Analysis of Financial Liquidity Management in the Enterprise and its Impact on the Profitability

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Abstract:
The goal of this paper is to analyze the relationship between liquidity and profitability in the company. The study was performed on 50 companies listed on the Warsaw Stock Exchange, having the largest revenues from sales and greatest market value at the end of 2012. The hypothesis is that along with the increase in liquidity the profitability of the company decreases. Liquidity is defined by three values: cash, current ratio and quick ratio. In order to measure profitability, on the other hand, net income, ROE and ROA are used. The study was carried out in the long term perspective, covering the period 2002 – 2012, which resulted in obtaining data vectors allowing for the calculation of the coefficient of correlation, indicating the phenomena occurring within the analyzed variables and their interrelationships. Correlations between selected variables describing liquidity and efficiency of the enterprise do not prove the existence of a general rule, a binding liquidity and profitability. In each group of analyzed variables there are companies that show the strongly correlated variables as well as inversely correlated variables, which would confirm the hypothesis. However, the presence of relationship of inversely correlated variables is so rare that one can say that such a configuration of variables characterizing the profitability and liquidity is accidental.

Key words: financial liquidity, effectiveness, profitability, Warsaw stock – exchange companies.
JEL codes: G15, G23, G32, G33.
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1. Introduction

Managing the finances of a company includes facing the dilemma associated with maintaining liquidity. The key issue is to find the optimum that allows for smooth functioning of the company and generating satisfactory profits for its owners (Bielawska 2009). It is because the available funds affect the key goal of the company, which is profitability for the shareholder. But at the same time excess liquidity in a company may cause reduction of capital efficiency. Maximizing the effectiveness of functioning of the company is its primary goal. This means working out a profit for the owner in relation to the employed capital and the value of assets. The choice between providing liquidity, understood as having an adequate amount of outstanding cash or current assets, and maintaining acceptable profitability of the company is one of the dilemmas which the financial management of the company has to face.

The interrelation of liquidity and profitability in the company was already the subject of the research, which results suggest an inverse relationship between liquidity and profitability. The higher level of liquidity companies have the lower profitability they reach, and vice versa (Wypych 2001). This would suggest maintaining low level of liquidity that is, accepting higher operating risk of functioning. The inverse correlation is also true. High level of liquidity that reduces the operating risk of functioning of the company, results in a decrease in profitability. The hypothesis posed in this study states that within the sample of companies listed on the Warsaw Stock Exchange inverse relationships between liquidity and profitability occur, that is a decrease in liquidity is accompanied by an increase in profitability and vice versa.

In case of positive verification of the hypothesis, it will be possible to state that the companies present in the Polish public market fit into previously observed trend in the correlation between profitability and liquidity. If the hypothesis is not confirmed, this would mean that there may be

additional factors and conditions that affect the relationship between liquidity and profitability in the company, or the theory that describes the relationship between liquidity and profitability is wrong.

2. The synthesis of knowledge on the investigated issue

Profitability is a key measure of financial performance of companies. In absolute terms the profitability is expressed as profit generated by the company from its business activity (Waściński 2010, Bień 2005). In order to determine the level of profitability, the relative measures of profitability should be used, referring the profit to different economic categories, such as sales, assets or equity. Depending on the reference base, profitability indicators can be divided into three groups: return on sales - ROS, return on assets - ROA and return on equity - ROE. All profitability indicators inform about the rate of return on financial resources engaged in the company. Various categories of profit can be used in order to calculate rates of return, i.e. profit on sales, operating profit, net profit or gross profit (Nowak 2005, Dobija 1994, 1997, Gąsiorkiewicz 2002, Rutkowski 2007). Especially important for the further analysis is the return on equity that is one of the most important financial information for the owners of the company and its shareholders:

$$ROE = \frac{NP}{E} \, x100\%$$

Where:

NP – Net profit
E – Equity

and ROA – return on assets:

$$ROA = \frac{NP}{A} \, x100\%$$

Where:

A – Assets

The practice shows that many businesses that go bankrupt show profits and are profitable at the time of bankruptcy, and many unprofitable businesses are doing well and are not at risk of bankruptcy. However, an excessive concern for the maintenance of liquidity results in reduction of profitability and in the long term it can lead to loss of liquidity and the exclusion of the company from the market (Sierpińska 2003, Hawryszczuk-Misztal 2007).

