CAPITAL MARKET DEVELOPMENT AND ECONOMIC GROWTH: THE CASE OF ROMANIA

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ABSTRACT: *Capital markets play an important role in the economic development of emerging capital markets. Well functioning markets insure that both corporations and investors get or receive fair prices for their securities. In the literature on endogenous growth, the link between capital markets development and economic growth has received much attention. This paper examines the correlation between capital market development and economic growth in Romania using a regression function. The results show that the capital market development is positively correlated with economic growth, with feed-back effect, but the strongest link is from economic growth to capital market, suggesting that financial development follows economic growth, economic growth determining financial institutions to change and develop.*

KEY WORDS: *capital market; economic growth; BET Index; quarterly PIB; time series; correlation*

JEL CLASSIFICATION: *O40, O16, D53, E44*

1. LITERATURE REVIEW

In the recent financial literature on endogenous growth, the relationship between capital markets development and economic growth has received much attention (see King and Levine, 1993; Levine, 1997; Rajan and Zingales, 1998; Filler, Hanousek, and Campos, 1999; Arestis, Demetriades, and Luintel, 2001; Calderon and Liu, 2002, Carlin and Mayer, 2003). In this context, King and Levine (1993) state that the level of financial intermediation is a good predictor for economic growth rate, capital accumulation and productivity. In the same context, Carlin and Mayer (2003) concluded that there is a strong relationship between the structure of countries' financial system and economic growth.

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Garretsen, Lensink and Sterken (2004) found out a causal relationship between economic growth and financial markets development: a 1% improvement of economic growth determines a 0.4% rise of market capitalization/GDP ratio. Yet, according to their results, market capitalization/GDP ratio does not represent a significant determinant of the economic growth.

Beck, Lundberg and Majnoni (2006), also, found a positive correlation between capital market development (measured by a dummy variable computed to reflect if the market capitalization exceeds 13,5% of GDP) and economic growth. Bose (2005) offers a theoretical financial model that explains the positive correlation between stock market development and economic growth; the model is based on the hypothesis that for levels of GDP per capita higher than a certain threshold the information costs become lower than bankruptcy costs, determining the development of capital markets.

Beckaert, Harvey and Lundblad (2005) analyzed financial liberalization as a special case of capital market development and determined that equity market liberalizations, on average, led to a 1% increase in annual real economic growth. Studying the link between domestic stock market development and internationalization, Claessens, Klingebiel and Schmukler (2006) using a panel data technique concluded that domestic stock market development as well as stock market internationalization are positively influenced by the log of GDP per capita, the stock market liberalization, the capital account liberalization and the country growth opportunities and negatively influenced by the government deficit/GDP ratio.

Minier (2003) analyzed the influence of the stock market dimension on economic development by regression tree techniques; he found evidence that the positive influence of stock market development on economic growth held only for developed stock markets in terms of turnover, in the case of underdeveloped stock markets the influence is negative. Ergungor (2006) analyzed the impact of financial structure on the economic growth on the period 1980-1995; he concluded that in countries with inflexible judicial systems the stronger impact on economic growth is generated by the development of the bank-system, whereas in countries with greater flexibility of judicial systems the development of the capital market had a stronger influence.

Studies on the relation between capital market development and economic growth in different countries were performed. Nieuwerburgh, Buelens and Cuyvers (2006) analysed the long-run relationship between stock market development (measured by market capitalization and number of listed shares) and economic growth (measured as a logarithmic difference of GDP per capita) in Belgium. They performed Granger causality tests and emphasized that stock market development determined economic growth in Belgium especially in the period 1873-1935, but also on the entire analyzed period (1800-2000) with variations in time due to institutional changes affecting the stock exchange.

Hondroyiannis, Lolos and Papapetrou (2005) studied the case of Greece (1986-1999); they found out that the relationship between economic growth and capital market development is bi-directional. Studying the effect of different components of financial systems on economic growth in Taiwan, Korea and Japan, Liu and Hsu

(2006) emphasized the positive effect of stock market development (measured by market capitalization as percentage of GDP, turnover as percentage in GDP and stock return) on economic growth. Bolbol, Fatheldin, and Omran (2005) analyzed the effect of financial markets (measured by the ratio of market capitalization on GDP and the turnover ratio) on total factor productivity and growth (the per capita GDP growth rate) in Egypt (1974-2002); they demonstrated that capital market development had a positive influence on factor productivity and growth.

