

Profitability and Financial Liquidity of Chemical Industry Companies*

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Abstract: *Objective* – The objective of the paper is to present an analysis of the condition of companies in respect of profitability and financial liquidity, as well as to attempt to establish the relationship between those two areas of analysis, enabling a fuller evaluation of the financial standing of enterprises.

Research methodology – The empirical research presented in the paper was conducted in accordance with this concept with the example of the chemical industry companies listed on the WSE for several years. The presented research results were obtained and based on the conducted literature study, economic analysis methods (namely, both liquidity and profitability were measured in accordance with the static and dynamic approach), and statistical methods (correlation analysis) used.

Result – As a result of the conducted research attention was drawn to the considerable significance of the liquidity and profitability analysis in the evaluation of the financial standing of enterprises. A correlative relationship was established between these two areas of a ratio analysis for joint stock companies of the chemical industry.

Originality/value – the article emphasizes the significance of the conducted analysis of enterprise profitability which is crucial in the evaluation of the financial standing of an entity but only in the case of the equal study of the situation in terms of the maintained financial liquidity.

Keywords: analysis of enterprise, profitability, financial liquidity

Introduction

An analysis of the profitability of conducted activity is undoubtedly a basis for the evaluation of the financial standing of a firm, but only with the simultaneous consideration of the level of financial liquidity. Maintaining financial liquidity in an enterprise is necessary for its functioning and maintaining the continuity of operations, thus, it is one of the fundamental short-term goals. In the long term, however, decisions taken in a firm should focus on its development which is conditioned by making profits. Therefore, conducting profitable activity by a firm enables survival in the conditions of competition and development in the long term. Yet, the profitability analysis conducted irrespective of the examination of the situation with regard to maintaining financial liquidity is not sufficient to evaluate the activity of a business.

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1. The evaluation of the financial standing of an enterprise based on a profitability and liquidity analysis

The analysis of the situation of a firm and its financial standing is made mainly on the basis of financial statements of the entity. The preliminary analysis of financial statements enables to evaluate the financial standing of the examined entity, but a fuller evaluation can be obtained after performing a ratio analysis. We can distinguish the following basic areas of a ratio analysis enabling the evaluation of a firm's activity in terms of: liquidity, profitability, efficiency of operations, debt and debt service ability, as well as a market analysis of the value of shares and capital.

In the area of finance, a special role in determining the current and future situation of a firm is assigned to profitability and financial liquidity. Profitability reflects, in the most synthetic form, the effectiveness of management in a company and keeping the continuity of the implemented business processes in a firm is not possible without maintaining financial liquidity (Sierpińska, Jachna, 2004, pp. 161–162). In spite of the fact that profitability and liquidity are usually examined within the same ratio analysis, the influence of changes in the area of profitability and liquidity on the condition or value of an enterprise is established, such an analysis is made somewhat separately. The phenomena of profitability and liquidity are discussed as if „next to” each other, in parallel. It is also noticed by J. Kowalczyk and A. Kusak (2006, p. 62) who write that it is most easily noticed in analyses with an annual (or shorter) time horizon, where in one part of reports or analytical studies the situation is discussed with regard to profitability, and in another part – with regard to liquidity.

A lot of ratios are used to measure both profitability and liquidity. Both phenomena – profitability and liquidity – can be measured and based on the static and dynamic approach. During the measurement of both profitability and liquidity in the static approach, computations are made on the basis of the balance and the profit and loss account of these entities. Considering the structure of the profit and loss account prepared in business entities, the counter of profitability ratios can include various categories of profits, and the denominator of this relationship can be revealed differently, too. If, however, for the measurement of financial liquidity and profitability the value of cash flows from operations from the cash flow statement is used, we can evaluate changes in both these areas in a dynamic approach.

Monitoring the situation of a firm based on the changes in the level of these ratios is probably the most popular way of their use, applied in practice to decide about a better or worse condition of a business. As a drawback we have to treat the fact that the analysis of both these phenomena is sometimes independent, although sometimes in the descriptive analysis we can find attempts of linking the fluctuations of profitability and liquidity ratios as a result of the combination of specific economic events.

In the literature on the subject (Bieniasz, Gołaś, 2011, pp. 68–81; Trippner, 2014; Abuzar Eljelly, 2004, pp. 48–61) it is emphasised that on the level of the ratios, no clear relationship having the character of a function, model or algorithm showing the relationship between

profitability and liquidity has been defined. The research carried out within this scope also proves that it is difficult to indicate an unambiguous character of this relationship.

