The Role of Emerging Futures Contracts in Supporting the Price Trend of BITCOIN - An Empirical Study for the Period (2017–2024) -

دور عقود المستقبليات المستجدة في دعم التوجه السعري لعملة BITCOIN

- دراسة قياسية خلال الفترة (2017-2024) -

Bounaas Chaima[*] 1
Chadli Bendjedid University, Algeria
E-mail (bounaas-chaima@univ-eltarf.dz)

Toumi Soumaya 2
Chadli Bendjedid University, Algeria,
E-mail (toumi-soumaya@univ-eltarf.dz)

Received: 28/06/2025; Revised: **Accepted: 30/09/2025**

Abstract:

This study aims to shed light on Bitcoin futures contracts and their role in influencing the price trend of the currency.

Therefore, the price trend of Bitcoin futures contracts and Bitcoin prices during the period (2017–2024) on the MCE exchange was studied using the ARDL model. The study concluded that trading Bitcoin futures contracts supports the price trend of the currency in the short term, regardless of the direction of movement. Additionally, a non-primary transfer of the effect of Bitcoin futures prices on the currency was observed in the long term on the MCE exchange. It was also concluded that the valuation of Bitcoin futures contracts has a varying impact on the pricing system of the Bitcoin currency with reference to the role of several other driving factors.

Keywords: Cryptocurrencies, Prices, Bitcoin, Bitcoin Futures Contracts, MCE Exchange.

Jel Classification Codes : C1 ; G2 ; F 3.

الملخص:

تهدف هذه الدراسة إلى تسليط الضوء على عقود المستقبليات لعملة البيتكوين ودورها في التأثير على التوجه السعري للعملة. لذلك تم دراسة التوجه السعري لعقود المستقبليات على البيتكوين وأسعار البيتكوين خلال فترة (2017-2024) في بورصة MCE بإستخدام نموذج ARDL، و خلصت الدراسة إلى أن تداول عقود مستقبليات البيتكوين تدعم التوجه السعري للعملة على المدى القصير، أيا كانت حركة المسار ، بالاضافة إلى رصد إنتقال تأثير غير رئيسي لأسعار عقود المستقبليات للبيتكوين على العملة في المدى الطويل في بورصة MCE. كما تم إستخلاص أن تقييم

[*] **Correspondent author, Bounaas Chaima, bounaas-chaima@univ-eltarf.dz**

عقود مستقبليات البيتكوين لديها تأثير متفاوت المدى على المنظومة السعرية لعملة bitcoin، مع الاشارة إلى دور عدد من العوامل الدافعة الأخرى.

الكلمات المفتاحية: عملات مشفرة، أسعار، بيتكوين، عقود مستقبليات البيتكوين، بورصة MCE.

تصنيف JEL : C1؛ **G2** ؛ **F 3**.

1. INTRODUCTION:

Cryptocurrencies are considered one of the outputs of financial technology, which has witnessed significant popularity in less than two decades. During this period, Bitcoin has played a fundamental role in representing this type of currency and has prominently and continuously dominated the cryptocurrency market. To meet the needs of users dealing with these currencies, a diverse package of derivatives linked to them has been introduced, through which Bitcoin has gained priority in the diversification of derivatives based on it. Within the framework of these developments, Bitcoin futures contracts emerged on the American MCE exchange as a new derivative in a regulated market that noticeably seeks to develop and attract participants. Based on the above, the following main question can be raised:

- **To what extent do Bitcoin futures contracts support the price trend of the currency?**

1.1. Importance of the Study:

The importance of the study lies in the novelty of these products, which are witnessing rapid development compared to traditional products. They have come to reflect a phenomenon influencing the structure of cash payments at the present stage through their decentralized nature, which heavily relies on encryption. In addition, the innovation of derivative markets based on these unconventional assets necessitates a study of these recent developments, which are newly emerged and represent the latest efforts of the current financial industry to develop in a way that sheds light on future transformations in this field that has begun to attract many participants.

1.2. Research Methodology:

This topic was addressed using the descriptive analytical method to review and analyze the nature of cryptocurrencies and to determine the price trend of the benchmark currency, Bitcoin, in the cryptocurrency market, while highlighting the role of the financial derivatives market for Bitcoin in influencing the pricing system of this dominant currency. Using the

statistical method, Bitcoin futures contracts on the MCE exchange were used as evidence.

1.3. Study Hypotheses:

Main Hypothesis:

This study proceeds from the following main hypotheses:

- **The prices of Bitcoin futures contracts have a varying impact on the pricing system of the Bitcoin currency**

The following sub- hypotheses fall under this main hypothesis:

- Trading Bitcoin futures contracts supports the price trend of the currency in the short term, regardless of the direction of movement.
- The price movement of Bitcoin futures contracts gives a primary impact on the value of the currency that extends into the long term.

1.4 . Objectives of the Study:

- To highlight the attractiveness of cryptocurrencies in modern finance.
- To define the nature of derivative contracts on Bitcoin.
- To study the effect of futures contract prices on the Bitcoin currency in the MCE exchange.

