ECONOMIC DYNAMICS – STOCK MARKET EVOLUTION: A RELATION COMMITTED TO DYSFUNCTIONALITY IN ROMANIA AND CROATIA

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Abstract
In the early 2000s' the stock markets from Central and Eastern European perimeter began to develop quantitatively and qualitatively in an accelerated manner and Romania and Republic of Croatia did not made an exception to this trend and, also, had not been spared by the effects of the economic crisis, but on the contrary. Given that in this area the position of this institution within the economy is far from being ideal and the contradictory results of the previous studies, our analysis investigates the anomalous nexus between stock market development and economic growth in Romania and Republic of Croatia in the period 2000-2014. Using a VEC framework, our findings indicate a weak bidirectional relation between stock market capitalization and GDP in both cases and the main reasons are a high degree of concentration of stock exchange activity and contagion.

Key words: *economic crisis, economic growth, emerging markets, stock market capitalization, VAR model.*

JEL Classification: *O11, O16, G01.*

I. INTRODUCTION

The revival of exchange trading in Romania and Republic of Croatia started in 1995 and 1991, respectively. Here, like in all the other former communist countries, re-establishing stock exchange markets were supposed to have the role of an instrument of governments meant to facilitate, optimize and control economic development strategy. Moreover, in the post-communist perimeter this institution was meant to support the privatization process which was imminent in the transformation into a market system. However, it seems that, until 2000, in Romania and Republic of Croatia the role of this institution in the economic landscape was a pure decorative one. Only starting with 2003, the year that marked the end of the wave of crises and successive manias and panics, these two stock exchanges began to experience an accelerated development that favored strengthening both their national and global importance. But this upward trend was interrupted by the current economic crisis.

Therefore, taking into account the ascending evolution of Bucharest Stock Exchange and Zagreb Stock Exchange and the functions that they should accomplish in order to promote economic growth, we consider that it is important to study the relation nominal-real economy – between stock market and economic growth. In other words, we try to find answers to the question: does stock market succeed to fulfill its role as a strategic tool of promoter of the development of the entire economy in Romania and Croatia?

In addition to the pragmatic utility, this topic is an increasingly interesting challenge for the research in the field, too, and the reason is simple: the disparity of existing theories. Briefly, the economic theory states four important views. The first hypothesis postulates that the financial development promotes the economic one. Authors like Beck and Levine (2004), Cooray (2010) support the idea that the financial sector is a "supplier of advance" in emerging markets. The second hypothesis emphasize that economic development creates demand for financial instruments, and not vice versa. After *The generalization of the General Theory and Other Essays* of Joan Robinson, this opposite point of view has been also validated in Eastern Europe (Kominek, 2004) and MENA region (Naceur, Ghazouani et al, 2008). The third hypothesis emphasizes a bi-directional relation

between emerging stock markets and economic growth (Dawson, 2008; Enisan and Olufisayo, 2009). Not least, the authors Stulz (2000), Luintel, Khan et al (2008) and Singh (2008) demonstrate a neutral relation between emerging stock markets and economic growth. They argue that in these countries the only contribution to economic development could come only from the banking sector and not from capital markets.

In Romania, the findings are contradictory. On one hand, the study of Brasoveanu, Dragota et al (2008) and supports a bi-directional effect between capital market development and economic growth, highlighting that financial development follows economic growth. On the other hand, Moldovan (2015) demonstrates that the capital market is small and does not fulfil yet the function of financing the real economy, at least on the long run. In the case of Croatia, Yıldırım, Ozdemir et al (2013) found a bi-directional between economic performance and financial development, indicating a more prominent causal relation from economic growth to financial development. Thus, the contradictory results in the case of Romania and the lack of research in the field in the case of Croatia support, once more, the relevance of our attempt in studying the nexus stock market – economic growth in these two emerging countries.

The remainder of this paper is structured as follows. Section 2 describes briefly the evolution of Romanian and Croatian stock markets. Section 3 presents the data and the methodology used. Section 4 reports our empirical results. Section 5 concludes.

