ANALYSIS OF THE AVERAGE SHARE PRICE OF COMPANIES LISTED ON BSE DEPENDING ON THE PROFIT AND EXCHANGE SEGMENT. DIFFERENT TECHNIQUES OF GENERAL LEAST SQUARE AND COMPUTING COEFFICIENT COVARIANCE FOR MEAN PRICE EQUATION ESTIMATION

Teodor Hada[1]
Emil Olteanu[2]
Iulian Bogdan Dobra[3]

ABSTRACT: *The main purpose in our scientific approach is the analysis of the evolution of the share price of Romanian companies listed on the Bucharest Stock Exchange in 2007-2013, and how this reacts to the registered profit. The forecast evaluation details for adjusted sample 2008-2013 indicated that the Bias and Variance Proportions are small, which implies that the error of prediction is concentrated in covariance proportion and shows that the forecast is quite "acceptable". The Theil Inequality Coefficient gives an acceptable indicator in measuring the "fit" of the model than the Mean Absolute Percentage Error. Finally the comparison between real data and the forecast outlined the fact that the PriceF reacts abnormally. Therefore analysis shows that if Profit increases, the stock price falls (i.e. Criterion 4 - PriceF&Profit) in almost 48% cases, compared with the real situation of about 24% cases (i.e. Criterion 4 - Price&Profit). In conclusion, even if we managed to translate the low prices of financial-economic crisis period into "normal capital market time", using the model, one may notice that in 2009-2013 the cases number of shares that recorded higher prices grow up to 113 instead of 77 (i.e. Appendix C). Yet if we look at the evolution of Price&Profit / PriceF&Profit tandem we note that the profit recorded by the company is not a strength factor for the dynamic average share price of the Romanian listed companies.*

Keywords*: share price, profit, GLS Weights, robust coefficient covariances, ANCOVA*

JEL code*: G11, G12, G14*

Introduction

Motto: "The curtain is drawn over the Pre-Global Era of Adversity and the first rays of the Global Era of Consensuality are starting to shine. The world is caught at once by the pains of unravelling and the pains of creation. It loses and it wins" (Marin Dinu, 2014).

In most of the decisions that investors take, on the capital market, they use as a measurement tool the Market Price per Share which is a financial metric to determine whether or not to purchase a stock.

Among the factors that determine the evolution course of shares there can also be found the issuer's financial and economic situation, characterized by the growth rate of financial results. Amid other market value ratios in financial ratio analysis, Price to Earnings Ratio (i.e. PER) shows how much investors are willing to pay for shares of stock of the company per a monetary unit of

[1] "Bogdan Vodă" University, Faculty of Economical Sciences, Cluj Napoca, România, *teohada@yahoo.com*
[2] "1 Decembrie 1918" University of Alba Iulia, Faculty of Engineering and Exact Sciences, Alba Iulia, România, *olteanu.emil@yahoo.com*
[3] "1 Decembrie 1918" University of Alba Iulia, Faculty of Economics, Alba Iulia, România, *dobra.iulian@uab.ro*

reported profit. This indicator can be computed (Prisăcariu, et al, 2008, p.200) based on the previous financial year profit, a method which is used by most publications which publish daily information about the evolution of listed shares, or the profits made by the issuer in the last 4 quarters.

Also, there are authors who have analysed the effect of profit, together with other indicators (e.g. interest rates) on the share price. Related to this, the famous expert on financial economics and global asset allocation Andrew Smithers revealed (2009): if we look independently at the separate impact of profit and interest rate changes on share prices, we might find that a relationship which appears to exist between interest rates and share prices is really due to a change in profits.

Informational testing events researches highlight the possibility of obtaining excess profits to those considered normal, in terms of the level of systematic risk characteristic of assets, by their trading based on available public information (Dragotă et al, 2009, p.161).

Even if this is not directly the scientific goal of our approach, however, we consider appropriate highlighting the effect on the share price of dividend taxes from the finance literature. Harris et al. (2001) examined the impact of dividend taxes on firm value and discovered consistent evidence with the hypothesis that a considerable segment of these taxes are capitalized in share prices.

The authors of the present article consider that profits remain an important factor in the decision of capital market investors. At the same time the relationship between price and profit can be viewed, by the company, as an "intermediatus" between company management decisions and global market, between the firm and the financial statements of the beneficiaries (i.e. investors), respectively.

Consequently, the main objective of our scientific approach is the analysis of the share price of Romanian companies listed on the Bucharest Stock Exchange (i.e. BSE) in 2007-2013, and how this reacts to the registered PROFIT by these entities. Due to adjustments made during the period under analysis and comparison 7 to 4 years and the number of observations from 245 to 140. In the final stage of our research we wanted to make a comparison between real data and forecast (i.e. Price & Profit and PriceF & Profit) for the period 2009-2012.

Literature review

It is well known that the price of quoted shares has been analysed through several variables in the specialized literature. According to Chakhovich (2013, p.149) the share price could be explained as long-term from the executive perspective (i.e. treating this issue in terms of three points of view, namely: linguistic, functionally practice-oriented and functionally morality-related and as short-term oriented (i.e. lack of deliberation and lack of imagination being the two key factors that strengthen this definition).

Gordon (1957) underlined, in our opinion a reasonable fact, which the fluctuation in price between common shares is of significant awareness for: the discovery of profitable investment opportunities, for the guidance of corporate financial policy, and for the understanding of the psychology of investment behaviour.

Weitzman and Kruse (1990) have conducted thorough research on the studies (i.e. six studies elaborated since 1960 until 1987) that compare profit-sharing and non-profit-sharing companies on measures of financial performance. They emphasized that the first entities have higher means or median values for performance indexes than the others do.

In efficient market theory the assumption that investors adjust immediate price assets so as to reflect the new information is also noticed Prisăcariu, et al, 2008, p.218).

American economist and Nobel laureate in Economics (i.e. 2013) Eugene Francis Fama (1970) has characterized an efficient market as a market in which share prices "reverberate" all accessible information. Also, Nobel Memorial Prize in Economic Sciences awarded, Canadian-American financial economist, Myron Samuel Scholes (1972) emphasizes: a market that is efficient

prevents traders with no special information from making abnormal profit. New information that becomes available is quickly reflected in a security's price (pp. 182-183).

Associate Professor Mike Metcalfe (1995) outlines in detail the profit forecast issue in his book Forecasting Profit. Dr. Metcalfe found a positive relationship between profit forecasts and prior share price changes.

Johnson and Zhao (2009) highlighted that investors react to negative earnings. They revealed that "negative earnings surprises" are supposed to induce an austere share price consequence because the disappointment to at least meet the anticipation of the market increases doubt between investors about the fundamental strength of the company.

In the scientific approach conducted by Mlonzi, Kruger and Nthoesane (2011), on the share price reaction to earnings announcement on the JSE-AltX, they analysed all the companies listed on the JSE-ALtX[4] that announced annual earnings between 1 January and 31 December 2009. They concluded that there is considerable negative share price reaction to earnings announcements on the ALtX stock market (i.e. both 16-day and five-day event periods lead to significant cumulative loss of 49.9% and 16.3%, respectively).

If we look in financial literature how earnings forecast announcement reacts, we can find some effects of this on share prices. Czerwonka (2009) finds that forecasts of improving financial results have positive influence on share prices for a short period of time.

It is well known that in the 1980's there has been a torrent of new research looking for forecastability, using new approaches, data sets, extended series and new predictors. In this sense, a baseline survey is the book of authors Guimaraes, Rui M.C., Kingsman, Brian G., Taylor, Stephen (1989).

Leading labour economist David G. Blanchflower (1991) in his article The Economic Effects of Profit Sharing in Great Britain made an inquiry about the effect The Incidence of Sharing Schemes at British establishments (i.e. Private manufacturing, Private non-manufacturing). Using data from 1980 until 1984 Workplace Industrial Relations Surveys, he found a significant growth in employee share ownership and that profit sharing is not at all uncommon in British establishments.

So synthesizing the brief incursion in the finance literature, it can be concluded that the profit can influence a number of microeconomic indicators and also, hypothetically, the share price.

Research design and methodology

All analysed information on indicators (i.e. profit, share price) was collected from the BSE and Ministry of Public Finance (i.e. MoPF) website.

