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Araştırma Makalesi * Research Article

Examining the Relationship between the Economic Discontent Index and BIST Bank Index with Wavelet Analysis

İktisadi Hoşnutsuzluk Endeksi ile BIST Banka Endeksi Arasındaki İlişkinin Dalgacık Analizi ile İncelenmesi

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Abstract: Financial markets are influenced by numerous factors, such as economic indicators, investor confidence, and macroeconomic conditions. Among these, the Economic Discontent Index is an essential measure reflecting the public's economic discontent, which can subsequently influence investor behavior and market performance. The BIST Bank Index, which represents the performance of banking stocks in Borsa Istanbul (BIST), is a critical component of Türkiye's financial ecosystem. Therefore, this study aims to investigate whether there is a relationship between the economic discontent index and the BIST Bank Index. Traditional econometric analysis methods may be insufficient to explain the non-linear and multiscale nature of these relationships fully. For this reason, the study analyses the relationship between economic discontent and the banking index from a multiresolution perspective using the Wavelet transform. As a result of the study, it is concluded that there is no relationship between the economic discontent index and the BIST banking index in the long run. At the same time, there is a relationship in the short run only in 2017 and 2018.

Keywords: Economic Discontent Index, BIST Bank Index, Wavelet Analysis.

Öz: Finansal piyasalar, ekonomik göstergeler, yatırımcı güveni ve makroekonomik koşullar gibi faktörlerden etkilenir. Bunlar arasında İktisadi Hoşnutsuzluk Endeksi kamuoyunun ekonomik hoşnutsuzluğunu yansıtan önemli bir ölçüt olarak hizmet eder ve bu da daha sonra yatırımcı davranışlarını ve piyasa performansını etkileyebilmektedir. BIST içindeki bankacılık hisse senetlerinin performansını temsil eden BIST Banka Endeksi, Türkiye'nin finansal ekosisteminin kritik bir bileşenidir. Buradan hareketle çalışmada, iktisadi hoşnutsuzluk endeksi ile BIST banka endeksi arasından bir ilişkinin olup olmadığı amaçlanmıştır. Geleneksel ekonometrik analiz yöntemleri, bu ilişkilerin doğrusal olmayan ve çok ölçekli doğasını tam olarak açıklamakta yetersiz kalabilmektedir. Bu nedenle çalışmada, Wavelet dönüşümü kullanılarak iktisadi hoşnutsuzluk ve bankacılık endeksi arasındaki ilişki çoklu çözünürlük perspektifinden ele alınmıştır. Çalışmanın sonucunda, iktisadi hoşnutsuzluk endeksi ile BIST banka endeksi arasında uzun dönemde ilişki tespit edilemezken, kısa dönemde ise sadece 2017 ve 2018 yıllarında ilişki olduğu sonucuna varılmıştır.

Anahtar Kelimeler: İktisadi Hoşnutsuzluk Endeksi, BIST Banka Endeksi, Dalgacık Analizi.

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INTRODUCTION

Inflation, unemployment, and the accompanying problems have been one of the biggest problems every country's economy faces for years. The indicator, which consists of inflation and unemployment rates, gives essential information about the course of the economy and is defined by economists as the Economic Discontent Index. The index, which was first introduced by the American economist Arthur Okun in 1970, is an indicator consisting of the sum of the unemployment and inflation rates. Since an increase in the unemployment rate indicates a decrease in the level of employment and an increase in the inflation rate indicates a decrease in purchasing power, an increase in the index level indicates disruptions in the course of the economy, deterioration in macroeconomic performance, and increasing discontent.

Inflation, which most countries struggle against and try to keep at reasonable levels, means a continuous increase in the general level of prices and a decline in the purchasing power of money. Although inflation is a macroeconomic problem arising in the functioning of the monetary system, it distorts income distribution as a result. Those in a society's upper income groupan protect themselves against inflation by investing their assets in various value-preserving instruments such as real estate, stocks, and jewelry.

High inflation and unemployment rates are among the undesirable conditions for every economy. The gradual increase in inflation and unemployment rates means a worsening economic situation for average individuals. While the increase in inflation reduces purchasing power, the increase in unemployment makes it difficult to find a job (Yetişen et al., 2022: 44). A combination of both worsens the economic situation, reduces average wages and tax revenues, increases income inequality, deepens social inequality and increases crime rates (Özcan, 2016: 300). Therefore, the course of unemployment and inflation indicators in the country is important in terms of determining their effects on the economy and the economic discontent of the people.