II. A BRIEF REVIEW OF ROMANIAN AND CROATIAN STOCK MARKETS

On the background of international financial and economic stability, the capital markets from Romania and Croatia began to show signs of growth in terms of quantity and quality in the early 2000s. The delayed but long-awaited regulations on these markets, along with a recovery in the economy have meant getting out from anonymity and joining the global trends.

In the table below we will present a short evolution of several important indicators that characterizes the Bucharest Stock Exchange and Zagreb Stock Exchange after the crisis.

Table 1. The main indicators of Romanian and Croatian stock markets, 2005-2014

Indicators	Romania				Croatia			
	2008	2010	2012	2014	2008	2010	2012	2014
Market capitalization (mil. EUR)	11629,8	23892,2	22063,4	28986,5	19430,0	19065,1	16926,6	16455,8
Mkt. cap./GDP	9,85%	21,33%	18,71%	22,14%	41,36%	43.50%	39,08%	37.61%
No. of companies	67	74	79	86	377	257	226	203
Liquidity ratio	4,8%	3,9%	4,5%	14,2%	11,9%	4,1%	2,3%	2,1%

Source: the official sites of Bucharest Stock Exchange and Zagreb Stock Exchange; Thomson Reutres Datastream.

Firstly, we want to emphasize that in Central and Eastern European countries the impact of the global crisis was more dramatic than in the rest of the continent. The declining trend of the stock markets in this period was driven by a considerable decrease in the share prices and a massive redemption by national and foreign investors. Furthermore, the situation of sovereign debt and banking sector problems in the euro area have led to the perpetuation of uncertainty among investors and, thus, a modest recovery in European stock markets.

The figures from Table 1 show that the importance of exchange trading activity is higher in Croatia. Here, both the market capitalization of the listed companies as a percentage of GDP and the numbers of listed companies are greater than in Romania.

Even though the role of these two stock markets in the economy is encouraging, the fact that the share in the total market capitalization of first ten companies is between 65% in Croatia and 85% in Romania is not satisfactory. Moreover, in the case of Croatia, 55% of stock market performance is held by 5 companies, namely: a) INA-industrija nafte d.d. is the leading Croatian public listed company which holds a share of 30% in the total market capitalization (with its domain of activity in the sector manufacture of coke, and refined petroleum products), b) Hrvatski Telekom d.d. is a telecommunications company which holds 10% of the total market capitalization, and c) two Croatian banks hold a share of 15%.

As related to Romania, the situation is not far away from the Croatian one, meaning: a) 30% of the market capitalization is held by Petrom from the category oil & gas producers, and b) three banks and six companies from the financial service sector (Financial Investment Companies and Fondul Proprietatea) held 55% of the total market capitalization. In addition, in Romania there is an important particularity that needs to be brought into attention. In the analyzed period, a percentage between 28-55% in the total market capitalization is held by Erste Group Bank AG. Why is this important? Because a significant part of the Romanian stock market performance is dictated by the evolution of a single company, an Austrian one! Therefore, the local companies' capitalization as a percentage in GDP is much smaller, ranging from the level of just 8.5% in 2009 to 15.8% in

2014. And if we add to this low weight the low number of listed companies, the result is not ideal at all: the stock exchange in Romania is not yet an effective, viable tool for financing the entire economy.

A high concentration of the market can have negative influences on liquidity, transaction costs and the risk of developing severe disruptions and crisis, and finally, an unfortunately denouement: higher volatility, weaker financial stability, with repercussions on the general economic framework (Chelley-Steeley, 2008).

In terms of liquidity, measured as a ratio of traded value and capitalization, this indicator was severely affected after the crisis in both analyzed countries. Liquidity in both equity markets remains thin and responsible for this are the lack of stabile and high daily turnover and the presence of numerous illiquid stocks (Benić and Franić, 2008). This indicator is of particularly importance because a higher level of illiquidity, like in Croatian and Romanian cases, leads to a higher risk on investment. In other words, the presence of illiquidity represents an obstacle to further stock market development, while a high rate of liquidity means low trading costs and high degree of maturity and sophistication of the market (Agnoli and Vilan, 2006).

