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Impact of the Sector and of Internal Factors on Profitability of the Companies Listed on the Warsaw Stock Exchange

A b s t r a c t. The aim of the article is to assess the impact of the sector environment and of selected internal factors on the profitability level of the companies listed on the Warsaw Stock Exchange in 1998–2016. An increase in the financial leverage, financial liquidity, non-debt tax shield and enterprise size cause a drop in the ROA. An increase in the ratio of fixed assets to the total assets results in an increase in the ROA. Similar results were obtained for the models estimated for the ROE. It means, that profitability of the examined companies results from the decisions made by the managers and from the impact of the sector environment.

K e y w o r d s: return on assets (ROA), return on equity (ROE), industry effect, panel estimation.

J E L Classification: G30.

Introduction

Identification of the factors shaping enterprise profitability is an important research trend that has been considered on many levels of economic sciences. In the traditional approach that is based on the S-C-P concept (Structure-Conduct-Performance), industrial economics focuses on the sectoral factors shaping the competitive advantage. These determinants entail the concentration, the scale effect as well as the entry and exit barriers (Porter 1992; Slater and

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Olson, 2002). By contrast, in accordance with the RBV concept (Resource-Based View), the role of company-specific internal factors is emphasized. According to this approach, the organizational structure and the managers' managerial skills are the source of the differences in the level of profitability of individual companies. Discussion has been continuing in the literature on the subject about the impact of both groups of factors on the financial results of enterprises. The attempts to confirm the validity of both approaches have been supported by many empirical studies, the results of which, however, are ambiguous. The hypothesis formulated assumes, therefore, that both the sector environment and the internal factors exert specific impact on the level of a given entity's profitability. Moreover, profitability is the main pillar for any company to survive in the long run. For this reasons, the aim of the article is to assess the impact of the sector environment and of selected internal factors on the profitability level of the companies listed on the Warsaw Stock Exchange in the years 1998–2016.

Implementation of a goal formulated as such and verification of the research hypothesis required estimation of panel data models. To group the examined enterprises according to their sectoral affiliation and to estimate the impact of the sector on their financial results, the sectoral classification used for the needs of the Warsaw Stock Exchange was applied. The profitability (ROA) and the capital (ROE) ratios of the examined entities were adopted as the dependent variables. The sector environment (INDUSTRY) is one of the independent variables. Other exogenous variables are the internal factors. The value of debt (LEVERAGE) has been expressed as the total debt and total assets ratio, thus it describes the structure of the capital, which is identified with the structure of financing. The growth rate (GROWTH) has been described by the percentage change in the sales revenue, relative to the previous year. Financial liquidity (LIQ) has been designated as the ratio of current assets to current liabilities. The non-debt tax shield (NDTS) was calculated as the ratio of the depreciation to the total assets. The natural logarithm of the total assets' value has been assumed as the volume (size). The structure of assets (TANG), also referred to as asset flexibility (tangibility), has been described by the ratio of the tangible fixed assets to the total assets. Calculations were carried out using the GRETL package.

The article consists of an introduction, four parts and an ending. The first part concerns the shaping of the enterprise performance results, in the context of the positional and the resource-related concept of the competitive advantage. In the second part, an overview of the studies based on these theories was made. The third part is methodical. The following part presents the results of the research, which have been summarized in the final part of the paper.

1. Enterprise Profitability in the Light of the Positional and the Resource-related Concept of the Competitive Advantage

The factors shaping enterprise profitability can be classified as: internal factors (specific for a given entity), those related to the sector environment and to the macro-environment (Pierścionek, 1997, p. 105–107). Impact of the internal factors and of the sector environment on the company's financial results can be considered in the light of two opposing concepts of the competitive advantage: the positional and the resource-related school of thought.

