Regression Analysis on the Impact of Economic Policy Uncertainty on Stock Index Returns

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Abstract— The research study sought to investigate the effect of the China Economic Policy Uncertainty Index (CNEPU) effect on the Chinese stock index return rate. It uses monthly time series data for twenty years between January 2000 and December 2019. Some interesting results can be obtained from the coefficient in the linear equation by using the least-squares regression to establish a linear economic model. The main findings of the research study are as follows: a specific inverse relationship existed between the China Economic Policy Uncertainty Index and the return rate on the Chinese stock market stock index. This result showed evidence that China's Economic Policy Uncertainty negatively affects the return rate on the stock index.

Keywords-Economic Policy Uncertainty Index; Return rate on the stock index; Least-squares regression

1. INTRODUCTION

Economic policy uncertainty refers to the unpredictability caused by the frequent changes of macroeconomic policy made by the government, which leads to the micro subject being unable to predict the direction of macroeconomic policy [1]. After the Financial crisis in 2008, a series of economic policies were implemented to avoid economic depression, such as “supply-side reform,” “the Belt and Road initiative,” and so on. According to the China Economic Policy Uncertainty Index constructed by Baker et al. [2], China’s average Economic Policy Uncertainty rose from around 48 in 2000 to slightly above 100 in 2019, with a 108% growth rate, which means that the uncertainty of China’s economic policy is increasing.

According to the research at present, economic uncertainty can affect China’s macro-economy and impact the micro behaviors of enterprises. Economic policy uncertainty has a short-term negative effect on China’s economic growth, investment, consumption, and CPI [3]. Besides, economic policy uncertainty has a significant restraining effect on enterprise value in general [4]. Actually, economic policy uncertainty also influences stock index returns.

Credit Suisse Global Investment Returns Yearbook 2020 shows that China’s stock market achieved a real annual return of 4.5%, and the returns of long-term and short-term bonds were -2.2% and 0.5%, respectively. But if we only look at the period from 2000 to 2019, China’s stock market returns reached 9.6%. Chinese mainland stock market ranks fourth in the world. China has become more and more critical in the global investment market.

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In developing China's stock market, it gradually presents the characteristics of a "policy market," the government will consciously change the economic policy tools to achieve a macroeconomic environment in different economic stages. Compared with economic policies, economic policy uncertainty is relatively easily overlooked. The lack of stability with the promulgation of policies significantly impacts stock index returns. However, economic policy uncertainty will exist in China's stock market for a long time. Therefore, studying the impact of economic uncertainty on stock index returns is of great importance for maintaining the stability of the stock market and policy-making in China.

2. LITERATURE REVIEW

The importance of policy uncertainty associated with economic decision-making is more significant than ever in today's society. In the research, most scholars try to analyze its influence and influencing factors. Baker et al. [2] compiled the economic policy uncertainty index (EPU) to measure it comprehensively and quantitatively for influencing factors. The research found that policy uncertainty is associated with greater stock price volatility and reduced investment and employment in policy-sensitive sectors like defense, health care, finance, and infrastructure construction [2]. Another research discovered that about 40 percent of EPU movements could be explained by long-run (media fragmentation) and short-run (inflation and unemployment rates) trends [5]. As for influence, Xuejun Zhong et al. found that the impact of policy uncertainty will harm GDP, investment, consumption, exports, and price changes, leading to a depreciation of the real effective exchange rate and a decline in stock prices and real estate prices [6]. Another is that increases in economic policy uncertainty foreshadow declines in output, employment, and investment [7]. Besides, in a firm-level investment, Kang et al. illustrated that when companies have doubts about operating costs due to uncertainty of economic policies, they will be more cautious about investment plans [8]. And for stock market liquidity, in times of economic turmoil or crises, the relationship between policy uncertainty and illiquidity becomes stronger, and illiquidity leads to economic policy uncertainty [9].

