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Research Article

Investor Sentiment and the Stock Market

Yatırımcı Duyarlılığı ve Hisse Senedi Piyasası

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Öz

Bu çalışmanın amacı, Borsa İstanbul'da Ocak 2005-Ağustos 2020 dönemleri arasında yatırımcı duyarlılığının etkisini araştırmaktır. Bu kapsamda, kapalı uçlu yatırım fonlarını ve hisse senedi getirilerini kullanarak regresyon analizi yapılmıştır. Bununla birlikte, yatırımcı duyarlılığı etkisinin olup olmadığını test etmek için piyasa volatilitesi de dikkate alınmıştır. Son olarak, yatırımcı duyarlılığı üzerinde belirleyici etkilerinin olup olmadığını test etmek amacıyla tüketici fiyat endeksi, sanayi üretim endeksi ve döviz kuru gibi ekonomik değişkenler de analize dahil edilmiştir. Analiz sonuçları Borsa İstanbul'da yatırımcı duyarlılığının hisse senedi getirileri üzerinde anlamlı bir etkisi olduğunu ancak piyasa volatilitesi ile yatırımcı duyarlılığı arasında anlamlı bir ilişkinin olmadığını göstermektedir. Ayrıca, ekonomik değişkenlerin belirleyici bir etkisi bulunmamaktadır.

Anahtar Kelimeler: *Kapalı Uçlu Yatırım Fonları, Yatırımcı Duyarlılığı, Hisse Senedi Piyasası.*

Abstract

The aim of the study is to examine the effect of investor sentiment on Borsa Istanbul between January 2005 and August 2020. In this context, a regression analysis was conducted by using closed-end fund discounts and stock market returns. Stock market volatility was also taken into consideration to examine whether it moves with investor sentiment. At last, economic variables such as Consumer Price Index (CPI), Industrial Production Index (IPI) and Exchange Rate (XR) were included into the analysis to examine whether there is an additional effect on investor sentiment. The results of the analysis state that while investor sentiment affects stock market returns, no relation is observed between market volatility and investor sentiment on Borsa Istanbul. Moreover, economic variables have no additional effect on investor sentiment.

Keywords: *Closed-End Fund Discounts, Investor Sentiment, Stock Market.*

1. Introduction

In traditional approach to corporate finance, stock prices can not deviate from their fair market values and investors behave as if markets are efficient (Shefrin, 2001). However, economists started to think about ineffectiveness of markets and irrationality of investors because of the large market events challenging the basic assumptions of this standard finance model (Ritter, 2003). One of the assumptions that lead to inefficiency and irrationality is investor sentiment which is

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defined as “a belief about future cash flows and investment risks that is not justfied by the facts at hand” (Baker and Wurgler, 2007: 129).

Shleifer (2000) has constructed an investor sentiment model and accordingly, if investors do not react to earnings news about the company during its revaluation, it is said that they use the conservatism heuristic. As a resut of this behavior, the prices decrease, and the stocks are undervalued, so the returns increase. Otherwise, in case of representativeness heuristic, investors receive news as repeatedly and overreact to this news by thought of an earnings trend. Hence, the prices overreact to earnings announcements (Ergün and Durukan, 2017).

Within this context, this study aims to examine whether stock market returns and volatility move with closed-end fund discounts - as a sentiment proxy - on Borsa Istanbul, covering the periods from January 2005 to August 2020. *CPI*, *IPI* and *XR* are also taken into consideration as economic variables, to examine whether an additional effect exists on investor sentiment.

The literature review on investor sentiment is presented, at first, in this study. Then, the aim of the study is explained and the data and methodology covering regression analysis with the sentiment proxy of the closed-end fund discount used in the study are summarized. At last, empirical findings of the study are discussed.

2. Literature Review

There are considerable amount of studies that present investor sentiment effect on stock returns. Important insights are provided into the role of investment decisions on stock valuation through these studies.

