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Measure and analyze influencing factors in Bitcoin prices for the period (2012-2024)

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Abstract

The research aims to identify the influencing macroeconomic factors in Bitcoin and an attempt to explain the reasons for the sharp fluctuations in this currency. The research used the inductive approach as well as the standard method through comparison between Standard methods Approved and including (OLS, ARDL) which means trying to detect N Some spurious relationships between the studied variables. The research reached to There is a direct relationship between changes in the global gold price and the Bitcoin price, and an inverse relationship between the federal interest rate and the Bitcoin price, as well as a direct relationship between Economic shocks and Price changes a job And Bitcoin, and the research presents some proposals to address the sharp fluctuations in Bitcoin prices, including holding an international conference focusing on examining the causes of these fluctuations and ways to reduce their serious effects on investment portfolios. For individuals and financial institutions.

Keywords: Bitcoin price, price global gold, federal interest rate

Introduction

The world is going through major transformations in all aspects of life due to technological developments. The technological revolution that the world is witnessing has led to clear changes in the global economy. Crypto currencies have attracted the attention of many investors, aroused the ire of researchers, and become a controversial issue between opponents who warn of their risks and supporters who see them as an inevitable result of global electronic development and that they may replace traditional currencies in the future. Crypto currencies were born from the womb of digital space, challenging all financial systems and traditional mechanisms that the world has known in the past centuries. The media and social networks contributed to spreading them effectively globally, so their prices rose significantly compared to their price at the beginning of their emergence, such as Bitcoin and a Ethereum and perhaps the Corona pandemic and the Russian-Ukrainian war have accelerated the pace of adoption On it Significantly, which led to a change in the pattern of financial and monetary transactions on a large scale in global markets. In general, some experts warn against dealing with it due to its sharp fluctuations and reliance on speculation.

First: The importance of research: Crypto currencies play a role in: Recently The latter plays an important role in economic activities, as the changes in its prices and the accompanying major risks to investment portfolios. For individuals Or financial institutions, makes this modest study important to track the relative instability in crypto currency prices, and the relentless pursuit to clarify the reasons for these fluctuations and verify the influential factors represented by: (the global gold price, the federal interest rate, global economic crises), and it can be noted that the communications revolution and modern developments in payment methods contributed to determining the form of financial transactions that have developed significantly in recent years, as billions of dollars are traded daily With activities A different economy through Bitcoin, which does not belong to any central bank nor It is supported by any government agency and is not subject to any financial or monetary policy. It is affected only by the law of trust and general acceptance among those dealing with it.

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Second: The research problem: The research problem is crystallized in the sharp fluctuations in the prices of crypto currencies, including Bitcoin, which constitutes 50% of the global trading volume in crypto currencies, as these fluctuations negatively affect portfolios. Investment the question is: What are the economic factors affecting Bitcoin prices?

Third, the research hypothesis: The research is based on a basic hypothesis that there are major factors that affect Bitcoin prices, leading to fluctuations in their prices. Accordingly, it can be said:

- Global gold prices have an impact on Bitcoin prices.
- The federal interest rate has an impact on currency prices. ShA variety of them, including Bitcoin.
- Global shocks and political statements affect Bitcoin prices.

Fourth: Goal Search: The research aims to shed light on the Bitcoin currency, which is used Kosel A modern and globally accepted payment method, as well as identifying the macroeconomic factors affecting Bitcoin.

Fifth: Research Method: The research depends on the use of the inductive approach in tracking the phenomenon of Bitcoin price fluctuations, and the use of the standard method to try to prove the research hypothesis, b Use Statistical program E views 12.

Sixth: Research structure

- Eat the first section: The concept of crypto currencies Reasons for the high cost of Bitcoin mining.
- But the second topic: Economic analysis of reality Bitcoin and the factors affecting it.
- Section Three: Measuring the impact of some factors Influential on Bitcoin.

The first topic: Introduction to crypto currencies

Firstly: The concept of crypto currencies: The concept of Crypto currencies is new in the global economy, as interest in it began before 2012, and global markets witnessed turbulent changes in their exchange rates. It belongs to virtual currencies, as it is a digital means of trading based on encryption principles that allow for secure and decentralized economic transactions. A specific quantity of it is produced or issued by a system dedicated to crypto currency. The crypto currency market faced many challenges, and development began gradually, but it took an accelerated and unprecedented pace, as many companies participated in establishing an alliance to develop a system(Block chain)To be safe and reliable Gikay, 2018, 6) ^[13] It enables users to exchange financial payments through virtual currencies without the need for a central authority, which in turn may reduce the costs of financial transfers, as many individuals from all over the world are quickly moving towards crypto currency and using it despite its unacceptability by governments and central banks (Burniske & Tatar, 2018, 77-78) ^[11].

Crypto currencies can be defined as a system of currencies that uses encryption to allow the exchange of digital symbols in a safe and reliable manner. The most widely accepted crypto currency among traders, which laid the foundation for all Crypto currencies, is Bitcoin, which was created by a group of people.Under pseudonyms Bitcoin is

known as a cash issue that represents a form of electronic money that allows payments to be sent directly from one party to another over the Internet without going through any financial institution, and Bitcoin can only be stored on a computer or smartphone as it has no physical presence., Many believe that the virtual currency was created to seize power from central banks and become a decentralized currency. The crypto currency has been defined by the European Central Bank as a type of digital money issued and controlled by its developers and used by a virtual community. (Lee & Low, 2018, 33) ^[15]. Digital currency works the same as traditional currency but does not have the same features. Digital currency is a form of virtual currency and not all digital currencies are encrypted currencies. They are a subset of digital currencies. In other words, all encrypted currencies are digital currencies, but not all digital currencies are encrypted currencies.

You will serve Crypto currencies Encryption system its own So that I don't yit is counterfeit because it is not issued by a central authority, despite being a strong competitor to traditional currencies. And Precious metals such as gold and silver However, there are supporters of investing in precious metals. Being rare and retaining its financial value and opponents of it due to its price fluctuations (Qarni & Gulzar, 2021, 3) ^[19].

