ARE THE ANNOUNCEMENTS REGARDING MACROECONOMIC FUNDAMENTALS RESPONSIBLE FOR CHANGES IN THE DYNAMICS OF STOCK MARKETS? CEE VS DEVELOPED MARKETS

Radu Lupu, PhD
Institute for Economic Forecasting, Romania

Adrian Cantemir Călin, PhD
Institute for Economic Forecasting, Romania

Georgiana Roxana Ene
Bucharest Academy of Economic Studies

Abstract*: Fama (1965) postulates that a market is efficient if the prices of the traded assets are an accurate estimator of their value. Moreover, the random walk hypothesis states that all the information available is included in the price of a certain asset.*

This paper aims to investigate if a series of macroeconomic announcements generates abnormal evolutions for Central and East European stock market indices and also for indices belonging to countries with solid and liquid financial markets. In order to achieve this objective, we use an event study that extends the methodology found in Albu et al (2014 a). Our analysis is carried out both in terms of abnormal returns and abnormal variances.

We find that the battery of macroeconomic announcements does not influence the dynamics of the indices considered in this study. In spite of this, our results point out strong effects in terms of abnormal variances, both for CEE and developed countries.

Keywords: macroeconomic fundamentals, stock market indices, efficient markets, event study

JEL classification G14, G17

Introduction

Over the last period, the financial research and literature have shown that financial markets are sensitive in relation to the launch of macroeconomic news.

In general, governments or public and private institutions such as statistical offices issue statements on several key economic elements that characterize the dynamics of the economy. These announcements tend to influence the dynamics of financial assets given the fact that they offer a clear image on the present state of the economic system and possible hints about its future evolution.

The magnitude of this influence is by no means homogenous and obviously varies depending on the nature of announcement. This fact constitutes the topic of a strong and fast growing literature that studies the impact of numerous economic variables on several financial assets.

The research question of the present research falls in line with a large block of literature that studies the linkages of macroeconomic variables and financial data such as:

Fama (1900), Maysami and Koh (2000) or, Lupu and Călin (2014) and also with the literature that analyzes the impact of economic news on financial markets like: Schwert (1981), Andersen et al (2007), or Bekaert and Engstrom (2010).

The purpose of this paper is to investigate the impact of a large battery of economic announcements on the dynamics of stock markets. More specifically, we aim to determine whether the launch of new economic information influences the dynamics of stock market indices. The analysis firstly considers a set of CEE indices and then focuses on a set of indices belonging to developed countries. In an event-study approach, we try to find if the considered announcements generate reactions in terms of returns (abnormal and cumulative abnormal) and in terms of variance.

The remainder of this paper is organized in the following manner. Section II offers a brief review of the related literature. Section III shows the data and the modeling approach. Section IV presents the results, while section V concludes.

Literature review

Our research relates to a large block of academic literature that studies the interconnections between macroeconomic variables and financial elements. Seminal work in this direction has been carried out by Chen, Roll and Ross (1986), Fama (1900), Lee (1992), or Albu Lupu and Călin (2014 b). Other interesting results derive from studies such as: Maysami and Koh (2000), Hondroyiannis and Papapetrou (2001), Gruber and Kamin (2012) or Karunanayake et al (2012).

More recently, Lupu and Călin (2014) conduct an analysis oriented towards the CEE countries. The authors focus on the potential connections between the dynamics of GDP and of stock market indices. The results show a mild degree of dependence between economic growth and the movements of the financial markets, the only clear evidences being reported for Slovenia and Lithuania.

In an industrious approach, Abdullah, Saiti and Masih (2014) study the interactions between macroeconomic fundamentals and national stock market index of Malaysia. The authors employ the Johansen VECM, generalized variance decompositions and wavelet techniques and find a cointergration between the Malayan index, bond yields, export exchange rate and the short term interest rate.

Belingher (2015) studies the linkages between domestic consumption and the dynamics of a short-term sovereign bond for the case of Romania. Using a VAR approach, the author confirms the existence of a connection between the two elements.