1.5. Study Structure:

The research was divided into the following sections:

- Theoretical Part: Cryptocurrencies and emerging derivatives in financial crypto markets
- Empirical Part: An empirical study on the Bitcoin currency and its futures contracts on the MCE exchange during the period (2017–2024)

2. Theoretical Part: Cryptocurrencies and Emerging Derivatives in Financial Crypto Markets:

2.1. Digital Currencies and Central Banks:

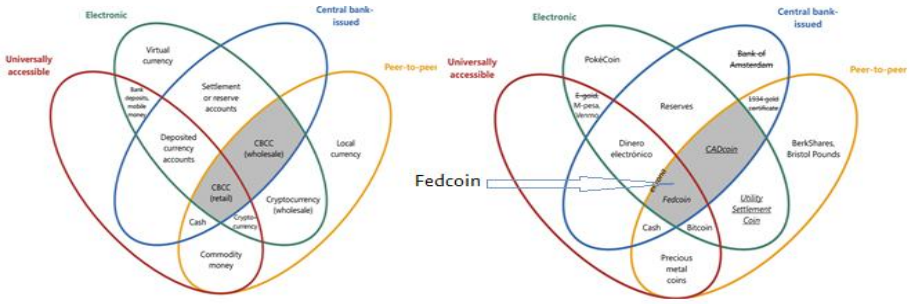
Digital currencies are usually defined as a new form of money issued by central banks, where central banks already provide digital cash in the form of reserves or settlement account balances held by commercial banks and some other financial institutions at central banks (Islamic Development Bank, 2022, p. 106).

2.1.1. Cryptocurrencies:

Cryptocurrencies are commonly known as "crypto-assets," and they are virtual digital assets based on blockchain technology through a decentralized ledger and an encrypted informational protocol. Their values are determined based on supply and demand, unlike other currencies that rely on many traditional criteria (Direction de la communicaon de l'AMF, 2020, p. 1).

The following chart, called "The Money Flower" and used by the Bank for International Settlements, allows for identifying the position of cryptocurrencies among other types of currencies.

Figure No. (01): The Money Flower



Source: (Morten Bech ;Rodney Garratt, 2017, pp. 60-61)

The Money Flower brings together forms of money from the past to the present and possibly the future. We find that the emergence of competing external (crypto) money seeks to be an alternative form to sovereign currency. To confront this competition, there has been a proposal to introduce Fedcoin, which involves the central bank creating its own cryptocurrency. It could be converted bidirectionally (with the US dollar), with the proposed management of the conversion by the Federal Reserve. However, this has not been adopted as of the current stage (Morten Bech ;Rodney Garratt, 2017, p. 61).

2.1.2. Centralization and Decentralization of Cryptocurrencies:

The distinction between centralized and decentralized currencies is of great importance. Although there exists a structure in cryptocurrencies that is characterized by centralization—for example, blockchains that behave like a single computer distributed identically across all nodes of the network some

contracts are decentralized in their components because they are managed by algorithms and smart contracts (Valence, 2019, p. 292).

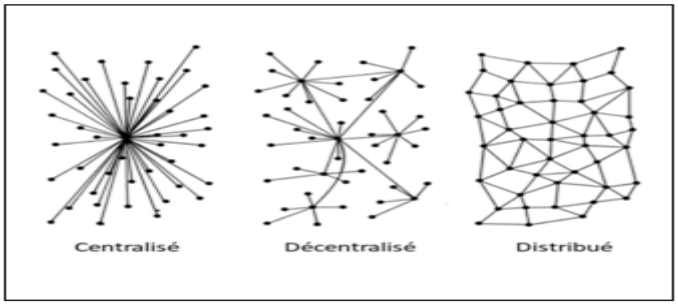
Decentralized virtual currencies, including cryptocurrencies, rely on decentralized issuance and control, ensured by a peer-to-peer network structure (Thibaud Guillebon, 2024, p. 26).

When identifying the position of cryptocurrencies in the overall monetary system, they appear decentralized in comparison to their traditional counterparts. They intersect harmoniously with existing monetary systems, which are subject to the sovereignty of central banks and regulated by banks. In contrast, in the cryptocurrency system, transaction proposals and verifications can be made by all users.

In this regard, many people consider the decentralized system a source of financial robustness and more resistant to cyberattacks. However, reconciling complete decentralization with absolute cybersecurity is not simple. This explains the complex structure of this system, which relies on interwoven procedures to verify the integrity and aggregation of digital data—making the process difficult and intensifying the work carried out amid numerous sources of employed resources.

This currently renders the system incapable of handling the increasing volume of transactions. Therefore, data is currently being processed in new modes of active research or within new network structures (Jean-Pierre Landau ,Alban Genais, 2018, p. 15).

Figure No. (02): Centralization and decentralization of networks



Source: (Jean-Pierre Landau ,Alban Genais, 2018, p. 15)

2.2. Blockchain and Cryptocurrencies:

The emergence of the role of technology in providing blockchain technology came as a result of the significant increase in the value of Bitcoin during the tracking of mathematical algorithms related to behavioral

trends in cryptocurrencies. An analysis of the scores on the Blockchain Readiness Index (Laurent Probst, 2019, p. 42) reveals that the blocks storing transactions are usually time-stamped and encrypted, and they are copied across multiple locations so they cannot be altered (Farouk, 2023, p. 80).

