.150]		-0.247 [0.165]
Global EPU*L1.PB		0.041 [0.133]		-0.184 [0.227]		0.070 [0.137]		-0.204 [0.226]
Constant	15.318*** [4.433]	9.274** [4.430]	13.432*** [4.454]	6.723 [4.524]	14.869*** [4.432]	8.197* [4.439]	12.501*** [4.453]	6.416 [4.536]
N	16,460	16,460	16,460	16,460	16,460	16,460	16,460	16,460
Firms	823	823	823	823	823	823	823	823

Note: The standard errors are presented in []. *, **, *** are significant at 10%, 5%, 1%, respectively.
Source: own calculation

Interestingly, most of the results are consistent with our findings in *Table 3* (for Chinese EPU), but the coefficient of global EPU and its interaction terms with firm size and firm market-to-book ratio show different results. In other words, the effects of Global EPU on Chinese firm stock returns are significantly positive, meaning that an increase in Global EPU increases the profit of Chinese-listed firms. The empirical findings indicate that Global EPU has a favorable and significant influence on the profitability of Chinese-listed firms, implying that an increase in Global EPU will increase the profitability of Chinese firms. This observation is actually in opposition to Cheng (2017), Yu et al. (2018), and Balcilar et al. (2019). Looking at the interaction terms between Global EPU and firm size, leverage, and profitability variables, it can be seen

that firms with leverage and high profitability benefit, while an increase in Global EPU would hurt firms of large size.

4.2. Pre- and Post-Global Financial Crisis

To examine the asymmetric effects of EPU on firm-level stock returns in different uncertainty conditions, our sample is divided into two sub-samples for the time windows 2002–2007 and 2008–2022. *Tables 4* and *5* report the results when we add Chinese EPU and Global EPU and their interaction terms with firm characteristics into our baseline model for the two sub-periods.

Table 4

EPU and firm stock returns 2002-2007 (FGLS estimations)

Dep. Var: Return	Part A: EPU and firm stock returns			
Explanatory var:	CEPU		CEPUm	
MR	0.838*** [0.017]	0.829*** [0.017]	0.240*** [0.064]	0.240*** [0.064]
Size	4.488*** [0.610]	3.726*** [0.617]	4.286*** [0.607]	4.599*** [0.649]
Lev	0.162*** [0.035]	0.167*** [0.035]	0.151*** [0.035]	0.175*** [0.039]
ROA	1.820*** [0.115]	1.855*** [0.115]	1.875*** [0.114]	1.902*** [0.126]
L1.PB	-0.111 [0.082]	-0.259*** [0.100]	-0.084 [0.081]	-0.059 [0.082]
Chinese EPU	23.569*** [2.540]	-270.927*** [42.950]	184.619*** [16.469]	-61.404 [76.034]
Chinese EPU*Size		13.375*** [2.078]		10.770*** [3.575]
Chinese EPU*Lev		0.101 [0.118]		0.140 [0.208]
Chinese EPU*ROA		0.102 [0.379]		0.028 [0.670]
Chinese EPU*L1.PB		0.784** [0.350]		2.232*** [0.531]
Constant	-115.891*** [12.545]	-99.574*** [12.714]	-80.957*** [12.852]	-89.397*** [13.676]
N	4,115	4,115	4,115	4,115
Firms	823	823	823	823