Many researchers have described and discussed several potential investment sentiment proxies. These proxies can be divided as direct and indirect. Direct proxies are generally determined by surveys to examine sentiment effect. American Association of Individual Investors Sentiment Survey, Investors Intelligence Index, Consumer Confidence Index can be used as direct proxies. Furthermore, mutual fund flows, turnover ratio, closed-end fund discounts, volatility premium are evaluated as indirect sentiment proxies (Çağlı et. al., 2020).

To achieve better results, some of the researchers (i.e. Baker and Wurgler, 2006; Çağlı et. al., 2020) have constructed an index including closed-end fund discounts, trading volume, dividend Premium, IPO first-day returns, IPO volume, share turnover, equity share in new issues.

Researchers have also used different proxies to test investor sentiment effect on Borsa Istanbul. The widely used proxies are closed-end fund discounts (Canbaş and Kandır, 2006, 2007, 2009; Kandır et al., 2013; Kaya, 2018; Çağlı, 2019), mutual fund flows (Canbaş and Kandır, 2007; Canbaş and Kandır, 2009; Çağlı et al., 2020) , the ratio of net stock purchases of foreign investors to ISE market capitalization (Canbaş and Kandır, 2007), consumer confidence index (Olgaç and Temizel, 2008; Kandır et al., 2013; Bolaman and Mandacı, 2014; Aydoğan and Vardar, 2015; Altuntaş et al., 2017; Çağlı et al., 2018; Çağlı, 2019; Sarı and Yiğiter, 2020), odd-lot sales-to-purchases ratio (Canbaş and Kandır, 2009), repo holdings of mutual funds (Canbaş and Kandır, 2009; Çağlı et al., 2020), market liquidity (Akarım, 2014), trading volume (Kaya, 2018;), IPO first-day returns (Kaya, 2018), equity shares (Kaya, 2018; Çağlı et al., 2020), accounting information (Fettahoğlu, 2017), real sector confidence index (Çağlı et al., 2018), turnover ratio (Çağlı et al., 2020) on Borsa Istanbul in the literature.

Because it is not easily measured, many researchers have studied to determine the most efficient investor sentiment proxy. Table 1 provides general details of research on investor sentiment, proxied by different measures.

Table 1. Overview of Investor Sentiment Studies

AUTHOR	AIM OF THE STUDY	DATA	METHODOLOGY	SENTIMENT PROXY	CONCLUSION
Brown and Cliff (2005)	Is there investor sentiment effect on asset values on the Dow Jones?	January 1963 - December 2000 January 1979 - July 1998	Regression Analysis	Investor Surveys	There is.
Baker and Wurgler (2006)	Does investor sentiment play any role on stock prices in the U.S. stock market?	1961 – 2001	Panel Data Analysis	Closed-End Fund Discount Trading Volume The Dividend Premium IPO First-Day Returns IPO Volume Share Turnover Equity Share in New Issues	There is.
Canbaş and Kandır (2006)	Is there any effect of investor sentiment on Borsa Istanbul?	January 1997-July 2005	Regression Analysis	Closed-End Fund Discount	There is.
Baker and Wurgler (2007)	Is there any effect of investor sentiment on stock returns in the U.S. stock market?	January 1990 - December 2005	VAR Model	Index of Sentiment Changes The Fund Flow Series	There is.
Canbaş and Kandır (2007)	Is there any effect of investor sentiment on stock returns on Borsa Istanbul?	July 1997 - June 2006	Regression Analysis	Closed-End Fund Discount Average Fund Flow of Mutual Funds The Ratio of Net Stock Purchases of Foreign Investors to ISE Market Capitalization	There is.
Olgaç and Temizel (2008)	Is there a relationship between stock markets and investor sentiment on Borsa Istanbul?	January 2004 - May 2007	Cointegration Analysis Vector Error Correction Model	Consumer Confidence Index	There is.