Some have defined it as being closer to financial assets than to currencies due to its characteristics similar to financial assets. Currency Bitcoin is an innovative financial investment tool capable of improving the financial payments system and stimulating digital economy operations. (Al-Bahooth, 2017: 53) ^[2] Or they are digital assets that act as a mediator for trade between individuals without government intervention in supporting them, such as the central bank, for example, which covers the value of traditional currency. The typical currency must fulfill three functions as a mediator of exchange, a unit of account, and a store of value. And with this Bitcoin lacks one of the functions of currency. Traditional Usually The currency of the T Coin is owned by investors and only a few are used in transactions., From this it is clear that it is the closest thing. It is more of an investment instrument than a currency, because it is offered in a manner similar to the initial public offering of shares, the purpose of which is to finance a project. This does not it applies to traditional currencies that have a legal basis guaranteed by the central bank, which is not found in Crypto currencies that are volatile and do not. It represents a commitment to the central bank as it is not central money. It is the closest thing to it is the property of gold that is extracted through mining. Ammous, 2018, 178) ^[9].

The aim of dealing with virtual currencies is to achieve unusual profits because the risk ratio is high, and with regard to digital currencies of central banks, there are many relevant issues related to the subject, such as economic efficiency, financial stability, and the success of monetary policy, because any new payment instrument has special factors for success. It is difficult to determine the period of time it takes for digital payment instruments to surpass cash, and this depends on the specific circumstances of each country. Countries that use a narrow money supply to a large extent need a longer period of time than developed countries that deal with a wider money supply, which need a shorter time to deal with modern digital payment instruments. Also, countries with low interest rates will remain in strong demand for cash because most of the cash

is outside banks, especially when it is used to store value. (Tawfiq, 2022: 33) ^[3]. Therefore, it is necessary to continuously digitize payments because digital innovation enhances the development of e-commerce. Digital transformation contributes to reducing the transaction cost of cash transfers to cover commercial transactions. In recent years, digital assets have moved from the margins of the global economy to the greater adoption of Crypto currencies by the public. So the total value of Crypto currencies exceeded \$4 trillion at the end of 2022, and Bitcoin prices reached their peak of more than \$95,000 per Bitcoin at the end of 2024. However, there are many challenges facing the virtual currency sector, and it will take years to properly organize its own market, as it requires international coordination. and Daily trading volume estimated for 2022 your More than \$275 billion is traded on more than 400 platforms around the world for the two most prominent Crypto currencies in the market, Bitcoin(Bitcoin)And Ethereum (Ethereum)which provided a decentralized system through the system (blockchain) to facilitate transactions Finance encrypted within the environment Economic Digital (Henriques & Sadorsky, 2018, 4) ^[14].

Second: Factors affecting the cost of one unit of Bitcoin:

The reasons for the rise in Bitcoin prices are due to the following objective factors (Essam El-Din, 2014: 65) ^[6]; Badev, Anton, and Matthew Chen (2014) 67) ^[10]:

1. The high cost of physical assets, such as high-speed computers.
2. Existence of Highly skilled person who manages the crypto currency ecosystem.
3. The presence of an integrated electronic system through advanced encryption systems it requires constant updating.
4. Using electronic programs to confront hacking operations or the risk of a virus attack possible.
5. The issuance process New Bitcoin Currency T Request for use quantities High voltage electricity.
6. There is a limited number of new Bitcoin units, as it has been announced that approximately (21) million monetary units will be issued until the year 2040. Charlie Shrem (2019): 56) ^[12]. This increases the cost of one unit.
7. Having a reward system Finance to open new platforms for dealing in Bitcoin.

8. Difficulty in increasing the money supply of Bitcoin for technological reasons (Marek D. & Lukasz J. 2018: 43) ^[17].

It is clear from the above that the reasons for the increase in demand for virtual money during the past few years are due to objective factors and other market factors (the existence of supply and demand forces). (Ismail, 2021: 14) ^[1].

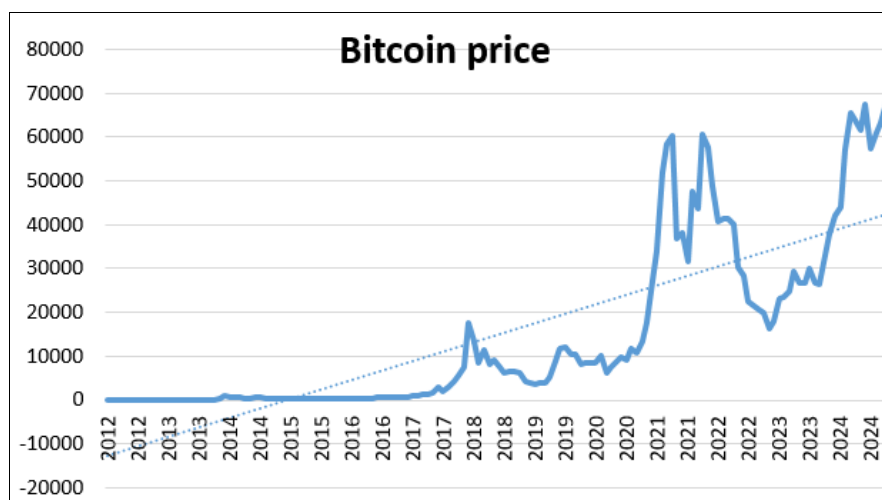
Third: Economic and non-economic factors affecting Bitcoin: First, it can be said that Bitcoin is affected by many factors, including (Al-Issawi, 2024: 65) ^[8]:

Economic factors it is represented by the following

- Monetary policy decisions: Since Bitcoin is a relatively new investment tool, it is affected by rising inflation rates or lower interest rates, which prompts investors to buy this currency as a hedging tool and as a result of traditional currencies losing their real value.
- Fiscal policy decisions: Bitcoin is affected by fiscal policy decisions and legislation, including tax laws and whether or not Crypto currencies should be banned.
- Economic crises and shocks: They may include many indicators, including regional and state conflicts and wars, such as the Russian-Ukrainian war, geopolitical developments, the spread of diseases and epidemics, such as the Corona pandemic, as well as political and media statements. These are called factors of optimism and pessimism.