Dep. Var: Return	Part B: Global EPU and firm stock returns							
Explanatory var:	GEPU1		GEPU1m		GEPU2		GEPU2m	
MR	0.694*** [0.014]	0.694*** [0.014]	0.767*** [0.020]	0.758*** [0.020]	0.716*** [0.014]	0.716*** [0.014]	0.699*** [0.023]	0.692*** [0.023]
Size	3.061*** [0.551]	2.890*** [0.553]	4.293*** [0.607]	6.225*** [0.669]	3.069*** [0.552]	2.943*** [0.553]	4.276*** [0.604]	6.285*** [0.686]
Lev	0.095*** [0.031]	0.122*** [0.032]	0.169*** [0.035]	0.216*** [0.040]	0.095*** [0.031]	0.118*** [0.032]	0.173*** [0.035]	0.225*** [0.042]
ROA	1.717*** [0.104]	1.723*** [0.103]	1.861*** [0.114]	1.925*** [0.129]	1.717*** [0.104]	1.726*** [0.103]	1.858*** [0.114]	1.916*** [0.133]
L1.PB	-0.026 [0.073]	0.013 [0.075]	-0.135* [0.081]	-0.182** [0.081]	-0.026 [0.074]	0.015 [0.075]	-0.147* [0.081]	-0.177** [0.080]
Global EPU	60.292*** [1.859]	152.854*** [33.549]	75.464*** [6.682]	-713.150*** [93.452]	62.409*** [1.931]	166.127*** [35.748]	116.169*** [9.152]	-752.507*** [111.651]
Global EPU*Size		-5.371*** [1.635]		35.229*** [4.533]		-5.960*** [1.742]		38.656*** [5.407]
Global EPU*Lev		0.477*** [0.098]		0.527** [0.266]		0.507*** [0.104]		0.607* [0.319]
Global EPU*ROA		-0.400 [0.313]		0.395 [0.840]		-0.413 [0.334]		0.295 [1.003]
Global EPU*L1.PB		-0.020 [0.164]		1.330* [0.711]		-0.029 [0.175]		1.899** [0.832]
Constant	-74.909*** [11.379]	-72.670*** [11.391]	-104.250*** [12.520]	-148.503*** [13.711]	-76.134*** [11.384]	-74.676*** [11.398]	-99.754*** [12.493]	-146.107*** [14.073]
N	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115
Firms	823	823	823	823	823	823	823	823

Note: the standard errors are presented in []. *, **, *** are significant at 10%, 5%, 1%, respectively.
Source: own calculation

Table 4 shows the results for the period 2002 to 2007. First, the insignificant coefficients for some variables mean that the effects of EPU on firm-level stock returns do not have strong significance. This observation is in line with Arouri et al. (2016), Dakhlaoui and Aloui (2016), and Xiong et al. (2018) who found that the influence of EPU on firm-level stock returns is much stronger in periods of high instability. Second, the effect of Chinese EPU on firm profitability is significantly positive. However, when incorporating interaction terms, the sign of Chinese EPU changes, implying that the effect of Chinese EPU is mixed for this period. Furthermore, the interaction between Chinese EPU and firm size (and price-to-book ratio) has a positive effect on the asset returns, implying that in a period of low economic instability, an increase in Chinese EPU would benefit the firm-level stock returns of large or high market-to-book firms. This observation also implies that the effect of Chinese EPU on firm-level stock returns is diluted through profitability since investors may invest in large firms or high market-to-book firms as a safety action. Further, the effect of Global EPU on firm-level stock returns is significantly positive in almost all cases, suggesting a diverse effect on Chinese stocks when Global EPU is volatile.

Table 5

EPU and firm-level stock returns: 2008-2022 period (FGLS estimations)

Dep. Var: Return	Part A: Chinese EPU and firm stock returns			
Explanatory var:	CEPU		CEPUm	
MR	0.963*** [0.010]	0.961*** [0.010]	0.948*** [0.009]	0.939*** [0.009]
Size	-4.419*** [0.245]	-4.443*** [0.246]	-4.340*** [0.244]	-4.802*** [0.255]
Lev	0.204*** [0.017]	0.217*** [0.017]	0.198*** [0.017]	0.220*** [0.018]
ROA	0.973*** [0.043]	0.986*** [0.043]	0.956*** [0.042]	1.043*** [0.046]
L1.PB	-0.927*** [0.071]	-1.058*** [0.079]	-0.905*** [0.071]	-1.003*** [0.081]
Chinese EPU	-1.254** [0.502]	-2.164 [7.245]	-5.933*** [0.757]	-76.175*** [12.490]
Chinese EPU*Size		0.223 [0.337]		3.476*** [0.586]
Chinese EPU*Lev		-0.097*** [0.023]		-0.155*** [0.040]
Chinese EPU*ROA		-0.097 [0.069]		-0.560*** [0.108]
Chinese EPU*L1.PB		0.354*** [0.095]		0.473*** [0.159]
Constant	89.994*** [5.221]	90.002*** [5.257]	89.090*** [5.197]	98.215*** [5.437]
N	12,345	12,345	12,345	12,345
Firms	823	823	823	823

