

# THE RELATIONSHIP BETWEEN FINANCIAL RATIOS AND THE STOCK PRICES OF SELECTED EUROPEAN FOOD COMPANIES LISTED ON STOCK EXCHANGES

Marie Ligocká<sup>1</sup>, Daniel Stavárek<sup>1</sup>

<sup>1</sup>Department of Finance and Accounting, Silesian University, School of Business Administration in Karviná, Univerzitní nám. 1934/3, 733 40 Karviná, Czech Republic

To link to this article: <https://doi.org/10.11118/actaun201967010299>

Received: 23. 7. 2018, Accepted: 29. 11. 2018

To cite this article: LIGOCKÁ MARIE, STAVÁREK DANIEL. 2019. The Relationship Between Financial Ratios and the Stock Prices of Selected European Food Companies Listed on Stock Exchanges. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 67(1): 299–307.

## Abstract

Stock prices can be influenced by many factors. It is possible to determine two categories of variables that can affect stock prices: macroeconomic and microeconomic variables. The paper is focused on microeconomic factors, specially financial ratios that reflect business activities of the companies. According to the study of Drummen and Zimmermann (1992) the individual characteristics of companies affect up to 50 % of stock prices. The object of this paper is to examine the relationship between selected financial ratios and the stock prices of food companies listed on selected European Stock Exchanges. Time series on annual frequency are used to examine the relationship between stock prices of selected companies and financial ratios with using the Generalized Method of Moments (GMM). Based on previous research we expect to find some linkages especially between stock prices and the profitability ratios.

Keywords: financial ratios, food industry, companies, Europe, stock price, GMM

## INTRODUCTION

Stock prices can be influenced by many factors. Some studies try to identify them. It is possible to determine two categories of variables that can affect stock prices: macroeconomic and microeconomic variables. According to a study by Drummen and Zimmermann (1992), the individual characteristics of companies affect up to 50 % of stock prices. Their analysis showed the importance of various market and sector factors to European stock price volatility. Due to the date of publication of their paper, it is

advisable to re-examine this topic. Therefore, our study is focused on identifying the financial ratios that affect the stock prices of food companies listed on European stock exchanges, namely in Austria, Poland and Switzerland. We examine Central European countries because the previous research is focused mainly on developed areas mainly Asia and US stock markets. Studies focused on CEE countries are sporadic due to the available dataset. These countries are typical by different development of the capital markets that is related to the economic transformation since the 1990s. Many

companies are listed on the CEE Stock Exchanges after 2000 and later. This presents the opportunity for the research in this geographical area. Due to the requirement on similar business profile and the quotation on the stock exchanges at the latest in 2005; Switzerland is included. The Switzerland was selected due to the geographical location near the selected CEE countries and there is generated the similar value of the GDP per year in analyzed countries. We selected food companies because the production of food products is one of the main components of the manufacturing industry. The importance of food production is related to the provision of food to the population by the production and sale of quality and safe food.

The food industry as an integral part of the Austrian economy contributes approximately 3.5 % on the GDP. The food sector's foreign trade accounted for approximately 7.4 % of the total foreign trade volume of the Austrian economy in 2015. Austrian consumer food and beverages expenditures have grown steadily, the growth of consumer expenditures on food and non-alcoholic beverages between 2011 and 2015 is estimated at 7.9 %. Poland is the largest food industry producer in Central and Eastern Europe and 7th in the European Union. The food processing sector was developing rapidly, growing at 9 % annually between 2008 and 2011 in terms of value generated. The Polish food sector had a share of 7 % of the GDP, and exports reached up to 12.9 % in 2015. The food industry is important to the Swiss economy because it is the third largest single-sector contributor of the Swiss GDP, with a share of approximately 2 % of the GDP in 2014. The exports were almost 12 % per year over the 2001–2014 period. The food industry includes network of the farmers and companies that cover all aspects of food production and sale for the population. Despite the lower contribution on the GDP the food industry is connected with many different types of work positions from farmers to scientists; many people in the world are involved in food industry. It is possible to say the food industry is very important part of the manufacturing industry for each country.

