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INVESTOR SENTIMENT IN THE CRISIS PERIODS: EVIDENCE FROM BORSA ISTANBUL¹

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ABSTRACT

Purpose- This study aims to analyze the effect of investor sentiment on Borsa Istanbul for the crisis periods between 1997 and 2017. Furthermore, whether the pattern of investor sentiment differs between the crises based on their origin as local or international is investigated.

Methodology – The crisis periods are determined based on the CMAX methodology and the regression analysis is applied to investigate the effect of investor sentiment on the stock market returns.

Findings- From the results of this study it is observed that in the whole period and local crisis period; when closed end fund discount as a proxy for sentiment increases, BIST 100 index returns decrease.

Conclusion- Overall, the findings of this study suggest that Borsa Istanbul is sensitive to investor sentiment especially in the crisis periods that originate locally. The results are substantial for portfolio managers; they have to take into consideration investor sentiment while making decisions.

Keywords: Behavioral finance, investor sentiment, closed-end fund discounts, stock market, financial crises

JEL Codes: G01, G10, G41

1. INTRODUCTION

According to Shefrin (2002:1), behavioral finance is the interaction of psychology with the financial actions and performance of practitioners, namely portfolio managers, financial planners and advisors, investors, brokers, strategists, financial analysts, investment bankers, traders and corporate executives. In contrast to the classical finance theories behavioral finance argues that people have some emotional instincts, and for that reason they often deviate from rationality and as stated by Barberis and Thaler (2003), investors' incentives, emotions and biases could affect the decision-making process. Hence in contrast to the assumptions of the efficient market hypothesis, behavioral finance argues that rational arbitrageurs in the market are limited and therefore insufficient to force prices to match fundamental value, and investor sentiment may significantly distort market outcomes and affect asset prices in equilibrium (Bodie, Kane and Marcus, 2010). Investor sentiment is defined as "a belief about future cash flows and investment risks that is not justified by the facts at hand" (Baker and Wurgler, 2007:1). Based on the Shleifer's (2000) investor sentiment model, when investors receive earnings news about the company if they do not react to this news in revaluing the company, it means they use the conservatism heuristic. Because of this behavior, the prices underreact to earnings announcements and to short horizon trends. Underreaction emerges because investors tend to assume that earnings are mean reverting although they follow a random walk. On the other hand, when the investors receive similar news repeatedly they use the representativeness heuristic, and they overreact to this news believing there is an earnings trend. As a result, the prices increase sharply, and the stocks are overpriced, so the returns go down (Shleifer, 2000).

It is hard to measure investor sentiment directly, and for that reason besides direct measurement methods such as surveys or questionnaires, many studies have attempted to find the most accurate proxy for investor sentiment. Studies that were

¹ This study was presented in the Istanbul Finance Congress on Nov. 3rd, 2017.

conducted in this area use various types of proxies to measure the effect of investor sentiment on the stock market, macroeconomic variables, volatility and recently on the bond market. The commonly used indirect proxies are closed-end fund discount (i.e. Lee, Shleifer and Thaler, 1991; Leonard and Shull, 1996), dividend premium (i.e. Baker and Wurgler, 2004; Fama and French, 2001), mutual fund flows (i.e. Brown, et al., 2002; Frazzini and Lamont, 2008), trading volume (i.e. Baker and Stein, 2004; Kaniel and Titman, 2004), internet search volume (i.e. Son-Turan, 2016), and Baker and Wurgler (2006) sentiment index. On the other hand, the most commonly used direct measurement is the Consumer Confidence Index (CCI) (i.e. Lemmon and Portniaguina, 2006).

The effect of investor sentiment, proxied by different measures, on stock returns was studied widely by many researchers. However, based on the literature, it is observed that there is a gap in the literature about the effect of investor sentiment on stock markets during the crises periods. For that reason, this study mainly aims to analyze the effect of investor sentiment on Borsa Istanbul for the crisis periods between 1997 and 2017. This study differs from previous research in several ways. First, CMAX crisis indicator will be used to detect the crisis periods between January 1997 and April 2017. Second, the detected crises are separated as local and international; in order to analyze if the pattern of investor sentiment differs between the crises based on their origin being local or international. Shefrin and Statman (2011) emphasized the Keynes' view as sentiment may lead to economic crises, so it is expected that the effect of sentiment is high during these periods. Therefore, it is believed that this study will have a significant contribution to the literature as well as investors, portfolio managers and policy makers by providing evidence on the effect of investor sentiment on the stock market and its persistence during financial crises and whether this effect differs based on the origin of the crisis as local or international. The rest of the study is structured as follows: in Section 2 related literature is discussed, Section 3 provides explanations on the data and the methodology including the CMAX method and the regression analyses, in Section 4 empirical findings are presented, and Section 4 concludes with the discussion of the findings.