Supporters of the positional school of thought emphasize the role of the sector environment in shaping the results of enterprise performance. The classic research approach consistent with this theory is the aforementioned S-C-P concept (Structure-Conduct-Performance), initiated by Bain (1951). It should be emphasized that the sector structure determines the activities of enterprises, in terms of price formation, research and development or investments, which in turn affect their financial results. Due to the superior role of the sector, impact of managerial decisions on the company's profitability is thus limited. In his pioneering work, Bain (1951) proved that the average level of profitability obtained by the enterprises belonging to the sectors with a high degree of concentration is higher than in dispersed industries. The greater degree of concentration provides these companies with a bargaining advantage and the ability to put pressure on the partners.

In contrast to the positional school of thought, the RBV (Resource-Based View) approach exposes the importance of internal factors in achieving a competitive advantage. This means that the key role in shaping a company's financial results is the way of managing the assets it owns (Wernerfelt, 1984; Barney, 1991). Therefore, market success of a company is determined by the ability to use the available resources, owing to which it is able to develop a highly competitive position.

Porter (1992, p. 21–23; 2008), emphasizes that relating a company to its environment constitutes the essence of a competition strategy formulation. The concept of five competitive forces developed by this researcher refers to the structural features of a sector, which determine the strength of the competitive forces, and therefore the level of profitability. This means that different sectors vary, in terms of the ultimate potential for generating profit. This author subjected this thesis to verification in his later works (Porter, 1991; McGahan and Porter, 1997). The research carried out confirmed, to a certain extent, previous observations. It turned out that both the sector-related and the internal factors had impact on the profitability of the examined enterprises. Porter (1991) emphasizes that a company is partly under the influence of the sector environment, however, to some extent, it can also affect it. Therefore, it is possible to determine to what extent a company's financial results are

shaped by the sector environment and to which by the internal factors associated with the decisions made by management.

2. Overview of the Studies on the Factors Shaping the Results of Enterprise Performance

Impact of the sector environment and internal factors on the profitability of enterprises has been the subject of numerous studies. Their results are diversified, ambiguous and even contradictory. Schmalensee (1985) analyzed the impact of the sector on the financial results of enterprises, on a sample of 456 US manufacturing companies, for the year 1975. The author stated that the sectoral effect is the key factor shaping the profitability of the examined entities and explains about 19% of their financial results. The same research shows that the internal factors, affecting profitability from the level of an enterprise, have negligible impact on it. Rumelt (1991) conducted analogous analyzes for the period of 1974–1977, in which he included 432 to 471 production enterprises for each year. This author obtained opposite results. According to him, the sectoral effect was not significant, it explained only 4% of the volatility of the profitability ratios in the examined entities. On the other hand, internal factors were shown to have significant impact on the profitability of the examined entities (44%). However, in the studies carried out by both cited authors, a very short period of time was analyzed, which could significantly distort the results obtained by them. In response to the studies carried out by Rumelt (1991) and Schmalensee (1985), McGahan and Porter (1997) analyzed a much longer period, covering all phases of the business cycle, i.e. 1981–1994 on a sample of 5196 US companies from all sectors, except the finance sector. The research conducted showed that the sectoral effect explained 19% of the volatility of the profitability ratios in the examined entities. What is more, the strength of this effect varied, depending on the sector. And so, the sectoral effect was of less significance in the case of manufacturing enterprises, and of larger importance in entertainment, commercial and transportation industries. In turn, internal factors explained the financial results of the surveyed entities in as many as 32%.