Section Two: Analysis of the reality of Bitcoin and the factors affecting it

1-Bitcoin price The Bitcoin system was introduced in 2009 and is outside the control of a single government or company, but rather is subject to the control of a decentralized group of users over the Internet, and its movement began to increase over time. (<https://coinmarketcap.com>), as shown in the graph No. (1), especially since June 2015, about 14.2 million Bitcoins were traded, with the total market value reaching about 3.5 billion US dollars, i.e. at an exchange rate estimated at 240 US dollars per Bitcoin, i.e. less than the highest market value of 14 billion US dollars in March 2013, so its value continues to increase continuously, as confirmed by the graph below.



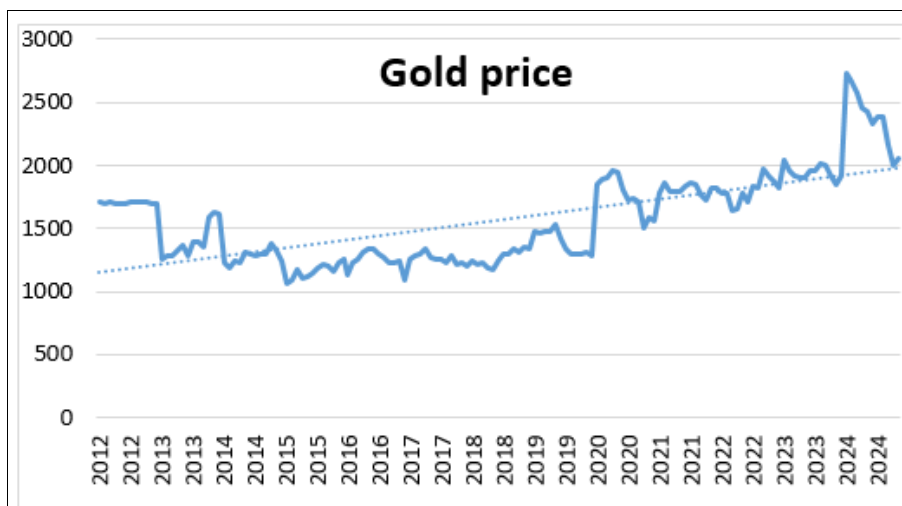
Source: Figure prepared by the researcher and the outputs of the statistical program Excel.

Fig 1: Monthly changes in Bitcoin

The general trend line shows that despite the continuous fluctuation, its value is A Raise it up continuous Compared to what He was TAt first and its circulation The central technological feature of Bitcoin is a global ledger containing its fully executed transactions. The fluctuations in the price of Bitcoin are due to speculation used by large investors who want to achieve unusual profits. They buy large quantities of Bitcoin during periods of low price. In this way, demand for it increases, which leads to a significant increase in the price. After that, they sell it all at once. This helps to lower the price of Bitcoin. Thus, it all depends on the year of expectations. When observing the virtual currency Bitcoin, we find that it is an investment tool very similar to stocks and bonds, i.e. it is a financial instrument and not money because it does not have all the characteristics of money that characterize regular money. Figure (1) it is clear that Bitcoin achieved a significant increase in price during the years 2018-2019, before falling again at the end of 2019. Some economists attribute this to the emergence of the Corona pandemic, and it stabilized somewhat until 2021, during which the price of Bitcoin rose significantly, to continue to rise and fluctuate until the end

of 2022. At the end of 2023, the price of Bitcoin rose rapidly to achieve its highest level in 2024, when its price exceeded \$95,000 per bitcoin.

World price of gold: that Gold price It has a meaning. Widely used in financial markets Global, Where was the gold? no Sass Cash in the system Capitalist For hundreds of years until the gold standard was abolished in the seventies of the last century and through the graphic form()Below it is clear that the price of gold has been constantly increasing during the study period. (<https://sa.investing.com>) The question is, is there a relationship between virtual currencies such as Bitcoin and other assets such as stocks, bonds, and other financial market instruments? It is clear from the theoretical frameworks that there is a weak relationship between them, but the relationship between virtual currencies and gold is a strong relationship, and this is what Figure (2) If it appears, The relationship between them is clear, as the graph is heading in the same direction, i.e. the continuous increase reflects the direct relationship between them. The lower the returns on other financial assets, the greater the trend towards gold and Crypto currencies, which clarifies the direct relationship between them.



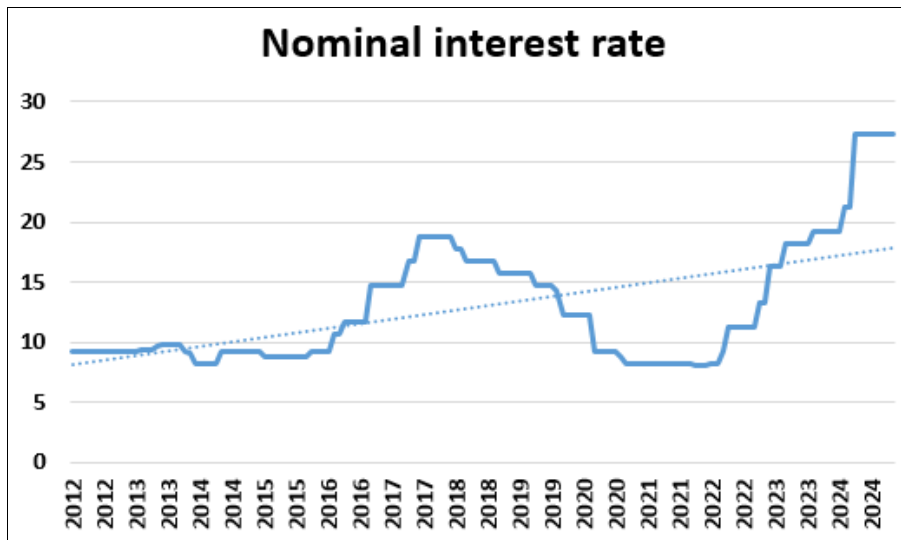
Source: Prepared by the researcher and the outputs of the statistical program Excel.