In the 1990s, Barro (1999) developed the index by adding growth rates and long-term interest rates to the index developed by Okun. According to Barro, an increase in unemployment, inflation, and interest rates will increase economic discontent. A decrease in economic growth also increases economic discontent (Kaya et al., 2023: 2438). The index is frequently used to make macroeconomic performance comparisons between periods. The course of a country's economy and the economic welfare of the people are closely related to unemployment, inflation, interest rates, and economic growth, which are related to macroeconomic performance (Işık & Öztürk Çetenak, 2018: 38). Although the variables included in the developed economic discontent indices vary, high unemployment, inflation and interest rates and low growth rates generally increase economic discontent. Therefore, high economic discontent indicates domestic economic imbalance and a decrease in the quality of life of individuals.

The BIST Bank Index, which represents the performance of banking stocks in Borsa Istanbul (BIST), is a critical component of Türkiye's financial ecosystem. The relationship between economic discontent and stock market indices, notably the BIST Bank Index, is a complex and multifaceted topic that has attracted considerable academic interest. Economic discontent, often measured through various indices that capture public sentiment about economic conditions, can have profound implications for financial markets. In the Turkish context, the BIST Bank Index serves as a critical barometer for the performance of the banking sector, reflecting the health of financial institutions and their response to macroeconomic conditions. Understanding the interaction between economic discontent and the BIST Bank Index is important for investors, policymakers, and researchers as it can provide insights into market behavior and economic stability.

In sum, the relationship between economic discontent and the BIST Bank Index is characterized by the interaction of macroeconomic factors, external shocks, and credit dynamics. The impact of external shocks, such as geopolitical events or natural disasters, further complicates the relationship between economic discontent and the BIST Bank Index. For example, Çilek (2023) analyzed the effects of the 2023 Kahramanmaraş earthquake on the BIST 100 and BIST Bank Index and found a causal link

between the magnitude of the earthquake and the declines in these indices. As economic discontent emerges through various indicators, its impact on the banking sector becomes increasingly evident and affects market performance and investor behavior. The fact that the banking sector is susceptible to economic fluctuations may significantly impact the performance of bank indices. Banks' lending status, profitability, general economic situation, and contributions may be adversely affected in an environment of economic instability.

Economic uncertainties and macroeconomic imbalances are among the key factors that directly affect the stability of financial markets. In particular, economic discontent indicators can play a decisive role in investor confidence and banking sector performance. The banking index is an important indicator that reflects the vulnerabilities and systemic risks in financial markets, and its dynamic relationship with economic discontent may vary over time. Traditional econometric analysis methods may be insufficient to explain the non-linear and multiscale nature of these relationships fully. This study will analyze the relationship between economic discontent and the banking index from a multiresolution perspective using the wavelet transform. By decomposing short-term and long-term effects through wavelet analysis, the reflections of economic fluctuations on the banking sector at different time scales will be analyzed more comprehensively.

The study aims to investigate whether there is a relationship between the economic discontent index and the BIST bank index. While the Economic Discontent Index reflects characteristics such as economic growth and security, in the Turkish context, the BIST bank index serves as a critical indicator for the performance of the banking sector, reflecting the health of financial institutions and their response to macroeconomic conditions. The relationship between these two links can be used effectively in the market decision-making processes. In this sense, the study's results are expected to contribute to the literature.

In the study, following the introduction section, where the general summary of the subject is made, a general summary of the studies conducted in the literature regarding the economic discontent index is made. Then, the methodology for determining the relationship between the economic discontent index and the BIST Bank index is given. After discussing the results of the analyses, the study concludes with a conclusion section.

LITERATURE REVIEW

Examining the relationship between the Economic Discontent Index and the BIST Bank Index fills the gaps in the existing literature. By further analyzing the relevance of social and economic liberalization for financial markets, especially the banking sectors, this research provides new insights and compiled recommendations for the market daily.