Călin (2015 a) tries to determine the connection between economic growth and the volatility of stock market indices for a series of European countries. The study does not point out a stable relation between the two variables. The only stable link reported is that of Germany.

Albu, Lupu and Călin (2015) study asymmetric volatility and its relationship with the economic variables. The results exhibit an important goodness of fit for Poland, Czech Republic, Hungary and Romania, though the dependence coefficients are not statistically sound.

In addition to this, this paper extends the existing literature that studies the impact generated by news on financial data.

The most relevant area of research in this field is that which investigates the influence of news regarding macroeconomic fundamentals on several financial assets. Key contributions in this direction have been put forward by Schwert (1981), Fleming and Remolona (1997), Balduzzi, Elton, and Green (2001), Andersen et al (2007), or Bekaert and Engstrom (2010). Similar approaches are found also in more recent works.

Aizenman et al (2015) use a similar methodology to our approach to study the effects of news regarding the global crisis and the Eurozone crisis on emerging countries equity and bond markets. The authors report that the global crisis induces a negative effect on the returns of the two above mentioned markets. The effect of Eurozone crisis is considered to be milder.

Kurov et al (2015) observe the price dynamics of American stock index and treasury futures in relation to US macroeconomic announcements. Using a series of 18 relevant announcements, the authors detect traces of price drifts and motivate them as causes of informational leakage and superior forecasting.

Thomas el al (2015) use a nowcasting approach and observe that in the 1998 – 2003 interval, the impact of announcements on Treasury bond futures can be a cause of differences of intrinsic value.

Smales and Young (2015) study the dynamics of gold future with respect to the launch of macroeconomic announcements. The authors report that the largest impact derives from announcements about the unemployment rate and the GDP. An interesting result is the fact that gold prices tend to react stronger to positive economic news and that this reaction is invariant in relation to the economic recession.

Călin (2015 b) focuses on the impact of trade announcements on the FOREX market. The results try to show what currencies react to the economic news and what types of announcements generate the largest impact. The author reports that the currency market is most sensitive to news regarding the trade balance and the level of imports and exports.

Methodology and data sources

Our approach uses two types of data. The first data set consists of stock market indices. On one hand the analysis considers CEE indexes (BET, BUX, PX, WIG, BIST 100, MICEX)[1], and respectively indices belonging to developed countries (S&P 500, FTSE 100, DAX 30, CAC 40, NIKKEI 225)

They were observed for the 01 January 2000 – 10 June 2015 interval and have a daily frequency. The graphical representation of the date is found in Figure 1 and Figure 2.

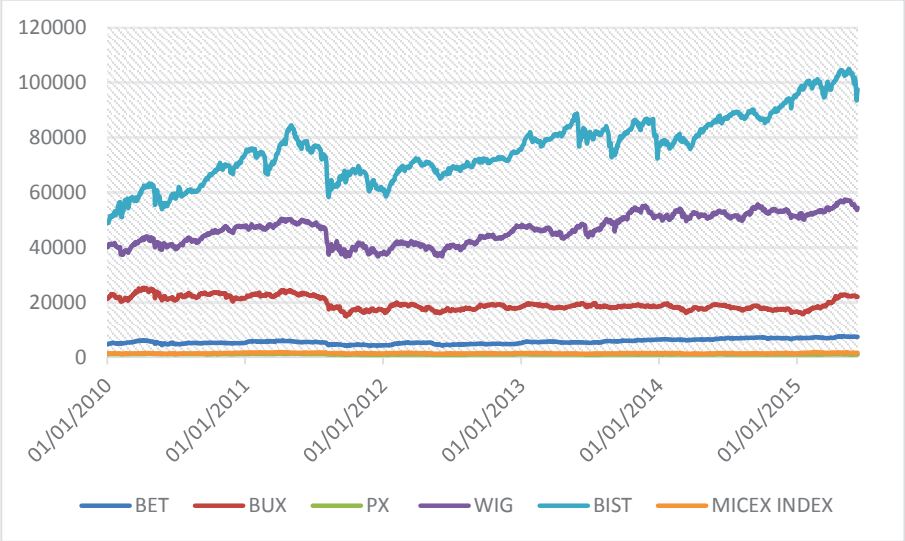
The second set of data consists in a large battery of announcements regarding several economic fundamentals. The main categories of events included in the study represent communications on:

- *Current account*
- *Imports*
- *Trade Balance*
- *Inflation*
- *Repurchase rate*
- *Private consumption*
- *Government consumption*
- *PPI (producer price index)*

The selected events are representative for the countries included in this analysis and total 271 announcements.

