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Relationship Between Public Expectations and Financial Market Dynamics in South-East Europe Capital Markets

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Summary

We examine the market efficiency, information asymmetry and the linkages between financial market dynamics and public expectations of the stock markets of South East Europe (SEE). Therefore, this study aims to answer the question of whether there is a difference between the stock market performance of the developed and emerging SEE stock exchanges. This paper employs GARCH models and uses the daily and monthly returns of eleven stock market indices of South East Europe (SEE) - Bulgaria, Banja Luka, Sarajevo, Croatia, Greece, Serbia, Slovenia, Turkey, Romania, Montenegro and Macedonia over the period from January 2005 to November 2015. The results reveal that SEE capital markets except Montenegro are not efficient in the context of the efficient market hypothesis (EMH). Moreover, the consumer sentiment information and inflation expectations affect the financial market dynamics of SEE stock indices. The analysis shows that there is no linkage between industrial expectations and the dynamics of the SEE capital markets. Test results potentially present that the consumer and inflation expectations have predictive power for the performance of SEE capital markets.

Key words: Efficient Market Hypothesis, market efficiency and information asymmetry, public expectations, capital markets, GARCH models.

JEL Classification: C32, E27, G14, G15

1. Introduction

Efficient market hypothesis and the random walk hypothesis have been major issues in finance for the past 50 years. The term *efficiency* is used to characterize a market in which relevant information is impounded into the price of financial assets. In practice, this means that the stock markets indices are unpredictable. According to the efficient markets hypothesis (EMH) market prices fully reflect all available information. On the other hand, behavior economists try to prove that economic agents don't always act rationally due to emotional and personal factors and sentiments. What is more, we can assume that the public expectation information can predict total production, which on the other hand affects the stock market indices. We will attempt to answer the following questions: *How efficient are capital markets actually? Can the public expectations be used to forecast the*

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dynamics and movements of stock indices?

Consequently, this study focuses on the market efficiency, information asymmetry and the linkages between financial market dynamics and public expectations of eleven capital markets of South East Europe (SEE). We can divide the stock exchanges of SEE into two groups in the context of their development, using the stock market capitalization as a criterion. The first group contains the emerging markets – Bulgaria, Romania, Serbia, Montenegro, Macedonia, Slovenia, Banja Luka and Sarajevo (Bosnia and Herzegovina) and the second one – developed markets – Croatia, Turkey and Greece (Table 3 and Table 4). The data range is 1st January 2005 to 4th November 2015. The indices under examination are eleven indices represent all capital markets of South East Europe: the Bulgarian SOFIX, the Banja Luka BIRS, the Sarajevo BIFX, the Greek Athex Composite Share Price Index, the Macedonian MBI10, the Romanian BET, the Serbian BELEX15, the Croatian CROBEX, the Slovenian SBI TOP, the Turkish BIST100 and the Montenegrin MONEX. We use daily returns to examine the market efficiency and monthly returns, respectively for analyzing the impact of the public expectations on the stock exchange performance, applying an appropriate GARCH models.

The paper is organized in the following way. The first section initiates with the introduction. Section 2 summarizes the literature review. Section 3 discusses the data and the research method employed. Section 4 shows the main estimation results. The final section provides summary and conclusions.

2. Literature review

Fisher and Statman (2002) examine the relationship between consumer confidence and capital markets dynamics. Besides, they find evidence that the consumer expectations can predict changes in the stock markets. What is more, the authors establish an inverse linkage between consumer confidence in one month and stock returns in the following month for the NASDAQ and small cap stocks. Kremer and Westermann (2004) examine the linkage between stock market developments and consumer confidence in the euro area using VAR analysis. The results reveal the existence of significant positive relationship between stock market performance and consumer confidence in the euro area. Görmüş and Güneş (2010) analyze the effect of Consumer Confidence Index (CCI) on real exchange rate and stock market in Turkey for the period 2002-2008 using econometric techniques. The results from GARCH-M and OLS model show that CCI affect real exchange rate and stock prices. Oprea and Brad (2014) investigate the relationship between the consumer confidence index and the Romanian stock market for the period 2002-2011. They argue that there is a positive correlation between changes in consumer confidence and stock market returns, displaying that individual investor sentiment affects stock prices.