When the economic discontent index literature is analyzed, it is seen that the studies investigating the relationship between economic discontent and both macroeconomic indicators and social indicators are limited. It is observed that each study differs in terms of country, method, and period, and the results also differ. The studies generally investigate the relationship between inflation-economic growth, unemployment-economic growth, and inflation, unemployment and economic growth. In addition, the relationship between this index and many variables has been empirically and theoretically discussed in the literature. The relationship of the index with many variables such as economic growth, current account balance, foreign direct investment, crime and suicide rates, life satisfaction, brain and labor migration, government performance, change in income distribution, health expenditures, and consumer confidence has been the subject of research. In the literature review, it is observed that there is no study analyzing the relationship between the economic discontent index and the banking index, and this study is expected to contribute to the literature in this respect. Below are summaries of the studies conducted with the economic discontent index in the literature.

Welsch (2007) analyzed the relationship between the economic discontent index and life satisfaction for 12 European countries between 1992 and 2002. The study covers Belgium, France, Denmark, Germany, the United Kingdom, Ireland, the Netherlands, Italy, Greece, Luxembourg, Spain, Portugal, Italy, Greece, Luxembourg, Spain and Portugal, and unemployment, inflation, economic growth and long-term interest rates are used as variables. Using regression analysis, he concluded that life

satisfaction decreases when economic discontent increases. Moreover, no matter how life satisfaction is measured, growth, employment, inflation, and stability are equally important for European citizens.

Lechman (2009) used correlation analysis to analyse the relationship between Okun and Barro discontent indices and poverty in his study of 27 European Union countries. He concluded that there is no relationship between the economic discontent index and the poverty rate.

Lee et al. (2007) investigated the relationship between Okun's economic discontent index and economic growth, unemployment, inflation, and current account balance for the USA, Japan, and Korea using data for 1967-2001. In the study, within-country analyses and cross-country comparisons were made regarding economic performance. The findings from the analyses show that the economic discontent index is consistent with economic performance and accurately reflects the economic situation. In terms of international comparisons, while Korea's economic discontent index is more affected by countries other than the USA and Japan, it is affected by Japan in terms of economic growth and balance of payments and by the USA in terms of inflation. While the economic discontent index of the USA is not affected by Korea and Japan at all, inflation and balance of payments are slightly affected by Japan. Japan's economic discontent index is mainly affected by the US, while the US and Korea have almost the same effect on the balance of payments. In general, it is found that high economic performance is associated with low economic discontent.

Grabia (2011) investigated the relationship between Okun's economic discontent index, which is the sum of inflation and unemployment rates, and GDP per capita (according to purchasing power parity) in 27 European Union countries using data from 2000-2009. In the study, which aims to evaluate the economic performance of countries, it is found that economic discontent is low in high-income countries such as Luxembourg, the Netherlands, Denmark, Austria, Sweden, and the United Kingdom. At the same time, it is high in lower-income countries such as Hungary, Estonia, Slovakia, Poland, Latvia, Lithuania, Bulgaria, and Romania, which are new members of the European Union.

Özer (2019) analyzed the relationship between the economic discontent index and the current account deficit in developing countries. According to the Fourier cointegration test results, there is an inverse relationship between the economic discontent index and the current account deficit in all countries examined. In Brazil, South Africa and India, a unidirectional long-run relationship was found from the current account deficit to the economic discontent index, in Indonesia, a unidirectional long-run relationship was found from the economic discontent index to the current account deficit, and in Türkiye, a bidirectional long-run relationship was found between the economic discontent index and the current account deficit. Analyses conducted by taking the countries' average also indicate a bidirectional long-run relationship between the economic discontent index and the current account deficit.

Çağlayan Akay and Oskonbaeva (2020), in 16 selected transition economies (Croatia, Bulgaria, Estonia, Czech Republic, Hungary, Lithuania, Latvia, Kyrgyzstan, Kazakhstan, Moldova, Romania, Poland, Slovenia, Slovakia, Ukraine, Russia) investigated the relationship between the poverty index, labor transfers, foreign direct investment and openness index indicators and economic growth with annual data for the period 1996-2017. Panel ARDL test was used to estimate the study analyses. The study results show a negative long-run relationship between the misery index and economic growth in the countries analyzed; a 1% increase in the misery index decreases economic growth by 0.22%. Moreover, the relationship between the poverty index and economic growth is also negative and significant in the short run; a 1% increase in the poverty index decreases economic growth by 0.01%.