Ben Naceur and Ghazouani (2007), studying the influence of stock markets and bank system development on economic growth on a sample of 11 Arab countries, concluded that financial development could negatively influence the economic growth in countries with underdeveloped financial systems; they stressed the role of building a sound financial system.

The literature focuses on the financial system's components, the banking sector or the capital market, that influence economic growth.

Graff (1999) stated that there are four possibilities concerning the causal relationship between financial development and economic growth:

(1) financial development and economic growth are not causally related. An example of this type of relation could be found in the development of modern economy, in Europe, in the 17th Century. In this case, the economic growth was the result of real factors, while the financial development was the result of financial institutions development;

(2) financial development follows economic growth. In this context, economic growth causes financial institutions to change and to develop, so as both the financial and credit market grow;

(3) financial development is a cause of economic growth. In this case, there could be identified two possibilities, respectively: (a) financial development is a precondition for economic growth; (b) financial development actively encourages economic growth (see, e.g. Thornton, 1995). Provided that there are no real impediments to economic growth, mature financial systems can cause high and sustained rates of economic growth (see, Rousseau and Sylla, 2001);

(4) financial development is an impediment to economic growth. Similar to the previous possibility, causality runs from financial development to real development, but the focus lies on potentially destabilizing effects of financial overtrading and crises (see, e.g. Stiglitz, 2002) rather than on the efficient functioning of the financial system. This view considers the financial system as inherently unstable.

There are several empirical studies that analyse the correlation between the economic growth and the financial development. Calderon and Liu (2002), studying the direction of this causality, conclude that, as a general trend, the financial development generates economic growth, the causal relation being stronger in the emergent countries and being explained by two channels: the fast capital accumulation and the growth of productivity. Rajan and Zingales (1998) emphasize that the financial development is a prediction element for the economic growth, because the capital market reflects the present value of the future growth opportunities. The ex-ante development of the financial markets facilitates the ex-post economic growth of the external financing dependent sectors.

Levine (1997) and Levine and Zevros (1998) consider that the capital market's liquidity is a good predictor of the GDP per capita growth and of the physical capital and productivity growth, but other indicators of the capital market development such as volatility, size and international integration are not significant for explaining economic growth. Carlin and Mayer (2003) analyse the link between financial systems and economic growth for developed countries and reveal a link between financial system and type of economic activities which can influence the economic growth. Arestis, Demetriades and Luintel (2001), use the autoregressive vector for an empirical analysis on five developed economies; their study concludes that the capital market has effects on the economic growth, but the impact of the banking sector is stronger. Filer, Hanousek and Campos (1999) notice that capital markets include the future growth rates in current prices, especially in the developed countries, which is a result consistent with the efficient markets hypothesis.

In the context of UE enlargement, an analysis of the relationship between capital markets development and economic growth could explain why different countries reach different economic growth rates, and could find solutions in order to stimulate the process of economic growth through capital market using public policy instruments. Related to this issue, although there are many studies regarding developed countries, approaches on East- European ex-communist countries' economies are very few relatively to developed countries cases.

Romanian capital market had developed slowly starting from 1995. Moreover, several years after 1989 Romania had negative economic growth rates (the real rate of GDP growth). Only since 2000 Romania had positive economic growth rates accompanied by the development of the financial system; these particular aspects could alter the relationship between economic growth and capital market development, and more specifically the conclusion on whether capital market development is a good predictor for economic growth rates. This is the reason why the starting point of our study is the year 2000.

2. DATA AND METHODOLOGY

In this chapter we try to assess how economic growth has sent it's influence over the stock market in Romania, during 2000-2009. We use quarterly data on Gross Domestic Product supplied by The National Institute of Statistics, and BET data provided by the website of Bucharest Stock Exchange.

