Investor Sentiment and Stock Returns: Evidence from Romania

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Abstract   *The attitude of individual investors is strongly correlated with their sentiment, so their behavior on the stock market can generate important changes in price fluctuations. The aim of our study was to provide evidence regarding the relationship between the evolution of stock market and the individual investor sentiment, proxy by the consumer confidence index. This study is conducted on the Bucharest Stock Exchange (BSE) for a 10 year time period, starting from 2002 to 2011 and includes 120 observations. The results proved that there is a positive correlation between changes in consumer confidence and stock market returns, demonstrating that individual investor sentiment affects stock prices. However, the influence of individual investor sentiment seems to be quickly removed by the force of arbitrage. The price adjustments are realized in less than a month. Moreover, the influence of individual investor sentiment on the prices of the most 10 liquid companies from BSE is not statistically significant.*

Key words   Investor sentiment, noise, arbitrage, consumer confidence, Bucharest Stock Exchange

1. Introduction

The general finding of sentiment – return relationship is not in accordance with the Efficient Market Hypothesis (Fama 1970) which states that the stock prices reflect the discounted value of expected cash-flows and the effect of irrational market participants in stock prices are removed by the rational participants. However, the behavioural finance suggests that irrational sentiment (overly optimistic/pessimistic expectations about investment risk and future cash flow; Chang et al. 2009) can persist and affect stock prices for significant periods of time. Baker and Wurgler (2006) state that stock mispricing is based on uninformed demand shocks induce by irrational investors and limits to arbitrage.

Brown and Cliff (2005) claim that sentiment could be a very persistent effect so, the demand shocks of irrational traders could be correlated over time leading to a strong and persistent mispricing. The limits of arbitrage prevent rational traders to eliminate this influence on stock prices since it is unclear how long the buying or selling pressure from overly optimistic or pessimistic irrational traders will persist (Shleifer and Vishny, 1997). However, every mispricing must eventually be corrected so that one should observe that high levels of investor optimism (pessimism) are on average followed by low (high) returns (Schmeling, 2009). Earlier evidence, Brown and Cliff (2005), do indeed showed that there is a negative sentiment – return relationship in the case of U.S. stock market.

This paper investigates the impact of individual investor sentiment (hereafter, investor sentiment) in the prices of stocks listed on the Romanian stock market. First of all, we analyzed the contemporaneous relationship between changes in investor sentiment and stock market returns. We observed that changes in investor sentiment and stock market returns are positively correlated. This finding suggests that investor sentiment affects stock prices. The increase of individual investor optimism leads to an increase in stock prices. The effect is reversed when pessimism grows. Secondly, we concluded that the impact of investor sentiment is stronger in the case of small stocks than large stocks. Thirdly, we investigated the relation between the current investor sentiment level and the future stock market return. In this way we could

observe the length of the period in which rational investors remove the influence of irrational traders on stock prices. The result is surprising. The rational investors remove the impact of irrational traders in less than a month.

2. Literature review

A large body of literature has provided empirical evidence about the relationship between investor sentiment and stock price. Studies that are focused on the time-series relationship between investor sentiment and stock price report that the current investor sentiment predicts lower future stock returns. Fisher and Statman (2000) find that the American Association of Individual Investors' sentiment index (proxy for individual/small investor sentiment) and Wall Street strategists' sentiment (proxy for institutional/large investor sentiment) are negatively correlated with the S&P 500 return in the following month.

In a later study, Fisher and Statman (2003) examine whether the consumer confidence index is a good proxy for the individual investor sentiment and if the consumer confidence index predicts stock returns. Their result shows that changes in consumer confidence index were accompanied by statistically significant changes in the individual investor sentiment about the stock market. The contemporaneous relationship between changes in consumer confidence and S&P 500 returns is positive. Also, Fisher and Statman (2003) observe that high consumer confidence is in general followed by low future S&P 500, NASDAQ and small stock returns.

Brown and Cliff (2004), using different proxies for investor sentiment, note that the sentiment level and change are positively and strongly correlated with the contemporaneous stock market return. Also, Brown and Cliff (2004) test the causal[1] relationship between sentiment level/change and stock return. It was suggested by them (Brown and Cliff (2004)) that the stock market return is a good predictor of individual and institutional investor sentiment in the short run. Charoenrook (2005) uses the University of Michigan Consumer Sentiment Index to investigate its explanatory power for stock market return and find that the changes in consumer sentiment are positively related to the contemporaneous excess market returns and negatively related to the future excess returns at one-month and one-year horizons. Using different sentiment proxies, Wang, Keswani and Taylor (2006) observe that their investor sentiment proxies are caused by stock returns and volatility rather than vice versa (in accordance with Brown and Cliff, 2004). Canbaş and Kandir (2009) obtained similar results for the Turkish stock market. The past stock returns clearly predict future level of investor sentiment. Similar, Schmeling (2009), in an international pooled analysis, suggests that there is two-way causality such that investor sentiment depends on previous returns and the returns depend on previous investor sentiment.