Dep. Var: Return	Part A: Global EPU and firm stock returns (2008-2022)							
Explanatory var:	GEPU1		GEPU1m		GEPU2		GEPU2m	
MR	0.937*** [0.010]	0.933*** [0.010]	0.958*** [0.009]	0.960*** [0.010]	0.938*** [0.010]	0.934*** [0.010]	0.948*** [0.009]	0.946*** [0.010]
Size	-4.350*** [0.244]	-4.425*** [0.247]	-4.453*** [0.243]	-4.496*** [0.262]	-4.350*** [0.244]	-4.420*** [0.247]	-4.440*** [0.243]	-4.630*** [0.261]
Lev	0.200*** [0.017]	0.212*** [0.017]	0.204*** [0.017]	0.222*** [0.018]	0.200*** [0.017]	0.213*** [0.017]	0.202*** [0.017]	0.223*** [0.018]
ROA	0.966*** [0.042]	0.948*** [0.043]	0.967*** [0.043]	0.983*** [0.046]	0.966*** [0.042]	0.953*** [0.044]	0.963*** [0.042]	0.992*** [0.046]
L1.PB	-0.904*** [0.071]	-1.041*** [0.078]	-0.923*** [0.071]	-1.027*** [0.079]	-0.904*** [0.071]	-1.050*** [0.078]	-0.917*** [0.071]	-1.013*** [0.079]
Global EPU	-8.131*** [1.109]	-31.178* [16.975]	-6.357*** [1.453]	-7.142 [22.496]	-7.526*** [1.104]	-28.563* [16.518]	-8.691*** [1.440]	-44.331** [21.981]
Global EPU*Size		1.236 [0.789]		0.413 [1.048]		1.179 [0.768]		2.002* [1.024]
Global EPU*Lev		-0.175*** [0.054]		-0.195*** [0.073]		-0.183*** [0.052]		-0.216*** [0.072]
Global EPU*ROA		0.310* [0.162]		-0.156 [0.170]		0.200 [0.161]		-0.274* [0.166]
Global EPU*L1.PB		0.821*** [0.210]		0.692*** [0.240]		0.850*** [0.206]		0.663*** [0.237]

Constant	89.994***	90.002***	89.090***	98.215***	88.861***	90.269***	91.172***	91.351***
	[5.221]	[5.257]	[5.197]	[5.437]	[5.201]	[5.274]	[5.199]	[5.579]
N	12,345	12,345	12,345	12,345	12,345	12,345	12,345	12,345
Firms	823	823	823	823	823	823	823	823

Note: the standard errors are presented in []. *, **, *** are significant at 10%, 5%, 1%, respectively.
Source: own calculation

The results for 2008–2022 in *Table 5* are in line with those for the full period (2002–2022). Market return has a positive effect, firm size and market-to-book ratio have a negative effect, while financial leverage and ROA also have a positive effect, implying that the determinants of firm-level stock returns as identified by the Fama-French five-factor model had more effect in the period 2008–2012 (in comparison to the previous period). This observation implies that Chinese stock markets have been more efficient recently, especially after the 2008 global financial crisis.

The analysis of the effect of Chinese EPU and Global EPU and the interaction terms with firm characteristics on firm-level stock returns are consistent with the full periods. The Chinese/Global EPU have a negative effect on stock returns – their interactions with financial leverage and ROA are negative, while the interaction with firm size and market-to-book ratios are positive. These findings confirm our previous results, which show that the negative effect of EPU on firm-level stock returns is less important for large/high market-to-book firms and stronger for high debt-capitalized/high profitability firms. This finding also confirms that investment activities in Chinese stock markets favor firm profitability and the effects of EPU on firm-level stock returns. These results, in combination with the results for the period 2002–2007, suggest that the effects of Chinese/Global EPU on firm-level stock returns are more significant between 2008 and 2022 (or the period of high instability of the economy). This observation suggests that the increased integration of the Chinese stock market into the global economy has resulted in a higher inflow of foreign capital. In this context, the rise of China has also brought about foreign uncertainty factors, such as Global EPU, which the government and investors in the Chinese stock market need to consider, increasing their levels of alertness in a period of high Global EPU (Bai et al., 2021).