Fig 2: Monthly changes in global gold prices

The reason is that investors and speculators are turning to them because they are considered a safe haven in light of the crises that the world has been facing since 2012 until now, and the future direction. SIIt is in favor of Bitcoin even if it has witnessed multiple fluctuations, but some countries have announced that they will officially work with it in the near future, such as the United States of America. However, gold has not lost its strength either, especially since there are major companies that have invested in global mining companies, which indicates that gold continues to be the safest asset most of the time, even if its profits are low compared to high-risk investments. The competition between gold and Bitcoin increases when Bitcoin spreads and the demand for it increases and it is adopted by international and local institutions, which makes them a strong competition. Gold is characterized by scarcity and stability and there is an increasing demand for it, while Bitcoin is characterized by high risks, which it makes it

achieve extraordinary profits. Considering that the profits are attractive and the demand for them is increasing, especially with their near-global recognition.

3-interest rate The Federal Reserve: Sharp changes in global interest rates or federal interest rates affect the crypto currency market through their impact on the expectations factor and thus their impact on investor behavior and market movement, as the US Federal Reserve controls the management of the interest rate, which determines the cost of borrowing money. Lowering the interest rate makes borrowing less expensive, which enhances economic liquidity and drives the wheel of consumer and investment spending, thus driving the wheel of the economy and achieving the sustainable development that all countries of the world seek. Also, raising the interest rate reduces borrowing and thus reduces the flow of money in the economy and limits high inflation rates.



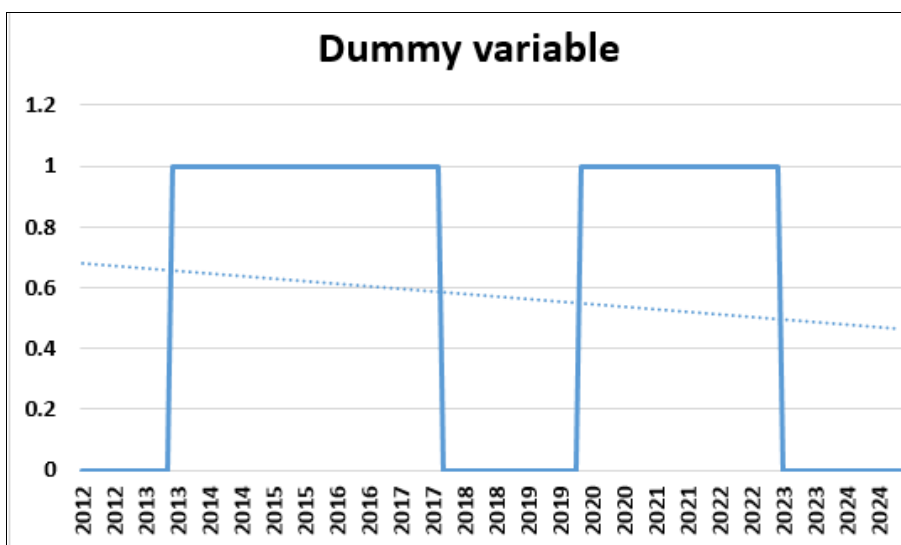
Source: Prepared by the researcher yen and the outputs of the statistical program Excel.

Fig 3: Monthly changes in Federal Reserve interest rates

Through the form (3 It is clear that there is a relationship between the price of Bitcoin and interest rates and even stock and bond prices, as we find that the movement of interest rates moves inversely with the movement of Bitcoin prices, and this is consistent with the logic of economic theory. This happens because the interest rate is a common factor used in pricing assets. When this factor rises, the value of most assets decreases, and vice versa. The same applies to Crypto currencies that are highly volatile. Expediter This is no exception to this effect, especially when interest rates are low, when banks offer low savings rates that are not economically feasible, which pushes investors to look for higher returns in riskier assets that achieve unusual profits, such as investing in Crypto currencies (Bitcoin), which in turn leads to raising Bitcoin prices. In return, the rise in interest rates makes safe assets such as bonds more attractive than high-risk assets such as

Bitcoin. Especially when compared to the prices of crypto currency (Bitcoin), which are highly sensitive to changes in the interest rate environment, and when taking into account historical developments, we will notice their impact more. Despite the clear fluctuations in the graph, the general trend line confirms its continuous rise over time.

4 - Global crises and shocks: Crises and social events can be measured by the dummy variable that is determined by: the Values (0, 1) the occurrence of economic crises such as the economic crisis encourages investors to buy Crypto currencies. The economic crisis in Greece in 2015 was followed by a significant increase in the purchase of Crypto currencies (Bitcoin) by investors and citizens to preserve their wealth from erosion. A global crisis prevailed in the world that continued until 2017. The reason for all this encouraged individuals to move towards investing in crypto currency (Bitcoin), which led to an increase in its price.



Source: Prepared by the researcher by dependence on Statistical program outputs Excel.

Fig 4: Monthly changes in economic crises and shocks

However, the noticeable rise in the price of Bitcoin began with the onset of the Corona pandemic, in light of the economic conditions witnessed by the global financial system and coinciding with the decline in oil prices that

prevailed during 2019, with governments taking precautionary measures to limit the spread of the virus and contain it and many countries closing their borders. These indicators She pointed to The beginning of the economic

recession, investors began in Bitcoin was acquired for fear of the collapse of the dollar, in search of a safe haven for their wealth, which led to a significant increase in the price of Bitcoin, and it continued to increase until it reached a record price estimated at about \$100,000 per Bitcoin.end2024. From the above, it is clear that the virtual currency is not a purely cash currency because it does not have all the functions of money, so it is closer to a financial instrument than to money. Investors and individuals use it for speculation and making profits, like stocks and bonds. Since it is characterized by high risk, it achieves unusual profits whose price is controlled by major investors, as their demand for it increases during periods of low prices. Since it is limited, its price rises until it reaches its peak, then major investors sell it and make unusual profits, so its price drops again, and so on.

Section Three: Measuring the impact of some factors on the price of Bitcoin

The economic indicators have been reviewed. You can and Rich in Bitcoin prices in an unstable economic environment.