2. LITERATURE REVIEW

The effect of investor sentiment, proxied by different measures, on stock returns was studied widely by many researchers. Baker and Wurgler (2006) studied the relationship between investor sentiment and cross-section of stock returns by using their constructed index as a proxy. As a result, they found that when sentiment is high, stocks are attractive to optimists and speculators, but unattractive to arbitrageurs, because younger, small, unprofitable, non-dividend-paying, high volatility, extreme growth, and distressed stocks tend to earn relatively low subsequent returns. Furthermore, Schmeling (2009) examined the relationship between consumer confidence (as a proxy for investor sentiment) and expected stock returns internationally in 18 industrialized countries including the U.S., Japan, Australia, New Zealand and 14 European countries. As a result of the long-horizon return regressions, it is found that sentiment is a significant predictor of expected returns across countries. In addition to the consumer confidence index, Bathia and Bredin (2013) also used equity fund flow, closed-end equity fund discount and equity put-call ratio as proxies for investor sentiment to examine the relationship between investor sentiment and G7 countries' stock market returns for the period 1995 and 2007 on a monthly basis. They found that value stocks are affected by investor sentiment particularly. The negative relationship was found between investor sentiment and future stock returns. Effect of investor sentiment, proxied by various measures, on stock returns was also studied extensively in the Turkish stock market. Canbas and Kandir (2007) used closed-end fund discounts, average fund flow of mutual funds and the ratio of net stock purchases of foreign investors to Borsa Istanbul (BIST) market capitalization as proxies for investor sentiment in order to analyze the effect of investor sentiment on returns of BIST sectoral indices for the period July 1997 and June 2006. As a result of the regression analysis, it is found that investor sentiment affects stock returns systematically (Canbas and Kandir, 2007). Canbas and Kandir (2009) also examined the effect of sentiment on Borsa Istanbul (BIST) by implementing a VAR model and Granger causality tests for the period 1997 to 2005. They defined six proxies for investor sentiment as: closed-end fund discounts, mutual fund flows, add lot sales ratios, share of equity issues in aggregate issues, repo shares in mutual fund portfolios, and ISE turnover ratios. As a result of their analyses, they found that previous stock portfolio returns affect all the investor sentiment proxies except share of equity issues in aggregate issues (Canbas and Kandir, 2009).

By using consumer confidence index as a proxy for investor sentiment, Olgac and Temizel (2008) investigated the short-term and long-term effects of investor sentiment on BIST-30 index. They utilized the co-integration test for the long-term relationship, and VAR model for the short-term relationship for the period 2004 - 2007. They used, CCI, BIST-30, consumer price index (CPI), government debt securities index monthly data. As a result of the analyses, they found that while there is a positive relationship between CCI and BIST-30; there is a negative relationship between CCI and government debt securities index. Moreover, Celik (2013) tested the relationship between investor sentiment and sovereign risk in Turkey for the period 2004-2010. For the sovereign risk she used JP Morgan EMBI+ spread, and for investor sentiment she used CCI. As a result of the co-integration analysis she did not find a long-term relationship, but as a result of the Granger causality test she found a short-term relationship between investor sentiment and sovereign risk in Turkey.

Although there are many studies about the effect of investor sentiment on financial markets, there are only a few studies which focus on the economic crises periods. Baur, Quintero and Stevens (1998) analyzed the effect of investor sentiment on the stock market crash of 1987. They used the data for the period between 1986 and 1988. As a sentiment proxy they used closed end funds discount. They found that, movement of stock prices were influenced by sentiment in 1987 stock market crash, but investor sentiment did not significantly influence stock prices in the period surrounding the crash. Zouaoui, Nouyrigat and Beer (2011) examined the impact of investor sentiment in the international context for the crises periods by dividing the countries in terms of their market integrity and herd like overreaction. They used monthly data for the period April 1995 to June 2009, and as a proxy for investor sentiment they used consumer confidence index. In order to detect the crises periods, they used the CMAX crisis indicator that was proposed by Patel and Sarkar (1998). As a result, they found that investor sentiment has a significant effect on financial crisis. They also found that, the impact of sentiment is more significant for countries that are culturally more prone to herd-like behavior, overreaction and low institutional development. Bolaman and Mandaci (2014) examined the relationship between investor sentiment and stock market especially for the crisis period. They used monthly CCI and BIST 100 index data for the period 2003-2012. Between these periods only 2008 crisis was detected. As a result of the ADF and co-integration tests, they found that there are structural breaks at the crisis period, and secondly as a result of the presence of co-integration they found that there is a long-term relationship between the variables. Therefore, from their results it could be concluded that there is an effect of investor sentiment in the crisis periods in Borsa Istanbul.