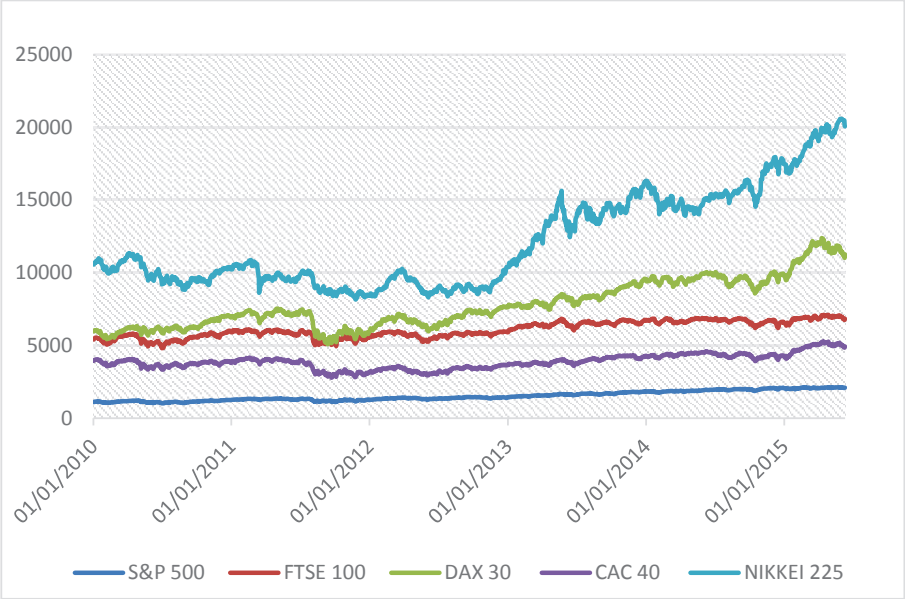
[1] For more details on the characteristics of CEE stock market indices see Panait and Lupu (2009) or Tudor (2011)

Figure 1: The dynamics of stock market indices – CEE countries



Source: Authors' calculation

Figure 2: The dynamics of stock market indices – developed countries



Source: Authors' calculation

Our methodology uses the setup put forward by Albu et al (2014a). Therefore, in our event study scenario we calibrate an ARMA (1, 1) – GARCH (1, 1) model for a time frame of 101 days that relate to 100 returns. The model is explained by the subsequent set of equations:

$$R_{t+1} = lR_t + m\varepsilon_t + \varepsilon_{t+1},\ \varepsilon_{t+1} \sim N(0, \sigma_{t+1})$$

$$\sigma_{t+1}^2 = \omega + \sum_{i=1}^{p} \alpha_i R_{t+1-i}^2 + \sum_{j=1}^{q} \beta_j \sigma_{t+1-j}^2$$