Low level of liquid assets may lead to a loss of liquidity, while maintaining current assets generates costs, which leads to decrease in profitability., There exists however a certain optimal level of liquidity allowing to maximize profitability.

Figure 1: The relationship between profitability and liquidity of the company
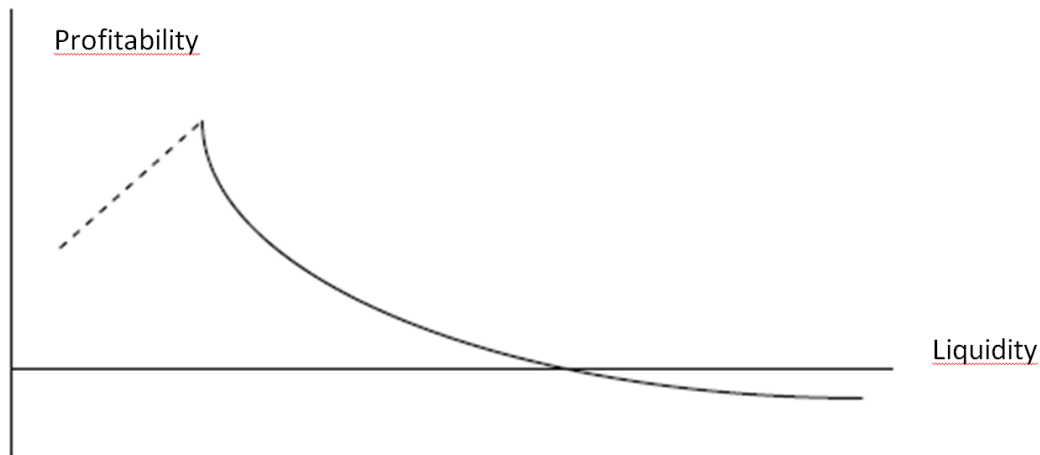
Source: Wypych 2001

The basic methods of measuring company's financial liquidity due to the professional literature are (Nowak 2005):

• Current Ratio,
• Quick Ratio.

The current ratio:

$$CR = \frac{CA}{CL}$$

Where:

CR – Current Ratio,
CA – current assets,
CL – current liabilities.

This ratio indicates how many times the current assets cover current liabilities. The ratio calculated in this way is compared with reference values, which, depending on the interpretation, range from 1.5 to 2.0 (Nowak 2005, Rutkowski 2007, Sierpińska 2003, Waśniewski 1993, Włoszczowski 1994). Since there is no consensus in the literature as to the reference value of this ratio, it seems necessary to compare the ratio calculated for the company with the ratios of other companies in the industry or with the ratios achieved by companies in a similar industry in developed countries. Evaluation and comparison of the calculated value with average values for the industry is particularly justified as a general standard value is too simplistic and can lead to misinterpretation of the calculated ratio. This is due to the specificity of different industries and different ways of managing particular companies.

The ratio calculated for the company is compared with data from the previous period. Such a comparison protects us from erroneous conclusions. The ratio should be (depending on the industry and specificity of the company) in the range of 1,2 to 2,0. Ratio values other than within specified range indicate disturbances in the liquidity of the company.

Excessively low or excessively high value of the ratio indicates that (Bednarski 1994):

–   low value - the company operates from day to day, it does not have sufficient cash resources to settle its current liabilities,
–   excessively high value - higher value of this indicator means an excessive freeze of funds in current assets that could otherwise be invested in alternative projects.

Current ratio is characterized by relatively high level of simplification, which is a result of including in the formula the current assets, which are characterized by varying degrees of liquidity (possibility of conversion into cash),. This fact confuses the actual liquidity of the company. This makes it necessary to exclude the least liquid assets that are inventory, from the formula:

$$QR = \frac{CA - I - PE}{CL}$$

QR – Quick Ratio,
CA – current assets,
I – Inventory,
PE – prepaid expenses.

This ratio indicates the degree of coverage of short-term liabilities by assets having high degree of liquidity. The obtained value should be compared with the reference value and the values from previous periods. Similarly as in case of the current ratio there are significant differences in interpretation (Włoszczowski 1994). It can be assumed that it should be in the range of 0.9 to 1.0. Also in this case, the reference value depends on the reference branch and its specificity.