Göksu and Mere (2022) investigated the effect of economic growth (real GDP) and economic discontent index on the insurance sector by using data from 1992-2020 for Türkiye. According to the study's findings using the Granger Causality Test and ARDL bounds test approach, a unidirectional causality was found from economic growth to economic discontent index and insurance sector. In the long run, it is found that a 1% increase in the economic discontent index will decrease the insurance sector by 0.02%. In comparison, a 1% increase in economic growth will cause an expansion of approximately 0.15% in the insurance sector.

In their study, Ali et al.(2024) examined how bank stock performance in G20 countries responds to economic policy uncertainty (EPU) and oil price shocks using a time-frequency (wavelet coherence) approach. The authors revealed cross-wavelet coherence using continuous wavelet transform while testing how the effect of uncertainty changed across different return quantiles using a non-parametric causality-in-quantiles test. Empirical findings showed heterogeneous impact profiles across countries; during crisis periods, EPU revealed a more pronounced and mostly negative relationship on bank returns.

Athari, et al. (2024) examined the relationship between the Twitter-based Economic Uncertainty Index (TEU) and US energy stocks using the wavelet coherence method; they reported that when the TEU rose, a homogeneous downward trend was observed in energy stocks. The study emphasises that the TEU establishes a positive and significant relationship with the S&P 500 in the medium to long term, but that the response is heterogeneous across sectors (e.g., energy vs. technology vs. banking). Using continuous wavelet coherence as a method, time-frequency-based co-movement maps were generated, and the findings showed that this co-movement strengthened during the COVID-19 period. The conclusion that such social media-based uncertainty indices affect financial sectors differently with short-frequency waves indicates how the choice of data source for the Economic Dissatisfaction Index (survey vs. news vs. social media) in the Turkish case could affect empirical results.

Abakah et al. (2024) examined the relationship between DeFi assets and G7 banking stocks using the wavelet quantile correlation approach; time-frequency and quantile-sensitive correlation analyses found that diversification/hedging benefits exist in the short to medium term. The study highlights the heterogeneity of DeFi-bank relationships across different quantiles (e.g., left quantile = downturn periods), underscoring the importance of considering time-frequency and risk-state factors in portfolio selection. Methodologically, the detail provided by wavelet-based quantile correlation (WQC) allows for a more nuanced interpretation of how the BIST Bank Index and the dissatisfaction index interact under different market conditions.

A study conducted by Huang and Charteris (2025) investigated how the 2023 banking crisis altered the time-frequency coherence structure within the global banking sector. The study shows that the 2023 crisis increased contagion effects in the short term through wavelet analysis, while strengthening intra-sectoral coherence in some frequency bands. Such findings highlight the importance of controlling for global shocks in analyses of the BIST Bank Index and dissatisfaction indices, particularly for studies covering the post-2023 period.

METHODOLOGY

In this study, the dynamic relationship between the Economic Discontent Index and the BIST Bank Index is analysed using the Wavelet Coherence Analysis method, which can reveal co-movements that vary in wavelength and time dimension. Thanks to this method, short—and long-term interactions between the series are identified, and the possible effects of economic discontent on the banking sector are evaluated at different time scales.

The attractive feature of the Wavelet transform in analysing macroeconomic data is a three-dimensional diagram that shows time series information at different frequencies (low and high) and time (short-term or long-term scale) horizons, and the strength of the relationship is measured by colours (Grinsted et al., 2004). In this study, we provide a methodological discussion based on the Wavelet coherence (WTC) transform to examine macroeconomic series that are suitable or preferred for orthogonal wavelet bases.

Wavelet transform or Wavelet analyses (Wavelet) focus on two fundamental questions. First, do the wavelet coefficients in Wavelet analysis characterize the time series data as a whole? Second, can the time series be reconstructed from the wavelet coefficients? The wavelet transform can provide time-frequency information without considering the stationarity of the time series data used in the analysis. In this respect, it offers a new perspective and a complementary role to traditional Fourier spectrum analysis. Since Fourier spectrum analysis is usually based on the assumption of stationarity, Wavelet makes an important contribution in this respect. Therefore, advanced wavelet data analysis has become a new method in the literature (Liu, 1994: 151-153).