Where $\alpha + \beta < 1$

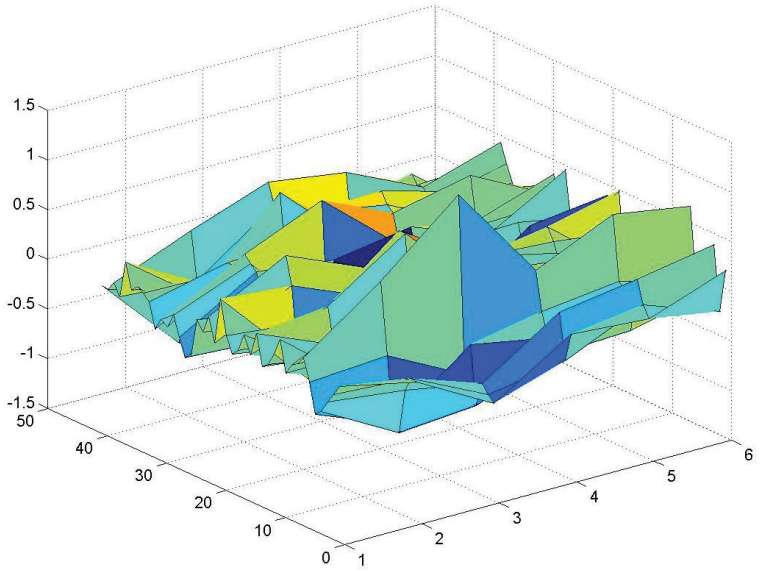
Following the above mentioned approach we isolate an event window of 41 days and we simulate forecasts with the GARCH model. By comparison to the real returns we obtain the series of abnormal returns.

Our methodology allows the computation of three sets of results. Firstly, we focus on abnormal and cumulative abnormal returns. In addition to this, we also seek to determine traces of impact in terms of abnormal variances.

Results

As stated above, our study tries to determine the effect generated by a large set of economic announcements on the evolution of several stock market indices from Central and Eastern Europe and developed countries. Our analysis investigates this effects both in terms of abnormal returns and variance.

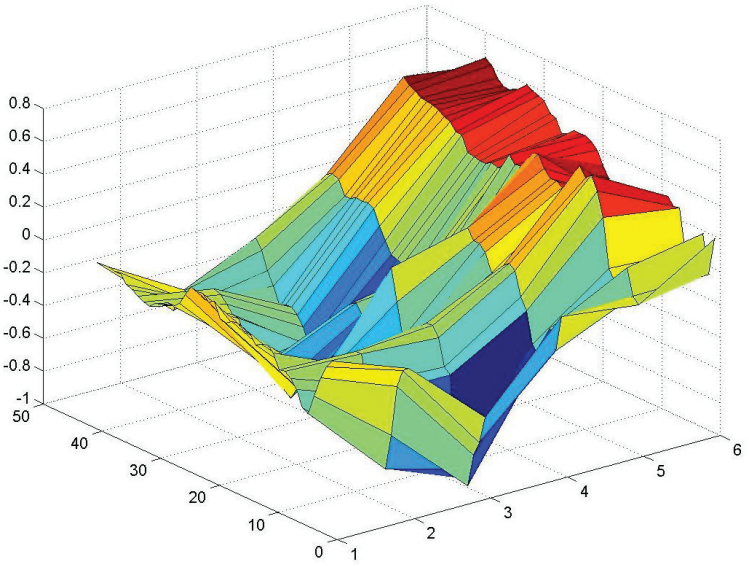
Figure 3: Abnormal returns - CEE



Source: Authors' calculation

Figure 3 shows the representation of abnormal returns. Our results indicate the fact that the large set of events does not succeed in generating a statistically valid influence. This result highlights the fact that the markets included in this study are efficient. The results obtained for cumulative abnormal returns indicate a similar situation. The impact of the above mentioned events on the stock market indices is not statistically valid. The graphical representation of the cumulative abnormal returns computed in our investigation is shown in Figure 4.