Canbaş and Kandır (2009)	Is there a relation between investor sentiment and stock returns on the Istanbul Stock Exchange?	July 1997 - June 2005	VAR Model Granger Causality Test	Closed-End Fund Discount Mutual Fund Flows Odd-Lot Sales-to-Purchases Ratio Repo Holdings of Mutual Funds	There is.
Kandır et al. (2013)	Is there relationship between closed end fund discount and consumer confidence index.	2005 – 2012	Correlation Analysis Engle-Granger Test	Closed-End Fund Discount Consumer Confidence Index	There is.
Akarım (2014)	Is there relationship between investor sentiment, economic growth and market liquidity in Turkey?	1988 – 2012	VAR Model Granger Causality Test	Market Liquidity	There is.
Huang et al. (2014)	Is there relationship between investor sentiment and the return of a specific industry?	January 2005 - January 2013	The Principal Component Analysis	The Aligned Sentiment Index	There is.
Bolaman and Mandacı (2014)	Is there a relationship between investor sentiment and the Turkish stock market?	December 2003 - December 2012	ADF Test Ziwot Andrews Test Gregory Hansen Co-Integration Test	Consumer Confidence Index	There is.
Aydoğan and Vardar (2015)	Is there any impact of individual investor sentiment on the Borsa Istanbul sector indices?	January 2004 - January 2014	VAR Model Generalized Impulse-Response Function	Consumer Confidence Index	There is.
Son-Turan (2016)	Is there a relationship between investor sentiment and leverage (bad news) effect on NASDAQ and NYSE Indices?	2004 - 2013	The EGARCH Model Augmented Dickey Fuller Test	Internet Search Volume	There is.

Fettahoğlu (2017)	Is there joint effect of sentiment and accounting information on stock prices?	2009 – 2015	Regression Analysis ANOVA	Accounting Information	There is not.
Altuntaş et al. (2017)	Is there an effect of consumer confidence index - as a sentiment proxy - on stock returns?	2007 – 2016	The Augmented Dickey-Fuller VAR Model	Consumer Confidence Index	There is.
Kaya (2018)	Is there a relationship between investor sentiment and stock returns?	June 1997 - September 2018	Regression Analysis	Trading Volume Closed-End Fund Discount IPO First-Day Returns Equity Shares	There is.
Çağlı et al. (2018)	Is there an effect of investor and managerial sentiment on capital structure decisions of manufacturing firms listed on Borsa Istanbul	2010 – 2017	Panel Data Analysis	Consumer Confidence Index Real Sector Confidence Index	There is.
Çağlı (2019)	Is there causality between consumer confidence index and stock returns?	January 2004 - January 2019	Granger Causality Test	Consumer Confidence Index	There is.
Çağlı et al. (2020)	Is there a causal relationship between BIST-100 return index and investor sentiment?	1997 – 2018	Granger Causality Test	Closed-End Fund Discount Mutual Fund Flows Share of Equity Issues in Aggregate Issues Repo Shares in Mutual Funds Turnover Ratio	There is not.
Sarı and Yiğiter (2020)	Are stock returns affected through investor sentiment?	January 2007 - December 2018	Support Vector Machines	Consumer Confidence Index	There is.

3. Aim of the Study

This analysis aims to find out the effect of investor sentiment on Borsa Istanbul. As suggested by Lee, Shleifer and Thaler (1991), the regression analysis was conducted to measure whether closed-end fund discount have an impact on expected stock returns and market volatility between the periods of January 2005 and August 2020. Economic variables such as *CPI, IPI* and *XR* were also included as control variables, following Ergün and Durukan (2017), to examine whether an additional effect exists on investor sentiment.

4. Data & Methodology

Stocks returns and closed-end fund discounts were used to analyze the effect of investor sentiment. BIST 100 index was determined as the market proxy and monthly closing prices of the market were requested from the Borsa Istanbul, covering the periods of January 2005 and August 2020.

To proxy investor sentiment, closed-end fund discounts were selected, as suggested by Baker and Wurgler (2007), and monthly data were obtained from the official website of Capital Market Board. At last, economic variables such as *CPI, IPI* and *XR* were obtained from Central Bank of Republic of Turkey.