First: Description of the standard model

This stage is one of the most important stages in preparing the standard model to obtain the best unbiased estimates, as the economic variables are determined and the type and strength of the tribal economic relations are identified. Accordingly, the explanatory variables can be determined according to the following: the global price of gold, symbolized byx1, the federal interest rate, symbolized by x2, as well as using the dummy variable, which represents crises, economic shocks, wars, armed conflicts, and epidemics that the world may witness from time to time (x3). As for the dependent variable (y): it represents the prices of Bitcoin. At first, we will try to test the data and study some standard methods to obtain the best estimates.

The data description test showed that (Y,X1,X2,X3) It is Not normally distributed according to the test (Jarque-Bera) If the value of this test is significant (0.00), which means that the (OLS) method may be inappropriate and the researcher must choose more appropriate standard methods. However, traditional standard tests and methods will be used to compare them with modern standard methods to obtain standard models that do not suffer from the problem of false regression.

Second: Correlation test: It shows the strength of the correlation between the independent variables and the dependent variable

Table 1: Study of the correlation between economic variables

	Y	X1	X2	X3
Y	1.000000	0.803856	0.594024	0.33536
X1	0.803856	1.000000	0.602293	0.217638
X2	0.594024	0.602293	1.000000	0.161978
X3	0.333536	0.217638	0.161978	1.000000

Source: Prepared by researchers

Table (1) attempts to explain the strength of the relationship between the studied variables, and the following was shown:

- The price of gold (X1) has an 80% correlation with the price of Bitcoin.

- The interest rate is (X2) has a 60% correlation with the price of Bitcoin.
- Crises or shocks (X3) has a 33% correlation with the price of Bitcoin.

Third: Testing causal relationships (Granger) (Khalaf, 2015: 67) [4]: This test examines the nature of causal relationships between economic variables. Table (2) indicates the possibility of the existence of a trend. Causal relationship between global gold prices (X1) and interest rate(X2) with Bitcoin price (Y), it is statistically acceptable as it appeared to have a significant value. (0.00 and 0.02) This is consistent with the alternative hypothesis, while the variable (X3) the null hypothesis can be accepted, which confirms that there is no causal relationship between the two variables (X3, Y).This is economically unacceptable.

Table 2: The causal relationship between economic variables

Parirwise granger causality tests			
Date: 02/13/25 time: 18:56			
Sample: 2012 M01 2024 M12			
Legs: 2			
Null Hypothesis	Obs	F-Statistic	Prob
X1 does not Granger Cause Y	154	6.36605	0.0022
Y does not Granger Cause X1		3.61486	0.0293
X2 does not Granger Cause Y	154	5.49083	0.0230
Y does not Granger Cause X2		4.64617	0.0110
X3 does not Granger Cause Y	154	0.44167	0.6438
Y does not Granger Cause X3		0.04146	0.9594
X2 does not Granger Cause X1	154	3.39238	0.0362
X1 does not Granger Cause X2		0.66681	0.5149
X3 does not Granger Cause X1	154	2.97502	0.0541
X1 does not Granger Cause X3		0.27902	0.7569
X3 does not Granger Cause X2	154	2.95428	0.0552
X2 does not Granger Cause X3		0.71194	0.4924

Source: Prepared by researcher yen Based on the statistical program E views 12

Third: Measuring the functional relationship using the usual least squares method (OLS):

Estimating the standard model using the multiple linear regression equation Regression equations can be estimated to reveal the nature of the functional relationships between economic variables and we note from equation (1, 2, 3) The following:

- The higher the price of gold, the higher the value of Bitcoin. Big.
- The higher the interest rate, the higher the price of Bitcoin and pennies. for High quality
- And whenever Increased T happened Economic crises have led to a significant rise in Bitcoin prices.
- And the constant limit (c) Which has a negative value to Presence of automatic factors T Influence on Bitcoin price.
- And the equivalent indicates at Multiple regression to:-

$$Y = -49263.18 + 35.89x1 + 1783.42 x2 + 7146.93 x3 \quad (1)$$

$$Y = - 54577.81+41.14x1+7383.7 x3 \quad (2)$$

$$Y = - 2494.78 +6008.53 x2 + 10809.66 x3 \quad (3)$$

Table 3: Equation (1) Multiple Linear Regression

Dependent variable: Y Method: least Squares Date: 02/13/25 18:48 Sample :2012 M01 2024 M12 Included observation: 156				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4926.18	4378.112	-11.25215	0.0000
X1	35.89568	3.069243	11.69529	0.0000
X2	1783.424	613.6243	2.906377	0.0042
X3	7146.937	2054.469	3.478727	0.0007
R-squared		0.689821	Mean dependent var	15530.76
Adjusted R-squared		0.683699	S.D. dependent var	20653.72
S.E. of regression		11615.78	Akaike info criterion	21.58342
Sum squared resid		2.05E+10	Schwarz criterion	21.66163
Log likelihood		-1679.507	Hannan-Quinn Criter	21.61519
F-statistic		112.6800	Durbin-watson stat	0.261409
Prob (F-statistic)		0.000000		

Source: Prepared by researcher yen Based on the statistical program E views 12

Statistical analysis of multiple regression equations

The table shows (4) Results Tests Statistics Which turns out to be statistically acceptable in the estimated standard models. But what Y Note the increase in the value of the

standard (AIC) which is T Statistical and standard tests must be carefully examined to obtain the best capabilities. Unbiased.

Table 4: Results of standard models estimated by the (Method OLS)

Models	Coefficient of determinationR2	Morale of parameters	a test F	a test Akaike
OLS (1)	0.69	X2=0.00 X3=0.00 X4=0.00	0.00	21.69
OLS (3)	0.67	X2=0.00 X4=0.00	0.00	21.62
OLS (4)	0.41	X3=0.00 X4=0.00	0.00	22.21

Source: Prepared by researcher yen Based on the estimated standard models

Regression equation with general trend (Trend) (Al-Sawa'i, 2013: 78) [5]: Table (5) to the possibility of a general trend case (Trend)

among the economic variables under study, as the value of this test was statistically significant (0.00).