During the reported period companies listed on BSE were categorized according to the specific conditions for admission to trading on a regulated market of shares (i.e. Law no. 297/2004[5] on the capital market and regulations issued by BSE) as follows: CATEGORY 1, Financial Investment Funds - FIF, Category 2 and UNLISTED.

The total number of economic agents which are the subject of our research and listed on the BSE exchange segment, amounts to 100. It should be noted that companies from Category II, have been subdivided into Category II - Services and Category II – Manufacturing taking into account their main activity.

The period subjected to analysis is 2007 - 2013, during which we have identified 585 companies' financial statements reported to the BSE and MoPF. The difference of 15 financial statements to the total of 600 could not be identified due to the fact that they were not found on the websites of both institutions.

[4] The AltX is the Johannesburg Stock Exchange's board for good quality, small and medium-sized high-growth companies.

[5] Law no. 297/2004 on the capital market, published in the Official Gazette no. 571 of 29.06.2004, republished and amended.

Regarding the Profit independent variable we mention that although there were companies that reported profit in the period under review, these were interspersed with period's losses. Also it was noted that some listed companies were either in bankruptcy or in insolvency and reorganization. So out of 100 companies analysed, only 45 have achieved positive results in 2007-2013, though 10 of them were not included in the analysis model because: 8 companies were listed on the BSE at different times during the seven years, a company has carried reports of financial statements in euros, as part of a group of companies, and a company has conducted primary public offering (i.e. 2007). Finally, the number of companies that were included in the multiple regression model is 35.

Concerning the Price dependent variable, we mention the following aspects: After processing the data it was found that there are three companies that had high values of price in period, values which could influence both the statistical significance of the variables in the regression model that we want to elaborate, and coefficient of multiple determination for multiple regression.

Regarding the dynamics of the share price it has been found that in 2010 (i.e. 16 drops) and in 2011 (i.e. 28 drops) there have been most decreases over the previous year (i.e. see Appendix C) ,in 2009 (i.e. 28 increase) and in 2012, respectively (i.e. 23 increases) the latter having increased the most in value of listed shares from the previous period.

In our scientific approach we want to determine the average price recorded by companies listed on the BSE (i.e. 35), with a total of 245 observations. The study focuses on determining the average price according to the following independent variables: Profit (i.e. quantitative regressor), FIF, Category 1, Category 2 (classified in Category 2 - Services and Category 2 - Production) and Unlisted (i.e. qualitative regressors/ dichotomous variables). Therefore the regression model contains two quantitative variables (i.e. Price, Profit) and five qualitative variables (i.e. CATEGORY_I, FIF, SERVICES, PRODUCTION, and UNLISTED). In this manner the specific function is:

PRICE= F (FIF, SERVICES, PRODUCTION, UNLISTED, PROFIT) (1.0)

For comparing the average values of the price, it was used a framework of regression analysis. Also we have tried try to use the ANCOVA model which provides a method of statistically controlling the effect of quantitative regressor (i.e. covariate). In order to complete the analysis it was considered the following model:

$$Z_i = \beta_1 + \beta_2 \cdot D_{2i} + \beta_3 \cdot D_{3i} + \beta_4 \cdot D_{4i} + \beta_5 D_{5i} + \beta_6 X_i + u_i \quad (1.1)$$

Where:
Zi = (average) share price of company in exchange segment i;
Xi = Profit of companies with listed shares;
D2i = 1 if the company is a Financial Investment Funds (i.e. FIF);
= 0 otherwise (i.e., in other exchange segment);
D3i = 1 if the company is in Category II - Service (i.e. SERVICE);
= 0 otherwise (i.e., in other exchange segment);
D4i = 1 if the company is in Category II - Production (i.e. PRODUCTION);
= 0 otherwise (i.e., in other exchange segment);
D5i = 1 if the company is in Unlisted category (i.e. UNLISTED);
= 0 otherwise (i.e., in other exchange segment);

Data were inserted in a balanced panel workfile and subsequently processed using Eviews 7 software application. Therefore according to the application software, into Equation Estimation, Least Squares Panel Options, we had the possibility to specify three additional panel specific estimation settings:

a) Effects specification (i.e. cross-section and period) for this option we selected "none" in every specification;
b) Weights –Generalized Least Squares Weights - in our software package we may estimate GLS specifications that account for various patterns of correlation between the residuals. There are five basic variance structures that we may specify: no weights, cross section specific heteroskedasticity, period specific heteroskedasticity, contemporaneous covariances, and between period covariances (i.e. No weights, Cross-section weights, Period weights, Cross-section SUR, Period SUR). In stage three we selected Period weights, in stage four, five and six Period SUR, respectively.

It is well know that period specific heteroskedasticity allows for a different residual variance for each period, in our case 2007-2013. Residuals among different cross-sections and diverse periods are still assumed to be 0 therefore:

$$\begin{aligned} E\left(u_{it}u_{jt} \mid X_t^{'}\right) &= \sigma_t^2 \\ E\left(u_{is}u_{jt} \mid X_t^{'}\right) &= 0 \end{aligned} \quad (1.2)$$

For all i, j, s and t with s ≠ t, where contains Xt and, if estimated by fixed effects, the relevant cross-section or period effects (δ, γt).

Accepting the period specific residual vectors, we could rewrite the main presupposition as:

$$E\left(u_t u_t' \mid \mathrm{X}_\mathrm{t}^{'}\right) = \sigma_t^2 I_M \text{, where t = 1 … 7 (1.3)}$$

Where: I_M is identity matrix.

Period SUR allows for random heteroskedasticity and serial correlation between the residuals for a given cross-section, in our case 35. Hence, we undertake that:

$$\begin{aligned} E\left(u_{is}u_{it} \mid \mathrm{X}_\mathrm{i}^{'}\right) &= \sigma_{st} \\ E\left(u_{is}u_{jt} \mid \mathrm{X}_\mathrm{i}^{'}\right) &= 0 \end{aligned} \text{, where t = 1 … 7 (1.4)}$$

For all i, j, s and t with i ≠ j.

Utilizing the cross-section specific residual vectors, we may rewrite this supposition as:

$$E\left(u_i u_i' \mid \mathrm{X}_\mathrm{i}^{'}\right) = \Omega_T \quad (1.5)$$

for all i, where: T = 7

$$\Omega_T = \begin{pmatrix} \sigma_{11} & \sigma_{12} & \cdots & \sigma_{1T} \\ \sigma_{21} & \sigma_{22} & & \vdots \\ \vdots & & \ddots & \\ \sigma_{T1} & \cdots & & \sigma_{TT} \end{pmatrix} \text{, where: T = 7}$$

c) Coefficient covariance method (i.e. Ordinary, White cross-section, White period, White diagonal, Cross-section SUR -PCSE, cross-section weights -PCSE, period SUR -PCSE and Period weights -PCSE) for this criteria we specified different methods for computing coefficient covariances thus: for second and third stage we selected from the various robust methods available for computing the coefficient standard errors the White cross-section (i.e. d.f. corrected); in fourth, fifth and sixth stage we designated White period (i.e. d.f. corrected)

Long and Ervin (1998) highlighted that tests based on a Heteroscedasticity Consistent Covariance Matrix (i.e. HCCM) are consistent and considered, from specific literature that treats this estimator, that there are three additional small sample versions of the HCCM as follow: a) HC1 (David V. Hinkley, 1977, pp. 285-292) resulted from a calculus by a degree of freedom correction of HC0 (White's, 1980, pp. 817-838), b) HC2 (MacKinnon and White, 1985, pp. 53-7) elaborated taking in account that the covariance matrix will be a less biased estimator, and c) HC3 (MacKinnon and White, 1982).