Figure 2. Excess liquidity
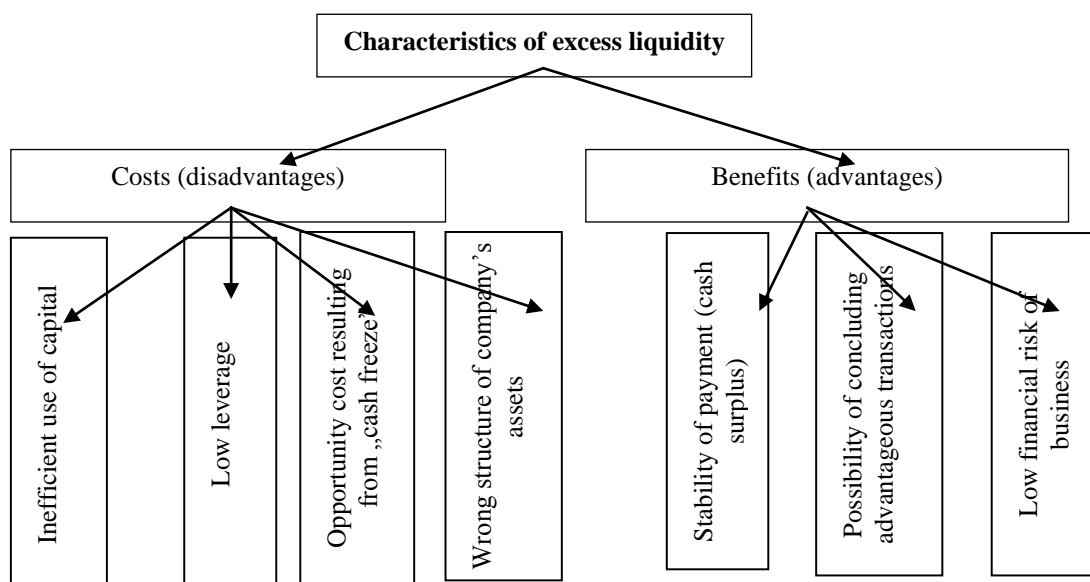
Source: Tokarski, Tokarski 2001

Concluding, the following weaknesses of static methods of liquidity measurement should be presented (Wędzki 2003, 1995):

− these methods measure the coverage of future liabilities of the company by the assets which the company disposes of in the current period,

− static methods are susceptible to various manipulations of their value, especially in the course of preparation of financial statements at the end of the period. This is possible due to more stringent receivables collection and inventory policy.

− lack of full compliance of the accounting and the actual value of the property (Wędzki, 1995):

a) current assets are accounted in historical prices, which differ from market prices,

b) valuation of some of the current assets (securities) is affected by the principle of prudence, according to which the company does not have to disclose the current value of these assets if the historical purchase price is lower,

c) in the calculation of the ratios the value of assets and liabilities as at the date of preparation of the financial statement is used and therefore only the historical value of assets and liabilities is covered, which does not allow to take into account the two aspects important for liquidity analysis, namely:

d) the impact of the structure of current liabilities and , in particular, due liabilities,

e) the size of the current assets requirement, which determines the size of real and financial resources, which must be involved.

3. The methodology and results of the performed analysis

In the analysis 50 largest companies listed on the Warsaw Stock Exchange were included. The element to be taken into account was the sales in 2012. This means that the objects of the analysis were the biggest Polish companies. Financial data that was used comes from the the period 2002 to 2012. Not all companies disclosed their financial data from that period, so it was decided to use the longest period of data available.

In course of the analysis it was decided to compare the liquidity and profitability with the use of correlation coefficient. Liquidity is described by three variables: the value of cash at the end of the year, the value of current liquidity ratio (current ratio) and quick ratio. Profitability achieved by the company is described by means of: net profit, ROE and ROA.

For pairs of the above variables the correlation coefficient in various configurations was calculated. Since previous studies assumed that the increase in liquidity causes reduction of profitability, the confirmation of the posed hypothesis would be a negative correlation between the selected variables with the value below -0.5. Sample data set for the biggest polish oil company and one of the biggest by market value companies on Warsaw Stock – Exchange PKN ORLEN for the years 2006 – 2012 is presented in Table 1.

Table 1: Selected financial data and indicators for PKN ORLEN for the years 2007 – 2012.