Due to lack of specific indicators constructed to measure the sentiment of individual investors, in the international context, most empirical tests employ the consumer confidence index to proxy for investor sentiment (see, for instance, such an argumentation in Schmeling 2009). Schmeling (2009) remarks that the investor sentiment is a contrarian indicator for the future stock market return across countries. High (low) investor sentiment tends to be followed by lower (higher) stock returns. Also, Schmeling (2009) notes that the negative impact of investor sentiment diminish as the forecast horizon of market return is increased. In economic terms, the decline of the investor sentiment impact suggests that the noise trading effects[2] in stock prices vanish over long time periods. In the short period, there are limits to arbitrage, but in the medium and long run, the arbitrage becomes stronger. This evidence is in accordance with a theoretical point of view. As Schmeling (2009) claims, an opposite finding would mean that the noise trade demand shocks move the stock prices permanently away from equilibrium.

The evidence above reveals three distinctive sentiment-return relationships. Firstly, the positive relationship between changes in investor sentiment and stock returns proves that the stock prices tend to be overvalued (undervalued) in a bullish (bearish) market, especially when the excessive optimism (pessimism) of investors is unjustified by fundamentals and there are limits to arbitrage. Secondly, the negative relationship

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[1] Causality in the statistically sense of Granger
[2] Black (1986) reveals that on the market are some investors who trade on "noise" as if it is information associated with fundamentals. The individual investors are considered to be the noisy investors on the market (Lee, Shleifer, and Thaler 1991). According to Shleifer and Summers (1990), the investors who based their trades on "noise", are not totally rational and their demand for risky assets is influenced by their beliefs or by their sentiments which are not fully justified by fundamental values.

between current investor sentiment and future stock returns suggests that the prices tend to revert to their fundamental values after gradual corrections. Finally, the relation between investor sentiment and return is not very clear in the sense that the noise trade approach state that the sentiment cause the stock returns, but some empirical test (Brown and Cliff, 2004; Wang, Keswani, and Taylor, 2006; Canbaş and Kandir, 2009) show that stock returns cause investor sentiment.

From another angle, some studies investigate the influence of individual investor sentiment on different categories of stocks. Baker and Wurgler (2006) argue that the stocks that are harder to arbitrage and whose valuations are highly subjective are more likely to be affected by changes in individual investor sentiment.[3] Lee, Shleifer and Thaler (1991) state that small stocks are owned, in principal, by individual investors, peoples which are more likely to trade on noise, as opposed to institutional investors. As such, when the sentiment of noise traders is changing, the prices of small stocks could be influenced more than the prices of large stocks. Kumar and Lee (2006) find that the individual investors buy or sell stocks in concert (their trading strategies are systematically correlated). Brown and Cliff (2005) observe that the investor sentiment has a stronger effect for growth than for value stocks. Baker and Wurgler (2006) show that the investor sentiment has similar impact for both value and growth stocks. Finally, Lemmon and Portniaguina (2006) provide evidence that sentiment has a significant effect for value, but not for growth stocks. Schmeling (2009) obtained similar results according with Lemmon and Portniaguina (2006).

As we can observed, mixt results are reported in the field, but no proper relevance of them has been realized upon the Romanian market, which is essentially our aim for this research.

To be in line with the literature developed so far, we based our research on three hypotheses:

H1: If the individual investor sentiment affects the stock prices then the contemporaneous relationship between change in individual investor sentiment and stock market return should be positive.

H2: The influence of individual investor sentiment on prices is stronger in the case of stocks for which valuation is subjective and they are hard to arbitrage, such as small stocks.

H3: The influence of individual investor sentiment on stock prices is mitigated by the rational investors, so a negative correlation between the current level of investor sentiment and future stock returns should be observed.

3. Database and methodology of research

In order to test our hypotheses, we collected the necessary data for the period 2002–2011. For investor sentiment, the proxy that we took into consideration was the consumer confidence index (see, for instance, Schmeling, 2009). This indicator is measured on a scale that has values between -100 and 100 and it's a qualitative variable calculated using survey' data. It was taken from the site of European Commission: http://ec.europa.eu/index_ro.htm. This indicator has only negative levels. As a fact, in order to reveal its impact on stock market return and to be in accordance with the literature in the field, modifications upon it have been realized. Firstly, we inversed it and secondly, we calculated the absolute value:

$$CCI_{abs,t} = \left| \frac{1}{CCI_t} \right| \qquad\qquad (1)$$

Where: CCI_t is the level of consumer confidence index in month t.