Regarding HC1, we considered the formula of Long and Ervin (1998), based on Lemma 2 -Consistency of variance estimate by Hinkley (1977), which maximized every residual by a factor of [n/ (n−k)]2, where k is the number of estimated parameters, and we outlined the following estimator:

$$HC1 = \left(\frac{n}{n-k}\right)\left(\sum_t X_t' X_t\right)^{-1}\left(\sum_t X_t' diag\left(u_t^2\right) X_t\right)\left(\sum_t X_t' X_t\right)^{-1} \quad (1.6)$$

Therefore in case of the White period method we defined the next estimator:

$$HC1 = \left(\frac{n}{n-k}\right)\left(\sum_i X_i' X_i\right)^{-1}\left(\sum_i X_i' diag\left(u_i^2\right) X_i\right)\left(\sum_i X_i' X_i\right)^{-1} \quad (1.7)$$

Noticing the high level of profits recorded by the companies in CATEGORY I (i.e. 401 million in 2007-2013) than those obtained by the other types of companies (i.e. 109 million FIF, Category II - PRODUCTION SERVICE and 5.9 million, UNLISTED category 5.1 million over 2007-2013), in our model, we decided to consider companies from CATEGORY I as the benchmark category (i.e. β1).

In our research we considered that the error term satisfies usual OLS assumptions, on taking expectation of (1.1) on both sides, therefore:

Mean share price of companies from Financial Investment Funds – FIF:

$$E\left(Z_i \mid D_{2i}=1, D_{3i}=0, D_{4i}=0, D_{5i}=0, X_i\right) = \beta_1 + \beta_2 + \beta_6 X_i \quad (1.8)$$

Mean share price of companies from Category II - SERVICE:

$$E\left(Z_i \mid D_{2i}=0, D_{3i}=1, D_{4i}=0, D_{5i}=0, X_i\right) = \beta_1 + \beta_3 + \beta_6 X_i \quad (1.9)$$

Mean share price of companies from Category II - PRODUCTION:

$$E\left(Z_i \mid D_{2i}=0, D_{3i}=0, D_{4i}=1, D_{5i}=0, X_i\right) = \beta_1 + \beta_4 + \beta_6 X_i \quad (1.10)$$

Mean share price of companies from UNLISTED category:

$$E(Z_i \mid D_{2i}=0, D_{3i}=0, D_{4i}=0, D_{5i}=1, X_i) = \beta_1 + \beta_5 + \beta_6 X_i \quad (1.11)$$

Mean share price of companies from CATEGORY I:

$$E(Z_i \mid D_{2i}=0, D_{3i}=0, D_{4i}=0, D_{5i}=0, X_i) = \beta_1 + \beta_6 X_i \quad (1.12)$$

In the first stage there were introduced 245 observations in a balanced panel workfile type, with 35 cross-sections and seven period included (i.e. 2007-2013 sample). The selected method in equation estimation settings was the Least Squares (i.e. Panel Least Squares Method).

In order to "improve" covariates probability, and considering relation (1.6) in second stage of our research in Least Square Panel Options for equation (1.1) we have chosen White cross-section standard errors & covariance for computing coefficient covariance's method (d.f. corrected). Where the total number of stacked observations are 245 for each of the variables in the model, and the total number of estimated parameters are 6 (i.e. C, PROFIT, CATEGORY_I, SERVICE, PRODUCTION, and UNLISTED).

In the third stage, due to the fact that the average price of the 35 companies traded on the BSE, decreased from one year to another (i.e. from 21.2 lei in 2007 to 10.39 in 2013, see Fig. no. 1), and there are a number of three companies that registered a price well above the average, respectively, which has determined a forced increased of the average price 3-4 times each year. At the same time the average profit made by companies decreased from year to year in the period 2007-2010, thus reaching from an average profit of 89.09 million lei, in 2007, to 81.55 million lei in 2010.

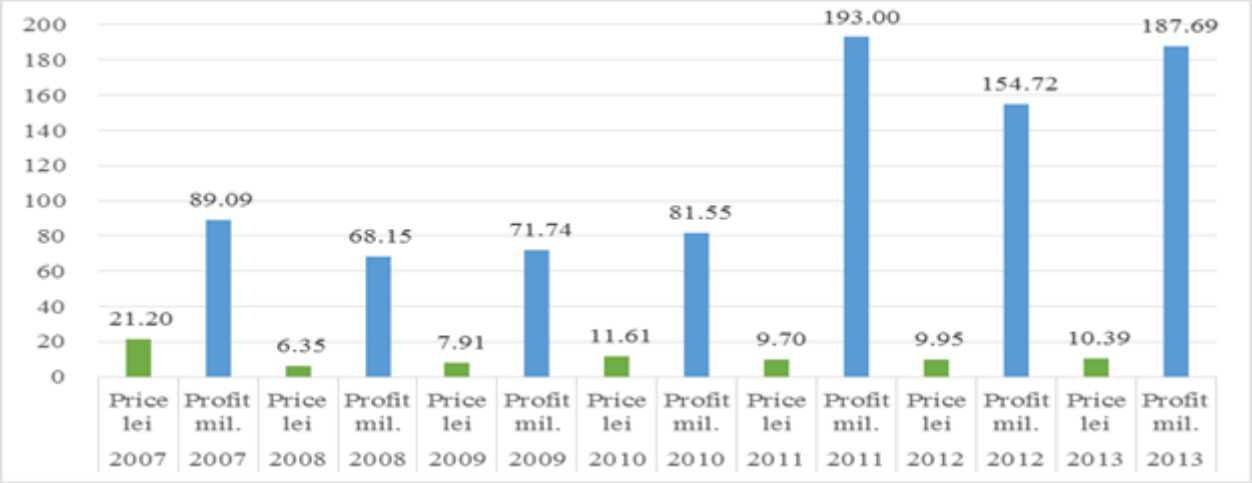

Figure 1. Average Price and Average Profit of companies listed on BSE in 2007-2013
Source: authors' own processing data from the website of BSE and MoF from 2007-2013

In those circumstances we wanted to see the effect of Period weights for Generalized Least Squares (i.e. GLS) Weights in setting the panel equation. Consequently, in Least Square Panel Options for equation (1.1), we specified settings for GLS Weights as follows: Period weights (Linear estimation after one-step weighting matrix – relation (1.3)) and White cross-section standard errors & covariance (i.e. df corrected) has computing coefficient covariance method (i.e. relation (1.6)).

According to Professors Mitchell Peterson (2006) and Jeffrey Wooldridge (2002) the GLS estimates are more effective than the OLS estimates (n.a. either with or without firm dummies) when the residuals are correlated.

In stage IV, we wanted to see if the economic crisis and financial record in the Romanian economy (i.e. 2009 and 2010) could have an effect on the equation estimation, on the average price

of shares listed on BSE, on the coefficient the determination (i.e. R2), respectively. Consequently we have made an adjustment to the initial sample (i.e. 2007-2013), and at the same time we have considered useful introduction to a new explanatory variable in the regression model, which is the Price of the previous period. It is known that regression models can introduce AR (1) terms, in our case we decided to get such a term (i.e. Price (-1)).

Based on specific notation for the general first-order autoregressive model (i.e. AR (1)) (Startz, 2015:321) we established a specific regression for the dependent variable in our study case, of course, without dummy variables, which is highlighted as follows:

$$\begin{aligned} Z_{it} &= X_{it}'\beta + u_{it} \\ u_{it} &= \rho u_{i,t-1} + \varepsilon_{it} \\ 0 &\leq \rho < 1 \end{aligned} \quad (1.13)$$

The error term for observations from 2007-2013, uit, transmits over part of the error from the previous period (i.e. 2007-2012), ρut – 1, and adds in a new innovation, eit.

Therefore from equation (1.1.), the first-order autoregressive model (1.13), respectively, we obtained the following regression model:

$$Z_{it} = \beta_1 + \beta_2 \cdot D_{2i} + \beta_3 \cdot D_{3i} + \beta_4 \cdot D_{4i} + \beta_5 D_{5i} + \beta_6 X_{it} + \rho Z_{i,t-1} + u_i + \varepsilon_{it} \quad (1.14)$$

Hence, at this stage, in Least Square Panel Options for equation (1.14), we specified settings for GLS Weights: Period SUR (i.e. Linear estimation after one-step weighting matrix –relation (1.5)), and for computing coefficient covariance's method: White period standard errors & covariance, respectively (df corrected) –relation (1.7).