2. DATA AND METHODOLOGY

In terms of methodology, first the crisis periods were detected using the CMAX approach as proposed by Patel and Sarkar (1998). CMAX initially compares the current value of an index to its maximum value over the previous T periods, usually one to two years. In this study, previous two years were used. The CMAX indicator is calculated as follows:

$$CMAX_{i,t} = \frac{P_{m,t}}{\max(P_{m,t-24}, \dots, P_{m,t})} \quad (1)$$

In equation (1), $P_{m,t}$ indicates the current closing value of the market index at time t.

If $CMAX_{i,t} < \overline{CMAX}_i - \sigma_m$; $C_{i,t} = 1$ and crisis is observed.

Otherwise, $C_{i,t} = 0$

$C_{i,t}$ is the crises indicator for country I at time t. The trigger level could be chosen as 2, 1.5 or 1 standard deviations below the mean of the series. In this study, to capture all known crisis periods, the trigger level is chosen as 1 standard deviation. If CMAX equals 1, it indicates price increases over the period. If prices decrease, CMAX is closer to 0. A crisis is detected when CMAX drops below a threshold level (mean of CMAX minus one standard deviation). Pre-crisis and post-crisis periods were determined as follows: the start of the crisis (pre-crisis period) is the point where the price reaches its historical maximum level (peak point) over a 2-year period. The date of the recovery (post-crisis period) is the first month after the crisis when the index reaches the pre-crisis maximum value (peak point).

Secondly, closed-end fund discount was used as a proxy for investor sentiment. The closed-end funds are issued only once with fixed capitalization in the initial public offering, and they are traded in the secondary markets like many securities in the market (Anderson and Born, 2002). Therefore, supply and demand of the shares trading on the market determine its price (Dimson and Minio-Kozerski, 1999). As indicated by Pontiff (1997) the value of the fund's portfolio, which is called as net asset value (NAV), is computed based on the market prices of the underlying assets. Since they are traded in the secondary market, the price may differ from its net asset value. Most closed end funds' prices are lower than their net asset values, which is called as "discounts", and these discounts can be substantial and long-lasting (Anderson and Born, 2002; Dimson and Minio-Paluella, 2002). Many researchers tried to explain the rationale behind the closed end fund discount with agency costs or tax liabilities (Lee, Shleifer and Thaler, 1991). Besides these explanations, Zweig (1973) stated that discounts may reflect the expectations of individual investors. As stated by Lee, Shleifer and Thaler (1991) closed end fund discounts are high when investors are pessimistic (negative sentiment) about future returns and low when investors are optimistic (positive sentiment). In other words, the more optimistic investors feel, the smaller the discounts of the closed end funds (Halkos, 2005). Following Lee, Shleifer and Thaler (1991) value weighted index of discounts (VWD) in month t are calculated using the following formulas:

$$VWD_t = \sum_{i=1}^{n_t} W_t DISC_{it} \quad (2)$$

where;

$$W_t = \frac{NAV_{it}}{\sum_{i=1}^{n_t} NAV_{it}} \quad (3)$$

$$DISC_{it} = \frac{NAV_{it} - SP_{it}}{NAV_{it}} \times 100 \quad (4)$$

In formula (2), n_t indicates the number of funds with available $DISC_{it}$ and NAV_{it} data at the end of month t . In formula (3) and (4), NAV_{it} shows the per share net asset value at the end of month t . In formula (4), SP_{it} is the stock price at the end of month t . In the second stage, changes in the value-weighted index of discounts (ΔVWD) are calculated with following equation and it is used as a proxy for investor sentiment:

$$\Delta VWD_t = VWD_t - VWD_{t-1} \quad (5)$$

In equation (5), VWD_{t-1} shows the value weighted index of discounts in the previous month². The monthly closed end funds data were obtained from Capital Market Board (CMB) monthly bulletins. Lastly, the following regression equation is applied to detect the effect of investor sentiment on the stock market returns proxied by BIST-100 index.

$$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \varepsilon \quad (6)$$

In Equation (6) $R_{BIST100_t}$ is the return of BIST 100 index at time t , $SENT_t$ is changes in the value-weighted index of closed end fund discounts (ΔVWD) at time t and ε is the error term. Return on the BIST 100 index was calculated as follows:

$$R_t = \ln(P_t/P_{t-1}) \quad (7)$$

In equation (7) R_t is the return of BIST 100 index at time t , P_t is the closing value of BIST 100 index at time t , and P_{t-1} is the closing value of BIST 100 index in the previous month.

