Does Investor Sentiment Matter in Post-Communist East European Stock Markets?

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Abstract

This study examines the relation between the sentiment of noise traders and stock prices in ten Post-Communist East European stock markets: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia over the period April 2004 to March 2014. The results suggest that, in general, the sentiment of noise traders, proxied by the consumer confidence index, seems to have no impact on stock prices at a market wide level.

Keywords: Investor Sentiment, Consumer Confidence Index, Noise, Causality, Post-Communist East European Countries.

JEL Codes: G12, G14, G15

1. Introduction

An important question in finance is whether noise traders, those who act on noise as if it is information associated with fundamentals (Black, 1986), influence asset prices.[1] For instance, De Long et al. (1990) suggest that the limits of arbitrage combined with the presence of noise traders in the markets which have similar behavior make their sentiment affect asset prices. This hypothesis indicates a negative relation between the level of sentiment and the future returns of assets widely held by noise traders if the mispricing is eventually corrected (Lemmon and Portniaguina, 2006). However, Qiu and Welch (2006) claim that the theory suggests that the level of sentiment correlates with prices and, consequently, that changes in sentiment correlate with returns. Thus, the changes in sentiment should be negatively related with future returns.

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[1]It is a general belief that noise traders are individual investors. For instance, Barber et al. (2009) deliver evidence that individual investors are noise traders. Barber et al. (2009) observed that the trading strategies of individual investors are systematically correlated; in every month individual investors systematically buy some stocks or sell others.

Brown and Cliff (2004) define sentiment as the expectations of market participants relative to a norm. Thus, a bullish investor expects returns to be above norm while a bearish investor expects the opposite. Baker and Wurgler (2007) consider that the sentiment represents that belief about futures cash flows and investment risks which is not justified by information. According to Chang et al. (2009), the sentiment is the investor opinion on future cash flows and risks that is usually affected by emotion.

Some papers (Brown and Cliff, 2004; Wang et al., 2006) analyzed the relation between sentiment and returns using both the level and the change of sentiment. Wang et al. (2006) indicate that the exact form in which the sentiment of noise traders will influence returns is not clear ex ante. Firstly, if noise traders are affected by sentiment changes, then sentiment changes should drive returns. Secondly, if noise traders only trade when the sentiment is very high or low comparative to previous levels, then actually the sentiment levels should influence returns. Moreover, Brown and Cliff (2004) argued that, from a theoretical point of view, both levels and changes in sentiment may influence returns. If the sentiment decreases from very bullish to bullish a positive return can be expected, since the sentiment is still bullish, but, because the sentiment has dropped we can also expect a decline in return.

All in all, if noise traders base their trading decisions on sentiment, level or change, we can expect that it might predict asset returns. However, if we ask which are the determinants of sentiment we can expect that previous returns could influence, in fact, the sentiment (Wang et al., 2006). Earlier findings (Brown and Cliff, 2004; Wang et al., 2006; Canbaş and Kandir, 2009), suggest that returns cause sentiment rather than the other way around.

Most studies are focused on developed markets, such as that of the United States or European countries. The number of studies focusing on developing markets is limited and to the best of my knowledge none of the studies investigated the impact of sentiment on stock prices in the context of Post-Communist East European stock markets. Therefore, using international data which have not been used in the past provides an out-of-sample test for earlier findings.

In this paper, I examine the relation between the sentiment of noise traders and stock returns for ten Post-Communist East European stock markets namely, Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia. The main objective of this paper is to observe if the sentiment influences stock prices and if this effect is correlated across stocks such that it affects the aggregate markets. This is an important issue, since if the sentiment is correlated across stocks, then its effect cannot be diversified away holding large portfolios of stocks (Charoenrook, 2005). Further, De Long et al. (1990) showed that the unpredictable nature of noise trader sentiment creates a risk in asset prices that deters arbitrageurs from aggressively betting against it.

Using Granger causality test, the results suggest that, for most of the stock markets, only the stock returns seem to have forecasting ability for the changes in sentiment of noise traders and not vice versa. Therefore, these results do not support the hypothesis that the sentiment of noise traders affects stock prices at a market wide level.

