



Section 6. Mathematical and instrumental methods in economics

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STUDY OF THE CRYPTOCURRENCY FEAR AND GREED INDEX: FEATURES, TRENDS, AND DEVELOPMENT PROSPECTS

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Abstract

The article examines the cryptocurrency fear and greed index as a tool for analyzing behavioral factors influencing the dynamics of the digital asset market. It is shown that the cryptocurrency market is characterized by a high sensitivity to investor sentiment, which determines the significance of aggregated sentiment indicators. Based on the analysis of scientific studies and empirical data, the structure, dynamics, and interpretation of the fear and greed index are investigated. It is established that changes in the index values are consistent with the phase states of the market. Particular attention is paid to the relationship between the index, inter-cryptocurrency correlations, and systemic behavioral effects. Prospects for the development of the cryptocurrency market are formulated, taking into account the transformation of investor sentiment and the evolution of analytical tools.

Keywords: *cryptocurrencies, fear and greed index, investor sentiment, behavioral finance, cryptocurrency market volatility, digital assets and market risks*

Introduction

Over recent years, cryptocurrencies have firmly established their position as a significant element of the global economic system (Mitskevich, 2024; Mitskevich, 2025). Today, digital assets are actively used not only in investment activities but also in cross-border payments, decentralized financial services (DeFi), smart contracts, as well as in the formation of new models of the digital economy.

The most prominent representative of this class of assets remains Bitcoin, whose price dynamics indicate both a high investment potential and, at the same time, an extreme level of risk. Thus, an important feature of the cryptocurrency market is its heightened sensitivity to behavioral factors. Unlike traditional financial assets, cryptocurrencies do not possess fundamental value in the classical sense, and their value is formed primari-

ly under the influence of expectations, emotions, and the collective sentiment of market participants (Zyl, 2024; Zyl, 2025). Accordingly, the crypto market proves to be particularly susceptible to the effects of irrational behavior – herd investing, the fear of missing out (FOMO), and panic sell-offs.

Modern research in the field of behavioral finance shows that investors' emotional states have a significant impact on the returns and volatility of cryptocurrencies. In particular, a pronounced relationship has been identified between changes in market sentiment and the dynamics of Bitcoin prices, and this relationship intensifies during periods of heightened uncertainty and crisis events (Güler, 2021; Gaies et al., 2023), which determines the need to develop and apply tools that allow the quantitative measurement and analysis of the market's emotional background.

One such tool is the cryptocurrency fear and greed index (Crypto Fear & Greed Index), which aggregates information on investor behavior, market volatility, trading activity, and informational signals. The index reflects the predominance in the market of either defensive strategies associated with fear of losses or aggressive strategies based on expectations of high profits. A number of empirical studies confirm that the values of this index are statistically related to Bitcoin returns in both the short-term and long-term periods (Huang et al., 2024; Koutmos, 2023). At the same time, there is no unified interpretation of the role of the fear and greed index in the scientific literature, since, on the one hand, it is considered a useful indicator for assessing market expectations and a potential tool for price forecasting (Bouteska et al., 2022; Huang, 2024). On the other hand, its limited predictive power and the instability of relationships over time are emphasized (Johnson, 2023). An additional complexity in interpreting the index is introduced by the nonlinear nature of its influence on market indicators, expressed primarily through the presence of U-shaped relationships and asymmetric effects (Wang et al., 2023).

The relevance of the present study is determined by the need to conceptualize the fear and greed index as a behavioral indicator of the cryptocurrency market. Under con-

ditions of growing institutional interest in digital assets and their increasing integration into the financial system, the importance of tools that make it possible to account for behavioral risks and emotional fluctuations of investors increases. An analysis of the structure, dynamics, and correlation properties of the fear and greed index makes it possible to expand the understanding of the mechanisms of cryptocurrency price formation and to substantiate the prospects for its practical application.