Research indicates the existence of a dynamic relationship in which signals and trends derived from the uses of the digital network and the resulting interactions among users contribute to the increase in the value of the cryptocurrency Bitcoin, which often ranks as the highest-valued cryptocurrency—"more than 800 cryptocurrencies are traded across 4,800 cryptocurrency markets" (Laurent Probst, 2019, p. 42).

2.3. The Emergence of Bitcoin

Bitcoin, with the symbol B, is a cryptocurrency created by Satoshi Nakamoto. Its protocols were published in 2008 during the mortgage crisis on a website specialized in encryption. Its first release was on January 3, 2009. It was traded through payments in Bitcoin (BTC), which represent the digital units transferred via the Bitcoin network (William Bisol, 2016, p. 10).

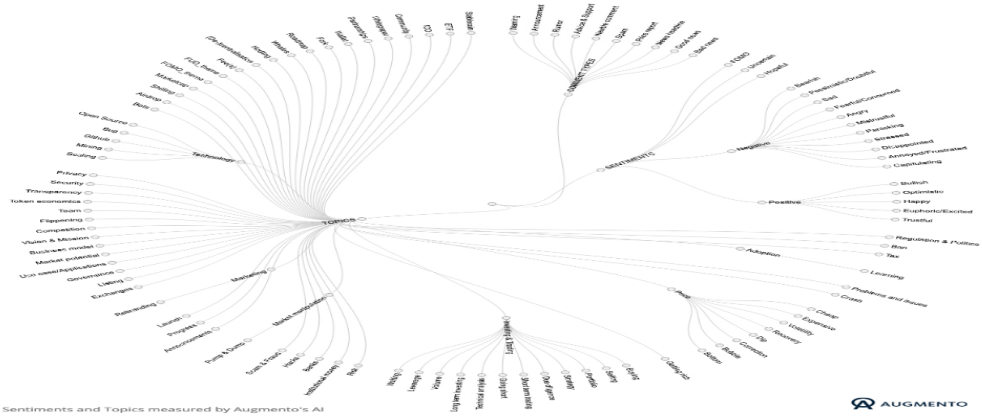
2.4. Bitcoin Sentiment

The dynamic nature of cryptocurrencies provides the market with significant profit opportunities, as the value of digital assets is influenced by many variables, including market sentiment. This sentiment reflects emotions, opinions, and perspectives regarding cryptocurrencies and everything related to them. It highlights the prevailing attitudes in the crypto world, as sentiment represents the general stance toward digital assets or sectors. Cryptocurrency markets rise and fall in response to people's ideas and moods. Sentiment assesses the collective psychology of investors and traders and is represented through specific indicators such as the Bitcoin Fear and Greed Index (Bitmarkets, 2025).

In this regard, Augmento allows for the use of artificial intelligence to analyze conversations related to cryptocurrencies from Twitter, Reddit, and Bitcointalk. Using a classifier trained on specific crypto language, the data is analyzed according to 93 sentiments and topics. This method enables the generation of stable data suitable for testing. For this index, a combination of these sentiments is used to create a score that reflects whether people on crypto social media are exhibiting optimistic or pessimistic sentiments,

which reflect bearish or bullish trends in Bitcoin prices. The figure below illustrates the elements that make up this index.

Figure No. (03): Sentiments and topics about Bitcoin measured by Augmento's AI Sentiment and topics measured by Augmento's AI



Source: (Bull & Bear Index, 2024)

The AI is trained to construct this index, using a hybrid approach (machine learning and linguistic analysis) to ensure the highest possible accuracy. While traditional sentiment analysis can only distinguish between positive and negative sentiments, Augmento's AI can identify and measure the full spectrum of user psychology concerning cryptocurrencies (Augmento, 2024, p. 3).

In this regard, the study by Naeem. Al et (2021) indicated that the predictive ability of investor happiness sentiment online regarding the returns of major cryptocurrencies significantly affects Bitcoin returns, as well as returns from other major cryptocurrencies in cases where the market experiences high surges (David Bourghelle et al, 2025, p. 6).

2.5. Financial Derivatives Contracts on Crypto Assets

Over the past few years, the volume, coverage, and diversity of contracts have continuously increased in cryptocurrency markets, as the financial derivatives industry has become a structurally decisive force in these markets. It continues to expand with new products. Although crypto derivatives represent a newly emerging category, they possess many of the same characteristics as the original cryptocurrencies. These derivatives can be traded on centralized exchanges, and even on decentralized exchanges (due to blockchain technology).

Although the decentralized derivatives market is considered a safer and more transparent alternative to its centralized counterpart, it remains significantly smaller in comparison to the centralized derivatives market (Ming Shi et autres, 2024, p. 3). According to a research paper published in December 2021 by the International Swaps and Derivatives Association (ISDA®), the trading volume of digital asset derivatives is regularly higher than the trading volume of spot digital asset markets.

