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Research on the Impact Mechanism of Economic Policy Uncertainty on Bitcoin Prices

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Abstract: Has there been a linkage mechanism between the prices of Bitcoin and traditional wealth preservation investment tools, that is, Bitcoin may serve as an investment substitute when other investment tool markets are sluggish, or can also benefit from it when the overall investment market is hot. The price of Bitcoin exhibits extremely unstable characteristics, as it can double its value dozens of times in a very short period of time or return to its starting point in a single day. The rapid rise and short duration of Bitcoin's price show us its infinite potential. Through research, this paper finds that the price of Bitcoin fluctuates greatly, while the U.S. Dollar Index and the S&P 500 index are basically horizontal, and their volatility is relatively small. Therefore, Bitcoin may be used as a speculative product, and there is a lot of speculative behavior in the market. When the investment attributes of Bitcoin dominate, an increase in economic policy uncertainty will significantly suppress investor sentiment and cause Bitcoin prices to decline. In addition, its impact on the world financial system is also increasing.

Keywords: Economic policy uncertainty, Bitcoin price, Impact mechanism.

1. Introduction

Has there been a linkage mechanism between the prices of Bitcoin and traditional wealth preservation investment tools, that is, Bitcoin may serve as an investment substitute when other investment tool markets are sluggish, or can also benefit from it when the overall investment market is hot[1]. The price of Bitcoin exhibits extremely unstable characteristics, as it can double its value dozens of times in a very short period of time or return to its starting point in a single day. However, the rise in Bitcoin prices has not been smooth sailing, as it has experienced several sharp declines along with its skyrocketing prices. The impact of economic policy uncertainty on investor sentiment and Bitcoin prices has significant time-varying characteristics. In the initial state of economy, the same actor can't have two currencies at the same time, so according to the types of initial endowment, the actor can be divided into three types: the initial endowment is legal tender, the initial endowment is bitcoin, and the initial endowment is neither coin nor bitcoin[2]. Assuming that the type of the actor and the proportion of the currency held can be observed, the transaction is conducted anonymously. Actors who own money should buy goods from others before production. The impulse response function value of economic policy uncertainty turns positive, and at the same time, it shows a significant time lag effect[3]. It is necessary to decide whether to trade after the actor matches successfully. Economic policy uncertainty before 2018 will have a negative impact on investor sentiment and Bitcoin prices. After 2018, economic policy uncertainty will have a positive impact on investor sentiment and Bitcoin prices. When the hedging attribute of Bitcoin dominates, the increase in economic policy uncertainty will significantly stimulate investors' hedging sentiment, thereby increasing the price of Bitcoin; When the investment attributes of Bitcoin dominate, an increase in economic policy uncertainty will significantly suppress investor sentiment, leading to a downward trend in Bitcoin prices[4]. Therefore, exploring the price mechanism and influencing factors of Bitcoin has become one of the key issues that urgently need to be addressed, and its impact on the world financial system is also increasing.

2. The Influence Mechanism of Economic Policy Uncertainty on Bitcoin Price

2.1. Theoretical model of bitcoin price determination

The supply and demand of Bitcoin itself are widely regarded as the most direct and important factors affecting its price. Due to the fact that Bitcoin is a virtual currency composed of a set of algorithms, unlike paper currency, which can be issued indefinitely, the number of Bitcoins has an upper limit based on the fields of its algorithm. The demand for Bitcoin mainly includes three parts: the first is the demand for trading as a Medium of exchange, the second is the demand for investment due to fixed supply and no inflation, and the third is the demand for speculation due to sharp fluctuations in the price of Bitcoin [5]. For the investment and speculative demand of Bitcoin, we selected variables such as the public's attention to Bitcoin and the exchange trading volume of Bitcoin on the exchange. We use the daily search volume VIEWS of Bitcoin on Wikipedia to measure the public's attention to Bitcoin. A good economic and financial environment will increase the exchange demand for Bitcoin, thereby positively affecting the price of Bitcoin. But at the same time, as an investment tool that investors can choose from, Bitcoin can replace securities as investment assets, so the economic and financial environment may also have a negative impact on the price of Bitcoin. The economic policy uncertainty index is constantly reaching new highs, and the rising economic policy uncertainty has made investors more concerned about Bitcoin's safe haven attribute. Bitcoin, as an emerging digital asset, is less affected by policy changes compared to traditional financial assets and has become a better safe haven, driving up the demand for Bitcoin among market participants. We use the value of the US dollar to measure the supply of Bitcoin [6].