Quarterly Gross Domestic Product at market price (QGDP), the main macro-economic aggregate of national accounting, represents the final result of production activity for resident productive units, for a certain period, a quarter, respectively:

Quarterly Gross Domestic Product at market price is estimated by two approaches:

1. output approach:

$$QGDP=GVA+TP-SP \quad (1)$$

where:

GVA=gross value added at basic prices;

TP=taxes on products;
SP=subsidies on products.

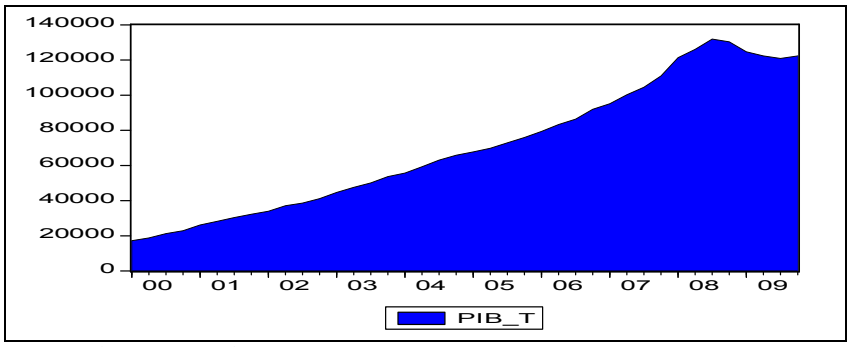
2. expenditure approach:

$$QGDP=FC+GCF+E-I \quad (2)$$

where:
FC= actual final consumption;
GCF=gross capital formation;
E=exports of goods and services;
I=imports of goods and services.

The main data sources used for quarterly Gross Domestic Product estimation are: *statistical sources*: short-term surveys regarding industrial production, construction, services, trade; production account for agriculture; short-term surveys regarding earnings and employment; *financial-accounting sources*: accounting statements of financial institutions; *administrative sources*: execution of state budget and local budgets, and of social security budget; balance of payments.

Quarterly Gross Domestic Product is estimated in current prices, in the prices of the corresponding period of the previous year and in the average prices of the year 2000. The estimates in average prices of 2000 are calculated by chain-linking volume indices. Besides the gross estimates of quarterly Gross Domestic Product, seasonally adjusted estimates are also compiled beginning with 2009, based on the regressive method, this method being recommended by the European regulations.



Source: data processed using EViews 5.0 program.

Figure 1. Evolution of QGDP seasonally adjusted during 2000-2009 (mil. RON, current prices)

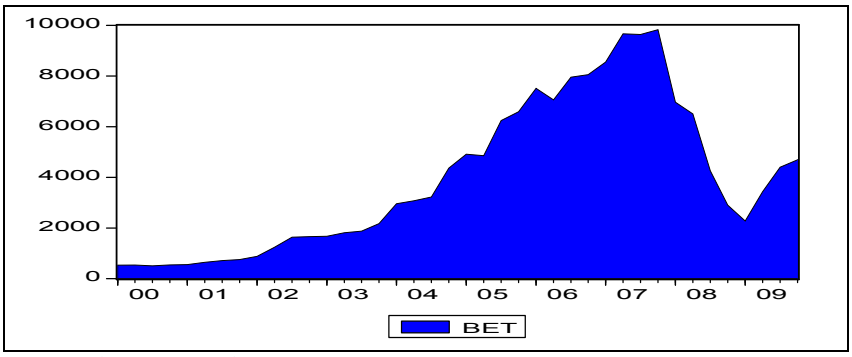
The seasonal adjustment envisages the removal of seasonal effects from the data series in view to highlight the real economic evolution during consecutive periods.

In order to adjust the main aggregates series, based on which the GDP is estimated through the production and expenditure methods, DEMETRA software package is used (TRAMO/SEATS method). This leads to the estimation of seasonal effect (events taking place each year at the same time, with the same amplitude and orientation, such as: seasons, holidays, etc.), of the working days number different

from one month to another and the calendar effect (Orthodox Easter, leap year and other national holidays) as well as to the outliers identification and correction (circumstantial, transitional or permanent changes in level) and to missing data interpolation.