In the literature, there is no consensus on the smoothing of the cross-wavelet spectrum in order to express a suitable wavelet coherence. However, in the Wavelet method, both time and scale smoothing are applied first. The smoothing process should depend on the choice of both wavelet and scale. Given a series (X and Y) with two different Wavelet transforms such as $W_n^x(s)$and $W_n^y(s)$ $Wn\,X(s)$, the equation is defined as follows. Where 'n' stands for time and 's' stands for scale (Torrence and Webster, 1999: 2689):

$$W_n^{XY}(s) = W_n^X(s)W_n^{Y*} \quad (1)$$

In Equation 1, $W_n^x(s)$and $W_n^y(s)$ denote the continuous wavelet transforms of X and Y, respectively, and (*) denotes expresses the conjugate of the complex number.

$$R_n^2(s) = \frac{\left|S(s^{-1}W_n^{XY}(s))\right|^2}{\left(S^{-1}|W_n^X(s)|^2\right)\left(S^{-1}|W_n^Y(s)|^2\right)} \quad (2)$$

In Equation 2, ' 〈 〉 ' stands for smoothing in time and scale. s is explained as a smoothing process over the period analysed together with frequency. The equation $R_n^2(s)$ takes values between 0-1 ($0<R_n^2(s)<1$). Accordingly, as the value of $R_n^2(s)$ increases, the correlation between data sets increases.

In other words, when this value approaches 1, it indicates that the time series move together on a particular scale during the analyzed period, and the relationship between them is strong. Moreover, the analysis results highlight this strong relationship in red tones. Similarly, when this value approaches 0, it indicates that the relationship between the time series is weak, and this is expressed in blue tones

The difference analysis, which is the stage that reveals the relationship of the analyzed time series, is calculated with the help of Equation 3:

$$\phi_n(s) = \tan^{-1}\left(\frac{\Im\left\{\left(s^{-1}W_n^{XY}(s)\right)\right\}}{\Re\left\{\left(s^{-1}W_n^{XY}(s)\right)\right\}}\right) \quad (3)$$

In Equation 3, ($\Re$) denotes the corrected genuine and ($\Im$) the imaginary (virtual) parts. With the help of Equation 3, wavelet plots are obtained. The black arrows show the results of the wavelet coherence phase difference. The direction of the arrows in the wavelet plots represents the relationship between the analyzed time series and provides information about the direction of the relationship. The direction of the arrows to the right (180^0) indicates that the relationship between the time series is positive. The direction of the arrows to the left (180^0) indicates the presence of a negative relationship. In addition, the upward (90^0) direction of the arrows indicates that the first variable causally affects the second variable. In comparison, the downward (90^0) direction of the arrows indicates that the second variable causally affects the first variable, that is, the existence of a unidirectional causality (Cohen, 2019:82).

The white curve in the wavelet graph indicates that the wavelet power is cut off. In this case, it is stated that it is difficult to make inferences about the parts outside the white curve. The thick black lines show the significance of test results through Monte Carlo simulations. Accordingly, it indicates a significant wavelet power range at a 5% significance level. The colors in this range indicate that the relationship strengthens as we move from blue to red (Morlet et al., 1984: 723).

Data Set

Arthur Okun first proposed the economic discontent index to measure economic discontent in the US in the early 1970s as rising unemployment and inflation caused severe costs (Cohen et al., 2014: 2). Okun's economic discontent index consists of the unweighted sum of inflation and unemployment rates. Inflation, which constitutes one of the parameters of the economic discontent index, is included in the consumer price index (CPI) since it is important for the consumer and is calculated in retail prices

(Çondur, 2016: 1314). Okun's economic discontent index, which can be calculated quarterly or annually, is formulated as follows (Cohen et al., 2014: 2):

$$mt = | \pi t | + ut \quad (4)$$

Where mt is the discontent index in period t, πt is inflation in period t, and ut is unemployment in period t. The absolute value of inflation in the formula indicates that deflation can be as harmful as inflation (Lovell and Tien, 2000: 2). The economic discontent index is the first statistical tool used to measure the economic welfare of countries and to determine the level of economic stability (Cohen et al., 2014: 2). Increases in any of the variables that make up the index negatively affect the stability and welfare level of the national economy. An increase in the index value generally indicates a deterioration in macroeconomic performance, while a decrease in the index value indicates an improvement in macroeconomic performance.