Since, there is a possibility that investor sentiment can be affected by particular economic factors; these were included into the analysis as control variables. The change in the industrial production index, consumer price index and change in the exchange rate are determined to be used as control variables following Chen, Roll and Ross (1986), Fama (1981) and Kasman (2003). Monthly returns or changes in economic variables were calculated as follows:

$$r_e = (EV_t - EV_{t-1})/EV_{t-1} \quad (8)$$

In Equation (8) r_e indicates the return or change ratio, EV_t indicates the value of the economic variable at the end of month t , and EV_{t-1} indicates the value of the economic variable at the end of the previous month. Finally, the following regression model was constructed which includes the control variables along with the sentiment proxy.

$$R_{BIST100_t} = \alpha + \beta_1 SENT_t + \beta_2 IPI + \beta_3 CPI + \beta_4 XR + \varepsilon \quad (9)$$

In Equation (9) $R_{BIST100_t}$ is the return of BIST 100 index on time t , $SENT_t$ is the changes in the value-weighted index of closed-end fund discounts (ΔVWD) at time t , IPI is the change in the industrial production index, CPI is the change in the consumer price index, XR is the change in the change in the exchange rate (\$) and ε is the error term. Moreover, the same regression equations were applied for the crisis periods, too. The dates of the crisis periods begin with the pre-crises periods and finish with the end of the post-crises periods. To observe the impact of each crisis period; "no crisis period", "all crisis periods", "local crisis period" and "international crisis periods" were subjected to the same regression analyses with equations (6) and (9) separately. For all the analyses E-Views software was used. The monthly data was collected from monthly bulletins of Capital Market Board of Turkey, Central Bank of Republic of Turkey and Borsa Istanbul website. BIST 100 index closing values were collected for the period 1995-2017 to be able to calculate the crisis periods beginning of the year 1997. Remaining data was collected for the period 1997-2017.

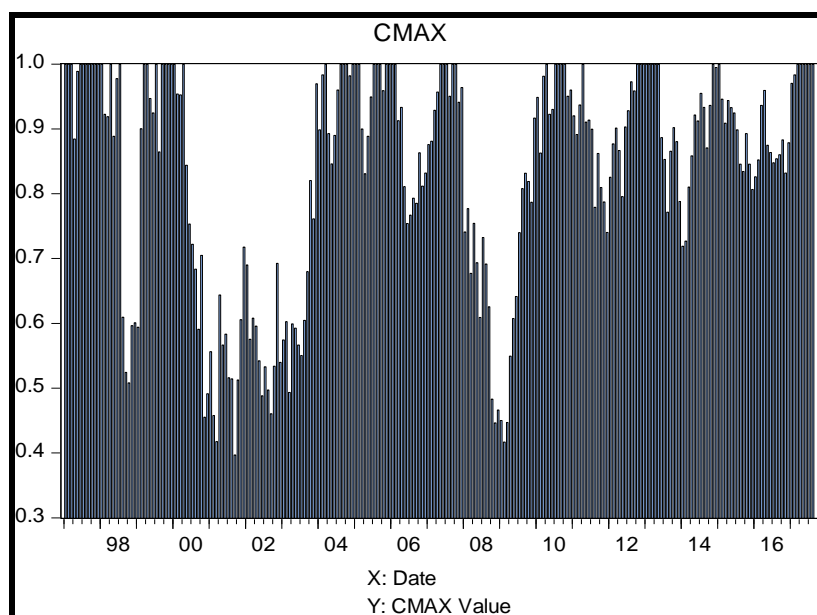
3. EMPIRICAL RESULTS

3.1. CMAX Results

Initially the crisis periods were determined as indicated in Figure 1 based on the CMAX methodology. Over the periods from January 1997 to April 2017 three crises periods are detected.

² In the study, since there were missing values for the months December 1997 and March 1999, the average of the series was calculated, and the average value was used for these two months.

Figure 1: Crisis Periods in BIST



First crisis is observed from August 1998 to January 1999 corresponding to the 1998 Asian crisis which is followed by the Russian crisis. For this period, pre-crisis period is observed in July 1998 and the post crisis period is between February 1999 and March 1999. Second crisis is observed from September 2000 to August 2003 corresponding to the 2001 Turkish financial crisis. For this period, pre-crisis period is observed from April 2000 to October 2000. The Index has reached its pre-crisis maximum value in March 2004, therefore post-crisis period is between September 2003 and March 2004. Last crisis is observed from September 2008 to June 2009 which corresponds to the 2008 global financial crisis. For this period, pre-crisis period is observed between October 2007 and August 2008. The Index has reached its pre-crisis maximum value in April 2010, so the period between July 2009 and April 2010 is the post-crisis period. These three crisis periods could be separated as international and local financial crises. For the selected period, only 2001 Turkish financial crisis could be categorized as local. Other two crises, Asian and global financial crises, could be categorized as international crises.

3.2. Regression Results

Before implementing the regression analyses, preliminary analyses have to be carried out in order to meet the assumptions of the regression. First, the descriptive statistics of the variables were examined as exhibited in Table 1. The results show that there are 244 observations. BIST100 index returns range between 0.59 and -0.49 with the standard deviation of 0.122. Sentiment, which is proxied by the changes in the value-weighted index of closed end fund discounts (ΔVWD), ranges between 30.43 and -38.85 with the highest standard deviation of 8.98, and hence it could be stated that variation of the sentiment is the highest among the variables. The change in the consumer price index has a maximum value of 50.50 and a minimum value of 20.50. On the other hand, change in the industrial price index ranges between 0.25 and -0.22; and the change in the exchange rate ($\$/TL$) ranges between 0.31 and -0.08.