The rest of the paper is organized as follows. In Section 2 the literature review is presented. Section 3 provides the methodology and the database is described in Section 4. Section 5 reports the results and Section 6 concludes.

2. Literature review

The theory of efficient markets, introduced by Fama (1970), defines an efficient market as one in which the asset prices always equal their fundamental values. This theory is based on three theoretical arguments (Shleifer, 2000). Investors are considered to be rational and consequentially to value assets correct. However, some investors could not be rational but their trades are random and, as a result, cancel each other without affecting prices. Finally, if the irrational investors behave in a similar way, they are met in the market by rational participants who remove their impact on prices, by arbitrage.

Taking in consideration the limits of arbitrage (Shleifer and Vishny, 1997), the possibility that the trades of some investors are based on their sentiment (Shleifer and Summer, 1990) and, also, they behave similarly (Barber et al., 2009), the behavioral finance states that prices diverge from their fundamental values. To some extent, this hypothesis is sustained by empirical proofs.

Studies that are focused on the relation between sentiment and stock returns observed that the sentiment forecasts future stock returns. Fisher and Statman (2000) found that the sentiment of individual investors is negatively correlated with the S&P 500 return from the following month. Fisher and Statman (2003) investigated whether the consumer confidence index is a good proxy for the individual investor sentiment. Also, they tested if the level of the consumer confidence index predicts stock returns. They showed that changes in the consumer confidence index are positively correlated with changes in individual investor sentiment. Further, they noted that the contemporaneous relation between changes in consumer confidence and returns in S&P 500, NASDAQ and small stock is positive. Also, Fisher and Statman (2003) reported that a high level of consumer confidence is followed by low future returns in S&P 500, NASDAQ and small stock. Brown and Cliff (2004) observed that the contemporaneous relation between changes in many proxies of sentiment and market returns is positive and strong. Charoenrook (2005), using the University of Michigan Consumer Sentiment Index as a proxy for individual investor sentiment, found that changes in consumer sentiment are positively related to the excess market returns and negatively related to the future excess returns at one-month and one-year horizons. Analyzing the contemporaneous relation between the sentiment of noise traders, proxied by the consumer confidence index, and the Romanian stock market returns, Oprea and Brad (2013) reported that returns are positively correlated with changes in sentiment. In an international context, Schmeling (2009), using a panel regression analysis, showed that the relation between the current level of consumer confidence index, used as a proxy of individual investor sentiment, and future stock market returns is significantly negative. Furthermore, Schmeling (2009) observed that the negative impact of sentiment weakens as the forecast horizon of returns is increased. This evidence demonstrates that the effect of sentiment in stock prices vanish over long time periods proving that in the short term, there are limits to arbitrage, but in the medium and long run, the arbitrage becomes stronger. As Schmeling (2009) suggested, an opposite finding would mean that the noise traders move prices permanently away from equilibrium. Similar results were reported for individual markets; eleven of the eighteen markets showed a significantly negative sentiment-return relation.

Other studies analyzed the impact of individual investor sentiment on different categories of stocks. Baker and Wurgler (2006) argue that the individual sentiment influences stocks differently. Stocks that are hard to arbitrage and whose valuations are highly subjective are more likely to be affected by sentiment. Lee et al. (1991) state that small stocks are held,

in principal, by individual investors, peoples which are more likely to trade on noise, as opposed to institutional investors. Therefore, the sentiment could influence in a greater extent the prices of small stocks than the prices of large stocks. The results reported by Oprea and Brad (2013) suggest that the sentiment influences the prices of small stocks rather than the prices of large stocks in the Romanian stock market. Baker and Wurgler (2006) found that the sentiment effect is stronger for the stocks of companies that are young, small, unprofitable, distressed or non-dividend paying. Brown and Cliff (2005) noted that the investor sentiment has a stronger effect for growth than for value stocks. Baker and Wurgler (2006) found that the investor sentiment has a comparable impact for both value and growth stocks. Somehow differently, Lemmon and Portniaguina (2006) observed that individual investor sentiment has a significant effect for value, but not for growth stocks. Schmeling (2009) obtained similar results with Lemmon and Portniaguina (2006).

