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The implications of financial performance on stock exchange indicators of listed companies:

empirical evidence for the Romanian capital market

Iulia-Oana ŞTEFAN (BELCIC-ŞTEFAN)
University of Craiova,
E-mail: iulia.oana.stefan@gmail.com

Abstract

This paper examines and quantifies the implications of financial indicators of performance on the share return of companies listed on Bucharest Stock Exchange. These implications are even more relevant as the Romanian capital market could benefit from increased visibility with its reclassification as an emerging capital market in the near future. The research is conducted at the level of 33 companies listed on BSE for the time frame 2011-2013, building a multiple linear regression model that quantifies the variation in price to book value depending on the evolution of nine financial indicators of performance out of a total of 38 such possible indicators. Correcting the effects of serial correlation within the model led to its respecification resorting to the generalized differences procedure. The value of the R-squared coefficient of determination for the processed model is 0.543, eight of the nine independent variables being significant at the 1% level. The 0 probability associated to the F-test as well as its value confirm that the regression equation is globally significant. Also, all the assumptions for validating the estimated model are confirmed, both general ones, characteristic to the multiple linear regression procedure, and, in particular, according to the specific set of data under processing. The applied usefulness of the regression model is valued in the next step of the research, that of testing the effectiveness of the Romanian capital market, after which it was found that the influence of financial performance indicators was already incorporated into the market price since the end of the reporting period.

Keywords: *Financial performance, stock exchange performance, listed companies, Bucharest Stock Exchange, market efficiency, multiple linear regression model.*

JEL Clasification: *C33, C51,C52.*

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Introduction

Financial accounting indicators involve a different degree of relevance depending on the interests of each category of stakeholders implicated, internally or externally, in the economic activity of the enterprise. It is equally true, however, that the information asymmetry which is formed between the company management and other users of information cannot be disputed. This asymmetry may however be minimized (Lev, 2001) through a chain of cause-effect actions that originate in the decision of some managers to provide more information when they consider that the company they are running is undervalued. As a result, investors will appreciate this extra information, allocating their funds first to these companies and under evaluating the ones that do not offer equal transparency on the evolution of their equity. The question that arises in this case concerns the extent to which this financial information is processed and transposed by investors on the size of the price that they are willing to pay for the shares of each company.

This issue is a concern for specialists ever since the mid-twentieth century. Thus, Ball and Brown (1968) were among the first to have examined how the company's results can influence the sign spread (positive or negative) between the present return of the security on the market and the forecasted one, noting that the results of profit nature exhibit more influence than cash flows. The lack of impact of cash flow on the market price of shares is supported by the results of a series of studies (Beaver and Dukes, 1972; Patell and Kaplan, 1977; Beaver, Griffin and Landsman, 1982). Some conclude only that cash flows do not contain more incremental information than gains in explaining stock quote fluctuations. Others are saying that there is a lower correspondence in the evolution cash flow – market price than in the one which relates earnings to the price on the stock market. In another study, Board and Day (1989) sustain the reduced amount of information expressed through cash flows, but conclude, however, that there is a high informational content in the traditional rates of return expressed at historical values. The content is also reflected in the evolution of shares on the stock market.

On the other hand, other empirical evidence (Schaefer and Kennelley, 1986) counters the lack of relevance of cash flows, proving that a measure of gross cash flow may surpass other more refined ratios. Starting from this idea the impact of cash flow on the market profitability in terms of its three components was investigated: cash flow derived from operating, investing and financing activity. Thus, Livnat and Zarowin (1990) conclude that the components of operating and financing cash flow are directly and significantly associated with the profitability of the share on the market, but the same cannot be said about the cash flows related to investment activity. The sphere of influence of cash flow as compared to that of profit on the evolution of the stock quote is still intensively analyzed. It is also proved in more recent studies (Kusuma, 2014) that cash flows contain a higher degree of incremental information than earnings quantified through various forms of profit.

But cash flow is not the only performance indicator whose informational efficiency was tested through the capital market. Thus, Hopwood and Schaefer (1988) analysed the impact of 38 financial ratios on market profitability of securities for 251 companies. The study is undertaken by grouping the 38 financial ratios into 7 components whose influence is subsequently tested: profitability, total assets and capital turnover, inventory turnover, receivables turnover, financial leverage, short-term liquidity, cash flow position. The conclusions place profitability indicators as the ratios that exhibit the most significant influence on the stock quote of shares, followed by total assets and capital turnover, inventory turnover, receivables turnover and financial leverage. The results of the study are all the more important as the correlation is significant at the threshold of 3.3% or less. In another study, Buchheit and Kohlbeck (2002) demonstrate that, on average, the companies' announcements on accounting earnings provide information in upward amounts to market participants, as evidenced by a reaction in the price at the announcements on profit (PREA – Price Reaction to Earnings Announcements), which intensifies over time. This temporal increase in the reaction of market price proves to be directly dependent on the size of the company, emphasized by its market value. In other words, the higher the market value of the enterprise, the bigger the extent to which the investors will incorporate information related to accounting earnings in the price they are willing to pay for the shares of that company, extent that will only increase over time. The impact of the financial indicators of performance on the variation of excess or deficit of return on the market (Abnormal return) is analysed also by Biddle, Bowen and Wallace

(1997). For this purpose they have tested the influence of four possible explanatory variables: operating cash flow, current result net of profit tax, economic profit and economic value added. Study findings reflected that the indicator with the greatest influence power on the market is net the current result, followed by the economic profit, the economic value added and the operating cash flow. It is thus proven the investors' preference for measures of profit nature which are included in the companies' reports, at the expense of those that require additional calculations.

In Romania, the implications of information contained by performance indicators on the return of shares on the market has been tested by Ciobanu (2006) in a study that included 34 companies listed on Bucharest Stock Exchange. Thus, for the period 2000-2004 the author has investigated to what extent the total shareholder return was influenced by certain indicators which either quantify the performance of a company, or have a direct or indirect impact on it. The study shows the Price to Book Value as the only indicator capable of influencing the profitability of the analysed securities on the market. However, its explanatory power diminishes from one period to another, leading to the general conclusion that, for investors making transactions on the capital market in Romania, information submitted by financial accounting performance indicators is irrelevant. This is consistent with results of previous studies. For instance the study of Ciobanu (2004) was made for 1998-2001 on companies listed on the regulated market of BSE and RASDAQ. On the other hand, more recent studies (Carp and Mironiuc, 2014) conclude that traditional financial indicators manifest their influence on stock exchange indicators, the most significant relationship being identified for the time frame 2011-2012 between the Price to Book Value and economic and financial profitability recorded by companies listed on BSE. At the same time, in a study (Buse and Stefan, 2014) conducted for the time frame 2010-2013 on companies listed on BSE belonging to the oil and retail trade industries a strong and direct correlation between market capitalization and sales, return on sales and net profit was revealed.

Nor the indicators that express value creation have been omitted by researchers in their efforts to identify the extent to which financial performance affects the profitability of shares on the market. An example is the study conducted by Fernandez (2015). Thus, by analysing a sample of 582 American companies, he observed the lack of correlation between economic value added and cash value added with market value added and shareholder return. He believes that the financial indicators can measure only historical performances of the company, highlighting their inability to truly reflect the value created for shareholders. In the spirit of this statement, Kothari (2001) looks at the evolution of share prices on the market as a direct function of the component of past profitability that has not been anticipated by investors, depending also on how their expectations on future business performance oscillate. Basically, in the spirit of the efficient markets hypothesis, he believes that any information contained by financial indicators of performance are already incorporated into the market price and that the only way they can still influence the profitability of shares on the market relies on the existence of a considerable positive or negative gap, between the published values and the investors' forecasts.

Subsequently passing through all these papers we can state that so far the economic theory could not establish with certainty whether the financial performance registered by companies influences or not their profitability on the capital market. Thus, although numerous studies have provided evidence supporting the accuracy of this statement, uncertainties surround also the identity of financial performance indicators that can explain a percentage as high as possible of the variation in the market price of shares.

In these circumstances, the present study aims to identify and quantify the implications of the information transmitted by the financial indicators of performance on the market profitability of companies listed on the capital market in Romania, a market still young and underdeveloped compared to other capital markets in Central and Eastern Europe. The analysis makes use of an extensive database built by manual collection of financial and stock data for companies listed on Bucharest Stock Exchange. Of the information held, an academic analysis of the impact of financial performance on the market performance of companies listed on the stock exchange has not so far been developed at this level for the Romanian capital market, which is why I manifest confidence that it will offer new perspectives to this long debated and still uncertain issue.