Figure 4: Cumulative abnormal returns - CEE



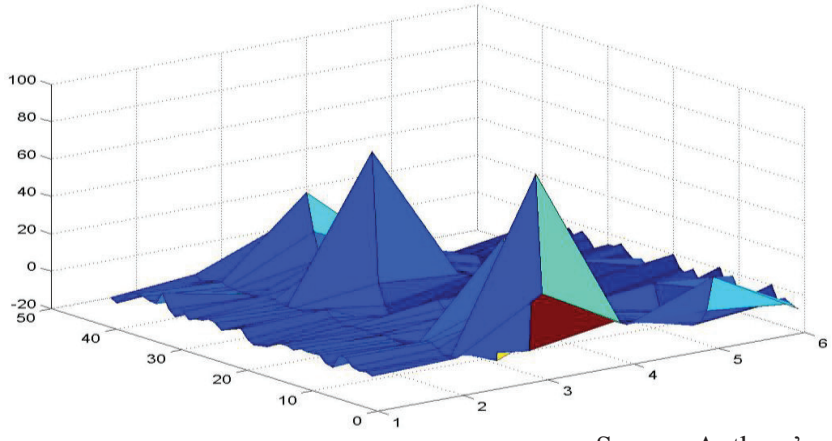
Source: Authors' calculation

Despite the results observed in terms of returns, the situation is totally different in the case of abnormal variances. They react profoundly and statistically significant for the case of every studied assets besides the WIX index. Figure 5 shows the dynamics of the abnormal variances computed in our analysis.

The aggregate results for the Romanian index show that the 271 events succed in generating abnormal variances in 41% of the days in event window. We detect abnormal variances prior to an announcement (in the (-4, -1) interval) and towards the end of the event window ((10, - 20) interval). Despite this fact, the result do not show traces of impact on the announcement day.

The BUX index manifests significant abnormal values in the days in which annoucenments are made. This index reacts in a similar way to BET in about 34% of the cases. The results show a period of strong abnormal volatily contrated towars the end of the first week of the event window.

Figure 5: Impact on variance - CEE



Source: Authors' calculation

The PX, BIST and MICEX indices react more profoundly in terms of variance to the announcements included in the study. The cumulative reaction for these three indices is 95%, 97.5% and respectively 87% of the total days of the event windows.

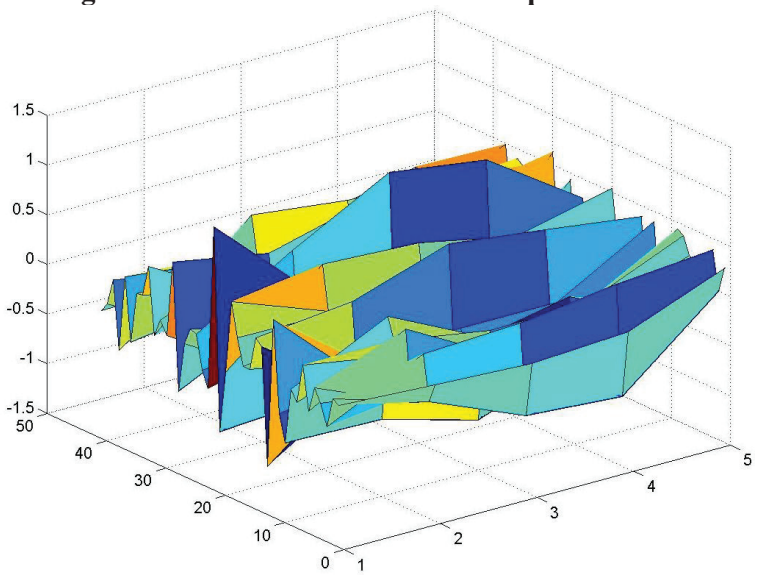
For these financial assets, the information present in the market prior to the launch of an event leads to significant volatility reactions in almost every day of the (-20, 0) interval. In addition to this, at an aggregate level, we observe abnormal variances for every announcement day. Relevant abnormal variances were observed for the three assets throughout the entire (1 – 20) interval.

The next step in our study consists in extending our approach towards a set of mature and liquid markets in order to have a reference for the previous results.

The abnormal and cumulative abnormal returns follow the previously explained paradigm and exhibit a low sensitivity towards the announcements included in the study. The results obtained for abnormal and cumulative abnormal results are graphically shown in Figure 6 and Figure 7. The lack of a statistically significant reaction in terms of returns highlights the idea that these markets are efficient.

Despite this shortage of statistically significant results in terms of returns, the analysis directed to the variance shows a relevant series of results that is presented in Figure 8.