In the study conducted by Miljković and Radović (2006) evidence that the Serbian stock market does not show efficiency even in the weak-form of EMH is presented. They find statistically significant levels of autocorrelation in returns with high kurtosis distribution, considerably different from the normal one. Borges (2010) studies stock markets of France, Germany, UK, Greece, Portugal and Spain to check for the presence of random walk for the period from January 1993 to December 2007. Using both parametric and nonparametric tests, he finds evidence of random walk in all six countries for monthly return. Moreover, the hypothesis of random walk was rejected for Portugal and Greece for the daily return.

Aga and Kocaman (2011) test the weak form of efficiency for return index-20 in

Istanbul Stock Exchange (ISE) for the period 1986-2005. They lead to the conclusion that there is a weak form of efficiency in ISE, which means that the market is weakly efficient if the current time cannot be explained with the past values. Investigating calendar anomalies for five SEE stock markets (Bulgaria, Croatia, Greece, Romania and Turkey) during the period 2000-2008, Georgantopoulos, Kenourgios and Tsamis (2011) find evidence for the existence of three calendar effects (day of the week, turn of the month, time of the month) in both mean and volatility equations for Greece and Turkey, which is consistent to the findings of previous studies. On the other hand, the effects for the three emerging SEE markets are limited and exist only in volatility. Samitas, Kenourgios and Paltalidis (2011) study long-run relationships among five Balkan emerging stock markets (Turkey, Romania, Bulgaria, Croatia, and Serbia), the US and three developed European markets (UK, Germany and Greece) during the period 2000-2006. The results indicate that both domestic and external factors affect the Balkan stock markets, shaping their long-run equilibrium. Overall, they show evidence in favor of significant long-run relations between the Balkan emerging markets within the region and globally. Armeanu and Cioaca (2014) test the EMH in the case of Romania for 01.01.2002 -15.05.2014 using four methods, including GARCH model. They find out that the Romanian capital market is not weak-form efficient. Dragota and Oprea (2014) investigate the Romanian stock market's informational efficiency and find out that the predictability of returns suggest that the Romanian stock market has a low level of efficiency. Furthermore, the impact of new information is more intense before and after its release. Estimating the effect of the World Economic Crisis on the Countries of the Balkan Region Geshkov (2014) finds that the most affected countries are Greece and Bosnia and Herzegovina.

Studying the impact of 2008 financial crisis on the efficiency of the capital markets of Central and Eastern European (CEE) countries, Tsenkov (2015) finds differences in market reaction of two of studied markets in the comparison with the rest CEE markets. The Bulgarian and the Romanian indices show disposition for faster and more sensitive reaction to negative market impulses, typical for the Crisis Period, in contrast to a moderate incorporation of the positive market impulses specific to the Pre-crisis Period. Incorporation of the market information by Bulgarian SOFIX during Crisis Period is so accelerated that when it becomes publicly available much of the content is already included in the values of SOFIX under the form of strongly followed market trend. This type of reaction is opposite to the behavior from other CEE indices which follows more sustainable market trends during the pre-crisis period and gives much lower significance of the new market information. This market behavior changes during the Crisis Period, showing an enhanced response only to the short-term market fluctuations. During the Post-crisis Period the Bulgarian and the Romanian indices are showing predisposition to the short-term market trends. This is opposite to the other CEE indices which tend to form and pursue longer-term market trends.

3. Methodology and data

In this paper, we analyze the market efficiency, information asymmetry and the linkages between financial market dynamics and public expectations of eleven capital markets of South East Europe (SEE) - Bulgaria, Croatia, Greece, Serbia, Slovenia, Turkey, Romania, Montenegro, Macedonia, Banja Luka and Sarajevo (Bosnia and Herzegovina). We can divide the stock exchanges of SEE into two groups in the context of their development, using the stock market