Digital asset derivatives can be traded on cryptocurrency exchanges (such as Coinbase or Binance), or on traditional exchanges like CME. Some digital asset derivatives traded on the exchange (traded on CME) are also settled through a clearinghouse (Robyn Llewellyn, Mayer Brown, 2024, p. 1). There are many different types of cryptocurrency derivatives and market products in regulated markets. The following are the main categories:

2.5.1. Cryptocurrency Futures Contracts

Cryptocurrency futures contracts are linked to the underlying asset, which is the cryptocurrency. There are two different types of futures contracts known as inverse futures contracts and non-inverse futures contracts, which are also referred to as vanilla futures contracts. Vanilla futures contracts operate in exactly the same way as in traditional finance, where profit and loss are paid in the derivative currency. Inverse futures contracts are designed to eliminate the need to hold any fiat or stable currency on the platform.

2.5.2. Options Contracts on Cryptocurrencies

Cryptocurrency options are emerging and relatively simple at this stage of development. Over the coming years, more complex cryptocurrency options structures may appear in addition to the existing option structures (coinbase, 2025).

2.6. Derivatives Contracts on Bitcoin

2.6.1. Bitcoin Futures Contracts

In December 2017, the Chicago Mercantile Exchange and the Chicago Board of Trade launched Bitcoin futures contracts, similar to other futures contracts, under the rationale that these contracts would provide greater price transparency and a tool for managing Bitcoin risk, using daily data collected from multiple sources.

2.6.2. Micro Bitcoin Futures Contracts

With the continued growing interest in Bitcoin and its adoption by many participants in the cryptocurrency market, a new trading strategy was introduced to facilitate market access and flexible risk management suitable for low-income earners: Micro Bitcoin futures contracts. The CME Group launched the Micro Bitcoin futures contract, which is a smaller contract than the standard futures contract. The advantage of these small contracts is that they offer the same features as the standard contract with lower capital requirements. While the typical Bitcoin futures contract is equivalent to 5 Bitcoins, the Micro Bitcoin futures contract is equivalent to one-tenth of a Bitcoin, making it a small contract sized at 1/50 the size of the larger Bitcoin contracts. It gives the contract holder greater flexibility and precision in managing their financial position as market conditions change, using these contracts that offer better access to liquidity (CME GROUP, 2025).

For example, open contracts (MBT1!) are held by traders in active positions that are neither closed nor expired. They allow tracking of the prevailing market trend and strategic adjustment. A decrease in open interest for MBT1! indicates that traders are closing their positions, which means a weakening market trend (Bitcoin, 2025).

3. Empirical Part: An Empirical Study on Bitcoin and Its Futures Contracts on the CME Exchange During the Period (2017–2024)

The empirical study sheds light on the nature of the pattern followed by the weekly price trends of both Bitcoin and its futures prices on the CME exchange during the specified period (2017–2024), evaluated in US dollars. Bitcoin was chosen as it is the most important and dominant cryptocurrency in the market, which allows it to provide strong indications about other currencies. The futures market for Bitcoin on the CME exchange was selected as it is the largest among the regulated exchanges, in order to derive a number of conclusions about each.

3.1. Tools and Tests of the Study

The ARDL model was applied to the financial values of both Bitcoin futures contracts and Bitcoin during the study period to determine the nature of the relationship between them, in a manner that achieves the objectives of the study using the EViews 10 program.

3.2. The Autoregressive Distributed Lag (ARDL) Model:

Based on the bounds testing approach to cointegration, which relies on the ARDL model developed by Pesaran et al. (2001), the model does not

require the same order of integration for the variables. That is, it can be applied whether the series are stationary at level I(0), at first difference I(1), or a mix of both. Based on the study variables, the logarithmic model can be formulated according to the following relationship:

$$In\ (ftr) = \beta_0 + \beta_1\ In(BTC) + e_t$$

$$\Delta\ (In\ ftr)_t = \beta_0 + \beta_1\ (In\ ftr)_{t-1} + \beta_2\ (InBTC)_{t-1} + \sum_{t=1}^{p} \beta_3\ \Delta\ (In\ ftr)_{t-1} + \sum_{t=0}^{p} \beta_4\ \Delta\ (InBTC)_{t-1} + \Psi\ (ECT)_{t-1} + e_t$$

Where:

- Δ: First difference
- et: Random error
- ftr: Futures contract price
- BTC: Bitcoin price
- $(ECT)t_{-1}$: Error correction term

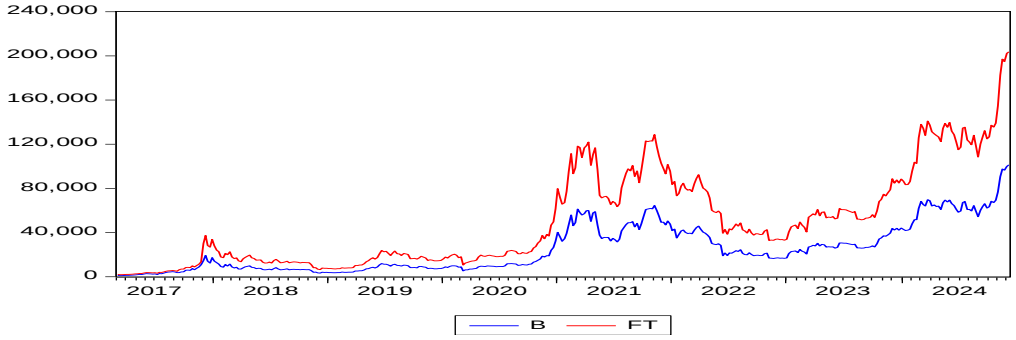
To verify the existence of cointegration or a long-term relationship between the explanatory variable and the dependent variable, the bounds testing approach proposed by Pesaran et al. will be used, which relies on the (F) statistic to analyze cointegration. The null hypothesis indicates no cointegration among the study variables, while the alternative hypothesis states that cointegration exists (Karim, 2020, p. 390).