4.3. Shanghai market and Shenzhen market

Another step in our work is to study the differences between the Shanghai and the Shenzhen markets regarding the effects of Chinese/Global EPU on firm-level stock returns. This analysis clarifies the diversifying features of these national markets. The major results of our analysis are reported in the tables below.

Table 6

EPU and firm-level stock returns in the Shanghai market (FGLS estimations)

Dep. Var: **Return**	**Part A:** Chinese EPU and firm stock returns			
Explanatory var:	CEPU		CEPUm	
MR	0.929*** [0.010]	0.931*** [0.010]	0.926*** [0.009]	0.929*** [0.009]
Size	-0.951*** [0.275]	-0.920*** [0.277]	-0.740*** [0.276]	-0.712** [0.281]
Lev	0.142*** [0.021]	0.152*** [0.021]	0.135*** [0.021]	0.156*** [0.021]
ROA	1.148*** [0.060]	1.171*** [0.061]	1.123*** [0.060]	1.315*** [0.065]
L1.PB	-0.270*** [0.063]	-0.350*** [0.071]	-0.251*** [0.063]	-0.283*** [0.065]
Chinese EPU	-2.042*** [0.574]	7.758 [9.423]	-6.642*** [0.922]	18.538 [15.836]
Chinese EPU*Size		-0.244 [0.443]		-0.636 [0.752]
Chinese EPU*Lev		-0.090*** [0.031]		-0.146*** [0.054]

Chinese EPU*ROA			-0.196** [0.096]				-1.185*** [0.163]	
Chinese EPU*L1.PB			0.337** [0.138]				0.268 [0.192]	
Constant		10.957* [5.769]		9.798* [5.824]		6.988 [5.789]		4.605 [5.889]
N		10,020		10,020		10,020		10,020
Firms		501		501		501		501
Dep. Var: **Return**	**Part B:** Global EPU and firm stock returns Shanghai market							
Explanatory var:	GEPU1		GEPU1m		GEPU2		GEPU2m	
MR	0.971*** [0.009]	0.971*** [0.009]	0.960*** [0.010]	0.967*** [0.010]	0.972*** [0.009]	0.975*** [0.009]	0.950*** [0.010]	0.957*** [0.010]
Size	-1.143*** [0.275]	-0.780*** [0.273]	-1.097*** [0.276]	-0.737*** [0.280]	-1.118*** [0.275]	-0.717*** [0.274]	-1.011*** [0.277]	-0.685** [0.281]
Lev	0.144*** [0.021]	0.137*** [0.021]	0.147*** [0.021]	0.156*** [0.021]	0.143*** [0.021]	0.137*** [0.021]	0.144*** [0.021]	0.156*** [0.021]
ROA	1.145*** [0.060]	1.126*** [0.061]	1.160*** [0.060]	1.269*** [0.066]	1.145*** [0.060]	1.133*** [0.061]	1.151*** [0.060]	1.277*** [0.066]
L1.PB	-0.316*** [0.063]	-0.328*** [0.064]	-0.304*** [0.063]	-0.327*** [0.065]	-0.314*** [0.063]	-0.330*** [0.065]	-0.290*** [0.063]	-0.311*** [0.065]
Global EPU	9.520*** [1.106]	255.967*** [17.584]	6.408*** [1.677]	216.817*** [25.756]	8.979*** [1.120]	246.341*** [17.734]	1.893 [1.690]	188.787*** [25.984]
Global EPU*Size		-11.658*** [0.843]		-9.197*** [1.221]		-11.135*** [0.849]		-8.027*** [1.230]
Global EPU*Lev		0.248*** [0.064]		0.005 [0.092]		0.207*** [0.064]		-0.038 [0.092]
Global EPU*ROA		0.311 [0.201]		-0.880*** [0.265]		0.206 [0.203]		-1.011*** [0.261]
Global EPU*L1.PB		0.058 [0.155]		-0.112 [0.282]		0.081 [0.162]		-0.108 [0.280]
Constant	14.675** [5.764]	7.397 [5.734]	13.465** [5.795]	4.823 [5.869]	14.106** [5.764]	5.883 [5.748]	11.926** [5.797]	3.768 [5.889]
N	10,020	10,020	10,020	10,020	10,020	10,020	10,020	10,020
Firms	501	501	501	501	501	501	501	501