capitalization as a criterion. The first group contains the emerging markets – Bulgaria, Romania, , Banja Luka and Sarajevo (Bosnia and Herzegovina), Serbia, Montenegro, Macedonia, Slovenia and the second one – developed markets – Croatia, Turkey and Greece (Table 3 and Table 4). Daily closing prices of eleven SEE market indices were available on the Stock Exchanges' websites of the investigated countries. The data range is 1st January 2005 to 4th November 2015. We should divide the analysis into two separated parts – in the first one we will examine if the capital markets are characterized with market efficiency in the context of the efficient market hypothesis (EMH) and in the second one – if the public expectations are related to the financial capitals dynamics, respectively. The first part of the analysis will be made by the daily returns (r_t) formulated below by using daily closing prices of the stock markets of the countries:

$$r_t = \log(P_t / P_{t-1}) \quad (1)$$

where P_t and P_{t-1} are the closing value of the market index at the current day and previous day, respectively. (Table 1).

Table 1. Analyzed stock exchanges, indices and a number of observations

Country	Stock exchange	Index	Number of observations
Bulgaria	Bulgarian Stock Exchange	SOFIX	2693
Bosnia and Herzegovina	Banja Luka stock exchange	BIRS	2660
Bosnia and Herzegovina	Sarajevo stock exchange	BIFX	2708
Greece	Athens Stock Exchange	Athex Composite Share Price	2704
Macedonia	Macedonian Stock Exchange	MBI10	2640
Romania	Bucharest Stock Exchange	BET	2717
Serbia	Belgrade Stock Exchange	BELEX15	2542
Croatia	Zagreb Stock Exchange	CROBEX	2704
Slovenia	Ljubljana Stock Exchange	SBI TOP	2395
Turkey	Borsa Istanbul	BIST100	2727
Montenegro	Montenegro Stock Exchange	MONEX	2675

Notes for Table 1.: Southeast Europe includes 10 countries: Bulgaria, Bosnia and Herzegovina, Greece, Macedonia, Romania, Serbia, Croatia, Slovenia, Turkey and Montenegro.

Source: Author's calculations.

Analyzing the SEE capital markets we use the models of the GARCH- family models (GARCH(p,q), EGARCH(p,q), TGARCH(p,q) and PGARCH(p,q)) for testing the market efficiency and information asymmetry. The selection of values *p* and *q* for used models is based on testing different combinations of values by applying the Akaike information criteria (AIC) test. The output combinations of parameters *p* and *q* are determined by the maximum value of 2 for both parameters and thus tested are the following combinations: (1,1), (2,1), (1,2) and (2,2). The selection procedure tries to find a combination of the two parameters that leads to more successful modeling of the studied data. The appropriate model has been chosen for each index (using the AIC values of each model, Table 2).

Table 2. The appropriate GARCH model of the GARCH-family models for each index, applying to examine the market efficiency

	examination – 01.01.2005г. – 04.11.2015г.
BIRS	*TGARCH(2,2)- t*
BIFX	*GARCH(2,2)-t*
SOFIX	*GARCH(2,2) -t*
CROBEX	*GARCH(2,2)-t*
ACSP	*PARCH(2,1)-t*
MBI10	*GARCH(2,2)-t*
MONEX	*EGARCH(2,2)-t*
BET	*EGARCH(2,1)-t*
BELEX15	*GARCH(2,2)-t*
SBI TOP	*GARCH(2,2)-t*
BIST100	*TARCH(2,2)-t*

Notes for Table 2.: The selection of values p and q for GARCH-family models is based on testing different combinations of values by applying the Akaike information criteria (AIC) test. The tested combinations are following: (1,1), (2,1), (1,2) and (2,2). The selection procedure seeks a combination of the two parameters that leads to more successful modeling of the studied data.

Source: Author's calculations

Table 3. Market capitalization of SEE capital markets for 2011

SEE capital markets	Market capitalization (US$)
Country	**2011 (billion)**
Bulgaria	8,253.25 US$
Croatia	22,558.38 US$
Greece	33,778.89 US$
Banja Luka (Bosnia and Herzegovina)	2,601.39 US$
Sarajevo (Bosnia and Herzegovina)	2,263.89 US$
Montenegro	3,509.11 US$
Romania	14,023.92 US$
Serbia	4,055.58 US$
Slovenia	6,325.86 US$
Turkey	197,074.46 US$
Macedonia	580.36 US$

Notes for Table 3.: The total market capitalization of each capital market is for 2011 (approximately in the middle of the examined period 2005-2015).