Methodology

The methodological basis of the study is formed by the principles of behavioral finance and modern empirical approaches to the analysis of cryptocurrency markets. The study employs the results of foreign scientific research devoted to the impact of investor sentiment on the returns, volatility, and price synchronicity of cryptocurrencies (Abraham, 2024; Tabash et al., 2025). The information base of the study consists of data on the cryptocurrency fear and greed index, information on price dynamics and correlations among major cryptocurrencies, as well as the results of previously published empirical studies. Within the framework of the research, methods of content analysis and theoretical generalization of scientific publications were applied to systematize approaches to the interpretation of the fear and greed index; a comparative analysis of empirical results presented in prior studies was conducted, as well as a descriptive analysis of the index dynamics in order to identify market trends and phase states.

Result and Discussion

The cryptocurrency fear and greed index represents an aggregated behavioral indicator designed to quantitatively assess the current sentiment of participants in the cryptocurrency market. The ideas underlying this index originate from behavioral finance theory, within which it is assumed that investment decisions are often made not solely on the basis of rational analysis, but under the influence of emotions, cognitive biases, and collective expectations.

From the perspective of economic theory, cryptocurrencies possess a number of characteristics that enhance the significance of

behavioral factors, including (1) the absence of intrinsic value, (2) a high speculative component of demand, and (3) a fragmented market structure. These characteristics determine the increased role of investor sentiment in the process of cryptocurrency price formation and in the pricing of related assets (Mitskevich, 2024; Mitskevich, 2025). In this regard, the fear and greed index is used as a proxy indicator of the collective emotional state of the market and makes it possible to identify the predominance of either defensive or risk-oriented behavioral strategies.

In contemporary research, the fear and greed index is interpreted as an indicator that reflects not only the emotional reactions of investors but also their actual trading behavior. Thus, in the study by Y. Huang and co-authors, the index is considered an extended measure of investor sentiment that integrates information on volatility, market momentum, and the activity of market participants, which makes it possible to identify both short-term and long-term effects of its influence on Bitcoin returns. The authors emphasize that the index demonstrates a statistically significant relationship with cryptocurrency returns, which confirms its applicability in the analysis of market sentiment (Huang et al., 2024).

From a methodological perspective, the fear and greed index is formed on the basis of a set of partial indicators, each of which reflects a specific aspect of market behavior. Such components include measures of price volatility, trading volumes, market momentum dynamics, the level of Bitcoin dominance, as well as informational signals related to search queries and activity in digital media. The final value of the index is normalized within a range from 0 to 100, where low values are interpreted as the dominance of fear, while high values indicate the predominance of greed.

Unlike traditional sentiment indices of the stock market, the cryptocurrency fear and greed index covers a broader range of data sources and is oriented toward a market in which fundamental valuations play a secondary role. This circumstance, for example, is described in the study by R. Abraham, in which the index is considered as an element of a broader system for measuring investor

sentiment related to cryptocurrencies, futures, and options on digital assets. The author shows that such aggregated indicators make it possible to better account for the specifics of the crypto market, in which informational and emotional impulses spread faster than in traditional financial markets (Abraham, 2024).

An important aspect of interpreting the index is the nonlinear nature of its influence on market indicators. A number of empirical studies demonstrate that extreme index values (both in the zone of intense fear and in the zone of pronounced greed) are associated with increased price synchronicity and heightened systemic risks. In particular, the existence of a U-shaped relationship between the index values and the degree of coherence in the price movements of major cryptocurrencies has been established, which indicates the increased role of collective behavioral effects in extreme phases of the market cycle (Wang et al., 2023).

In addition, the fear and greed index is considered as a tool capable of reflecting structural shifts in market dynamics. Studies show that the relationship between the index values and Bitcoin prices may change over time, which is associated with transitions between different market regimes (in particular, from phases of heightened speculative activity to periods of relative stabilization). In this context, the index acts not so much as a universal price predictor as an indicator of the current state of market equilibrium and the dominant strategies of investor behavior (Koutmos, 2023). On the basis of the corresponding data, decision-making is also possible.