Firstly, a value-weighted index of discounts *(VWD)* were constructed at the monthly level as in Lee, Shleifer and Thaler (1991):

$$VWD_t = \sum_{i=1}^{n_t} W_t DISC_{it}$$

where n_t is the number of funds with available $DISC_{it}$ and NAV_{it} data at time *t*.

$$W_t = \frac{NAV_{it}}{\sum_{i=1}^{n_t} NAV_{it}}$$

$$DISC_{it} = \frac{NAV_{it} - SP_{it}}{NAV_{it}} \times 100$$

where NAV_{it} shows the per share net asset value at time *t* and SP_{it} is the stock price at time *t*.

The following equation was used to calculate the changes in the value-weighted index of discounts (ΔVWD) which is used as a sentiment proxy. ΔVWD can be measured by using the value of *VWD* in the previous day (VWD_{t-1}), as seen in the following equation:

$$\Delta VWD_t = VWD_t - VWD_{t-1}$$

The following equation was used to examine whether closed-end fund discount affects expected stock market returns proxied by BIST 100 Index[1].

$$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \varepsilon$$

where $R_{BIST100_t}$ is the market return at time *t*, $SENT_t$ calculated by ΔVWD, is expression of investor sentiment at time *t*, and ε is the error term.

[1] To be used in the regression analysis, monthly closing prices of the market were converted to monthly logarithmic returns, as expressed:

$$R_{BIST100_t} = \ln(P_t / P_{t-1})$$

where P_t is the closing price of the market index at time *t*, and P_{t-1} is the closing price of the market index on the month before.

To test whether investor sentiment affects market volatility[2], the following regression equation was analyzed:

$$\sigma_{mt} = \alpha + \beta_1 SENT_t + \varepsilon$$

where σ_{mt} is market volatility at time *t*.

At last, economic variables such as *CPI, IPI* and *XR* were taken into account as control variables to examine whether an additional effect exists on investor sentiment. Monthly changes in each economic variable were denoted as follows:

$$r_e = (EV_t - EV_{t-1})/EV_{t-1}$$

where EV_t is the value of the economic variable at time *t*.

To measure the additional effect of the economic variables on Borsa Istanbul, the following equations were used, respectively:

$$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \beta_2 CPI + \beta_3 IPI + \beta_4 XR + \varepsilon$$

$$\sigma_{mt} = \alpha + \beta_1 SENT_t + \beta_2 CPI + \beta_3 IPI + \beta_4 XR + \varepsilon$$

5. Empirical Findings

Before predicting the results of linear regression, the estimated regression coefficients were adjusted for stationary, normality, multicollinearity, autocorrelation and heteroscedasticity. First of all, descriptive statistics of the variables are presented on monthly basis between January 2005 and August 2020 on Table 2.

Table 2. Descriptive Statistics

	Mean	Minimum	Maximum	Standard Dev.	Kurtosis	Skewness
$\mathbf{R_{BIST100}}$	-0.0102	-0.3132	0.2493	0.2097	0.3880	0.9253
$\boldsymbol{\sigma_{mt}}$	2.9582	1.7149	8.0343	2.4927	5.9005	2.4236
SENT	0.0776	-35.7207	35.2377	8.8538	-0.4429	-0.8241
CPI	0.5917	13.6856	57.2123	3.0967	-0.8090	0.5314
IPI	0.0116	-0.1257	0.3335	0.1698	-1.1919	0.0448
XR	-0.0172	-0.0673	0.2611	0.0280	-1.2866	-0.4232

The results show that with the highest standard deviation of 8.854, ΔVWD which is used to proxy investor sentiment, ranges between 35.24 and -35.72. Additionally, while maximum and minimum values of the market index ($R_{BIST100}$) are reported as 0.25 and -0.31, with the standard deviation of 0.210, maximum and minimum values of the market volatility are reported as 8.03 and 1.71, respectively, with the higher standard deviation of 2.493. It is also seen from the Table 2 that *CPI* has the highest value of 57.00 and the lowest value of 13.6 with the highest standard deviation of 3,09 among the economic variables added to the analysis. On the other hand, *IPI* ranges between 0.33 and -0.12; and *XR* ranges between 0.26 and -0.07.