Source: The websites of the SEE stock exchanges.

On the other hand, for the second part of the analysis, we will use the values of the returns of the indices with a monthly frequency. We calculate the percentage change between the opening value of the index on the first working day of month (Vt) and the opening value on the first working day of next month (Vt+1), or:

$$R_t = \frac{V_{t+1} - V_t}{V_t} \qquad (2)$$

Again, in the analysis of the SEE capital markets we use the models of the GARCH- family models (GARCH(p,q), EGARCH(p,q), TGARCH(p,q) and

Table 4. Developing and developed capital markets (according to the market capitalization)

Developing SEE capital markets	Developed SEE capital markets
Bulgaria	***Greece***
Banja Luka (Bosnia and Herzegovina)	***Croatia***
Sarajevo (Bosnia and Herzegovina)	***Turkey***
Macedonia	
Montenegro	
Romania	
Serbia	
Slovenia	

Notes for Table 4.: Median market capitalization is US $ 6,325.86 billion.

Source: Author's calculations.

PGARCH(p,q)) for examining the relationship between public expectations and financial market dynamics, including the additional variables in the models, such as consumer confidence indicator (CCI), industrial confidence indicator (ICI) and inflation expectations (InfExp). All data is available in the database of the Eurostat Statistical Service. Consumer and industrial confidence indicators are indices composed of questions about general conditions for households and firms, respectively. Inflation expectations data is a question asking the general public if they expect prices to rise faster, rise at the same rate, rise slower, remain the same, or decrease. Additionally, there is not available data for these indicators for Montenegro, Serbia, Bosnia and Herzegovina and Banja Luka, although in the nearest future these SEE countries should start calculating the public expectation indicators because of the terms of joining the European Union.

Higher order GARCH models, denoted GARCH (*q, p*) can be estimated by choosing

Table 5. The appropriate GARCH model of GARCH-family models for each index, applying to examine the relationship between public expectations and capital market dynamics

Indices	Monthly data-131 observations
SOFIX	*PGARCH(1,2) -t*
CROBEX	*PGARCH(2,1)-t*
ACSP	*EGARCH(2,1)-t*
MBI10	*EGARCH(1,1)-t*
BET	*EGARCH(2,2)-t*
SBI TOP	*EGARCH(1,2)-t*
BIST100	*EGARCH(2,2)-t*
MONEX *	*EGARCH(1, 2)-t*

Notes for Table 5.: The selection of values p and q for GARCH-family models is based on testing different combinations of values by applying the Akaike information criteria (AIC) test. The tested combinations are following: (1,1), (2,1), (1,2) and (2,2). The selection procedure seeks a combination of the two parameters that leads to more successful modeling of the studied data.

**Only data for the inflation expectations.*

Source: Author's calculations

either *q* or *p* greater than 1 where *q* is the order of the autoregressive GARCH terms and *p* is the order of the moving average ARCH terms.

The representation of the GARCH (q, p) variance is:

$$\sigma_t^{\ 2} = \omega + \sum_{i-1}^{q} \beta_j \sigma^{2}{}_{t-j} + \sum_{i-1}^{p} \beta_i \varepsilon_{t-i}^2 \quad (3)$$

The EGARCH or Exponential GARCH model was proposed by Nelson (1991). The specification for the conditional variance is:

$$\log(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j \log(\sigma_{t-j}^2) + \\ + \sum_{i=1}^{p} \alpha_i \left| \frac{\varepsilon_{t-i}}{\sigma_{t-i}} \right| + \sum_{k=1}^{r} \gamma_k \frac{\varepsilon_{t-k}}{\sigma_{t-k}} \quad (4)$$

Note that the left-hand side is the log of the conditional variance. This implies that the leverage effect is exponential, rather than quadratic, and that forecasts of the conditional variance are guaranteed to be nonnegative. The presence of leverage effects can be tested by the hypothesis that $\gamma_i < 0$. The impact is asymmetric if $\gamma_i \neq 0$.