In this section of the study, the changes in the variables of the Turkish economy in the 2004:1-2023:4 time interval are analyzed. The data used in the analysis are obtained from the Central Bank of the Republic of Türkiye Electronic Data Distribution System (EDDS) and investing.com. Figure 1 shows the economic discontent index values according to Okun (1970) and Barro (1999) calculated from inflation and unemployment data for Türkiye covering the 2004-Q1/2023-Q4 periods.

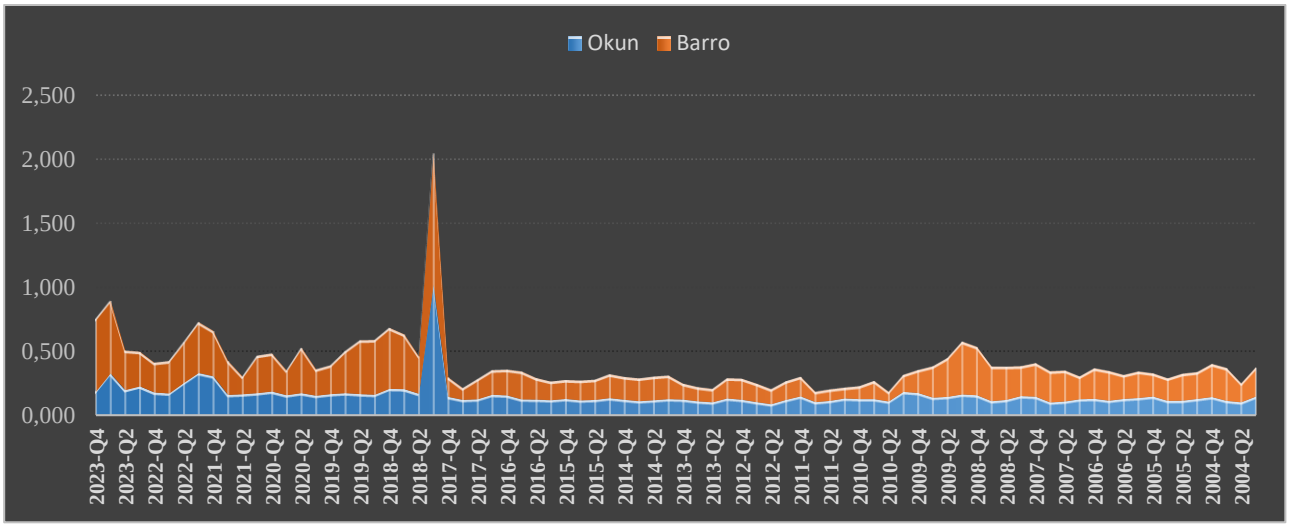

Figure 1. *Time Series Graph*

RESULTS

The results obtained are planned to be explained in this section of the study using the Wavelet method. R Studio program was used in the analysis. The analysis was performed with the "wavelet" code developed by Gouhier et al. (2013).