In the 5th and 6th stage we tried to see if observations of listed companies registered during the economic and financial crisis (i.e. 2009 and 2010) will have any influence on the values of coefficients, standard error (i.e. se) , t-statistic (i.e. t), statistical significance of variables, and coefficient of determination, respectively. Consequently, in the fifth stage we adjusted the sample by excluding data's from year 2009, and in the sixth stage by removing data's year 2010. In Least Square Panel Options for equation (1.14), we specified settings for GLS Weights: Period SUR (i.e. Linear estimation after one-step weighting matrix –relation (1.5)), and for computing coefficient covariance's method: White period standard errors & covariance, respectively (df corrected) – relation (1.7)

Comparation beetwen real data and forecast from the model for 2009-2012

1. At the end of our research we highlighted a comparison between the actual data of the evolution pair Price&Profit. In the first case we have taken into account the real data evolution of the price (i.e. current year minus previous year) and profit growth in 2009-2012.
2. In the second case it was analysed pair PriceF&Profit, but with information data from forecasting model using (1.18) from stage four. The forecast sample is 2007-2013, the ajusted sample is 2008-2013 and the total number of included observations is 210. To achieve "fair comparison", given that the period has been adjusted (i.e. PRICE(-1)), we considered the same period in which there are values for pair Price & Profit or PriceF & Profit. So the period under comparison is 2009-2012 and the total number of observations studied is 140.

Results and discussion

1. Using the data from balanced panel workfile and the regression (1.12), we acquire the following results:

$\hat{Z}_i$	= 27.2292	-25.5507D_{2i}	-26.6060D_{3i}	-14.5396D_{4i}	-24.5525 D_{5i}	-3.79E-09
se	= 6.1185	9.5930	10.4302	8.1196	8.8429	5.99E-09
t	= 4.4502	-2.6634	-2.5508	-1.7906	-2.7765	-0.6326
prob.	(0.0000)	(0.0083)	(0.0114)	(0.0746)	(0.0059)	(0.5276)
					$R^2 = 0.0485$	(1.15)

As these regression results show, the mean share price of companies from CATEGORY I is about 27 lei, that of FIF companies is lower by about 25.6 lei, for an actual average share price of 1.68 lei; that of companies from Category II – SERVICE is lower by about 26.6 lei, for an actual average share price of 0.62 lei; that of companies from Category II – PRODUCTION is lower by about 14.5 lei, for an actual average share price of 12.69 lei; and that of companies from UNLISTED is lower by about 24.6 lei, for an actual average share price of 2.68 lei.

The "slope" in (1.15) is statistically significant for FIF companies, as its p value is 0.0083, the "slope" for companies from Category II – SERVICE is statistically significant, as its p value is 0.0114, and the "slope" for companies from Unlisted exchange segment is statistically significant, as its p value is 0.0059. The intercept coefficient (i.e. companies from CATEGORY I) is also statistically significant (p = 0.0000). The "slope" in (1.15) is not statistically significant for companies from Category II – PRODUCTION, as its p value is 0.0746, and for exogenous variable Profit, as its p value is 0.5276.

We are aware that the average price of shares of companies in Category I is distorted by two companies that have registered extreme values in the analysed period, particularly in 2007 (see Fig. no. 1). Please note that in stage IV, due to the method used in Equation Estimation for GLS Weights (i.e. Panel EGLS - Period SUR) these values were "dropped" from the current period.

The sign of PROFIT predictor variable shows that most listed companies (i.e. 66% of the analysed companies) recorded a small involution of the price. From an economic point of view this cannot be justified, an aspect which could represent a paradox in our opinion. There have been situations where companies have registered higher profit than the previous year's and share price declined in current year.

In fact out of 35 companies, only 12 recorded a high and direct correlation between price and profit. We believe that this trend could be explained by the effects of the global financial-economic crisis which also influenced the Romanian capital market, and the decisions of investors to trade shares listed on BSE, or by legislative instability in our country (e.g. amendments to Romanian Tax Code).

The coefficient of determination R2 shows that the sample regression line do not fits the date, as its value is 0.0485.

2. Under these conditions we carried out, in stage two, the White cross-section standard errors & covariance (d.f. corrected) coefficient covariances method and consequently the regression model is as follows:

$\hat{Z}_i$	= 27.2292	-25.5507D_{2i}	-26.6060D_{3i}	-14.5396D_{4i}	-24.5525 D_{5i}	-3.79E-09
se	= 3.1690	3.3006	3.2834	9.3074	3.1759	8.64E-10
t	= 8.5921	-7.7410	-8.1031	-1.5621	-7.7306	-4.3838
prob.	(0.0000)	(0.0000)	(0.0000)	(0.1196)	(0.0000)	(0.0000)
					$R^2 = 0.0485$	(1.16)

The "slope" in (1.16) is statistically significant for companies from FIF, for companies from Category II – SERVICE, for companies from UNLISTED exchange segment, and for control variable PROFIT, as their p value is 0.0000. The intercept coefficient (i.e. companies from CATEGORY I) is also statistically significant (p = 0.0000).

The "slope" in (1.16) is not statistically significant for companies from Category II – PRODUCTION, as its p value is 0.1196. This value can be explained by the extremely high data's registered by 1 company in this category (i.e. 103.68 lei in 2007-2013) over the average of 11.62 lei in the sample.

3. In stage three the effect of setting GLS Weights for the Period weights in equation estimation is highlighted as follows:

$\hat{Z}_i$	= 25.6527	-24.3947D_{2i}	-25.2043D_{3i}	-19.4038D_{4i}	-23.3552D_{5i}	-3.18E-09
se	= 3.1750	2.9478	3.1532	3.0752	2.9258	1.05E-09
t	= 8.0795	-8.2753	-7.9930	-6.3096	-7.9822	-3.0157
prob.	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0028)
	Weighted Statistic	$R^2 = 0.0882$	Unweighted Statistic	$R^2 = 0.0424$		(1.17)

It shows a change of se and the t values for independent variables, an improving of statistical significance of the dichotomous variables (particularly variable PRODUCTION) and covariate variable PROFIT, respectively.

4. The effects of adjusting the initial sample (i.e. 2007-2013) on the coefficient of determination and the coefficients of the independent variables, by PRICE(-1) are as follows:

$\hat{Z}_i$	= 5.9899	-5.8517D_{2i}	-6.0222D_{3i}	-6.2055D_{4i}	-5.9891D_{5i}	-3.88E-10	0.4540
se	= 2.8892	2.8806	2.8911	2.9856	2.9454	2.17E-10	0.0055
t	= 2.0731	-2.0313	-2.0830	-2.0784	-2.0333	-1.7884	81.1354
prob.	(0.0394)	(0.0435)	(0.0385)	(0.0389)	(0.0433)	(0.0752)	(0.0000)
	Weighted Statistic	$R^2 = 0.9658$		Unweighted Statistic	$R^2 = 0.4507$		(1.18)

It can be observed that the average share price of companies in CATEGORY I is influenced by the period adjusted by using autoregressor PRICE(-1). The specification (1.18) results, in this stage of research, show that the mean share price of companies from CATEGORY I is about 6 lei, that of companies from FIF is lower by about 5.85 lei, that of companies from Category II – SERVICE is lower by about 6.02 lei, that of companies from Category II – PRODUCTION is lower by about 6.2 lei, and that of companies from UNLISTED is lower by about 5.99 lei.

The "slope" in (1.18) is statistically significant for companies from Financial Investment Funds, as its p value is 0.0435, the "slope" for companies from Category II – SERVICE is statistically significant, as its p value is 0.0385, the "slope" for companies from Category II – PRODUCTION is statistically significant, as its p value is 0.0389, and the "slope" for companies

from Unlisted exchange segment is statistically significant, as its p value is 0.0433. The intercept coefficient (i.e. companies from CATEGORY I) is also statistically significant (p = 0.0394). The "slope" for autoregressor PRICE(-1) is statistically significant as its p value is 0.0000. The "slope" in (1.18) is not statistically significant for exogenous variable profit, as its p value is 0.0752.

By using autoregressor PRICE(-1) we consider that share prices in the years before the financial and economic crisis were "reflected" in the period of crisis and those during the crisis were highlighted in the post-crisis period. The t value of the coefficient of the PRICE(-1) is larger than 1, which determined a increasing of R2. So, theoretically, in our opinion, high average prices were transposed in the periods in which average recorded profits by listed companies were lower. This aspect has determined the change of R2 (i.e. 0.9658 from 0.0882 on previous stage), which emphasizes that explanatory variables significantly influence on the average share price.

