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Analysis of the Factors Affecting the Price Fluctuation of Bitcoin

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Abstract: According to the monetary theory, this paper believes that the demand for Bitcoin mainly includes two aspects: transaction demand and investment demand. This paper further discusses the impact of different demands on the price of Bitcoin based on two aspects of demand. Transaction demand and investment demand together affect the supply and demand relationship of the Bitcoin market. The empirical results show that the volatility of Bitcoin price is higher than that of international currencies and stocks as investment tools. This article emphasizes that the price of Bitcoin is primarily affected by supply and demand.

Keywords: Bitcoin price, Supply and demand.

1. Introduction

The first blockchain concept was proposed by Nakamoto in [1], which is the technology behind Bitcoin. According to Abadi and Brunnermeier [2], blockchain provides a peer-to-peer approach that eliminates the need for third-party intermediaries, improves the resilience of the system and reduces rental costs. Bitcoin is the best developed of all cryptocurrencies. In [3], Ciaian et al. stated that the most striking feature of Bitcoin compared to fiat currency is that its circulation is not controlled by any third party with monopoly position and power.

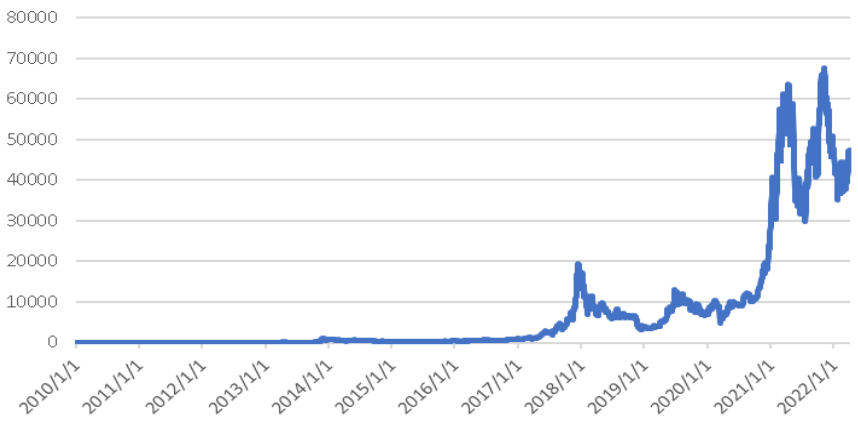

Figure 1: Bitcoin Price Over-Time.

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While Bitcoin's origins can be traced back to 2008, empirical studies typically cite data from 2010 onwards. Bitcoin prices climbed slowly from 2010 until the Mt. Gox hack collapsed in 2014, triggering a two-year bear market. In 2016, the price of Bitcoin returned to its 2013 high and gradually climbed, reaching a new high of $17,319.2 on January 16, 2018. However, such high levels have not been maintained. Bitcoin prices fell and entered a period of slow volatility. The sudden outbreak of the Coronavirus pandemic in January 2020 affected the global economy. It is worth noting that the price of Bitcoin fell to $4,830.21 on March 13, 2020, and quickly rebounded. Since then, the price of Bitcoin has fluctuated significantly, but its price is still much higher than before 2020.

As the price of Bitcoin has shown, it has huge price swings that fiat currencies do not. Therefore, this article believes that there may be some special factors that affect the price fluctuation of Bitcoin.

2. Literature Review

In recent years, with the gradual development of Bitcoin, the price formation mechanism of Bitcoin has also attracted much attention. Šurda believed in [4] that Bitcoin is mainly determined by market forces and investor confidence.

2.1. Bitcoin Supply and Demand

Market supply and demand can affect the scarcity of currency or commodities. Buchholz et al. insisted in [5] that supply and demand was a crucial factor affecting the price of Bitcoin. However, Kristoufek [6] said that the factors that usually affect the price of a currency may not exist in Bitcoin’s price formation mechanism.

Bitcoin supply. For traditional fiat currencies, issuers can often adjust the money supply in circulation by controlling the scope of use of the issued currency and expanding or contracting lending activities. Hayek [7] held that to ensure the stability of the value of fiat money, issuers should not blindly increase the money supply without increasing expenditure, increasing the general price level. Bitcoin's money-supply mechanism is different. The Bitcoin community cannot regulate the money supply, which is elastic. Therefore, according to Grinberg [8], the Bitcoin community cannot control the value of its currency by increasing or decreasing the supply of Bitcoin.