To sum, Romania and Croatia accede to the construction of viable and efficient stock markets, but it is still a long way to achieve this goal. Zagreb Stock Exchange and Bucharest Stock Exchange cannot really compete with the advanced exchanges markets from Western Europe. Once again, the question is: does these two stock markets promote the development of the real economy?

III. DATA AND METHODOLOGY

In order to depict movements and interdependencies between economic growth and the evolution of stock market, we perform our empirical research in a VAR framework in the cases of Romania and Republic of Croatia. Therefore, a two dimensional VAR model is used with: log of real GDP (log_GDP) and log of stock market capitalization (log_mkt).

Quarterly time series data ranging from 2000Q01 to 2014Q4 have been used. GDP is obtained from Datastream Thomson Reuters, and the stock market capitalization is from the official sites of Bucharest Stock Exchange and Zagreb Stock Exchange.

The economic crisis could represent a structural break in the data, but a time series data ranging from the end of 2008 to 2014 would simply not be enough to perform a structural analysis, because the error bands would be very large and results non-informative.

In what follows we will briefly present the methodology used for testing our hypothesis, namely: the higher impact is from economic growth to stock market, while the converse is not sustainable.

First, we tested the stationarity of logarithmic series of two variables in order to determine the order of their integration. To achieve this we used Dickey-Fuller GLS and Ng-Perron tests as they show a greater statistical power than usual stationary tests, at least for a small number of observations, as in our case (Elliot, Rothenberg et al, 1996).

In line with Lutkepohl (2004) we employed the steps as follows:

Let Y_t be a VAR model of order *p* with the following form:

$$Y_t = \nu + A_1 Y_{t-1} + \cdots + A_p Y_{t-p} + u_t \qquad (1)$$

where Y_t is a (K x 1) vector of endogenous variables, ν is a (K x 1) vectors of intercepts, A_i are the (K x K) fixed VAR coefficient matrices and $u_t=(u_{1t},...,u_{kt})'$ is an unobservable error term, with the usual properties:

$$E[u_t] = 0$$
$$E[u_t u_t'] = \sum u$$
$$E[u_t u_s] = 0, \forall t \neq s.$$

K is the number of time series variables and it is equal to two, therefore, the vector of endogenous variables recursively arranged is represented as follows:

$$Y_t = \begin{bmatrix} \ln\_GDP \\ \ln\_BET \end{bmatrix} \qquad (2)$$

Further, we investigate the presence of equilibrium relations between the two variables by using the Johansen trace test. If the test rejects the rank 0, then the two variables are cointegrated. In this case, Vector Error Correction Model (VECM) with the following standard representation is used:

$$\Delta Y_t = \alpha\beta' Y_{t-1} + \Gamma_1 \Delta Y_{t-1} + \cdots + \Gamma_{p-1} \Delta Y_{t-p-1} + CD_t + u_t \qquad (3)$$

We have estimated several models with different numbers of lags (as suggested by LR, AIC, SC, HQ informational criteria) and we have selected the model which fulfils most of the checking criteria. And, in order to check if the fitted VECM provides a good representation of the time series set, we have disentangled the followings: (1) descriptive analysis of residuals; (2) diagnostic tests of the residuals, i.e. Portmanteau test for serial autocorrelation, Breusch-Godfrey LM test for autocorrelation, ARCH-LM test, Jarque-Bera test for non-normality; (3) stability analysis, i.e. recursive Analysis- a simple descriptive tool for assessing parameter stability and recursive eigenvalues.