In case of Unweighted Statistic, the coefficient of determination is only 0.4507, and all variables, regressand and the regressors, are not highly positively correlated. In this circumstances R2 it has improved substantially, from 0.0424 in the equation (1.17) at 0.4507 in relation (1.18). Therefore, in our future research, it is necessary to identify one or more independent variable which can improve the coefficient of determination.

5. Adjusting initial sample (i.e. 2007-2013) by excluding the year 2009, took effect on the coefficient of determination, independent variables coefficients, respectively, as follows:

$\hat{Z}_i$	= 6.6840	-6.6063*D2i*	-6.7512*D3i*	-6.9050*D4i*	-6.8080*D5i*	-5.24E-10	0.4268
se	= 3.2810	3.2579	3.2824	3.3915	3.3486	2.51E-10	0.0081
t	= 2.0371	-2.0277	-2.0567	-2.0359	-2.0330	-2.0835	52.6937
prob.	(0.0432)	(0.0442)	(0.0413)	(0.0433)	(0.0436)	(0.0387)	(0.0000)

Weighted Statistic $R^2 = 0.9504$ Unweighted Statistic $R^2 = 0.4351$ (1.19)

It can be seen that the standard error for all variables increased insignificantly, t-statistic is also approximately equal to those of the previous stage and the probability is significant for dichotomous and for profit quantitative variable, autoregressor PRICE(-1), respectively. On the coefficient of determination can notice that it decreased slightly both weighted statistics (from 0.9504 to 0.9658) and unweighted statistics (from 0.4507 to 0.4351). At the end of this stage we found that stimulus variable PROFIT is significant compared to the stage 1 and 4. This leads us to believe that stock prices were lower in prior periods and that there are factors that had a negative effect on this variable (i.e. presumably financial and economic crisis) in the context of our developed multiple linear regression model (1.19).

6. Extracting year 2010 from initial sample (ie 2007-2013), effected the coefficient of determination, independent variables coefficients, respectively, as follows:

$\hat{Z}_i$	= 8.5506	-8.7058*D2i*	-9.0854*D3i*	-10.5242*D4i*	-7.2497*D5i*	-4.16E-10	0.3924
se	= 4.0896	4.0933	4.1303	4.3460	4.1884	1.81E-10	0.0079
t	= 2.0908	-2.1268	-2.1996	-2.4215	-1.7308	-2.3010	49.5308
prob.	(0.0381)	(0.0349)	(0.0292)	(0.0165)	(0.0853)	(0.0226)	(0.0000)

Weighted Statistic $R^2 = 0.9442$ Unweighted Statistic $R^2 = 0.4639$ (1.20)

Most dichotomous variables were statistically significant except UNLISTED variable, which recorded a p value of 0.0853. Regarding the coefficient of determination in case of Unweighted statistics it is found, in this stage, that "achieved" the highest value of 0.4639.

Thus, according to (1.20) average price of the share companies in CATEGORY 1 is approximatively 8.6 lei, and the average price of the FIF`s shares is lower approximately by 8.7 lei, the SERVICE category shares is lower by about 9 lei, the PRODUCTION shares ranging by 10.5 lei, while those in category UNLISTEAD by about 7.25 lei.

7. Forecast evaluation and similitude real data and forecast from the model for 2009-2012

The forecast evaluation details are presented in Table no. 1 Forecast evaluation of (1.18). The forecast sample is 2007-2013, adjusted sample is 2008-2013, and number of included observations 210.

Table 1

Forecast evaluation of (1.18)

Indicators	Value
Root Mean Squared Error	36.57635
Mean Absolute Error	10.33745
Mean Absolute Percentage Error	519.2897
Theil Inequality Coefficient	0.670053
Bias Proportion	0.012671
Variance Proportion	0.198468
Covariance Proportion	0.788861

Source: authors' own processing data with EViews

The reported forecast statistics indicate that our forecasting model does perform "relative" well out-of-sample. The Root Mean Squared Error is "relatively" small when compared to the standard deviation of Price series (i.e. 45.42). The Theil Inequality Coefficient (i.e. TIC) shows an average error of about 67% which is quite large, but the value is smaller than 1. Also the Mean Absolute Percentage Error (i.e. MAPE) is higher, but it is well known that the MAPE is scale sensitive and should not be used when working with low-volume data (i.e. 245 observations). The Bias and Variance Proportions are small which implies that the error of prediction is concentrated in covariance proportion (i.e. 0.79) and shows that the forecast is quite "acceptable". In conclusion The TIC gives an acceptable indicator in measure the "fit" of the model than MAPE.

Comparing real data and forecast

A. In Table no. 2 one can see the results of the two situations. According to real data there is an increase of Profit obtained by companies and an increase of the Price (i.e. Criterion 1) in 34.30% of analysed cases, (i.e. 48 observations analysed in 2009-2012). Also there was a decrease in Profit and decrease in Price (i.e. Criterion 2) in 24.30% of cases. However, in the same period it was a Profit drop simultaneously with an increase of Price in about 18% of cases (i.e. Criterion 3) and an increase of Profit recorded by companies with a lower Price of share (ie Criterion 4) in 23.60% of cases.

Table 2

Dynamics of Price and Profit according Criterions 1-4

Period / Observations	Criterion 1	Criterion 2	Criterion 3	Criterion 4
2009-2012 / Real data				
	34.30%	24.30%	17.90%	23.60%
Observations Price&Profit	48	34	25	33

Total	140			
2009-2012 /Forecast from 1.19				
	10.00%	37.10%	5.00%	47.90%
Observations PriceF&Profit	14	52	7	67
Total	140			

Source: authors' own processing data from the website of BSE, MoF and EViews.

B. Due to the forecast results based on (1.18) for period 2009-2012 it has been established that PriceF increased only 10.00% of the cases while the PROFIT recorded by companies has increased (i.e. Criterion 1; 14 observations PriceF&Profit). The price has fallen in 37.10% of cases while the PROFIT declined from the previous year (i.e. Criterion 2, 52 observations). Also in the same period, the PriceF rose, unjustified in terms of the "normal reaction" of the capital market, or the "intermediatus" status of the relation between Price and Profit, in 5% of cases (i.e. Criterion 3), and an decreasing of PriceF synchronous with an increase of Profit recorded by listed companies (i.e. Criterion 4) in 47.90% of cases.

Therefore, using elaborated model (1.14), the actual data and predicted results of this simulation, it can be noticed that variable Profit is not a "stimulating factor" for share prices of listed companies on the BSE.

Limitations of the study

Our study has had a number of limitations, which determined the approach for further research in this area. For example to investigate the influence of share prices on investment decisions. Andersen and Subbaraman (1996) established that the estimated fundamental component of real share prices has a stronger relationship with investment than the aggregate real share-price series. Also we intend to search for other variables that provide some forecastabilty, using the characteristic regression elaborated by Granger (1992)

The article admits the next limitations:

1. The reliability of the study could have been improved if other measuring methods had been applied;
2. The authors have not analysed the effects of price as a response to 5-day and 16-day event periods, respectively;
3. The scientific examination did not deal with earnings announcements (i.e. quarterly and/or half-yearly), and the data content of those earnings was therefore not taken in this research.
4. The study had a relatively small sample (i.e. Cross-sections included: 35 and total panel /balanced observations: 210).

Conclusions

In the first stage of our research (i.e. 1.15) the sign of predictor variable PROFIT shows that, in average, with the exception of benchmark category, most listed companies (i.e. 66% of the analysed companies) recorded a small decrease of the price. From capital market point of view this cannot be justified, aspect which could represent a paradox in our opinion. There have been situations where companies have registered higher profit than the previous year's and share price declined in current year (i.e. out of 35 companies, only 12 recorded a high and direct correlation between price and profit).

After we selected GLS Weights and the White cross-section standard errors & covariance (d.f. corrected) coefficient covariance method in equation estimation (i.e. stage two and three) the regression model was changed in (1.16) and (1.17). All the slopes are statistically significant for companies from Financial Investment Funds, for companies from Category II – SERVICE, for companies from UNLISTED exchange segment, and for control variable PROFIT. The "slope" in

(1.17) is not statistically significant for companies from Category II – PRODUCTION, and this value can be explained by the extremely high data's registered by 1 company in this category.