Note: the standard errors are presented in []. *, **, *** are significant at 10%, 5%, 1%, respectively.
Source: own calculation

Table 6 presents the results for the Shanghai market. The positive effects of market returns mean that the Shanghai market has a positive market beta, indicating that it is quite a sensitive market. The negative effect of firm size and the market-to-book ratio are consistent with financial theory and expectations from the Fama-French model. Meanwhile, the positive effect of ROA and financial leverage indicates that investors in the Shanghai market favor profitability, as is evident in the full sample. Second, while Chinese EPU has a negative effect on firm-level stock returns, Global EPU has a positive effect, implying that Chinese stock markets are favorable from the perspective of foreign investors and may have a diversity effect as global volatility increases.

In addition, the interaction terms between Chinese EPU and firm leverage and profitability have a negative effect, implying that the *negative* effect of Chinese EPU on firm-level stock returns in the Shanghai market is less important for firms with low leverage and low profitability. This effect occurs because, during a period of high Chinese EPU, firms with high leverage and high profitability are often sold for cash, making their stock a less safe investment. Further, the interaction term between Global EPU and firm size has a significantly negative effect on firm returns, indicating that larger firms tend to experience lower returns during periods of high Global EPU.

Table 7

EPU and firm-level stock returns in the Shenzhen market (FGLS estimations)

Dep. Var: **Return**	**Part A:** Chinese EPU and firm stock returns			
Explanatory var:	CEPU		CEPUm	
MR	0.958*** [0.010]	0.958*** [0.010]	0.965*** [0.010]	0.965*** [0.010]
Size	-1.480*** [0.326]	-1.505*** [0.329]	-1.603*** [0.328]	-1.773*** [0.337]
Lev	0.127*** [0.023]	0.139*** [0.024]	0.131*** [0.023]	0.137*** [0.024]
ROA	0.873*** [0.055]	0.882*** [0.056]	0.879*** [0.055]	0.910*** [0.057]
L1.PB	-0.743*** [0.101]	-0.879*** [0.111]	-0.772*** [0.101]	-0.858*** [0.115]
Chinese EPU	0.327 [0.671]	7.767 [10.688]	3.247*** [1.096]	-33.066* [18.615]
Chinese EPU*Size		-0.218 [0.501]		1.715** [0.875]
Chinese EPU*Lev		-0.067* [0.035]		-0.053 [0.060]
Chinese EPU*ROA		-0.059 [0.107]		-0.302** [0.145]
Chinese EPU*L1.PB		0.334*** [0.126]		0.448* [0.245]
Constant	21.843*** [6.932]	22.048*** [6.997]	24.172*** [6.970]	27.669*** [7.138]
N Firms	6,440 322	6,440 322	6,440 322	6,440 322

Dep. Var: **Return**	**Part B**: Global EPU and firm stock returns in the Shenzhen market							
Explanatory var:	GEPU1		GEPU1m		GEPU2		GEPU2m	
MR	0.966*** [0.010]	0.961*** [0.010]	0.954*** [0.010]	0.958*** [0.010]	0.967*** [0.010]	0.964*** [0.010]	0.955*** [0.010]	0.958*** [0.010]
Size	-1.597*** [0.326]	-1.422*** [0.329]	-1.445*** [0.328]	-1.313*** [0.335]	-1.586*** [0.326]	-1.408*** [0.329]	-1.454*** [0.328]	-1.361*** [0.336]
Lev	0.130*** [0.023]	0.130*** [0.023]	0.126*** [0.023]	0.128*** [0.024]	0.129*** [0.023]	0.131*** [0.023]	0.127*** [0.023]	0.128*** [0.024]
ROA	0.871*** [0.055]	0.852*** [0.056]	0.872*** [0.055]	0.856*** [0.057]	0.872*** [0.055]	0.853*** [0.056]	0.872*** [0.055]	0.861*** [0.057]
L1.PB	-0.783*** [0.101]	-0.841*** [0.109]	-0.728*** [0.102]	-0.817*** [0.118]	-0.782*** [0.101]	-0.849*** [0.110]	-0.732*** [0.101]	-0.805*** [0.117]
Global EPU	5.150*** [1.272]	117.686*** [21.350]	-1.100 [1.897]	62.448** [30.512]	5.024*** [1.285]	110.073*** [21.387]	-0.751 [1.919]	41.115 [30.722]
Global EPU*Size		-5.229*** [1.009]		-2.936** [1.427]		-4.844*** [1.011]		-1.938 [1.435]
Global EPU*Lev		0.027 [0.071]		0.006 [0.103]		0.009 [0.071]		-0.001 [0.103]
Global EPU*ROA		0.544** [0.217]		0.205 [0.211]		0.444** [0.220]		0.139 [0.210]
Global EPU*L1.PB		0.141 [0.264]		0.422 [0.400]		0.204 [0.262]		0.376 [0.402]
Constant	24.274*** [6.945]	20.765*** [6.989]	21.179*** [6.979]	18.466*** [7.119]	24.010*** [6.942]	20.371*** [6.998]	21.361*** [6.974]	19.455*** [7.133]
N Firms	6,440 322	6,440 322	6,440 322	6,440 322	6,440 322	6,440 322	6,440 322	6,440 322