The quarterly national accounts of Romania generally show a strong seasonality, while the effect of working days number and of the calendar is not significant. For this reason no adjustment method is necessary for these two components. The seasonally adjusted series was obtained by removing this effect from the unadjusted series, by means of correction coefficients, selected depending on the regression model used (additive or multiplicative). The additive or multiplicative model used for regression is automatically identified by the DEMETRA software, depending on the nature of series that are subject to adjustments.

BET is an index weighted by market capitalization and is designed to reflect the overall trend in prices of 10 most liquid shares traded on the Bucharest Stock Exchange. To offset any effect due to artificial changes in capital or equity prices because of its division, the index value is adjusted by a correction factor on the day the change occurs affecting the share price. The selection rules of the 10 shares that make up the index portfolio are: shares must be listed on the first category of the Exchange; shares must have the highest market capitalization; shares must be the most liquid (to ensure that the total index portfolio transactions are at least 70% of the total value traded). BET Index allows portfolio managers to calculate the beta coefficient, and thus provide a more accurate measure of the volatility of listed shares. Beta coefficient is an indicator of variability (volatility) course of action (is covariance of a type of action in relation to overall market).



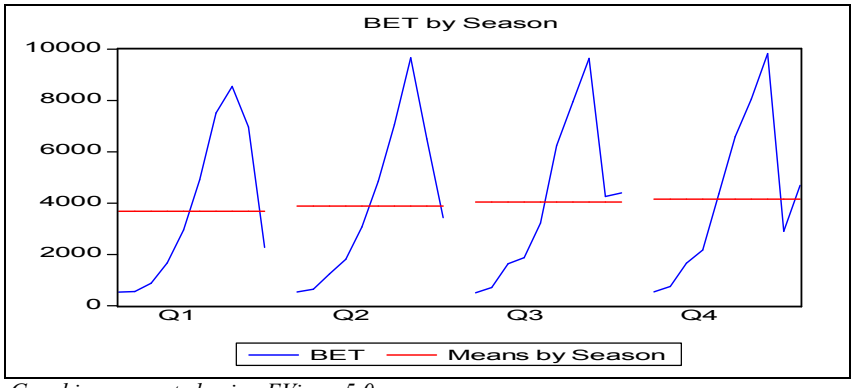
Source: data processed using EViews 5.0 program.

Figure 2. BET developments during 2000-2009

Study period covers the period 2000 - 2009, quarterly series and the method of analysis used is the econometric modelling, using the software package EViews 5.0. Practically, we will test the stationarity of data series, identify the seasonal influences and perform the deseasonalisation of the series (only in terms of BET, because the QGDP series is already seasonally adjusted), and analyze and quantify the link between BET stock index and QGDP development (economic growth).

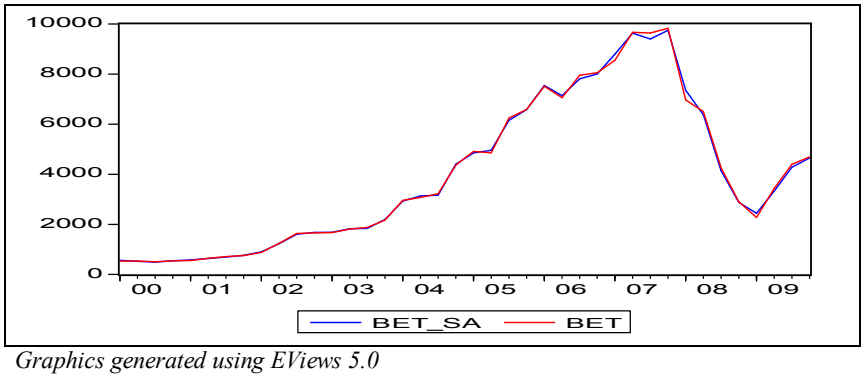
a) Logarithm of the series "bet" and "pib_t" - the series of data were logarithmised (L), order „2"; the resulting coefficients of the model are interpreted in this case as "elasticity". As a result of this operation, new series were generated, renamed as follows: "l_bet" and "l_pib_t".