The studies conducted by Bamiatzi and Hall (2009), on a sample of as many as 71750 entities operating in Great Britain in the years 2002–2004, show that the financial results of micro-, small- and medium- as well as large-sized enterprises during the analyzed period were affected by both the sectoral factors, and the internal ones. However, the strength of their impact varied. The reason for this lies in the fact, that entities of various sizes operate in different segments of the market, which can be distinguished within individual sectors. The company size turned out to be an important factor impacting the

financial results of US public companies in the years 1987–2006. In turn, impact of the sector environment on the profitability of the examined entities was small (Lee, 2009). Also, Ruefli and Wiggins (2003) believe that the sector environment does not have any significant impact on enterprise performance. The authors emphasize that managers play a key role in formation of the financial results and that it is primarily the financial situation of a company that determines its performance. Similar results were obtained by Stierwald (2010), who analyzed 961 large Australian enterprises in the years 1995–2005. The author concluded that, in contrast to the internal factors, impact of the sectoral effect on the profitability of the analyzed entities was scant.

The authors of the above-cited studies used the return on assets, and thus considered enterprise performance in accounting terms. In contrast, Hawawini, Subramanian and Verdin (2003), applied measures based on enterprise value, i.e. the economic value added (EVA) and the market value added (MVA), in addition to the return on assets (ROA). The research carried out by these authors confirms that a given sector has significant impact on the financial results of the enterprises within it, while the strength of its impact is greater than that of the internal factors specific for individual entities. Only in the case of the enterprises operating as market leaders and those least competitive within a given sector, a reverse relation was observed. For both groups of entities, the strength of the impact of internal factors was greater than that of the sectoral ones.

Dragonić (2014) conducted the study on Croatian fast-growing small and medium businesses. The research showed that an impact of internal factors and sector on company's profitability depends on the period, i.e. life cycle stage of a company and general state of the economy.

Margaretha and Supartika (2016) examined internal factors affecting profitability and industry affiliation of SMEs firm listed in Indonesia Stock Exchange. The results confirmed that firm size, growth, lagged profitability, productivity and industry affiliation significantly effect on profitability. The industry affiliation has a positive impact on profitability. The authors emphasize that for further improve company's performance the manager should define a strategy to increasing profitability with focusing on productivity and industry affiliation.

Many other studies confirmed that industry affiliation influences company's profitability ratio. For example, Vijayakumar (2011) concluded that vertical integration is significantly associated with profitability. The studies conducted by Salman and Yazdanfar (2012) and Yazdanfar (2013) indicate that firm industry affiliation has and impact on its profitability.

The influence of internal factors on company's performance was also analyzed by many other authors. Tailab (2014) analyzed an impact of leverage,

liquidity, inventory, growth, size and firm's age on financial performance of 100 top non-financial American firms listed on Fortune 500 in 2009–2013. Alarussi and Alhaderi (2018) examined the internal factors affecting profitability in Malaysian-listed companies. This study applies the resource-based theory. Research is based on five independent variables that were empirically examined for their relationship with profitability. The findings show a strong positive relationship between firm size, working capital, company efficiency and profitability. The results also show a negative relationship between leverage and profitability.

In the available literature on the subject, few studies can be found regarding the impact of the sector environment and the internal factors on the profitability of Polish enterprises (Matyjas, 2012, 2016). The author analyzed companies listed on the Warsaw Stock Exchange. The research results vary, depending on the number of the subjects admitted to the sample and the period covered by the analysis. Thus, during the period of 2008–2011, 389 companies were examined. The author proved that internal factors played an important role in shaping those companies' profitability. Sector environment, in turn, did not affect it (Matyjas, 2012). In further studies, the same author obtained different results (Matyjas, 2016). This time, the subject of the analysis entailed 221 companies listed on the Warsaw Stock Exchange in the years 2007–2012. It turned out that their profitability was impacted by both the internal factors and the sector environment. It should be noted, however, that the strength of the company-specific factors was, in this case, much higher than that of the sector-specific ones.