The Threshold GARCH (TGARCH) Model TARCH or Threshold ARCH and Threshold GARCH were introduced independently by Zakoïan (1994) and Glosten, Jaganathan, and Runkle (1993). The generalized specification for the conditional variance is given by:

$$\sigma_t^2 = \omega + \sum_{j=1}^{q} \beta_j \sigma_{t-j}^2 + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-i}^2 + \\ + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-i}^2 + \sum_{k=1}^{r} \gamma_k \varepsilon_{t-k}^2 I_{t-k} \quad (5)$$

where $I_t = 1$ if $\varepsilon_t < 0$ and 0 otherwise.

In this model, good news, $\varepsilon_{t-i} > 0$, and bad news $\varepsilon_{t-i} < 0$, have differential effects on the conditional variance; good news has an impact of α_i, while bad news has an impact of. If $\gamma_i > 0$, bad news increases volatility, and we say that there is a *leverage effect* for the i-th order. If $\gamma_i \neq 0$, the news impact is asymmetric.

The Power GARCH (PGARCH) Model Taylor (1986) and Schwert (1989) introduced the standard deviation GARCH model, where the standard deviation is modeled rather than the variance. This model, along with several other models, is generalized in Ding et al. (1993) with the Power ARCH specification. In the Power ARCH model, the power parameter δ of the standard deviation can be estimated rather than imposed, and the optional γ parameters are added to capture asymmetry of up to order r :

$$\sigma_t^{\delta} = \omega + \sum_{j=1}^{q} \beta_j \sigma_{t-j}^{\delta} + \sum_{i=1}^{p} \alpha_i (|\varepsilon_{t-i}| - \gamma_i \varepsilon_{t-i})^{\delta} \quad (6)$$

where $\delta > 0, |\gamma_i| \leq 1$ for $i = 1,....,r, \gamma_i = 0$, for all $i > r$, and $r \leq p$.

The symmetric model sets $\gamma_i = 0$ for all *i* . Note that if $\delta = 2$ and $\gamma_i = 0$ for all *i* , the PARCH model is simply a standard GARCH specification. As in the previous models, the asymmetric effects are present if $\gamma \neq 0$.

4. Empirical results

4.1. Market efficiency and information asymmetry

Table 6 shows the coefficient of persistence, leverage effect and power parameter for daily stock returns of the SEE indices for the whole analyzed period - 01.01.2004 – 04.11.2015. Here, we can make a note that coefficients of persistence take values in the range from 0.837173 (BIST100) to 1.011489 (ACSP). Also, we can separate the SEE indices into two groups according to the values of the coefficient of persistence. The first group contains indices MONEX and BIST100 with coefficients of persistence lower than 0.97. This leads us to the conclusion that the indices from the first group are with relatively high market efficiency. On the other hand, the second group includes BIRS, BIFX, SOFIX, CROBEX, ACSP, MBI10, BELEX15, SBI TOP and BET which coefficients of persistence are

Table 2. The value of the power parameter, coefficient of persistence and leverage coefficient for the sample period

Indices	coefficient of persistence	leverage coefficient *(Prob.)*	power parameter * *(Prob)*	ARCH(1)** *(Prob)*	ARCH(2)** *(Prob)*
BIRS	1.003158	-0.006457 *(0.0000)*	NA	0.248206 *(0.0000)*	-0.243656 *(0.0000)*
BIFX	1.000438	NA	NA		
SOFIX	0.999957	NA	1.547060 *(0.0002)*		
CROBEX	0.998951	NA	NA		
ACSP	1.011489	0.556827 *(0.0044)*	0.706169 *(0.0000)*	0.074464 *(0.0011)*	0.054461 *(0.0450)*
MBI10	1.002842	NA	NA		
MONEX	0.893132	0.047719 *(0.0109)*	NA		
BET	0.984285	-0.030569 *(0.0162)*	NA		
BELEX15	0.999269	NA	NA		
SBI TOP	0.996553	NA	NA		
BIST100	0.837173	0.176648 *(0.0000)*	NA	-0.021530 *(0.2265)*	0.087876 *(0.0002)*

Notes for Table 6.:

** Only for PGARCH*

*** Only for TGARCH and PGARCH with power parameter close to 1.*

Source: Author's calculations

larger than 0.97. We should make important remark here that these indices above are with relatively low market efficiency.