The VEC analysis is finalized, in our case, with the error variance decomposition. We assume that the innovations are orthogonal and consider the VEC form with the following specifications:

$$\Delta Y_t = \alpha\beta'^{*}Y_{t-1} + \Gamma_1^{*}\Delta Y_{t-1} + \cdots + \Gamma_{p-1}^{*}\Delta Y_{t-p-1} + C^{*}D_t^{*} + u_t \qquad (4)$$

In what follows we will report only the fitted model. The results of all the tests that we employed are not provide here, but are available by the authors upon the request.

IV. EMPIRICAL RESULTS

Firstly, and briefly, we specify that the unit root analysis, according to Dickey-Fuller GLS and Ng-Perron tests, indicates that the unit root hypothesis cannot be rejected in the case of the two considered time series and that they can be characterized as integrated of order 1, I(1). For Romania one lag seem enough to capture the dynamics of the systems, while for Croatia two are needed. Johansen trace test points out a cointegration relationship in both analyzed countries, therefore we estimate the VEC model.

Table 2 displays the variance decomposition of the two logarithmic series in the case of Romania for the entire period that ranges from the first quarter of 2000 to the last quarter of 2014.

Table 2. Error variance decomposition – Romania (Q12000-Q42014)

Variable	Horizon	Own innovation	Other variable innovation
Log_GDP	1	100.0000	0.000000
	2	98.12161	1.878388
	3	98.02486	1.975144
	4	98.39902	1.600985
	5	98.83813	1.161874
Log_MKT	1	97.35770	2.642296
	2	94.82252	5.177476
	3	95.95734	4.042660
	4	96.39315	3.606846
	5	96.59972	3.400276

Source: own calculations using Eviews

First, table 2 shows that the dynamics of the two variables is explained mainly by their own innovations. Secondly, the magnitude of the other variable influence is not high. Which are the reasons for these results?

On the one hand, the fact that the influence local stock market is not the most important in determining the economic development was expected. In defending this assumption, the figures from Table 1 already indicated the relatively small importance of stock market in the economy measured as market capitalization to GDP, in the case of Romania. In this case, the literature in the field argues that, given that the national financial system is predominantly a banking one, is more likely the long-term benefits to be achieved through this (Singh, 2008).

Furthermore, it is difficult to establish the interdependence between the two indicators in Romania (National Commission for Prognosis, 2006) and the reasons are multiple. Firstly, the differences come from the structure of GDP by industry and the structure of stock market capitalization by sector. In Romania, the GDP in the analyzed period was mainly due to: industry (23-26%), trade (20-23%), agriculture (6-13%), construction (3-10%) and other service activities (25-29%) – in which is included the very small contribution of financial and banking services (2-3%), while over 80% of market capitalization was represented by the following sectors: banking and finance and mining and quarrying. Therefore, these numbers highlight that the contribution of the listed companies on Bucharest Stock Exchange in GDP formation is relatively small. Secondly, the small number of companies listed on the national stock exchange (see Table 1) can only emphasize the weak representativeness for the economy. Once again the concentration stock exchange activity in the oil and banking and financial sectors, the small number of issuers and the lack of ones from key areas can explain the limited impact of exchange activities in GDP. Thirdly, on average, only 1.7% (2010-2011) and 0.6% (2013-2014) of the general expense of a family in Romania is oriented towards investment for purchasing or construction of

housing, buying land, purchasing shares etc., highlighting the very small percentage of the active population on national stock market. In conclusion, the stock market in Romania is not yet a viable tool for funding-savings among companies and population.

On the other hand, what surprised us was the weak impact of economic growth on Bucharest Stock Exchange. This result could be explained by the fact that the analyzed time frame covers the period corresponding to the Romanian market internationalization, the increasing of foreign investors' number, contagion caused by the global economic crisis, and decoupling from the national economic growth trend (2008-2011). In this regard, authors like Syllignakis and Kouretas (2010) and Pirovano (2012) argue that in times of crisis the external shocks have the biggest impact on emerging stock markets.

Table 3 presents the results of the variance decomposition of the two analyzed variables in the case of Croatia for the interval between 2000Q1 to 2014Q4.