Accordingly, the cryptocurrency fear and greed index should be regarded as an analytical tool that reflects the combined influence of emotional, informational, and behavioral factors on the digital asset market. The significance of the index lies primarily in identifying phase states of the market, assessing the level of behavioral risks, and interpreting changes in the structure of investor behavior, which makes the index an important element of modern cryptocurrency market analysis and substantiates the need for further research into its dynamics and practical applicability.

Turning to the dynamics of the cryptocurrency fear and greed index, the following

values are identified (Fig. 1; Fig. 2). An analysis of the current dynamics of the cryptocurrency fear and greed index makes it possible to identify characteristic phase states of the digital asset market and their relationship with the price dynamics of leading cryptocurrencies. As of January 2026, the value of

the fear and greed index was predominantly in the “fear” category and reflected the predominance of cautious sentiment among market participants. This value indicates the persistence of uncertainty and the ожидание of additional signals from investors, who refrain from active purchases.

Figure 1. Values and dynamics of the cryptocurrency fear and greed index – BTC

ETH and BTC (USD) prices



Source: publicly available online sources: <https://cryptonisation.com/indeks-straha-i-zhadnosti>

Figure 2. Values and dynamics of the cryptocurrency fear and greed index – ETH

ETH and BTC (USD) prices



Source: publicly available online sources: <https://cryptonisation.com/indeks-straha-i-zhadnosti>

The historical analysis of the index values over the past year demonstrates its high variability and cyclicity. Thus, the annual maximum was recorded on January 22, 2025, at the

level of 84 points, which corresponds to a state of “extreme greed,” while the annual minimum on February 27, 2025, amounted to 10 points and was characterized as “extreme fear.” Such

a range of fluctuations indicates pronounced volatility in investors' behavioral expectations and confirms the thesis of high emotional sensitivity of the cryptocurrency market.

Of particular interest is the comparison of the dynamics of the fear and greed index with the price trajectories of Bitcoin and Ethereum. The charts presented on the Cryptonisation platform show that periods of index growth, as a rule, coincide with upward price trends, while a decline in the index is accompanied by corrections or phases of sideways price movement. In particular, in the first half of 2025, a transition from a state of "extreme fear" to zones of "greed" and "extreme greed" was observed, which was accompanied by a significant increase in the prices of Bitcoin and Ethereum.

At the same time, an analysis of time lags between changes in the index and price fluctuations shows that the fear and greed index does not always act as a leading indicator. In a number of cases, changes in the index values occur synchronously with prices or with a slight lag, which demonstrates its predominantly descriptive rather than predictive nature. This conclusion is consistent with the results of empirical studies that emphasize the limited predictive power of the index in the short-term horizon and its greater informativeness in the analysis of market phase states.

The patterns in the dynamics of the fear and greed index identified on the basis of Cryptonisation data are consistent with the results of contemporary empirical research. Thus, B. Gaies and co-authors show that investor fear and greed form a bidirectional, dynamically changing relationship with Bitcoin prices, and that the influence of sentiment intensifies during periods of heightened market uncertainty and instability. It is argued that precisely the phases of pronounced fear or greed are accompanied by sharp price movements and increased volatility (Gaies et al., 2023).

The cyclicity of the fear and greed index observed in 2025 – early 2026 and recorded on the Cryptonisation platform confirms this conclusion. Transitions of the index from the zone of "extreme fear" to the zones of "greed" and "extreme greed" were accompanied by an accelerated increase in the prices of Bitcoin and Ethereum, while the return of the index to the "fear" zone coincided with

phases of correction and consolidation. Accordingly, the index reflects not only the emotional background of the market but also the feedback mechanisms between sentiment and price dynamics described in the study by Gaies et al. (2023).