1. Data and methodology

The study took as its starting point the evolution of companies listed on the capital market in Romania. For this purpose we analysed 33 companies listed on Bucharest Stock Exchange, for a reference period of 3 years, i.e. 2011-2013, the selection process for companies considering a best possible representation of the directly productive sectors of the national economy as well as fulfilling minimum criteria relating to liquidity and the value of shares included in free-float. Thus, the analysis includes companies belonging to various industries, such as: Mining and quarrying, (OMV Petrom, Rompetrol Well Services, Dafora), Manufacturing (Vrancart, Rompetrol Rafinare, Antibiotice, Biofarm, Zentiva, Artego S.A Tg Jiu, Romcarbon S.A Buzău, Teraplast, Stirom S.A. Bucuresti, Alro, TMK-Artrom, Electromagnetica S.A. Bucureşti, Electroargeş S.A. Curtea de Argeş, Retrasib S.A. Sibiu, Mecanica Ceahlău, Altur, Compa, Aerostar, Turbomecanica), Electricity, gas, steam and air conditioning supply (Amonil, C.N.T.E.E. Transelectrica), Constructions (Impact Developer & Contractor, Condmag), Wholesale and retail trade (Alumil Rom Industry, Ropharma S.A. Braşov), Transportation (Conpet, S.N.T.G.N. Transgaz), Storage (Oil Terminal, Socep), Hotels and restaurants (Turism Felix S.A Băile Felix).

It should be mentioned that the absence from the sample structure of three major companies present on the capital market in Romania, namely S.N.G.N. Romgaz, S.N.N. Nuclearelectrica and Electrica is motivated by the lack of information on stock quotes during certain periods of time, which would have been capable of affecting the quality of the statistical processing.

For the 33 companies data were extracted from the annual financial statements but also from other published sources as well as from the records of Bucharest Stock Exchange, from where there were taken also the stock quotes of securities. The research was based, therefore, on 99 observations of each variable analysed, a number considered significant to validate the conclusions reached.

In order to start the econometric modelling we aim to elucidate the magnitude and direction in which the market development of listed companies is influenced by the following system of 38 indicators that measure different sides of their financial performance which are treated as independent variables. They are characterizing:

1. The results of the company's activity: gross profit (Pb), profit before interest and tax (EBIT), sales (CA);
2. Profitability: return on assets (ROA), return on capital employed (ROCE) return on equity (ROE), return on total expenses (Rrct), EBIT margin (RMEBIT), gross profit margin (RMPB), net profit margin (RMPN);
3. Shareholders' earnings: net profit per share (EPS), dividend per share (DPS);
4. Funding potential: self-financing capacity (CAF), self-financing (AF), net cash flow (CFn), ratio CAF/CA;
5. Value creation: economic value added (EVA), cash value added (CVA), cash flow return on investment (CFROI);
6. The size and efficiency of the company's activity: share of fixed assets in total assets (GAi), efficiency of use of fixed assets (EAi), share of current assets in total assets (GAc), efficiency of use of current assets ((EAc), equity efficiency (EKpr);
7. Liquidity and solvency: general liquidity (Lg), current liquidity (Lc), immediate liquidity (Li), general solvency (Sg), entity's solvency (Sp);
8. Balance and financial stability: global indebtedness ratio (RIG), financial leverage (LF), financial leverage effect (ELF), net working capital (CLN), ratio claims/liabilities (Rc/d) term collection of receivables (Tcr), risk coverage ratio (Rar), fixed assets finance ratio (FAi), total debt turnover ratio (RDt).

In the study there were analysed the manner in which different sides of financial performance measured by the sizes above is liable to affect the profitability of shares on the capital market, as expressed by the most relevant stock exchange indicator, assimilated as dependent variable, i.e. the price to book value (PBV). The relevance of this indicator lies in its ability to reflect the profitability of shares on the market by correspondence with the size of the activity conducted by the company and, at the same time via it being alleviated the effects of the often absurd oscillations of the stock quote. In fact, it is well known the degree of volatility that can affect the stock quote even during a trading day, more so among a series of annual intervals. These fluctuations are caused most often by simple unjustified emotions shown by investors, so that the pure level of the stock quote was not taken into account from the very outset. Instead, using the most important

indicator derived from the stock quote as a way of reflecting the profitability of the share on the market appears as more appropriate.

Once established the structure of the population of variables, the study was started by initiating the econometric modelling through the classical multiple linear regression model, which establishes a stochastic dependence for a number of I observations between a dependent (endogenous) variable Y and a number of independent (exogenous) variables X1...Xk with the equation form:

$$y_i = b_0 + b_1 x_{1i} + b_2 x_{2i} \ldots + b_k x_{ki} + e_i \quad (1)$$

where: b_0, b_1, b_2,...,b_k are estimators of the parameters $\beta_0,\beta_1,\beta_2,\ldots,\beta_k$;

e_i- residual term;

Determining the estimators b_0, b_1, b_2, ..., b_k for the unknown parameters β_0, β_1, β_2, ..., β_k of the multiple linear regression model is achieved through the ordinary least squares method (OLS), which considers that the function which best adjusts the data is the one which minimizes the variance of the error e, which is equivalent to minimizing:

$$S(b0,b1,b2,\ldots,bk)=\sum_{i=1}^{n} e_i^2 = \sum_{i=1}^{n}(y_i - b_0 - b_1 x_{1i} - b_2 x_{2i} \ldots - b_k x_{ki})^2 \quad (2)$$

Following the evaluation of goodness of fit of the regression model estimated using the ordinary least squares method it is necessary to confirm its predictive value, achieved by analysing and validating the fundamental assumptions that allowed the initial specification of the model using the multiple linear regression technique:

- The error terms εi are random variables of mean zero, E(εi)=0;
- The variance of the error terms is constant (the homoscedasticity assumption), Var(εi)=σ2;
- The absence of serial correlation (autocorrelation) between errors, Cov(εi, εj) = 0,i≠j;
- The absence of multicolinearity;
- The error terms are normally distributed, $\varepsilon_i \sim N(0, \sigma^2)$;

In order to both test the validity of the assumptions on which the regression model is based and to estimate and test the parameters of the model a number of statistical tests offered by the software EViews, version 7.0 were used. Detecting the presence of serial correlation between errors determined applying the generalized differences procedure, specific to the generalized least squares method. The procedure, as described by Georgescu (2014), involves defining the errors correlation coefficient ρ via its estimator, $\hat{\rho}$ as follows:

$$\hat{\rho} = \frac{\sum_{i=2}^{I} e_i e_{i-1}}{\sum_{i=2}^{I} e_{i-1}^2} \quad (3)$$

Multiplying the equation (1) with $\hat{\rho}$ and applying the delay operator with one period of time (lag=1), we obtain:

$$y_{i-1}\hat{\rho} = b_0\hat{\rho} + b_1 x_{1i-1}\hat{\rho} + b_2 x_{2i-1}\hat{\rho} + e_{i-1}\hat{\rho} \quad (4)$$

Then the model is expressed under the form of generalized differences ((1)-(4)):

$$y_i - y_{i-1}\hat{\rho} = b_0 - b_0\hat{\rho} + b_1 x_{1i} - b_1 x_{1i-1}\hat{\rho} + b_2 x_{2i} - b_2 x_{2i-1}\hat{\rho} + e_i - e_{i-1}\hat{\rho} \quad (5)$$

Noting the generalized differences:

$$\Delta y_i = y_i - y_{i-1}\hat{\rho} \quad (6)$$

$$\Delta x_{1i} = x_{1i} - x_{1i-1}\,\hat{\rho} \quad (7)$$

$$\Delta x_{2i} = x_{2i} - x_{2i-1}\,\hat{\rho} \quad (8)$$

The OLS method is once again applied in order to estimate the parameters of the regression equation, using as variables the generalized differences, as it follows:

$$\Delta y_i = b_0' + b_1'\Delta x_{1i} + b_2'\Delta x_{2i} + e_i' \quad (9)$$

By respecifying the regression model in the form of the generalized differences takes place the correction of serial correlation of the residual terms expressed through $\Delta e_i = e_i - e_{i-1}\hat{\rho}$, the satisfaction of the hypotheses necessary for applying the OLS method being, thus, ensured.

2. Results

2.1. Grounding the regression model of the market profitability via financial performance

A first step in the direction of grounding a regression model that highlights the trends in the stock exchange

profitability of companies listed on the capital market in Romania via the financial performance that characterizes their undertaken activity consists of selecting and processing the dependent variable, represented by the price to book value, as I present in the following paragraphs.