b) Testing the "BET" series' seasonality - statistical series have been subject to verification of the existence of seasonal ingredients, in which case no significant differences were identified in the monthly averages (the series aren't "seasonal"). This can be seen with the help of „Seasonal stacked line" graphs, related to the series; to reinforce this claim, we have achieved the deseasonalisation of the series (SA - seasonal adjustment), by using the „Census X12" method (used by the U.S. Statistical Office), the additive alternative, which resulted in the construction of new five statistical series, renamed "bet_sa". Figure 3 presents the quarterly values of the studied variable. Where significant differences were observed between the averages, it would consider that time series are seasonal. In reality, it is noted that there aren't important differences between monthly averages; they converge to the same value. Also, figure 4 indicates the same thing, namely that the seasonal adjusted series do not present significant fluctuations from the actual series.



Graphics generated using EViews 5.0

Figure 3. Quarterly BET average



Graphics generated using EViews 5.0

Figure 4. Comparative evolution of BET and seasonal adjusted BET

c. The testing of the series dl_bet and dl_pib_t (dl = first difference operator) Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP). Eligibility conditions for a time series to be stationary are: the average of the time series is constant or, in other words, the observations should fluctuate around the average; the series' variance is constant. In economic terms, a series is stationary if a shock over the series is temporary (is absorbed in time), not permanent. If a series is not stationary, through differentiation is achieved a stationary series. The order of integration of the series is the number of successive differentiations required to obtain a stationary series.

Regarding the studied variables, we first tested the level stationarity of the log-series and the result is that the series aren't stationary. Therefore, we proceeded to the first differentiation of the series and the results contained in the 4 tables indicate that these first order integrated series are stationary (there's no unit root).

The two tests provide information about outcomes, critical values for each level of relevance (1%, 5% or 10%) ant the probability „p" associated to the test's result. For both tests, ADF and PP, if the test value is greater than the critic values, the null hypothesis is accepted, then the series has a unit root (is nonstationary). The results of both tests for each of the series are listed in Tables 1, 2, 3 and 4:

Table 1. „Unit root" test ADF for dl_bet

Null Hypothesis: DL_BET has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.898586	0.0048
Test critical values:	1% level		-3.615588	
	5% level		-2.941145	
	10% level		-2.609066	

Source: data processed using EViews 5.0 program.

Tabel 2. „Unit root" test PP for dl_bet

Null Hypothesis: DL_BET has a unit root				
Exogenous: Constant				
Bandwidth: 1 (Newey-West using Bartlett kernel)				
			Adj. t-Stat	Prob.*
Phillips-Perron test statistic			-3.890381	0.0049
Test critical values:	1% level		-3.615588	
	5% level		-2.941145	
	10% level		-2.609066	

Source: data processed using EViews 5.0 program.

In the previous tables, it can be seen that the value of tests is lower than the critical one, regardless of the relevance level; by choosing the most restrictive level of relevance, 1%, you can say that at 1% level of relevance, the null hypothesis (the series

is nonstationary) is rejected. This result can be observed also from the associated probability value "p". So, it is smaller than the most restrictive level of relevance, 1%, and, therefore, the null hypothesis - a nonstationary series - is rejected. So, the series' order of integration is 1 or the series is I(1).

Tabel 3. „Unit root" test ADF for dl_pib_t

Null Hypothesis: D(DL_PIB_T) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-10.39605	0.0000
Test critical values:	1% level		-3.621023	
	5% level		-2.943427	
	10% level		-2.610263	

Source: data processed using EViews 5.0 program.

Tabel 4. „Unit root" test PP for dl_bet

Null Hypothesis: D(DL_PIB_T) has a unit root				
Exogenous: Constant				
Bandwidth: 4 (Newey-West using Bartlett kernel)				
			Adj. t-Stat	Prob.*
Phillips-Perron test statistic			-11.32330	0.0000
Test critical values:	1% level		-3.621023	
	5% level		-2.943427	
	10% level		-2.610263	

Source: data processed using EViews 5.0 program.

d) In order to demonstrate that there is an influence of the economic growth on the capital market evolution, we opted for the method of econometric analysis, building a regressive model with the following form:

$$Y_{it} = \alpha + \beta * X_{it} + \varepsilon_{i\,t}, \quad (3)$$

where:
Y_{it} - dependent variable - BET Index;
α - free term's coefficient;
β - the coefficient of the independent variable;
X_{it} - the independent variable - QGDP;
ε_{it} - the random variable;
i - number of sectors implied by the regression;
t - time period (years 2000-2009).

