Araştırma Makalesi / Research Article

Financial Factors Affecting Investors' Risk Appetite: Empirical Evidence from Domestic and Foreign Investors on BIST

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Abstract

This study aims to reveal the risk appetite of domestic and foreign investors in BIST. For this purpose, the effect of weekly data of BIST100 Index, 10-year bond yields, CDS, USD and Euro on the Risk Tendency for the period 2010-2024 is analysed. According to the ARDL bounds test results, Dollar and Euro have a significant effect on the risk appetite of domestic investors. Independent variables have no significant effect on the risk appetite of foreign investors. The findings reveal that equity investments of domestic investors are sensitive to foreign exchange markets.

Keywords: Financial Markets, Risk Appetite, Stock Markets. *JEL Codes:* G12, G32, G33, G41

Yatırımcıların Risk İştahını Etkileyen Finansal Faktörler: Yerli ve Yabancı Yatırımcılardan BİST'e İlişkin Ampirik Kanıtlar

Öz

Bu çalışma, BİST'teki yerli ve yabancı yatırımcıların risk iştahını ortaya koymayı amaçlamıştır. Bu amaçla 2010-2024 döneminde BİST100 Endeksi, 10 yıllık tahvil faizleri, CDS, altın, Dolar ve Euro'nun haftalık verilerinin Risk Eğilim Endeksi üzerindeki etkisi analiz edilmiştir. ARDL sınır testi sonuçlarına göre Dolar ve Euro yerli yatırımcıların risk iştahı üzerinde anlamlı etkiye sahip olduğunu göstermiştir. Bağımsız değişkenlerin yabancı yatırımcıların risk iştahı üzerinde anlamlı etkisi yoktur. Bulgular yerli yatırımcıların hisse senedi yatırımlarının döviz piyasalarına karşı hassasiyet gösterdiğini ortaya koymuştur.

Anahtar Sözcükler: Finansal Piyasalar, Risk İştahı, Hisse Senedi Piyasaları. JEL Kodları: G12, G32, G33, G41

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1. Introduction

Traditional finance assumes that financial markets are efficient and that individuals make decisions to maximise expected returns through rational analysis based on information. This approach emphasises expected returns, risk assessment and portfolio diversification. Behavioural finance uses insights from psychology to understand how cognitive biases and emotional factors influence financial decisions. It explores phenomena such as herd behaviour, overconfidence, loss aversion and framing effects. It attempts to explain how such cognitive and emotional factors play a role in investment decisions and market anomalies. While traditional finance assumes that markets are efficient and that individuals make decisions rationally, behavioural finance seeks to understand the complexity of financial decisions and market dynamics through psychological insights, thus providing a more nuanced view of investor behaviour and market efficiency (Hirshleifer, 2015).

According to behavioral finance, variations in how investors interpret market information and their corresponding risk sensitivity also influence their investment decisions (Nur, 2022). Thus, the finance literature analyses the impact of changes in investors' risk appetite on asset prices (Bauer et al., 2023; Kasoga, 2021; Hui et al., 2013).

Risk appetite reflects investors' preference and willingness to take risks when investing in financial markets. The propensity to take risk can contribute significantly to the volatility of pricing and asset prices in the markets. Investors with a high risk appetite often seek higher returns, which can often lead to volatility and the speed of market movements (Köycü, 2022). This can lead to increased speculation and excessive volatility of prices. On the other hand, investors with low risk appetite may favour more stable and low volatility assets, which may contribute to calmer market movements. The overall level of risk appetite can also affect the overall risk perception and pricing in the markets; therefore, changes in investors' risk appetite can significantly affect market dynamics and cause sudden movements in the markets (Heo et al., 2021).

Analysing the determinants of risk-taking propensity in financial markets is a critical aspect of understanding investor behaviour and predicting market movements. Investors' propensity to take risk is one of the important factors affecting market pricing and asset prices. Investors with low risk appetite generally prefer safe-haven assets, while investors with high risk appetite may prefer more volatile and high-yielding assets. These tendencies can provide clues about how prices will be shaped in the markets and are important in understanding the reasons behind sudden price movements. Moreover, risk-taking propensity is closely related to economic and financial developments; for example, factors such as economic growth expectations, monetary policy decisions and geopolitical risks may affect investors' risk-taking propensity. Therefore, analysing the determinants of risk-taking propensity is important for understanding market dynamics and predicting investor behaviour (Rahman, 2020; Yıkılmaz, 2022).