Note: the standard errors are presented in []. *, **, *** are significant at 10%, 5%, 1%, respectively.
Source: own calculation

Table 7 shows that Chinese EPU has an inconsistent effect on firm-level stock returns in the Shenzhen market, while Global EPU has a positive effect. Overall, the results are consistent with Xiong et al. (2018) who show that the impact of EPU on the Shanghai stock market is greater than on the Shenzhen stock market. In addition, the interaction terms between Global EPU and firm size have a negative effect, the interaction terms with ROA have a positive effect, and the effect of Chinese EPU shows an inconsistent result. These results imply that the effects of Chinese/Global EPU on firm-level stock returns in the Shenzhen market are not important.

5. CONCLUSION

This study extends the Fama-French five-factor model by including EPU as a potential explanatory factor for firm-level stock returns. We focused on Chinese markets across two periods (2002–2007 and 2008–2022). Our empirical findings are notable, marking the first investigation into the effects of EPU on firm-level stock returns.

First, the increase in Chinese EPU has a negative effect on firm-level stock returns in China, while Global EPU shows a positive effect. We show that the negative effect of Chinese EPU on firm-level stock returns is more prominent in high-debt capitalized and profitable firms, while it is less prominent in firms with high market-to-book ratios. This observation implies that the effect of EPU on stock returns is mostly through firms' financial and business risks. Moreover, the effects of Chinese EPU and its associations with firm characteristics are more statistically significant than those of Global EPU, implying that domestic uncertainty shocks explain firm-level stock returns.

Second, the effect of Chinese EPU and its associations with firm characteristics on firm-level stock returns is not consistent during the period 2002–2007, while this effect is strongly significant between 2008 and 2017. This result confirms the stronger effect of EPU on stock markets in a period of high instability. Based on these observations, this study extended the current literature to include the effect of EPU on firm-level stock returns in a period of high economic instability. Furthermore, the impact of Global EPU is noteworthy: during the 2002–2007 period, its effect was positive, whereas from 2008 to 2022, it exhibited a negative impact. These findings indicate that the Chinese market has become more deeply integrated into the global economy post the Global Financial Crisis, making it more susceptible to external shocks and volatility.

Third, the effect of Global/Chinese EPU on Chinese firm-level stock returns is more significant and consistent in the Shanghai market than in the Shenzhen market. This result suggests that the Shenzhen market can be considered a reasonable option in China to hedge against Global and Chinese EPU shocks.

This article is one of the first to explore the channels through which shocks in EPU can be transmitted to firm-level stock returns. Our research focuses on China but could be extended to other emerging countries. By combining two streams of the literature (the Fama-French five-factor model and the influence of EPU), our study offers an original framework to investigate the influence of EPU on financial markets.

This study has limitations as it focuses exclusively on 823 firms listed on China's Shanghai and Shenzhen stock markets. While these firms represent a significant portion of the market, they do not fully capture the broader dynamics of small, private, or non-listed enterprises, which may respond differently to EPU. This limitation is primarily due to data availability, as financial and EPU data for non-listed firms is often incomplete. The study examines the period 2002–2022, which includes multiple economic cycles, financial crises, and significant policy changes. While robustness checks have been conducted to address potential inconsistencies, regime shifts, such as changes in government policies or updated financial regulations, may influence the results.

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