

RESEARCH OF TRENDS IN THE CRYPTOCURRENCY MARKET AS A BASIS FOR ENSURING FINANCIAL STABILITY AND DEVELOPMENT OF RETAIL COMPANIES

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ABSTRACT

Financial stability largely determines the possibility of successful and continuous business development. The key factor is proper financial support. In particular, for retail companies, such support allows maintaining an acceptable level of product range to meet the demand and needs of potential buyers. To solve the problem of financial support, one of the sources of raising funds is the stock market. This market allows using various tools to achieve the set goals. One of these tools is cryptocurrency, which allows both attracting the necessary resources and hedging possible risks. Based on this, the work examines the main trends of individual segments of the cryptocurrency market. At the same time, an analysis of the relationship between individual segments of the cryptocurrency market and the dynamics of shares of individual retail companies is carried out. For these purposes, the wavelet coherence methodology is considered. The results of the work are presented in the form of various graphs and diagrams, which allows you to understand the course of the study, assess its reliability.

Keywords: Development, Research, Trends, Cryptocurrency, Funding, Sustainability, Trading, Benchmarking.

Introduction

Modern business development is impossible without proper and uninterrupted financing [1]-[3]. This also fully applies to retail companies. In order to implement business ideas and ensure stable profits, a necessary condition for the development of retail is the constant renewal of the product range, meeting the needs of potential consumers. All this requires the presence of proper financial support.

In the classical form, it is possible to provide the necessary financial resources either by attracting a bank loan or by means of the securities market [4], [5].

In the first case, such provision involves passing certain licensing procedures and a mandatory fee for using the provided resource [6], [7].

The second resource is more flexible and provides various opportunities, although it is also necessary to pass certain licensing procedures [8]-[10].

The flexibility of attracting the necessary financial resources through the securities market lies in the possibility of using various instruments: funds, shares, bonds, cryptocurrency [11], [12]. Among such instruments, the cryptocurrency market attracts special attention, which is characterized by diversity and the ability to use such a resource as a direct source of raising funds, as well as an insurance instrument, hedging the risks of the activities of the relevant companies.

In this case, to analyze the possibilities and feasibility of considering various sources of attracting the necessary resources, various methods and approaches should be used, both classical [13]-[25] and non-standard [26]-[41].

However, the choice of such analysis tools is largely determined by the task that needs to be solved and the set of data that determines the solution to such a task.

Thus, the main objective of this paper is, first of all, to study the trends of the cryptocurrency market as a basis for financial support and hedging in the field of sustainable development of retail companies.

For these purposes, a brief analysis of relevant studies is carried out, an overview of individual segments of the cryptocurrency market is carried out and an analysis of their relationship with the dynamics of shares of individual retail companies is carried out.

Related work

The stated objective of the study involves taking into account and considering various aspects. This explains the large number of works devoted to this topic. Therefore, for a better understanding of the objective of our study, let us consider some of them.

The study [42] examines the main financial indicators that, in their interrelation, diagnose the financial condition of retail market companies. It is shown that some indicators characterize the insufficient financial stability of the companies under consideration. However, the work does not consider sources of financing and the possibility of their effective use in difficult market conditions of business.

E. Fuior, L. Cobzari and T. Zavaṭki analyze the problems that arise, the possibilities of overcoming them and the development paths of retail companies [43]. The authors emphasize that at present, one of the key problems in the global retail system is related to sustainable financial support. This is due to the fact that retail companies play a significant role in society. At the same time, changes in the market situation should be constantly taken into account, since retail companies directly interact with a wide range of consumers [43]. Based on this, the authors of the study analyze the development of retail trade as a type of entrepreneurial activity, paying attention to the sources of financial support for such activities.

Z. Nikolaos, K. Christos, T. George and L. Efstratios conduct a detailed analysis of large retail chains in an unstable economic environment [44]. This study is conducted on the example of Greek companies operating in the retail sector. The aim of the study was to examine the impact of the economic crisis on the sector using a number of financial indicators. The authors note that the economic crisis has particularly affected the financial security and sustainability of retail companies. The study emphasizes that the decline in the supermarket sector, which is attributed to the financial situation of the country, has led to a decrease in disposable household income [44]. This is what determines the increased attention to ensuring the financial sustainability of retail companies.