These mathematical tricks have been applied in order to sustain and to provide proper interpretation.

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[3] Baker and Wurgler (2006) suggest that the stocks of companies with short and instable earnings history and with an apparently unlimited growth opportunities determinate individual investors to construct a large spectrum of valuations, according to their sentiment. In contrast, the value of a company with a long and stable earnings history, stable dividends is less subjective (Baker and Wurgler, 2007). Also, some papers show that arbitrage tends to be more risky and costly for young, small (in terms of capitalization), unprofitable, extreme growth firms and stocks of financial distressed companies (Wurgler and Zhuravskaya, 2002; Amihud and Mendelsohn, 1986).

To quantify the Romanian stock market evolution, we used the indexes from the Bucharest Stock Exchange (BSE). Both, the Bucharest Exchange Trading Composite index (BET-C) and the Bucharest Exchange Trading index (BET) were used, the first one as a measure for the evolution of the entire stock market and the second one, as a proxy for the evolution of the most liquid stocks which are, in general, the biggest in terms of market capitalization. BET-C is a market capitalization weighted index. BET-C is the most comprehensive index of stocks and reflects the evolution of all companies listed on the first and second category on the BSE regular market. BET reflects the price movements of the most liquid stocks quoted on the BSE. The source of index data was the BSE website: www.bvb.ro.

As data for consumer confidence index usually appears at the end of the month, for reliable and comparable data, we also took the level of BET and BET-C at the end of each month for the accounted period. In order to test our hypotheses, the return of stock indexes was calculated as follow:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

(2)

Where: $R_{i,t}$ represent the realized return of stock index in month t, $P_{i,t}$ is the last index level in month t and $P_{i,t-1}$ is the last index level in month $t-1$.

Also, the change of consumer confidence index was computed as follow:

$$GCCI_t = \frac{CCI_{abs,t} - CCI_{abs,t-1}}{CCI_{abs,t-1}}$$

(3)

Where: $GCCI_t$ is the change of consumer confidence index in month t.

In order to test our first and second hypothesis (H1 and H2), we estimated the following regressions:

$$R_{BET-C,t} = \alpha_0 + \alpha_1 \cdot GCCI_t + u_t$$

(4)

$$R_{BET,t} = \beta_0 + \beta_1 \cdot GCCI_t + v_t$$

(5)

Where: $R_{BET-C,t}$ is the realized return of BET-C index (proxy of the stock market return) in month t, $R_{BET,t}$ is the realized return of BET index (proxy of the returns of large stocks) in month t, $GCCI_t$ is the change of consumer confidence index in month t, u_t and v_t are residual terms.

In order to test the third hypothesis (H3), we estimated the following regressions:

$$R_{BET-C,t} = \alpha_2 + \alpha_3 \cdot CCI_{abs,t-1} + w_t$$

(6)

$$R_{BET,t} = \beta_2 + \beta_3 \cdot CCI_{abs,t-1} + z_t$$

(7)

Where: $R_{BET-C,t}$ is the realized return of BET-C index (proxy of the stock market return) in month t, $R_{BET,t}$ is the realized return of BET index (proxy of the returns of large stocks) in month t, $CCI_{abs,t}$ is the absolute value of the inverse level of consumer confidence index in month t (see, also, relation (1)), w_t and z_t are residual terms.

4. Results and discussion

As it was pointed out before, the aim of this research is to observe if the individual investor sentiment, measured through consumer confidence, affects the prices of stock listed on the Romanian stock market (H1).

The result of this analysis is provided in Table 1. Also, the influence of investor sentiment could be stronger in the case of stocks which are hard to value and arbitrage, like small stocks (H2). Table 1 reports the result of this investigation.

Table 1. The investor sentiment and stock prices

Element	EQ-(4)^{NW}	Element	EQ-(5)^{NW}
Intercept	0.0179	*Intercept*	0.0193*
GCCI$_t$	0.1509**	*GCCI$_t$*	0.1041
R-squared	0.0371	*R-squared*	0.0158
F statistic	4.5095**	*F statistic*	1.8833

Notes: Table 1 presents the results obtained after the estimation of equation (4) and (5). We analyzed the presence of heteroscedasticity and autocorrelation in the residual terms during the estimation of regressions. The heteroscedasticity was tested by the White heteroscedasticity test (White, 1980) and the serial correlation was verified by the Breusch–Godfrey Lagrange multiplier test (Breusch, 1978; Godfrey, 1978). If we detected only the heteroscedasticity, we applied the correction proposed by White (1980) and if errors were autocorrelated, we applied the correction proposed by Newey and West (1987) (see Brooks, 2008, p. 152). ^{NW} indicates that the t-statistics are corrected for heteroscedasticity and autocorrelations with Newey West procedure. * and ** indicates significant at the 1% and 5% levels, respectively.