Table 5: General trend equation (Trend)

Dependent variable: Y Method: least Squares Date: 02/13/25 18:53 Sample :2012 M01 2024 M12 Included observation: 156				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-44093.66	3781.439	-11.66055	0.0000
X1	26.46259	2.881842	9.182526	0.0000
X2	-1481.663	672.0166	-2.204802	0.0290
X3	412.8247	672.0166	0.211402	0.8329
@Trend	259.7036	33.70375	7.705481	0.0000
R-squared		0.777364	Mean dependent var	15530.76
Adjusted R-squared		0.771466	S.D. dependent var	20653.72
S.E. of regression		9873.560	Akaike info criterion	21.26464
Sum squared resid		1.47E + 10	Schwarz criterion	21.36239
Log likelihood		1653.642	Hannan-Quinn Criter	21.30434
F-statistic		131.8090	Durbin-watson stat	0.300076
Prob (F-statistic)		0.000000		

Source: Prepared by researcher yen Based on the statistical program E views 12

Analyze the results of the multiple regression equation using the method. (OLS)

Economic standard: From the above, we note the stability of the type of functional relationship between the economic

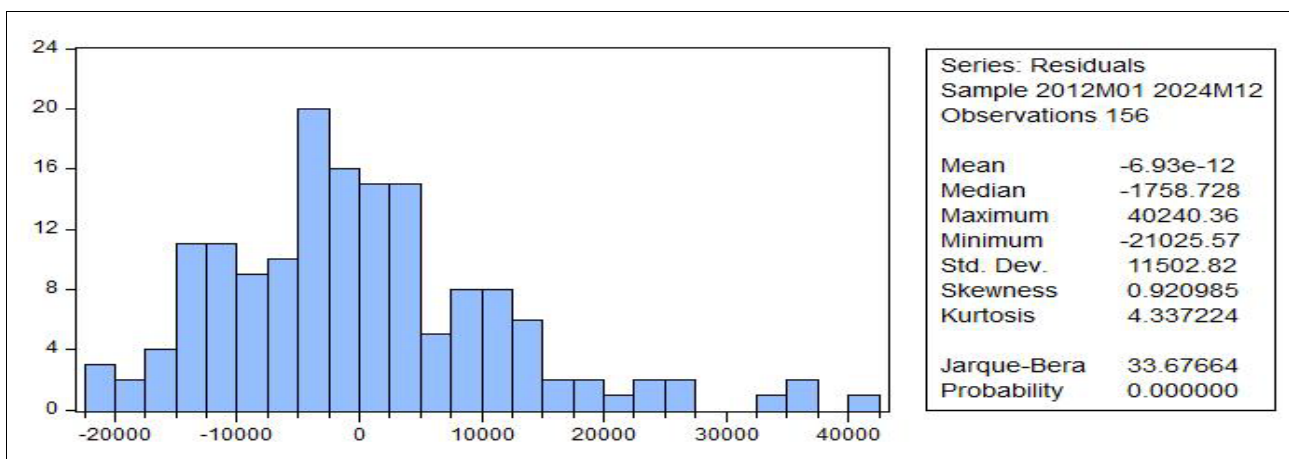
variables under study, but what interestingly, the values of the estimated parameters are clearly increased in equations (1), (2) and (3), as well as the significance of the parameters. We also note that the higher the values of the

variable, the higher the independent variable increased in value (y) represented by Bitcoin prices, respectively, and according to the regression equations, but the reality implicitly indicates that reducing the federal interest rate opens the way for an increase in the prices of virtual currencies. Including Bitcoin as a new investment tool

Statistical standard: Statistical tests showed that the estimated standard models were statistically acceptable according to the tests (t) (R2) and (F), and the table (4) shows that the coefficient of determination (R2) had values of (0.69), (0.67) and (0.41) respectively, which indicates that the independent variables were able to explain the changes that occurred in the dependent variable at a statistically acceptable rate. What confirms what we are saying is the overall significance of the (F) test, as it had a significant significance of (0.00) in all standard models.

Standard Criterion: It can be noted that the use of the regression equation in the case of the presence of a general trend (Trend) A modest attempt to reveal the extent of spurious regression. (Atiya, 2005, 320) [7] We note from the table (4) the variable parameter (Trend) was significant. And I reached (0.00) which is less than (0.05) according to the (t) test, which indicates the possibility of the existence of unreal or spurious relationships.

This is confirmed by the fact that the estimated standard model suffers from some standard problems, including the problem of autocorrelation and heterogeneity of variance, as the test values were significant.0.00) and (0.00), as well as the problem of non-normal distribution of the random variable (ei) in the multiple regression equation (1), and we note from Shape (5) The attached table The test (JB) has a significant value, which indicates that the random variable is not normally distributed, as the test value is significant (0.00).



Source: Prepared by researcher yen Based on the statistical program E views 12

Shape 5: Normal distribution test (Jarque-Bera)

Fourth: Using the autoregressive method with slowed gaps

Testing the stability of time series: The test is (Unit Root Test) is one of the basic tests to detect the stability of a time series. A time series is stable if it meets certain conditions, including (stability of its average over time and stability of

variance over time), which indicates the stability of the time series.

Testing the stationarity of time series is important because it helps researchers determine the appropriate statistical methods. (NARDL, ARDL or others) and thus avoid the problem of spurious regression (Khalaf, 2015: 76) [4].

Table 6: Results of stability tests Philips Perron (PP) at Level

Result	Prob	pp t	p.pc	VARBEL
NO.st	0.99	2.88	0.68	Bitcoin price (Y) with (c)
NO.st	0.97	2.88	0.22	The price of gold worldwidex1) With (c)
NO.st	0.74	2.88	1.02	interest rate (X2) With (c)

Source: Prepared by researcher yen According to the program. 12 E views

Based on the above, the variables were tested (x1,x2,y)With the presence of The limit is constant (Constant)According to the Phillips-Perron test It is clear from the table (6All the economic variables under study are not stable at the level of (Level) according to the Phillips-Perron test (PP), and the calculated values (P.PC) are less than their counterparts, the tabulated values (P. Pt), so the tests appeared insignificant for all variables. As for the table (7) It shows the stability of the time series after taking the first differences, as we notice that the time series (of the studied variables) are stable at the first difference and have a significant significance and reached (0.00) according to the (PP) tests, which implicitly means that these series are integrated of the first degree I (1)

for all economic variables., and models can be used (ARDL).

