UDC: 665.6/.7:061.5]:005.21
DOI: 10.5937/AnEkSub2248119J
Original scientific article

Анали Економског факултета у Суботици – The Annals of the Faculty of Economics in Subotica
Vol. 58, No. 48, pp. 119-137
Received: 17/02/2022
Accepted: 18/04/2022

Liquidity analysis of oil companies in the Republic of Serbia

Анализа ликвидности нафтних компанија у Републици Србији

Tanja Janaćković*
Academy of Vocational Studies Southern Serbia, Leskovac, Republic of Serbia, spasictanja7@gmail.com
Maša Georgiev
Academy of Vocational Studies Southern Serbia, Leskovac, Republic of Serbia, kulic.masa@vpsle.edu.rs
Marko Janaćković
Academy of Vocational Studies Southern Serbia, Leskovac, Republic of Serbia, janackovic.marko@vpsle.edu.rs

Abstract: The focus of the paper is liquidity analysis, which is an essential tool of the corporate financial management process. Converting assets, especially working capital, into cash is the primary way for a company to obtain the resources it needs to pay its current liabilities. The aim of the research is to look at the movement of current, quick and cash liquidity indicators, their comparative analysis, as well as differences in the level of liquidity for the period 2011-2020 on the example of certain oil companies in the Republic of Serbia. Ratio analysis based on their official financial statements was used to measure the liquidity of selected companies (NIS, OMV and LUKOIL), while the one-way ANOVA test was used to test hypotheses. The research results show that there is a statistically significant difference in the level of current liquidity between NIS and LUKOIL and OMV and LUKOIL, while there is no significant difference between NIS and OMV. There is a statistically significant difference in terms of quick ratios between NIS and LUKOIL, while there is no significant difference between NIS and OMV and OMV and LUKOIL. Observing the cash liquidity indicator, there is no significant difference between these indicators in the companies that are the subject of the research.
Keywords: oil companies, analysis, liquidity
JEL classification: G39

Сажетак: Фокус рада је анализа ликвидности, која је есенцијални алат процеса корпоративног финансијског менаџмента. Конвертовање средстава, а нарочито обртних средстава у готовину је примарни начин на који компанија долази до ресурса који су јој неопходни за плаћање текућих обавеза. Циљ истраживања је да се на примеру одређених нафтних компанија у Републици Србији сагледа кретање показатеља текуће, убрзане и тренутне ликвидности, њихова компаративна анализа, као и разлике у нивоу ликвидности у временском периоду од 2011-2020. године. За мерење ликвидности одабраних компанија коришћена је рацио анализа на основу њихових званичних финансијских извештаја, док је за тестирање хипотеза примењен тест one-way АНОВА. Резултати истраживања показују да постоји статистички значајна разлика у нивоу текуће ликвидности између компанија НИС и ЛУКОИЛ и ОМВ и ЛУКОИЛ, док нема значајније разлике између компанија НИС и ОМВ. Статистички значајна разлика у погледу показатеља убрзане ликвидности постоји између компанија НИС и ЛУКОИЛ, док између компанија НИС и ОМВ и компанија ОМВ и ЛУКОИЛ нема значајније разлике. Посматрајући тренутни показатељ ликвидности нема значајне разлике између ових показатеља код компанија које су предмет истраживања.
Кључне речи: нафтне компаније, анализа, ликвидност
ЈЕЛ класификација: G39

* Corresponding author

Introduction

Analysis of financial statements (financial analysis) involves examining and evaluating the financial position and performance of the company. Generally speaking, performance is defined as the achievement of the goals set by the company within an agreed timeframe and at minimal costs while using the available resources (Delova-Jolevska et al., 2018). A well-organized group of individuals with specialized knowledge from different areas, which are united and well organized, make up the basis of corporate performance (Marić et al., 2019). The success of the company's operations, as well as the successful audit of financial statements requires knowledge of the basic principles of financial analysis. In economic theory, there are financial analyses, which speak not only about various aspects of financial condition (position and financial structure of the company), its activity in the financial field (asset and liability management) and its functioning in the financial field, but also analyze expressions and relationships, look at the overall activity of the company, its position and development. The analysis of financial statements is based on past, present and future results presented in the financial statements. The data contained in the financial statements form the starting point for economic and financial analysis of business entities over time, as well as for reviewing their business performance and financial capacity, or relative position in relation to the environment and overall economic trends. Therefore, the basic financial statements on the state and success of the company, the balance sheet and income statement, as well as the cash flow balance and statistical annex, form the information basis for financial analysis. In order to fully assess the financial status and earning capacity of the company, it is necessary to analyze previous reports, bearing in mind that the individual analysis of each of these reports provides an assessment of certain aspects of financial activities of the company. The analysis of financial statements quantifies and investigates the relation that exists between the positions of financial statements, which allows a correct assessment of financial position, liquidity and business performance. In practice, there are different tools for analysis (techniques). The most common techniques (instruments) of analysis include: 1) horizontal analysis, 2) vertical analysis, 3) ratio analysis or analysis of basic financial indicators, 4) cash flow analysis, 5) analysis using net working capital, 6) leverage analysis (Knežević et al., 2013).