A. Ramadan and A. Morshed substantiate the need for working capital management for the development of retail trade, which is directly related to ensuring the financial stability of trading companies [45]. To conduct the analysis, the work uses a mixed methods approach – quantitative analysis using AMOS software with qualitative findings from interviews with financial managers and retail experts [45]. At the same time, the main direction of the study is aimed at cash flow management, where special attention is paid to financial management methods.

A. Oyedijo, S. Kusi-Sarpong, M. S. Mubarik, S. A. Khan and K. Utulu study sustainable supply chain management in the retail sector [46]. The authors emphasize that this is a complex task. The solution to which, on the one hand, depends on adequate financial support, and on the other, directly affects such support. The study revealed the main obstacles that hinder the implementation of sustainability in multi-tier food supply chains, among which the cost of sustainability stands out.

M. Ozdamar, A. Sensoy, and L. Akdeniz examine the relationship between retail investors and the cryptocurrency market [47]. The paper shows that retail investor attention has a negative impact on cryptocurrency returns [47]. At the same time, retail investor attention exacerbates idiosyncratic volatility in volatile market conditions. This should be taken into account when using cryptocurrencies as a risk hedging tool, especially in the context of retail companies.

The study by S. Goel and H. Mittal is devoted to a detailed review of the growth of cryptocurrencies, their capabilities and future prospects [48]. At the same time, the work emphasizes that the functionality of cryptocurrency largely depends on the use of advanced technologies. At the same time, cryptocurrency provides users with enormous opportunities in the form of increased labor propensities and new market enterprises along with certain problems [48], what must be taken into account correctly when using it.

M. N. Saleem, Y. Doumenis, E. Katsikas, J. Izadi, and D. Koufopoulos examine the impact of cryptocurrencies on financial stability in general [49]. The paper examines issues such as the relationship between cryptocurrency and various aspects of the financial system. For these purposes, linear regression models, Granger causality tests, and case studies, including the crash of the futures exchange (FTX) and the successful integration of Binance, are used [49]. However, the paper emphasizes the need for further study of the complex interactions between cryptocurrencies and financial stability.

F. Kalfaoglou examines the issue of potential consequences for financial stability [50]. At the same time, the novelty of this problem and its insufficient study are noted.

In turn, H. Joebges, H. Herr and C. Kellermann study crypto assets as a threat to financial market stability [51]. The work notes that the partial use of crypto assets as money contributes to toxic changes in the financial system. Therefore, traditional fiat money requires several interacting institutions to stabilize their value and regulate their use [51]. Also noted is the difficulty of creating regulatory institutions in the crypto sphere, and the increasing likelihood of periods of high volatility, as well as their consequences for the traditional financial system due to mutual integration [51]. Consequently, the regulation of crypto assets remains a pressing issue, which requires their ongoing study.

Thus, the presented brief review shows the importance and appropriateness of considering the issues raised, and the need for their further research.

Dynamics of quotes in individual segments of the cryptocurrency market

First of all, it should be emphasized that the cryptocurrency market has many corresponding instruments that have different capitalization and quote dynamics. This allows for an adequate approach to the issues of using cryptocurrency as a source of financing or a hedging instrument. Fig. 1 and Fig. 2 show the dynamics of quotes for some types of cryptocurrency in the period from 01.02.2022 to 02.16.2025 (from the website <https://investing.com/>).

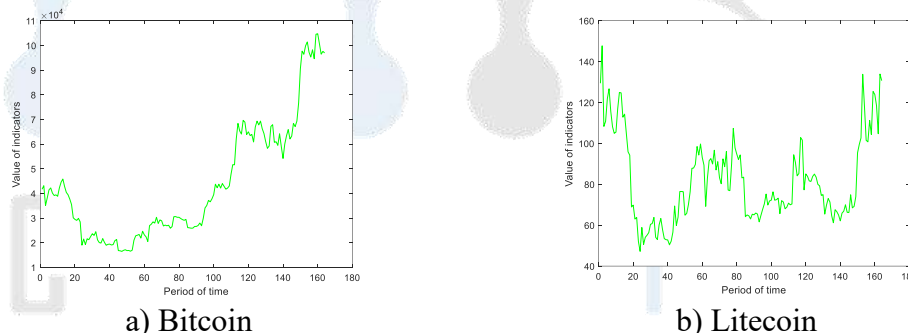


Figure 1: Bitcoin and Litecoin quotes dynamics on the cryptocurrency market

Fig. 1 shows the dynamics of Bitcoin (Fig. 1a) and Litecoin (Fig. 1b). In general, the dynamics of Bitcoin quotes in the studied interval is increasing. Although at the beginning of the first third of the studied period, such quotes were decreasing. Starting from September 2023, there is an accelerated growth of Bitcoin quotes. This growth in the period March 2024 - October 2024 has some stabilization. Then, there is again an accelerated growth of Bitcoin quotes.