Figure 6: Abnormal returns – developed countries

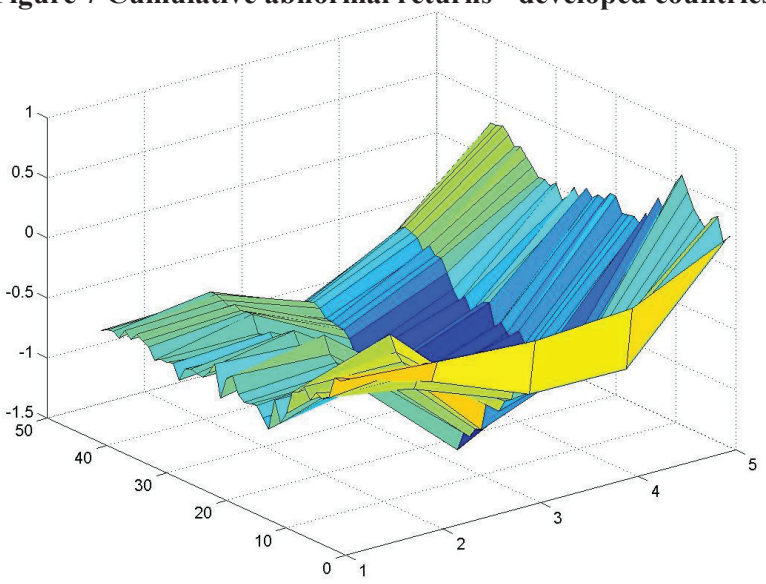


Source: Authors' calculation

S&P 500 reacts substantially to the announcements that are specific to the US economy, exhibiting significant values in 92.6% of the days of the event windows. The results point to a clear tendency of volatility expansion in the (-4 ; 2) interval and during the first week after an announcement. For the S&P 500 we noticed volatility reactions for each of macroeconomic announcements included in this study. This evolution is similar with that previously observerved for the PX, BIST and MICEX indices.

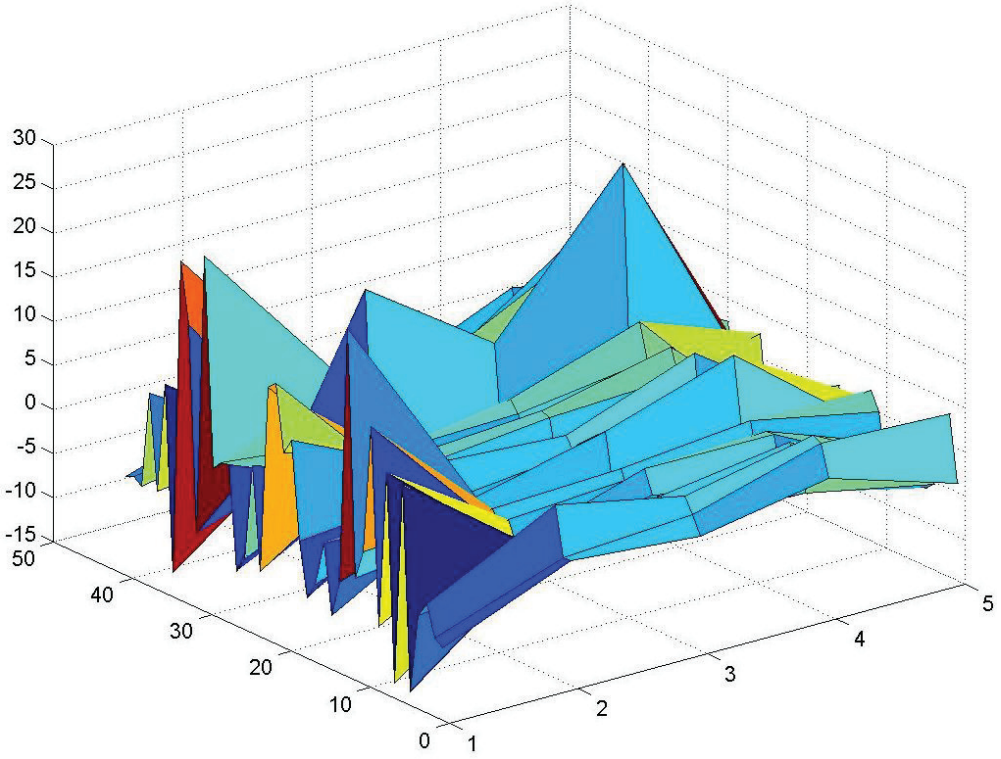
The situation of the FTSE 100 is contrasting. The results indicate abnormal volatilities in 395 of the possible cases. These are concentrated in the (-3 ; 0) intervals and then towards of the end of the first ten days after the announcement. Despite an aparent weak reaction we notice a strong surge of volatility on the days in which announcements are made.