The market capitalization of the Vienna Stock Exchange was approximately 110.1 billion EUR in 2017. The Vienna Stock Exchange plays a key role in the Austrian capital market and it is the driving force that contributes substantially to the further development of the local market. The market capitalization of the Warsaw Stock Exchange is 1.3 trillion PLN, and as measured by the number of IPOs, Warsaw was the 3rd largest in

Europe after London and Stockholm. The Warsaw Stock Exchange is CEE's top stock market by the number of listed companies. The total number of companies listed on the Warsaw Stock Exchange is 472; therefrom 424 are Polish companies. The market capitalization of the Swiss Stock Exchange is approximately 1.22 trillion CHF. The SIX Swiss Exchange, which is one of the leading exchanges in Europe, was the 13th largest stock exchange in the world in 2017. Switzerland is one of the leading global financial centers and belongs to the most competitive financial centers in the world. The proportions of Polish and Austrian food companies are about 2 % of total market capitalization and the proportion of Swiss food companies is about 29 % of total market capitalization. These differences can be related with some reasons. The important role can present industrial traditions in individual countries and market positions of the companies.

The object of our paper is to examine the relationship between several financial ratios and the stock prices of food companies listed on selected European Stock Exchanges. For this purpose, certain institutions are considered, including 20 food and beverage companies listed on selected European Stock Exchanges. Financial ratios include the acid ratio, the current ratio, the net working capital, the return on assets, the return on equity, the return on capital employed, the debt ratio, the equity ratio and the financial leverage. Individual sectors should be analyzed separately because each sector is very specific; there are different legislation regulations, manufacturing process, human resources intensity, material inputs intensity, technology, financial resources, technical equipment, etc. This could reflect the impact of company characteristics on stock prices. It seems that investors are interested about different financial ratios across individual sectors, as findings of thus far empirical studies demonstrated.

Our contribution is divided into several sections: A Review of the Literature follows the Introduction. Then, we present the section Materials and Methods, followed by Results, in which the results of the tests are presented; the final sections are the Discussion and the Conclusion.

## Review of the Literature

Many studies have been conducted to examine the relationships between financial ratios and stock prices or stock returns, mainly on Asia and US stock markets. We present the empirical literature

focused on the relationship between stock prices or stock returns and financial ratios and on studies that are oriented on European countries. There were and still are some limitations for researchers focused on this topic and region. The limitations are usually following; (1) insufficient number of empirical literature with focus on CEE countries due to capital markets development after the 1990s, (2) many companies had IPO after 2000 and later, and some stock exchanges are underdeveloped with low number of listed companies, (3) sometimes there can be problem with availability of accounting data. Despite that, we try to present relevant literature.

Jindrichovska (2001) investigated whether there is a statistically significant permanent relationship between stock returns and accounting data on the Czech market during the period of 1993–1998. The results suggest that there is significant relationship between accounting earnings and stock prices. Jindrichovska (2001) also argues cannot infer with a confidence that the Czech capital market views earnings changes to be largely permanent.

Dumontier and Raffournier (2002) focused on survey, and summaries of the main results related to the relationship between accounting information and capital markets in Europe. They argue that although European capital markets have theoretically been unified, important differences remain across countries. They also demonstrate that there is a low association between market returns and accounting numbers; this is generally considered as an evidence that accounting information is not relevant for security pricing, but it may also be possible that prices do not reflect the true value of firms because stock markets are not as efficient as generally assumed.

Pritchard (2002) analyzed the relationship between accounting data and stock returns in the Lithuania, Latvia and Estonia. The findings show that there are different results among all Baltic countries. The relationship between earnings and stock returns has the highest value relevance in Estonia. The authors attribute this to the higher liquidity of Estonian stock market and more developed accounting system.

Asteriou and Dimitropoulos (2009) analyzed specific ratios and their impacts on the stock returns of 101 non-financial firms listed on the Athens Stock Exchange from 1995 to 2004. The results show that the ratios of working capital to total assets and net profit to sales have a negative impact on stock returns, while the ratios of net profit to total assets and sales to total assets positively affect returns.

Muradoglu and Sivaprasad (2009) examined the effect of firm's leverage on stock returns. They used 788 non-financial companies listed on the London Stock Exchange for the period 1980–2008. Data were classified into 9 main industries: oil and gas, basic material, industries, consumer goods, healthcare, consumer services, telecommunications, utilities and technology. The results showed that leverage has a negative relation to stock returns.