Litecoin quotes are more volatile during the period under study (Fig. 1b). Both periods of growth and periods of decline can be noted. At the same time, in general, Litecoin quotes are significantly lower than Bitcoin quotes. This allows us to build various strategies for using this type of cryptocurrency for certain needs, for example, in the retail sector.

Fig. 2 shows the dynamics of Dogecoin (Fig. 2a) and Tezos (Fig. 2b).

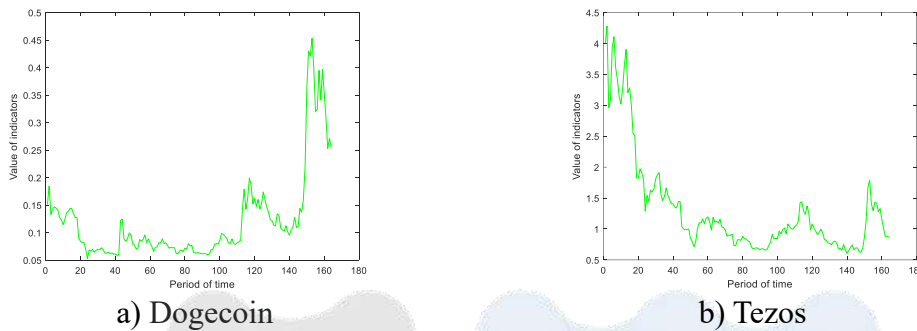


Figure 2: Dogecoin and Tezos quotes dynamics on the cryptocurrency market

The dynamics of Dogecoin quotes is generally increasing. But as can be seen from Fig. 2a, in the prevailing time interval such growth is insignificant and variable. Since November 2024, there has been a significant increase in Dogecoin quotes. Since December 2024, the dynamics of Dogecoin quotes has been decreasing. At the same time, the overall values of Dogecoin quotes are insignificant, compared to Bitcoin and Litecoin quotes.

The dynamics of Tezos quotes (Fig. 2b) is a mirror image of Dogecoin quotes. In general, Tezos quotes tend to decrease. Tezos quotes are also insignificant compared to Bitcoin and Litecoin quotes.

Thus, it should be noted that quotes for each type of cryptocurrency have their own unique dynamics, which should be taken into account when developing appropriate strategies when working in the retail market.

Examples of stock price dynamics for a number of individual retail companies

Now, for further analysis, let's look at the stock performance of a number of individual companies operating in the retail sector (Fig. 3 and Fig. 4).

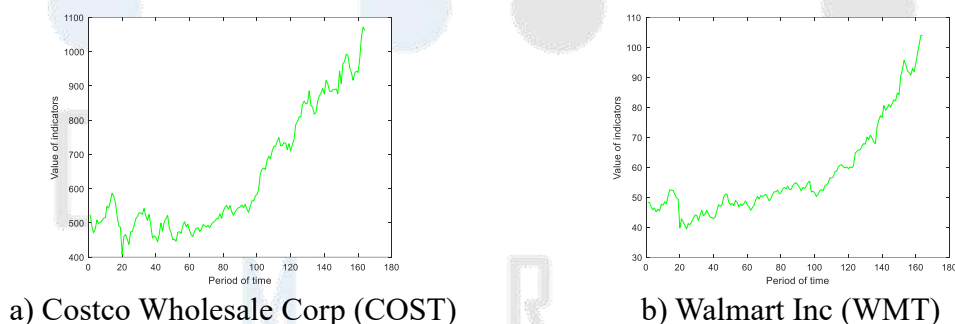


Figure 3: Dynamics of stock quotes for Costco Wholesale Corp (COST) and Walmart Inc (WMT)

The data presented in Fig. 3 and Fig. 4 cover the period from 01.02.2022 to 02.16.2025 (from the website <https://investing.com/>).