This study aims to analyse the risk-taking tendencies of domestic and foreign investors in Turkish stock market for the period 2010-2024. For this purpose, the effect of USD, Euro, Credit Default SWAP (CDS), 10-year bond rates on the domestic and foreign Risk Tendency Index calculated by the Central Registry Agency is examined by ARDL bounds test. The literature focuses on the effect of risk-taking propensity on asset prices. However, this study contributes to the literature by analysing the determinants of risk-taking propensity.

This paper is organized as follows: Section 2 presents the theoretical background, Section 3 reviews the literature, Section 4 deals with methodology and data, Section 5 presents the empirical results, and we conclude this study in Section 6.

2. Theoretical Background

This study, which examines the factors affecting risk-taking propensity, can be based on several financial theories. Classical finance theories and behavioural finance theories approach risk appetite from a different perspective. One of these theories is the modern portfolio theory. Modern Portfolio Theory (MPT) suggests that investors optimise their portfolios by striking a balance between risk and return; within the framework of this theory, risk appetite refers to an investor's propensity to include risky assets in their portfolio and their tolerance for the risk of these assets. Investors' risk appetite determines how they assess the risk-reward profile of risky assets and adjust the proportion of risky assets in their portfolios. Investors with a higher risk appetite prefer risky assets with higher return potential and include greater volatility in their portfolios, while those with a lower risk appetite choose safer and lower volatility assets. By taking these risk appetites into account, MPT aim to investors achieve the targeted risk-return balance by diversifying and optimising risk (Beyhaghi & Hawley, 2013). According to the Capital Asset Pricing Model, the concept of risk appetite arises as a result of changes in the relative value of the expected mean-variance or risk-return ratios of all assets, taking into account the risk aversion of investors (Pericoli & Sbracia, 2009). The Fama-French Three-Factor Model explains how factors such as market risk, company size (small-large effect) and value (value-growth effect) affect returns. Risk appetite is important for understanding how these factors influence an investor's portfolio choices (Foye et al., 2013).

According to the Expected Utility Theory, an investor's risk propensity is explained by a personal utility function that determines how he or she makes decisions under risk and uncertainty. This function measures the satisfaction or utility that the investor derives from different outcomes. Risk-averse investors seek more certain but lower returns by favouring low-risk alternatives, while risk averse investors are willing to take more risk for higher potential returns. As investors seek to maximise expected utility, risk appetite determines how the utility function is shaped and how they respond to risks when choosing between risky and risk-free situations (Jammernegg & Kischka, 2007). Behavioural finance addresses risk appetite through the psychological and emotional dispositions of investors, since in this field individuals' risk-taking behaviour is often shaped by cognitive biases and emotional influences rather than rational ones. In this context, concepts such as fear of loss, overconfidence, and the framing effect influence investors' responses to risk; for example, investors may fear losses more and therefore avoid risky investments, or they may make risky decisions in pursuit of higher returns. Behavioural finance provides tools and theories used to understand how these biases and emotional factors affect risk appetite, thus helping to model investor behaviour in a more complex and realistic way (Köycü, 2022).

According to prospect theory, which is one of the basic theories of behavioural finance, decision makers maximise their utility in situations of risk and uncertainty; in expected utility theory, they maximise their utility with rational inferences, and in uncertainty, they like risk, escape or hedge. According to prospect theory, cognitive contradictions may distort rational thoughts and behaviours, and emotions and thoughts may irrationally affect individuals' decisions in the decision-making process. Investors who make decisions based on human emotions such as ethics, expectations, fears, pleasure, etc. may make systematic mistakes and tend to be risk averse in case of gains and risk loving in case of losses (Cao et al., 2010).

Finance theories attribute risk-taking behaviour to different goals and motives. This study reveal the financial and macroeconomic variables affecting the risk-taking behaviour of Turkish and foreign stock market investors.

3. Literature Review

Table 1

The literature analyses risk appetite to explain financial market movements and understand investor behaviour. This Section reviews the risk appetite literature. Table 1 presents the studies on the risk appetite of financial markets in Türkiye.