Dobija and Klimczak (2010) examined the relationship between accounting data and stock prices of companies listed on the Warsaw Stock Exchange from 1997 to 2008. In their analysis, there was traced the changes in financial reporting regulation from 1994. They detected positive relationship between accounting earnings and stock prices.

Filip and Raffournier (2010) investigated the relation between accounting earnings and stock returns of companies listed on the Bucharest Stock Exchange. According to the findings they argue that there is weaker relationship between accounting earnings and stock returns then on developed markets; they suggest the results can be affected by bank orientation of financial system, lower efficiency of stock markets and lower timelessness of earnings.

Dzikevičius and Šaranda (2011) examined the relationship between selected financial ratios and stock prices of companies listed on the Lithuanian stock exchange. They used 5 companies and 20 financial ratios to their analysis. Their results show the positive impact of the ER on stock prices, the negative influence of the DR on stock prices, and both the positive and the negative impact of the ROA, the ROE, the L2 and the L3 on stock prices of selected companies.

Janjic *et al.* (2012) investigated the relationship between accounting earnings and stock returns of companies listed on Belgrade Stock Exchange from 2006 to 2011. Their study showed that stock prices lead accounting earnings, meaning that the stock prices reflect information, not only about current and past accounting earnings, but also about future earnings.

Angyal *et al.* (2013) analyzed the impact of selected financial ratios on stock prices included in FTSE 100, CAC 40, DAX, OMX over the 2003–2011 period. Their findings demonstrate the positive impact of the ROA and the L3 on European stock prices. The results also show that there are different reactions of European and United States' stock prices to the financial information.

## MATERIALS AND METHODS

We used 20 food and beverage companies listed on selected European Stock Exchanges, mainly Central European countries. In particular, there are 4 Austrian companies, 10 Polish firms and 6 Swiss firms, as Tab. I shows. Only 2 Central European countries are included because it is very difficult to find a sample of companies with similar business profile. It was necessary to include further country for analysis. The Switzerland was selected due to the geographical location near the selected CEE countries and there is generated the similar value of the GDP per year in analyzed countries. The data sample for selected companies cannot be wider because there is important most similar business profile of the companies and then the quotation on the stock exchanges had to be at the latest in 2005 due to the attainment of the required time series. The including of companies with later quotation on stock exchanges than in 2005 would shorten the time series even more; this is not adequate due to the annual frequency of the time series.

Data with an annual frequency will be used for the period 2005–2015. Data on stock prices are from Yahoo Finance and databases of the individual stock exchanges. Stock prices are measured by the average of daily values for each year. We chose to use basic financial ratios of liquidity, rentability and indebtedness, which can be calculated using financial analysis methods and reflect the success of the business activity. We selected financial ratios used in thus far published studies and we also added other basic financial ratios to examine whether they can have an impact on stock prices. Selected financial ratios are

the acid ratio (L2), the current ratio (L3), the net working capital (NWC), the return on assets (ROA), the return on equity (ROE), the return on capital employed (ROCE), the debt ratio (DR), the equity ratio (ER) and the financial leverage (Leverage). These time series are calculated using financial statements of the companies.

The financial ratios studied are as follows: the L2 is calculated as (current assets – inventories)/current liabilities; the L3 is calculated as current assets/current liabilities; the NWC is calculated as current assets – current liabilities; the ROA is calculated as the operation profit/total assets; the ROE is calculated as profit for the year/total shareholders' equity; the ROCE is calculated as profit for the year/(non-current liabilities + total shareholders equity); the DR is calculated as non-current liabilities/total shareholders' equity; the ER is calculated as non-current liabilities/total assets; and the Leverage is calculated as total assets/total shareholders' equity.

The L2 provides information about whether a company has sufficient short-term assets to cover its immediate liabilities without selling its supplies. The L3 is financial ratio that shows ability of the company to pay off its short-term liabilities with its current assets. The NWC is a part of current assets that is financed by long-term financial resources; the NWC shows whether a company has enough short-term assets to cover its short-term debt and the ratio measures operational efficiency and financial health. The ROA and ROE indicate how well the firm uses its resources in generating profit. The ROCE is profitability ratio that reflects how efficiently the company using own capital and debt capital in generating profit. The DR and