The absolute values of the leverage coefficient represented in Table 3 for observed SEE indices are in the range from 0.006457 (BIRS) to 0.556827 (ACSP). In the TGARCH (2, 2)-t model, the good news has an impact on the volatility of 0.066346 while the bad news has an impact of 0.242994 for BIST100, indicating that good news generate less volatility than bad news. In comparison, the results of TGARCH (2, 2)-t for BIRS represents that the negative information has an influence of (-0.001907) showing that bad news decreases the volatility during the whole period. Additionally, we should analyze the values of power parameter (in the case of estimating PGARCH (2, 1)-t). First, for the ACSP the value of this parameter is almost unity (0.706169) meaning that the PGARCH becomes TGARCH model. Second, for the ACSP bad news increases the volatility (the leverage effect is set at 0.556827). Significantly, the indices ACSP (0.556827) and BIRS100 (0.176648) are with large in size and positive leverage coefficients (above 0.15), that means that the new information

entering the market causes great changes in the volatility during the whole period under examination. By contrast, the leverage effect for the BIRS, MONEX and BET is with relatively low absolute value (0.006457, 0.047719 and 0.030569 respectively). We hypothesize that news has a less impact on the volatility.

The overall picture for the whole period shows that the registered information asymmetry attributes to separation of the SEE indices into two groups. The first group contains indices ACSP and BIST100 which leverage coefficients have high absolute values indicating that market information has large effect on the volatility. The members of the second group are BIRS, MONEX and BET, which leverage coefficients have low value resulting in weak reaction to the new information entering the market and the attenuation of the information asymmetry. Moreover, the findings above about the values of the coefficient of persistence and related informational efficiency reveal that the SEE indices can be divided into two groups. The first group includes indices MONEX and BIST1000 characterized with high market efficiency (the value of coefficient of persistence is lower than 0.97) and the second group - BIRS, BIFX, SOFIX, CROBEX, ACSP, MBI10, BELEX15, SBI TOP and BET with market inefficiency (the value of coefficient of persistence is above 0.97).

To sum up, the indices BIRS, BIFX, SOFIX, CROBEX, ACSP, BELEX15, SBI TOP, MBI10 and BET (Banja Luka, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Serbia, Macedonia and Romania, respectively) are defined as market inefficient according to the EMH during the whole period. Additionally, the indices ACSP and BIST100 are with high values of their leverage coefficients indicating that market information has large effect on the volatility. All things considered, it seems reasonable to assume that SEE capital markets aren't efficient in the context of EMH.

4.2. The impact of consumer and industrial sentiment on the capital market dynamics

Table 7. Estimating results of GARCH models for the influence of the consumer confidence indicator on the capital market dynamics

Index	The most appropriate GARCH model	*CCI (Prob)*
SOFIX	*PGARCH (1,2) -t*	***0.125358 (0.0113)***
CROBEX	*PGARCH (2,1)-t*	-0.010476 (0.6703)
ACSP	*EGARCH (2,1)-t*	-0.011788 (0.8629)
MBI10	*EGARCH (1,1)-t*	***-0.008110 (0.0117)***
BET	*EGARCH (2,2)-t*	***-0.102886 (0.0047)***
SBITOP	*EGARCH (1,2)-t*	***-0.053161 (0.0008)***
BIST100	*EGARCH (2,2)-t*	0.001895 (0.9213)

Notes for Table 7.:The data of the consumer confidence indicator is included in the equation of EGARCH(p,q) or PGARCH(p,q) model.

Source: Author's calculations.