[2] To examine market volatility values (σ_{mt}), squared monthly returns were covered as in Schwert (1989):

$$\sigma_{mt}^2 = \sum_{i=1}^{N_n} (r_{it} - \overline{r_t})^2$$

where $\overline{r_t}$ is the sample mean of the monthly returns of the market and r_{it} is the monthly returns of the market in month *t*, respectively. N_n represents the number of monthly returns in month *t*.

After presenting the descriptives, unit root test was used to test whether time series is stationary. Therefore, an augmented Dickey-Fuller *(ADF)* test was carried out and the results are presented on Table 3.

Table 3. Unit Root Test Results for Stationarity

	I(0)				I(1)			
	Intercept		Intercept+Trend		Intercept		Intercept+Trend	
	ADF	Prob.	ADF	Prob.	ADF	Prob.	ADF	Prob.
$R_{BIST100}$	-6.502	0.000***	-5.529	0.000***	-7.420	0.000***	-6.522	0.000***
σ_{mt}	-1.865	0.969	-2.710	0.997	-4.576	0.000***	-5.287	0.000***
SENT	-0.375	0.910	-0.378	0.890	4.920	0.000***	4.938	0.000***
CPI	-8.097	0.000***	-8.121	0.000***	-8.096	0.000***	-8.051	0.000***
IPI	-3.887	0.123	-3.274	0.218	-12.053	0.000***	-13.112	0.000***
XR	-10.178	0.000***	-9.985	0.000***	-8.553	0.000***	-8.506	0.000***

*** Significance at 1%.

**Significance at 5%.

The ADF test suggests rejecting the null hypothesis of unit root for $R_{BIST100}$, *CPI* and *XR*, implying that time series are stationary over time, I(0). On the other hand, null hypothesis of unit root is not rejected for σ_{mt}, *SENT* and *IPI* series, hovewer, it becomes stationary when first-differenced, I(1).

Then, the correlation analysis was used to examine the multicollinearity of the variables. Table 4 reports the correlation matrix between all variables. Accordingly, a positive correlation (0,071657) is observed between sentiment and index return as well as a positive correlation (0,453398) is observed between sentiment and market volatility. Thus, it can be concluded that when sentiment of the investors increases, both return of the BIST 100 index and market volatility will increase. Furthermore, the correlation between all the variables is below 50%, indicating no multicollinearity problem among variables.

Table 4. Correlation Matrix

	$R_{BIST100}$	σ_{mt}	SENT	CPI	IPI	XR
$R_{BIST100}$	1.00000	-0.48443	0.071657	0.207664	0.447264	-0.44862
σ_{mt}	-0.48443	1.00000	0.453398	-0.48075	0.068707	-0.07417
SENT	0.071657	0.453398	1.00000	0.319716	0.113355	-0.23701
CPI	0.207664	-0.48075	0.319716	1.00000	-0.38905	0.361184
IPI	0.447264	0.068707	0.113355	-0.38905	1.00000	-0.87018
XR	-0.44862	-0.07417	-0.23701	0.361184	-0.87018	1.00000

In addition, normality of the residuals was checked and concluded that series of residuals are normally distributed. Because normality of the residuals indicates statistically insignificance (p=0.247) with the JB (Jarque-Bera) test statistics of 2.82.

Serial correlation (autocorrelation) and heteroscedasticity of the series were also checked before regression analyses and the results were exhibited on Table 5. While serial correlation (autocorrelation) was analysed with the Breusch-Godfrey Serial Correlation LM Test, heteroscedasticity was analysed with the Breusch-Pagan-Godfrey test. Statistically insignificant

results indicate that there is no heteroscedasticity problem (p>0.05) and no autocorrelation problem (p>0.05).