2.2. Theoretical model of transaction matching

In the initial state of economy, the same actor can't have two currencies at the same time, so according to the types of initial endowment, the actor can be divided into three types: the initial endowment is legal tender, the initial endowment is bitcoin, and the initial endowment is neither coin nor bitcoin. Assuming that the type of the actor and the proportion of the currency held can be observed, the transaction is conducted anonymously. Actors who own money should buy goods from others before production[7]. The impulse response function value of economic policy uncertainty turns positive, and at the same time, it shows a significant time lag effect. It is necessary to decide whether to trade after the actor matches successfully [8-9]. When trading, the two successful matching actors trade at the negotiated price, or directly trade goods and currencies. Whether the transaction can be successful depends on two aspects. Only when both aspects are satisfied can the transaction be successful. The longer the lag period, the greater the response intensity of bitcoin price to the impact of a unit of positive economic policy uncertainty. When there are government actors in the economy, the government will obviously reduce the circulation of bitcoin by issuing a policy to restrict bitcoin transactions, which will lead to a decrease in people's demand for bitcoin and a decrease in the price of bitcoin. At the same time, we also notice that the ban policy needs certain preconditions for its strong implementation effect [10].

3. Empirical Study

3.1. Indicator selection and data sources

In China, Bitcoin belongs to a virtual commodity and does not have the status of a legal currency, and investors' bearishness has also led to a decrease in the expected price of Bitcoin. From the current world market perspective, there is still a strong speculative atmosphere in the global market of Bitcoin. Speculative demand remains an important reason for traders to hold Bitcoin, and there are still significant problems in the global market of Bitcoin that require rectification and governance[11]. Through Johansen's cointegration test, it was found that there is no long-term stable linear combination between the five macro variables compared to the same period last year. Therefore, the fluctuation of Bitcoin prices is not the result of an overall increase or decrease in the heat of a certain investment market in the long run. The impact of macroeconomic and financial development on the price of Bitcoin is multifaceted. In order to better describe the impact of financial markets on the price of Bitcoin, two variables are added: gold price and oil price. Bitcoin is similar to gold in that it serves as a hedging product. In order to eliminate Homoscedasticity and heteroscedasticity and reduce data fluctuation, the following data are logarithmized for each variable. The names, definitions and data sources of the indicators discussed earlier in this paper are shown in Table 1.

Table 1. Variable Definition and Data Source

Variable	Describe	Data sources
Bitcoin BTC	The exchange rate between Bitcoin and the US dollar	Quandl
Bitcoin Google Search Volume Google	Bitcoin's search volume on Google	Google Trend
Hashrate	The estimated number of gigabit hashes executed per second by the Bitcoin network	Quandl
Bitcoin trading volume Eov	Daily Estimator of Bitcoin	Quandl

For the investment and speculative demand of Bitcoin, we selected variables such as the public's attention to Bitcoin and the exchange trading volume of Bitcoin on the exchange. We use the daily search volume VIEWS of Bitcoin on Wikipedia to measure the public's attention to Bitcoin. A good economic and financial environment will increase the exchange demand for Bitcoin, thereby positively affecting the price of Bitcoin. But at the same time, as an investment tool that investors can choose from, Bitcoin can replace securities as investment assets, so the economic and financial environment may also have a negative impact on the price of Bitcoin.

3.2. Empirical results

There is a short-term lag relationship between bitcoin dollar price and federal funds rate, Dow Jones index and RMB dollar exchange rate. Specifically, as an investment means, when the RMB appreciates, Bitcoin indirectly invests in foreign exchange as a circulation medium to make a profit, so the corresponding investment demand for Bitcoin also rises; At the same time, when the capital market represented by the stock market is in good condition, the investment demand will also rise, thus driving the price of bitcoin. As shown in Table 2, the lag phase of Bitcoin is significant at the level of 4%, indicating that the lag of Bitcoin will have a positive effect on the price of Bitcoin. If the price of Bitcoin rose by 1% last week, the price of Bitcoin is expected to rise by 0.184% this week. At the same time, the Standard & Poor's Index 500 also has a positive effect on bitcoin prices, and it is significant at the level of 2%.