The table 7 shows the values of the consumer confidence indicator (CCI) in the equation of EGARCH(p,q) or PGARCH(p,q) model. We should note that for four of the examined indices there are statistically significant values at 5% of CCI. Moreover, the absolute values of CCI are in the range from 0.008110 (MBI10) to 0.125358 (SOFIX). Remarkably, the highest value of CCI is registered for SOFIX, indicating that this sentiment indicator has a relatively

significant influence on the dynamics of Bulgarian capital market. Here, we should specify that statistically significant consumer confidence indicators are calculated only for the emerging SEE capital markets – Bulgarian (0.125358), Slovenian (-0.053161), Macedonian (-0.008110) and Romanian (-0.102886). One of the possible explanation of the registered insignificant values of CCI for the developed markets (Greece, Turkey and Croatia) is that the customer expectations are already included in the pricing decisions of the market agents. The results obtained for the numbers of CCI that reach statistical significance (for four SEE countries) are really impressive despite the large amount of noise that characterizes the surveys. Here we can make a conclusion that the consumer sentiment information has influence on the capital market dynamics of Bulgaria, Macedonia, Slovenia, Romania, therefore on the prices of financial assets. Logically, we should make an assumption that the consumer expectations will have larger effect on the stocks of the companies especially dependent on consumption (e.g. consumer goods companies) than on the other stocks.

All things considered, we find evidence that consumer sentiment has predictive capability, connecting with the financial market dynamics of the emerging SEE capital markets. This conclusion is similar to the one proposed by Baumohl (2012) i.e the happiness of the consumers is important as when consumers feel less confident of the economy they tend not to be willing to make major purchases such as houses and cars which may derail the economic activity. Additionally, falling confidence is not favorable towards equities as it is an indication of declining business sales.

Table 8. Estimating results of GARCH models for the influence of the industrial confidence indicator on the stock market dynamics

Index	The most appropriate GARCH model	*ICI (prob)*
SOFIX	*PGARCH (1,2) -t*	6.15E-05 (0.9882)
CROBEX	*PGARCH (2,1)-t*	0.000679 (0.8019)
ACSP	*EGARCH (2,1)-t*	-0.000931 (0.8455)
MBI10	*EGARCH (1,1)-t*	0.000851 (0.2213)
BET	*EGARCH (2,2)-t*	0.000516 (0.7391)
SBITOP	*EGARCH (1,2)-t*	-1.32E-05 (0.9967)
BIST100	*EGARCH (2,2)-t*	0.001566 (0.4101)

Notes for Table 8.:The data of the industrial confidence indicator is included in the equation of EGARCH(p,q) or PGARCH(p,q) model.

Source: Author's calculations.

When we add the industrial confidence indicator (ICI) in the GARCH model equation, the results are quite different – none of the eight values of ICI is statistically significant at 5 %. Thus, there is not linkage between industrial sentiment and the market dynamics of the SEE capital markets. Actually, these results are not unexpected, in view of the assumption that business expectations do not affect the movement of the indices.

4.3. Inflation expectations

Table 9. Estimating results of GARCH models for the influence of the inflation expectations on the stock market dynamics

Index	The most appropriate GARCH model	*InflExp* (prob)
SOFIX	*PGARCH(1,2) -t*	***0.060200 (0.0190)***
CROBEX	*PGARCH(2,1)-t*	***-0.000195 (0.0414)***
ACSP	*EGARCH(2,1)-t*	-0.000779 (0.5752)
MBI10	*EGARCH(1,1)-t*	***-0.007848 (0.0000)***
BET	*EGARCH(2,2)-t*	-0.004912 (0.3951)
SBITOP	*EGARCH(1,2)-t*	0.005638 (0.2260)
BIST100	*EGARCH(2,2)-t*	***0.010756*** (0.0051)
MONEX	*EGARCH(1, 2)-t*	-0.006195 (0.2610)

Notes for Table 9.:The data of the inflation expectations is included in the equation of EGARCH(p,q) or PGARCH(p,q) model.

Source: Author's calculations.

