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THE CONNECTION BETWEEN ECONOMIC GROWTH AND STOCK MARKETS

Empirical studies

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Abstract

This paper examines the connection between economic growth and stock market performance in the case of an emerging economy, namely Romania, by using quarterly financial data, during the period 2000-2013. This topic is widely studied in the financial literature and seeks to provide an answer for the following questions: does economic growth influences the capital market, does capital market influences economic growth, or there is no connection between these variables. I have analyzed the long term relationship between economic growth and stock market for Romania, by applying Johansen cointegration test, Granger causality and Gregory Hansen cointegration test, which allows the presence of the structural breaks in the time series. The empirical results obtained highlighted that portfolio investments have a positive impact on economic growth and the GDP growth engages in turn, a long term positive capital markets return. The main conclusion of this study is that in the case of Romanian economy, is a bi-directional link between the economic growth and the capital market performance.

Introduction

The transition period of the Central and Eastern Europe emerging economies towards a market economy was characterized by a low level of industrial production, high unemployment and inflation rates and low level of national capital. Compared with developed economies, the main catalyst of a sustainable growth was represented by the level of foreign investments. The development of stock markets and the augmentation of the investors' confidence were the premises for the enhancement of capital inflows in these emerging markets, which has been materialized in higher levels of foreign direct investments and portfolio investments. This growth of investments highlights the importance of financial intermediaries in ensuring economic growth, through the major role of efficiently lead the capital surplus to those activities that require funds for their investments.

The placing of the capital is influenced by the asymmetric information held by investors, which may have different views regarding the risk-performance correlation, thus favoring the appearance of adverse selection and moral hazard. Viewed in terms of maturity, foreign direct investments and portfolio investments have different characteristics, so on one hand, foreign direct investments are stable and reflect long term investments and on the other hand, portfolio investments are considered to be short term and speculative investments, market participants seeking opportunities to obtain gains in a short period of time. On a larger time horizon, the increase of foreign direct investments provide a stable environment for investors, having a positive impact on economic growth. For a short term period, the capital markets transmit signals regarding the domestic financial conditions to foreign investors, thereby influencing the capital flows movements. I mention the authors' opinion (Arcabic, Globan, Kristic, 2013), whereby in the case of negative expectations of investors, the portfolio investments will constitute the first massive capital outflows, being able to generate contagion between capital markets. Furthermore, the authors indicate the existence of a causality in both direction between capital flows and stock markets evolution, but is different, depending of the time horizon considered, so for a long term period, the foreign direct investments influence the economic growth through the level of technological progress and the evolution of capital markets and for a short term period, stock markets development, the existence of a stable economic environment and their ability to attract investors may impact the stock of foreign direct investments. Moreover, (Arestis et al., 2001) pointed out the positive effects of capital markets on economic growth, because encourages specialization and reduce the mobilization cost of savings, thereby facilitating investments, the developed stock markets could increase corporate control by reducing deficiences encountered by market participants. The investors trade on stock markets and change their portfolios' structure, so that through them, the traded financial assets are less risky. Another advantage of the capital markets is the facile acces to capital through the issue of shares and the improvement of capital allocation, having a positive impact on economic growth. Another conclusion is that the capital allocation is influenced by the stock markets volatility. I consider relevant the opinion of (Shiller, 1981, 1989), who highlights that the excessive volatility reflects the deviations of market value from the fundamental value of a financial asset. The excessive volatility generates pressure on the evolution of interest rates, increases uncertainty and reduces the volume and the profitability of investments, having a negative impact on economic growth.

Moreover, according to (Eller et al. 2006) the foreign direct investments can influence the economic growth by three directions: inflows of foreign capital which influences the domestic capital stock, the human capital development at natioanl level and boosting economic growth through its positive effect on global efficiency.

In the financial literature are presented divergent views regarding the influence of capital markets on economic growth: capital markets influence economic growth, economic growth affects capital markets and there is no connection between them.

In order to achieve an overview of economic development, (Schumpeter 1912, 1939) has indicated that financial intermediation provides suitable conditions for economic growth. Moreover, the author has realized the distinction between the two concepts: economic growth and economic development. From Schumpeter point of view, on one hand, economic growth emphasizes the slowly, progressive and cumulative shift of the economic system, resulting from the actions of exogenous factors and on the other hand, the economic development which is influenced by the discontinuous internal changes, generated by economic innovations coming from the economic system.

Another vision was presented by (Robinson, 1952), who highlighted that financial development do not has a major role in providing economic growth, because through economic growth is ensured the development of the financial sector. Moreover, the assumption that economic growth causes the development of capital markets, as a result of the increase in the demand, was supported by (Robinson, 1952) and (Friedman, Schwartz, 1963).

Another study was realized (Pagano, 1993) who has identified two channels through which the

financial intermediation can influence the economic growth: firstly, through the transformation process of savings into investments and secondly, through resource allocation for those units, which record a higher rate of productivity.