Authors	Subject	Findings
Çelik et al.,	Determinants of risk	Regression analysis shows that risk appetite
2017	appetite.	has a negative impact on interest rate and
		exchange rate.
Fettahoğlu,	Determinants of risk	There is a negative relationship between risk
2019	appetite.	appetite and CDS premiums.
Demirez &	The impact of risk appetite	Findings show that risk appetite has an effect
Kandır, 2020	on the BIST 100 Index.	on stock returns.
Balat 2020	The impact of risk appetite	A long-term cointegration relationship exists
	on the BIST 100 Index.	between risk appetite and the BIST 100 index.
Çiftçi &	The impact of risk appetite	There is a unidirectional causality from risk
Reis, 2020	on the BIST 100 Index.	appetite to liquidity.
Nur, 2022	Determinants of the risk-	Panel cointegration and causality analyses are

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	taking propensity of banks	applied to banks' Z scores and financial ratios.
	traded in the Borsa Istanbul	Empirical results show that There is a long-
	Bank Index.	run cointegration relationship between the
		variables. Besides, it is determined that the
		increase in the equity / Total Assets ratio,
		return on assets and illiquidity decreases the
		propensity to take risk and there is a
		relationship from the propensity to take risk to
		return on assets, from the franchise value to
		the propensity to take risk and from illiquidity
		to the propensity to take risk.
Köycü, 2022	Investor risk appetite before	The study finds a unidirectional causality
	and after COVID 19.	relationship from the BIST100 index to the
		Risk Tendency Index both in the pre-COVID-
		19 period and in the post-COVID-19 period at
		the 1% significance level.
Can Ergün et	Risk appetite and stock	The results reveal a significant degree of
al., 2023	market.	interconnectedness in the risk appetites of
		various investor types. Notably, domestic
		investors experience substantial spillovers
		from either professional or foreign investors,
		highlighting the long-term influence that
		foreign and more sophisticated investors have
		on domestic investors in Borsa Istanbul.
Sözen et al.,	The relationship between	According to the findings, there is
2024	risk appetite and	unidirectional causality from risk appetite
	macroeconomic variables.	index to interest rate.

The literature analyzing the determinations of risk appetite in Türkiye is limited. Most studies focus on the effect of risk appetite on financial markets. This study may contribute to the literature on the determinants of risk appetite in Türkiye. While the literature includes risk appetite as an independent variable in the model, this study analyses risk appetite as a dependent variable. The findings may contribute to the literature that does not adequately address the financial determinants of risk appetite. Table 2 presents international risk appetite studies.

Table 2

Risk 1	4p	petite	Studies
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Authors	Subject	Findings
Baek et al.,	Risk appetite and	Risk appetite index is calculated and it is found that this
2005	bonds.	index has a significant effect on bond prices.
Liu et al.,	Risk appetite and	Authors find that asymmetric adjustment in the response of
2012	exchange rates.	exchange rates to changes in global risk aversion.
Bekaert &	Risk appetite and	Empirical results show that the variance premium contains
Hoerova,	stock market.	a substantial amount of information about risk aversion
2016		whereas the credit spread has a lot to say about uncertainty.
Qadan, 2019	Risk appetite and	The findings indicate the effect of risk appetite on expected

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	stock market.	returns and idiosyncratic volatility.
Qadan &	Risk appetite and	According to the GARCH model, there is a notable
Bayaa, 2020	oil prices.	connection between risk appetite, as indicated by the
-	-	conditional variance in the VIX index, and oil prices.
Saiti et al.,	Risk appetite and	The authors argue that there is no significant relationship
2023	stock market.	between risk appetite and stock return.

The literature on the sample outside Türkiye analyses financial markets holistically beyond the stock market. Studies analyzing the determinants of risk appetite show that financial and non-financial variables affect risk appetite.

4. Data and Methodology

The study examines the relationship impact of Dollar, Euro, CDS, BIST 100 and 10-year bond yields on Risk Tendency Index. For this purpose, ARDL bounds test is applied to weekly data for the period 02.04.2010-28.06.2024. The analysis period is determined according to the trading date of the Risk Tendency Index. The data is accessed from Investing.com and the logarithm of the data is taken. The variables' description is presented in Table 3.