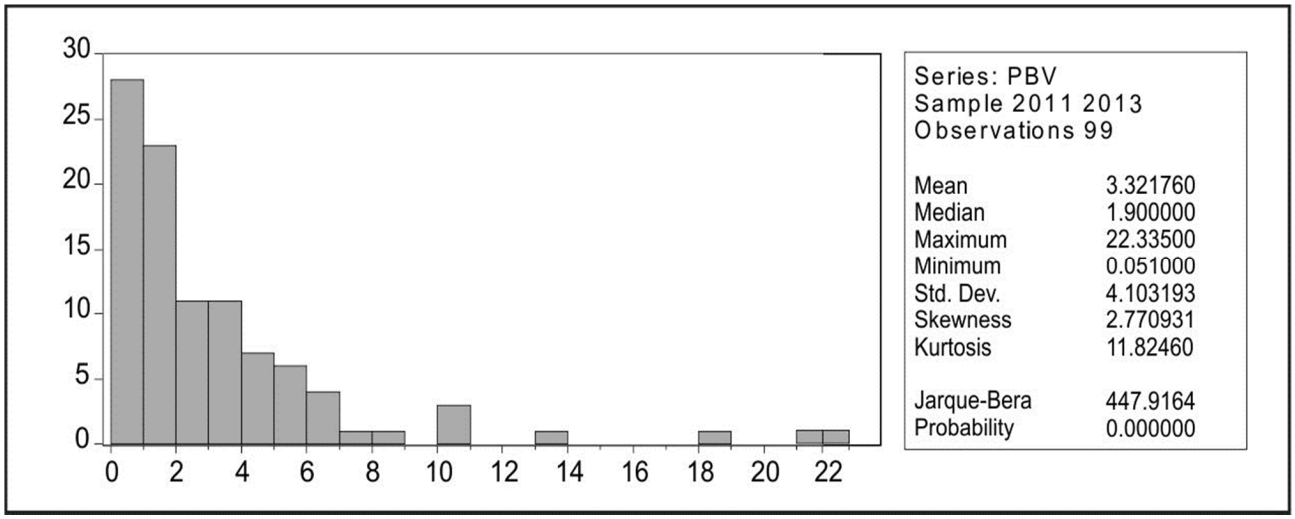
2.1.1. Selecting and processing the endogenous variable of the regression model

The opportunity of using the price to book value as the dependent variable of the study is given by the greater representativeness that it benefits of over other stock indicators, which by their way of construction are subject to certain limitations. For example, the price to earnings ratio is no longer conclusive if the profit is handled by management in order to demonstrate the quality of the exercised leadership or if the company registers losses. The same can be said about the dividend yield, if shareholders are not compensated in certain periods of time.

From this point of view I believe that the price to book value ratio of a share represents the most appropriate indicator to reflect the evolution of a company's shares on the stock market. The net assets of the company cannot be manipulated and are used as a source of information on the real situation of the entity which is considered much more eloquent by investors. The choice is supported also by records encountered in the specialized literature, foreign authors and Romanian alike (Cho and Pucik, 2005; Zaretzky and Zumwalt, 2009; Carp and Mironiuc, 2014) considering the PBV ratio as one of the most important and effective sizes to express market profitability when there are pursued the implications of different aspects of the companies' financial diagnosis on the evolution of shares on the capital market.

Once selected the dependent variable represented by the price to book value, it must be subjected to further analysis in order to verify the normality of the distribution of values, otherwise being required its additional processing.

Figure 1. Descriptive statistics of the price to book value

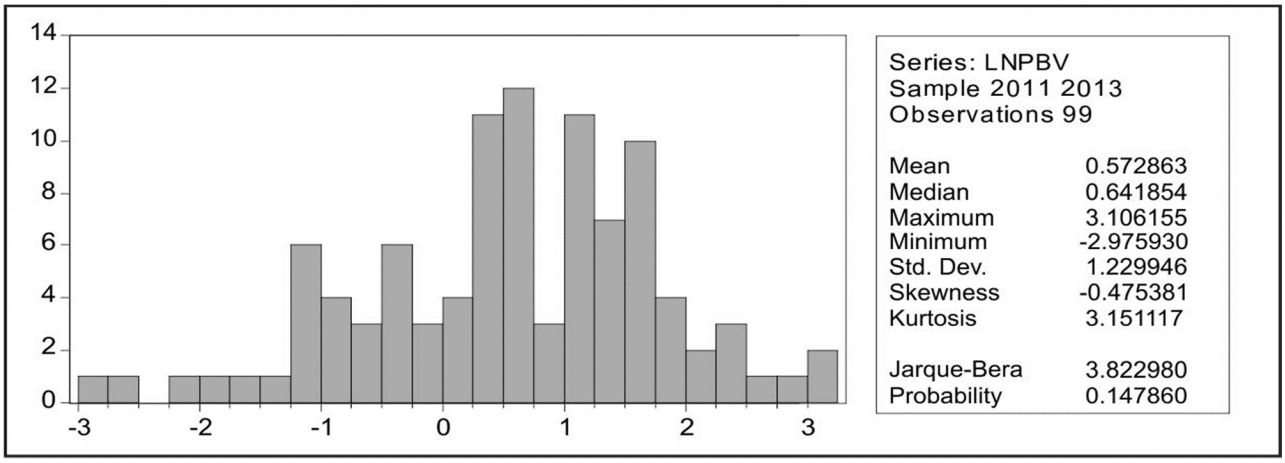


Source: author processing

As can be seen through **Figure 1**, the distribution of the dependent variable does not follow a normal law, the histogram not having the shape of a bell. Also, the value of the Jarque-Bera statistic is very high and the associated probability is 0, which does not allow us to admit that the series values are normally distributed.

To remedy this problem I will proceed to a logarithmic transformation of the price to book value, this being an often used method as a way to lessen excessive fluctuations in the value of the data series.

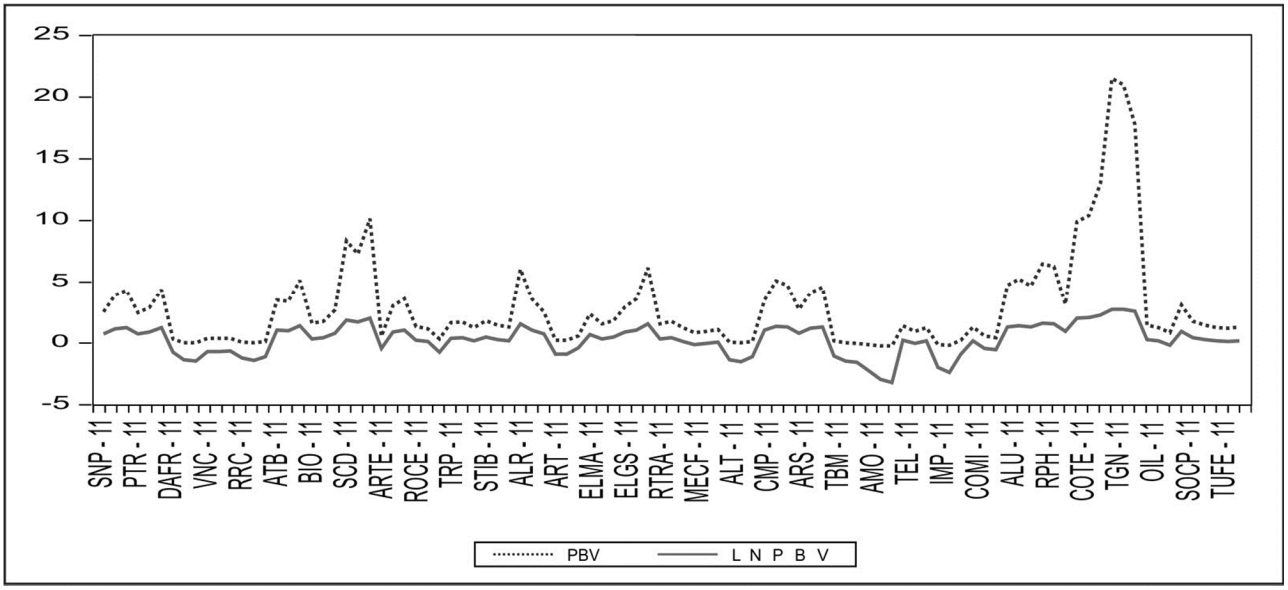
Figure 2. Descriptive statistics of the logarithm of the price to book value



Source: author processing

Following the procedure of logarithmic transformation, we notice according to **Figure 2** that the distribution of the series has become a normal one, fact proved both through the shape of the histograms from the figure and in terms of descriptive statistics. Thus, the value of the Jarque-Bera test is now much lower, of only 3.82 and the associated probability exceeds the critical threshold of 0.05, which means that we can accept the null hypothesis, that of a normally distributed variable. The beneficial effects of the logarithmic transformation procedure are shown through the comparative evolution of the initial and processed variable, as shown below:

Figure 3. The evolution of the price to book value before and after the logarithmic transformation



Source: author processing

As we can see, taking the log of the price to book value determined the correction of excessive fluctuations manifested in the data series, the variation of the processed variable being much reduced compared with the initial variable, which will allow generating a regression model characterized by increased precision and significance.

2.1.2 Generating the initial regression model

Following the selection of the price to book value as endogenous variable and its processing according to statistical principles, the next step for grounding the regression model is to explain its variation by identifying the best combination of independent variables represented by the indicators of financial performance. For this purpose we used the stepwise forwards method.