In stage four (i.e. 1.18), using autoregressor PRICE(-1), we noticed that share prices in the years before the financial and economic crisis were "reflected" in the period of crisis and those during the crisis were highlighted in the post-crisis period. The t value of the coefficient of the PRICE(-1) is larger than 1, which determined an increasing of R2 (i.e. 0.9658), so explanatory variables significantly influenced the average share price.

In case of Unweighted Statistic, the coefficient of determination is only 0.4507, and all variables, regressant and the regressors, are not highly positively correlated. However, in these circumstances, R2 has improved substantially, from 0.0424 in the equation (1.17) at 0.4507 in relation (1.18). Therefore, in our future research, it is necessary to identify an independent variable or more independent variables which can improve the coefficient of determination.

Removing year 2009 (i.e. stage five) and 2010 (i.e. stage six) from the initial sample (i.e. 2007-2013) played an effect on the coefficient of determination, coefficients of independent variables, respectively. Also, the coefficient of determination values are above 0.94 for Weighted statistic and above to 0.43 for Unweighted statistic. Regarding the coefficients of independent variables, in general, there was an increase by 1-2 monetary units for intercept coefficient (i.e. companies from Category I), and a decrease of 2-3 units for dichotomous variables coefficients. Also coefficients of independent variables PROFIT and PRICE(-1) registered a slight decrease. In these circumstances we believe that there may be other factors that have determined the evolution of the average share price of listed companies (i.e. the low capitalization of BSE, and / or the decision of investors to buy shares of profitable companies during the financial and economic crisis).

The forecast evaluation details for adjusted sample 2008-2013 indicated that the Bias and Variance Proportions are small which implies that the error of prediction is concentrated in covariance proportion and shows that the forecast is quite "acceptable". In conclusion The Theil Inequality Coefficient gives an acceptable indicator in measure the "fit" of the model than Mean Absolute Percentage Error.

Finally the comparison between real data and forecast outlined the fact that the PriceF reacts abnormally. Therefore analysis shows that if Profit increased, the stock price (i.e. PriceF) has fallen (i.e. Criterion 4 - PriceF&Profit) in almost 48% cases, compared with the real situation of about 24% cases (i.e. Criterion 4 - Price&Profit). In only 10% of cases (i.e. Criterion 1 - PriceF&Profit) it was found that the share price has increased, as companies recorded a higher profit than the previous year, compared with the real situation of over 34% (Criterion 1 - Price&Profit).

In conclusion, even if we managed to translate the low prices of financial-economic crisis period in to "normal capital market time", using the model notice that in 2009-2013 the cases number of shares that recorded higher prices grow up to 113 instead of 77 (i.e. Appendix C). Yet if we look at the evolution of Price&Profit / PricetF&Profit tandem we noted that the profit recorded by the company is not a strength factor for the dynamic average share price of the companies listed at Bucharest Stock Exchange.

We believe that these results may be explained by the effects of the global financial-economic crisis which also influenced the Romanian capital market, and the decisions of investors to trade shares listed on BSE, or by legislative instability of Romanian policymakers (e.g. amendments to Romanian Tax Code).

Acknowledgements

The research assistance of our distinguished colleague Professor Ph.D. Nicoleta Breaz is greatly appreciated by authors. In writing this paper, we have benefitted greatly from discussions with our renowned colleague and friend Lecturer Ph.D. Gabriel Bărbuleț. We are grateful to anonymous referees for helpful discussions and suggestions.

Bibliography

1. Andersen, M., Subbaraman, R., 1996. Share Prices and Investment, Reserve Bank of Australia, RBA Research Discussion Papers with number rdp9610, pp. 1-40.
2. Blanchflower, D., G., 1991. The Economic Effects of Profit Sharing in Great Britain, International Journal of Manpower, Vol. 12, No. 1, pp. 3-9.
3. Chakhovich, T., 2013. Perceptions of share price: long-term or short-term oriented?, Accounting, Auditing & Accountability Journal, Vol. 26, No. 1, pp. 133-155.
4. Czerwonka, L., 2009. Changes in Share Prices as a Response to Earnings Forecasts Regarding Future Real Profits, Analele Stiintifice ale Universitatii "Alexandru Ioan Cuza" din Iasi, Ştiinţe Economice, Tomul LVI, Issue Nov., pp. 586-601.
5. David, V., Hinkley, 1977. Jackknifing in Unbalanced Situations, Technometrics, Vol. 19, No. 3 (Aug.,), pp. 285-292.
6. Dinu, M., 2014. The turbulence of cycles, Theoretical and Applied Economics Journal, Vol. 599, No. 10, pp. 1-2.
7. Dragotă, V., et al 2009. Securities portfolio management. 2nd Edition, Bucharest, România, Economic Publishing House.
8. EViews 7 User's Guide II, 2010. Chapter 35. Pooled Time Series, Cross-Section Data; Generalized Least Squares; Robust Coefficient Covariances Quantitative Micro Software, LLC, USA.
9. EViews 7 User's Guide II, 2010. Chapter 37 Panel Estimation, Least Squares Panel Options, Quantitative Micro Software, LLC, USA.
10. Fama, E., F., 1970. Efficient Capital Markets: A Review of Theory and Empirical Work, Papers and Proceedings of the Twenty-Eighth, Annual Meeting of the American Finance Association New York, N.Y. December, 28-30, The Journal of Finance, Vol. 25, No. 2, pp. 383-417.
11. Gordon, M., J., 1959. Dividends, Earnings, and Stock Prices, The Review of Economics and Statistics, Vol. 41, No. 2, Part 1, pp. 99-105.
12. Granger, C., W., J., 1992. Forecasting stock market prices: Lessons for forecasters, International Journal of Forecasting, Vol. 8, pp. 3-13.
13. Guimaraes, et al 1989. A Reappraisal of the Efficiency of Financial Markets, Springer-Verlag Berlin Heidelberg Publisher, Germany.
14. Harris, T., S., et al. 2001. The share price effects of dividend taxes and tax imputation credits, Journal of Public Economics, Vol. 79, pp. 569 –596.
15. Johnson, W., B., and Zhao, R., 2009. Contrarian Share Price Reactions to Earnings Surprises, Journal of Accounting, Auditing & Finance, Vol. 27, Issue 2, pp. 236–266.
16. Law no. 297/2004 on the capital market, published in the Official Gazette no. 571 of 29.06.2004, republished and amended.
17. MacKinnon, White using a complex estimator of Efron, B., 1982. The jackknife, the bootstrap and other resampling plans, Society for Industrial and Applied Mathematics, Philadelphia, PA.
18. MacKinnon, White, 1985. Based on work by Horn, Horn and Duncan (i.e. Horn, S.,D., Horn, R.,A., Duncan, D.,B., 1975), Estimating heteroscedastic variances in linear model, Journal of the American Statistical Association, 70, pp. 380-385), Journal of Econometrics, 29, 53-7.
19. Metcalfe, M., 1995. Chapter 13 Profit Forecasts, Forecasting Profit, New York, USA, Springer US Publisher, Springer Science & Business Media.
20. Mlonzi, V., F., et al 2011. Share price reaction to earnings announcement on the JSE-ALtX: A test for market efficiency, Southern African Business Review Vol. 15 No. 3, pp. 142-166;
21. Petersen, M., A., (2006), Estimating standard errors in finance panel data sets: Comparing approaches, NBER Working Paper No. 11280.