Table 3. Error variance decomposition – Croatia (Q12000-Q42014)

Variable	Horizon	Own innovation	Other variable innovation
Log_GDP	1	100.0000	0.000000
	2	97.45729	2.542706
	3	95.08076	4.919235
	4	93.14426	6.855743
	5	92.52062	7.479380
Log_MKT	1	96.45134	3.548659
	2	95.80499	4.195006
	3	96.84613	3.153866
	4	97.38055	2.619454
	5	97.81553	2.184469

Source: own calculations using Eviews

First, the table above shows that the two variables are explained in the highest proportion by their own innovations. Regarding the relation between the analysed time series, this is a bivariate one, mentioning that stock market shocks have a bigger impact on economic growth in Croatia.

On the one hand, the Croatian stock market capitalization has a relatively small influence on economic development, but higher than in the case of Romania. The main reasons is that on Zagreb Stock Exchange the number of listed companies is about 200, as compared to 83 in Romania. However, this number decreased sharply from 377 companies in 2008 to 200 companies in 2014 and the stock market concentration is even bigger than in Romania. In this particular case, the advantage of a large number of issuers is shadowed by the fact that only one company, one from the sector manufacture of coke, and refined petroleum products has a share of 30% of the total market capitalisation. Moreover, the low level of liquidity (Table 1) in conjunction with its related lower traded value is a weak feature of the stock exchange in Croatia (Benić and Franić, 2009). Another distinction between Romanian and Croatian stock market is that even though the largest impact of the economic crisis was felt in Romania, in 2009 this decreasing trend ended. But, in the case of Croatia, the stock market have not managed to reach the performances registered before the collapse.

On the other hand, the economic growth has a very little influence on Croatian economy. The main reason is that, in contrast with Romania, Croatia is still mired in recession and struggling with the rebalancing of its economy after six years from the bust of the financial bubble. In addition, the external influences cannot be minimized, especially in times of crisis. In this regard, the studies in the field demonstrate an contagion and irrational escalation between world developed and Croatian stock markets (Sajter and Ćorić, 2009; Horvath and Petrovski, 2013).

V. CONCLUSION

In this paper we demonstrated that in the case of Romania and Republic of Croatia, a positive shock in the stock market has a small impact on the economic growth and vice-versa. These results are not only repercussions of the global crisis that is synonymous with contagion, investors' risk aversion and herd behavior, but are also due to some particularities of these two stock markets like a higher degree of concentration of the first five companies and a very low level of liquidity ratio.

On the one hand, our results are in line with those of Mazur and Alexander (2001), Singh (2008) and Moldovan (2015) who emphasize that an emerging/frontier stock market cannot have a big influence on the economic development. On the other hand, it seems like the real economy has also little to say in the process of stock market development. We may argue that, broadly, for this result is responsible only the big degringolade, because prior to the crisis, the studies of Brasoveanu, Dragota et al (2008) and Diaconasu (2015) shows that the nexus is as in text books: economic growth leads the development of domestic stock market.

These results have many implications for the current policymakers and for researchers in the field. Given

the fact that the establishment of stock exchange was and still remains an instrument of governments meant to facilitate, optimize and control economic development strategy, it is not allowed for a responsible decision maker to neglect positioning arising from analyses of this kind.