3. The Research Sample and Description of the Research Method

The subject of the analysis entails the companies listed on the main market of the Warsaw Stock Exchange in the years 1998–2016, as of 15 December 2017. To select the entities, the sector classification used for the needs of the Warsaw Stock Exchange was applied to the sample. Out of 477 companies, companies from the following sectors and subsectors were accepted for the research: fuels and energy (14 companies); chemistry and raw materials (37 companies); construction (44 companies); electromechanical industry (24 companies); transport and logistics, business supplies and enterprise services (20 companies in total); consumer goods (39 companies); wholesale trade, retail chains and e-commerce (13 companies in total); recreation and leisure, media and games (26 companies in total); health care (15 companies) and technologies (28 companies). Companies from the financial sector were

excluded from the research. Therefore, 64 entities were rejected, with the exception of the enterprises included in the real-estate subsector (20 companies), which carry out property development activity, consisting in the construction of real estate and then its sale or rental. The sector, and more generally – the real estate market can be considered from two perspectives: the financial and the material one. In the first case, it should be perceived through the prism of the links with the financial capital market, while in the second – in terms of the real estate supply and demand (Wiśniewska, 2004, p.79). Due to the presumptions resulting from the second conceptualization, real estate development companies were accepted for research.

The sample excluded the entities that did not submit complete financial statements during the period under consideration, i.e. 52 enterprises. The companies in bankruptcy or under restructuring, i.e. 15 enterprises, were also rejected. Moreover, only the entities that were continuously listed on the Warsaw Stock Exchange for a period of at least 5 years were admitted to the study. Therefore, 66 companies were excluded from the sample. Ultimately, 280 enterprises were qualified for the research, i.e. almost 59% of the pre-selected entities.

To identify the impact of selected internal factors on the profitability of the examined companies and the dependence of profitability on the sectoral affiliation, estimation of an econometric model, in a panel approach, was proposed. Due to the fact that not all companies were listed on the Warsaw Stock Exchange or operated since 1998, it was an unbalanced panel.

A linear model of the dependence of the profitability level on the affiliation to the sector and on the internal factors has the following form:

$$y_{it} = \beta_0 + \sum_{j=1}^{11} \beta_j S_j + \alpha_1 LAVERAGE_{it} + \alpha_2 GROWTH_{it} + \alpha_3 LIQ_{it}$$
$$+ \alpha_4 NDTS_{it} + \alpha_5 SIZE_{it} + \alpha_6 TANG_{it} + \xi_{it}$$

where y_{it} is an endogenous variable representing the profitability of the *i-th* company in the period *t*. Profitability is defined by the relation of the profit to the total assets (ROA) or the ratio of the net profit to the total equity (ROE). The variables *Sj* are centered dummy variables, taking the value of one if it belongs to a given sector, zero in other cases. While identifying individual sectors, the following markings were adopted: the real estate sector (RES); the fuels and energy (FE); chemistry and raw materials (CRM); construction (C); electromechanical industry (EI); transport and logistics, business supplies and services for enterprises (TLS); consumer goods (CG); wholesale trade, retail chains and e-commerce (TREC); recreation and leisure, media and games (RM); health care (HC) and technologies (TE).

Additionally, the remaining exogenous variables that represent the internal factors of companies are:

LEVERAGE – debt, the total debt and total assets ratio;

GROWTH – increase, a percentage change in sales revenues in relation to the previous year;

LIQ – financial liquidity, the relation of current assets to current liabilities;

NDTS – investment tax shield, the depreciation and total assets ratio;

SIZE – size, natural logarithm from the value of total assets;

TANG – the structure of assets, the ratio of fixed assets to the total assets.

Symbols $\beta_0, \beta_1, ..., \beta_{11}, \alpha_1, ..., \alpha_6$ are the structural parameters, while ξ_{it} signifies the model's random component.

The proposed model was estimated using the least squares panel method (pooled model). Then, using the Wald test, it was checked whether estimation of a fixed effects would be correct.

4. Research Results

As already mentioned, the empirical analysis aims to indicate whether internal factors and sectoral affiliation determine the profitability level of an enterprise. The above-proposed model was estimated in a panel approach. While modeling the shaping of the ROA variable, the results of the estimations of the 4 versions of the model have been presented in Table 1. Model (1) includes the statistically significant variables. This means that an increase in the financial leverage, the financial liquidity, the non-debt tax shield and the size of an enterprise cause a decrease in the ROA, while an increase in the share of the fixed assets in the total assets, expressing the structure of assets, results in an increase in the ROA.