22. Prisăcariu, M., Ursu, S., Andrieș, A., 2008. Markets and financial instruments, Iași, Romania, "Alexandru Ioan Cuza" University of Iași Publishing House.
23. Scholes, M., S., 1972. The market for Securities: Substitution Versus Price Pressure and effects of Information on Share Prices, The Journal of Business, Vol. 45, Issue 2, pp 179-211.
24. Scott Long, J., S. and Ervin L., H., 1998. Correcting for Heteroscedasticity with Heteroscedasticity Consistent Standard Errors in the Linear Regression Model: Small Sample Considerations, Working Paper, Indiana University, Bloomington, IN 47405, September 23.
25. Site of Bucharest Stock Exchange, old version: http://www2.bvb.ro/ (December 2014).
26. Site of Minister of Public Finance from Romania: http://www.mfinante.ro/agenticod.html?pagina=domenii (December 2014).
27. Smithers, A., 2009. Wall Street Revalued: Imperfect Markets and Inept Central Bankers, Chapter 4 Interest Rate Changes and Share Price Changes, Chichester, West Sussex, UK, Publisher John Wiley & Sons, Ltd., Smithers &Co Ltd.
28. Starzs, R., 2015. Chapter 13. Serial Correlation - Friend or Foe?, EViews Illustrated for Version 9, IHS Global Inc.
29. Weitzman, M. L., Kruse, D., 1990. Profit sharing and productivity. In Paying for productivity: A look at the evidence, ed. Alan Blinder, 95–139. Washington, DC: Brookings Institution.
30. White H., 1980. A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, Econometrica, Vol. 48, No. 4, pp. 817-838.
31. White's, 1980. Original paper is presenting HC0 -Halbert White, A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, Econometrica, Vol. 48, No. 4 (May, 1980), pp. 817-838.
32. Wooldridge J., M., 2002. Chapter 7 Estimating Systems of Equations by OLS and GLS, Econometric Analysis of Cross Section and Panel Data, The MIT Press Cambridge, Massachusetts, London, England.

Appendix A

Type of Criterion for Price&Profit	Relative Value	Cumulative Value	Abs. value
C1 Criterion 1 – the Price increase and Profit increase	34.29%		48
C2 Criterion 2 – the Price declines and Profit declines	24.29%	58.57%	34
C3 Criterion 3 – the Price increase and Profit declines	17.86%		25
C4 Criterion 4 – the Price declines and Profit increase	23.57%	41.43%	33
Total	**100%**	**100%**	**140**

Type of Criterion for PriceF&Profit	Relative Value (%)	Cumulative Value	Abs. value
C1 Criterion 1 – if PriceF increase and Profit increase	10.00%		14
C2 Criterion 2 – if PriceF declines and Profit declines	37.10%	47.10%	52
C3 Criterion 3 – if PriceF increase and Profit declines	5.00%		7
C4 Criterion 4 – if PriceF declines and Profit increase	47.90%	52.90%	67
Total	**100%**	**100%**	**140**

Source: authors' own processing data

Appendix A.a

	PRICE 2007-2013 (LEI)	**PROFIT 2007-2013 (LEI)**
Mean	11.01595	121,000,000
Median	1.057	8,182,412
Maximum	510	4,840,000,000
Minimum	0.0158	585
Std. Dev.	45.42454	507,000,000
Observations	245	245

Source: authors' own processing data

Appendix B

Indicators	**Stage 1 (Eq. 1.15)**				**Stage 2 (Eq. 1.16)**				**Stage 3 (Eq. 1.17)**			
Dependent Variable:	PRICE				PRICE				PRICE			
Method:	Panel Least Squares				Panel Least Squares				Panel EGLS (Period weights)			
Sample (ajusted):	2007-2013				2007-2013				2007-2013			
Periods included:	7				7				7			
Cross-sections included:	35				35				35			
Total panel (balanced) observations:	245				245				245			
Linear estimation after one-step weighting matrix	no				no				yes			
White cross-section standard errors & covariance (d.f. corrected)	no				yes				yes			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.
C	27.22925	6.118567	4.4502	0	27.22925	3.16907	8.5921	0	25.65275	3.175004	8.0795	0
PROFIT	-3.79E-09	5.99E-09	-0.6326	0.5276	-3.79E-09	8.64E-10	-4.3838	0	-3.18E-09	1.05E-09	-3.0157	0.0028
FIC	-25.55077	9.593003	-2.6634	0.0083	-25.55077	3.30068	-7.7410	0	-24.39478	2.947889	-8.2753	0
SERVICE	-26.60602	10.43026	-2.5508	0.0114	-26.60602	3.28343	-8.1031	0	-25.2043	3.153272	-7.9930	0
PRODUCTION	-14.53963	8.119612	-1.7906	0.0746	-14.53963	9.30749	-1.5621	0.1196	-19.40386	3.075265	-6.3096	0
UNLISTED	-24.55254	8.842954	-2.7765	0.0059	-24.55254	3.17598	-7.7306	0	-23.35521	2.925885	-7.9822	0
PRICE(-1)	-	-	-	-	-	-	-	-	-	-	-	-
									Weighted Statistics	Unweighted Statistics		
R-squared	0.048517	-	-	-	0.048517	-	-	-	0.088224	0.042466	-	-
Adjusted R-squared	0.028611	-	-	-	0.028611	-	-	-	0.069149	-	-	-
F-statistic	2.437357	-	-	-	2.437357	-	-	-	4.625145	-	-	-
Prob(F-statistic)	0.035335	-	-	-	0.035335	-	-	-	0.000477	-	-	-
Durbin-Watson stat.	0.649353	-	-	-	0.649353	-	-	-	0.278509	0.645101	-	-

Source: authors' own processing data with EViews

Continued Appendix B

Indicators	**Stage 4 (Eq. 1.18)**				**Stage 5 (Eq. 1.19)**				**Stage 6 (Eq. 1.20)**			
Dependent Variable:	PRICE				PRICE				PRICE			
Method:	Panel EGLS (Period SUR)				Panel EGLS (Period SUR)				Panel EGLS (Period SUR)			
Sample (ajusted):	2008-2013				2008, 2010-2013				2008-2009, 2011-2013			
Periods included:	6				5				5			
Cross-sections included:	35				35				35			
Total panel (balanced) observations:	210				175				175			
Linear estimation after one-step weighting matrix	yes				yes				yes			
White cross-section standard errors & covariance (d.f. corrected)	yes				yes				yes			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.
C	5.989968	2.889244	2.0731	0.0394	6.684086	3.281039	2.0371	0.0432	8.550693	4.08967	2.0908	0.0381
PROFIT	-3.88E-10	2.17E-10	-1.7884	0.0752	-5.24E-10	2.51E-10	-2.0836	0.0387	-4.16E-10	1.81E-10	-2.3011	0.0226
FIC	-5.851744	2.880668	-2.0313	0.0435	-6.751264	3.282486	-2.0568	0.0413	-8.705858	4.093342	-2.1268	0.0349
SERVICE	-6.022205	2.891117	-2.0830	0.0385	-6.905013	3.391576	-2.0359	0.0433	-9.085454	4.130368	-2.1997	0.0292
PRODUCTION	-6.205509	2.985669	-2.0784	0.0389	-6.808018	3.348613	-2.0331	0.0436	-10.52428	4.346085	-2.4216	0.0165
UNLISTED	-5.989152	2.945489	-2.0333	0.0433	-6.606353	3.257951	-2.0278	0.0442	-7.249788	4.18848	-1.7309	0.0853
PRICE(-1)	0.454012	0.005596	81.1358	0	0.426818	0.0081	52.6937	0	0.392416	0.007923	49.5308	0
	Weighted Statistics	Unweighted Statistics			Weighted Statistics	Unweighted Statistics			Weighted Statistics	Unweighted Statistics		
R-squared	0.965846	0.450717			0.950445	0.435164			0.944276	0.46391		
Adjusted R-squared	0.964837				0.948675				0.942286			
F-statistic	956.7897				537.0318				474.4799			
Prob(F-statistic)	0				0				0			
Durbin-Watson stat.	1.970798	0.682838			1.661165	0.566135			1.740811	0.711228		