Investor attention. Regarding the motivation of users to hold Bitcoin, Glaser et al. [9] concluded that major users regard Bitcoin as an investment method rather than a payment method through research. That means Bitcoin is widely used by investors as an investment product. Briere et al. [10] found an interesting phenomenon by correlating Bitcoin with other assets, that is, Bitcoin investment has diversified returns.

2.2. Global Macroeconomic Developments

Van Wijk [11] emphasized the vital role of global macro-finance in the formation of Bitcoin prices. Ciaian et al. [12] insisted that the price formation mechanism of Bitcoin is studied comprehensively through market supply and demand forces, Bitcoin's attraction to investors and global macroeconomic development. This paper agrees that the three factors mentioned in Ciaian et al. [12] can have an important impact on the price of Bitcoin. However, this paper argues that Bitcoin's attraction to investors indirectly affects the price fluctuation of Bitcoin by affecting the supply-demand relationship of Bitcoin.

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3. Methodology

3.1. Factors Affecting the Price of Bitcoin

Theoretical model of Bitcoin price. To analyze the price factors affecting Bitcoin, this paper expands on the model of money and general price level under the gold standard proposed by Barrow in 1979. Supposing B represents the total amount of Bitcoin in circulation and PB represents the number of dollars that can be exchanged for each unit of Bitcoin. Therefore, the total Bitcoin supply.

$$M^S = P_B * B \tag{1}$$

It is assumed that Bitcoin's transactional demand M1D fits Fisher's equation, depending on the general price level P, Bitcoin's economic size Y, and Bitcoin flow velocity V (the frequency of one unit of Bitcoin is used to purchase commodities).

$$M_1^D = PY/V \tag{2}$$

Therefore, the equilibrium relationship between supply and demand is:

$$P^B = PY/VB \tag{3}$$

In a complete market, the price of Bitcoin is inversely related to circulation speed and stock, but directly related to economic scale and price level.

Based on previous empirical studies, Bitcoin demand is generally reflected in transactional demand and investment demand. Glaser et al. [9] held that investment demand plays a dominant role. Therefore, the following relationship exists:

$$M^D = M_1^D + M_2^D \tag{4}$$

M^D represents the total demand for Bitcoin. M_1^D indicates demand for Bitcoin transactions. M_2^D is the speculative demand for Bitcoin.

Baumol model, Whalen model and Miller-Orr model all believe that the transaction volume and cost are non-negligible factors that affect the demand for currency transactions. There is following equation:

$$M_1^D = M_1^D(P, Y, CBT, CT) \tag{5}$$

CBT represents Bitcoin transaction volume. CT indicates the transaction cost of Bitcoin. In a speculative aspect, disclosure of information about Bitcoin is vital. Information about Bitcoin can greatly influence the decisions of potential investors and users, such as news. An increase in investor demand for Bitcoin may lead to an increase in the price of Bitcoin, and vice versa, due to an increase in investor attractiveness. Lee [14] demonstrated the impact of news reports on the price of Bitcoin through an empirical study of Bitcoin price.

To sum up, this article uses the search volume of Bitcoin to represent the investment demand for Bitcoin.

$$M_2 = M_2^D(WIKI) \tag{6}$$

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Macroeconomic development. The research of Van Wijk [11] emphasized that the macroeconomic fundamentals cannot be ignored when discussing the price formation mechanism of Bitcoin. Positive macro fundamentals can encourage investors to enter the Bitcoin market, increasing Bitcoin's acceptance, which in turn pushes Bitcoin's price higher.

3.2. Variable Selection

The dependent variable of the research model is the price of Bitcoin (data from quandl.com). There are 6 independent variables that affect the supply and demand relationship of Bitcoin in this paper.

Firstly, in terms of Bitcoin transaction demand, there are five independent variables, including the number of Bitcoins (nob), the number of daily confirmed Bitcoin transactions (cbt), Bitcoin cost per transaction (ct), Bitcoin flow velocity (v) and US Dollar Index (usdx). The number of Bitcoins, the number of daily confirmed Bitcoin transactions and Bitcoin cost per transaction are from quandl.com. It's worth noting that velocity is difficult to observe because the frequency with which the same Bitcoin is used to buy goods and services over a given time span cannot be directly tracked. In previous empirical articles, scholars adopted many different methods to measure velocity. In this paper, the Bitcoin Total Number of Transactions is divided by the Number of Bitcoins to replace the velocity. In addition, the US dollar index (usdx) is an effective indicator to reflect the exchange rate of the US dollar in the foreign exchange market, so this paper chooses it to represent the general commodity price level. The data of usdx comes from Investing.com.