I: *Analyzed Companies*

Austria	Poland	Switzerland
Agrana Beteiligungs AG	Ambra	Barry Callebaut AG
Manner Josef and Comp. AG	Atlanta Poland	Chocoladefabriken Lindt and Sprüngli AG
Ottakringer Getränke AG VZ	Colian	Emmi AG
Schlumberger AG	Gobarto	Groupe Minoteries SA
	Grupa Zywiec	Hügli Holding AG
	Indykpol	Nestlé AG
	Kruszwica	
	Pepees	
	Wawel	
	Wilbo	

Source: Vienna Stock Exchange, Warsaw Stock Exchange, SIX Swiss Exchange

## II: Descriptive statistics of stock prices

Variable	Austria	Poland	Switzerland
Mean	46.8439	21.8890	769.0774
Median	50.3507	2.3362	440.0587
Maximum	98.7350	269.5799	4,881.401
Minimum	9.5870	0.1027	29.0578
Std. Dev.	23.5223	45.6965	1,024.447

Source: Authors' calculations

ER show to what extent the assets are funded from their own and debt sources. This provides creditors and investors with a general idea about the amount of leverage being used by a company, which indicates how strong the equity position is.

Before the empirical estimations, we present Tab. II., which shows descriptive statistics of stock prices for each country. It specifies the mean, median, maximum, minimum and standard deviation. The Tab. II. shows that the maximum value of the stock prices is 4,881.4 EUR in Switzerland, and the minimum value is 0.10 EUR in Poland. The standard deviation, which is the highest for Switzerland, shows the market risk. The values of stock prices declined significantly during the beginning of the global financial crisis. Food companies should be neutral to business cycles in general. However, many of the selected companies produce different types of convenience foods or confectionaries, for which demand may fall during a global financial crisis.

Following the descriptive statistics, we present the methodology. First, we tested the existence of unit roots in panels. There are several methods for implementing the panel unit root tests. We used the Levin-Lin-Chu panel unit root test, the Hadri panel unit root test, the Breitung panel unit root test, the ADF Fisher panel unit root test, and the Im, Pesaran and Shin panel unit root test.

Then, the data were subjected to correlation analyses to determine a linear relationship between stock prices of analyzed companies and selected financial ratios. The Pearson correlation coefficient can be defined as (Pearson, 1895):

$$\rho_{XY} = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y} \quad (1)$$

Then, there is examined relationship between stock prices and financial ratios by the Generalized Method of Moments (GMM). The GMM is general method for estimating parameters, the method is used often in economic and financial statistical

models. The GMM is recommended to models who deal with a variety of moment of orthogonality conditions derived from the properties of their economic models. The method is connected with certain number of moment conditions that are functions of the model parameters; and the data, therefore the sample of population orthogonality conditions is close to zero. The GMM model can be expressed mathematically as (Hansen, 1982):

$$Y_{it} = \alpha_1 + \beta_1 * Y_{i(t-1)} + \beta_2 * X_{it} + \varepsilon_{it} \quad (2)$$

where  $Y_{it}$  present endogenous variable, namely stock prices,  $\alpha_1$  is a constant, coefficient  $t$  presents the time period and  $\varepsilon_{it}$  is random variable. Independent variable is the delayed value of the previous year  $Y_{i(t-1)}$  and  $X_{it}$  that symbolizes all independently variables that are subjected to investigation, specifically they represent analyzed financial ratios.  $\beta_1$  and  $\beta_2$  are estimated coefficients.

## RESULTS

At the beginning we calculated correlation coefficients between the stock prices and financial ratios. The correlation coefficients are given in Tab. III. The correlation coefficients between the stock prices and financial ratios are both negative and positive. The stock prices of Austrian food companies detected statistically significant correlation coefficients with the ROA, the ROE and the ROCE. These results show that increase in profitability ratios can cause the decrease of the Austrian stock prices. Then, the stock prices of Polish food companies demonstrate statistically significant coefficients with the L2, the ROA, the ROE and the ROCE. The positive values of the correlation coefficients show that the increase in financial ratios should be related with increasing of the Polish stock prices. And the stock prices of Swiss food companies show statistically significant correlation coefficients with the ER, the DR, the L2, the L3, the Leverage and the ROA. The results

indicate the increase of the L2, the L3 and the ROA should cause the rising of the Swiss stock prices, and the increase of the ER, the DR and the Leverage can mean the decrease of the Swiss stock prices.