One of the most commonly used techniques of financial analysis is ratio analysis, which has been applied in business practice for many years. The preliminary financial analysis allows to assess the financial standing of the examined entity, but a more complete assessment can be obtained after performing a ratio analysis (Kowalik, 2018). Credit institutions in the United States of America (USA) contributed greatly to the affirmation of ratio analysis in the second half of the 20th century, since they used it as a basic instrument in assessing the creditworthiness of borrowers. The goal of ratio analysis is to examine and evaluate the financial position and business performance, based on a set of ratio numbers. A ratio number is a quotient that quantifies the relationship between related balance sheet items and quantities, which belong to assets, liabilities, expenses or income. They are therefore obtained by placing in a relative relationship the individual positions of the

balance sheet and income statement and are expressed in a mathematical formula. Ratio analysis implies the application of certain norms and standards, which relate to the fact that: 1) analysis is performed in relation to data from previous periods, 2) analysis is performed in relation to planned ratio numbers, 3) analysis is performed in relation to selected data groups of enterprises, 4) comparison can be performed with data of enterprises in a certain economic branch or group, 5) analysis can be performed based on experience, 6) analysis can be performed in the context of funding rules. Ratio numbers can be classified as follows: 1) liquidity ratio or short-term financial balance, 2) long-term financial balance ratio, 3) asset structure ratio, 4) capital structure ratio, 5) management efficiency ratio, 6) expenditure structure ratio, 7) ratio of income structure, 8) ratio of profitability, 9) economic ratio, 10) ratio of productivity and 10) ratio of market value of shares (NARR, pp. 4-9).

One of the basic requirements for management is liquidity, which is generated by the requirements of creditors. Liquidity is a traditional, primary measure of financial position and of a company's survival or disappearance (Čavlin et al., 2021; Ejike & Agha, 2018) and it is very important for a company to have a good liquidity ratio (Karim et al., 2021). Financial liquidity is the basis for building a strong company (Zimon, 2020) and it indicates the capacity of the company to cover its current liabilities to suppliers and creditors on the basis of its working capital (Batranchea, 2021; Ali & Bilal, 2018). Depending on which values contained in the balance sheet items are compared, liquidity indicators differ, namely: 1) current liquidity, 2) quick liquidity, 3) cash liquidity, 4) future or prospective liquidity and 5) financial stability. Maintaining liquidity is an extremely important goal of every legal entity's business, and by liquidity we mean the company's ability to settle all due obligations in a timely manner. Liquidity analysis is used to analyze the financial position of a company.

The subject of the research is the liquidity of selected oil companies in the Republic of Serbia in the period from 2011 to 2020. First, a review of the literature in relation to the subject of research is considered, and then the methodology and results of the research are indicated. Within the methodology, a presentation of the method of calculation and meaning of current, quick and cash ratios are given, on the basis of which the analysis and measurement of liquidity of selected oil companies were performed. After the methodology, liquidity analysis is performed, i.e. the movement of liquidity indicators of the observed companies in the period from 2011-2020 is considered, as well as a comparison as well as a comparison of the liquidity level of these companies. After that, in order to measure the differences of the liquidity level of the observed companies and test hypotheses, a statistical test of variance analysis (one-way ANOVA) is conducted. The petroleum industry is specific for many reasons (high equipment costs, fierce market competition, volatile prices, regulations etc.), so the companies need to pay attention to important facts during the decision-making process, because wrong decisions can be too expensive, especially for smaller companies (Veselinović & Veselinović, 2019).

1. Literature review

Effective business management requires managers to use financial indicators. In order to smoothly perform business activities and achieve positive results, it is necessary to obtain, use and return funds, where the management of funds is an extremely complex task that requires the use of certain principles (Hodžić & Gregović, 2014). The principle of liquidity is particularly important and it is one of the earliest indicators used in the analysis of financial statements. Liquidity plays an important role in unifying all operations of a firm (Yameen et al., 2019) and forms an imperative part in the development, improvement and successful functioning of company (Li et al., 2020; Musah & Kong, 2019; Zimon et al., 2022). It is an important issue in financial decision making (Bibi & Amjad, 2017) and it affects financial costs or growth, changes in business and the level of risk of the company and consequently, the profitability of the company (Ali et al., 2019). Liquidity can be viewed from the aspect of assets and enterprises, where the liquidity of an asset in non-monetary form implies its ability to transform into monetary form. The degree of liquidity is determined based on the time required for this transformation. If liquidity is viewed from the aspect of the company, it is defined as the ability of the company to settle due liabilities in a short time. Liquidity is a ratio that shows the company's ability to settle liabilities or pay short-term debt (Prihatiningsih et al., 2022) and working capital management largely involves short-term investments and financing (Bijendra & Singhvi, 2017; Zambrano-Farías et al., 2021). Three important elements that include liquidity are time, means of payment and financial obligation. The basic condition for achieving and maintaining the liquidity of the company is the quantitative and temporal harmonization of these elements. In addition, liquidity can be defined as the financial balance of the company, bearing in mind that the financial balance implies that the cash expenditures that the company has at a certain time, are covered by its cash income.

The analysis of company liquidity is the subject of numerous researches. Kontuš & Mihanović (2019) point out that liquidity is an important factor in determining short-term financial management policies. Vásquez Villanueva et al. (2021) analyze the volume of accounts receivable and liquidity through financial ratios, in companies in the dairy sector and it was concluded that good collection standards provide companies with considerable liquidity.

The study Kala, Maan & Kumar Kala (2020) included a comparative analysis of the liquidity of selected real estate companies, pointing out the significant factors that affect the liquidity of companies. Different liquidity ratios of selected companies were analyzed, with the aim of analyzing the liquidity position and solvency of companies in the short term. The important role of liquidity in the survival of business was emphasized and the trends of liquidity fluctuations during the observed period were pointed out. In addition, it is pointed out that liquidity analysis is the most important tool for understanding the financial strength and solvency capacity in the short term of comparative companies.

Mitrović, Knežević & Milašinović (2019) in their research conduct an analysis of cash flow ratios and traditional liquidity ratios on the example of hotel companies in Serbia. The research points to the analysis of financial statements as a significant technique that is

often used to assess the historical performance of a company. In addition, ratio analysis is pointed out as the most important technique for analyzing financial statements, as it provides a wealth of useful information for potential buyers, including a large number of indicators, which are used in different time periods and provide information on different users. The aim of the research is to analyze liquidity indicators with a focus on hotel companies in the period from 2016 to 2018. Based on the results of the research, the movement of the observed indicators is indicated, taking into account the three-year period, as well as the trend analysis and the historical analysis of the movement of liquidity indicators.