Table 1: Descriptive Statistics

Variables	Mean	Maximum	Minimum	Standard Dev.	Observations
R	0.018749	0.586585	-0.494860	0.122714	244
SENT	-0.075376	30.42630	-38.84693	8.979035	244
IPI	0.005492	0.250840	-0.222357	0.083169	244
CPI	0.512492	50.50000	20.50000	5.406791	244
XR	0.015581	0.308708	-0.084083	0.044110	244

Note: This table presents the results of the descriptive statistics. R is the return of BIST100 index, SENT is investor sentiment proxied by the changes in the value-weighted index of closed-end fund discount, IPI is the change in the industrial production index, CPI is the change in the consumer price index, and XR is the change in the exchange rate ($\$/TL$).

Second, the correlation analysis was carried out in order to examine the multicollinearity of the variables. As it can be observed from Table 2, there is a negative correlation between sentiment and the index return. Therefore, it is expected that when sentiment of the investors decreases return of the BIST100 index will increase. Moreover, there is no multicollinearity problem detected among variables, because all the correlations are below 50%.

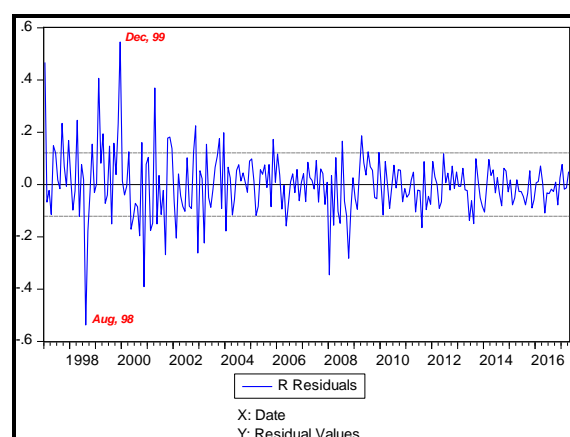
Table 2: Correlation Matrix

	R	SENT	CPI	IPI	XR
R	1.000000	-0.155881	-0.018455	-0.049157	-0.026909
SENT	-0.155881	1.000000	0.086479	0.052848	-0.020807
CPI	-0.018455	0.086479	1.000000	0.003687	-0.025370
IPI	-0.049157	0.052848	0.003687	1.000000	0.011590
XR	-0.026909	-0.020807	-0.025370	0.011590	1.000000

Note: This table presents the correlation matrix between all variables. R is the return of BIST100 index, SENT is investor sentiment proxied by the changes in the value-weighted index of closed-end fund discount, IPI is the change in the industrial production index, CPI is the change in the consumer price index, and XR is the change in the exchange rate (\$/TL).

Third, normality of the residuals was checked. According to the Jarque-Bera test statistics with the value of 166.46 (statistically significant at %1) null hypothesis of normality was rejected which means residuals are not normally distributed. Brooks (2014) states that in financial modelling, one or two very extreme residuals that are outliers may cause a rejection of the normality. Therefore, Brooks (2014) suggests removing those outliers by using dummy variables may improve the model. Based on Figure 2, the two extreme residual values were determined in August 1998 and December 1999. After excluding them, the distribution of residuals became close to normality and significance of each model was improved.

Figure 2: Residual Graph



Finally, serial correlation (autocorrelation) and heteroscedasticity of the series were controlled. Serial correlation was analysed with the Breusch-Godfrey Serial Correlation LM Test, and according to the results, Prob. Chi Square Value is 0.8057 which is not statistically significant hence there is no autocorrelation problem. Moreover, heteroscedasticity was analysed with the White test, and according to the results, Prob. Chi Square Value is 0.0000 which is statistically significant at 1%, and indicates a heteroscedasticity problem. That is the series are not homoscedastic which means errors do not have a constant variance, and to minimize this problem White's modified standard error estimates were used while implementing the regression analyses. After the preliminary analyses and corrections, regression equation (6) was run for the "whole period", "no crisis period", "all crisis periods", "local crisis period", and "international crisis period" respectively. The whole sample period includes monthly data from January 1997 to April 2017. After specifying the effect of sentiment on BIST100 index return for the whole period, the crises periods were analysed. The data composed of three crises periods, and each of them starts with the pre-crisis date and finishes with the end of the post-crisis date. "No Crisis Period" represents the period that the crisis dates are not included. "All Crisis Periods" includes only the crises periods data. "Local Crisis Period" includes only the data of the 2001 crisis of Turkey. "International Crisis Period" includes both the 1998 Asian crisis and 2008 Global Financial Crisis data.