Table 2. ARDL and GARCH results

	ARDL		GARCH	
Period	(1)	(2)	(1)	(2)
BTCt-1	0.185 (2.11)**	0.251 (2.02)**	0.213 (4.58)**	0.328 (4.31)**
Spdt	1.451 (3.43)**	1.623 (2.56)**	0.756 (2.75)**	0.926 (2.54)**
Googlet	0.158 (3.77)**	0.099 (2.49)**	0.042 (2.12)**	0.038 (1.84)**

Let's take a look at the price BP of the dependent variable Bitcoin. The price BP of Bitcoin is positively skewed to the peak. During the sample period, the average price is 61.23, which is less than the median value of 60.44. The skewness is 0.79, and the kurtosis is 3.30, which is greater than the kurtosis of the Normal distribution of 2.50. The maximum and minimum prices of Bitcoin are $1842.76 and $957.72, respectively. The huge gap between the two indicates that a large price foam may exist in the Bitcoin market. In order to compare the price of Bitcoin, the U.S. Dollar Index and the S&P 500 index, the verification results are shown in Figure 1.

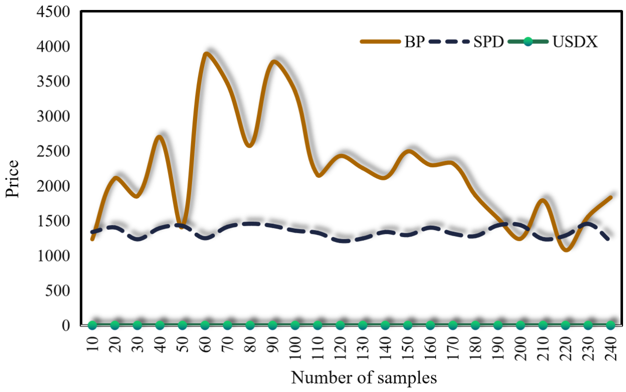

Figure 1. Comparison of Bitcoin price, US dollar index and S&P 500 index

From Figure 1, we can find that the fluctuation range of bitcoin price is very large, while the dollar index and the Standard & Poor's 500 index are basically horizontal, and their fluctuation degree is very small. Therefore, Bitcoin may be used as a speculative product, and there are many speculative behaviors in the market. The uncertainty index of economic policy is rising, and investors' risk aversion is rising. At this time, the risk aversion property of Bitcoin is gradually dominant, and investors tend to overreact to the existing information. Whether in the short term or in the long term, the investment attraction is a positive factor to promote the price of Bitcoin. Therefore, in the face of rising economic policy uncertainty, investors' sentiment of seeking safe-haven assets is even higher, further pushing bitcoin prices higher than the reasonable level of the market.

4. Conclusions

The emergence of Bitcoin can be said to be a revolution in the history of currency. Since the birth of Bitcoin, there has been continuous controversy over it, and its price has experienced a sharp rise and fall. This article studies the impact mechanism of economic policy uncertainty on Bitcoin prices. The Bitcoin market has responded to a downward price trend, and due to speculative behavior in the market, Bitcoin has experienced an upward trend after a price decline. At the same time, in China, Bitcoin belongs to a virtual commodity and does not have the status of a legal currency, and investors' bearishness has also led to a decrease in the expected price of Bitcoin. From the current world market perspective, there is still a strong speculative atmosphere in the global market of Bitcoin. Speculative demand remains an important reason for traders to hold Bitcoin, and there are still significant problems in the global market of Bitcoin that require rectification and governance. The research shows that the price of Bitcoin fluctuates greatly, while the U.S. Dollar Index and the S&P 500 index are basically horizontal, and their volatility is relatively small. Therefore, Bitcoin may be used as a speculative product, and there is a lot of speculative behavior in the market. Finally, the uncertainty of China's economic policies has limited impact on the volatility of digital currencies, indicating that China's policies to restrict digital currency transactions and curb speculative behavior have played a certain role, and it is still necessary to maintain a cautious attitude towards the regulation of digital currencies.

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