But the relationship between the stock prices of food companies and selected financial ratio is subjected to a deeper analysis with using the GMM estimations. In Tab. IV., there we can see results of GMM estimations for Polish food companies. The Sargan-Hansen test shows the model is robust. According to the results the stock prices of Polish food companies were affected by the NWC, the ROE and the ROCE. The NWC is included into the group of liquidity ratios, it was expected the positive impact on stock prices. The results show that

the NWC has negative impact on stock prices of Polish food companies; this can be caused by negative values of NWC in some of analyzed years despite improving of the value in comparison with previous year. Investors could evaluate negatively that there is not sufficient amount of short-term assets to cover its short-term debt. It could have a relation to the threat of the financial health of the companies. There is also possibility that investors were not able to evaluate information about the NWC correctly. The negative impact of the ROE is not consistent with theory but this result can be related with lower increase of the ROE, than investors expected or they evaluated increasing of the ROE as not sufficient. The positive influence of

### III: Correlation Coefficients

Variable	Austria	Poland	Switzerland
ER	0.2203	-0.0317	-0.4117*
DR	0.2234	0.1543	-0.3081**
L2	-0.1576	0.2034**	0.5693*
L3	0.0203	0.0155	0.5339*
Leverage	0.1710	0.1259	-0.3088**
NWC	0.0870	-0.1220	0.1412
ROA	-0.5528*	0.3153*	0.2877**
ROE	-0.4874*	0.2124**	-0.0511
ROCE	-0.5253*	0.3254*	0.1100

Source: Authors' calculations

Note: \*, \*\* and \*\*\* denote significance at the 1 %, 5 % and 10 % levels.

### IV: Results of GMM estimations – relation between selected financial ratios and Polish stock prices

Variable	Coefficient	Standard Error	t-Statistic	Probability
ER	5.0254	48.0513	0.1045	0.9170
DR	-0.1256	0.2833	-0.4435	0.6585
L2	0.6983	1.1343	0.6155	0.5398
L3	-0.2636	0.2706	-0.9741	0.3328
NWC	5.99E-06*	1.27E-06	4.7124	0.0000
Leverage	-0.8096	1.8485	-0.4380	0.6625
ROA	9.1309	7.0890	1.2880	0.2012
ROE	-6.9110*	2.4489	-2.8219	0.0060
ROCE	36.313**	7.8699	4.6142	0.0000

#### Effects Specification

S.E. of regression	8.5910
J-statistic	7.8766
Prob (J-statistic)	0.1631

Source: Authors' calculations

Note: \*, \*\* and \*\*\* denote significance at the 1 %, 5 % and 10 % levels.



the ROCE is in accordance with theory. The result suggests investors thought that companies used the capital employed appropriately in generating profit and the profitability is on adequate level.

Further, the results of GMM estimations for the Swiss food companies are presented in Tab. V. The Sargan-Hansen test proves the model is robust but all coefficients are statistically insignificant. These findings mean none of selected financial ratios had an impact on stock prices of Swiss food companies. It seems investors could be interested

about a different type of information. They could evaluate macroeconomic variables and industry specifics as sufficient indicators for investment opportunities; and they did not have to consider the evaluating of business financial performance as important for making investment decisions.

The findings of GMM estimations for Austrian food companies in Tab. VI follows. The Sargan-Hansen test confirms the robustness of the model. The results show that the stock prices of the Austrian food companies were influenced

V: Results of GMM estimations – relation between selected financial ratios and Swiss stock prices

Variable	Coefficient	Standard Error	t-Statistic	Probability
ER	184356.7	1309776.	0.1407	0.8887
DR	352.4815	1537.048	0.2293	0.8196
L2	7565.743	78216.28	0.0967	0.9233
L3	46.1059	1015.685	0.0453	0.9640
NWC	3.52E-05	6.27E-05	0.5617	0.5768
Leverage	-43963.16	285688.7	-0.1538	0.8783
ROA	60646.91	330544.5	0.1834	0.8552
ROE	-9326.252	55390.34	-0.1683	0.8670
ROCE	-3457.438	4594.285	-0.7525	0.4553
<b>Effects Specification</b>				
S.E. of regression			322.5389	
J-statistic			1.3937	
Prob (J-statistic)			0.2377	

Source: Authors' calculations

VI: Results GMM estimations – relation between selected financial ratios and Austrian stock prices