In a study by Vuković, Pjanić & Kalaš (2018), the liquidity analysis of agricultural companies in AP Vojvodina was performed. The paper investigates the trend of liquidity performance of agricultural enterprises, in order to examine the stability and sustainability of liquidity. In addition, it is pointed out that regardless of the fact that liquidity is a short-term category, the establishment of an optimal level of liquidity is the starting point for the success of medium and large agricultural enterprises in achieving the economic activity of AP Vojvodina.

Hiadlovský, Rybovičová & Vinczeová (2016) investigated the importance of liquidity analysis in the process of financial management of companies operating in the tourism sector in Slovakia. The research defines financial analysis with an emphasis on liquidity analysis as a key tool of the corporate financial management process. The aim of the research is based on statistical verification and includes the analysis of liquidity of the observed companies, with the identification of key factors influencing the degree and development of liquidity. It is emphasized that if they are adequately managed, they can affect the improvement of liquidity management, and thus improve the quality of the financial management process in companies. Given that liquidity is one of the areas that affects one side of a company's performance, its systematic and good management can help the company achieve its goals in the best possible way.

Singh & Singh (2018) in their study analyze the liquidity of pharmaceutical companies in India for the period 2010-2015, bearing in mind that this pharmaceutical market is one of the most developed industries in the world. They measured the liquidity of selected companies using ratio analysis, which confirmed that companies based on the NSE Pharma index maintain an ideal level of liquidity. Saini & Bansal (2020) also explore and analyze the liquidity position of selected pharmaceutical companies by analyzing various liquidity ratio such as current ratio and quick ratio for the period 2004-2013.

2. Data and methodology

The research is based on the analysis and evaluation of the scientific literature on liquidity indicators, as well as their role in companies, with a focus on oil companies in the Republic of Serbia. The aim of the research is to consider the liquidity position, as well as to compare and analyze the liquidity positions of selected companies. Liquidity analysis examines the

company's ability to meet liabilities on maturity, i.e. whether it has sufficient liquid assets to cover short-term liabilities. The paper first examines previous research on liquidity indicators, and then discusses and systematizes the liquidity indicators of oil companies. For the purpose of liquidity analysis, the research included three oil companies in the Republic of Serbia, namely: Petroleum Industry of Serbia (NIS AD), LUKOIL Serbia AD and OMV Serbia DOO, where the liquidity indicators of these companies in the period from 2011 to 2020 are considered. For the purpose of analysis, official data from the financial statements of companies for the observed period were used. Ratio numbers, i.e. liquidity indicators were used for analyzing the liquidity of oil companies. For the needs of analysis and measurement of liquidity of the observed companies, the following ratios (variables) were used: a) current ratio, b) quick ratio and c) cash ratio.

The current ratio is obtained by applying the following formula:

$$\text{Current ratio} = \text{Current Assets}/\text{Current Liabilities}$$

This ratio shows how many dinars of current assets are covered for each dinar of short-term liabilities. In order to determine whether liquidity is satisfactory, standards for ratio analysis are applied, including financing rules. The fact is that there are no rules that can be applied equally to all companies and the situations in which they find themselves. According to the 2:1 financing rule, liquidity is satisfactory if the current ratio is greater than or equal to 2, or if the ratio of short-term assets to short-term liabilities is 2:1. If the value of the ratio is between 1 and 2, the liquidity is relatively satisfactory, while if its value is less than 1, the company is illiquid. This financing rule originates from American banking practice and it is a requirement that the value of current assets should be twice the value of short-term liabilities. The application of this rule aims to provide liquidity, while it is important to keep in mind the amount of inventories and the time required for their conversion into cash. High stocks with a low turnover ratio make it impossible to achieve liquidity, although the rule has been met. The quick ratio is calculated using the following formula:

$$\text{Quick ratio} = \text{Quick Assets}/\text{Current Liabilities}$$

Given that in many companies inventories are transformed into liquid assets in a relatively long period, this ratio is considered a more reliable measure of liquidity. The quick ratio shows how many dinars of relatively liquid assets each dinar of short-term liabilities is covered with, i.e. it represents the company's ability to settle short-term liabilities with liquid assets (cash, cash equivalents and short-term receivables) in a period of 1 year. Based on the 1:1 (acid-test) financing rules, the ratio of relatively liquid assets and cash to short-term liabilities should be at least 1:1 to maintain liquidity. If RRL > 1 the liquidity is satisfactory. There is also the possibility of compliance with the rules by the company with the simultaneous illiquidity, if the amount of receivables is high and they are collected slowly, while on the other hand most of the short-term liabilities mature in a very short time.

Cash ratio is calculated using the following formula:

$$\text{Cash ratio} = \text{Cash and equivalent}/\text{Current Liabilities}$$

Cash ratio measures the ability of a company to settle current liabilities with the most liquid assets. The reference value of this indicator is 1 or more than 1, and it is determined as the most inaccurate liquidity ratio, which is based on the fact that the ability to settle current liabilities is measured at the moment, on the day of liquidity. In accordance with the financing rules, if RGL > 1 the company is liquid on the day of liquidity measurement, if RGL=1 it is the lower limit below which the value of the indicator should not fall, and if RGL < 1 available cash and cash equivalents are not enough to settle current liabilities. Based on this indicator, it cannot be claimed whether the company will be able to meet its obligations in the coming period.