Thus, in the first stage was specified, first of all, the dependent variable of the regression equation, constituted by the natural logarithm of the price to book value calculated at the end of the current year, variable noted as LNPBV. Then, in order to respect the structure of the regression equation, we specified an always included regressor, represented by the constant c. Finally, we introduced the 38 possible independent variables of the model for a minimum threshold of significance set at 0.05. After applying the method, the independent variables considered relevant for explaining the variation of the price to book value are: gross profit margin, term collection of receivables, dividend per share, share of fixed assets in total assets, financial leverage, net working capital, financial leverage effect, equity efficiency, economic value added.

Further, the results of the multiple linear regression are presented in **Table 1**.

Table 1. Regression characteristics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.775255	0.243770	11.38471	0.0000
MARJAPB	0.571254	0.148909	3.836259	0.0002
TCR	-0.003023	0.000361	-8.365367	0.0000
DPS	0.099165	0.016956	5.848446	0.0000
GAI	-2.528167	0.363389	-6.957192	0.0000
LF	-1.408572	0.213432	-6.599617	0.0000
CLN	8.57E-10	1.59E-10	5.372776	0.0000
ELF	-1.687388	0.357689	-4.717476	0.0000
EKPR	-0.042222	0.013124	-3.217169	0.0018
EVA	-2.16E-10	9.30E-11	-2.324582	0.0224
R-squared	0.749604	Mean dependent var		0.572863
Adjusted R-squared	0.724283	S.D. dependent var		1.229946
S.E. of regression	0.645830	Akaike info criterion		2.058976
Sum squared resid	37.12158	Schwarz criterion		2.321109
Log likelihood	-91.91931	Hannan-Quinn criter.		2.165036
F-statistic	29.60403	Durbin-Watson stat		1.135629
Prob(F-statistic)	0.000000			

Source: author processing

Thus, the resulted multiple linear regression model presents the following estimative equation:

$$LNPBV = C(1) + C(2)*MARJAPB + C(3)*TCR + C(4)*DPS + C(5)*GAI + C(6)*LF + C(7)*CLN + C(8)*ELF + C(9)*EKPR + C(10)*EVA + \varepsilon \quad (11)$$

Estimating the parameters of the regression equation determines rewriting the model by substituting the coefficients as follows:

$$LNPBV = 2.775255 + 0.571253*MARJAPB - 0.003023 * TCR + 0.099164 * DPS - 2.528167*GAI - 1.408571*LF + 8.565735e\text{-}10 * CLN - 1.687388 * ELF - 0.042221 * EKPR - 2.161144e\text{-}10 * EVA + \varepsilon \quad (12)$$

Before starting evaluating the quality of the linear adjustment of the multiple linear regression model, we proceeded to test its validity through the set of assumptions defined in the methodology section, the first faced challenge concerning the validation of the assumption of uncorrelated errors. The actions taken in this respect are detailed as follows.

2.1.3. Processing the model to correct the effects of serial correlation

The assumption of uncorrelated errors designates the necessity that the residuals (errors) of the regression equation are statistically independent from each other. Testing was conducted through the Breusch-Godfrey test, the decision rule being:

- If the probability is less than 0.05 then the null hypothesis is rejected, therefore exists serial correlation between residuals;
- If the probability is greater than 0.05, the null hypothesis is accepted, therefore the errors are not statistically correlated with each other.

Table 2. The result of the Breusch-Godfrey test on the serial correlation of residuals

F-statistic	22.43999	Prob. F(1,88)	0.0000
Obs*R-squared	20.11553	Prob. Chi-Square(1)	0.0000

Source: author processing

As we can see EViews offers two versions of the test, an F version, and a χ^2 (Chi-Square) version. In our case, both the probability of F and χ^2 is 0, leading to the rejection of the null hypothesis and indicating the presence of significant serial correlation within the regression model. Ignoring autocorrelation when it is present would lead to estimation of inefficient coefficients through the OLS method, whose standard error estimates could be wrong, even for samples of high volume. In fact, the database used in this study has a panel-type structure, involving observations of the variables in both space (the 33 companies) and time (2011-2013), the possibility for the presence of autocorrelation in the regression of a time series being extremely high. In this context it is necessary to undertake measures to correct serial correlation and respecify the initial regression model. In this respect, whereas the inclusion of delayed values (lags) of the dependent variable counters to a classic principle of the linear regression model, that according to which the explanatory variables must be non-stochastic, in order to respecify the model I will appeal to the generalized differences procedure related to the GLS method.

Thus, according to the mentioned procedure, we note with ρ the linear correlation coefficient of errors and with $\hat{\rho}$ its estimator. Since the number of observations is important (99> 15) it results that estimating $\hat{\rho}$ through $\hat{\rho} \approx 1 - \frac{DW}{2}$ is possible. The DW indicator represents the value of the Durbin Watson test registered for the initial regression model. Substituting, we get$\hat{\rho}$≈0,4321855.

To correct the effect of autocorrelation it is started from the original regression equation (11) which, after multiplication by ρ and applying the one period time delay operator, becomes:

$$\rho*LNPBV_{t-1} = C(1)*\rho + C(2)\rho*MARJAPB_{t-1} + C(3)\rho*TCR_{t-1} + C(4)\rho*DPS_{t-1} + C(5)\rho*GAI_{t-1} + C(6)\rho*LF_{t-1} + C(7)\rho*CLN_{t-1} + C(8)\rho*ELF_{t-1} + C(9)\rho*EKPR_{t-1} + C(10)\rho*EVA_{t-1} + \rho\varepsilon_{t-1} \quad (13)$$

Then the model is expressed using the form of generalized differences:

$$LNPBV_t - \rho*LNPBV_{t-1} = C(1)*(1-\rho) + C(2)*(MARJAPB_t - \rho*MARJAPB_{t-1}) + C(3)*(TCR_t - \rho*TCR_{t-1}) + C(4)*(DPS_t - \rho*DPS_{t-1}) + C(5)*(GAI_t - \rho*GAI_{t-1}) + C(6)*(LF_t - \rho*LF_{t-1}) + C(7)*(CLN_t - \rho*CLN_{t-1}) + C(8)*(ELF_t - \rho*ELF_{t-1}) + C(9)*(EKPR_t - \rho*EKPR_{t-1}) + C(10)*(EVA_t - \rho*EVA_{t-1}) + \varepsilon_t - \rho\varepsilon_{t-1} \quad (14)$$

With the help of the $\hat{\rho}$ estimator of ρ, the generalized differences can be further on estimated:

$\Delta LNPBV = LNPBV_t - \hat{\rho} * LNPBV_{t-1}$

$\Delta MARJAPB = MARJAPB_t - \hat{\rho} * MARJAPB_{t-1}$

$\Delta TCR = TCR_t - \hat{\rho} * TCR_{t-1}$

$\Delta DPS = DPS_t - \hat{\rho} * DPS_{t-1}$

$\Delta GAI = GAI_t - \hat{\rho} * GAI_{t-1}$

$\Delta LF = LF_t - \hat{\rho} * LF_{t-1}$

$\Delta CLN = CLN_t - \hat{\rho} * CLN_{t-1}$

$\Delta ELF = ELF_t - \hat{\rho} * ELF_{t-1}$

$\Delta EKPR = EKPR_t - \hat{\rho} * EKPR_{t-1}$

$\Delta EVA = EVA_t - \hat{\rho} * EVA_{t-1}$

Next is applied the OLS method to the model (14), considering as variables the generalized differences in order to eliminate the autocorrelation of errors expressed by the differences $\Delta\varepsilon_t = \varepsilon_t - \hat{\rho} * \varepsilon_{t-1}$, which ensures meeting the assumptions required to implement this method. Another aspect worth mentioning is that the transition to generalized differences has the negative effect of eliminating the first observation for each analysed company, which in this case would be equivalent to a reduction in the total number of observations from 99 to only 66. In order to avoid this elimination the specialized literature (Georgescu, 2014) recommends using a transformed observation of X_1[1], equal to $X_1\sqrt{1-\hat{\rho}^2}$. Considering these aspects, I present below the results of the second linear regression procedure:

Table 3. The characteristics of the generalized differences regression

Dependent Variable: ΔLNPBV
Method: Panel Least Squares
Sample: 2011 2013
Included observations: 99

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.185888	0.188500	6.291180	0.0000
ΔMARJAPB	0.543118	0.169330	3.207454	0.0019
ΔTCR	-0.002180	0.000406	-5.365431	0.0000
ΔDPS	0.095632	0.022529	4.244851	0.0001
ΔGAI	-1.109454	0.411294	-2.697470	0.0084
ΔLF	-1.047203	0.278227	-3.763841	0.0003
ΔCLN	6.99E-10	2.01E-10	3.482801	0.0008
ΔELF	-1.323462	0.418028	-3.165962	0.0021
ΔEKPR	-0.038447	0.013181	-2.916952	0.0045
ΔEVA	-1.22E-10	9.57E-11	-1.278585	0.2044