The management of current assets in a firm, considering mainly receivables management as well as inventory management, results in the evaluation of many other areas of a firm's activity. The necessity to engage long-term capitals to finance increased inventory or receivables raises the cost of a firm's equity, which will negatively affect its profitability, and in the long term – its value. If, however, the enterprise had a possibility to increase the share of short-term capitals in financing the activity, the situation would be insignificantly reflected in the achieved liquidity levels. Such a choice of the source of finance will have a positive impact on the achieved level of profitability, since the costs of financing will be lower. A higher share of short-term sources in the financing of an enterprises activity results, on the other hand, in lower values of liquidity ratios and can prove the problems related to the maintenance of financial liquidity.

The situation will not threaten the loss of financial liquidity if it results, for example, from the specificity of the industry in which the enterprise functions, or is the effect of a strong negotiation position of the company in relations with suppliers and recipients, owing to which it is possible to achieve these additional benefits at the expense of contracting parties. When mentioning the conditionings of the functioning of, for example, the trade sector, it should be emphasised that the high level of short-term liabilities and very low levels of short-term receivables result in the achievement of low values by financial liquidity ratios. The results will not, however, indicate the loss of financial liquidity by those entities but they arise from the specificity of conducting activity by enterprises belonging to this industry,

The research findings presented in the – paper show that undoubtedly managers, when deciding about the profitability of the firm, should take into consideration that the undertaken actions will also affect the liquidity level in the firm they manage. Moreover, an attempt is made to verify and establish what relationship can be observed between the ratios measuring enterprise profitability with the ratios expressing its liquidity with the example of chemical industry firms.

2. The choice of the research objects and methodological assumptions

The chemical industry is one of the key branches of the processing industry and at the same time it is a sector which is very sensitive to the current economic situation. The industry is characterised by high capital intensity and low labour intensity, since a great majority of processes depend on the sources of raw materials. The main problem of the Polish chemical industry is the price level of natural gas, which is used both for further processing and as a fuel. The industry is characterised by the very large-scale production of semi-finished goods which are then processed by other branches of industry. Therefore, most of the sales find their way to other sectors of the economy, and the rest directly to consumers – the industry is strongly correlated with the automotive or construction industry, for example.

The profitability and liquidity analysis of the chemical industry enterprises was based on data covering 18 years of the activity of joint stock companies listed on the Warsaw Stock Exchange. The study adopted the classification of companies by the types of activity from the Notoria database and considered the companies classified by this base to have been active in the chemical industry for several years. The data concerning the activities of the chemical industry companies were thus taken from the mentioned Notoria database, and the data included in the annual reports of these companies for the years 1998–2015 were used. The following 14 companies of the chemical industry were included in the study: Azoty Tarnów SA, Bioton SA, Boryszew SA, Decora SA, Dębica SA, Permedia SA, Plast-Box SA, Police SA, Pollena Ewa SA, Ropczyce SA, Stomil Sanok SA, Suwary SA, Synthos SA, and Śnieżka SA.

The evaluation of the profitability and liquidity of the studied companies in the first place was performed considering the static approach. In the profitability analysis in this approach the net profit or net loss values achieved by the companies in the subsequent years of activity, as well as the average values of assets in total and the average values of equities (considered as the arithmetic mean of the value from the beginning and the end of a given year) were used. In this way the values of return rates called ROA (return on assets) and ROE (return on equity) were computed. To measure financial liquidity in this approach, the current ratio computed as the ratio of current assets to current liabilities was used¹.

In the further part of the analysis, the study of the total return on assets and the total return on equity based on the dynamic approach, i.e. monetary rates of return were computed, understood as the ratio of net cash flows from operating activities to the average assets in total or the average equity (Sierpińska, Jachna, 2004, pp. 203 and 209).

When analysing profitability and financial liquidity in the chemical industry, an attempt was also made at establishing the correlation occurring between those two, very important areas of the evaluation of the financial standing of enterprises. To do this, the linear correlation coefficient $r(X, Y)$ was used, called Bravais – Pearson coefficient (Zeliaś et al., 2002, p. 103) or Pearson coefficient (Sobczyk, 2001, p. 224). Also the coefficient of linear determination $r^2(X, Y)$ was computed.