The research hypotheses are as follows:

$H_{0.1}$: $\mu_{\text{current ratio NIS}} = \mu_{\text{current ratio OMV}} = \mu_{\text{current ratio LUKOIL}}$

$H_{1.1}$: $\mu_{\text{current ratio NIS}} \neq \mu_{\text{current ratio OMV}} \neq \mu_{\text{current ratio LUKOIL}}$

$H_{0.2}$: $\mu_{\text{quick ratio NIS}} = \mu_{\text{quick ratio OMV}} = \mu_{\text{quick ratio LUKOIL}}$

$H_{1.2}$: $\mu_{\text{quick ratio NIS}} \neq \mu_{\text{quick ratio OMV}} \neq \mu_{\text{quick ratio LUKOIL}}$

$H_{0.3}$: $\mu_{\text{cash ratio NIS}} = \mu_{\text{cash ratio OMV}} = \mu_{\text{cash ratio LUKOIL}}$

$H_{1.3}$: $\mu_{\text{cash ratio NIS}} \neq \mu_{\text{cash ratio OMV}} \neq \mu_{\text{cash ratio LUKOIL}}$

In order to analyze the data and test the hypotheses, a statistical test of variance analysis (one-way ANOVA) is employed with SPSS, and the obtained results are presented in tables and textually interpreted. First, the movement of the value of liquidity indicators of oil companies in the observed period is considered, and then the differences in the level of liquidity are measured on the example of selected companies.

3. Liquidity analysis of oil companies in Serbia

Table 1 provides an overview of the movement of the liquidity ratio of companies for the observed period.

Table 1: Trends of the liquidity indicators of oil companies in the period 2011-2020

	Current ratio			Quick ratio			Cash ratio		
	NIS	**OMV**	**LUKOIL**	**NIS**	**OMV**	**LUKOIL**	**NIS**	**OMV**	**LUKOIL**
Year									
2011	**1.79**	0.50	0.55	**1.07**	0.31	0.32	**0.51**	0.03	0.02
2012	**1.69**	1.53	1.37	0.98	0.81	**0.99**	**0.13**	0.12	0.03
2013	**1.18**	**1.18**	0.55	0.77	**0.92**	0.41	0.05	**0.21**	0.06
2014	**1.54**	1.47	1.14	**1.05**	0.83	0.71	0.07	**0.17**	0.05
2015	**1.29**	1.16	0.66	**0.97**	0.81	0.48	**0.26**	0.06	0.08
2016	**1.36**	1.20	0.88	**1.01**	0.63	0.63	**0.29**	0.09	0.15
2017	**1.69**	1.50	0.41	**1.14**	0.95	0.24	**0.38**	0.33	0.03
2018	**1.77**	1.30	0.86	0.95	**0.98**	0.57	0.22	**0.31**	0.18
2019	**1.51**	1.18	0.93	0.82	**0.85**	0.64	0.21	0.21	**0.26**
2020	1.15	**1.33**	**1.33**	0.74	0.82	**0.99**	0.14	0.17	**0.68**

Source: the authors' research

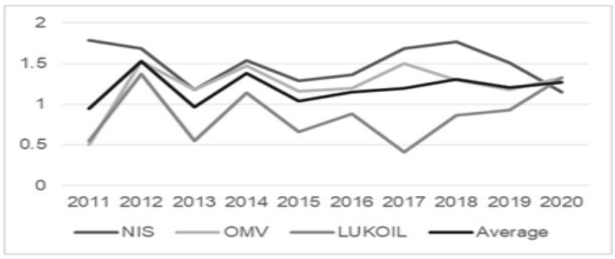
Based on the data from Table 1, it can be noticed that all companies have generally lower values of all liquidity indicators in the observed time period. Observing the value of current liquidity indicators from 2011 to 2020 (Table 2), the value below 2 can be seen for all companies. Based on the data from Table 2, the average values of current liquidity indicators by year can be seen. Thus, for NIS, the value of current liquidity ratios ranged between 1 and 2, as much as for OMV, except in 2011, when the value of current ratio for OMV was 0.50. Looking at the data for LUKOIL, it can be seen that the value of indicators is generally below 1, which indicates low liquidity, with exceptions in 2012, 2014 and 2020 when their value was above 1. Comparative analysis of current liquidity indicators for all three companies shows the highest values of this indicator in NIS in the period from 2011 to 2019, while in 2013 OMV had the same value of the indicator and it was 1.18, while in 2020 there was a noticeable increase in the value of this indicator for OMV and LUKOIL amounting to 1.33, while for NIS the value was 1.15. Fluctuations of the value of current liquidity indicators caused by fluctuations of the value of due liabilities and current assets from which liabilities are covered can also be observed (Chart 1). Thus, observing the average value of the coefficient, in the dynamics of business there is its growth for the period 2011-2012, 2013-2014, 2015-2018, 2019-2020, while for the period 2012-2013, 2014-2015 and 2018-2019 there is a decrease in the value of this coefficient.

Table 2: Current liquidity of oil companies

Year	Coefficient values			
	NIS	OMV	LUKOIL	Average
2011	1.79	0.50	0.55	0.95
2012	1.69	1.53	1.37	1.53
2013	1.18	1.18	0.55	0.97
2014	1.54	1.47	1.14	1.38
2015	1.29	1.16	0.66	1.04
2016	1.36	1.20	0.88	1.15
2017	1.69	1.50	0.41	1.20
2018	1.77	1.30	0.86	1.31
2019	1.51	1.18	0.93	1.21
2020	1.15	1.33	1.33	1.27

Source: the authors' research

Figure 1: Trend of current ratio



Source: the authors' research

If the current ratio has a high value over a long period of time, there are problems related to the utilization of cash, holding too high inventories, inability to lend to suppliers or inadequate receivables management policies. As a consequence, an inadequate corporate governance policy may occur (Vuković, Pjanić & Kalaš, 2018, p. 210). Good planning and control of current assets and liabilities is a prerequisite for the balance between liquidity and profitability of each company (Vuković, Andrić & Jaksić, 2017). In order to determine the appropriate working capital management policy, it is necessary to shorten the time period for settling liabilities to suppliers, i.e. collection of receivables from customers. In addition, it is required to shorten the time period in which stocks are tied up, in order to achieve faster production and sales. The goal of an efficient working capital management policy is to strive to establish the optimal size and structure of these assets, which will affect the growth of liquidity and financial stability of the company. Table 3 provides an