Table 5. Serial Correlation and Heteroscedasticity

Breusch-Godfrey Serial Correlation LM Test			
F-Statistic	0.568	Prob. F(2,72)	0.574
Obs*R-Squared	1.187	Prob. Chi-Square	0.538
Breusch-Pagan-Godfrey Test for Heteroscedasticity			
F-Statistic	2.832	Prob. F(2,75)	0.172
Obs*R-Squared	5.385	Prob. Chi-Square (2)	0.171
Scale explained SS	6.403	Prob. Chi-Square (2)	0.241

After the preliminary analyses, regression analysis was carried out between the periods January 2005 and August 2020. Table 6 provides monthly regression results examining the effect of investor sentiment on index returns and market volatility, respectively. Accordingly, while the R-squared values are 24% for the market return model, 18% for the market volatility model. As seen, market return explains the variation in investor sentiment more than market volatility. F values verify the validity of the models. However, statistically significant effect of investor sentiment shows that there is a significant relation between the market return and investor sentiment. On the contrary, it can be clearly said that no relation is observed between the market volatility and investor sentiment.

Table 6. Results of Regression Analysis

	α	**β_1**	**F-Statistics**	**Adj. R-Squared**
$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \varepsilon$	0.011562***	-0.005256**	0.206449***	0.243582
$\sigma_{mt} = \alpha + \beta_1 SENT_t + \varepsilon$	0.017599	0.001765	18.350545***	0.175569

*** Significance at 1%.

**Significance at 5%.

Table 7 provides whether the coefficient of β_1 is affected, when particular economic factors are added to the regression, as control variables. Accordingly, the coefficient of β_1 indicating investor sentiment is also negative and significant for the market return model at 5% level. Thus, it can be concluded that there is no additional effect of macroeconomic variables on investor sentiment. Both the direction of the relationship and its significancy support the result. On the contrary, statistically insignificant coefficient of β_1 is an indication of the absence of the relation between market volatility and investor sentiment during the analysis period. F values of the market models are significant enough to show validity of the models. Moreover, the R-squared values are 13% for market return model and 16% for market volatility model.

Table 7. Regression Results with Control Variables

α	β_1	β_2	β_3	β_4	F-Statistics	Adj. R-Squared
$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \beta_2 CPI + \beta_3 IPI + \beta_4 XR + \varepsilon$						
-0.00705***	-0.005471**	0.004967***	-0.00047**	-0.10898***	9.520472***	0.13980
$\sigma_{mt} = \alpha + \beta_1 SENT_t + \beta_2 CPI + \beta_3 IPI + \beta_4 XR + \varepsilon$						
0.018397	0.002429	-0.000394	0.094394	0.461208	8.491946***	0.16481

*** Significance at 1%.

**Significance at 5%.

6. Conclusion

Efficient market hypothesis deveoped by Fama (1965) states that the market does not deviate from rationality and all information is rapidly incorporated into stock prices that no investor can use it to earn abnormal returns. Contrary to this standard finance model, large market events have clearly showed that investors behave based on their incentives, emotions and biases while making decisions under uncertainty and risk (Barberis and Thaler, 2003) and thus, market efficiency and asset pricing are affected from investor sentiment (Economou, 2016). Baker and Wurgler (2007: 129) define investor sentiment as "a belief about future cash flows and investment risks that is not justified by the facts at hand". Hovewer, because it is not easily measured, many researchers have studied to determine the most efficient investor sentiment proxy.

In this study, whether investor sentiment affects stock market returns and volatility on Borsa Istanbul is examined. As suggested by Lee, Shleifer and Thaler (1991), the regression analysis was conducted to measure whether closed-end fund discount have an impact on the stock market between the periods of January 2005 and August 2020. The results of the regression analysis state that investor sentiment does not affect market volatility. On the other hand, a significant relation is observed between the market return and investor sentiment on Borsa Istanbul, supporting the results of Olgaç and Temizel (2008), Bolaman and Mandacı (2014), and Canbaş and Kandır (2016).

To test whether there is an additional effect on investor sentiment, economic variables such as *CPI*, *IPI* and *XR* were included into the analysis. Findings support that stocks traded on BIST 100 Index are also affected from investor sentiment, consistent with earlier results. On the contrary, no relation is found between market volatility and investor sentiment. Thus, no additional effect is observed due to the fact that there is no change of the direction of the relationship and significance level of the economic variables, consistent with Ergun & Durukan (2017).