Some papers argue that the relation between the sentiment and stock returns is not very clear in the sense that the noise trade approach state that the sentiment cause returns, but some empirical evidence showed that returns cause sentiment. Brown and Cliff (2004) concluded that stock returns are strong predictors of levels and changes in individual and institutional sentiment. On the other hand, sentiments are weak predictors of returns. Employing different proxies for the sentiment of noise traders, Wang et al. (2006) found strong and consistent proofs that sentiment proxies are not the causal variables, but the variables being caused. Kling and Gao (2008) investigated the relation between the institutional investor sentiment and stock returns in the Chinese stock market. They reported that stock returns cause sentiment and not vice versa. Further, Canbaş and Kandir (2009) showed that stock returns influence, in general, sentiment. Schmeling (2009), in an international pooled analysis, observed that there is bidirectional causality; individual investor sentiment depends on previous market returns and market returns depend on previous sentiment. He argued that this is a reasonable result since the investors could be overly optimistic or pessimistic due to a series of good or bad returns, news, macroeconomic evolutions and so on.

3. Methodology

The behavioral literature states that the sentiment of noise traders influences the stock movements. However, if we ask which are the determinants of sentiment we can expect that the stock behavior could influence the sentiment (Wang et al., 2006). As a consequence, to examine the relation between individual investor sentiment and Post-Communist East European stock market returns, I employ VAR models. Following Wang et al. (2006), bivariate VAR models are used to test for Granger causality (Granger, 1969) as follows:

$$R_{it} = \alpha_0 + \sum_{j=1}^{n} \alpha_{ij} R_{it-j} + \sum_{j=1}^{n} \beta_{ij} Sentiment_{it-j} + u_{it}$$

(1)

$$Sentiment_{it} = \alpha_0 + \sum_{j=1}^{n} \alpha_{ij} R_{it-j} + \sum_{j=1}^{n} \beta_{ij} Sentiment_{it-j} + u_{it}$$

(2)

where R_{it} is the return of stock market i at time t, $Sentiment_{it}$ is the sentiment, level or change, of individual investors from stock market i at time t, m is the appropriate lag length for the causality test and u_{it} is a disturbance term in both equations.

Sentiment Granger cause stock returns if the lags of sentiment are jointly significant in the return equation (1). Similar, stock returns Granger cause sentiment if the lagged stock market returns are jointly significant in the sentiment equation (2). A finding of Granger causality in only one direction from sentiment to stock returns (stock returns to sentiment) may be considered as an evidence for the view that only sentiment (stock returns) cause stock returns (sentiment). If the two sets of lags are significant, then this indicates bidirectional causality. Finally, if neither set of lags are significant in the equation for the other variable then, the sentiment and stock returns are independent.

The causality test assumes that the variables are stationary. As a preliminary step, I test for the presence of a unit root in the variables. Both, Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979) and Kwiatkowsky-Phillips-Schmidt-Shin (KPSS) test (Kwiatkowski et al., 1992) are used. The Granger causality test requires the determination of an appropriate lag structure. The Akaike information criterion (Akaike, 1974) is used to select the appropriate lag length.

4. Database

In order to investigate the relation between stock returns and individual investor sentiment I used data for the period April 2004-March 2014. In implementing this analysis, I have chosen to concentrate on aggregate markets instead of individual stocks. In this way, I am able to examine if the sentiment affects individual stock prices and whether this effect is correlated across stocks such that it influences the aggregate markets (Charoenrook, 2005). I collected the monthly closing levels of ten Post-Communist East European stock indices and the monthly values of consumer confidence indices. The data for country indices were obtained from the Thomson Reuters Database and for consumer confidence indices from the Directorate Generale for Economic and Financial Affairs website[2]. For Slovenia the Thomson Database did not provide information about the monthly closing levels of stock index for the whole period and, as a consequence, the analysis period was shortened.