In addition, as for the investment demand of Bitcoin, this paper adopts the degree of investors' attention to describe this aspect. According to Kristoufek [6], investors' interest in Bitcoin can be measured by the volume of searches related to digital currency. Therefore, this paper uses the volume of visits to Bitcoin on Wikipedia to measure the attraction of Bitcoin to investors. The source of this data is http://stats.grok.se.

Macroeconomic fundamentals. In the aspect of the global macroeconomy, Ciaian et al. [12] and Van Wijk [11] used oil prices and Dobbs Industrial Index. These two variables are often used in empirical articles to explain the situation of global macroeconomic and financial development. Therefore, this paper takes a similar approach. Compared with the Dow Jones, the S&P 500 (sp) has obvious advantages, including a wider sample, better representation, and higher precision. Therefore, in this article, we are using the S&P 500, which is obtained from the Federal Research Bank of St. Louis.

Measurements of Variables.

Table 1: Measurements of Variables.

Variable	Regression Name	Measurement	Expected coefficient
Bitcoin Price	bpi	natural logarithm	/
Number of Bitcoins	nob	natural logarithm	negative
daily Bitcoin transactions	cbt	natural logarithm	positive
Bitcoin cost per transaction	ct	natural logarithm	negative
velocity	v	natural logarithm	negative
USDX	usdx	natural logarithm	positive
investors' attention	wiki	natural logarithm	positive
STANDARD & Poor index	sp	natural logarithm	/

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4. Findings and Results

4.1. Statistics Analysis

In the sample period, the maximum value of Bitcoin price is $67,562.17 on November 9, 2021, and the minimum value is $13.4 on January 1, 2013. The maximum value is 5041.95 times the minimum value, indicating that the price span of Bitcoin is wide, and the price volatility is even much higher than that of The American stock price as an investment tool.

Table 2: Descriptive Sample Statistics.

Variable	Mean	Standard deviation	Min	Max
bpi	7.7053	1.9735	2.6000	11.1208
nob	16.5741	0.1613	16.1784	16.7602
cbt	12.1315	0.6481	10.4505	13.1035
ct	3.2849	1.1411	-0.2196	5.5652
v	2.4036	1.0030	-0.0016	3.6393
usdx	4.5270	0.0694	4.3710	4.6406
wiki	8.9395	0.7255	7.5486	12.2026
sp	7.8370	0.2947	7.2842	8.4757

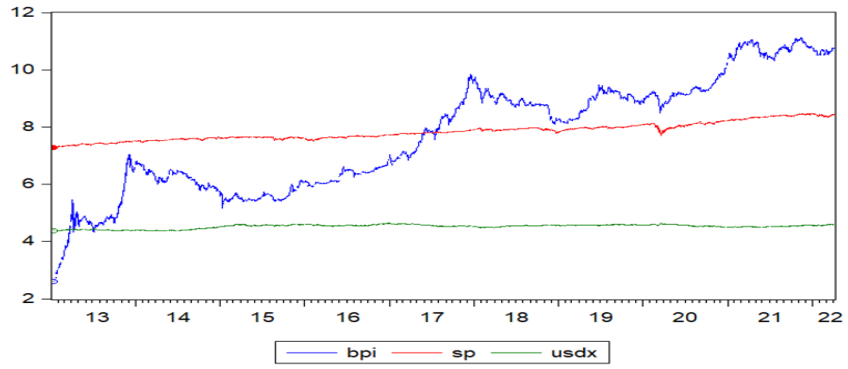

Figure 2: Bitcoin prices and US Dollar index, S&P 500 index.

From the results of descriptive statistics and line charts, Bitcoin is highly speculative relative to stocks. Furthermore, although the market size of Bitcoin has expanded rapidly in recent years, it is still far smaller than the market size of traditional financial products, so this paper uses the US dollar index and the S&P 500 index as the exogenous variables of the Bitcoin price index. Finally, for further research on the formation mechanism of Bitcoin price, this paper makes difference for each variable, which is approximately equal to the change rate of each variable in mathematics.