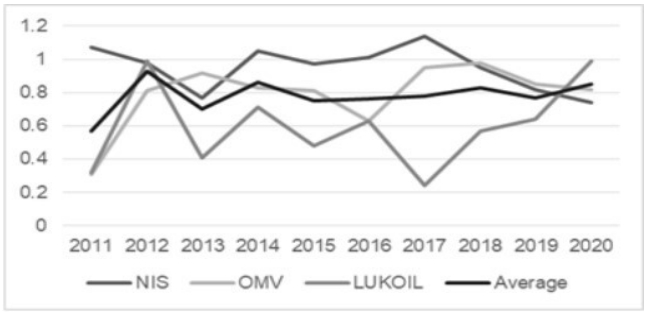
overview of the movement of quick ratios and their average values, while the following chart shows the trend of these indicators in the observed period.

Table 3: Quick ratios of oil companies

Year	Coefficient values			
	NIS	OMV	LUKOIL	Average
2011	1.07	0.31	0.32	0.57
2012	0.98	0.81	0.99	0.93
2013	0.77	0.92	0.41	0.70
2014	1.05	0.83	0.71	0.86
2015	0.97	0.81	0.48	0.75
2016	1.01	0.63	0.63	0.76
2017	1.14	0.95	0.24	0.78
2018	0.95	0.98	0.57	0.83
2019	0.82	0.85	0.64	0.77
2020	0.74	0.82	0.99	0.85

Source: the authors' research

Figure 2: Trend of quick ratio



Source: the authors' research

Observing the quick ratios, it can be seen that they had values higher than 1 for NIS in 2011 (1.07), 2014 (1.05), 2016 (1.01) and 2017 (1.14), which indicates that the company is liquid. In addition, the values of this indicator of the company NIS in 2012 (0.98), 2015 (0.97), and in 2018 (0.95), which were close to the reference value, can be highlighted. Based on these values, it can be concluded that in the period 2011 to 2018 NIS was liquid and able to settle current liabilities using liquid assets, i.e. cash, cash equivalents and short-

term receivables over a period of 1 year. In the period 2011-2020, the quick ratios of OMV and LUKOIL were below 1, with their value being close to 1 for LUKOIL in 2012 and 2020 (0.99), while for OMV in 2013 and 2018, the values of this coefficient are close to 1 (0.92 and 0.98). It is important to point out 2019, when the quick ratio was the highest for OMV and amounted to 0.85. It can be concluded that, in general, with exceptions, oil companies operated illiquidly in other years, i.e. they failed to settle due liabilities within one year with liquid assets. Liquidity was not greatly impaired, given that the ratios are below 1, which indicates that the liquid assets used to cover current liabilities were lower than the amount of due liabilities. Observing the fluctuations of the average values of quick ratio in the dynamics of business, it can be seen that its value increased for the period 2011-2012, 2013-2014, 2015-2018, 2019-2020, while it marked a decline for the periods 2012-2013, 2014-2015 and 2018-2019 (Chart 2). The average value of the quick ratio for the period 2011-2020 was 0.78. It can be noticed that the tendencies in the movement of the value of the quick ratio correspond to the movement of the value of the current ratio during the entire observed period, i.e. both ratios record an increase or decrease in the same time period.

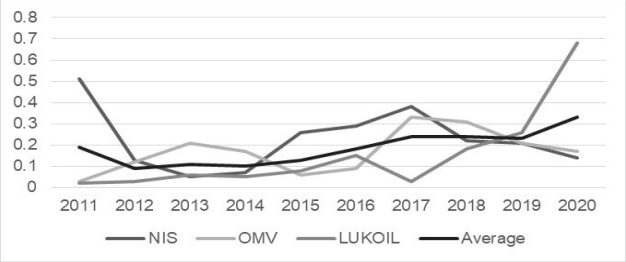
The trend of low values of current and quick indicators was reflected in the cash indicator, which is the most rigorous liquidity indicator in this group, bearing in mind that its value was lower than 1 in all companies in the observed period (Table 4). According to the results of the value of this indicator, it can be concluded that the observed oil companies in the Republic of Serbia do not operate liquidly during the entire observed period, i.e. they do not have enough cash and cash equivalents to meet current liabilities. Considering that this is the current liquidity, that is, the ability of the company to settle due liabilities, it is necessary to consider other indicators in order to assess the liquidity of the business. Observing the value of the cash ratios by companies, it can be seen that the value of ratio for NIS ranged from 0.05 in 2013 to 0.51 in 2011. OMV had values of this coefficient from 0.03 in 2011 to 0.31 in 2018. At LUKOIL, the coefficient values ranged from 0.02 in 2011 to 0.68 in 2020. By comparative analysis of these ratios, it can be concluded that the highest value of the cash ratio was achieved in LUKOIL in 2020 (0.68) in relation to NIS (0.14) and OMV (0.17), while on average NIS had the highest value of the ratio. The trend of cash indicators is shown in Chart 3. Observing the fluctuations of the value of the achieved cash ratio, a decrease in its value is observed for the periods 2011-2012, 2013-2014, 2018-2019, while in the periods 2012-2013, 2014-2018 and 2019-2020 there is growth. The trend of the value of the cash ratio corresponds to the movement in the value of current and quick ratios in certain periods (growth in the period 2015-2018 and 2019-2020, and fall in the period 2018-2019).