Our first hypothesis is confirmed. The investor sentiment affects the prices of stock listed on the Romanian stock market. The change of investor sentiment is positively related to the stock market return in contemporaneous terms (EQ-(4)). An increase of the investor sentiment leads to an increase in stock prices. The effect is reversed for a decrease in investor sentiment. Moreover, the irrational investors buy and sell in concert affecting the entire stock market. As such, investor sentiment has an impact on aggregate Romanian stock market.

However, the question is if the investor sentiment influences different types of stocks in the same way and with the same power. Lee, Shleifer and Thaler (1991) argue that small stocks are owned by individual investors, peoples that are more likely to be affected by sentiments. As such, when the sentiment of individual traders is changing, the prices of small stocks could be influenced more than the prices of large stocks. The result obtained after the estimation of equation (5) suggests that the impact is different. In particular, our finding is that the investor sentiment tends to have no influence on the prices of large stocks. Therefore, investor sentiment seems to have an impact on the prices of small stocks. Similar results were obtained by Schmeling (2009) in an international framework.

The investor sentiment proves to have an impact on stock prices in the case of Romanian stock market. Furthermore, in principal, the prices of small stocks are affected. However, from a theoretical point of view, the impact of investor sentiment should be removed by the rational investor trough the arbitrage operation. Indeed, Schmeling (2009) shows that the forces of arbitrage work and the effect of investor sentiment in stock prices is wash out in long periods of time. The result of our analysis, however, suggests that the impact of investor sentiment in stock prices seems to be removed very quickly. This evidence is reported in Table 2.

Table 2. Arbitrage vs. investor sentiment

Element	EQ-(6)^{NW}
Intercept	0.0489*
CCI$_{abs,t-1}$	-0.7230
R-squared	0.0205
F statistic	2.4464

Notes: Table 2 presents the results obtained after the estimation of equation (6). We analyzed the presence of heteroscedasticity and autocorrelation in the residual terms during the estimation of regression. The heteroscedasticity was tested by the White heteroscedasticity test (White, 1980) and the serial correlation was verified by the Breusch–Godfrey Lagrange multiplier test (Breusch, 1978; Godfrey, 1978). If we detected only the heteroscedasticity, we applied the correction proposed by White (1980) and if errors are autocorrelated, we applied the correction proposed by Newey and West (1987) (see Brooks, 2008, p. 152). ^{NW} indicates that the t-statistics are corrected for heteroscedasticity and autocorrelations with Newey West procedure. * and ** indicates significant at the 1% and 5% levels, respectively.

The estimated coefficient of consumer confidence ($CCI_{abs,t-1}$) is negative, but not statically significant. As such, the relationship between the current stock market return and previous level of investor sentiment is negative. This finding suggests that the rational investors mitigate the influence of irrational investors led by sentiments. Moreover, because the estimated coefficient is not statistically significant, we can conclude that the impact of investor sentiment is erased by rational investors in less than a month.

5. Conclusions

The aim of this study was to provide evidence about the relationship between stock prices and individual investor sentiment. We decided to use the consumer confidence index as a proxy for investor sentiment since, as for Romania no specific indicator is constructed to measure the sentiment of individual investors.

The results showed that indeed, the stock prices seem to be affected by the investor sentiment. Moreover, it appears that the investor sentiment has a significantly impact on the prices of small stocks, as it does not influence the price of stocks of the most ten liquid Romanian companies which are, in general, the biggest in term of market capitalization. These finding are somehow similar with the findings of Schmeling (2009). Also, we showed that the forces of arbitrage are working in the context of Romanian stock market. The impact of investor sentiment appears to be mitigated and removed by the rational investors in less than a month. This evidence is surprising, because Schmeling (2009) observed that the impact of investor sentiment is removed over long period of time.

One limitation of our study is that we used only one proxy for the investor sentiment. Other studies used various measures of investor sentiment. For instance, Baker and Wurgler (2006) argued that the turnover ratio of stock market reflects the investor sentiment. Also, this study did not investigate the impact of investor sentiment simultaneous with the influence of fundamental factors.

Further research should be directed to provide evidence about the influence of investor sentiment, proxy by more than one variable (consumer confidence index). Also, the impact of investor sentiment should be analyzed simultaneous with the influence of fundamental factors like macroeconomic variables.

Acknowledgements

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