Table 3 shows the result after the first difference of each variable. The standard deviation of the Bitcoin price index after one difference is higher than the standard deviation of the US dollar index and the S&P 500 index after one difference, confirming that its volatility is much higher than that of traditional currencies and stocks. Additionally, the fluctuation of the Bitcoin circulation rate (dv) is relatively small, which reflects that the turnover rate of Bitcoin is not high within a certain time span, the proportion of Bitcoin that may be used for circulation is not high, and more people hold Bitcoin for collection and investment. The variance of the growth rate of the total amount of Bitcoin in

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circulation (dnob) is the smallest, which means that it has the least volatility. Therefore, this paper assumes that the supply of Bitcoin is an exogenous variable.

Table 3: Descriptive Sample Statistics (after the first difference of each variable).

Variable	Mean	Standard deviation	Min	Max
dbpi	0.35%	5.8%	-49.66%	51.29%
dnob	0.03%	0.03%	-0.03%	0.21%
dcbt	0.08%	10.00%	-56.06%	59.26%
dct	0.20%	12.63%	-80.07%	53.19%
dv	0.16%	0.23%	-0.43%	2.60%
dusdx	0.01%	0.42%	-2.41%	2.17%
dwiki	0.01%	27.04%	-191.96%	344.58%
dsp	0.05%	1.07%	-12.77%	8.97%

4.2. Research Model

VAR model. Since the dynamic relationship between variables is researched in this paper, the common model of multivariable time series (VAR) is adopted. Its advantage is to analyze the relationship between time series of variables more intuitively and analyze the dynamic influence of random disturbance on the system.

The general form of the VAR model is:

$$Y_t = \sum_{i=1}^{k} \Gamma_i Y_{t-i} + \Phi D_i + \varepsilon_t \quad (7)$$

Y_t is the time series column vector of $N \times 1$ order endogenous variables. μ is the column vector of order $N \times 1$ constant sequence. $\Gamma_1 \ldots \Gamma_k$ are $N \times N$ order coefficient matrix, D_t is $N \times d$ order exogenous variables time series column vector, Φ is the coefficient matrix, $\varepsilon_t \sim i.i.d(0, \Omega)$ is $Nx1$ order random error column vector, where each element is non-autocorrelation, but these elements, i.e., the corresponding random error terms of different equations may be correlated. The precondition of establishing VAR model is stability, so the stationarity test of each variable should be carried out first.

Stationary test. ADF was used to test the unit root, and the test showed that the variable bpi, cbt, usdx, ct and sp were not stable. Additionally, all variables were first-order integration. There is the possibility of long-term trends. Therefore, VEC model is established:

$$\Delta Y_t = \sum_{i=1}^{k-1} \Gamma_i Y_{t-i} + \prod Y_{t-1} + \varepsilon_t = \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \alpha ecm_{t-1} + \varepsilon_t, \varepsilon_t \sim i.i.d(0, \Omega) \quad (8)$$

The VEC model is a restricted VAR model, which can better explain the interaction of the studied variables in the long-run and short-run equilibrium states. k is lag order, $\prod = \alpha\beta', ecm_{t-1} = \beta' y_{t-1}$is the error correction term, β represents the long-term relationship between the variables. α represents the adjustment vector.

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Table 4: Results of stationarity test of variables.

Variable	ADF test statistics	P value	Unit root	First-order integration
bpi	-3.1705	0.0907	√	√
nob	-3.8554	0.0024	×	√
cbt	1.1088	0.9310	√	√
ct	-2.6055	0.2779	√	√
v	-6.7036	0.0000	×	√
usdx	-2.0158	0.2801	√	√
wiki	-5.2094	0.0001	×	√
sp	-3.2171	0.0812	√	√
dbpi	-21.6019	0.0000	×	√
dnob	-2.6698	0.0074	×	√
dcbt	-22.4307	0.0000	×	√
dct	-36.6768	0.0000	×	√
dv	-8.6934	0.0000	×	√
dusdx	-48.3005	0.0001	×	√
dwiki	-34.0596	0.0000	×	√
dsp	-15.4725	0.0000	×	√

The √ of the unit root column indicates that there is a unit root, and × indicates that there is no unit root.

VEC model and Cointegration test. This paper establishes two VEC models of the Bitcoin price index, and the setting instructions of the models are shown in Table 5. Model 1 describes the relationship between transactional demand variables and their influence on the price of Bitcoin. Model 2 describes the interaction between transactional demand, investment speculative demand variables and macroeconomic variables and their influence on the Bitcoin price index. Model 2 describes the impact of multiple factors on the price of Bitcoin.