Table 4: Cash ratios of oil companies

Year	Coefficient values			
	NIS	OMV	LUKOIL	Average
2011	0.51	0.03	0.02	0.19
2012	0.13	0.12	0.03	0.09
2013	0.05	0.21	0.06	0.11
2014	0.07	0.17	0.05	0.10
2015	0.26	0.06	0.08	0.13
2016	0.29	0.09	0.15	0.18
2017	0.38	0.33	0.03	0.24
2018	0.22	0.31	0.18	0.24
2019	0.21	0.21	0.26	0.23
2020	0.14	0.17	0.68	0.33

Source: the authors' research

Figure 3: Trend of cash ratio



Source: the authors' research

4. Measuring differences of the liquidity level of oil companies in Serbia

The ANOVA test was used to test hypotheses i.e. to examine whether differences of liquidity level are significant between the observed companies, from the aspect of liquidity indicators. Table 5 shows the test results in which current liquidity ratio was observed. The value of the sample statistics is F = 11,734. The table shows that the value of p is 0.000, which is less than the significance level of 0.05(α), which rejects the null hypothesis $H_{0.1}$: $\mu_{\text{current ratio NIS}} = \mu_{\text{current ratio OMV}} = \mu_{\text{current ratio LUKOIL}}$ and accepts alternative hypothesis $H_{1.1}$: $\mu_{\text{current ratio NIS}} \neq \mu_{\text{current ratio OMV}} \neq \mu_{\text{current ratio LUKOIL}}$, which indicates that one of the indicators of

current liquidity of selected oil companies is not equal to others. Multiple comparisons were made in order to examine the differences of the liquidity position in more detail. The data are presented in Table 6, based on which we can see that there is a statistically significant difference in terms of current liquidity ratios between NIS and LUKOIL (p = 0.000) and OMV and LUKOIL (p = 0.024) while there is no significant difference between NIS and OMV (p = 0.129).

Table 5: ANOVA

Current ratio					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.997	2	.998	11.734	.000
Within Groups	2.297	27	.085		
Total	4.294	29			

Source: the authors' research

Table 6: Multiple comparisons

	(I) Companies	(J) Companies	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	NIS	OMV	.26200	.13044	.129	-.0614	.5854
		LUKOIL	.62900*	.13044	.000	.3056	.9524
	OMV	NIS	-.26200	.13044	.129	-.5854	.0614
		LUKOIL	.36700*	.13044	.024	.0436	.6904
	LUKOIL	NIS	-.62900*	.13044	.000	-.9524	-.3056
		OMV	-.36700*	.13044	.024	-.6904	-.0436
Dunnett t (2-sided)	NIS	LUKOIL	.62900*	.13044	.000	.3246	.9334
	OMV	LUKOIL	.36700*	.13044	.017	.0626	.6714

*. The mean difference is significant at the 0.05 level.

Source: the authors' research

Table 7 shows the results of the ANOVA test for the quick liquidity ratio. The value of the sample statistics is F = 7,779. The table shows that p is 0.002 which is less than the significance level 0.05(α), which rejects the null hypothesis $H_{0.2}$: $\mu_{\text{quick ratio NIS}} = \mu_{\text{quick ratio OMV}} = \mu_{\text{quick ratio LUKOIL}}$ and accepts alternative hypothesis $H_{1.2}$: $\mu_{\text{quick ratio NIS}} \neq \mu_{\text{quick ratio OMV}} \neq \mu_{\text{quick ratio LUKOIL}}$, which indicates that one of the indicators of quick liquidity of selected oil companies is not equal to others. In order to examine the differences of the liquidity

position in more detail, multiple comparisons were made. The data are presented in Table 8, based on which we can see that there is a statistically significant difference in terms of quick liquidity ratios between NIS and LUKOIL (p = 0.001) while there is no significant difference between NIS and OMV (p = 0.196) and OMV and LUKOIL (p = 0.097).

Table 7: ANOVA

Quick ratio					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.621	2	.311	7.779	.002
Within Groups	1.078	27	.040		
Total	1.700	29			

Source: the authors' research

Table 8: Multiple comparisons

						95% Confidence Interval	
	(I) Companies	(J) Companies	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Tukey HSD	NIS	OMV	.15900	.08938	.196	-.0626	.3806
		LUKOIL	.35200*	.08938	.001	.1304	.5736
	OMV	NIS	-.15900	.08938	.196	-.3806	.0626
		LUKOIL	.19300	.08938	.097	-.0286	.4146
	LUKOIL	NIS	-.35200*	.08938	.001	-.5736	-.1304
		OMV	-.19300	.08938	.097	-.4146	.0286
Dunnett t (2-sided)	NIS	LUKOIL	.35200*	.08938	.001	.1434	.5606
	OMV	LUKOIL	.19300	.08938	.072	-.0156	.4016

*. The mean difference is significant at the 0.05 level.

Source: the authors' research

The results of the ANOVA test for the cash ratio are given in Table 9. The value of the statistical sample is F = 0.609, while the p value is 0.551, which is higher than the significance level of 0.05 (α). This provides enough statistical evidence to accept the null hypothesis $H_{0.3}$: $\mu_{\text{cash ratio NIS}} = \mu_{\text{cash ratio OMV}} = \mu_{\text{cash ratio LUKOIL}}$ and reject the alternative $H_{1.3}$: $\mu_{\text{cash ratio NIS}} \neq \mu_{\text{cash ratio OMV}} \neq \mu_{\text{cash ratio LUKOIL}}$. Acceptance of the null hypothesis indicates that the cash ratio is the same for all observed companies.