Overall, as exhibited in Table 3, according to the F-statistics the model is statistically significant and valid at 1% level for each period. The adjusted R-square values range between 14-25 % which means; that amount of the total variation in index returns is explained by the regression model consisting of closed-end fund discount as a sentiment proxy. When the coefficients are evaluated, sentiment is statistically significant and negative only for the whole period and the local crisis

period. However, the significance level of sentiment in the local crisis period is higher relative to the whole period. In the remaining periods, the coefficient of the sentiment variable is not found to be statistically significant indicating no statistically significant effect of investor sentiment on BIST 100 index returns. These results could be interpreted as in the local crisis period the effect of sentiment on the stock market is higher relative to the other periods.

Table 3: Results of the Regression Analyses

Variables	Whole Period	No Crisis Period	All Crisis Periods	Local Crisis Period	Global Crisis Period
Included Observations	244	156	88	48	40
α	(0.018554)***	(0.023675)***	(0.007058)	(-0.001045)	(0.019723)
SENT	(-0.002139)*	(-0.001111)	(-0.003206)	(-0.005366)**	(0.001902)
Adj. R-Square	(0.174221)	(0.210984)	(0.146067)	(0.145862)	(0.258455)
F-statistic	(18.08923)***	(21.72366)***	(8.440773)***	(9.026259)***	(7.796453)***

***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Note: This table presents the results of the regression equation $R_{BIST100_t} = \alpha + \beta_1 SENT_t + \varepsilon$. The dependent variable is BIST100 index returns, and the independent variable is investor sentiment (SENT) proxied by the changes in the value-weighted index of closed-end fund discounts. The whole sample period includes monthly data from January 1997 to April 2017.

Since, there is a possibility that investor sentiment can be affected by particular economic factors; these were included into the analysis as control variables. Therefore, the regression analyses were re-run using the regression equation (9) which includes control variables along with the sentiment proxy for each period. As exhibited in Table 4, according to the F-statistics the model is statistically significant and valid for each period. The adjusted R-square values range between 9-26 % which means; that amount of the total variation of index return is explained by the regression model consisting of closed-end fund discount, change in the industrial production index, change in the consumer price index and change in the exchange rate. Coefficients show that the sentiment proxy is again statistically significant and negatively related with the index returns when the control variables were added to the model only in the whole period and local crisis period. Hence neither the direction of the relationship nor its statistical significance level has changed following the inclusion of the control variables.

Table 4: Results of the Regression Analyses with Control Variables

Variables	Whole Period	No Crisis Period	All Crises Periods	Local Crisis Period	Global Crisis Period
Included Observations	244	156	88	48	40
α	(0.021018)***	(0.027972)***	(0.008097)	(-0.003806)	(0.029446)
SENT	(-0.002111)*	(-0.000839)	(-0.003203)	(-0.005384)**	(0.002768)
IPI	(-0.061975)	(-0.118248)	(0.009074)	(-0.107196)	(0.367005)
CPI	(-0.000157)	(-0.000673)	(0.000579)	(0.007697)	(-0.000392)
XR	(-0.132444)	(-0.228404)	(-0.080274)	(0.063686)	(-0.622000)
Adj. R-Square	(0.167970)	(0.213677)	(0.116072)	(0.096870)	(0.265861)
F-statistic	(9.176133)***	(9.424011)***	(3.284863)***	(2.260306)*	(3.824688)***

***, **, * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Note: This table presents the results of the regression equation: $R_{BIST100_t} = \alpha + \beta_1 SENT_t + \beta_2 IPI + \beta_3 CPI + \beta_4 XR + \varepsilon$. The dependent variable is BIST100 index returns. The independent variables are investor sentiment (SENT) proxied by the changes in the value-weighted index of closed-end fund discounts, change in the industrial production index (IPI), change in the consumer price index (CPI) and change in the exchange rate (XR). The whole sample period includes monthly data from January 1997 to April 2017.

4. CONCLUSION

The study aimed to examine the relationship between investor sentiment and Borsa Istanbul during the financial crisis periods covering the period from January 1997 to April 2017. The relationship is examined for the crisis periods also by differentiating between local crisis and international crisis using regression analysis. The findings of the regression analyses show that investor sentiment proxied by the change in the changes in the value-weighted index of closed-end fund discount in Turkey has a statistically significant and negative relationship with the BIST-100 index returns in the whole period and local crisis period. According to Lee, Shleifer and Thaler (1991) discounts increase when investors are pessimistic, and decrease when investors are optimistic. Therefore, from the results of this study it is observed that in the whole period and local crisis period; when closed end fund discount increases (pessimistic investors), returns of the BIST 100 index returns decreases. Moreover, since no statistically significant relationship between investor sentiment and BIST 100 index returns

during international crisis periods was determined, the findings imply that the statistically significant relationship between sentiment and returns in the local crisis period can be the reason for the statistically significant relationship in the whole period sample. In Borsa Istanbul the share of foreign investors is substantial at approximately 78% level based on the Turkish Capital Markets Association figures. Therefore, during international crises it can be argued that they continue trading at Borsa Istanbul and keep Turkish stocks in their portfolios to diversify internationally. Since the international markets are all affected from the crises, there is no safe haven for the international investors to go. In other words, even though they are pessimistic for the overall economy, they do not take any action that would have a significant effect on market returns. On the other hand, during the local crisis, they have alternative other markets which are not in crisis, so they take action. Hence the investors' actions are more influenced by sentiment and the market is significantly affected.