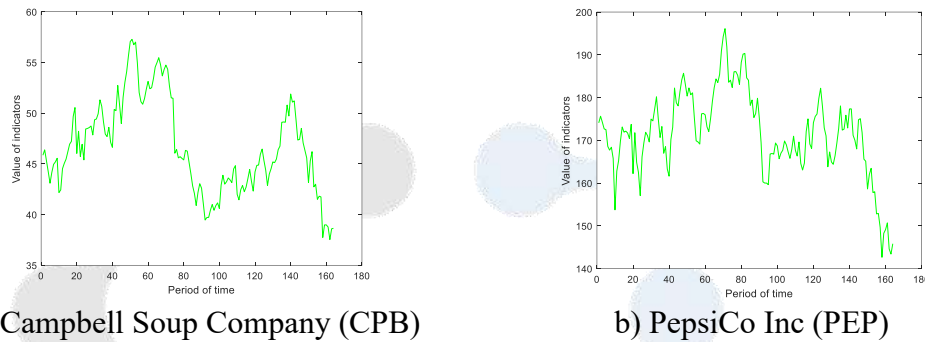
From the data in Fig. 3, it is clear that the dynamics of quotes for Costco Wholesale Corp (COST) and Walmart Inc (WMT) shares over the studied period of time is increasing. Moreover, such growth is accelerated: from December 2023 for Costco Wholesale Corp (COST) and from February

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2024 for Walmart Inc (WMT). At the same time, the quote values for Costco Wholesale Corp (COST) shares are higher than for Walmart Inc (WMT) shares.

Fig. 4 shows the dynamics of quotes for shares of Campbell Soup Company (CPB) and PepsiCo Inc (PEP).



a) Campbell Soup Company (CPB)

b) PepsiCo Inc (PEP)

Figure 4: Dynamics of stock quotes for Campbell Soup Company (CPB) and PepsiCo Inc (PEP)

The dynamics of stock quotes presented in Fig. 4 differs from the dynamics of stocks presented in Fig. 3. It should be noted that the dynamics of Campbell Soup Company (CPB) and PepsiCo Inc (PEP) stocks is volatile. At the same time, in the last period of time, the quotes of the corresponding stocks have tended to decrease.

Thus, it is of particular interest to assess the mutual dynamics between the quotes of retail companies and the quotes of cryptocurrencies.

Comparative assessment of the mutual dynamics of the studied data

To examine the relationship between the data under study, various methods and approaches can be used, among which it is advisable to highlight the wavelet coherence methodology [37]-[41]. This methodology operates with data presented in the form of time series and allows one to evaluate the mutual dynamics on different time horizons. For these purposes, the concept of the depth of cross-relationships is used. This allows one to evaluate in detail the dynamics of mutual relationships and understand the essence of the studied data. For such an analysis, the following formalization is used [52]-[54]:

$$S^2(a, h) = \frac{|\Psi(a^{-1}W_{k(t)d(t)}(a, h))|^2}{\Psi(a^{-1}|W_{k(t)}(a, h)|^2)\Psi(a^{-1}|W_{d(t)}(a, h)|^2)}, \tag{1}$$

where:

$W(a, h)$ – values of transverse wavelet spectra,

a, h – the scale and center of time localization that determine the scale of the wavelet transform,

$k(t), d(t)$ – series of data that we study,

Ψ – smoothing operator,

$S^2(a, h)$ – square of the wavelet coherence coefficient. $0 \leq S^2(a, h) \leq 1$. If these values tend to zero, then we have a weak correlation. Otherwise we have a strong correlation [52].

Fig. 5 and Fig. 6 present individual results of wavelet coherence estimates between the data in the context of this study.

Fig. 5 presents wavelet coherence estimates between Bitcoin and Costco Wholesale Corp (COST) quotes (Fig. 5a); Bitcoin and Walmart Inc (WMT) (Fig. 5b).