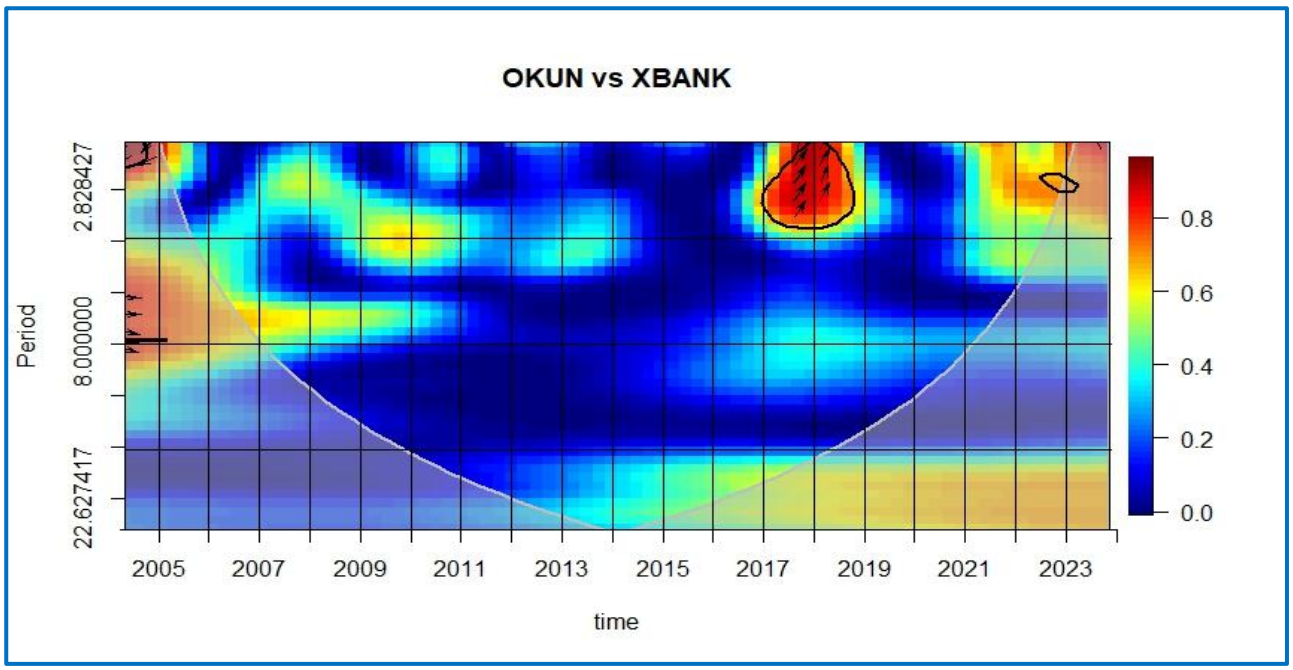

Figure 2. *Okun Economic Discontent Index and XBANK Index*

When Figure 2 is examined, it is seen that there are significant effects at short-term frequencies between the economic discontent index proposed by Okun (1970) and the BIST Bank Index according to the results of the wavelet analysis, while there is a high correlation in the relevant period starting from 2017 until the 3rd quarter of 2018. According to the direction of the arrows (), they move together for 2 years under the leadership of the economic discontent index. The islands in the effect funnel indicate that the results obtained are significant at the 5% level. When the long-run frequencies are analyzed, it is observed that there is no relationship.