Table 5: Models contain variables.

Factors	Variable	Model 1	Model 2
Transaction demand	nob	√	/
	cbt	√	√
	ct	√	√
	v	√	√
	usdx	√	√
Investment demand	wiki	×	√
Macroeconomic	sp	×	√

The √ in table 5 indicates that whether the variable is included in model 1 or 2.

The cointegration test is required when using the VEC model, so this paper uses the Johansen Juselius test (JJ test) to test whether there is a long-term equilibrium relationship between variables.In the case of two variables, the two variables must be integral of the same order. whereas in the case of many variables, the integral order of the explanatory variable is usually no less than that of the explained variable.

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Table 6: Results of the JJ test.

No. of CE(s)	Model 1 Trace Statistic	Model 1 P value**	Model 2 Trace Statis-tic	Model 2 P value**
None *	359.2197	0.0001	503.3252	0.0001
At most 1 *	62.7635	0.0000	154.5517	0.0000
At most 2 *	23.6857	0.0023	79.8475	0.0000
At most 3 *	2.1657	0.1411	24.7016	0.0016
At most 4	/	/	1.6107	0.2044
Summary	Three cointegration variables	Three cointegration variables	Four cointegration variables	Four cointegration variables

M1: Trace test indicates 3 cointegrating eqn(s) at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values.M2: Trace test indicates 4 cointegrating eqn(s) at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values.

4.3. Empirical Results

Transaction Demand and Bitcoin price index. Model 1 incorporates other factors into the stochastic disturbance term, focusing on the relationship between transaction demand variables and their possible impact on the Bitcoin price index. The empirical results of Eviews' VEC model are divided into two parts: the cointegration equation (long-term relationship) and the adjustment vector (short-term relationship) when deviating from equilibrium. Therefore, this paper studies the impact of various factors on the Bitcoin price index from both long-term and short-term perspectives.

Table 7: The long-term impact of Bitcoin trading demand on the Bitcoin price Index (M1).

Explaining variables	CointEq1	CointEq2	CointEq3
bpi (-1)	1	0	0
cbt (-1)	0	1	0
ct (-1)	0	0	1
v (-1)	-4.7936	0.2628	-3.8119
C	3.8264	-12.7667	5.8867

According to Table 7, the co-integration equation of Model 1 can be obtained as follows:

$$bpi=4.7936*v+3.8264+ecm1 \quad (9)$$

$$cbt=-0.2628*v-12.7667+ecm2 \quad (10)$$

$$ct=3.8119*v+5.8868+ecm3 \quad (11)$$

Because ecm1, ecm2 and ecm3 are stable, Bitcoin's circulation velocity is significant at the 5% level, consistent with the hypothesis. It can be seen from (9) that in the long-term equilibrium state, the transaction speed of Bitcoin can have a positive impact on the transaction demand and price index, which is inconsistent with the expectation of this paper. However, this conclusion is different from [12]. Ciaian et al. [12] argue that the turnover rate of Bitcoin has no significant impact on the price

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over a longer period of time. The reason may be that the method of measuring the turnover speed of Bitcoin in this paper is different from that in [12]. Moreover, it can be inferred from (10) that the number of daily transactions is negatively correlated with the turnover speed of Bitcoin. The faster the turnover speed of Bitcoin is, the less the number of Bitcoin transactions is, which may be because people are more willing to keep their own Bitcoin, thus reducing the transaction volume. All other things being equal, the price of Bitcoin will rise as its acceptance increases. According to (11), each transaction cost of Bitcoin is normally correlated with the transaction speed.

Table 8: The short-term impact of Bitcoin trading demand on the Bitcoin price Index (M1).