R-squared	0.543286	Mean dependent var	0.390368
Adjusted R-squared	0.497101	S.D. dependent var	0.883743
S.E. of regression	0.626710	Akaike info criterion	1.998870
Sum squared resid	34.95609	Schwarz criterion	2.261003
Log likelihood	-88.94407	Hannan-Quinn criter.	2.104930
F-statistic	11.76336	Durbin-Watson stat	1.685642
Prob(F-statistic)	0.000000		

Source: author processing[1]

[1] By X_1 we refer in this case to the observation of the year 2011 (for each company) of all variables of the regression model (the independent ones and the dependent one), noted generically with X

So, following the processing of the model in order to correct the effects of serial correlation, it presents the following estimating equation:

$$\Delta LNPBV = C(1) + C(2) * \Delta MARJAPB + C(3) * \Delta TCR + C(4) * \Delta DPS + C(5) * \Delta GAI + C(6) * \Delta LF + C(7) * \Delta CLN + C(8) * \Delta ELF + C(9) * \Delta EKPR + C(10) * \Delta EVA + \varepsilon \quad (15)$$

Estimating the parameters of the regression equation determines rewriting the model by substituting the coefficients as follows:

$$\Delta LNPBV = 1.185887 + 0.543118 * \Delta MARJAPB - 0.002180 * \Delta TCR + 0.095632 * \Delta DPS - 1.109453 * \Delta GAI - 1.047203 * \Delta LF + 6.99e\text{-}10 * \Delta CLN - 1.323461 * \Delta ELF - 0.038446 * \Delta EKPR - 1.22e\text{-}10 * \Delta EVA \quad (16)$$

As can be noticed, the value of R-Squared is lower than in the initial model (0.749), which means that in the new regression model about 54% of the variation in the dependent variable is explained by the evolution of the independent variables. It should be borne in mind that this experimental approach involves modelling the market return, being obvious that in addition to economic reasons, other irrational causes will also impact the share price (like speculation). In this sense, it appears as impossible to surprise these irrational causes into any type of model. That said, the value of 54% is regarded as a meaningful one, particularly in comparison with other similar studies[1]. At the same time, the probability associated with the F-statistic test is 0 and its value (11.763) is higher than the tabular value for 9 respectively 89 degrees of freedom (1.986) confirming that the regression equation is globally significant. At the same time, it is noticed the low level of standard errors associated with the variables of the new regression model a well as the associated probability lying below the 1% threshold for almost all of them.

Thus, it can be stated that 8 of the 9 independent variables, namely gross profit margin, term collection of receivables, dividend per share, share of fixed assets in total assets, financial leverage, net working capital, financial leverage effect and equity efficiency are significant at the 1% level, while the variable economic value added is significant at the 20% level. Although a margin of error of 20% is considered usually too high to conduct a statistical analysis (15% is most often the maximum level) in this context this variable is regarded as significant. The basis for this assertion is that the process of selection and processing undertaken until now kept in the final model only the independent variables that are relevant to explain the variation in the market return.

Analysing the coefficients assigned to the independent variables, I find that the direction of their influence remains unchanged within the processed regression model compared to the original model but the intensity of the influence changes sensitively to the downside, this aspect being considered normal given the resorting to the generalized differences of the variables.

Thus, gross profit margin has a significant positive effect (at the 1% level) on price to book value, confirming, as it was expected, that a high gross profit margin will lead to better performance on the market, measured by the share price. In other words, it can be said that if a company is able to improve its gross profit margin, the stock market will react positively and investors will buy the share in question.

The term collection of receivables has a negative effect (at the 1% level) on the stock market performance, which means that a reduced term collection of receivables will lead to improved profitability on the market, a result that confirms the expectations regarding the direction of this indicator's influence.

The dividend per share is related positively (at the 1% level) with stock exchange performance, increasing shareholder remuneration causing unequivocal market appreciation of the shares of companies that take this decision.

The share of fixed assets in total assets has a significant negative effect (at the 1% level) on the stock exchange performance of companies. This indicator represents, along with total assets or market capitalization, one of the tools of expressing the size of an enterprise, size that is considered one of the most important variables in explaining the variation in the profitability of shares on the market. In the specialized literature, researching the influence of the size of companies on their stock

1 Hobarth in his thesis "Modeling the relationship between financial indicators and company performance. An empirical study for US-listed companies" (2006) considers sufficient a value of the coefficient of determination equal to 0.24

exchange performance demonstrated that the two measures are negatively related (Banz, 1981, Basu, 1983, Fama and French, 1992), smaller companies recording superior profitability on the capital market compared with the large-scale ones. The result obtained through the linear regression model developed in this study confirms this negative relationship, explained by the fact that the growth potential is much higher in the case of smaller companies. Another argument in terms of which the relationship between the two indicators is a negative one consists of that a higher share of fixed assets in the total patrimony of the company is equivalent to a high level of depreciation expenses and the remaining net profit for the remuneration of shareholders is thus diminished.

Financial leverage presents a significant negative effect (at the 1% level) on stock exchange performance, confirming expectations that increasing the indebtedness degree of the company would bring down its value in the view of investors. This result confirms the findings of previous studies (Korteweg, 2004, Zaher, 2010), which found that investments made in companies with low financial leverage give higher returns to investors.

Net working capital is related positively (at the 1% level) with market profitability, maximizing its level constituting an essential step towards increasing its efficiency, and companies with an efficient working capital will be clearly appreciated by investors.

Financial leverage effect is negatively related (at the 1% level) with the performance of shares on the stock exchange, contrary to the expectation that a significant leverage effect would attract a higher return in terms of the capital market. This aspect is caused by the fact that Romanian companies recorded a primarily negative financial leverage effect, investors associating this indicator with a poor performance.

Equity efficiency too manifests a negative effect (at the 1% level) on the price to book value, aspect that does not necessarily constitute a surprise. Indeed, an increase in equity efficiency through sales represents an important goal to pursue for any company but, at the same time, its growth can be a signal to investors that conducting the current activity of the company relies more and more on borrowed capitals, causing them to evaluate this indicator in a negative way.

Lastly, we note that economic value added is negatively related to the market return (at the 20% level). The reasons for this fact can be likened to a boomerang effect manifested by the growth of this indicator. Thus, once the economic value added of a company rises, investors will consider themselves entitled to claim a higher rate of return for their advanced equity. Given that the risk index of the share and the average return of the market remain unchanged, being no justification for them to change, the investors' request cannot be achieved and, therefore, they decide the sale of the owned shares in order to get the compensation required from holding other stocks. Thus, takes place the diminishing of the market profitability for companies generating economic value added to a higher level.

2.1.4. Testing the validity of the processed regression model

After processing the regression model it is resumed the procedure of its validation in the light of the set of assumptions specific to linear regression, as shown below. This process is initiated through firstly testing the residuals of the regression equation, after which the attention is focused on the parameters of the resulted function.

- Assumption of uncorrelated errors, $cov(\varepsilon_i \varepsilon_j) = 0$ for $i \neq j$

In order to test this assumption we perform again the Breusch-Godfrey test, as follows:

Table 4. The result of the Breusch-Godfrey test on the regression of the generalized differences

F-statistic	2.823953	Prob. F(1,88)	0.0964
Obs*R-squared	3.078168	Prob. Chi-Square(1)	0.0793

Source: author processing

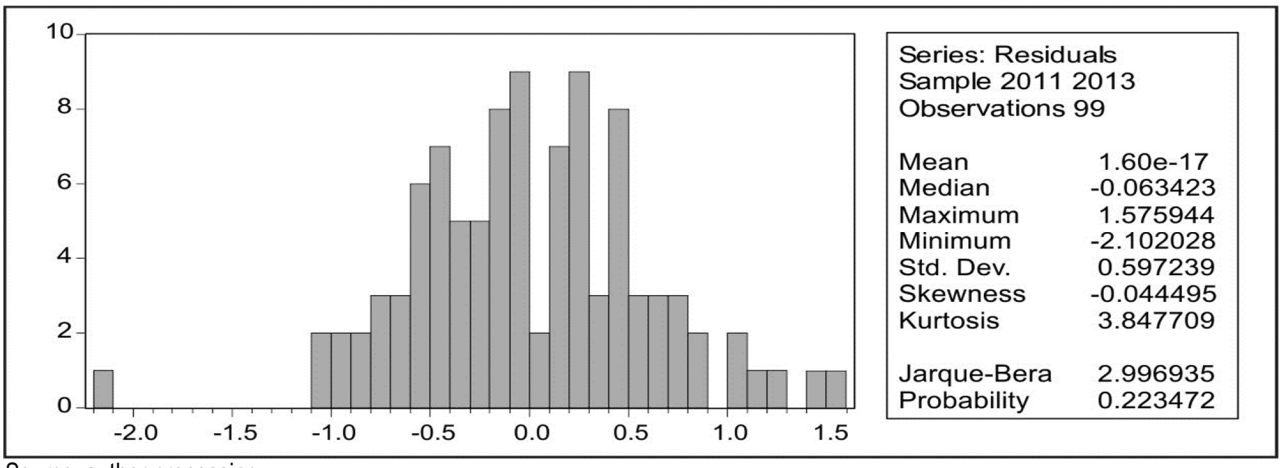
As we can see, the probability of both versions of the Breusch-Godfrey test (F and χ^2) is above the threshold of 0.05 (0.096 and 0.079), indicating, this time, to accept the null hypothesis of lack of

autocorrelation among the residuals of the regression.