This study contributes to the literature in several ways. First, the sample period covers three crisis periods in Turkey which are not examined in the literature previously, and the CMAX methodology is used to determine the pre-crisis, crisis and post-crisis periods. Second, the existing literature generally focuses on the developed markets, and there are few studies done in emerging markets. Hence, this study contributes by analysing the Turkish stock market as an emerging market. Finally, this study provides evidence that whether the effect of investor sentiment differs based on the origin of the crisis as local or international by examining the relationship separately for each type. In this study only the closed-end fund discount was used as a proxy for investor sentiment. Since the data of closed-end funds are on a monthly basis the analysis was performed monthly. However, in the crisis periods, lower frequency data such as daily data may capture the effect of sentiment better. Therefore, as a further study different proxies may be used, and the analyses could be done on a daily basis to reach more substantial results. Overall, the findings of this study suggest that Borsa Istanbul is sensitive to investor sentiment especially in the crisis periods that originate locally. Therefore, investors, portfolio managers and policy makers have to take into consideration the presence of investor sentiment while making investment decisions during these risky periods by distinguishing between international and local causes.

REFERENCES

- Akdag, Ö. (2011). *Investor Sentiment and Its Effect on Stock Returns*. (Doctoral dissertation, Istanbul Technical University, Institute of Science and Technology).
- Anderson, S.C. and Born, J.A. (2002). *Closed-End Fund Pricing Theories and Evidence*. USA: Springer.
- Baker, M., and Stein, J. (2004). Market Liquidity as a Sentiment Indicator. *Journal of Financial Markets*, 7 (3), pp. 271-299.
- Baker, M., and Wurgler, J. (2004). A Catering Theory of Dividends. *Journal of Finance*, 59 (3), pp. 1125-1165.
- Baker, M., and Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Journal of Finance*, 61 (4), pp. 1645-1680.
- Baker, M., and Wurgler, J. (2007). Investor sentiment in the stock market. (Working Paper No. 13189). <http://www.nber.org/papers/w13189> (Date Accessed: 08.09.2017).
- Baker, M., Wurgler, J. and Yuan, Y. (2012). Global, Local, and Contagious Investor Sentiment. *Journal of Financial Economics*, 104 (2012), pp. 272-287.
- Bathia, D. and Bredin, D. (2013). An examination of investor sentiment effect on G7 stock market returns. *The European Journal of Finance*, 19 (9), pp. 909-937.
- Baur, M.N., Quintero, S., and Stevens, E. (1998). The 1986-88 Stock Market: Investor Sentiment or Fundamentals? *Managerial and Decision Economics*, 17 (3), pp. 319-329.
- Barberis, N. and Thaler, R. (2003). A Survey of Behavioral Finance. *Handbook of the Economics of Finance*, 1, pp. 1053-1128.
- Beker, C. (2006). *Yatırımcı Duyarlılığı: İMKB'de İşlem Gören Menkul Kıymet Yatırım Ortaklıkları Üzerine Bir Uygulama*. (Master Dissertation, Ankara University, Graduate School of Social Sciences).
- Bodie, Z., Kane, A. and Marcus, A.J. (2010). *Essentials of Investments*. 8th Edition. Singapore: McGraw Hill.
- Bolaman, Ö. and Mandacı, P. (2014). Effect of Investor Sentiment on Stock Markets. *Finansal Araştırmalar ve Çalışmalar Dergisi*, 6 (11), pp. 51-64.
- Brooks, C. (2014). *Introductory Econometrics for Finance*. 3rd Edition. United Kingdom: Cambridge University Press.
- Brown, S. J., Goetzmann, W. N., Hiraki, T., Shirishi, N., and Watanabe, M. (2003). *Investor sentiment in Japanese and US daily mutual fund flows* (No. w9470). National Bureau of Economic Research.
- Canbas, S. and Kandir, S.Y. (2007). The Effect of Investor Sentiment on ISE Sector Indices. *Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 22 (2), pp. 219-248.