Source: authors' own processing data with EViews

Appendix C

No.	Oscillation of real Price (lei)								Oscillation of PriceF (lei)							
	simbol-year	Price +/-	simbol-year	Price +/-	simbol-year	Price +/-	simbol-y	Price +/-	simbol-year	PriceF +/-	simbol-year	PriceF +/-	simbol-year	PriceF +/-	simbol-year	PriceF +/-
1	AER - 09	-0.13	AER - 10	1.44	AER - 11	0.6	AER - 12	1.3	AER - 09	1.813	AER - 10	0.822	AER - 11	0.371	AER - 12	0.165
2	ALB - 09	0.21	ALB - 10	-0.27	ALB - 11	0.22	ALB - 12	0.04	ALB - 09	0.067	ALB - 10	0.031	ALB - 11	0.015	ALB - 12	0.008
3	ALT - 09	0.0142	ALT - 10	0.0105	ALT - 11	-0.0065	ALT - 12	-0.0045	ALT - 09	-0.294	ALT - 10	-0.350	ALT - 11	-0.375	ALT - 12	-0.388
4	ALU - 09	1.46	ALU - 10	-0.7	ALU - 11	-0.42	ALU - 12	0.106	ALU - 09	1.125	ALU - 10	0.294	ALU - 11	-0.083	ALU - 12	-0.255
5	AMY - 09	0.06	AMY - 10	0.13	AMY - 11	-0.15	AMY - 1	-0.04	AMY - 09	0.129	AMY - 10	0.059	AMY - 11	0.028	AMY - 12	0.013
6	APC - 09	0.14	APC - 10	0.1195	APC - 11	-0.0495	APC - 12	0.085	APC - 09	-0.120	APC - 10	-0.272	APC - 11	-0.342	APC - 12	-0.373
7	ARS - 09	0.025	ARS - 10	0.415	ARS - 11	-0.02	ARS - 12	0.447	ARS - 09	3.185	ARS - 10	1.226	ARS - 11	0.337	ARS - 12	-0.069
8	ARTE - 09	0.4	ARTE - 10	0.9	ARTE - 11	-0.6	ARTE - 1	6.4	ARTE - 09	2.242	ARTE - 10	0.801	ARTE - 11	0.147	ARTE - 12	-0.154
9	ATB - 09	0.27	ATB - 10	-0.01	ATB - 11	-0.23	ATB - 12	-0.0136	ATB - 09	9.126	ATB - 10	10.128	ATB - 11	10.580	ATB - 12	10.783
10	BRM - 09	0.257	BRM - 10	0.19	BRM - 11	0.055	BRM - 1	0.66	BRM - 09	0.443	BRM - 10	0.168	BRM - 11	0.043	BRM - 12	-0.013
11	CBC - 09	-6.05	CBC - 10	0.35	CBC - 11	2.7	CBC - 12	2.4	CBC - 09	2.902	CBC - 10	1.101	CBC - 11	0.284	CBC - 12	-0.087
12	CMF - 09	-2.4	CMF - 10	-0.69	CMF - 11	0.14	CMF - 12	-0.3	CMF - 09	1.088	CMF - 10	0.278	CMF - 11	-0.090	CMF - 12	-0.258
13	CMP - 09	0.195	CMP - 10	0.137	CMP - 11	-0.038	CMP - 12	0.161	CMP - 09	0.026	CMP - 10	-0.207	CMP - 11	-0.316	CMP - 12	-0.368
14	COTE - 09	4.7	COTE - 10	0	COTE - 11	4.5	COTE - 1	1.65	COTE - 09	19.197	COTE - 10	14.691	COTE - 11	12.649	COTE - 12	11.721
15	COTR - 09	7	COTR - 10	-3.9	COTR - 11	-7.1	COTR - 1	3.69	COTR - 09	104.810	COTR - 10	47.370	COTR - 11	21.290	COTR - 12	9.450
16	EFO - 09	-0.141	EFO - 10	-0.293	EFO - 11	-0.074	EFO - 12	-0.0105	EFO - 09	0.353	EFO - 10	0.127	EFO - 11	0.025	EFO - 12	-0.022
17	ELMA - 09	0.035	ELMA - 10	-0.055	ELMA - 11	-0.073	ELMA - 1	-0.0831	ELMA - 09	9.144	ELMA - 10	10.131	ELMA - 11	10.584	ELMA - 12	10.789
18	FAU - 09	3.96	FAU - 10	4.15	FAU - 11	-3.85	FAU - 12	0	FAU - 09	0.672	FAU - 10	0.305	FAU - 11	0.137	FAU - 12	0.063
19	PREH - 09	0.61	PREH - 10	0.4	PREH - 11	-0.85	PREH - 1	0.401	PREH - 09	11.697	PREH - 10	11.299	PREH - 11	11.120	PREH - 12	11.037
20	PTR - 09	0.12	PTR - 10	-0.107	PTR - 11	-0.032	PTR - 12	0.0439	PTR - 09	0.294	PTR - 10	0.096	PTR - 11	0.005	PTR - 12	-0.039
21	RBL - 09	-1.95	RBL - 10	0.75	RBL - 11	-0.34	RBL - 12	0.13	RBL - 09	0.514	RBL - 10	0.223	RBL - 11	0.095	RBL - 12	0.037
22	SIF1 - 09	0.585	SIF1 - 10	-0.116	SIF1 - 11	-0.111	SIF1 - 12	0.31	SIF1 - 09	0.872	SIF1 - 10	0.510	SIF1 - 11	0.345	SIF1 - 12	0.256
23	SIF2 - 09	0.61	SIF2 - 10	0.022	SIF2 - 11	-0.082	SIF2 - 12	0.37	SIF2 - 09	0.862	SIF2 - 10	0.492	SIF2 - 11	0.287	SIF2 - 12	0.215
24	SIF3 - 09	0.408	SIF3 - 10	-0.1365	SIF3 - 11	0.0235	SIF3 - 12	0.1445	SIF3 - 09	0.617	SIF3 - 10	0.392	SIF3 - 11	0.236	SIF3 - 12	0.163
25	SIF4 - 09	0.085	SIF4 - 10	-0.066	SIF4 - 11	-0.073	SIF4 - 12	0.199	SIF4 - 09	0.650	SIF4 - 10	0.406	SIF4 - 11	0.297	SIF4 - 12	0.224
26	SIF5 - 09	0.685	SIF5 - 10	-0.01	SIF5 - 11	-0.203	SIF5 - 12	0.346	SIF5 - 09	1.007	SIF5 - 10	0.564	SIF5 - 11	0.362	SIF5 - 12	0.268
27	SNP - 09	0.068	SNP - 10	0.086	SNP - 11	-0.045	SNP - 12	0.1381	SNP - 09	8.100	SNP - 10	8.969	SNP - 11	8.630	SNP - 12	8.412
28	SOCP - 09	-0.015	SOCP - 10	0.225	SOCP - 11	-0.0255	SOCP - 1	-0.1325	SOCP - 09	8.763	SOCP - 10	9.967	SOCP - 11	10.512	SOCP - 12	10.762
29	TEL - 09	2.5	TEL - 10	5.85	TEL - 11	-1.95	TEL - 12	-4.71	TEL - 09	16.945	TEL - 10	13.679	TEL - 11	12.165	TEL - 12	11.500
30	TGN - 09	35	TGN - 10	123	TGN - 11	-56.65	TGN - 12	-5.35	TGN - 09	10.359	TGN - 10	10.547	TGN - 11	10.631	TGN - 12	10.689
31	TLV - 09	1.868	TLV - 10	-0.902	TLV - 11	-0.344	TLV - 12	0.386	TLV - 09	8.801	TLV - 10	9.948	TLV - 11	9.806	TLV - 12	10.317
32	TUFE - 09	0.05	TUFE - 10	-0.042	TUFE - 11	-0.018	TUFE - 1	-0.0075	TUFE - 09	0.136	TUFE - 10	0.028	TUFE - 11	-0.022	TUFE - 12	-0.044
33	UAM - 09	-0.056	UAM - 10	0.128	UAM - 11	-0.06	UAM - 1	-0.0167	UAM - 09	-0.103	UAM - 10	-0.263	UAM - 11	-0.335	UAM - 12	-0.369
34	UZC - 09	3.27	UZC - 10	-0.8	UZC - 11	-1.7	UZC - 12	-0.63	UZC - 09	1.872	UZC - 10	0.848	UZC - 11	0.384	UZC - 12	0.175
35	VAC - 09	0.5	VAC - 10	-0.55	VAC - 11	-0.08	VAC - 12	0.83	VAC - 09	0.337	VAC - 10	0.153	VAC - 11	0.070	VAC - 12	0.031

Summary count of decreasing Price by year								Summary count of decreasing PriceF by year							
2009	7	2010	16	2011	28	2012	12	2009	3	2010	4	2011	7	2012	13
Total	63							Total	27						
Summary count of increasing Price by year								**Summary count of increasing PriceF by year**							
2009	28	2010	19	2011	7	2012	23	2009	32	2010	31	2011	28	2012	22
Total	77	Grand Total		140				Total	113	Grand Total		140			

Source: authors' own processing data