Figure 7 Cumulative abnormal returns - developed countries



Source: Authors' calculation

Figure 8: Impact on variance - developed countries



Source: Authors' calculation

The results show a symmetrical dynamics for the DAX 30 index that has reacts in about 41.6% of the possible cases. In other words, for this index we observed abnormal volatilities in 17 of the 41 days of the event window. Relevant moves in abnormal volatility are seen around the announcement moments and in the first week that follows.

The variance of the CAC 30 index is also influenced by the macroeconomic news. This index shows signs of impact in 44% of cases. The results reflect significant areas of abnormal volatility, especially in the (3, 11) interval. In a similar way to the above discussed financial assets, the abnormal variance of the CAC index is statistically significant on announcement dates.

A powerful influence is also observed for the NIKKEI 225. The index reacts in terms of variance in 32 of the 41 days of the event window. The (-20; -11) interval shows important abnormal variances. This pattern is maintained during the first weak that follows the launch of economic announcements.

Conclusions

The present paper aimed at investigating the effects induced by macroeconomic announcements on stock markets, focusing on the case of CEE countries versus developed countries. For this purpose, our modeling setup incorporated specifications for both abnormal returns and abnormal variances.

For both types of indices (CEE and developed) the results showed a lack of impact in terms of returns from news that describe phenomena such as: GDP, current account, imports, trade balance, expected inflation, private and governmental consumption.

This shortage of significant results in terms of abnormal returns hints to the fact the financial markets included in this study are efficient and incorporate correctly the level of available information.

Despite these results, the analysis that aims at abnormal variances has revealed significant values for all the studied cases. Moreover, the degree of influence was generally high. The announcements consisting in details about the dynamics of macroeconomic variables determine thus oscillations and surges of abnormal volatility for the markets included in this research.

This substantial and ubiquitous volatility that exceeds the level considered normal for the existing information can be interpreted as a state of uncertainty that derives from the difficulties which investors face in the right interpretation of the effects that will follow the economic announcements.

References

1. Abdullah A. M., Saiti B. and Masih A.M.M. (2014), "Causality between Stock Market Index and Macroeconomic Variables: A Case Study for Malaysia", MPRA Paper No. 56987
2. Aizenman J., Jinjarak Y., Lee M. and Park D. (2015), "Developing countries' financial vulnerability to the eurozone crisis: an event study of equity and bond markets", Journal of Economic Policy Reform, DOI: 10.1080/17487870.2015.1018831
3. Albu L.L., Lupu R., Călin A.C. (2015), "Stock market asymmetric volatility and macroeconomic dynamics in Central and Eastern Europe Procedia Economics and Finance", Volume 22, pp. 560–567,
4. Albu L.L., Lupu R., Calin A.C. and Popovici O.C., (2014 a), "Estimating the Impact of Quantitative Easing on Credit Risk through an ARMA – GARH Model", Romanian Journal of Economic Forecasting, 17(3), pp. 39-50.
5. Albu, L. L., Lupu, R., and Calin, A. C. (2014 b),"A Nonlinear Model to Estimate the Long Term Correlation between Market Capitalization and GDP per capita in Eastern EU Countries", Journal of Economic Computation and Economic Cybernetics Studies and Research, Issue 3, pp. 5 – 22.