It is believed that this study will be useful for both individual and institutional investors who trade on Borsa Istanbul and will contribute to the finance literature as a reference for further studies. In this context, it would be suggested to measure investor sentiment by using a different proxy mentioned by Baker and Wurgler (2007). To take into consideration large market events; such as Coronavirus (Covid-19) pandemic, might be profitable in terms of comparison of the results. It would provide a more comprehensive analysis to evaluate investor sentiment by examining the effects of financial crises on stock market returns.

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Araştırma Makalesi

Investor Sentiment and the Stock Market

Yatırımcı Duyarlılığı ve Hisse Senedi Piyasası

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Genişletilmiş Özet

Fama (1965) tarafından geliştirilen etkin piyasa hipotezi, piyasaların rasyonel olduğunu, hisse senetlerinin gerçek fiyatlarını yansıttıklarını ve yatırımcılar için piyasa ortalamasının üzerinde bir getiri elde etmenin mümkün olmadığını savunmaktadır.

Bu geleneksel finans modelinin aksine, piyasaları etkileyen beklenmedik gelişmeler, yatırımcı psikolojisinin ve duyarlılığının varlık fiyatlarına ve piyasa etkinliğine etkisini açıkça göstermektedir (Economou, 2016). Çünkü yatırımcılar belirsizlik ve risk altında karar verirken duygularından ve ön yargılarından etkilenmektedirler (Barberis ve Thaler, 2003). Ancak, yatırımcı duyarlılığını temsil ettiği düşünülen çok fazla değişken bulunmaktadır. Birçok araştırmacı tarafından en etkin temsilciyi belirlemek için çalışmalar yapılmaktadır.

Bu kapsamda, bu çalışmanın amacı, Borsa İstanbul'da Ocak 2005 ve Ağustos 2020 dönemleri arasında kapalı uçlu yatırım fonlarının hisse senedi getirileri ve piyasa volatilitesi üzerindeki etkisini araştırmaktır. Bununla birlikte, yatırımcı duyarlılığı üzerinde belirleyici etkilerinin olup olmadığını test etmek amacıyla tüketici fiyat endeksi, sanayi üretim endeksi ve döviz kuru gibi ekonomik değişenler de analize dahil edilmiştir.

Piyasa temsilcisi olarak BIST 100 Endeksi belirlenmiş ve hisse senetlerinin aylık kapanış fiyatları Borsa Istanbul'dan temin edilmiştir. Yatırımcı duyarlılığını temsil etmek üzere kapalı uçlu yatırım fonları seçilmiş ve aylık veriler Sermaye Piyasası Kurulu resmi web sitesinden elde edilmiştir. Son olarak, tüketici fiyat endeksi, sanayi üretim endeksi ve döviz kuru gibi ekonomik değişkenler Türkiye Cumhuriyeti Merkez Bankası'ndan temin edilmiştir.

Lee, Shleifer ve Thaler (1991)'ın çalışmasında olduğu gibi, ilk olarak, aylık ağırlıklı iskonto oranları *(VWD)* oluşturulmuştur.

$$VWD_t = \sum_{i=1}^{n_t} W_t DISC_{it}$$

Ağırlıklı iskonto oranlarının belirlenebilmesi için, *t* döneminde her bir yatırım ortaklığı net varlık değerinin (NAV_{it}) tüm yatırım ortaklıkları net varlık değerleri toplamı içerisindeki payı (W_t) hesaplanmıştır.

$$W_t = \frac{NAV_{it}}{\sum_{i=1}^{n_t} NAV_{it}}$$

$$DISC_{it} = \frac{NAV_{it} - SP_{it}}{NAV_{it}} \times 100$$

NAV_{it}, i yatırım ortaklığı hisse senedinin t dönemindeki net varlık değerini ifade ederken, SP_{it}, t dönemi sonundaki hisse senedi fiyatıdır.