Also (Greenwood, Johanovici, 1990) and (Saint-Paul, 1992) have estimated models in order to highlight the connection between economic growth and financial development, so their assumptions used in both models imply the existence of fixed costs or a level of costs less than proportionally to the volume of traded funds, as the economy grows, individual incentive to trade in capital markets increases and benefits achieved increase with the extent of the investments, while the costs rise less, or not at all. (Roubini and Martin, 1992) have extended the analysis of the connection between economic growth and financial development by emphasizing the role of state intervention and the desire to increase the level of tax revenues, so the state can influence the financial intermediation by increasing the money demand and thus raising the revenues from seigniorage (Pagano,1993).

Regarding the capital markets from Central and Eastern Europe, the financial literature makes reference both at individual and group level, through the cross country analysis. Most of the emprical studies were performed for the major capital markets from CEE, namely, Poland, Czech Republic and Hungary. In this context, it becomes necessary to complete the previous researches and analyze the behavior of small capital markets. Therefore, I consider that the Romanian market represents a „fertile ground" for the investigation of the long term connection between economic growth and stock market development.

Literature review

The connection between economic growth, foreign direct investments and stock markets performance is a debated topic in the financial literature. There is homogeneity between the results obtained in the empirical studies, both for individual and for group level of financial markets and on the direction of the link: economic growth influences the capital market, capital market influences economic growth, or there is no connection between these variables. Firstly, I will provide a brief overview of the main contributions made over time on this area of interest by making references to individual stock markets in Central and Eastern Europe. (Arcabic, Globan, Kristic, 2013) have examined the capital market from Croatia, during the period between 2001-2011 by using Engle Granger and Johansen cointegration test. The results obtained do not support a long term relation between FDI and stock market, but on a short term period, there is a causality relation between stock market and FDI stock. Furthermore,

(Yu Hsing, 2011) has investigate the Czech Republic economy during 2002-2010 and has concluded that stock market and GDP evolutions are positive correlated. Another study was performed by (Samitas, Kenourgios, 2007) for Poland during the period 1994-2003, and their findings pointed out that loans and the level of fixed capital are the major factors of economic growth. Similar results were obtained by (Bojan, Corovei, Trenca, 2014), who concluded that level of retail payments has an important impact on economic growth and by (Arestis, 2001) who highlighted that the capital markets contribute to long-term economic growth, but in a lesser extent than bank loans. Moreover, by realizing a group analysis for Czech Republic, Hungary and Poland, (Caporale, Spagnolo, 2011) have concluded that there is an unidirectional relationship from capital markets towards economic growth.

Data and methodology

The data used in this study contains quaterly prices of the BET Index and quaterly values of gross domestic product of Romania, during the period 2000Q1-2013Q4. The analysis was performed by using logarithmic values. Data sources were Eurostat and Bucharest Stock Exchange.

In order to capture a possible connection between the economic growth and the evolution of stock market, I have applied two cointegration test: Johansen and Gregory Hansen. In order to establish the appropriate number of lags, I have used a VAR model by taking into consideration the characteristics of the time series. Firstly, I have examined the time series stationarity and then I have applied Johansen cointegration test for identification of the number of cointegrating vectors between the analyzed variables.

Furthermore, in order to test the existence of a causality relation between economic growth and financial development, I have used the Granger causality test to highlight if the lagged values of economic growth can be used as predictors of the Romanian stock market evolution. The Granger causality (1968) can be estimated based on the below equations:

$$X_t = \sum_{j=1}^{m} a_j X_{t-1} + \sum_{j=1}^{m} b_j Y_{t-1} + \vee_t (1)$$

$$Y_t = \sum_{j=1}^{m} c_j X_{t-1} + \sum_{j=1}^{m} d_j Y_{t-1} + y_t (2)$$

where, $_t$ and $_t$ represent two uncorrelated residual series, having the following common characteristics: $E[E,E,]= 0 =E[y,y,],s \# t,$ and $E[E,E,]= 0$ for all t , s.

Moreover, in order to test the existence of cointegration relation between economic growth

and stock market evolution, by taking into consideration the presence of structural breaks, I have used Gregory-Hansen test.

Gregory and Hansen (1996) have estimated a new cointegration test, by taking into consideration the existence of structural breaks in time series. The null hypothesis points out that the time series are not cointegrated, with the alternative that there is a cointegration relation between time series with a single structural break. There are three models for structural breaks: the first model allows the existence of one structural break in the intercept (model C), the second model allows the existence of one structural break in the în shift (model C/T) and the third model allows the existence of a structural break in the intercept or shift (regime shift-model C/S). The equations of the three models are presented below:

Model C: $y_t = \mu_0 + \mu_1 \varphi_1 + \alpha x_t + \omega_t$ (3)

Model C/T: $y_t = \mu_0 + \mu_1 \varphi_1 + \beta_t + \alpha x_t + \omega_t$ (4)

Model C/S: $y_t = \mu_0 + \mu_1 \varphi_1 + \alpha x_t + \alpha_2 \varphi_t x_t + \omega_t$ (5)

Each model has a dummy variable φ_t, which allows the existence of a one structural break and takes the following values:

$$\varphi_t = \begin{cases} 1, if \rightarrow t > \tau \\ 0, t \leq \tau \end{cases}$$

where, $\tau \in (0,1)$, and τ represents the point of structural break in the time series. Furthermore, for the residual series, it will be applied a unit root test. The ADF test will be used. The value of ADF test statistic is compared with the corresponding critical value. If ADF statistic is smaller than the critical value, the null hypothesis is rejected, which shows that the residuals are stationary and supports the existence of a cointegration relationship with a structural break.