The country stock indices are used to compute the monthly returns of national stock markets. Following Schmeling (2009), I use the consumer confidence index as a proxy of the sentiment of individual investors. The consumer confidence index is measured on a scale that has values between -100 and 100 and it is derived from monthly surveys. Table 1 reports the descriptive statistics of returns and consumer confidence indices.

Table 1: Descriptive statistics

Country	Market index	Start date	Market Return		Consumer Confidence	
			Mean	Standard Deviation	Mean	Standard Deviation
Bulgaria	SOFIX	Apr-2004	0.63%	9.08%	-35.14	7.72

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[2] Data can be downloaded from: http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm.

Czech Republic	PX	Apr-2004	0.40%	6.62%	-11.53	9.82
Estonia	OMXTGI	Apr-2004	1.08%	8.65%	-7.82	11.25
Hungary	BUX	Apr-2004	0.64%	7.06%	-38.62	13.60
Latvia	OMXRGI	Apr-2004	0.37%	6.28%	-19.64	13.39
Lithuania	OMXVGI	Apr-2004	0.93%	8.21%	-15.83	16.50
Poland	WIG20	Apr-2004	0.50%	6.52%	-19.03	8.74
Romania	BET-C	Apr-2004	0.87%	9.04%	-31.19	13.65
Slovak Republic	SAX	Apr-2004	0.33%	5.76%	-19.62	11.51
Slovenia	SBITOP	Apr-2006	-0.28%	6.23%	-24.20	9.33

5. Results

As I argued in the Introduction, it is not very clear ex ante which is the form in which the sentiment of noise traders will influence the stock returns (Wang et al., 2006). If noise traders are affected only by changes in sentiment, then sentiment changes should influence returns. On the other hand, if noise traders only trade when the sentiment is extremely high or low comparative to previous levels, then the level of sentiment should affect returns.

Since I implement a Granger causality test to examine the relation between sentiment and return, it is necessary that all the variables to be stationary. The results of stationarity tests are reported in Table 2. Using ADF and KPSS test, I observed that the return series do not have unit roots. At the same time, ADF shows that all the consumer confidence series have a unit root. Moreover, KPSS confirms the conclusions of ADF for some countries (Bulgaria, Czech Republic, Poland, Romania, Slovak Republic and Slovenia) and invalidates the conclusions of ADF for the remaining countries (Estonia, Hungary, Latvia and Lithuania). As a consequence, in the causality analysis I use the first difference of consumer confidence for all countries, in order to avoid spurious results.

Table 2: Stationarity tests

Country	Market Return		Consumer Confidence	
	ADF	KPSS	ADF	KPSS
Bulgaria	-7.45	0.14	-2.27	0.86
Czech Republic	-9.55	0.17	-1.81	0.75
Estonia	-9.81	0.09	-1.54	0.15
Hungary	-8.68	0.19	-2.35	0.21
Latvia	-7.97	0.12	-1.29	0.23
Lithuania	-8.31	0.09	-1.53	0.37
Poland	-10.89	0.13	-2.26	0.48
Romania	-8.19	0.17	-1.36	0.68
Slovak Republic	-9.19	0.40	-1.98	0.51
Slovenia	-6.62	0.14	-2.23	0.89

Note: For a significance level of 5% the critical value of ADF is -2.88 and the critical value of KPSS is 0.46.

According to Akaike information criterion, the optimal number of lags depends on the pair of variables employed in the causality test. The appropriate lag length varies between 0 and 7. Table 3 reports the optimal number of lags selected by Akaike information criterion.

Interestingly, Akaike information criterion does not select a lag structure in the case of Latvia and Slovak Republic.[3] This result suggests, somehow, that previous changes in sentiment do not seem to predict stock market returns and, also, previous returns do not appear to influence future changes in sentiment. Thus, the sentiment seems to have no influence on aggregate market. Another explanation could be that a causal relation exists, but it is very short term in nature such that it cannot be detected with monthly observations (Jansen and Nahuis, 2003).