Bir sonraki eşitlik, yatırımcı duyarlılığı temsilcisi olarak belirlenen ağırlıklı iskonto oranlarındaki aylık değişimleri (ΔVWD) belirlemek için kullanılmaktadır.

$$\Delta VWD_t = VWD_t - VWD_{t-1}$$

Yatırımcı duyarlılığının hisse senedi piyasası getirileri üzerindeki etkisini test etmek amacıyla aşağıdaki regresyon denklemi kurulmuştur.

$$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \varepsilon$$

$R_{BIST100_t}$, t dönemindeki piyasa endeksinin getirisini temsil ederken, $SENT_t$, ağırlıklı iskonto oranlarındaki değişimleri ifade eden yatırımcı duyarlılığının göstergesidir.

Yatırımcı duyarlılığının piyasa volatilitesi üzerindeki etkisini belirlemek amacıyla aşağıdaki eşitlikten yararlanılmıştır.

$$\sigma_{mt} = \alpha + \beta_1 SENT_t + \varepsilon$$

σ_{mt}, t dönemine ait piyasa volatilitesidir.

Son olarak, tüketici fiyat endeksi, sanayi üretim endeksi ve döviz kuru gibi ekonomik değişkenler kontrol değişkeni olarak analize dahil edilmiş ve her bir değişkenin yatırımcı duyarlılığı üzerinde ekstra bir etkisinin olup olmadığı incelenmiştir. Ekonomik değişimlerdeki aylık değişimler aşağıdaki gibi hesaplanmaktadır.

$$r_e = (EV_t - EV_{t-1})/EV_{t-1}$$

EV_t, t döneminde ekonomik değişkenin değeridir.

Her bir değişkenin yatırımcı duyarlılığı üzerinde ekstra bir etkisinin olup olmadığını ölçmek için aşağıda belirtilen denklemler kullanılmıştır.

$$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \beta_2 CPI + \beta_3 IPI + \beta_4 XR + \varepsilon$$

$$\sigma_{mt} = \alpha + \beta_1 SENT_t + \beta_2 CPI + \beta_3 IPI + \beta_4 XR + \varepsilon$$

Çalışmanın sonuçları yatırımcı duyarlılığı ile endeks getirileri ve piyasa volatilitesi arasında pozitif bir korelasyonun olduğunu göstermektedir. Dolayısıyla, duyarlılık arttıkça, piyasa getirisi ve volatilite artmaktadır. Bununla birlikte, yatırımcı duyarlılığı ile piyasa getirisi arasında anlamlı bir ilişki gözlemlenirken, yatırımcı duyarlılığı ile piyasa volatilitesi arasında anlamlı bir ilişkinin olmadığı sonucuna ulaşılmıştır.

Ekonomik faktörlerin kontrol değişkenleri olarak regresyon analizine eklendiğinde, piyasa modeli için farklı bir sonuca ulaşılmamış ve aynı şekilde yatırımcı duyarlılığının β_1 katsayısının %5 seviyesinde negatif ve anlamlı olduğu görülmüştür. Buradan hareketle, makroekonomik değişkenlerin yatırımcı duyarlılığı üzerinde belirleyici bir etkisi olmadığı görülmektedir. Diğer taraftan, volatilite ile yatırımcı duyarlılığı arasında anlamlı bir ilişkinin gözlemlenmemesi araştırma sonuçlarını desteklemektedir.

Bu çalışma, Borsa İstanbul'da faaliyet gösteren bireysel ve kurumsal yatırımcılar açısından yol gösterici nitelikte olmakla birlikte, daha sonraki çalışmalara referans olması itibariyle finans literatürüne katkı sağlamaktadır. Bu kapsamda, yatırımcı duyarlılığını test etmek için Baker ve Wurgler (2007) tarafından kullanılan ve önerilen farklı bir temsilci kullanılması çalışmanın sonuçlarını karşılaştırabilmek ve literatüre katkı sağlamak açısından faydalı olacaktır. Özellikle yatırımcıların rasyonel davranmakta güçlük çekebilecekleri Covid-19 salgını döneminde

yatırımcı duyarlılığının hisse senedi piyasalarındaki etkisini değerlendirmek konu ile ilgili daha kapsamlı bir analiz yapılmasını sağlayacaktır.