3. The analysis of trends in profitability and financial liquidity of the studied enterprises

The evaluation of the profitability and financial liquidity of the chemical industry companies includes 14 mentioned enterprises. In the first place, the total return on assets in the subsequent years 1999–2015 was computed. The research showed that the chemical

¹ Establishing this ratio on the basis of a balance sheet imposes the necessity to take into consideration that current assets – trade receivables maturing above 12 months; on the other hand, current liabilities = short-term liabilities – trade liabilities maturing above 12 months + short-term provisions + short-term accruals.

industry companies are characterised by a great variety of the achieved ROA. The highest average total return on assets in the analysed period was revealed by Synthos SA (the average ROA was 12.8%), Śnieżka SA (12.3%) and Stomil Sanok SA (11%). On the other hand, the lowest level of profitability, actually unprofitability, was revealed on average during the studied period of time, by the following companies: Pollena Ewa SA (−2.3%) and Bioton SA (−2%). The average value of ROA in the chemical industry was 3.5 % in the analysed period. The trends in the achieved average values of ROA for the industry in the years 1999–2015 is presented in Figure 1.

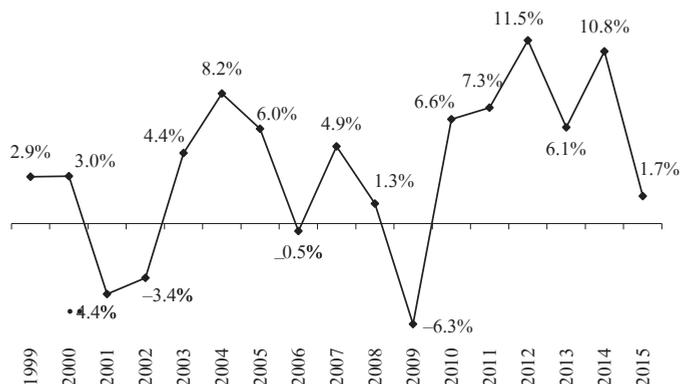


Figure 1. ROA in the chemical industry companies (averages in the industry) in the years 1999–2015

Source: own study.

Therefore, the situation of firms in the chemical industry is really varied – it can be observed in the graph (Figure 1) that the annual average value of ROA for the industry is characterised by significant fluctuations in the analysed several years and it is quite distinctly correlated with the situation in the economy. It should be emphasised that the industry displayed unprofitability during slowdowns and economic crises, it is visible already in the first analysed period of the economic slowdown that is in the years 2000–2002. However, the growth of the pro-export character of chemical production and the economic recovery in the following years brought the gradual improvement of financial results. In the year 2008 again the global economic crisis affected a decline in profitability in the sector and in 2009 the industry marked the lowest level of unprofitability – the average ROA in the industry was −6.3%. The economic recovery in the following years influenced a considerable improvement of the situation on the key markets for the chemical industry and a significant growth of profitability is observed in companies belonging to this industry.

Similar high volatility can be also observed in the values achieved by the next ratio, ROE in the chemical industry. The results of the conducted computations are presented in Figure 2.

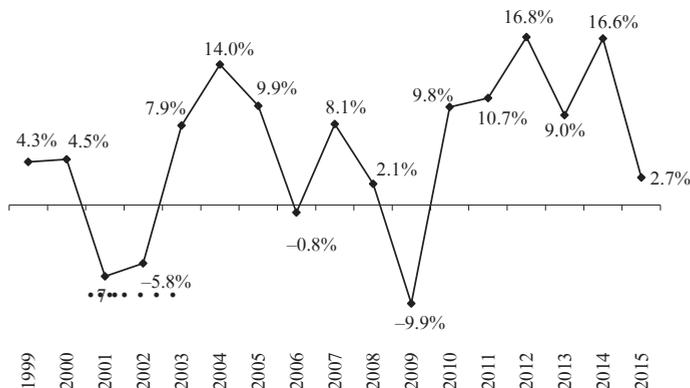


Figure 2. ROE in the chemical industry companies (averages in the industry) in the years 1999–2015

Source: own study.

The average ROE in the chemical industry in the investigated years reached the level of 5.5%. We can observe considerable fluctuations of the average value of ROE in the industry in the subsequent years, just like in the case of the ROA value analysis. The chemical industry marked a deficit during economic slowdowns; ROE achieved particularly low average values in the industry in the years 2001, 2002 and 2009. Therefore, the difficult macroeconomic situation in Poland arising from the global economic crisis was reflected in the results achieved at that time in individual enterprises.