Table 7: Results of the Phillips-Perron tests (pp) for the first difference with the presence of the fixed term

Co integration	Result	Prob	pp t	pp c	wearable
I(1)	sta	0.00	2.88	11.00	Bitcoin price (Y)
I(1)	sta	0.00	2.88	13.80	Gold price (X1)
I(1)	sta	0.00	2.88	12.32	interest rate (X2)

Source: Prepared by researcher yen, Based on the statistical program E views 12

Sixth: Test (Co integration Test)

First, it can be said that economic theory assumes the existence of long-term equilibrium relationships between economic variables in the light of short-term imbalances, and there are economic and non-economic forces that have a positive impact and correct these imbalances through slow dynamic behavior towards equilibrium in the long term. Based on the above, models can be used (ARDL), for the following reasons: It is compatible with small samples and is used in the case of two or more variables and is not affected by the difference in the degree of joint integration I

(0) and I (1), in addition to the possibility of measuring the (Error Correlation Model).

Seventh: Model (ECM): The error correction model is one of the standard methods adopted in economic studies because it examines both short-term and long-term relationships, in addition to measuring the speed of adaptation to reach the equilibrium position in the long term. The study reached an estimate of (ARDL) and the Error Correction Model (ECM), according to the following two formulas:

Table 8: Error correction models (ECM) and its statistical tests

Model	F-Bounds t.	Ft	R2	Coint- Eq	Akaike
$y = -10185.4 + 75.05X_1 - 1505.55X_2 + 1350X_3$	3.93	2.79 3.67	0.96	-0.06 (0.0)	19.68
$\ln(y) = 3.12 + 0.05 X_1 - 0.55X_2 + 0.28X_3$	4.85	2.79 3.67	0.99	-0.01 (0.0)	0.09

Source: Prepared by researcher yen Based on the statistical program E views 12

Table (8) indicates relative stability in the type of functional relationships between economic variables, as we note that global gold prices and the variable of economic crises are directly related to the price of gold, as the higher the price of gold, the higher the price of Bitcoin, and the more severe the global crises and shocks, such as the Russian-Ukrainian war and the Corona pandemic. This led to Rise I know the value of Bitcoin, as for the Federal Interest Rate only, is inversely related to the value of Bitcoin. Whenever the US Federal Reserve lowers the interest rate, the prices of Crypto currencies, including Bitcoin, increase in global markets as an investment tool.

Statistical tests can be observed (F-Bounds Test) so It reached (3.93) and (4.85) which is greater than the critical values (F), which means that there is joint integration in the first and second estimated models, and that the coefficient of determination is statistically acceptable and its value in the first model reached (0.96) and in the second model (0.99), which gives explanatory power to the standard model in explaining the changes that occur in the dependent variable as a result of changes in the independent variables. Also, the adaptation speed (Coint Eq (-1)) is statistically acceptable as it reached (0.06) and (0.01) in the first model and has negative values and has significant values (0.00), which indicates that the time period for the transition from the short term to the long term takes (1.3) year In the first standard model and (8.3) Years In the second standard model, it must be emphasized that the second standard model has an advantage over the first model for many reasons, the first of which is that the explanatory power reached (0.99) Also, the statistical information criteria (AIC) had small values and may approach zero (0.09), which gives it an advantage over the first standard model. Separately, probability the estimated standard model is free from some standard problems.

Eighth: Tests (Goodness of Fit)

To estimate the parameters of the standard model and determine the nature of the relationship between economic

variables in the short and long term, it is necessary to ensure that the model is free of standard problems, which requires conducting some statistical tests, which are as follows:

1- a test (LM test) It is clear from the results of the table (9) The value Morale To test (-stat F) reached (0.11) and it is not significant and is greater than (0.05), which means accepting the null hypothesis, which states that the standard model does not suffer from the problem of autocorrelation. Also in the table (10) valueMoraleI reached (0.50) for the second standard model.

Table 9: Autocorrelation test for the first standard model

Breusch-Godfrey serial correlation LM test			
F-statistic	2.171124	Prob. F(2,142)	0.1178
Obs* R-squared	4.510125	Prob. Chi-Square (2)	0.1049

Source: Prepared by researcher yen

Table 10: Autocorrelation test for the second standard model

Breusch-Godfrey serial correlation LM test			
F-statistic	0682824	Prob. F(2,146)	0.5068
Obs* R-squared	1.427129	Prob. Chi-Square (2)	0.4899

Source: Prepared by researcher yen

2-A test Multicollinearity problem: It is clara test (VIF) Ban Variables under consideration Search no TI suffer from the problem of multicollinearity because the value of (VIF) less than (10) in all economic variables This means that there is no problem of multicollinearity.

3- Structural stability test of the remains: to ensure the structural stability of the growth to determine the consistency of the long-term parameter estimates with the short-term parameter estimates, and to show that the estimated standard model is free of any structural changes. Possible the test was used (Cusum of Sq.), and through the form (6) and (7) It is found that the two standard models are structurally stable:

- Cumulative sum of squares of residuals test (Cusum of Sq.) The first equation:

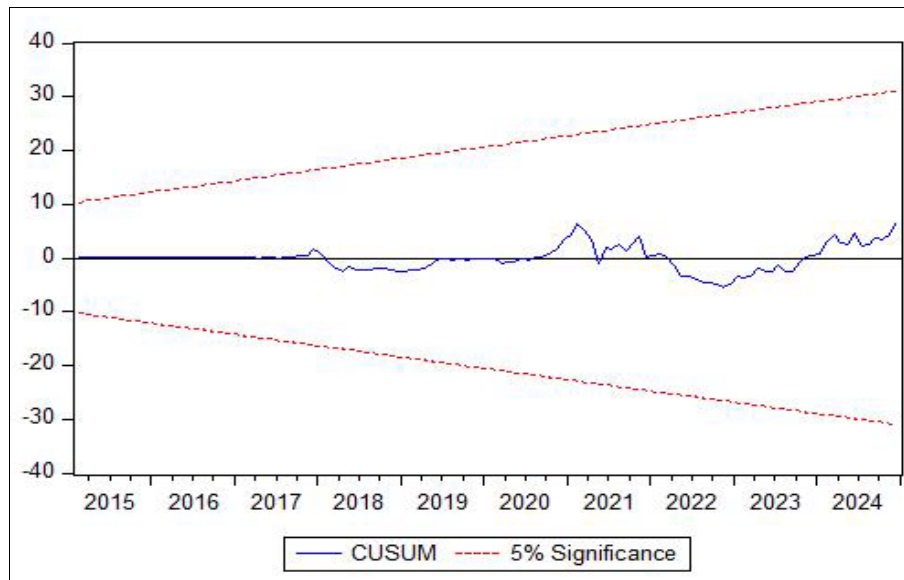
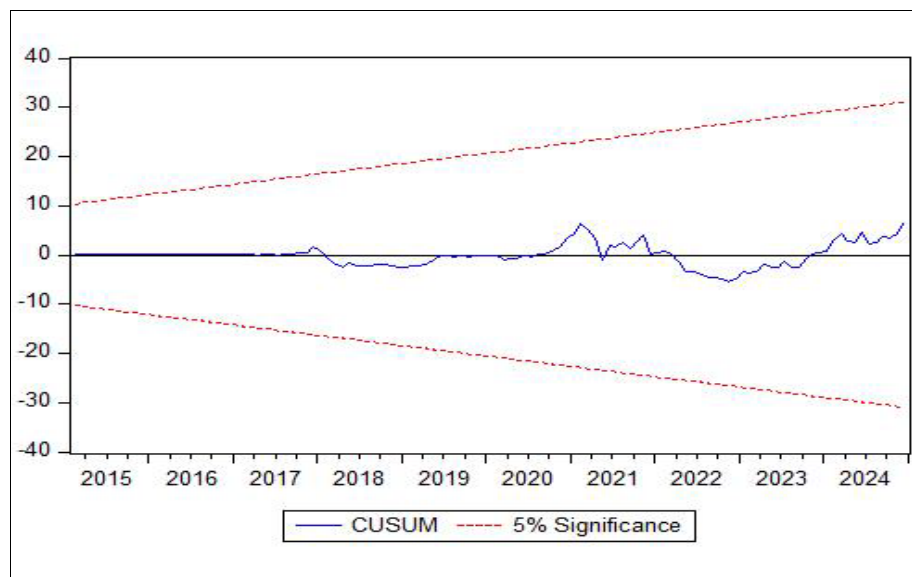


Fig 6: Cumulative sum test of the residuals of the model the first

Cumulative sum of squares of residuals test (Cusum of Sq.) The second equation



Source: Prepared by researcher yen.

Fig 7: Cumulative sum test of the residuals for the second model

Seventh: Analysis of test results and standard methods Use the method (OLS)

It is clear from the above, there are false relationships between the economic variables studied under study according to the standard models estimated using the (OLS) we notice the stability of the functional relationship between the interest rate and the price of Bitcoin. The results are almost biased. The following notes can be installed:

- An increase in the values of the estimated parameters as well as an increase in the significance of the parameters.
- Relative increase in the information standard (AIC).
- There are some standard problems including autocorrelation and heteroscedasticity.
- Many studies indicate the weakness of the parameters of the method (OLS) under non-stationarity of time series.

Use the form (ARDL): The use of the standard method (ARDL) may lead to avoiding spurious regression, for many reasons, including the high value of the coefficient of determination with a low value of the Akaike criterion, in addition to the model being free of standard problems.

Analysis of the results of the nature of economic relations: From the above, we note that the models (ARDL) refers to the following:

- The relationship between the global price of gold and the price of Bitcoin is a direct relationship, as each of them is an investment asset. This is due to some common factors that link them. Each of them is a safe haven to confront global crises or when inflation rates rise, in addition to the relative scarcity that they enjoy.
- The relationship between the Federal Reserve interest rate and the price of Bitcoin is an inverse relationship. As is known, Bitcoin is a high-risk investment asset and is affected by the amount of cash liquidity. For

example, when interest rates are lowered, we notice that the amount of cash level increases in global markets, which means a weakness in the value of the dollar and some other currencies, which makes investors look for physical assets with high financial returns, in addition to hedging against the decline in the real value of paper currencies.

- The relationship between economic crises and Bitcoin is a direct relationship with economic and non-economic crises. Bitcoin is directly affected by global crises, including the Russian-Ukrainian war, the Corona pandemic, and the statements of the US President. All of these factors have a clear impact on the prices of Crypto currencies.

Conclusions

- A Search for existence Fluctuations Sharpen Bitcoin prices During the study period (2024 - 2012), but what is striking is the sharp rise in its prices during the Corona pandemic and after it, as well as at the end of 2024 with Trump assuming the presidency of the United States of America.
- Presence joint integration between economic variables and Bitcoin prices, and it was shown through the error correction model that there is relationship Direct relationship between (gold prices and global crises or shocks) and Between changes Especially in price Bitcoin, as well as the inverse relationship between Bitcoin and the global interest rate.
- -Using the standard experimental method and comparing standard models allows the researcher to obtain the best standard models estimated for different economic phenomena, which reduces the possibility of the emergence of some false relationships or misleading results.

Suggestions

- In spite of Extreme fluctuations in prices Bitcoin is a relatively new investment management that is in line with the trends of the electronic economy and the digital economy, which makes the global demand for it large. Therefore, we propose holding an international conference similar to previous international financial agreements to lay the foundations for a new phase of the global financial system to confront the risks of sharp fluctuations in the prices of Crypto currencies, including Bitcoin, and their negative effects on investment portfolios, and the serious effects on global currency exchange.
- I present this modest research paper and invite my fellow researchers to use it. Standard experimental method who may Contributes In finding the best unbiased estimates by verifying and comparing the estimated standard models, to avoid what is known for false regression.

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