Variable	Coefficient	Standard Error	t-Statistic	Probability
ER	-126.2356	83.3241	-1.5149	0.1406
DR	32.2107	57.0990	0.5641	0.5770
L2	-16.4933	13.0519	-1.2636	0.2164
L3	9.4148	7.7665	1.2122	0.2352
NWC	2.82E-07	2.71E-07	1.0400	0.3069
Leverage	-15.5906	56.4823	-0.2760	0.7845
ROA	-59.7548	93.8446	-0.6367	0.5293
ROE	45.7952***	26.9658	1.6982	0.0989
ROCE	-220.0546	266.0678	-0.8270	0.4150
<b>Effects Specification</b>				
S.E. of regression			6.8767	
J-statistic			4.1541	
Prob(J-statistic)			0.3855	

Source: Authors' calculations

Note: \*, \*\* and \*\*\* denote significance at the 1 %, 5 % and 10 % levels.

by the ROE, but the relationship is very weak. Despite that, the positive impact of the ROE is consistent with theory. The finding indicates investors evaluated positively the value of the ROE that companies generated. The profitability could be considered as sufficient, and development of the ROE was without significant fluctuations that could influence investors' investment decisions. We also must note that none of further selected financial ratios have an impact on stock prices of Austrian food companies.

## DISCUSSION

The existence of the statistically significant results is consistent with Drummen and Zimmermann (1992) who confirmed the importance of various market and sector factors to the European stock prices volatility. The findings of the GMM estimations show different relationship between stock prices of selected companies and financial ratios across analyzed countries. It seems results can be affected by the fact that although European capital markets are theoretically unified, important differences remain across countries and then stock prices do not need to reflect the true value of companies because stock markets are not as efficient as generally assumed as Dumontier and Raffournier (2002) argue.

Despite that, the negative impact of the NWC on Polish stock prices is consistent with results of Asteriou and Dimitropoulos (2009), and the positive impact of the profitability ratios in Poland, and in

Austria is in accordance with findings of Asteriou and Dimitropoulos (2009), Dziukevičius and Šaranda (2011), Angyal *et al.* (2013) whose studies showed there is positive relationship between stock prices and profitability. The relationship between Austrian stock prices and the ROE is positive but weak, and relationship between Swiss stock prices and selected financial ratios is not detected. The results can be caused by bank orientation of financial system, and liquidity of individual stock markets, respectively liquidity of individual stock titles, as study of Filip and Raffournier (2010) demonstrates. The difference of relationships between selected financial ratios and stock prices of food companies can reflect specifics of each stock market, and different approach to the importance of information that investors evaluated. Thus far published studies focused on relationship between European stock prices and accounting earnings show that investors could evaluate primary information from financial statements without deeper financial analysis; but results show that investors were able to evaluate correctly development of accounting earnings and their relation to the stock prices, as studies of Jindrichovská (2001), Dobija and Klimczak (2010), Janjić *et al.* (2012) prove. It seems there can be possibility investors did not have sufficient financial education, and they were able to evaluate only basic information, mainly earnings of the companies. There can be also a variant that investors are interested about different type of information that they evaluate as more important, and the impact of financial ratios on stock prices is more of anomaly.

## CONCLUSION

The objective of this study was to examine the relationship between financial ratios and the stock prices of the food companies listed on selected European Stock Exchanges. The sample period was from 2005 to 2015.

The GMM method was used to examine relationship between the stock prices of the food companies and the L2, the L3, the NWC, the Leverage, the ROA, the ROE, the ROCE, the DR and the ER. It was found that Austrian stock prices are influenced by the ROE, the Polish stock prices are affected by the ROE, the ROCE and the NWC, and the Swiss stock prices are influenced by none of analyzed financial ratios.

Despite the fact, the basic financial ratios are included to the analysis; the relationship between selected financial ratios and stock prices of food companies is sporadic. We try to identify the causes of the results. It seems the strongest relationship is between financial ratios and stock prices of Polish food companies; it can be attributed to the situation the Polish stock market is one of the most developed stock markets in Central and Eastern Europe. Due to the different findings mainly in Austria and Switzerland, there is also idea that investors could be interested about more general variables as macroeconomic factors and industrial specifics and they did not evaluate company characteristics as important and significant variables. This support an idea that investors could have a weaker financial education and they were not able to evaluate some of financial information.