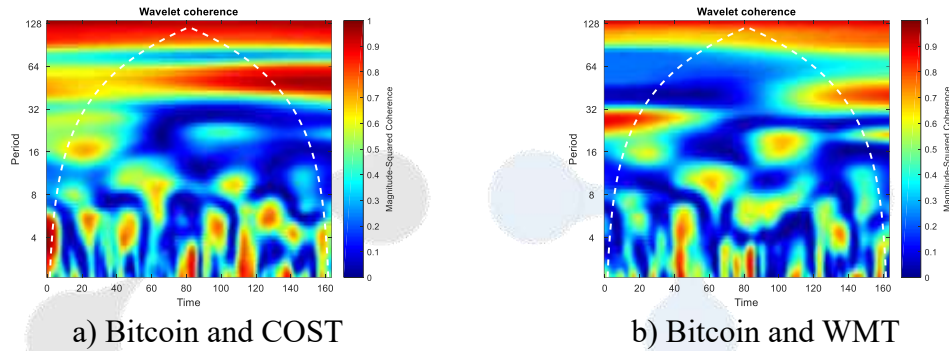


Figure 5: Wavelet coherence estimates between Bitcoin and COST quotes (Fig. 5a); Bitcoin and WMT (Fig. 5b)

Fig. 6 presents wavelet coherence estimates between Litecoin and Campbell Soup Company (CPB) quotes (Fig. 6a); Litecoin and PepsiCo Inc (PEP) (Fig. 6b).

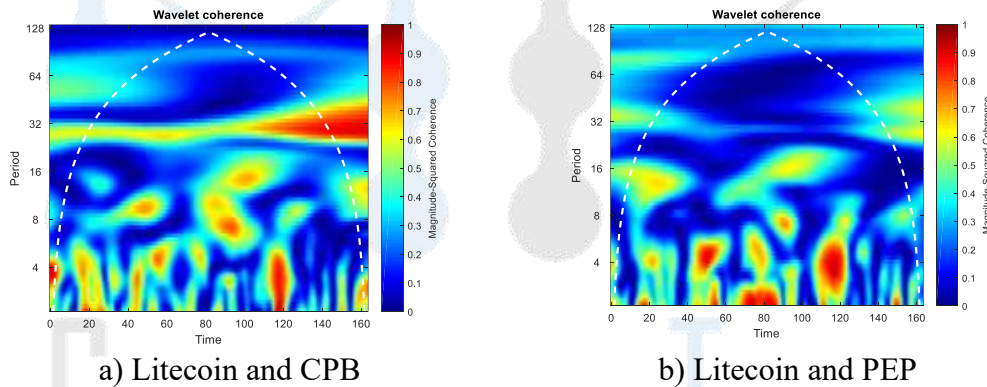


Figure 6: Wavelet coherence estimates between Litecoin and CPB quotes (Fig. 6a); Litecoin and PEP (Fig. 6b)

The presented data show wavelet coherence estimates between data that show approximately the same mutual dynamics. These are data sets such as: Bitcoin – Costco Wholesale Corp (COST), Bitcoin – Walmart Inc (WMT), Litecoin – Campbell Soup Company (CPB) and Litecoin – PepsiCo Inc (PEP).

Analysis of the data in Fig. 5 and Fig. 6 shows that the corresponding wavelet coherence estimates are fragmented over the studied time interval. At the same time, such fragmentation is approximately the same for all sets of original data that are considered. This is necessary and important to take into account when considering the appropriate strategy for using cryptocurrencies for companies operating in the retail business. At the same time, the joint use of cryptocurrencies such as Dogecoin and Tezos allows you to develop certain risk hedging strategies.

In general, it is worth noting the effectiveness of the wavelet coherence methodology for conducting a comparative analysis between the dynamics of quotes by types of cryptocurrencies and the dynamics of quotes for shares of various companies operating in the trading sector.

Conclusion

The article considers the issues of analyzing the mutual influence between the dynamics of quotes by types of cryptocurrencies and the dynamics of quotes for shares of retail companies. Such an analysis is carried out in the context of ensuring financial stability and development of trading companies operating in the retail sector. For these purposes, the dynamics of quotes for individual types of cryptocurrencies and the dynamics of quotes for shares of various retail companies were studied.

In order to conduct an in-depth analysis, some estimates of wavelet coherence between the dynamics of the selected data sets were considered. Among such data sets, the following were highlighted: Bitcoin – Costco Wholesale Corp (COST), Bitcoin – Walmart Inc (WMT), Litecoin – Campbell Soup Company (CPB) and Litecoin – PepsiCo Inc (PEP). The expediency of using wavelet coherence estimates for conducting the corresponding analysis is shown. It is noted that the obtained results can be used to develop strategies for using cryptocurrency for the purposes of development and provision of retail companies.

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