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VII. REFERENCES

1. Agnoli, M.Q., Vilan, D (2006) *Financing trends in Latin America*, BIS Papers, no. 36, pp. 15-27.
2. Beck, T., Levine, R. (2004) *Stock Markets, Banks and Growth: Panel Evidence*, Journal of Banking and Finance, 28(3), pp. 423-42.
3. Benić, V., Franić, I. (2008) *Stock Market Liquidity: Comparative Analysis of Croatian and Regional Markets*, Financial Theory and Practice, 32(4), pp. 477-498.
4. Brasoveanu, L. O., Dragota, V., Catarama, D., Semenescu, A. (2008) *Correlations between Capital Market Development and Economic Growth: The Case of Romania*, Journal of Applied Quantitative Methods, 3(1), pp. 64-75.
5. Chelley-Steeley, P. (2008) *Concentration of the UK Stock Market*, Journal of Business Finance & Accounting, no. 35, pp. 541-562.
6. National Commission for Prognosis (2006) *Capital market. Achievements and Perspectives / Piaţa de capital. Realizări şi perspective*, http://www.cnp.ro/user/repository/453c7fe36dce1c752b51.pdf, accessed September 25th, 2015.
7. Cooray, A. (2010) *Do stock markets lead to economic growth?*, Journal of Policy Modeling, 32(4), pp. 448-460.
8. Dawson, P. J. (2008) *Financial development and economic growth in developing countries*, Progress in Development Studies, 8(4), pp. 325-31.
9. Diaconasu, D. E. (2015) Stock market – economy growth nexus in an emerging country. The case of Romania, Theoretical and Applied Economics, no. 2(603), pp. 103-112.
10. Elliott, G., Rothenberg, T., Stock, J. (1996) *Efficient Tests For An Autoregressive Unit Root*, Econometrica, 64(4), pp. 813-836.
11. Enisan, A., Olufisayo, A. (2009). *Stock market development and economic growth: Evidence from seven sub-Sahara African countries*, Journal of Economics and Business, 61(2), pp. 162-171.
12. Horvath, R., Petrovski, D. (2013) *International stock market integration: Central and South Eastern Europe compared*, Economic Systems, 37(1), pp. 81–91.
13. Kominek, Z. (2004) *Stock markets and industry growth: an eastern European perspective*, Applied Economics, 36(10), pp. 1025-1030.
14. Luintel, K., Khan, M., Arestis, P., Konstantinos, T. (2008) *Financial structure and economic growth*, Journal of Development Economics, 86(1), pp. 181-200.
15. Lutkepohl, H. (2004) *Applied Time Series Econometrics*, Cambridge University Press, Cambridge.
16. Mazur, E.M., Alexander, R. (2001) *Financial Sector Development and Economic Growth in New Zealand*, Applied Economics Letter, vol. 8, pp. 545-549.
17. Moldovan, A. I. (2015) *Financial Market's Contribution to Economic Growth in Romania*, Management Dynamics in the Knowledge Economy, 3(3), pp. 447-462.
18. Naceur, B.B., Ghazouani, S., Omran, M. (2008) *Does stock market liberalization spur financial and economic development in the MENA region?*, Journal of Comparative Economics, no. 36, pp. 673-693.
19. Pirovano, M. (2012) *Monetary policy and stock prices in small open economies: Empirical evidence for the new EU member states*, Economic Systems, vol. 36, pp. 372–390.
20. Sajter, D., Ćorić, T. (2009) *(I)rationality of Investors on Croatian Stock Market: Explaining the Impact of American Indices on Croatian Stock Market*, Zagreb International Review of Economics and Business, 12(2), pp. 57-72.
21. Syllignakis, M.N., Kouretas, G.P. (2010) *Dynamic Correlation Analysis of Financial Contagion: Evidence from the Central and Eastern European Markets*, International Review of Economic and Finance, no. 20, pp. 717-732.
22. Singh, A. (2008) *Stock Markets in Low and Middle Income Countries*. Centre for Business Research, University of Cambridge, Working Papers, no. 377, pp. 1-30.
23. Stulz, R. M. (2000) *Financial structure, corporate finance, and economic growth*, International Review of Finance, 1(1), pp. 11-38.
24. Yıldırım, S., Ozdemir, B. K., Dogan, B. (2013) *Financial Development and Economic Growth Nexus in Emerging European Economies: New Evidence from Asymmetric Causality*, International Journal of Economics and Financial Issues, 3(3), pp. 710-722.
25. *** Bucharest Stock Exchange, http://www.bvb.ro/TradingAndStatistics/Statistics/GeneralStatistics, accessed September 10th, 2015.
26. *** Zagreb Stock Exchange, http://zse.hr/default.aspx?id=44326, accessed September 10th, 2015.