When it comes to the impact of economic policy uncertainty, most literature is focused on the stock market. The stability of the financial market is of great significance to the regular operation of the real economy. Due to the development of economic globalization, governments of various countries have successively promulgated different fiscal, monetary, and other economic policies. The implementation of these policies will undoubtedly increase the instability in the financial market. At the same time, the stock market is an essential part of the financial market. Therefore, the size of the stock volatility also implies the development of the macroeconomic situation to a certain extent. There are two main streams about the relationship between the uncertainty of economic policy and stock market volatility. One is to study the predictability of economic policy uncertainty (EPU) to stock market volatility. For example, the research found that the ability of EPU to forecast stock returns depends not only on the country used but also on the sectors examined [10]. Another research discovered that incorporating EPU as an additional predictive variable into the existing volatility prediction models improves the forecasting ability of these models [11]. The second is to study the impact of economic policy uncertainty on the stock market of a specific country or the co-movements effects on the economy of other countries. For instance, through studying the impact of economic policy uncertainty on stock markets in the United States over the period 1900–2014, Arouri et al. found

that increasing policy uncertainty will reduce stock returns, and this effect will be more intense and lasting during periods of extreme volatility [12]. Chen studied the Chinese stock market as a sample and found that the increase in economic policy uncertainty significantly affects market volatility, especially the long-term market volatility. Besides, Japanese EPU has the strongest spillover effect on the U.S. stock markets, while EPU from the U.K. plays a very limited role [13]. Another research investigated the impact of innovations in U.S. economic policy uncertainty on the co-movements of China's A/B stock markets with the U.S. stock market [14]. Generally, the literature on the relationship between the uncertainty of economic policies and the stock market volatility is relatively limited. Most studies are focused on the predictability of economic policy uncertainty to stock market volatility and the impact of economic policy uncertainty on the stock markets of some specific areas.

Besides, most scholars study the impact of economic policy uncertainty on stock market volatility. Some scholars at home and abroad have investigated the volatility of the stock. Binder, J. J. and Merges, M. J. use a simple economy model under certainty identities four determinants of stock market volatility: uncertainty about the price level, the riskless rate of interest, the risk premium on equity, and the ratio of expected profits to expected revenues. Rohitha Goonatilake and Susantha Herath analyze the influence of news on the DJIA, NASDAQ, and S&P 500 and conclude that there is an association between news items and the stock market fluctuations. Tobias Olweny and Kennedy Omondi use monthly time series data for ten years between January 2001 and December 2010. The empirical analysis is carried out through EGARCH and TGARCH models. They find that foreign exchange rate, interest rate, and inflation rate affect stock returns volatility. Li Zhiyang and Yang Wancheng use samples between the first quarters of 2000 to the fourth quarter of 2012 to research the impact of institutional investors on stock volatility from the aspects of shareholding and its change. The empirical results show that a higher proportion of fund holdings will increase the stock volatility in the next period. In contrast, the increase of fund holdings will reduce the stock volatility. Another significant contribution is provided by Xu Weijun and Wu Guixiong, who utilize panel regression to research the margin on the underlying stocks' volatility. They find that the effect of margin on the underlying stocks' volatility changed with the market condition change. Not in a boom or crash market, leveraged buyouts decrease the underlying stocks' volatility and short selling increase or decrease the underlying stocks' volatility, and because the effect of leveraged buyouts is greater than short selling, therefore the margin decreases the underlying stocks' volatility; in a boom or crash market, margin increases the underlying stocks' volatility.

3. QUANTITATIVE ANALYSIS

3.1 Variable selection

The explanatory variable used in this paper was China economic policy uncertainty index which Huang, Y., & Luk compiled, P., Hong Kong Baptist University, including fiscal policy uncertainty index, monetary policy uncertainty index, trade policy uncertainty index, foreign exchange, and capital account policy uncertainty index[15]. The explained variable was the Chinese stock index return rate, including Shanghai Composite Index, Shanghai Composite A-share Index, Shanghai Composite B-share Index, Shenzhen Component Index, Shenzhen Component A-share Index, Shenzhen Component B-share Index, Shenzhen Stock Exchange

Component Index, SSE constituent index, SSE 180, Shenzhen Stock Exchange 100, CSI 300 index, CSI Circulation, CSI 100, SME Board Index and SSE Medium-sized Enterprise Composite Index, etc. Data came from the CSMAR database.

3.2 Statistical description

Fig. 1 shows the variety of Chinese economic policy uncertainty index and Corresponding events. Figure 2 shows the trend graph of the Chinese economic policy uncertainty index and the stock index return rate from January 2000 to December 2019.