The research carried out showed that return on equity was the highest in Śnieżka SA and Synthos SA, where the average level of ROE was over 21%. High ROE shaping during the investigated period at the level of more than 17% on average was achieved by Stomil Sanok SA, whereas the average deficit in the studied several years of activity was revealed by Bioton SA and Pollena Ewa SA. Therefore, in the chemical industry a great diversity in terms of the achieved profitability can be observed, both with regard to the average for the industry and analysing the obtained ROA or ROE values by individual companies.

The analysis of the trends in the total return on assets and equity takes also into consideration the dynamic approach that is the monetary rates of return were computed. In the first place, the value of the monetary rate of return on total assets were computed – the results of the computations are presented in Figure 3.

The analysis of the value of the monetary rates of return achieved in the studied companies indicates that the rates are characterised by a smaller diversity of value in comparison

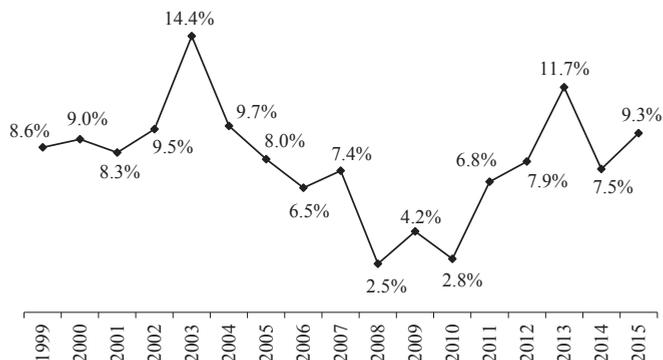


Figure 3. The monetary rate of return on total assets in the chemical industry companies (averages in the industry) in the years 1999–2015

Source: own study.

with ROA. In the majority of the analysed situations the companies generated positive operating cash, and thus they achieved monetary rates of return at a relatively high level. When evaluating the trend of changes in the average value in the industry in the subsequent years, we can indicate an unfavourable phenomenon of a decrease in the level of the monetary rate of return on total assets in the years 2003–2010. Starting from 2011, the reversal of this trend is visible and the analysed rate for the industry increases till 2013 to decrease again in the following two years.

Similar trends of changes are observed when analysing the values of the monetary rate of return on equities in the years 1999–2015. The results of the study are presented in Figure 4.

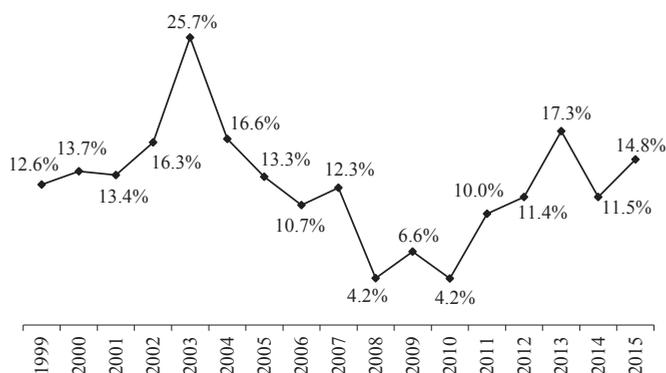


Figure 4. Monetary rate of return on equity in the chemical industry companies (averages in the industry) in the years 1999–2015

Source: own study.

The conducted investigation shows that the companies in the chemical industry in the majority had a high ability to generate operating cash. On average in the industry during 18 years they generated the annual average of 12.2 grosz per every zloty of equity. The level of the average monetary rate of return on equities was also declining in the years 2003–2010, but in the following years the companies achieved a rate higher than 10%. High monetary rates of return in a few of the following years confirm the high developmental capabilities of a company and its ability to pay a dividend, as it is observed by M. Sierpińska and T. Jachna (2004, p. 209). The condition is that they do not arise from an increase in the operating cash as a result of the growth of short-term liabilities, as it always requires the control of the time structure of such liabilities. Operating cash can be then allocated to development which is the basis for the generation of higher profits increasing the rates of return on equities.