Therefore, the value of the (F) statistic will be compared to the upper and lower bounds of Pesaran et al. If the (F) statistic is greater than the upper bound, the null hypothesis is rejected and the alternative is accepted. If the (F) statistic is less than the lower bound, the alternative is accepted. If the (F) statistic falls between the upper and lower bounds, the results are inconclusive.

3.3. Stationarity Study of the Time Series of the Study Sample:

To study the stationarity of the financial value series, the price movements during the trading of Bitcoin and its futures contracts over the study period are used, as illustrated in the following figure:

Figure No. (04): Changes in Bitcoin Prices and the Values of Its Futures Contracts on the CME Exchange During the Period (2017–2024)



Source: Prepared by the two researchers based on the outputs of the EViews10.

It is observed from the figure that the cryptocurrency Bitcoin witnessed significant price movements, especially in recent years. The futures contracts on this currency (on the CME exchange) followed a similar trend, where the values of the contracts exceeded the prices of the underlying asset, but at varying levels—whether in terms of the increases or the decreases recorded throughout the study period, which coincides with the early emergence of this type of futures contract on the currency (Bitcoin).

3.4. Stationarity Test

To determine the stationarity of the value series, several tests will be conducted, one of the most important being the Dickey-Fuller test (1979). This test has evolved (to account for the possibility of autocorrelation) and became known as the Augmented Dickey-Fuller test (ADF). The ADF formula adds lagged differences $\Delta f_{(t_j_{+1})}$ and relies on estimating models using the least squares method (Ghafour, 2019, p. 238).

$$ft = \rho\, ft-1 + \varepsilon t$$

By subtracting ft_{-1} from both sides of the equation, it takes the following form:

$$ft - Yt - 1 = (\rho - 1)\, ft - 1 + \varepsilon t$$

$$\Delta ft = \delta\, ft - 1 + \varepsilon t$$

The equation can take the following forms:

$$\Delta ft = \beta 1 + \delta\, ft - 1 + \varepsilon t$$

$$\Delta ft = \beta 1 + \beta 2t + \delta\, ft - 1 + \varepsilon t$$

- β_1: Constant (or intercept)
- t: Time variable (or trend)

According to the last three equations, the hypotheses for the Dickey-Fuller test can be formulated as follows:

- H_0: $\delta = 0$ (Presence of unit root or non-stationarity of the time series)
- H_1: $\delta < 0$ (Stationarity of the time series)

The Phillips-Perron (PP) test will also be added to support the verification of time series stationarity, as it has better and more accurate testing power than the ADF test. Phillips and Perron developed a generalization of the Dickey-Fuller method that allows for the existence of conditional variance in errors, which the ADF test does not address (Sabah, 2020, pp. 219-220).

Based on the ADF test and the Phillips-Perron test, the results shown in the table below were obtained.

Table No. (01): Results of the Unit Root Test

Variables	A Dickey-Fuller			Phillips-Perron		
	Constant Only	Constant and Trend	No Constant & Trend	Constant Only	Constant and Trend	No Constant & Trend
	Prob	Prob	Prob	Prob	Prob	Prob
LFT	0.0450	0.0515	0.1287	0.0450	0.0515	0.1287
LB	0.0381	0.0641	0.0604	0.0381	0.0641	0.0604

Source: Prepared by the two researchers based on the outputs of the EViews10.

The tests applied to the values of the two variables indicate that the series is stationary at level according to the Augmented Dickey-Fuller test, as well as the Phillips-Perron test when only a constant is included. However, when a constant and a general trend or no constant and no trend are included, the series is non-stationary at level, as indicated by the p-values.

3.5. Determining the Optimal Lag Length for the Study Variables

The optimal lag length for the study variables can be determined using the AKAIKE criterion.

From the test, it can be stated that the optimal lag periods were determined according to the AKAIKE criterion for the ARDL model as (2, 2) (Appendice 1).

3.6. ARDL Model Goodness-of-Fit Test

From the program's outputs, we find that the R-squared value reached (0.992865), which makes the model suitable for the study. In addition, the F-statistic yielded a value of (11076.68) with a statistical significance level of (0.000000) (Appendice 2).

3.7. Model Diagnostic Tests

3.7.1. Breusch-Godfrey Serial Correlation LM Test

According to the test results, the null hypothesis (H_0), which states that there is no autocorrelation between the residuals, is accepted, as the P-value of the $\chi^2(2)$ statistic is greater than 5% (Appendice 3) .

3.7.2. Heteroskedasticity Test:

ARCH The result of the Prob. Chi-Square (1) value is greater than 5%, thus the null hypothesis (H_0) is accepted and the alternative hypothesis (H_1), which states that there is heteroskedasticity in the residuals, is rejected (Appendice 4) .