- Assumption of normally distributed errors $\varepsilon \rightarrow N(0, \sigma^2)$

To test the assumption of normally distributed errors I have used both their graphical representation through histogram and the Jarque-Bera test.

Figure 4. The distribution of residuals



Source: author processing

In our case the Jarque-Bera statistics has a low value (2.996), with a probability of 0.223, therefore exceeding the threshold of 0.05, which leads to accepting the null hypothesis, of distribution of errors after a normal law. The same conclusion is provided by plotting the residuals.

- The random variable is a normal variable of average 0, $E(\varepsilon_i)=0$

In this case testing the null hypothesis is undertaken through the t-test which compares the average of residuals to 0, its acceptance or rejection resulting from comparing the test's associated probability to the critical threshold of 0.05.

Table 5. The result of the test E(εi)=0

Hypothesis Testing for RESID
Sample: 2011 2013
Included observations: 99
Test of Hypothesis: Mean = 0.000000

Sample Mean = 1.60e-17
Sample Std. Dev. = 0.597239

Method	Value	Probability
t-statistic	2.66E-16	1.0000

Source: author processing

As we can notice, the probability of the t-test is 1>0.05, which leads to the acceptance of the null hypothesis, that the average of residuals is equal to 0.

- The homoscedasticity assumption, $Var(\varepsilon_i)= \sigma^2$

In order to test the homoscedasticity of errors I have used the White test, specifying:

- H0: homoscedastic model;
- H1: heteroscedastic model.

Table 6. The result of the White test

F-statistic	0.305681	Prob. F(9,89)	0.9712
Obs*R-squared	2.968480	Prob. Chi-Square(9)	0.9655
Scaled explained SS	3.415933	Prob. Chi-Square(9)	0.9455

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Sample: 2011 2013
Included observations: 99

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.342184	0.105524	3.242721	0.0017
ΔMARJAPB^2	0.100063	0.098931	1.011437	0.3145
ΔTCR^2	8.27E-08	4.07E-07	0.203255	0.8394
ΔDPS^2	-0.000517	0.000896	-0.576934	0.5654
ΔGAI^2	0.022318	0.458742	0.048651	0.9613
ΔLF^2	0.065054	0.280731	0.231730	0.8173
ΔCLN^2	-4.02E-21	1.16E-19	-0.034552	0.9725
ΔELF^2	-0.127225	0.309400	-0.411201	0.6819
ΔEKPR^2	-1.85E-05	0.000388	-0.047609	0.9621
ΔEVA^2	-5.61E-21	1.80E-20	-0.311665	0.7560

R-squared	0.029985	Mean dependent var	0.353092
Adjusted R-squared	-0.068107	S.D. dependent var	0.598880
S.E. of regression	0.618938	Akaike info criterion	1.973914
Sum squared resid	34.09453	Schwarz criterion	2.236048
Log likelihood	-87.70877	Hannan-Quinn criter.	2.079974
F-statistic	0.305681	Durbin-Watson stat	2.373679
Prob(F-statistic)	0.971191		

Source: author processing

As we can see, EViews presents three different types of the White test on detecting heteroscedasticity, in version F, χ^2 and Scaled Explained SS, the latter being based, as its name suggests, on a normalized version of the sum of the squares explained by the auxiliary regression presented in the second part of the table above. This auxiliary regression also provides useful additional information about the source of heteroscedasticity, in the event that it is detected. In this case, all three statistical tests refute the presence of heteroscedasticity in the adjusted regression model, validating, through the associated probabilities, of 0.971, 0.965 and 0.945, the null hypothesis that the model is homoscedastic.

Once confirmed the validity of the assumptions on the residual values of the regression function, we want to also certify that its parameters provide reliable information, both in terms of explanatory variables included in the model and the coefficients associated with them, further on in our work.

- Multicollinearity

Using the OLS method to estimate the regression equation is based on the implicit assumption that the explanatory variables are not correlated with one another or, in other words that the explanatory variables are orthogonal one towards the other. Even though in the first regression model this propriety was confirmed, it is necessary that it should be also validated after the regression of generalized differences of the variables taken into consideration, through analysing the variance inflation factors (VIF).

Table 7. Variance inflation factors

Variable	Coefficient Variance	VIF
C	0.035532	NA
ΔMARJAPB	0.028673	1.091757
ΔTCR	1.65E-07	1.049186
ΔDPS	0.000508	1.099234
ΔGAI	0.169163	1.122719
ΔLF	0.077410	2.943408
ΔCLN	4.03E-20	2.857278
ΔELF	0.174748	3.991673
ΔEKPR	0.000174	2.716647
ΔEVA	9.16E-21	1.736799

Source: author processing

According to **Table 7** the variance inflation factor values are low, well below the maximum acceptable level of 10, and thus confirming the absence of collinearity between the explanatory variables of the model, which are orthogonal to each other.

Next, we want to certify the relevance of the coefficients associated to the explanatory variables, ensuring that there is no possibility for them to be null and thus the regression model to be statistically invalidated.

- The coefficients are not null

In order to test this characteristic we use the Wald test.

Table 8. The result of the Wald test

Equation: EQ02

Test Statistic	Value	df	Probability
F-statistic	11.76336	(9, 89)	0.0000
Chi-square	105.8703	9	0.0000

Null Hypothesis: C(2)=C(3)=C(4)=C(5)=C(6)=C(7)=C(8)=C(9)=C(10)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	0.543118	0.169330
C(3)	-0.002180	0.000406
C(4)	0.095632	0.022529
C(5)	-1.109454	0.411294
C(6)	-1.047203	0.278227
C(7)	6.99E-10	2.01E-10
=C9C(8)	-1.323462	0.418028
C(9)	-0.038447	0.013181
C(10)	-1.22E-10	9.57E-11

Source: author processing

Also regarding the Wald test the program displays its two possible versions F and χ^2, both having an associated probability of 0, well below the critical threshold of 0.05. This leads to the rejection of the null hypothesis, namely the coefficients of the regression equation are different from 0, the model being statistically significant.

Further, we consider necessary to check the quality of the regression model also in the light of the data set that underlies our experimental approach. As mentioned, the 33 companies whose financial and stock performance indicators could be maintained for conducting this study are carrying on different activities, falling through eight representative sectors of the Romanian economy. These companies were selected both for reasons of representativeness and due to limitations imposed by the still reduced size of the capital market in our country. What I aim next is to ensure that this heterogeneity of enterprises forming the support of the present study does not distort in any sense the representativeness of the regression model developed. To this end, I proceeded to create a structure variable in the software EViews. To this variable called Sector were assigned for each observation in part, values between 1 and 8, corresponding to the area of activity of each company, as follows:

Table 9. The construction of the variable Sector

Sector	Value	Sector	Value
Mining and quarrying	1	Wholesale and retail trade	5
Manufacturing	2	Transportation	6
Electricity, gas, steam and air conditioning supply	3	Storage	7
Constructions	4	Hotels and restaurants	8

Source: author processing

Then I analysed the vector of the regression equation's Resid variable, corresponding to the residual values of our model. Through this analysis, I tested the equality of means of these residual values, classifying the observations using the Sector variable of structure, issuing the following set of hypotheses:

H0*: The means of residuals are equal across sectors*

H1*: The means of residuals differ from one sector to another*

Accepting the null hypothesis of the equality of errors' means across sectors represents a confirmation of the fact that that the affiliation of companies to different areas of activity does not generate disturbances capable to affect the validity of the model from economic and financial perspective, residual values being, on average, the same from one sector to another.

Table 10. The result of the test for equality of means of the residuals classified by the variable Sector

Test for Equality of Means of RESID
Categorized by values of SECTOR
Sample: 2011 2013
Included observations: 99

Method	df	Value	Probability
Anova F-test	(7, 91)	1.813745	0.0940
Welch F-test*	(7, 15.2781)	1.165272	0.3766

Source: author processing

As we can see, **Table 10** gives the result of the F-test in ANOVA and Welch version, the latter allowing unequal observations in the testing. The probability associated with both tests is superior to the critical threshold of 0.05 (0.094 and 0.376), which is why we accept the null hypothesis that the means of the regression's residuals are equal across sectors, the type of activity of the analysed companies not affecting the economic and financial validation of the resulted model. A similar conclusion results from the analysis of variation:

Table 11. The analysis of variation of inter and intrasector residuals

Source of Variation	df	Sum of Sq.
Between	7	4.279905
Within	91	30.67619
Total	98	34.95609

Source: author processing

Analysing the data in the above table it can easily be ascertained that the source of the residuals' variation comes in, mostly, from within sectors (30.6), their variation between sectors being quite low (4.27).