Further, for the remaining cases the results of Granger causality test are reported in Table 3. The main findings are as follows.

On the one hand, the Granger causality test suggests that the null hypothesis of Granger non-causality from changes in sentiment to market returns cannot be rejected at a 5 percent significance level in the case of Bulgaria, Czech Republic, Estonia, Poland, Romania and Slovenia. This result reveals that changes in sentiment do not drive subsequent market returns, a sign that the sentiment has no influence on aggregate market. Further, the findings for Hungary and Lithuania show that previous changes in sentiment appear to predict market returns.

On the other hand, the Granger causality test suggests that the null hypothesis of Granger non-causality from market returns to changes in sentiment can be rejected, in all cases, at a 5 percent significance level. This result suggests that market returns forecast changes in sentiment.

Table 3: Test for Granger causality

Country	lag	Sentiment change to Return		Return to Sentiment change	
		F-statistic	*P*-value	*F*-statistic	*P*-value
Bulgaria	3	0.5404	0.6556	*5.0997*	*0.0024*
Czech Republic	7	1.0701	0.3890	*3.4806*	*0.0024*
Estonia	1	0.0505	0.8226	*10.8602*	*0.0013*
Hungary	1	*3.9651*	*0.0488*	*8.8995*	*0.0035*
Lithuania	2	*7.6668*	*0.0008*	*8.0508*	*0.0005*
Poland	1	0.1240	0.7254	*6.6936*	*0.0109*
Romania	1	0.9668	0.3275	*5.0327*	*0.0268*
Slovenia	2	0.4725	0.6250	*6.8164*	*0.0018*

Note: P-values of Granger causality test are based on White standard errors (White, 1980) if heteroskedasticity was detected or on Newey-West standard errors (Newey and West, 1987) if heteroskedasticity and serial correlation were identified.

The results presented here support the conclusion that, in general, the stock returns seem to have forecasting ability for the sentiment of noise traders and not vice versa, in the context of Post-Communist East European stock market. These findings confirm earlier results from Brown and Cliff (2004) and Wang et al. (2006) for United States or Kling and Gao (2008) for the Chinese stock market and Canbaş and Kandir (2009) for Turkey. It appears that the

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[3] Similar, Schwarz and Hannan-Quinn information report the same result.

sentiment of individual investors, proxied by the consumer confidence index, does not have an impact on stock prices at aggregate level.

6. Conclusions

In this paper, I investigate an important question in finance: do noise traders, those who act on noise as if it is information associated with fundamentals (Black, 1986), influence asset prices?

Recent studies in behavioral finance, considering the limits of arbitrage and the presence of noise traders in the market with similar behavior, suggest that the sentiment of noise traders influence stock prices (Baker and Wugler, 2007; Schmeling, 2009).

I investigate if the consumer confidence, as a proxy of noise trader sentiment, influence stock prices at a market wide level in ten Post-Communist East European stock markets. Using Granger causality test, the results suggest that, in general, the stock returns seem to have forecasting ability for the changes in sentiment of noise traders and not vice versa. Thus, these results do not support the hypothesis that the sentiment of noise traders affects stock prices at a market wide level. However, other studies use more than one proxy for the sentiment of noise traders which represents a limitation of this study. Nevertheless, the findings reported here confirm earlier results, for other stock markets, presented in Brown and Cliff (2004), Wang et al. (2006) and Canbaş and Kandir (2009).

Lemmon and Portniaguina (2006) consider that the consumer confidence index reflects investor sentiment but also the influence of macroeconomic variables. For this reason, they separated the fundamental component from the sentiment component and analyzed the impact of sentiment component on stock prices. However, this is a difficult task for the Post-Communist East European context because of data limitation. On the other hand, to separate the fundamental component from the sentiment component is a subjective approach depending on the macroeconomic variables taken into account. Although, this is a limitation of this study, exploring this approach represents a direction for further research. Moreover, further research should be directed to provide evidence about the influence of investor on different categories of stocks like small stock, large stocks, value stocks, growth stocks and so on.

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