In turn, the results of the study by Y. Huang and colleagues make it possible to interpret the temporal nature of the identified relationships. Their research shows that the fear and greed index exerts a statistically significant but asymmetric influence on Bitcoin returns, with the effect differing across short-term and medium-term horizons. The authors note that during periods of dominant greed, increases in returns may be speculative in nature and accompanied by heightened risks of subsequent correction (Huang et al., 2024).

In particular, the current state of the market serves as a signal of a weakening of speculative expectations and a transition of investors toward more cautious behavioral strategies, which is consistent with the conclusion of Huang et al. (2024) regarding the corrective role of fear following phases of excessive greed.

At the same time, the fear and greed index can be considered an aggregated indicator that reflects precisely those emotional states that intensify correlations between assets. During periods of dominant greed, investors tend to expand risky positions across a wide range of cryptocurrencies, which leads to an increase in positive correlations. By contrast, in phases of fear, a synchronous exit from risky assets is observed, accompanied by a simultaneous decline in prices across the entire market. Sentiment indicators enhance the explanatory power of models of Bitcoin returns, especially during periods of crisis shocks and heightened uncertainty (Bouteska et al., 2022), which makes it possible to interpret high correlation values between cryptocurrencies as the result of common behavioral factors reflected by the fear and greed index. At the same time, global waves of fear are capable of spreading across different segments of financial markets, increasing volatility and the synchronicity of price fluctuations (Tabash et al., 2025).

It should be noted that the current state of cryptocurrency development, taking into account prevailing trends and changes in the

fear and greed index, is associated with several circumstances.

First, the strengthening of institutional investor participation implies a gradual change in the nature of market reactions to behavioral signals. Previously, the dominant share of retail investors made the market particularly sensitive to sentiment fluctuations, whereas the increase in institutional capital investments contributes to a certain stabilization of price reactions to emotional impulses. Nevertheless, as empirical data on the dynamics of the fear and greed index show, acute phases of emotional response persist, although they manifest themselves over larger time scales, which creates prerequisites for the formation of new behavioral models in which the index serves as an indicator not only of short-term market fluctuations but also of medium-term cycles involving institutional investors.

Second, current trends indicate an expansion of the analytical application of the fear and greed index beyond the classical monitoring of retail investor sentiment. Contemporary studies point to the prospects of incorporating machine learning models and big data processing for a more accurate integration of the index into price forecasting models (Carosia et al., 2024).

Third, the strengthening of correlation links between cryptocurrencies and traditional financial assets creates prerequisites for the fear and greed index to become part of a multiparadigmatic analysis of market risks. In this context, the current index values, which are recorded in the range between “fear” and “neutrality,” may serve as signals of potential turning points in market cycles.

Conclusion

The conducted study has shown that the cryptocurrency fear and greed index is an analytical tool that makes it possible to identify behavioral and emotional regimes of the cryptocurrency market's functioning. Under conditions of high volatility and uncertainty characteristic of digital assets, this index performs the function of an aggregated indicator of investor sentiment, reflecting shifts between phases of fear, neutral expectations, and greed. The analysis of theoretical and empirical studies confirmed that the dynamics of the fear and greed index are associated with the price dynamics of leading cryptocurrencies, primarily Bitcoin and Ethereum; however, this relationship is nonlinear and regime-dependent in nature. The index reflects market phase states and collective behavioral effects to a greater extent than it serves as a universal tool for short-term price forecasting. The use of Cryptonisation data made it possible to identify the cyclicity of index changes and their consistency with stages of market movements, including periods of growth, correction, and consolidation. In the future, the fear and greed index may evolve from a descriptive sentiment indicator into an element of multifactor analysis that contributes to the assessment of processes occurring in the cryptocurrency market. Overall, the results of the study confirm the appropriateness of using the fear and greed index as an auxiliary tool for analyzing the cryptocurrency market, particularly in assessing market regimes and behavioral risks, which makes it promising for further research.

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