Table 9: ANOVA

Cash ratio					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.029	2	.014	.609	.551
Within Groups	.633	27	.023		
Total	.662	29			

Source: the authors' research

Table 10: Multiple comparisons

						95% Confidence Interval	
	(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Tukey HSD	NIS	OMV	.05600	.06849	.696	-.1138	.2258
		LUKOIL	.07200	.06849	.552	-.0978	.2418
	OMV	NIS	-.05600	.06849	.696	-.2258	.1138
		LUKOIL	.01600	.06849	.970	-.1538	.1858
	LUKOIL	NIS	-.07200	.06849	.552	-.2418	.0978
		OMV	-.01600	.06849	.970	-.1858	.1538
Dunnett t (2-sided)	NIS	LUKOIL	.07200	.06849	.479	-.0878	.2318
	OMV	LUKOIL	.01600	.06849	.961	-.1438	.1758

Source: the authors' research

Conclusion

Based on the analysis of liquidity of selected oil companies in the Republic of Serbia, it can be seen that all companies generally have lower values of liquidity ratios in the observed time period. The value of the current liquidity indicator for the observed period is below 2, with the value of the indicator at NIS ranging between 1 and 2, as well as at OMV (the exception is 2011 when it was 0.50), while LUKOIL records the values of current liquidity indicators generally below 1. The comparative analysis of current liquidity shows the highest values of indicators at NIS. In addition, there are fluctuations in the value of this indicator, which is a consequence of fluctuations in the value of due liabilities and working capital from which liabilities are covered. Based on the analysis of quick liquidity indicators, it can be concluded that NIS was liquid having in mind that its values were higher than 1, or were close to the reference value. For OMV and LUKOIL, the values of this indicator are mostly below 1, with the exceptions when the values were close to 1 (for LUKOIL in 2012 and 2020, and for OMV in 2013 and 2018). In general, it can be concluded, with exceptions that the business of oil companies from the aspect of this indicator is illiquid in the observed period, but liquidity is not significantly compromised given that the value of the indicator is below 1. In addition, there are fluctuations of average values of the quick liquidity ratios in business dynamics, which correspond to the

movement of the value of the current liquidity ratio in the observed time period. Low values of current and quick liquidity indicators also had an impact on the cash ratio. Based on the review of cash indicator, it can be noticed that the selected oil companies do not operate liquidly in the observed period. Bearing in mind that this is the instant liquidity, it is necessary to consider other indicators in order to adequately assess the liquidity of the business. For NIS, the value of this indicator ranged from 0.05 to 0.51, for OMV from 0.03 to 0.31, while LUKOIL had values from 0.02 to 0.68. Comparing this indicator between companies, it can be concluded that on average, NIS had the highest value.

By measuring the differences in the level of liquidity between companies, observed from the aspect of current, quick and cash ratios, the following can be concluded. From the aspect of current and quick liquidity indicator, the null hypothesis is rejected, given the existence of a significant difference between these indicators in the observed companies. There is a statistically significant difference in terms of current liquidity indicators between NIS and LUKOIL ($p = 0.000$) and OMV and LUKOIL ($p = 0.024$), while there is no significant difference between NIS and OMV ($p = 0.129$). There is a statistically significant difference in terms of cash ratios between NIS and LUKOIL ($p = 0.001$), while there is no significant difference between NIS and OMV ($p = 0.196$) and OMV and LUKOIL ($p = 0.097$). Observing the cash ratio, the null hypothesis is accepted, because there is no significant difference between these indicators in the companies that are the subject of the research.

References

Ali, M. M., Hussin, N.N.A.N., & Ghani, E. K. (2019). Liquidity, growth and profitability of non-financial public listed Malaysia: Malaysian evidence. *International Journal of Financial Research, 10*(3), 194-202. Doi: https://doi.org/10.5430/ijfr.v10n3p194

Ali, M., & Bilal, M. E. (2018). Determinants of financial performance in the industrial firms: evidence from Jordan. *Asian Journal of Agricultural Extension, Economics & Sociology, 22*(1), 1-10. Doi: https://doi.org/10.9734/AJAEES/2018/37476

Batrancea, L. (2021). The influence of liquidity and solvency on performance within the healthcare industry: evidence from publicly listed companies. *Mathematics, 9*(18), 1-15. Doi: https://doi.org/10.3390/math9182231

Bibi, N., & Amjad, S. (2017). The relationship between liquidity and firms' profitability : a case study of Karachi Stock Exchange. *Asian Journal of Finance & Accounting, 9*(1), 54-67. Doi: https://doi.org/10.5296/ajfa.v9i1.10600

Bijendra, S. M., & Singhvi, D. (2017). Research paper on liquidity & profitability analysis of the pharmaceutical companies of India. *International Journal of Scientific Research and Management (IJSRM), 5*(8), 6717-6724. Doi: https://doi.org/10.18535/ijsrm/v5i8.20

Čavlin, M., Vapa-Tankosić, J., Miletić, V., & Ivaniš, M. (2021). Analysis of the impact of liquidity on the profitability in the medium and large meat processing enterprises in the Republic of Serbia. *Ekonomika poljoprivrede, 68*(3), 789-803. Doi: https://doi.org/10.5937/ekoPolj2103789C

Delova-Jolevska, E., Andovski, I., & Jolevski, L. (2018). The impact of ownership of banks on their performance: case study of sample of Balkan countries. *Ekonomika*, *64*(3), 55-65. Doi: https://doi.org/10.5937/ekonomika1803055D

Ejike, S.I., & Agha, N.C. (2018). Impact of operating liquidity on profitability of pharmaceutical firms in Nigeria, *International Journal of Academic Research in Accounting, Finance and Management Sciences, 8*(3), 73-82. Doi: http://dx.doi.org/10.6007/IJARAFMS/v8-i3/4466

Hiadlovský, V., Rybovičová I., & Vinczeová, M. (2016). Importance of liquidity analysis in the process of financial management of companies operating in the tourism sector in Slovakia: an empirical study. *International Journal for Quality Research, 10*(4), 799–812. Doi: https://doi.org/10.18421/IJQR10.04-10

Hodžić, N., & Gregović, N. (2014). Racio pokazatelji finansijskog položaja preduzeća. *Ekonomski izazovi, 3*(6), 92-105.