After analysing all the assumptions for validating the estimated model, both of a general nature, characteristic of the multiple linear regression procedure and at a particular level, according to the specific data set being processed, we can say that

$$\Delta LNPBV = 1.185887 + 0.543118 * \Delta MARJAPB - 0.002180 * \Delta TCR + 0.095632 * \Delta DPS - 1.109453 * \Delta GAI - 1.047203 * \Delta LF + 6.99e\text{-}10 * \Delta CLN - 1.323461 * \Delta ELF - 0.038446 * \Delta EKPR - 1.22e\text{-}10 * \Delta EVA$$

Represents a valid model of multiple linear regression, the values of its coefficients' parameters thereof indicating progress, upward or downward, in the price to book value as determined by the increase with one unit of each of its explanatory variables, while the other independent variables are maintained at a constant level.

2.2. Testing the efficiency of the Romanian capital market using the regression model

As stated at the beginning of our scientific approach, the price to book value has been selected as the most representative stock exchange indicator to reflect how the financial performance of listed companies puts its mark on their evolution on the capital market. The PBV ratio is determined using the market price of shares registered at the end of each period in the analysed time frame. In fact, all indicators of financial performance and, thus, those used in this study, are determined based on the information contained in the annual financial statements whose deadline for submission is, according to the legislation of our country, 31st of May of the current year for statements concerning the previous year. However, after investigating the dates when the selected companies have decided to publish their annual financial statements, we found that these were available much earlier, the term days ranging from the second half of February, March or April and the first week of May. It can therefore arise the matter of determining the price to book value using a market price available at an earlier moment than the availability of information underlying the assessment of the financial performance of companies. This approach is consistent with the principles of the efficient market hypothesis developed in the second half of the twentieth century by Eugene Fama, that any relevant information, be it financial or not, once made public does no longer influence than perhaps in a marginal degree the stock quote since it was already anticipated by investors and incorporated into the market price.

Although there are many supporters of the efficient market hypothesis, being developed even several manifestation forms[1] of it, they are not few those

1 Weak form: the prices of securities already reflect all past information that are publicly available; Semi-robust form: the prices reflect all publicly available information and change instantly to reflect the new revealed public information; Robust form: additionally, the prices also reflect the inside information, unknown to the public.

whose opinion is contrary to these principles. An example of this is given by Robert Shiller, Nobel laureate for Economics in 2013, who believes, instead, that markets are not efficient, but tend to be influenced by human behaviour, behaviour that is not always rational and may cause distortion of the market price. Under these conditions, we intend to investigate whether the financial performance of companies is likely to influence the stock indicators to a greater extent when the information underlying its determination are made public, or, on the contrary, they were already anticipated by investors and reflected in the share price. To perform this task we will test the explanatory variables of the processed regression model in connection with a new dependent variable in order to conclude whether or not its variation is reflected to a higher or smaller extent by the independent variables, compared with the variation of the original variable. To this end I calculated again the level of the price to book value using, according to the above finding, the average daily rates for the periods 15th to 28th of February, 15th to 31th of March and 25th of April to 5th of May of the year following the one that the financial performance indicators refer to. The resulting data were used to create a variable similar to the original dependent variable, denoted ΔLNPBV (t + 1).

Since the model based on the generalized differences was the one that proved its validity according to all the principles of linear regression, also this variable is processed accordingly, the results of its regression in relation to the explanatory variables being presented as follows.

Table 12. The characteristics of the variable ΔLNPBV(t+1)'s regression

Dependent Variable: ΔLNPBV(t+1)
Method: Panel Least Squares
Sample: 2011 2013
Included observations: 99

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.201633	0.184415	6.515906	0.0000
ΔMARJAPB	0.562957	0.165661	3.398250	0.0010
ΔTCR	-0.002003	0.000398	-5.038923	0.0000
ΔDPS	0.095835	0.022041	4.348041	0.0000
ΔGAI	-1.100032	0.402382	-2.733804	0.0076
ΔLF	-1.064846	0.272198	-3.912026	0.0002
ΔCLN	6.46E-10	1.96E-10	3.287041	0.0015
ΔELF	-1.442834	0.408970	-3.527971	0.0007
ΔEKPR	-0.035650	0.012895	-2.764684	0.0069
ΔEVA	-7.68E-11	9.36E-11	-0.820026	0.4144

R-squared	0.549979	Mean dependent var	0.420319
Adjusted R-squared	0.504472	S.D. dependent var	0.870999
S.E. of regression	0.613129	Akaike info criterion	1.955054
Sum squared resid	33.45754	Schwarz criterion	2.217188
Log likelihood	-86.77520	Hannan-Quinn criter.	2.061114
F-statistic	12.08542	Durbin-Watson stat	1.198286
Prob(F-statistic)	0.000000		

Source: author processing

Comparing the above data to the ones from table 3 we find that the results of the regression model do not change but only in a very limited extent along with recalculating the dependent variable for time t + 1. Thus, we find an extremely low difference between the values of the coefficient of determination (0.549 to 0.543), which means that the variation of the variable ΔLNPBV (t + 1) is explained by only 0.6% more than the variable ΔLNPBV on account of the independent variables from the model. At the same time, also the values of coefficients of the regression equation parameters are maintained at an extremely close level, which shows that the influence of financial performance indicators was already incorporated into the market price since the end of the reporting period.

We can therefore affirm through testing the linear regression model, that the capital market in Romania is a sufficiently efficient market, on which the information likely to appoint the financial performance of companies are, mostly, expected by investors, their effective publication having an indistinguishably effect on the profitability of shares on the market. This does not appear to be surprising given the constant efforts of Bucharest Stock Exchange to improve the transparency and standardization in terms of issuers, investors being much better and more quickly informed of the developments in the company whose shares are of interest to them. Moreover, publicly listed companies are obliged to the preparation and publication of quarterly and half-year financial statements according to the International Financial Reporting Standards, so that the correct estimation of the information comprised in the financial statements at the level of the entire financial exercise constitutes an approach easy to undertake. Of course more accurate records on capital market efficiency can be achieved when the analysis involves also non-financial indicators but such a direction will be pursued within a further research. In addition, we can state that if financial information, for which processing is laborious and time-consuming, requiring at least mid-level knowledge of the economic and financial theory, are incorporated quickly into the market price of the shares, then even more the action sphere of the phenomenon will include also non-financial information that involve, obviously, an easier interpretation.

That said, the regression model of the market profitability of shares through the financial performance has high practical utility, serving both the interests of the management of listed companies and those of their current and potential investors. Statistically and economically validated, the regression model constitutes a genuine management tool, providing managers for the opportunity to meet more effectively shareholders' expectations of maximizing the value of their wealth, by taking action to improve financial performance parameters that are considered relevant on the capital market. At the same time, the regression model takes on the value of an effective forecasting instrument, creating conditions for current and potential investors of listed companies to estimate with a significant level of accuracy the evolutionary tendencies of market return for the shares they are interested in. Thus, they have the possibility to adjust accordingly their investment strategy and the structure of their held portfolio.

Conclusions

The essential purpose of initiating our experimental approach aims to offer new perspectives on an issue that concerns specialists within the economic and financial domain of over six decades, ie, elucidating the implications of financial indicators of performance on the profitability on the capital market.

For this purpose I proceeded to substantiate a regression model of market profitability in terms of financial performance, considering the indicator values for 33 companies listed on BSE, over the last three years of activity for which there was data availability at the initiation moment of the study, namely 2011-2013. The analysis was performed using the software package EViews version 7.0, taking into account 38 financial performance indicators and the most representative stock exchange indicator to illustrate the market profitability of shares, i.e. the price to book value.

Developing such a model presents a level of much higher utility for the economic and financial theory and practice in our country as it was ascertained the notable expansion of the Romanian capital market, whose visibility will be particularly pronounced among investors along with its reclassification as emerging capital market in the near future.

Thus, I proceeded to generate the initial regression model having as independent variables the indicators of financial performance and as dependent variable the price to book value in logarithmic form, its processing being necessary to correct excessive fluctuations

manifested in the data series. By assessing the quality of the model's linear adjustment we obtained the following regression equation:

*LNPBV = 2.775255 + 0.571253*MARJAPB - 0.003023 * TCR + 0.099164 * DPS - 2.528167*GAI - 1.408571*LF + 8.565735e-10 * CLN - 1.687388 * ELF - 0.042221 * EKPR - 2.161144e-10 * EVA + ε*; through which a percentage of about 75% of the variation in the resulting variable is explainable through the factorial variables (R^2 = 0.749).