Specification	2012	2011	2010	2009	2008	2007
Cash (zl)	1 223 302,27	711 847,17	716 253,39	11 396 528,03	417 967,96	613 314,08
Net profit (zl)	455 700,15	619 665,76	316 639,47	-612 970,82	691 974,67	537 378,35
ROE (%)	7,52	10,13	5,99	-12,31	10,97	9,55
ROA (%)	3,43	4,80	2,65	-5,38	5,38	4,54
Current Ratio	1,52	1,28	1,37	0,81	1,56	1,19
Quick Ratio	0,70	0,58	0,62	0,40	0,72	0,70

Source: own analyses based on www.gpw.pl

The set of the output data is presented in Enclosure. For each company the correlation coefficient for the following pairs of variables was calculated:

- cash - net profit
- cash - ROE,
- cash - ROA,

- Current Ratio - ROE,
- Current Ratio - ROA,
- Quick Ratio - ROE,
- Quick Ratio - ROA,

The analysis of the overall data makes it possible to draw the following conclusions:

- The coefficients of correlation of cash and the net profit in the selected companies ranges from - 0,75 to 0,96, which means that there is no regularity in the interrelation of cash and net income, only four companies reach a correlation coefficient below – 0,5,
- The coefficients of correlation between cash and ROE, reach a minimum of – 0,81 and a maximum of 0,93, here no regularity is observed either. There is no relationship between coefficients of correlation cash - net income and cash – ROE. Data contained in Enclosure shows a summary of correlation coefficients for selected pairs of variables, they do not indicate the interrelation between them, only 9 companies achieved a correlation coefficient below – 0,5,
- The coefficients of correlation between cash and ROA have similar characteristics as the values above. The minimum value is – 0,84 and the maximum value is 0,90. In this case, only seven companies reached a value of correlation coefficient lower than – 0,5.
- The coefficients of correlation between the current liquidity ratio and the ROE and ROA, have the following values:

Table 2: Correlation between Current Liquidity Ratio and ROE and ROA.

	Min – max	Companies with correlation below -0,5
Current Ratio – ROE	-0,62 / 0,98	4
Current Ratio – ROA	-0,62 / 0,99	1

Source: own calculations

- The coefficients of correlation between the quick ratio and the ROE and ROA, have the following values:

Table 3: Correlation between Quick Liquidity Ratio and ROE and ROA.

	Min – max	Companies with correlation below -0,5
Quick Ratio – ROE	-0,80 / 0,95	4
Quick Ratio – ROA	-0,65 / 0,98	3

Source: own calculations

4. Final conclusions

In the perspective of conducted analysis, the initially posed hypothesis seems to be false. It is not possible to prove the linkage between profitability and liquidity represented by the selected indicators and financial values. The inconsistence of the obtained results and the current theory may result from:
- the selected group of companies and the analytical procedure used, which is not statistically representative. Author has decided to analyses fifty biggest by market value companies from Warsaw Stock – Exchange from 443 companies in total. All companies are grouped in two main Stock – Exchange indexes: WIG – 30 and mWIG – 40.
- the selected period of analysis which has a dynamic character. During analyzed period there were a lot of fluctuations on international financial markets, including capital market in Poland. In the result financial results of many companies in Poland have deteriorated strongly, which probably may have influenced results of the researches.

- the chosen method of the analysis, which may be inadequate to describe the phenomenon, the dynamic correlation coefficient may poorly reflect the described phenomenon.