The negative relationship between the financial leverage and the asset profitability is explained by the pecking order theory. The most profitable enterprises are in low debt due to the fact that they prefer internal financing first (they use their earned profits for this purpose), not because they ultimately set a low level of the debt ratio. In contrast, enterprises with low profitability are more willing to use debt, because they do not have sufficient resources from their internal sources. The tendencies described are supported by the studies on the capital structure of Polish enterprises, carried out by other authors (Marzec, 2010; Janus, 2006; Lisińska 2012; Barburski, 2014, Wrońska-Bukalska, 2014; Jaworski and Czerwonka, 2017).

The negative relationship between asset profitability of and financial liquidity is justified by the fact that purchase of inventories exceeding current needs generates additional costs, which do not bring additional revenues – it provides a hedge, in the event of a sudden increase in the demand or in the

prices of supplies and raw materials. On the other hand, current assets and therefore liquidity increase, while profitability does not. Asset profitability may even drop, because the value of assets increases, while profits may decrease, since excessive stocks create additional costs.

Table 1. Estimates of the linear regression model for ROA

Variable	Model			
	(1)	(2)	(3)	(4)
	pooled	FE	pooled	FE
const	2,4175***	4,4642***	2,5358***	4,5556***
RES			–0,3417	
FE			0,3121**	
CRM			–0,0195	
C			–0,0858	
EI			–0,0646	
TLS			–0,3982***	
CG			0,0352	
TREC			–0,0365	
RM			0,2938***	0,4461**
HC			–0,1665	–0,7783***
TE			0,4717***	–1,0186***
LEVERAGE	–0,1599***	–0,1531***	–0,1588***	–0,1536***
GROWTH			0,0000	
LIQ	–0,0064**	–0,0099***	–0,0059**	–0,0105***
NDTS	–37,7074***	–47,928***	–38,8988***	–47,6416***
SIZE	–0,1476***	–0,2990***	–0,1574***	–0,3086***
TANG	2,9309***	3,4679***	3,0362***	3,6041***
Joint significance test	3,7365#	na	3,6960#	na
Breusch-Pagan test	376,6740#	na	300,6340#	na
Hausman test	388,53538#	na	429,5220#	na

Note: **) ***) *statistically* significant at the significance levels 0.05 and 0.01 respectively; #) statistically significant at the significance level of 0.05.

The non-debt tax shield – expressed as the ratio of the depreciation to the total assets, is a substitute for an interest tax shield. Enterprises collecting funds through depreciation do not have to involve debt in their investment financing. Therefore, entities that have the option of financing investments from internal sources, use a non-debt tax shield. However, making high depreciation charges applies only to modern components of the fixed assets, with a high initial value. Hence, if high-value modern fixed assets dominate in the structure of the company's assets, the value of the return on assets may be lower than in the entities that have efficient but used-up fixed assets.

The negative relationship between the size of an enterprise and the profitability of the assets can be justified by the fact that there are components within the asset structure that do not bring additional revenues over a short period of time, e.g. some long-term investments or stocks of raw materials and

supplies, providing security in the event of a sudden increase in the demand or in the prices of supplies and raw materials. In enterprises with a high share of such assets in the total assets, profitability may be low, because their value is high, while profits may be reduced, because a high level of non-production assets creates additional costs.

The positive relationship between the structure of assets and the value of ROA should be explained by the significant share of the investments yielding a high rate of return in the asset structure of the companies under examination. It causes an increase in the profitability level of these entities.