The values of inflation expectations in the GARCH model equation are presented in Table 9. In macroeconomic theory the inflation expectations (InflExp) have a significant role in the formulation of the expectations-augmented Philips curve. In economics, the inflation expectations affect the overall production and through it indirectly influence financial market dynamics. Here we can make two important remarks. Firstly, statistically significant values of InflExp are registered for SEE indices – SOFIX (0.060200), CROBEX (-0.000195), MBI10 (-0.007848) and BIST100 (0.010756). Secondly, the absolute values of InflExp are in the range from 0.000195 (MBI10) to 0.060200 (SOFIX). Consequently, inflation expectations influence on the capital market dynamics of four SEE indices. Here we should note that the statistically significant values of inflation expectations are calculated for two developed financial markets – Turkey and Croatia and two developing markets – Bulgaria and Macedonia. It's necessary to compare these results with the previous results revealing statistically significance of the CCI for Bulgarian and Macedonian indices. These conclusions are really remarkable because despite relatively illiquid trading on the markets and incomplete data surveys, the public expectations can be used for prediction purposes. Notably, inflation expectations are cointegrated with the real inflation and actually can be used to forecast it in the most of the examined countries.

To sum up, data for the inflation expectations have predictive power for the market performance of the stock indices, although relatively low values of InflExp (from 0.000195 to 0.060200).

Here, we can look at the macroeconomic fundamentals in order to evaluate the money supply influence on the stock market. What is more, money supply can have a negative impact on asset prices by its relationship to unexpected and future inflation. Keynesian hypothesis states that when money supply changes it will affect stock prices if it alters the expectations of future monetary policy. For instance, if the money supply increase, market participants will anticipate a contractionary monetary policy in the future which will lead to less investments and therefore increased interest rates. Thereby lowering stock market prices by a higher discount rate and lower expectations regarding future cash flows due to decreased economic activity (Sellin, 2001).

5. Conclusion

The emerging capital markets in Banja Luka, Sarajevo (Bosnia and Herzegovina), Bulgaria, Greece, Serbia, Macedonia, Romania and the developed Croatian market can be defined with inefficiency according to the EMH during the sample period. The indices ACSP (developed Greek capital market) and BIST100 (developed Turkish capital market) are with high values of their leverage coefficients indicating that market information has large effect on the volatility. Only Montenegrin stock exchange is market efficient due to the values of the coefficient of persistence and leverage effect. All things considered, it is reasonable to assume that SEE capital markets aren't efficient in the context of EMH. These results are consistent with the findings of Ivanov and et al. (Ivanov, I., Lomev, B., Bogdanova, B., 2012). They investigate the market efficiency of seven emerging East-European stock exchanges (Serbia, Romania, Turkey, Croatia, Russia, Ukraine, and Bulgaria) in respect of long-range dependence (LRD). The authors establish that for all of the examined indices there is clearly an indication for deviation from Random walk hypothesis and thus the studied markets manifest inefficiency.

The consumer sentiment information has influence on the capital market dynamics of Bulgaria, Macedonia, Slovenia, Romania, therefore on the prices of financial assets. Additionally, consumer expectations have predictive capability for the performance of the emerging SEE capital markets. In fact, these results are in agreement with results obtained by Gerunov (2014). Gerunov (2014) examines whether the stock market indices of twelve key EU economies are consistent with the implications of the Efficient Market Hypothesis (EMH) and if some publicly available information can be usefully utilized to forecast market movements. He finds enough evidence that the public expectations display predictive power for financial index dynamics in fully 6 (Germany, France,Poland, Bulgaria, Hungary and Greece) out of the 12 sampled countries. On the contrary, there is no linkage between industrial expectations and the dynamics of the SEE capital markets. Inflation expectations have impact on the performance of four SEE indices – Turkey, Croatia, Bulgaria and Macedonia. What is more, the inflation expectations information has predictive power for the market dynamics of the SEE stock exchanges. Our findings suggest that the public expectations impact the financial market dynamics in Bulgaria. Hence, macroeconomic indicators are important as they provide a tool for analyzing the current and future state of the Bulgarian economy. As the Bulgarian stock exchange is a concurrent part of our economy, indicators are used in order to evaluate stock market investments. Importantly, in Bulgarian emerging economy, the daily available source of information for households is the development of the financial market in Bulgaria. Generally, households in developing markets can only follow the economic outlook through the willingness to buy factor due to the fact that the level of income is close to subsistence. Consequently, in the case of Bulgaria, consumer confidence should be considered as an economic indicator which derives most of its information content from past and current economic outlook. This is especially true during the financial crisis of 2008 when the future is uncertain and risky.

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