Kala, K., Maan S., & Kumar Kala, V. (2020). Liquidity analysis: a comparative study of selected real estate companies in India. *International Journal of Research and Analytical Reviews (IJRAR), 7*(1), 27-32.

Karim, M.R., Shetu, S.A., & Razia, S. (2021). COVID-19, liquidity and financial health: empirical evidence from South Asian economy, *Asian Journal of Economics and Banking, 5*(3), 307-323. Doi: https://doi.org/10.1108/AJEB-03-2021-0033

Knežević, G., Stanišić, N., & Mizdraković, V. (2013). *Analiza finansijskih izveštaja*. Beograd: Univerzitet Singidunum.

Kontuš, E., & Mihanović, D. (2019). Management of liquidity and liquid assets in small and medium-sized enterprises. *Economic Research-Ekonomska Istraživanja, 32*(1), 3253-3271. Doi: https://doi.org/10.1080/1331677X.2019.1660198

Kowalik, M. (2018). Profitability and financial liquidity of chemical industry companies. *Finanse, Rynki Finansowe, Ubezpieczenia, 1*(91), 47-58. Doi: https://doi.org/10.18276/frfu.2018.91-04

Li, K., Musah, M., Kong, Y., Mensah, I. A., Antwi, S., K., Bawuah, J., Donkor, M., Coffie, C. P. K., & Osei, A. A. (2020). Liquidity and firms' financial performance nexus: a panel evidence from non-financial firms listed on the Ghana Stock Exchange. *SAGE Open, 10*(3), 1-20. Doi: https://doi.org/10.1177/2158244020950363

Marić, S., Uzelac, O., & Strugar-Jelača, M. (2019). Ownership structure as a measure of corporate performance. *Strategic Management*, *24*(4), 28-37. Doi: https://doi.org/10.5937/StraMan1904028M

Mitrović, A., Knežević, S., & Milašinović, M. (2019). Analiza racija zasnovanih na novčanim tokovima i tradicionalnih racija likvidnosti hotelijerskih preduzeća u Republici Srbiji. *Knowledge – International Journal, 35*(1), 71-76.

Musah, M., & Kong, Y. (2019). The relationship between liquidity and the financial

performance of non-financial firms listed on the Ghana Stock Exchange (GSE). *International Journal of Advanced Research in Management and Social Sciences, 8*(4), 1-34.

Nacionalna agencija za regionalni razvoj – NARR (2014). Finansijsko upravljanje - Finansijska analiza poslovanja preduzeća. Retrieved 20/12/2021 from https://valjevo.rs/Dokumenta/PrivredaGradValjevo/Dokumenta/Privreda/finansijska%20analiza.pdf

Prihatiningsih, M., Subagya, Y. H., & Winidyaningsih, V. A. (2022). Financial analysis of liquidity, profitability and solvency with EVA as a moderate variable in improving economic value added manufacturing companies times of COVID-19 period 2019-2020. *International Journal of Economics, Business and Accounting Research (IJEBAR), 6*(1), 10-25.

Saini, N., & Bansal, S. (2020). Pharmaceutical companies & liquidity analysis: a review. *International Journal of Economics and Financial Issues*, *10*(5), 236–242. Doi: https://doi.org/10.32479/ijefi.10465

Singh, H., & Singh, B. (2018). Liquidity analysis of pharmaceuticals companies. *Journal of Emerging Technologies and Innovative Research, 5*(11), 466-482.

Vásquez Villanueva, C. A., Terry Ponte, O.F., Huaman Tito, M. J., & Cerna Carrazco, C. S. (2021). Liquidity and accounts receivable ratios: comparative analysis of companies in the dairy sector trading in the Bolsa de Valores de Lima. *Revista Científica "Visión de Futuro", 25*(2), 215-224. Doi: https://doi.org/10.36995/

Veselinović, N., & Veselinović, M. (2019). Technological innovation in the petroleum industry: the case of NIS jsc Novi Sad. *Economics of Sustainable Development*, *3*(1), 19-28. Doi: https://doi.org/10.5937/ESD1901019V

Vuković, B., Andrić, M., & Jaksić, D. (2017). The impact of working capital management on company's profitability: empirical evidence from Serbia. *Custos e @gronegócio online, 13*(1), 333-349.

Vuković, B., Pjanić, M., & Kalaš, B. (2018). Analiza likvidnosti poljoprivrednih preduzeća AP Vojvodine. *Anali Ekonomskog fakulteta u Subotici, 54*(39), 205-217. Doi: https://doi.org/10.5937/AnEkSub1839205V

Yameen, M., Farhan, N. H. S., & Tabash, M. I. (2019). The impact of liquidity on firms' performance: empirical investigation from Indian pharmaceutical companies. *Academic Journal of Interdisciplinary Studies, 8*(3), 212-220. Doi: https://doi.org/10.36941/ajis-2019-0019

Zambrano-Farías, J. F., Sánchez-Pacheco, M. E., & Correa-Soto, S. R. (2021). Profitability, indebtedness and liquidity analysis of microenterprises in Ecuador. Retos. *Retos Revista de Ciencias de la Administración y Economía, 11*(22), 233-246. Doi: https://doi.org/10.17163/ret.n22.2021.03

Zimon, G. (2020). Financial liquidity management strategies in Polish energy companies.

International Journal of Energy Economics and Policy, 10(3), 365-368. Doi: https://doi.org/10.32479/ijeep.9150

Zimon, G., Nakonieczny, J., Chudy-Laskowska, K., Wójcik-Jurkiewicz, M., & Kochański, K. (2022). An analysis of the financial liquidity management strategy in construction companies operating in the Podkarpackie Province. *Risks, 10*(5), 1-15. Doi: https://doi.org/10.3390/risks10010005