Model (1) indicates predominance of the fixed effects model, hence the version (2), which is an estimation of the model describing the impact of internal factors, which is the fixed effects one. Version (3) contains estimations of the model with sectoral effects and factors, using the pooled model. The final version (4) indicates the sectoral effects, statistically significant, and the internal factors of the fixed effects model. The results indicate in which sectors statistically significant differences in the ROA level were noted, while impact of individual factors on the ROA level was indicated (Table 1).

Table 2. Estimates of the linear regression model for ROE

Variable	Model			
	(1)	(2)	(3)	(4)
	pooled	FE	pooled	FE
const	0,2354	0,6781	2,5358***	4,5556***
RES			–0,3417	
FE			0,3121**	
CRM			–0,0195	
C			–0,0858	
EI			–0,0646	
TLS			–0,3982***	
CG			0,0352	
TREC			–0,0365	
RM			0,2938***	0,4461**
HC			–0,1665	–0,7783***
TE			0,4717***	–1,0186***
LEVERAGE			–0,1588***	–0,1536***
GROWTH			0,0000	
LIQ			–0,0059**	–0,0105***
NDTS	16,0422**	17,0020*	–38,8988***	–47,6416***
SIZE			–0,1574***	–0,3086***
TANG	3,8527**	–5,8666**	3,0362***	3,6041***
Joint significance test	1,1625#	na	3,6960#	na
Breusch-Pagan test	0,1408	na	300,6340#	na
Hausman test	0,4527	na	429,5220#	na

Note: **) ***) *statistically* significant at the significance levels 0.05 and 0.01 respectively; #) statistically significant at the significance level of 0.05.

Next, a model was estimated by adopting the value of ROE as a determinant of the profitability level. The results are presented in Table 2. Similarly, as in the case of the ROA, it was estimated in four versions. Generally, the results justify using the panel OLS method (pooled model), only the model in version (4) contains estimates with fixed effects (within group estimator). It can be noticed that the value of ROE statistically significantly differs in the consumer goods and services sectors, in the case of a model containing only sectoral effects. The significance of internal factors confirmed the results obtained for the ROA index.

Conclusions

The empirical analysis carried out enabled indication of the dependence of the profitability level of companies on their sectoral affiliation and on selected internal factors characterizing those companies. The model estimated for the ROA indicates a statistically significant level of this index, higher than the average in the service sector, and higher in the sectors of health care and technology. In addition, an increase in the financial leverage, financial liquidity, non-debt tax shield and enterprise size cause a drop in the ROA. On the other hand, an increase in the value of the ratio of fixed assets to the total assets results in an increase in the ROA. Similar results were obtained for the models estimated for the ROE. Therefore, it can be concluded that there are no grounds to reject the hypothesis assumed in the introduction, about the profitability of companies listed on the Warsaw Stock Exchange being dependent on their sectoral affiliation and on selected factors. In other words, profitability of the examined enterprises results from the decisions made by the managers and from the impact of the sector environment.

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Wpływ sektora i czynników wewnętrznych na rentowność spółek notowanych na GPW w Warszawie

Z a r y s   t r e ś c i. Celem artykułu jest ocena wpływu otoczenia sektorowego oraz wybranych czynników wewnętrznych na poziom rentowności spółek notowanych na GPW w Warszawie w latach 1998–2016. Wzrost dźwigni finansowej, płynności finansowej, nieodsetkowej tarczy podatkowej oraz wielkości przedsiębiorstwa powodują spadek ROA. Z kolei wzrost wskaźnika rzeczowych aktywów trwałych do aktywów ogółem powoduje wzrost ROA. Analogiczne wyniki otrzymano w przypadku modeli oszacowanych dla ROE. Oznacza to, że rentowność badanych przedsiębiorstw jest wypadkową decyzji podejmowanych przez menedżerów i wpływu otoczenia sektorowego.

S ł o w a   k l u c z o w e: rentowność aktywów ROA, rentowność kapitału ROE, efekt sektorowy, estymacja panelowa.