6. Andersen, T. G., Bollerslev, T., Diebold, F. X., and Vega, C. (2007), "Real-time price discovery in global stock, bond and foreign exchange markets", Journal of International Economics, 73 (2), 251–277.
7. Balduzzi, P., Elton, E. J., and Green, T. C. (2001), "Economic news and bond prices: Evidence from the U.S. Treasury market", Journal of Financial and Quantitative Analysis, 36 , 523–543.
8. Bekaert, Geert, and Eric Engstrom, (2010), "Inflation and the stock market: Understanding the "fed model" ", Journal of Monetary Economics 57, 278–294.
9. Belingher D.S. (2015), "A Short-Run Relationship Between 1-Year Bonds Yield And The Domestic Consumption In Romania", Annals of the „Constantin Brâncuşi" University of Târgu Jiu, Economy Series, Issue 2/2015, pp. 28 - 36
10. Călin A.C. (2015 b), "The impact of trade announcements on financial markets. an event study analysis", The Romanian Journal of Economic Forecasting, Issue 2, pp. 81-91
11. Călin A.C., (2015 a), "Connection of European Economic Growth with the Dynamics of Volatility of Stock Market Returns", Financial Studies, Volume 19, Issue 1, pp. 53 - 66.
12. Chen N. F., Roll R. and Ross S. A. (1986), "Economic forces and the stock market", Journal of Business, 59, 383-403
13. Fama E. F. (1990), "Stock Returns, Expected Returns and Real Activity", Journal of Finance, 45, 1089-1108
14. Fleming, Michael J. and Eli M. Remolona, (1997), "What moves the bond market?", Economic Policy Review 3, 31–50.
15. Gruber J. W. and Kamin S. B. (2012), "Fiscal Positions and Government Bond Yields in OECD Countries", Journal of Money, Credit and Banking, Volume 44, Issue 8, Pages: 1563-1587
16. Hondroyiannis, G. and Papapetrou, E. (2001), "Macroeconomic influences on the stock market", Journal of Economics and Finance, 25(1), 33-49.
17. Karunanayake, I., Valadkhani, A. and O'Brien, M. (2012), "Stock market and GDP growth volatility spillovers", Proceedings of the 41st Australian Conference of Economists (pp. 1-23). Melbourne: Victoria University.
18. Kurov A., Sancetta A., Strasser G. and Wolfe M. H. (2015), "Price Drift before U.S. Macroeconomic News: Private Information about Public Announcements?" Boston College Working Papers in Economics, no. 881.
19. Lee B.S. (1992), "Casual Relations among Stock Returns, Interest Rates, Real Activity, and Inflation", Journal of Finance, Vol. 47, No. 4, pp. 1591-1603
20. Lupu R. and Călin A.C. (2014), "A mixed frequency analysis of connections between macroeconomic variables and stock markets in Central and Eastern Europe", Financial Studies, Volume 18, issue 2, pp. 69-79.
21. Maysami, R. C., and Koh, T. S. (2000), "A vector error correction model of the Singapore stock market", International Review of Economics & Finance, 9(1), 79-96
22. Panait, I., and Lupu, I. (2009), "The behavior of the Bucharest Stock Exchange during the current financial markets crisis and proposed measures for its sustainable development", Annals of Spiru Haret University Annals – Economic Series, vol.1, issue 1, pag. 73-80
23. Schwert, W.G., (1981), "The adjustment of stock prices to information about inflations", Journal of Finance 36, pp. 15-29.
24. Smales L.A. and Yang Y. (2015), "The importance of belief dispersion in the response of gold futures to macroeconomic announcements", International Review of Financial Analysis, doi:10.1016/j.irfa.2015.01.017

25. Thomas G, Scotti C., Strasser G. and Vega C. (2015), "Is the Intrinsic Value of Macroeconomic News Announcements Related to their Asset Price Impact?" Finance and Economics Discussion Series 2015-046. Washington: Board of Governors of the Federal Reserve System, http://dx.doi.org/10.17016/FEDS.2015.046
26. Tudor, C. (2011), "Changes in Stock Markets Interdependencies as a Result of the Global Financial Crisis: Empirical Investigation on the CEE Region", Panoeconomicus, 58(4): 525-543.