3.8. Jarque-Bera Normality Test

If the statistical distribution of the financial value series follows the normal law, then the statistic will follow a Chi-square (χ^2) distribution with two degrees of freedom (Rafiq, 2015, pp. 144-145).

Therefore, the Jarque-Bera test (which tests whether the residuals follow a normal distribution).

It is concluded from the Jarque-Bera test that the series values follow a normal distribution, which leads to the acseption of the null hypothesis of normal distribution at a 5% significance level. This is supported by the probability statistic, which exceed 5% in the study sample (Appendice 5).

3.9. ARDL Bounds Test for Cointegration

Based on the F-statistic value, estimated at (10.88461), which is greater than the I1 Bound (Appendice 6), there is evidence of a long-term equilibrium cointegration relationship at all significance levels. Therefore, we reject the null hypothesis that there is no cointegration between the study variables and accept the alternative hypothesis, which indicates the existence of cointegration between: Bitcoin futures contract prices and the Bitcoin currency.

3.10. Estimating the Short- and Long-Term Relationship Within the Error Correction Model

The data above indicates that a one-unit change in the price of futures contracts will lead to a change in the price of Bitcoin by 0.81 units (Appendice 7). Thus, an increase in the price of futures contracts serves as an indicator of a potential rise in the price of Bitcoin.

It is also found that the error correction term from the short term to the long term yielded a result of (–0.297157), representing a 29.7% rate of correction for short-term imbalances in the previous period toward a long-term relationship between the two variables. This is a Acceptable rate , and its explanation lies in the characteristics of both markets, which are marked by a high concentration of liquidity and daily settlement of transactions on both Bitcoin futures contracts and Bitcoin itself. This supports immediate and short-term valuation in both markets at the expense of long-term valuation, whose estimates weaken as the financial time horizon extends.

In light of the p-value, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted, which states that there is a long-term equilibrium relationship, and that the direction of this relationship is from the futures contract price of Bitcoin to the Bitcoin price. A one-unit increase in the futures contract price leads to a 1.16-unit increase in the price of Bitcoin.

This is acceptable considering that the money market in general is a short-term flow market on the one hand, and on the other, the cryptocurrency markets—especially Bitcoin, the most widely accepted currency—are extremely active markets. As such, participants in these markets respond quickly to prior short-term actions. Since Bitcoin futures contracts are subject to the behavior of the underlying currency from which they are derived, the effect extends to the long term, but with (price waves providing atypical values concentrated in short periods), which explains the price trend driven by many internal and external variables within an overlapping, influential combination, with the added advantage of the ability to achieve significant and rapid profits.

3.11. Stability Test of the Estimated Autoregressive Distributed Lag (ARDL) Model

The stability test of the ARDL model indicates that the study data does not contain structural changes and that the short-term parameters are stable and consistent with the long-term parameters. In this context, two tests are commonly used to confirm the model's stability: the Cumulative Sum of

Recursive Residuals (CUSUM) test and the Cumulative Sum of Squares of Recursive Residuals (CUSUM of Squares) test.

Structural stability of the estimated coefficients in the error correction form of the ARDL model is confirmed if the graphical plots of both tests lie within the critical bounds at the 5% significance level (Lazhar S. , 2021, p. 149). In such a case, the null hypothesis—that all estimated parameters are stable—can be accepted, meaning the short- and long-term parameters of the estimated model are stationary. The two figures below present the results of the model's stability test (Lazhar B. S., 2020, pp. 352-353).

From the two teste (Appendice 8), the following can be concluded:

- The CUSUM plot lies within the critical bounds at the 5% significance level, indicating the stability of the short- and long-term parameters of the estimated model. This implies consistency in the model between long-term and short-term results.
- The CUSUM of Squares plot also lies within the critical bounds at the 5% significance level, further confirming the stability of the short- and long-term parameters of the estimated model. This also implies consistency in the model between long-term and short-term outcomes.

4. Conclusion:

It is very important to study the emerging derivatives markets related to Bitcoin, as this currency has dominated the cryptocurrency market for a long period since the inception of this modern market. Moreover, this currency has witnessed significant rises, which necessitate studying all elements related to the formation and direction of its pricing system. This is what has been addressed in this study, which examined the extent to which Bitcoin futures prices affect the price trend of this currency. The following conclusions were drawn:

- Since price trends may be upward or downward, the study results indicate that the trend is not continuous in the short term, highlighting the strength of active price movements. Furthermore, the influence of futures prices alone cannot fully explain Bitcoin's price trend, as there are many other variables that may push the price trend in varying directions and with varying intensities. This confirms the validity of the first secondary hypothesis, which states: Trading Bitcoin futures contracts supports the price trend of the currency in the short term, regardless of the direction of movement.