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Enclosure

Company / cor-relation	Cash – net profit	Cash – ROE	Cash – ROA	Current Ratio – ROE	Current Ratio – ROA	Quick Ratio – ROE	Quick Ratio – ROA
PKN	-0,7579	-0,7993	-0,7055	0,7446	0,7092	0,7897	0,8066
AB	-0,7256	0,5366	0,1846	0,7419	0,4500	0,7658	0,6539
LOTOS	-0,6934	-0,7462	-0,6192	0,1175	0,3011	0,2077	0,3989
TVN	-0,5097	-0,4910	-0,8479	-0,0595	0,1254	-0,0136	0,1046
KRUSZWICA	-0,4124	-0,3865	-0,4032	0,9877	0,9904	0,4245	0,4409
DĘBICA	-0,3676	-0,5796	-0,2081	-0,3219	0,0252	-0,4326	-0,1021
Żywiec	-0,3226	-0,6833	-0,2615	0,1907	0,2556	0,2678	0,3077
ABC	-0,2548	-0,6655	-0,4804	0,9131	0,9838	0,4580	0,6357
KĘTY	-0,2543	-0,7723	-0,7165	-0,2003	-0,1286	-0,3990	-0,3023
HYDRO	-0,1865	-0,6038	-0,3436	-0,4312	-0,1627	-0,3333	-0,0654
TAURON	-0,1649	-0,1917	-0,1076	0,7831	0,7905	0,7077	0,7294
ARCTIC	-0,1095	-0,3222	-0,2615	0,8581	0,8423	0,9106	0,9051
TPSA	-0,0107	0,0517	0,0668	0,0945	0,0645	0,1115	0,0761
DUDA	-0,0014	-0,0690	-0,0637	0,4227	0,4553	0,3776	0,4065
ACTION	0,0194	0,0447	0,8032	0,1191	0,8569	-0,0441	0,6675
ERBUD	0,0295	-0,8168	-0,6880	-0,3846	-0,2115	0,4506	0,5378
CIECH	0,0906	-0,1601	-0,3418	0,5848	0,8003	0,5839	0,7965
PGN	0,1554	-0,4665	-0,2569	-0,6296	-0,3745	-0,5896	-0,3496
IMPEXMETAL	0,2320	0,0542	0,0689	0,7045	0,7621	0,6933	0,6956
FARMACOL	0,2341	-0,3644	-0,0250	-0,5492	0,0471	-0,1911	-0,1405
NFI	0,2589	0,4348	0,3911	-0,6192	-0,6287	-0,5299	-0,5315
COGNOR	0,3408	0,2660	0,2727	0,4031	0,3042	0,5302	0,4375
POLICE	0,3621	0,3206	0,3432	0,7465	0,8020	0,5538	0,6274
NETIA	0,3701	0,4309	0,4494	0,0736	0,0696	0,0636	0,0595
ENEA	0,4715	0,3103	0,3505	0,5165	0,5916	0,5107	0,5857
LPP	0,4770	-0,0709	-0,1804	-0,2223	-0,0630	-0,3533	-0,3072
KOPEX	0,4923	-0,1431	0,2444	0,2822	0,6898	0,5320	0,5998
EKO HOLD	0,5106	-0,0068	0,2164	-0,2817	-0,1474	-0,5472	-0,4370
BORYSZEW	0,5311	-0,2092	-0,1526	0,6377	0,5687	0,5313	0,4584
NEUCA	0,5428	-0,4835	-0,6218	0,6231	0,6287	0,9598	0,9890
JSW	0,5667	-0,2272	-0,1644	-0,2022	-0,1535	-0,1692	-0,1240
POLSAT	0,5849	-0,0615	0,5146	0,0377	0,8140	-0,1456	0,7501
MOSTOSTAL	0,5881	0,6130	0,6903	0,7281	0,6699	0,8443	0,8321
ROVESE	0,6506	-0,2302	-0,2415	-0,6260	-0,4751	-0,1458	-0,0113
PELION	0,6915	0,1068	0,4112	0,1698	0,2555	-0,4582	-0,5394
Z.A. TARNÓW	0,7045	0,2945	0,3723	0,0452	0,0713	0,0185	0,0428
GRAJEWO	0,7949	0,7691	0,7463	0,6562	0,5981	0,7106	0,6686
TRAKCJA	0,8023	0,4823	0,4898	0,3981	0,8375	0,2227	0,7337
PGE	0,8633	0,1683	0,2171	0,5514	0,5851	0,5846	0,6132
STALPRODUKT	0,8666	0,6846	0,7941	0,2847	0,4824	0,3703	0,5682
INTER CARS	0,9012	0,0804	0,4237	-0,1057	0,3327	-0,1220	0,3278
ASSECO	0,9017	0,2498	0,3021	0,2518	0,3079	0,2426	0,2995
SYNTHOS	0,9076	0,7629	0,8018	0,0807	0,1717	0,0986	0,1878
POLIMEX	0,9081	0,3506	0,4098	0,4293	0,4659	0,6227	0,6293
EUROCASH	0,9107	0,5022	-0,6358	0,4392	0,8369	0,8683	0,4650
PĄTNÓW	0,9153	0,8803	0,9068	0,8541	0,8756	0,8527	0,8753
PBG	0,9292	-0,5175	-0,2600	-0,3618	0,3212	-0,2307	0,4790
BUDIMEX	0,9602	0,9352	0,8226	-0,4130	-0,2284	-0,8014	-0,6529
KGHM	0,9698	0,7478	0,8307	0,6201	0,8084	0,5689	0,7547