Since the approach of testing the predictive value of the model estimated through the analysis of the fundamental assumptions specific to multiple linear regression confirmed the significant presence of serial correlation within the regression model, it has imposed the need to take measures in order to correct these correlations and revise the initial model. Following the implementation of corrective measures with the help of the generalized differences procedure, the regression model of market profitability in terms of financial performance has become:

∆LNPBV = 1.185887 + 0.543118∆MARJAPB - 0.002180*∆TCR + 0.095632*∆DPS - 1.109453*∆GAI - 1.047203*∆LF + 6.99e-10*∆CLN - 1.323461*∆ELF - 0.038446*∆EKPR - 1.22e-10*∆EVA+ ε*; where approximately 54% of the variance in the dependent variable is explained by the evolution of independent variables (R^2 = 0.543), the percentage being considered significant. This statement is substantiated by the very nature of our experimental approach based on modelling market return, being obvious that in addition to economic reasons, also other irrational causes, like speculation, will influence the price of shares on the market. Or surprising these irrational causes in any type of model constitutes an approach impossible to achieve in practice.

After analysing all the assumptions for validating the estimated model both of a general nature, characteristic of the multiple linear regression procedure and at a particular level, according to the specific data set being processed, we can state that the new regression model represents a both statistically and economically viable tool, with the help of which is quantified the influence of financial performance of companies on the market profitability of shares, in the context of the practical reality of the Romanian business environment and capital market.

Once validated, the regression model constituted the essential tool for meeting the last objective of our scientific research approach, to test the efficiency of the Romanian capital market. Achieving this goal has been implemented by investigating the extent to which the financial performance of companies is likely to influence the stock market indicators to a greater extent when the information underlying its determination are made public, or, on the contrary, they were already expected by investors and reflected in the share price. After conducting such scientific activities we drew the conclusion that the capital market in Romania is a sufficiently efficient market, on which the information likely to appoint the financial performance of companies are largely expected by investors, their effective publication having an almost imperceptible effect on the market profitability of shares.

Based on all the issues presented we conclude that researching the direction and intensity of the implications of financial performance on stock exchange indicators of listed companies as well as quantifying these implications through a viable and effective instrument represents an important step to increase the efficiency and accuracy of formulation of management strategies serving in this way, both the interests of listed companies and those of the investors on the capital market.

The complexity of the addressed theme allows its enrichment by drawing further research directions that may, for example, imply quantifying the non-financial aspects that characterize the economic activity of listed companies and including this information in the regression model.

REFERENCES

1. Ball, R. and Brown, P. (1968), An Empirical Evaluation of Accounting Income Numbers, *Journal of Accounting Research*, vol. 6, no. 2, pp. 159-178, DOI http://dx.doi.org/10.2307/2490232 .
2. Banz, R.W. (1981), The relationship between return and market value of common stocks, *Journal of Financial Economics*, vol. 9, no. 1, pp. 3-18, DOI http://dx.doi.org/10.1016/0304-405x(81)90018-0 .

3. Basu, S. (1983), The relationship between earnings yield, market value and return for NYSE common stocks: Further evidence, *Journal of Financial Economics*, vol. 12, pp. 129-156, DOI http://dx.doi.org/10.1016/0304-405x(83)90031-4 .
4. Beaver, W.H. and Dukes, R.E. (1972), Interperiod tax allocation, earnings expectations, and the behavior of security prices, *The Accounting Review*, vol. 47, pp. 320-333.
5. Beaver, W.H., Griffin, P.A. and Landsman, W.R. (1982), The incremental information content of replacement cost earnings, *Journal of Accounting and Economics*, vol. 4, pp. 15-39, DOI http://dx.doi.org/10.1016/0165-4101(82)90004-0 .
6. Biddle, G., Bowen, R. and Wallace, J. (1997), Does EVAs beat earnings? Evidence on the associations with stock returns and firm values, *Journal of Accounting and Economics*, vol. 24, pp. 301-336, DOI http://dx.doi.org/10.1016/s0165-4101(98)00010-x .
7. Board, J.L.G. and Day, J.F.S. (1989), The Information Content of Cash Flow Figures, *Accounting and Business Research*, vol. 12, no. 20, pp. 3-11, DOI http://dx.doi.org/10.1080/00014788.1989.9729389 .
8. Buchheit, S. and Kohlbeck, M. (2002), Have Earnings Announcements Lost Information Content?, *Journal of Accounting, Auditing & Finance*, vol. 17, no. 2, pp. 137-153.
9. Buşe, L. and Ştefan, I.O. (2014), *Study on the Correlation between Economic and Financial Performance and Stock Exchange Performance in Romanian Companies from Oil and Retail Trade Industries,* 21st International Economic Conference of Sibiu, Prospects of Economic Recovery in a Volatile International Context: Major Obstacles, Initiatives and Projects, Procedia Economics and Finance, Elsevier, vol. 16, pp. 149-159.
10. Carp, M. and Mironiuc, M. (2014), Fundamentarea deciziilor investiţionale prin studii de asociere între indicatorii financiari tradiţionali and indicatorii bursieri, *Audit Financiar*, vol. 12, no. 113/5, pp. 37- 47.
11. Cho, H.J. and Pucik, V. (2005), Relationship between Innovativeness, Quality, Growth, Profitability and Market Value, *Strategic Management Journal*, vol. 26, no. 6, pp. 555-575, DOI http://dx.doi.org/10.1002/smj.461.
12. Ciobanu, A. (2004), *Analiza relevanţei indicatorilor financiari de măsurare a performanţelor întreprinderii,* Academia Română, Institutul de Cercetări Financiare and Monetare „Victor Slăvescu", vol. 1, pp. 139-150.
13. Ciobanu, A. (2006), *Analiza performanţei întreprinderii*, Bucureşti: Editura ASE.
14. Fama, E.F. and French, K.R. (1992), The Cross-Section of Expected Stock Returns, *The Journal of Finance*, vol. 157, no. 2, pp. 427-465, DOI http://dx.doi.org/10.1111/j.1540-6261.1992.tb04398.x.
15. Fernandez, P. (2015), *EVA and Cash Value Added Do Not Measure Shareholder Value Creation,* SSRN Papers, available at http://ssrn.com/abstract=270799.
16. Georgescu, V. (2014), *Curs de Econometrie*, Editura Sitech, Craiova.
17. Hobarth, L. (2006), *Modeling the relationship between financial indicators and company performance. An empirical study for US-listed companies,* Doctoral Thesis, WU Vienna University of Economics and Business.
18. Hopwood, W.S. and Schaefer, T.F. (1988). Incremental information content of earnings- and nonearnings-based financial ratios, *Contemporary Accounting Research*, vol. 5, no. 1, 318-342, DOI http://dx.doi.org/10.1111/j.1911-3846.1988.tb00708.x.
19. Korteweg, A. (2004), *Financial leverage and expected stock returns: evidence from pure exchange offers*, available at SSRN: http://ssrn.com/abstract=597922.
20. Kothari, S.P. (2001), Capital markets research in accounting, *Journal of Accounting and Economics*, vol. 31, pp. 105-231, DOI http://dx.doi.org/10.1016/s0165-4101(01)00030-1.
21. Kusuma, H. (2014), The Incremental Information Content of Cash Flow Statement: An Australian Empirical Investigation, *International Journal of Business Administration*, vol. 5, no. 4, pp. 90-102, DOI http://dx.doi.org/10.5430/ijba.v5n4p90.

22. Lev, B. (2001), *Intangibles: Management, Measurement and Reporting,* Washington D.C.: The Brookings Institution.
23. Livnat, J. and Zarowin, P. (1990), The Incremental Information Content of Cash-Flow Components, *Journal of Accounting and Economics*, vol. 13, no. 1, pp. 25-46, DOI http://dx.doi.org/10.1016/0165-4101(90)90066-d.
24. Patell, J. and Kaplan, R. (1977), *The Information Content of Cash Flow Data Relative to Annual Earnings.* Working paper, Stanford University (August).
25. Pindyck, R.S. and Rubinfeld, D.L. (1998), *Econometric Models and Economic Forecasts*, Fourth Edition, Irwin, McGraw-Hill.
26. Schaefer, T. and Kennelley, M. (1986), Alternative Cash Flow Measures and Risk-Adjusted Returns*, Journal of Accounting, Auditing and Finance*, pp. 278-287.
27. Zaher, T.S. (2010), *Performance of debt free firms*, Managerial Finance, Vol. 36, No. 6, pp. 491-501, DOI http://dx.doi.org/10.1108/30743581080001333.
28. Zaretzky, K. and Zumwalt, J.K. (2007), Relation between distress risk, book-to-market ratio and return premium, *Managerial Finance*, vol. 33, no. 10, pp. 788-797, DOI http://dx.doi.org/10.1108/03074350710779232.