- Due to the nature and characteristics of these emerging products and their associated derivatives—especially futures contracts—the process of long-term pricing and the linkage of Bitcoin's value with the direction of futures contracts becomes less impactful as the time horizon extends. This is due to several factors, including the nature of both markets, the high liquidity concentration, daily market value adjustments, daily settlement of highly active financial positions, and the decentralized nature of Bitcoin, which is fundamentally priced through supply and demand mechanisms in the crypto market. This does not support the validity of the second secondary hypothesis, which states: The price movement of Bitcoin futures contracts has a primary impact on the value of the currency that extends into the long term.
- The evaluation of Bitcoin futures contracts has a varying impact on the pricing system of Bitcoin, which is what the results of the empirical tests concluded, confirming the validity of the main hypothesis.
- The significant price trends of both Bitcoin and its futures contracts over benchmark periods indicate the attractiveness of both: (the digital monetary product Bitcoin and the futures contract based on it). This demonstrates that these financial innovations are gaining increasing general acceptance among market participants, especially given the role of regulated exchanges in providing information that boosts user confidence. This confidence becomes reflected in the future pricing of derivatives in both regulated and unregulated markets—directly and indirectly-at levels that support the price trend but with varying intensities. This, in turn, contributes to the momentum of valuation processes, considering the influence of many other driving factors.

5. Recommendations:

- There is a need to adapt and generalize financial laws and regulations at the international level in accordance with cryptocurrency products and their derivatives.
- The impact of political information on the valuation of cryptocurrencies-especially Bitcoin and its related financial derivatives-should be reduced.

- It is very important to disseminate information about these currencies and their derivatives with high transparency to reduce misleading influences.

6. Bibliography

Augmento. (2024). *Social Sentiment Data For Crypto Assets*. (postera, Producer) Retrieved from www. Posrera :IO

Bitcoin. (2025, 03 11). *bitcoin*. Retrieved from https://www.bitcoin.com/fr/exchanges/derivatives/

Bitmarkets. (2025, 3 15). *bitmarkets*. Récupéré sur https://bitmarkets.com/fr/education/tutorials/sentiments-du-marche-des-crypto-monnaies

Bull & Bear Index. (2024, 12 14). *Bitcoin sentiment*. Retrieved from https://www.augmento.ai/bitcoin-sentiment/

CME GROUP. (2025, 01 14). *CME GROUP*. Retrieved from https://www.cmegroup.com/fr/education/courses/introduction-to-bitcoin/micro-bitcoin-futures-product-overview.html

coinbase. (2025). *SECTION IX ,DERIVATIVES*. Retrieved from https://www.coinbase.com/fr/derivatives

David Bourghelle et al. (2025). *Do Collective Emotions Drive Bitcoin Volatility? A Triple Regime-Switching Vector Approach*. Retrieved from Version of Record: https://www.sciencedirect.com/science/article/pii/S0167268122000397

Direction de la communicaon de l'AMF. (2020). Qu'est-ce qu'une « cryptomonnaie » ? Direcon de la communicaon, paris - france: Autorité des marchés nanciers.

Farouk, B. (2023). The Relationship of Blockchain Technology to Cryptocurrencies: The Case of Bitcoin and Binance Coin. *Journal of Humanities and Social Sciences, 9*(2).

Ghafour, M. A. (2019). Economic policies in developing countries between the reality of financial globalization and the requirements of development - the case of Algeria. *A thesis submitted for the degree of Doctor of Science, Economics, Development Economics*. Algeria: Faculty of Economics, Business and Management Sciences.

Islamic Development Bank. (2022). *The Future of Finance: Redefining the Role of Finance in the Fourth Industrial Revolution.* Dubai: ISDB.

Jean-Pierre Landau ,Alban Genais. (2018). *Les crypto-monnaies.* Ministre de l'Économie et des Finances. France: Ministre de l'Économie et des Finances.

Karim, e. A. (2020). The impact of financial development and trade openness on economic growth in Algeria during the period: 1970-2018. *Al-Baheth Journal, 1*(20).

Laurent Probst. (2019). *Foreseeing the Future of Knowledge.* Dubai, United Arab Emirates: Mohammed bin Rashid Al Maktoum Knowledge Foundation.

Lazhar, B. S. (2020). Econometric modeling of the impact of financial depth and exchange rate on inflation in Algeria using the autoregressive distributed lag (ARDL) model for the period 1974-2018. *Journal of Economics, Management and Business Sciences, 13*(1).

Lazhar, S. (2021). Proven oil reserves and economic development in Algeria: an empirical study for the period (1980-2018). *Journal of Economic Integration, 09*.

Ming Shi et autres. (2024). *An introduction of market landscape, emerging trends, valuation and risk management.* Exploring crypto derivatives.

Morten Bech ;Rodney Garratt. (2017). BIS Quarterly Review.

Rafiq, M. (2015). *Random and complementary trends in price behavior in Gulf stock markets and their impact on investment diversification opportunities, PhD thesis.* Batna.

Robyn Llewellyn, Mayer Brown. (2024). *Crypto Derivatives: Overview.* Practical Law. Récupéré sur content.next.westlaw.com/w-042-3724

Sabah, D. (2020). Predictability of returns as a deviation of financial markets from the efficient financial market hypothesis, a case study of the Saudi financial market for the period 2002-2007 using ARIMA(n.d.m) - GARCH(p.q) tests. *MECAS notebooks*.