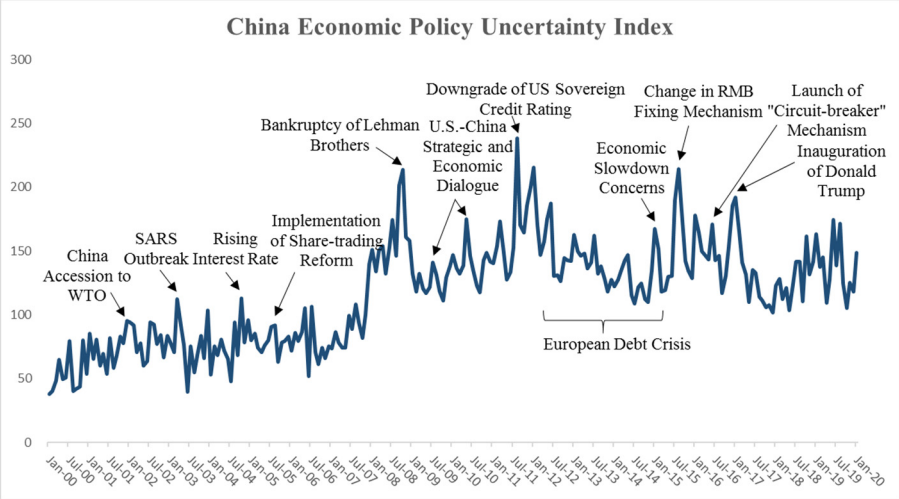

Figure 1. Chinese economic policy uncertainty index

Based on Figure 2, it is easy to see a certain inverse relationship between the China Economic Policy Uncertainty Index and the return rate on the Chinese stock market stock index. The stronger the uncertainty is, the lower the return rate on the stock index is.

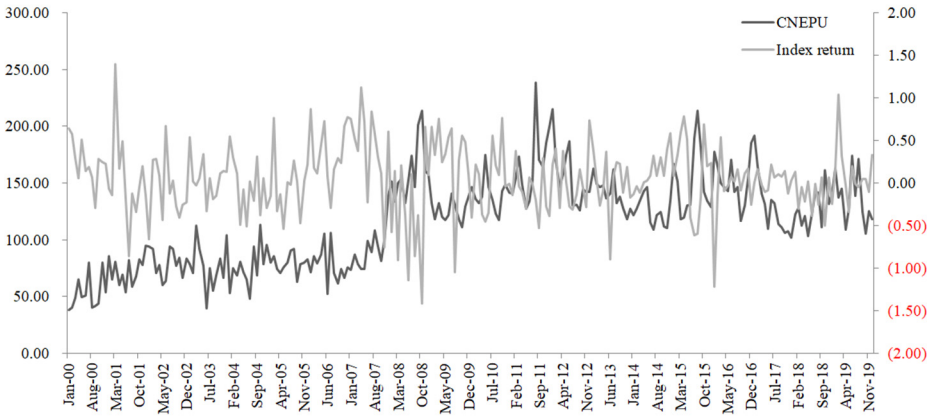

Figure 2. Trend graph

3.3 Empirical analysis

To research the causal relationship between the China Economic Policy Uncertainty Index and the return rate on the Chinese stock market stock index, this paper established an econometric model as follow:

$$Index\_return_t = \alpha_0 + \alpha_1 \ln CNEPU_t + \varepsilon_t \quad (1)$$

Utilizing the least squares to regress the above equation (1), we can obtain the main regression results (shown in Table 1):

TABLE1 BASELINE RESULT

VARIABLES	Index Return
CNEPU	-0.213***
	(0.0697898)
Constant	1.054***
	(0.3256892)
Observations	240
R-squared	0.0394

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Because other variables affect the return rate of the stock index, this paper further introduces related control variables to analyze. According to economic intuition, the return rate of the stock index may be related to the level of economic development. This paper introduces gross domestic product (GDP) as the control variable and establishes a multiple linear regression model. Since other variables affect the return rate of the stock index, this paper further introduces related control variables for analysis. According to economic intuition, the return rate of the stock index may be related to the level of economic development. This paper introduces GROSS domestic product (GDP) as the control variable and establishes a multiple linear regression model. The regression model is as follows：

$$Index\_return_t = \alpha_0 + \alpha_1 \ln CNEPU_t + \alpha_2 \ln GDP_t + \nu_t \quad (2)$$

The least-square method is also used for regression equation (2), and the regression results are shown in Table 2.