Empirical results

In order to test whether the economic growth and the capital market from Romania are cointegrated, I have used Johansen cointegration test. In this line, I begin by testing the variables stationarity using ADF and Philips Perron tests. The results obtained indicate that the analyzed time series are integrated of first order I (1). Moreover, in order to analyze if there is a long-term relationship between Romania's economic growth and the capital market performance, I employ a VAR model. The optimal number of lags is determined by the AIC and SIC criteria. Using the SIC criteria, I selected a VAR with one lag. Forwards, I applied the Johansen test, by using the optimum lag established after the VAR model running.

Johansen test is used to observe the presence of the cointegrated vectors. The null hypothesis of Johansen test is that the economic growth is not cointegrated with the capital market, with the

alternative that there is one or more cointegrated vectors. The results from Table 1, highlight that the null hypothesis is rejected and there is a cointegration relationship between the economic growth and the capital market performance in Romania, indicating a high probability of the existence of a long-term relationship between economic growth and capital market performance, and if there are short term imbalances, they will be followed by a return to the equilibrium level.

According to the method proposed by Granger (1969) X is a cause for Y, or X explains the evolution of Y if X helps to forecast the evolution of Y. The method involves analyzing the current level of Y and how much it can be explained by its historical values and then investigates whether the insertion of some lagged values of another variable X can explain the evolution of Y. The results of Granger method can be seen in Table 2. The coefficients are statistically significant, indicating that the economic growth has a major impact on the capital market performance in Romania. The results support the rejection of the null hypothesis according to which the GDP growth does not influence the capital market performance, showing the existence of a bi-directional link between the two variables.

Structural changes may occur in the long-term relationship between economic growth and capital market performance. In order to improve the performance of statistical tests used to analyze the cointegration relationship between variables, it must take into account the existence of structural breaks. Further, in order to consider the existence of structural breaks in establishing the cointegration relationship, I apply the Gregory Hansen test. The null hypothesis of Gregory-Hansen test is the absence of cointegration with structural breaks and the alternative hypothesis refers to the presence in the time series of cointegration with structural breaks. Table 3 presents the results of this test. The findings indicate the existence of cointegration with structural breaks between economic growth and capital market performance in Romania, by using the all three models C, C/T and C/S (with level shift in constant, level shift with trend, regime shift). Gregory-Hansen test results are therefore similar to those obtained by employing the Johansen test, both supporting the existence of a cointegration relationship between economic growth and capital market performance in Romania.

Conclusions

This paper examines the relationship between the economic growth and the capital market performance in an emerging economy, such as Romania. In this line, I used the following statistical methods: Johansen test, Granger

causality test and Gregory Hansen test, applied during the period 2000Q1-2013Q4. For capturing the capital market performance, I used as a variable the logarithmic value of stock prices and for the economic growth I used the logarithmic value of gross domestic product, expressed in million Euro. The statistical tests results support the existence of a bi-directional link between the economic growth and the capital market performance, so that portfolio investments have a positive impact on economic growth and the GDP growth engages in turn, a long term positive capital markets return. Future research directions could consider extending the sample of the analyzed countries and the investigation of the impact of foreign direct investment and bank loans on economic growth.

Aknowledgement

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Tables
Table No. 1
The results of Johansen cointegration test

GDP and capital market perfromance	λ_{trace} test	Critical values 5%	λ_{max}	Critical values 5%
r=0	20,52	15,49	13,78	14,26
r ≤ 1	6,73 ***	3,84	6,73	3,84

Note: Author's processing using Eviews 7

Table No. 2
The causality relationship between economic growth and capital market performance

Granger test hypothesis	F statistic	Probability
GDP does not cause stock market evolution	3,976	0,025**
Stock marlet does not cause GDP evolution	9,711	0,0003***

Note: Author's processing using Eviews 7

Table No. 3
The results of cointegration Gregory Hansen test

Test Assumption	Structural break point	GH test statistic	5% Critical value	H0: no cointegration	ag
Level Shift (Constant)	2007Q1	-23,388	-3,694	reject	1
Level Shift with trend model (Trend)	2006Q2	-19,401	-3,331	reject	1
Regime shift model (Fullbreak)	2006Q2	-23,928	-3,657	reject	1

Note: Author's processing using Eviews 7**,** The critical values of Gregory –Hansen tests are consistent with Gregory and Hansen (1996)