Table 3

Variable List Variable Abbrevation Definition Risk Tendency Index Logrisk Weekly score of investor risk appetite. BIST100 Logbist BIST 100 Index weekly closing data. Bond Yield Log10y 10 Years Bond Yield Credit Default SWAP A 5-year CDS is a financial derivative contract that Logcds provides insurance against the default of a borrower's debt obligations over a 5-year period. Dollar Logdol Dollar weekly closing data. Euro Logeur Euro weekly closing data.

The determinants of the Risk Tendency Index are analysed by ARDL bounds test. The main advantage of this model is its ability to include variables with different levels of stationarity in the analysis. However, the ARDL model cannot be applied to variables that are stationary at the second level. Applying an unrestricted error correction model is a factor that enhances the reliability of ARDL model results. Another significant advantage of the ARDL model is its applicability to smaller sample groups (Narayan and Smyth, 2005). The calculation of the ARDL bounds test is as follows;

$$\Delta Y_{t} = \rho_{0} \sum_{i=1}^{m} \rho_{1i} \Delta Y_{t-i} + \sum_{i=0}^{m} \rho_{2i} \Delta X_{1t-i} + \sum_{i=0}^{m} \rho_{ki} \Delta X_{K2-i} + \varepsilon_{i} Y_{t-i}$$

$$+ \varepsilon_{2} X_{1t-1} + \cdots + \varepsilon_{k} X_{kt-1} + U_{t}$$
(1)

The ARDL bounds test consists of three basic stages. In the first stage, the cointegration relationship between the variables is analyzed. If cointegration is present, both the long and the short term relationships between variables are examined in the second and third stages (Gülmez, 2015).

5. Empirical Results

The data's stationarity is assessed through unit root tests, with Table 4 displaying results from the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) tests.

Table 4

Unit Root Tests

ADF		PP		
	Level	Differences	Level	Differences
Logriskyerli	-5.582***	-28.811***	-5.787***	-28.874***
Logriskyabancı	-5.832***	-33.639***	-6.768***	-40.361***
Logbist	-3.430**	-26.102***	-4.450***	-45.992***
Log10y	-0.852	-27.037***	-0.876	-27.037***
Logcds	-2.433	-29.782***	-2.391	-29.714***
Logdol	5.757	-10.740***	4.763	-34.373***
Logeur	5.230	-13.573***	4.632	-33.686***

Note:*,**, and *** indicate the significance at the 10, 5 and 1% levels, respectively.

For ARDL-bound testing, the model must be determined. Model 1 reflects the risk appetite of domestic investors and Model 2 reflects the risk appetite of foreign investors. In the ARDL model and prerequisite tests, the Akaike Information Criterion (AIC) is used for lag length. As a result of the analysis, the ARDL model's lag length is (1,1,3,4,0,2) for Model 1. (2,0,3,0,0,0) is lag length for Model 2. Table 5 presents the models.

Table 5			
ARDL Models			
F Statistic	Critical Values	Lower Limit	Upper Limit
7.55	%10	2.26	3.35
	%5	2.62	3.79
	%2.5	2.96	4.18
	%1	3.41	4.68
Model 2			
6.22	%10	2.26	3.35
	%5	2.62	3.79
	%2.5	2.96	4.18

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The long-term effect of the independent variables is presented in Table 6. The findings indicate that exchange rates have a significant effect on the risk appetite of domestic investors. However, independent variables have no statistically significant effect on foreign investors' risk appetite.

Long Term Coefficients		
Dependent Variable: Logriskyer	li	
Independent Variables	Coefficients	P-Value
Logbist	-0.00	0.40
Log10y	9.54	0.77
Logcds	-0.01	0.13
Logdol	6.16	0.03^{**}
Logeur	-5.79	0.04^{**}
Dependent Variable, Logriskval	anai	
Dependent variable. Dogribkyat	Janei	
Independent Variables	Coefficients	P-Value
Independent Variables Logbist	Coefficients 0.00	P-Value 0.16
Independent Variables Logbist Log10y	Coefficients 0.00 -0.00	P-Value 0.16 0.15
Independent Variables Logbist Log10y Logcds	Coefficients 0.00 -0.00 0.01	P-Value 0.16 0.15 0.24
Independent Variables Logbist Log10y Logcds Logdol	Coefficients 0.00 -0.00 0.01 -1.79	P-Value 0.16 0.15 0.24 0.54

Table 6

Note:***, **, and * indicate statistical significance at 1, 5, and 10 percent significance level, respectively.