TABLE2 ROBUSTNESS RESULT

VARIABLES	Index Return
CNEPU	-0.0038931***
	(0.0012271)
GDP	-0.0006787
	（0.0068172）
Constant	0.6042804***
	(0.1804733)
Observations	132
R-squared	0.0591

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

According to the above regression result, when the uncertainty of economic policy increases, the return rate of the stock market index will drop significantly. This result is consistent with economic intuition. When investors face high economic policy uncertainty, it becomes more difficult for them to make reasonable expectations of the stock market's future. Once a new shock occurs, they are more likely to make irrational behaviors such as overreaction, leading to increased volatility in the stock market. On the other hand, companies tend to reduce investment if they face high economic policy uncertainty. This phenomenon will affect future cash flow to a greater extent, thus leading to more dramatic fluctuations in the stock market price. At the same time, the Chinese stock market is in the transition period from retail to institutional. Short-term transactions in the financial market are still widespread before completing this transformation. Many investors in China do not have professional knowledge in forecasting and analysis. Instead, they have limited ability, but they are keen to obtain gossip about various policy changes in the market, and some investors even listen to the opinions of some so-called authoritative financial institution workers. Another situation is that risk-averse investors will transfer their funds to relatively safe assets such as gold. There will be a decrease in the enthusiasm of stock market investors. According to Morningstar Global ETF flows data in August 2019, global institutional investors have cut back on equity ETF investments and switched to bonds, gold and other assets. ETFs focused on Chinese stocks continued to post net outflows in August, with US-traded ETFs recording outflows of about $2.1bn, the second largest monthly outflow of the year. Precious metal ETFs, particularly gold-themed ETFs, saw their biggest monthly inflows in nearly three years in August, with US ETFs seeing inflows of almost $5bn, while non-US ETFs saw net inflows of more than $1.5bn. Therefore, the capital inflow of the stock market will decline, thereby triggering a drop in stock index returns. In conclusion, when the uncertainty of the economic policy is rising, investors will worry about whether or how much they will lose due to fluctuations in the asset price, which will cause the stock index to fall. Hieu V. Phan et al. considered that policy uncertainty is positively related to firm cash holdings for their precautionary motives [16]. Hence the increase in EPU may delay some important decisions for public companies results in a fall in the expected profits of enterprises in the future, which will cause the stock price to decrease. Badar Nadeem Ashraf and Yinjie Shen deemed EPU boosts banks' loan prices because of the increase of the borrowers' default risk, increasing financing and manufacturing costs, exacerbating the decline in investment and profits, and then trigger a fall in stock price [17]. In addition, according to the results in Table 3, even if the GDP variable is added, it will not affect the benchmark regression results, and the increase of economic policy uncertainty will still lead to the decline of stock index yield. However, the level of economic development has no significant impact on the return rate of the stock index, which also shows that there is no obvious barometer between China's economy and the stock market. China's financial market is not perfect. If the direct relationship between economic development and the stock market is to be realized, the financial market needs to be further improved.

4. CONCLUSION

This study shows the relationship between EPU and stock index return. Based on empirical analysis, we use CNEPU for the year from 2000 to 2019, composed by Huang, Y., & Luk, P., to be an explanatory variable. The empirical result shows that CNEPU negatively affects stock

index return; when CNEPU increases, then index return will experience a decrease. Even if the GDP variable is added, it will not affect the benchmark regression results. The increase of economic policy uncertainty will still lead to the decline of stock index yield. However, the level of economic development has no significant impact on the return rate of the stock index, which also shows that there is no obvious barometer between China's economy and the stock market. EPU negatively affects GDP, investment, and consumption, causing the real effective exchange rate to depreciate, further driving down the stock price. An increase in EPU brings additional costs and delays some crucial decisions for the public firms, leading to profit decreases in the future and stock prices falling. Moreover, rises in EPU can boost stock market panic and pessimistic expectations of stock market participants, resulting in a drop in stock prices.

Although the impact of economic policy uncertainty on the yield of the stock index is not significant, the impact of economic policy uncertainty on the stock market is diverse. Further research may be carried out, such as studying the impact of economic policy uncertainty on the stock market. Volatility is a permanent classic theme in the study of the stock market. The moderate volatility of the stock market can help the stock market better play its role in financing and resource allocation and positively impact the standard and healthy development of the stock market. However, the excessive volatility of the stock market not only causes a huge impact on the market itself, which causes market disorder and leads to rampant speculation but also leads to the fragility of the financial system to a certain extent and affects the stable development of the macro-economy. In the course of development, the stock market is inevitably affected by economic policies. On the one hand, the uncertainty of economic policies will affect the expectation and behavior of the stock market to some extent. On the other hand, the spillover of stock market volatility to macroeconomic volatility will, in turn, affect the uncertainty of economic policy.

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