However, the development of capital markets and investors' education are changed in time; and therefore the relationship between financial ratios and stock prices, and its intensity can be also different. Therefore, studies of this type can be appreciated by investors and management of the companies. There is also possibility of other research because findings of thus far published studies show there can be different relationships between financial ratios and stock prices across individual sectors due to the specifics of individual sectors.

#### Aknowledgements

Publication of this paper was supported by the Student Grant System of Silesian University in Opava within the project "The effect of fundamental factors and corporate governance on stock prices" [nr. 23/2016]. The support is greatly acknowledged.

#### REFERENCES

- ANGYAL, C., DIMA, B., DIMA, S. M. and ȘĂRĂMĂȚ, O. 2013. Financial Ratios and Stock Prices on Developed Capital Markets. *Economic Series*, 23(1): 1–12.
- DIMITROPOULOS, P. and ASTERIOU, D. 2009. The Value Relevance of Financial Statements and Their Impact on Stock Prices, Evidence from Greece. *Managerial Auditing Journal*, 24(3): 248–265.
- DOBIJA, D. and KLIMCZAK, K. M. 2010. Development of Accounting in Poland: Market Efficiency and the Value Relevance of Reported Earnings. *International Journal of Accounting*, 45(3): 356–374.
- DRUMMEN, M. and ZIMMERMANN, H. 1992. The structure of European stock returns. *Financial Analysts Journal*, 48(4): 15–26.
- DUMONTIER, P. and RAFFOURNIER, B. 2002. Accounting and capital markets: a survey of the European evidence. *The European Accounting Review*, 11(1): 119–151.
- DZIKEVIČIUS, A. and ŠARANDA, S. 2011. Can financial ratios help to forecast stock prices? *Journal of Security and Sustainability Issues*, 1(2): 147–157.
- FILIP, A. and RAFFOURNIER, B. 2010. The Value Relevance of Earnings in a Transition Economy: The Case of Romania. *International Journal of Accounting*, 45(1): 77–103.
- GPW. *GPW Main Market*. [Online]. Available at: <https://www.gpw.pl/list-of-companies>. [Accessed: 2018, February 13].
- HANSEN, L. P. 1982. Large Sample Properties of Generalized Method of Moments Estimators. *Econometrica*, 50(4):1029–1054.
- JANJIC, V., ČUPIĆ, M. and TODOROVIC, M. 2012. The Usefulness of Earnings Numbers in Explaining Stock Returns in an Emerging Market: The Case of Serbia. In: *Proceedings of the 7<sup>th</sup> International Conference on Currency, Banking and International Finance: How Does Central and Eastern Europe Cope up with the Global Financial Crisis?* University of Economics in Bratislava, 27–28 September. Bratislava: Department of Banking and International Finance, University of Economics in Bratislava, pp. 79–91.
- JINDRICHOVSKA, I. 2001. The Relationship between Accounting Numbers and Returns: Some Empirical Evidence from the Emerging Market of the Czech Republic. *European Accounting Review*, 10(1): 107–131.
- MURADOGLU, Y. G. and SIVAPRASAD, S. 2009. *Leverage, stock returns, taxes and industry concentration*. [Online]. Available at: <http://dx.doi.org/10.2139/ssrn.1031987> [Accessed: 2014, June 11].
- PEARSON, K. 1985. Notes on regression and inheritance in the case of two parents. *Proceedings of the Royal Society*, 58(1): 240–242.
- PRITCHARD, N. J. 2002. *The Relationship between Accounting Numbers and Returns in the Baltic Stock Markets*. CERT Discussion Paper, 2002/6. School of Management and Languages, Heriot-Watt University.
- SIX SWISS EXCHANGE. Market data – Shares. *SIX*. [Online]. Available at: [https://www.six-swiss-exchange.com/shares/overview\\_en.html](https://www.six-swiss-exchange.com/shares/overview_en.html) [Accessed: 2018, February 28].
- WIENER BÖRSE. Market data – Shares & Others. *Wiener borse*. [Online]. Available at: <https://www.wienerborse.at/en/market-data/shares-others/prime-market/> [Accessed: 2018, February 26].

#### Contact information

Marie Ligocká: [ligocka@opf.slu.cz](mailto:ligocka@opf.slu.cz)  
Daniel Stavárek: [stavarek@opf.slu.cz](mailto:stavarek@opf.slu.cz)