- Canbağ, S. and Kandır, S.Y. (2009). Investor Sentiment and Stock Returns: Evidence from Turkey. *Emerging Markets Finance and Trade*, 45 (4), pp. 36-52.
- Celik, S. (2013). Investor Sentiment and Sovereign Risk: Empirical Evidence from an Emerging Market. *International Journal of Management Sciences and Business Research*, 2 (2), pp. 11-18.
- Chen, N. F., Roll, R., and Ross, S. A. (1986). Economic Forces and the Stock Market. *Journal of Business*, pp. 383-403.
- Dimson, E. and Minio-Kozerski, C. (1999). Closed-End Funds: A Survey. *Financial Markets, Institutions and Instruments*, 8 (2), pp. 1-41.
- Dimson, E. and Minio-Paluella, C. (2002). The Closed End Fund Discount. USA: The Research Foundation of AIMR.
- Fama, E. F. (1981). Stock Returns, Real Activity, Inflation, and Money. *The American Economic Review*, 71 (4), pp. 545-565.
- Fama, E. F., and French, K. R. (2001). Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay? *Journal of Financial Economics*, 60 (1), pp. 3-43.
- Frazzini, A., and Lamont, O. A. (2008). Investor Sentiment and Stock Returns. *Journal of Financial Economics*, 88 (2), pp. 299-322.
- Halkos, G. (2005). Determining Empirically Behavioral and Fundamental Factors of Discounts on Closed End Funds. *Applied Financial Economics*, 5 (16), pp. 395-404.
- Kaniel, R., Saar, G., and Titman, S. (2004). Individual Investor Sentiment and Stock Returns, NYU Working Paper. Retrieved from Social Science Research Network website: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1297085 (Date accessed: 08.09.2017).
- Kasman, S. (2003). The Relationship Between Exchange Rates and Stock Prices: A Causality Analysis. *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 5 (2), pp. 70-79.
- Lee, C. M. C., Shleifer, A. and Thaler, R.H. (1991). Investor Sentiment and the Closed-End Fund Puzzle. *The Journal of Finance*, 46 (1), pp. 75-109.
- Lemmon, M., and Portniaguina, E. (2006). Consumer Confidence and Asset Prices: Some Empirical Evidence. *Review of Financial Studies*, 19 (4), pp. 1499-1529.
- Leonard, D. C. and Shull, D. M. (1996). Investor Sentiment and The Closed-End Fund Evidence: Impact of the January Effect. *The Quarterly Review of Economics and Finance*, 36 (1), pp. 117-126.
- Ni, Z., Wang, D. and Xue, W. (2015). Investor Sentiment and its Nonlinear Effect on Stock Returns- New Evidence from the Chinese Stock Market Based on Panel Quantile Regression Model. *Economic Modelling*, 50 (2015), pp. 266-274.
- Ricciardi, V. and Simon, H. (2000). What is Behavioral Finance? *Business, Education and Technology Journal*, 2 (2), pp. 1-9.
- Olgac, S. and Temizel, F. (2008). The Relationship between Stock Returns and Investor Sentiment: Turkish Case. *TISK Akademi*, 2 (2008), pp. 225-239.
- Patel, S. A. and Sarkar, A. (1998). Crisis in Developed and Emerging Stock Markets. *Financial Analysts Journal*, 54 (6), pp. 50-61.
- Pontiff, J. (1997). Excess Volatility and Closed-End Funds. *The American Economic Review*, 87 (1), pp. 155-169.
- Schmeling, M. (2009). Investor sentiment and stock returns: Some international evidence. *Journal of Empirical Finance*, 16 (2009), pp. 394-408.
- Shefrin, H. (2002). *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*. NY: Oxford University Press.
- Shefrin, H., and Statman, M. (2011). Behavioral finance in the financial crisis: Market efficiency, Minsky, and Keynes. Santa Clara University, November.
- Shleifer, A. (2000). *Inefficient Markets*. NY: Oxford University Press.
- Senkesen, E. (2009). *Davranışsal Finans ve Yatırımcı Duyarlılığının Tahvil Verimi Üzerindeki Etkisi: İMKB Tahvil ve Bono Piyasasında Bir Uygulama*. (Doctoral Dissertation, Istanbul University Graduate School of Social Sciences).
- Son-Turan, S. (2016). The Impact of Investor Sentiment on the "Leverage Effect". *International Econometric Review*, 8 (1), pp. 4-18.
- Uygur, U. (2015). *The Effects of Investor Sentiment on Conditional Volatility of Asset Returns: Evidence from International Stock Markets*. (Doctoral Dissertation, Istanbul Technical University. Graduate School of Science Engineering and Technology).
- Zouaoui, M., Nouyrgat, G. and Beer, F. (2011). How Does Investor Sentiment Affect Stock Market Crises? Evidence from Panel Data. *The Financial Review*, 46, pp. 723-747.
- Zweig, M. E. (1973). An Investor Expectations Stock Price Predictive Model Using Closed-End Fund Premiums. *The Journal of Finance*, 28 (1), pp. 67-78.
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