On the basis of the presented research findings we can claim that companies in the chemical industry are characterised by a great variety of profitability measured both in the static and dynamic approach. Monetary rates of return, similarly to ROA and ROE (on average in the industry) are characterised by the lowest values during the periods of economic slow-downs and crises. Unfortunately, the global economic crisis which started in 2008 stamped its strong influence on the chemical industry. In particular, it brought a distinct drop in the prosperity in construction and motorisation, and these two industries are important recipients of goods offered by the chemical industry. Therefore, the distinct impact of the overall unfavourable macroeconomic situation in the whole economy on the functioning of the analysed enterprises and profitability achieved by them is visible at that time, manifested, among others, in the declining consumption of individual customers, higher unemployment and problems with getting loans for development.

The profitability analysis should, however, be supplemented with the evaluation of financial liquidity in the investigated period, which would enable to carry out a more comprehensive evaluation of the financial standing of the analysed companies belonging to the chemical industry. For this purpose, the current ratio was computed – the results of the study are presented in Figure 5.

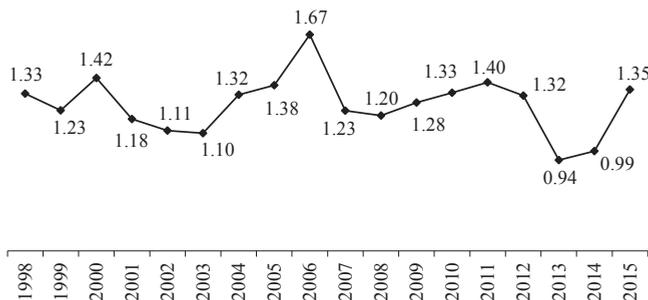


Figure 5. The current ratio in the chemical industry companies (averages in the industry) in the years 1998–2015

Source: own study.

The situation in terms of the financial liquidity of firms operating in the chemical industry was presented on the basis of the computed liquidity ratios. The current ratio for this industry in the whole studied period in the majority of companies shaped within the optimum level which according to standards is considered to be the range of 1.2–2.0. As it was mentioned before, we can compare the values of the ratio to the standard values, but this does not enable a univocal evaluation since there is always a necessity to consider factors which determine the level of financial liquidity in an enterprise. Taking also into consideration the average values of this ratio in individual years for the whole industry, it should be observed that its level declined in the periods of economic crises – then we can observe the growth of the share of trade liabilities in particular in financing the activity and an increase in the use of short-term loans, caused by the drop in the liquidity of firms of the sector (Kowalik, 2012, p. 365).

The monitoring of financial liquidity statically is often supplemented by means of a liquidity ratio. In the chemical industry, cash saved on operating activities to the highest degree covered current liabilities in the years 2013 and 2015. In the remaining period, the level of the ratio was lower than 0.4. The trends in annual average values in the industry are shown by the data in Figure 6.

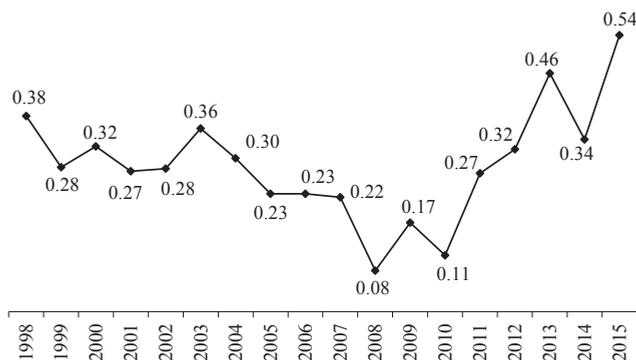


Figure 6. The cash ratio in the chemical industry companies (averages in the industry) in the years 1998–2015

Source: own study.

Generally, as for the trends in the average values of the cash ratio in the chemical industry we can observe a downward trend from the year 2004 to 2008, whereas in the following years the ratio is on a higher level again (in 2015 over 50% of current liabilities are covered by operating cash). Similarly, a distinct drop in the annual average value for the industry during economic slowdowns, i.e. in the years 2001–2002 and 2008–2010 can be observed. Operating cash covered current liabilities on an annual average base in 29% in the chemical industry in the years 1998–2015. Therefore, the presented research results mean that the

sensitivity of the sector to economic fluctuations is relatively high. Financial results, profitability of the chemical industry companies, as well as their liquidity to a great extent are correlated with the overall economic situation in the country.