The error correction model and short-run coefficients are analyzed to determine the short-run relationship between the variables. The empirical results show that the short-run coefficient is statistically significant and has a negative value. Table 7 shows the error correction model and short-run coefficients.

Table 7

Error Correction Form

Variables	Coefficients	P-Value
Model 1 CointEq(-1)*	-0.09	0.00
Model 2 CointEq(-1)*	-0.11	0.00

The significance of the ARDL model is tested with varying variance, serial correlation, and normality in Table 8. The probability values of the analyses are above 5%. Therefore, the model is statistically significant.

8

elerosceausticity, serial Correlation, and Normality			
Model 1	Coefficients	P-Value	
Breusch-Pagan-Godfrey	3.84	0.11	
Breusch- Godfrey-LM	0.97	0.62	
Jarque-Bera	11.97	0.20	
Model 2	Coefficients	P-Value	
Breusch-Pagan-Godfrey	80.71	0.09	
Breusch- Godfrey-LM	1.72	0.42	

Table 8

Hete 1 3 7 1.,

The model's structural break is examined using CUSUM test. According to Graphic 1 there is no structural break in the models.

The findings indicate that foreign exchange markets have a statistically significant effect on domestic investor risk appetite. There are studies supporting this result in the literature (Celik et al., 2017; Sözen et al., 2024).

The significant effect of exchange rates on the risk appetite of stock market investors in a country can be explained through several interconnected financial and psychological mechanisms. exchange rates have a direct impact on the profitability of multinational companies and, consequently, on stock market performance. For investors, fluctuations in exchange rates can alter the earnings reports of firms with significant foreign revenue or expenses. A depreciation of the domestic currency can increase the value of foreign earnings when converted back into the domestic currency, potentially boosting stock prices of export-oriented companies. Conversely, a currency appreciation can reduce these earnings and negatively affect stock prices. Investors, therefore, closely monitor exchange rates as they can influence market returns, shaping their risk-taking behavior (Celik et al., 2017; Sözen et al., 2024).

Exchange rate volatility can affect investor sentiment and risk perception. When exchange rates become volatile, it often signals economic instability or uncertainty, which can heighten perceived risks in financial markets. Investors might adjust their risk appetite in response to this uncertainty, becoming either more cautious or more aggressive based on their expectations of future currency movements and economic conditions. For instance, a weakening currency might lead investors to anticipate higher inflation and potential economic instability, prompting them to adjust their portfolios towards safer assets or hedging strategies (Tai, 2010; Du & Hu, 2012).



Graphic 1

6. Conclusions

Investors' cognitive elements are used in the discipline of finance to explain the behaviour of financial instruments. Thus, factors affecting risk sensitivity and investor's risk appetite are analysed. This study identify the financial determinants of risk appetite. Risk appetite is measured by the risk tendency index published by the Central Registry Agency. Independent variables are BIST100 index, CDS, 10-year bond yields, USD and Euro.

Empirical evidence suggests that foreign exchange markets are the main factor affecting the risk appetite of domestic investors. This result has important implications for investors, policy makers and academia.For investors, it's crucial to closely monitor currency fluctuations and their potential impacts on investment returns. This means that they might have to make adjustments to their portfolios and risk management strategies to accommodate the volatility in exchange rates. These adjustments could include diversifying assets or using hedging techniques to minimize currency risk.

For decision-makers, the link between exchange rates and investor behavior highlights the necessity of factoring in currency stability when formulating economic and monetary policy. This could entail making adjustments to interest rates or intervening in foreign exchange markets to stabilize the currency and uphold investor confidence. Implementing effective financial regulations may also be crucial to managing market volatility and guarding against sudden shifts in investor sentiment.

In the academia, it has become clear that exchange rates greatly influence investor risk appetite. This emphasizes the urgency for delving deeper into the mechanisms that connect currency movements with market behavior. Through this research, we can improve financial theories and models, providing valuable insights for policymakers and investors alike. Furthermore, academic studies can offer evidence-based recommendations for managing the economic impact of exchange rate fluctuations on financial markets.

The study has some limitations. Since weekly data were analysed, some financial variables could not be included in the model. Furthermore, non-financial variables is not analysed. Future studies can extend the model by adding geopolitical variables and may contribute to the expanding literature.

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