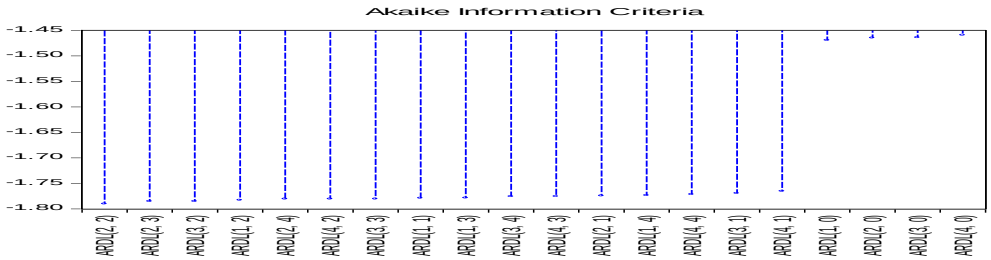
Thibaud Guillebon. (2024). Les monnaies virtuelles : essai sur l'intégration d'une nouvelle classe d'actifs dans les concepts fondamentaux. *Doctorat*. Université de Bordeaux, france.

Valence, A. (2019). Les Crypto-Monnaies Sont-Elles Vraiment Décentralisées ? Quelques Leçons De L'Écosystème Bancaire. *Revue D'Économie Financière, 133*(1).

William Bisol. (2016). Le Bitcoin : la monnaie du futur?, De l'intégration à l'utilité commerciale. *étude centrée sur les entreprises suisse*.

7. Appendices :

Appendice 1 : Optimal Lag Length of the Model According to the AKAIKE Criterion



Appendice 2: ARDL Model Selection

Dependent Variable: LFT
Method: ARDL
Date: 04/21/25 Time: 23:02
Sample (adjusted): 3/19/2017 12/08/2024
Included observations: 404 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LB
Fixed regressors: C
Number of models evaluated: 20
Selected Model: ARDL(2, 2)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LFT(-1)	0.796288	0.049801	15.98953	0.0000
LFT(-2)	0.106555	0.049022	2.173642	0.0303
LB	0.811515	0.047426	17.11103	0.0000
LB(-1)	-0.520114	0.073471	-7.079188	0.0000
LB(-2)	-0.178568	0.063215	-2.824781	0.0050
C	-0.158280	0.053424	-2.962681	0.0032

R-squared	**0.992865**	Mean dependent var	9.628432
Adjusted R-squared	**0.992775**	S.D. dependent var	1.152985
S.E. of regression	0.098001	Akaike info criterion	-1.792934
Sum squared resid	3.822485	Schwarz criterion	-1.733507
Log likelihood	368.1727	Hannan-Quinn criter.	-1.769409
F-statistic	11076.68	Durbin-Watson stat	2.000650
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Appendice 3 : Serial Correlation Test of the Model

Breusch-GodfreySerial Correlation LM Test:

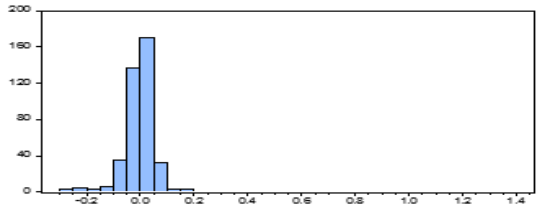
F-statistic	0.044287	Prob. F(2,396)	0.9567
Obs*R-squared	0.090342	Prob. Chi-Square(2)	0.9558

Appendice 4 : Results of the Heteroskedasticity Test

HeteroskedasticityTest:

F-statistic	0.948878	Prob. F(1,401)	0.3306
Obs*R-squared	0.951359	Prob. Chi-Square(1)	0.3294

Appendice 5 : Results of the Normality Test



Series: Residuals
Sample 3/19/2017 12/08/2024
Observations 404

Mean	8.74e-16
Median	0.002006
Maximum	1.408545
Minimum	-0.302798
Std. Dev.	0.097391
Skewness	7.800236
Kurtosis	3.564414
Jarque-Bera	0.558295
Probability	0.160020

Appendice 6 : Results of the ARDL Bounds Test for Cointegration

ARDL Bounds Test
Date: 04/21/25 Time: 23:15
Sample: 3/19/2017 12/08/2024
Included observations: 404
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	10.88461	1

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	4.04	4.78
5%	4.94	5.73
2.5%	5.77	6.68
1%	6.84	7.84

Appendice 7 : Results of the Short-Term and Long-Term Relationship for the ARDL Model

ARDL Cointegrating And Long Run Form
Dependent Variable: LFT
Selected Model: ARDL(2, 2)
Date: 04/21/25 Time: 23:19
Sample: 3/05/2017 12/08/2024
Included observations: 404

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LFT(-1))	-0.106555	0.049022	-2.173642	0.0303
D(LB)	0.811515	0.047426	17.111032	0.0000
D(LB(-1))	0.178568	0.063215	2.824781	0.0050
CointEq(-1)	**-0.297157**	0.021298	-4.561742	0.0000

Cointeq = LFT - (1.1614*LB -1.6291)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LB	1.161350	0.051035	22.756120	0.0000
C	-1.629117	0.497625	-3.273784	0.0012

Appendice 8 : (CUSUM) end (CUSUM of Squares)