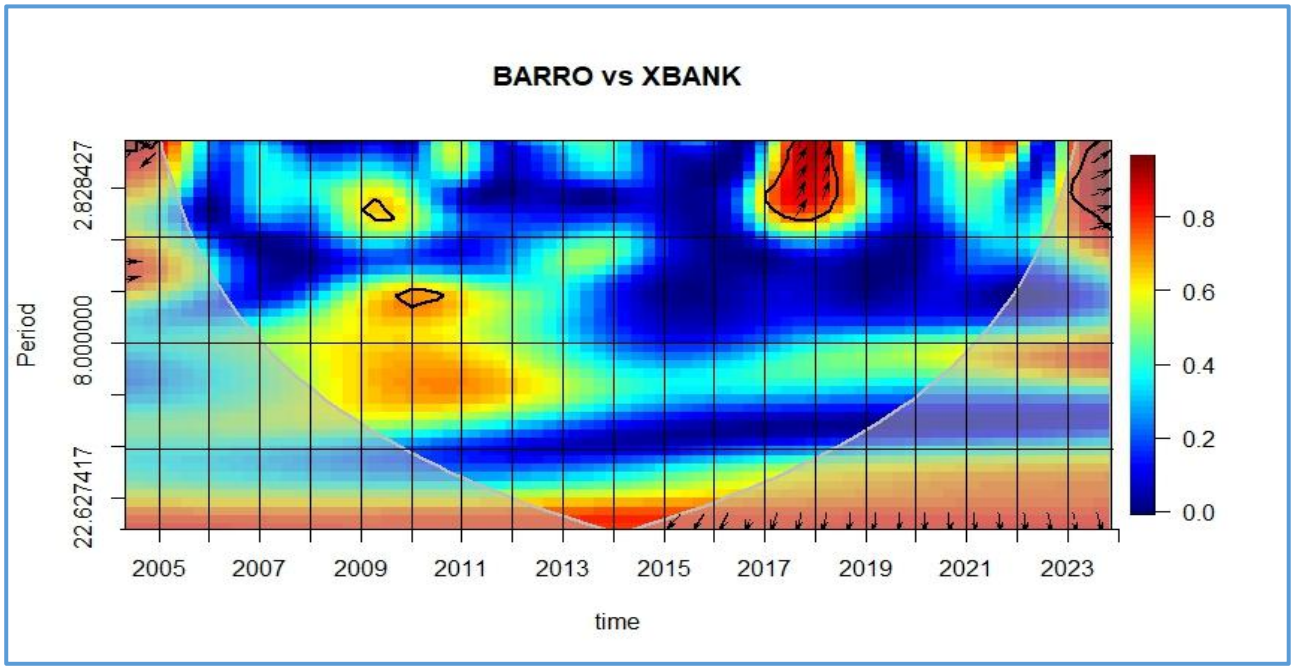

Figure 3. *Barro Economic Discontent Index and XBANK*

Figure 3 shows a short-term relationship between the economic discontent index proposed by Barro (1996) and the BIST Bank Index. However, no relationship was detected at long-run frequencies. When the obtained relationships are analyzed, it is seen that they move together in the funnel of influence at the 5% significance level, starting from 2017 until mid-2018, with the direction of the arrows () led by Barro's economic discontent index in the relevant period. In addition, significant

relationships were found at different frequencies from the first half of 2009 and the last quarter of 2009 to mid-2010.

CONCLUSION

The relationship between the Economic Discontent Index and the BIST Bank Index is an important indicator for evaluating Türkiye's economic dynamics. While the Economic Discontent Index reflects characteristics such as economic growth and security, in the Turkish context, the BIST Bank Index serves as a critical indicator for the performance of the banking sector, reflecting the health of financial institutions and their response to macroeconomic conditions. The relationship between these two links can be effectively utilized in market decision-making processes.

When the findings obtained from the analysis are analyzed, while there was no relationship between the Economic Discontent Index developed by both Okun and Barro and the Borsa Istanbul Bank Index in the long run, the relationships obtained in the short run were realized only in 2017 and 2018. While it was found that the variables moved together in this period and there was a high level of correlation between them, the reason for the relationship in this period may be that inflation in Türkiye exceeded 20% in 2018 for the first time since 2002. Therefore the policy rate was increased 3 times in 2018.

When the results are analyzed in general, although there is a relationship between the economic discontent index and the Borsa Istanbul bank index, it is not sufficient. When the results are analyzed from the perspective of investors, economic discontent alone does not significantly affect investment decisions. If appropriate conditions are provided, different countries can be included in the analysis, comparisons between countries can be made, and the study can be taken further.

The relationship between the BIST Bank Index and the Economic Discontent Index is not limited to economic factors. Foreigners' buying and selling transactions can also be realized in this way. Kaya (2020) analyzed the relationship between foreigners' buying and selling transactions and stock prices and found that these variables move together in the long run. This suggests that foreign investors' attitudes towards economic returns in Türkiye have a distribution on the BIST Bank Index. In conclusion, the relationship between the Economic Discontent Index and the BIST Bank Index has a multidimensional structure. Economic returns, investor sentiment, systemic risks and foreign investor inflows are important factors that shape this two-band interaction. Therefore, adopting a multidisciplinary approach and observing differential economic growth for sustainability is necessary. Forward-looking studies can contribute to a better understanding of these dynamics and help shape economic policies.

Central banks and regulatory authorities should develop communication strategies that are stabilising, transparent and consistent during periods of uncertainty. Transparency in monetary policy communication—regular and understandable information about policy objectives, instruments, and possible scenarios—helps prevent unnecessary volatility and erosion of confidence in financial markets, thereby reducing the likelihood of short-term waves of discontent translating into market behaviour. This communication should not be limited to technical texts; summaries for the public, frequently asked questions and rapid explanation mechanisms during crises should also be established.

The banking sector's liquidity and capital resilience must be made more resistant to rapid sentiment shocks originating from social media and news sources. As liquidity stresses similar to those seen in 2023 can spread rapidly in the digital age, regulators should revise regulations on liquidity management, deposit insurance regulations and emergency liquidity support mechanisms, in addition to macro-prudential risks. Furthermore, regulators should use short-frequency (daily/weekly) sentiment shocks in stress tests and scenario analyses to assess how banks would respond to short-term liquidity gaps.

When designing policy packages, coordination should be prioritised: the interaction between monetary policy, macroprudential tools and fiscal policy is particularly important. If economic discontent and financial volatility rise simultaneously, coordinated and communicative steps by

different institutions (e.g. coordinated intervention, joint statements, emergency liquidity cooperation protocols) are effective in stabilising market confidence and public perception.

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