Variable	D(bpi)	D(cbt)	D(ct)	D(v)
CointEq1	-0.0128	-0.0145	0.0696	0.0020
CointEq2	0.0067	-0.0727	0.0137	0.0014
CointEq3	0.0001	0.0035	-0.0711	-0.0021
D (bpi (-1))	-0.1636	0.1634	0.2183	-0.0017
D (bpi (-2))	-0.0261	0.1119	0.2647	0.0012
D (bpi (-3))	-0.0429	0.0803	0.2375	-0.0024
D (bpi (-4))	0.1044	0.1023	0.1199	-0.0002
D (cbt (-1))	0.0597	-0.5322	0.0099	-0.0014
D (cbt (-2))	0.0416	-0.3279	0.0122	-0.0012
D (cbt (-3))	0.0511	-0.2267	0.0079	-0.0008
D (cbt (-4))	0.0364	-0.1313	0.0476	-0.0003
D (ct (-1))	0.1028	-0.0582	-0.3727	0.0028
D (ct (-2))	0.0431	-0.0203	-0.2818	0.0015
D (ct (-3))	0.0264	-0.0079	-0.1641	0.0012
D (ct (-4))	0.0172	-0.0033	-0.0787	0.0002
D (v (-1))	1.3276	4.4726	-4.8603	-0.5283
D (v (-2))	-0.1081	3.0964	-3.5873	-0.3972
D (v (-3))	-0.1752	0.1732	-0.5023	-0.0761
D (v (-4))	-1.2868	-1.8442	-0.1743	0.2032
C	4.6905	-3.5049	3.3611	0.3351
nob	-0.2500	0.1911	-0.1701	-0.0204
usdx	-0.1199	0.0725	-0.1161	0.0014

In the short term, velocity is significant, and has a positive effect on the Bitcoin price index in the early stage and a negative effect in the late stage, which may be due to the lag effect after the acceleration of Bitcoin re-circulation speed. Bitcoin's transaction cost ct is also significant, consistent with the long-term impact. The short-term impact of daily Bitcoin trading volume on bpi is different from that in the long run. This may be because in the long run, when BPI rises, individuals hoard Bitcoin and reduce the supply, while in the short run, price increases encourage individuals to buy Bitcoin and increase daily trading volume. The impact of usdx on the price of Bitcoin is negative and significant at the level of 10%, which is inconsistent with expectations. This may be because Bitcoin has certain risk transfer properties. When usdx performs poorly, more customers are willing to invest in Bitcoin and the Bitcoin price index rises. The number of Bitcoin is significant at the 1% level, and when it rises, the price index falls, which is consistent with the hypothesis of this paper.

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Influence of comprehensive factors on the Bitcoin price index. Model 2 describes the influence of various factors (transactional demand, investment demand and macroeconomics) on the Bitcoin price index. In this paper, Eviews is used for regression and the following results are obtained.

Table 9: The long-term impact of Bitcoin investment demand on the Bitcoin price Index (M2).

Explaining variables	CointEq1	CointEq2	CointEq3	CointEq4
bpi (-1)	1	0	0	0
cbt (-1)	0	1	0	0
ct (-1)	0	0	1	0
v (-1)	0	0	0	1
wiki (-1)	-4.2038	-0.4058	-2.9784	-1.2706
C	29.8698	-8.5063	23.3383	8.9518

The cointegration equation is as follows:

$$bpi=4.2038*wiki+29.8698+ecm1 \quad (12)$$

$$cbt=0.4058*wiki-8.5062+ecm2 \quad (13)$$

$$ct=2.9784*wiki+23.3383+ecm3 \quad (14)$$

$$v=1.2706*wiki+8.9518+ecm4 \quad (15)$$

By the unit root test, ecm1, ecm2, ecm3 and ecm4 are stable, long-term stable equilibrium relationship. According to (12), the number of wiki searches is positively correlated with the Bitcoin price index. If people pay more attention to Bitcoin, they may choose to invest in Bitcoin. As speculative demand increases, bpi will increase. Similarly, in (13), (14) and (15), people's speculative demand increases, which promotes the circulation of Bitcoin transactions and thus increases the transaction cost of Bitcoin. Therefore, speculative demand for Bitcoin investment is one of the vital factors affecting the price. Investors' attention to Bitcoin can drive the price of Bitcoin higher, and higher prices will attract more investors to the Bitcoin market.

In terms of short-term impact, the Bitcoin attention wiki in model M2 is significant, but the influence of Bitcoin attention Wiki on Bitcoin price is contrary to the long-term situation and assumptions. This may be because attention has a certain stickiness, that is, the current attention is closely related to the previous attention. Even when the price turns from rising to falling, there may be a lag effect (i.e. it may continue to rise rather than fall rapidly) due to the stickiness of attention. Besides, there is another explanation. Because this article does not distinguish between positive and negative attention on the Bitcoin attention variable. In fact, increased negative attention to Bitcoin could cause its price to drop. It is worth noting that Bitcoin’s rise in price has a positive effect on Bitcoin’s attention. Usdx and the total amount of Bitcoin in circulation are consistent with M1 results. However, the macro-economic variable S&P 500 index has no significant influence on the Bitcoin price index. The reason is that macro-economic and financial factors have little influence on virtual currencies like Bitcoin. This conclusion is similar to the research conclusion of Van Wijk [11], but based on the huge fluctuations of Bitcoin price since the epidemic of Novel Coronavirus in 2020, this paper deduces that the change in macroeconomic fundamentals will affect investors' psychological expectations and investment preference of Bitcoin price. Whether Bitcoin is used as an alternative investment product in the traditional capital market, such as stocks and bonds, indirectly affects the price of Bitcoin.