The data shown in Table 5, come off the following conclusions: 1) Standard error values of the regression function coefficients are below - in module - the coefficients' value. This means that these coefficients are correctly estimated. 2) The probabilities attached to the t-Statistic test are 0, so they are below the relevance level

of 5%; therefore, coefficients are considered statistically significant. 3) Correlation coefficient with a value of **77,88%**, shows that the statistical link between the dependent variable -BET - and the independent one - QGDP - is a **strong** one, which means that changes in the evolution of BET is being found in a significant proportion in the changes of QGDP development. 4) The Durbin-Watson test, with a value below the critical 2, indicates that the residual variables are not autocorelated.

Table 5. QGDP impact over BET Index during 2000-2009

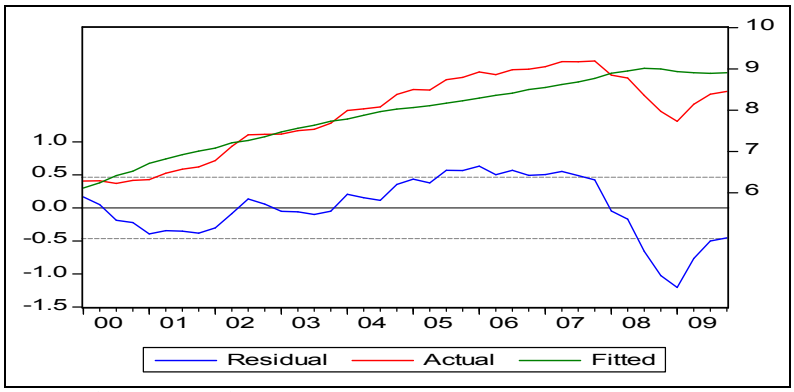
Dependent Variable: L_BET				
Method: Least Squares				
Sample: 2000Q1 2009Q4				
Included observations: 40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.781378	1.357391	-5.732599	0.0000
L_PIB_T	1.424633	0.123140	11.56918	0.0000
R-squared	**0.778872**	Mean dependent var		7.899568
Adjusted R-squared	0.773053	S.D. dependent var		0.974071
S.E. of regression	0.464038	Akaike info criterion		1.351005
Sum squared resid	8.182582	Schwarz criterion		1.435449
Log likelihood	-25.02011	Durbin-Watson stat		0.165141

Source: data processed using EViews 5.0 program.

Therefore, we can state that the built model can be considered representative to describe the link between BET and the evolution of QGDP during 2000-2009. The regression equation can be rewritten as:

$$L_PIB_T = -7.781378 + 1.424633 * L_BET \quad (4)$$

Next, we graphically represented the actual value of the dependent variable, the estimated value and the regression errors.



Source: data processed using EViews 5.0 program.

Figure 5. Actual, fitted, residual graph

4. CONCLUSIONS

The fact that Romania hasn't benefited from a capital market for almost five decades, made the development process start from scratch. The effects of this situation are reflected even today, when after a transition period of almost two decades, capital markets hasn't reached a level of development that would enable it to fulfil its main function in the economy, the gap with the countries of Europe being still quite high.

It may be mentioned that in terms of market capitalization and development of key indices, Bucharest Stock Exchange since 2002 recorded an upward trend until the end of 2007, corresponding to the overall evolution of the Romanian economy. Although the upward trend recorded, Romanian capital market is still far from achieved performance comparable to the markets of Central Europe.

Regarding the impact of growth on capital market development, we tried to quantify and analyze the relationship between stock index and BET QGDP evolution, so economic growth. Following the econometric testing of the link between economic growth and development of BET revealed a correlation coefficient with a value of 77,88%, which shows that the statistical relationship between the outcome variable (dependent) - BET - and the endogenous (independent) - QGDP - is strongly, growth (positive or negative) having an important impact on the efficiency and performance of the capital market.

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