The next step in the conducted research was an attempt to establish a correlative relationship between the current ratio and the total return on assets. The following results of the investigation were obtained:

$$r(X, Y) = 0.07 \text{ and } r^2(X, Y) = 0.0051.$$

Similar results were obtained during the establishment of the correlative relationship between the current ratio and the return on equity:

$$r(X, Y) = 0.045 \text{ and } r^2(X, Y) = 0.002.$$

The obtained values of the ratios prove the occurrence of a very poor positive correlative relationship, i.e., if enterprises achieve the current ratio at a higher level, the level of ROE or ROA of these companies is higher. On the other hand, the value of the coefficient of linear determination informs that less than 1% of the changeability of the current ratio level of the chemical industry companies is explained by the changeability of ROE or ROA.

When analysing the relationship between the profitability and liquidity of enterprises, we can find confirmation of its positive character also in the research by M. Bolek and R. Wolski (2010, p. 232) who find out that better use of the occurring business opportunities can result in a positive influence both on liquidity and profitability. The Authors lean towards the statement that the positive relationship between liquidity and profitability can arise from these situations. Therefore, the conclusions from the conducted research and analyses indicate that the phenomenon of the growth of profitability with the growth of liquidity of an enterprise is a fact.

Conclusions

The conducted research confirms that the establishment and explicit indication of the existence of the linear correlation between profitability and financial liquidity is problematic and difficult. The obtained research results in the companies of the chemical industry show that in those enterprises with the growth of profitability also financial liquidity increased. On the basis of the obtained results, however, it is not possible to say univocally whether and how changes in profitability will influence future changes in financial liquidity and vice versa. However, attention should be paid to the fact that there are a number of limitations in conducting research within that scope, since the obtained analysis results are influenced by many other factors of both a micro and macroeconomic character.

The paper draws attention to two extremely important areas of management in an enterprise and it points out that both financial liquidity and profitability can be established,

evaluated and based on the static and dynamic approach. When managing enterprises and taking decisions in the operating area, influencing, for example, the level of financial liquidity, managers should take into consideration that as a consequence of the implemented tasks changes occur simultaneously also in other areas of the activity of firms, including also the area of the achieved profitability. To take effective decisions, managers need, among others, full and reliable information about the financial situation in the enterprise. Therefore, when evaluating and diagnosing the situation in an enterprise it is necessary for managers to consider that the profitability analysis conducted in isolation from studying the situation in the maintenance of financial liquidity is not sufficient.

This paper emphasises that the profitability analysis conducted along with the financial liquidity analysis and establishing the relationships between those areas of research provides managers with necessary information to evaluate the situation of enterprises in terms of the effectiveness of the resources used by them, as well as the ability to maintain the continuity of the implemented processes.

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RENTOWNOŚĆ A PŁYNNOŚĆ FINANSOWA PRZEDSIĘBIORSTW PRZEMYSŁU CHEMICZNEGO

Streszczenie: *Cel* – Celem opracowania jest przedstawienie analizy sytuacji spółek w zakresie rentowności i płynności finansowej, a także próba ustalenia zależności pomiędzy tymi obszarami analizy, umożliwiającą dokonanie pełniejszej oceny sytuacji finansowej przedsiębiorstw.

Metodologia badania – Badania empiryczne zaprezentowane w artykule przeprowadzone zostały zgodnie z tą koncepcją na przykładzie spółek przemysłu chemicznego notowanych na GPW w Warszawie od kilkunastu lat. Zaprezentowane wyniki badań otrzymano na podstawie przeprowadzonego studium literaturowego, wykorzystanych metod analizy ekonomicznej (tj. zarówno płynność jak i rentowność zmierzone zostały zgodnie z ujęciem statycznym i dynamicznym) i metod statystycznych (analiza korelacji).

Wynik – W wyniku przeprowadzonych badań zwrócono uwagę na istotne znaczenie analizy płynności i rentowności w ocenie sytuacji finansowej przedsiębiorstw. Ustalono zależność korelacyjną pomiędzy tymi dwoma obszarami analizy wskaźnikowej dla spółek akcyjnych z przemysłu chemicznego.

Oryginalność/wartość – W artykule podkreślono istotność przeprowadzanej analizy rentowności przedsiębiorstwa, która jest kluczowa w ocenie kondycji finansowej podmiotu, ale tylko przy równorzędnym zbadaniu sytuacji w zakresie utrzymywanej płynności finansowej.

Słowa kluczowe: analiza przedsiębiorstwa, rentowność, płynność finansowa

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