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Table 10: The short-term impact of Bitcoin investment demand on the Bitcoin price Index (M2).

Variable	D(bpi)	D(cbt)	D(ct)	D(v)	D(WIKI)
CointEq1	-0.0430	0.0102	0.0569	0.0012	0.0878
CointEq2	0.0237	-0.1217	0.0240	0.0029	0.1143
CointEq3	0.0133	-0.0142	-0.0648	-0.0015	-0.0162
CointEq4	0.0955	0.0349	-0.0468	-0.0012	-0.2185
D (bpi (-1))	-0.1445	0.1465	0.2291	-0.0012	0.0914
D (bpi (-2))	-0.0136	0.1007	0.2719	0.0016	0.1046
D (bpi (-3))	-0.0334	0.0748	0.2377	-0.0021	-0.0004
D (bpi (-4))	0.1083	0.1046	0.1205	-0.0002	0.2108
D (cbt (-1))	0.0484	-0.4953	0.0020	-0.0025	-0.0480
D (cbt (-2))	0.0322	-0.2947	-0.0002	-0.0021	-0.0690
D (cbt (-3))	0.0443	-0.1984	-0.0007	-0.0014	0.0492
D (cbt (-4))	0.0329	-0.1153	0.0470	-0.0007	0.0714
D (ct (-1))	0.0920	-0.0418	-0.3775	0.0023	0.0545
D (ct (-2))	0.0335	-0.0062	-0.2874	0.0011	0.0483
D (ct (-3))	0.0195	0.0037	-0.1693	0.0009	-0.0113
D (ct (-4))	0.0125	0.0039	-0.0813	0.0001	-0.0050
D (v (-1))	1.1091	5.0319	-4.8793	-0.5482	5.7752
D (v (-2))	-0.5188	4.0906	-3.9717	-0.4228	0.2903
D (v (-3))	-0.5729	1.3145	-0.9970	-0.0998	-1.6185
D (v (-4))	-1.6076	-1.0135	-0.4109	0.1860	-5.1891
D (wiki (-1))	-0.0139	-0.0032	-0.0086	-0.0002	-0.2612
D (wiki (-2))	-0.0004	-0.0201	0.0214	-0.0002	-0.1819
D (wiki (-3))	-0.0058	-0.0164	0.0033	-0.0003	-0.1316
D (wiki (-4))	0.0008	-0.0060	-0.0010	0.0000	0.0000
C	5.8525	-6.2584	4.3878	0.4098	2.3667
nob	-0.3384	0.4014	-0.2554	-0.0260	-0.1685
usdx	-0.1880	0.1098	-0.1167	-0.0005	0.0900
sp	0.07819	-0.1156	0.04990	0.0034	0.0025

5. Conclusion

This article attempts to shed light on what factors influence Bitcoin's short- and long-term price movements. This paper analyzes the impact of Bitcoin market supply and demand and global macroeconomic fundamentals on its price through empirical research methods. The basis for the formation of Bitcoin price mechanism in this paper is the gold standard model of Barro. The formation of Bitcoin price is deduced from previous studies. Daily data were used from January 1, 20013 to April 6, 2022 (over 9 years of data). Eviews are used to establish the VEC model of time series to further determine the short-term and long-term impact of different variables on the price of Bitcoin.

This paper compares the mechanisms by which various factors affect the price of Bitcoin in the short and long term. The results show that the price of Bitcoin is mainly affected by its supply and demand. Firstly, on the supply side, the supply of Bitcoin is externally determined, with a significant inverse effect on price over a shorter period of time. On the demand side, both trading demand and speculative investment demand are vital elements that affect price movements. And Bitcoin's huge

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price swings suggest it's more of a speculative investment. In particular, the huge volatility in Bitcoin's price after 2020 could herald a huge economic bubble.

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