

## WORKING CAPITAL AS AN ENTERPRISE VALUE ASSESSMENT TOOL

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**Abstract.** *The valuation of an entity in off-exchange transactions involves the use of different techniques. Nevertheless, none of them guarantees the most accurate result. Therefore, it is very difficult to choose one evaluation method. Both investors, corporate managers, financial professionals, portfolio managers, and securities analysts should have a basic understanding of the process of evaluating companies. To that end, professionals recommend evaluating a company's financial reports to detect its financial position and solvency. According to the methods of financial analysis, working capital is one of the solvency ratios, which describes the value of resources that remain after the company's current liabilities have been bared. The research study is aimed at determining the impact of changes in working capital on the valuation of a company. In order to achieve the aim and confirm or deny the hypothesis, the methodological basis for the research study was developed, necessary information was collected, calculations were performed using data from companies listed on Nasdaq OMX Riga, and the obtained results were analysed. Literature review and economic and statistical analysis, including the SPSS method for assessing the effects of working capital and stock price, were used in the research.*

**Keywords:** *current assets, current liabilities, evaluation methods, working capital.*

### Introduction

When purchasing stocks or shares of companies, determining their value is crucial. If a joint stock company is listed on a stock exchange, participants of a securities market determine the price. Listed stock prices can be found in stock exchange bulletins. However, if a joint stock company is not listed on a stock exchange, then the stocks or shares do not have such a fixed price, and a buyer and a seller must determine the price by other methods to be able to execute their transaction. The valuation of the stocks of private companies is required for stocks to be donated and bequeathed, companies to be merged, when stocks are received instead of cash, stocks are presented as collateral for credit, and new stocks are issued. There is a similar situation for limited liability companies when shares thereof are valued.

A choice of an evaluation method is the major problem in valuing stocks or shares. There are several approaches available: price-earnings ratio method; return on capital employed method; fair value method; dividend basis method; yield-basis method; and asset-backing method (Swayamjit, 2016) providing different results, none of which is actually perfect. Therefore, it is vital to use other, sufficiently simple methods for determining the value of a company and the value of its stocks or shares in the event of off-exchange transactions. As potential investors often have access to the financial reports of companies only, it is useful to use ratios that can be derived from the balance sheet, profit or loss account or other components of that report. When assessing the financial standing of a company, working capital is among the key indicators of its operational activity, which can be easily calculated using the balance sheet data. According to financial analysts, positive working capital (the difference between current assets and current liabilities) can be regarded as the basis for the development of the company because, assuming that all current liabilities are settled, the residual value represents the resources that can be used to expand the company's business (Stolowy & Ding, 2017). Hence, it should also affect the company's valuation.

Therefore, the research study is aimed at determining the impact of changes in working capital on the valuation of a company. To achieve that aim, the research study uses monographic research methods for literature review, statistical methods for data collection and analysis, as well as calculations made with SPSS programs using information from the financial reports of the companies listed on the official list of Nasdaq OMX Riga.

### **Literature review**

'Working capital' is an arithmetic difference between two balance sheet aggregated accounts: current assets and current liabilities (Sagner, 2014). "The word 'working capital' seems relatively simple to comprehend. Nevertheless, quantification of working capital for an enterprise or assessment of it for lending purposes is as complex as anything else in the financial domain (Gupta & Gupta, 2015).

Working capital, its structure, and management by applying the enterprise data have been extensively studied in many countries around the world. H.K. Baker, S. Kumar, S. Colombage, and H.P. Singh have studied working capital management (WCM) practices adopted by Indian firms listed on the National Stock Exchange (NSE), and they concluded that a majority of respondents indicated that their firms had a comprehensive policy for WCM, but it tended to be informal and compared with other research areas of corporate finance WCM was a relatively neglected topic." (Baker, Kumar, Colombage, & Singh, 2017).

The interconnections between working capital and other indicators have been studied such as a correlation between cash flow and working capital (Afrifa, 2016) or the influence of working capital level on SME profitability. For instance, the study of 160 London stock exchange SMEs over a six-year period (2005-2010) led to the conclusion that the results confirmed the existence of a working capital level, which maximised the profitability of an enterprise. Deviations from the optimal level reduce the profitability of an enterprise. Hence, WCM is an important element for firms (Afrifa & Padachi, 2016). Shaista Wasiuzzaman indicates, “Unlike cash holdings, working capital’s relationship with firm value has not been studied as extensively” (Wasiuzzaman, 2015). Shaista Wasiuzzaman has researched the data of 192 companies in Malaysia over a period of eight years (from the year 2000 to 2007) resulting in her finding that “the studies so far on working capital valuation confirm two things. Firstly, working capital does influence firm value significantly, and secondly, financing constraints play an important part in this relationship. However, the studies are still limited, and further empirical evidence is needed to support these findings” (Wasiuzzaman, 2015). The effect of working capital management strategies on stock price changes and the cash value added have also been studied by Abbas Ali Pouraghajan, Yousef Taghipouryan, and Samira Bavandi in 59 companies listed in the Tehran Stock Exchange during 1999-2011. They concluded, “An aggressive strategy positively and directly influences stock price changes; therefore, bold policies will lower the ratio of net working capital followed by reduced liquidity. In this case, the firm should take the risk of untimely payment of due debt. This is followed by the increased likelihood of bankruptcy and reduced credit, which eventually can increase stock price falling. It was also determined that businesses can positively and significantly influence stock price changes in companies listed in the TSE by adopting moderate policies which are the balanced utilization of assets and current debts and take a reasonable risk. On the other hand, working capital management strategies do not influence the CVA (Cash Value Added)” (Pouraghajan, Taghipouryan, & Bavandi, 2015).

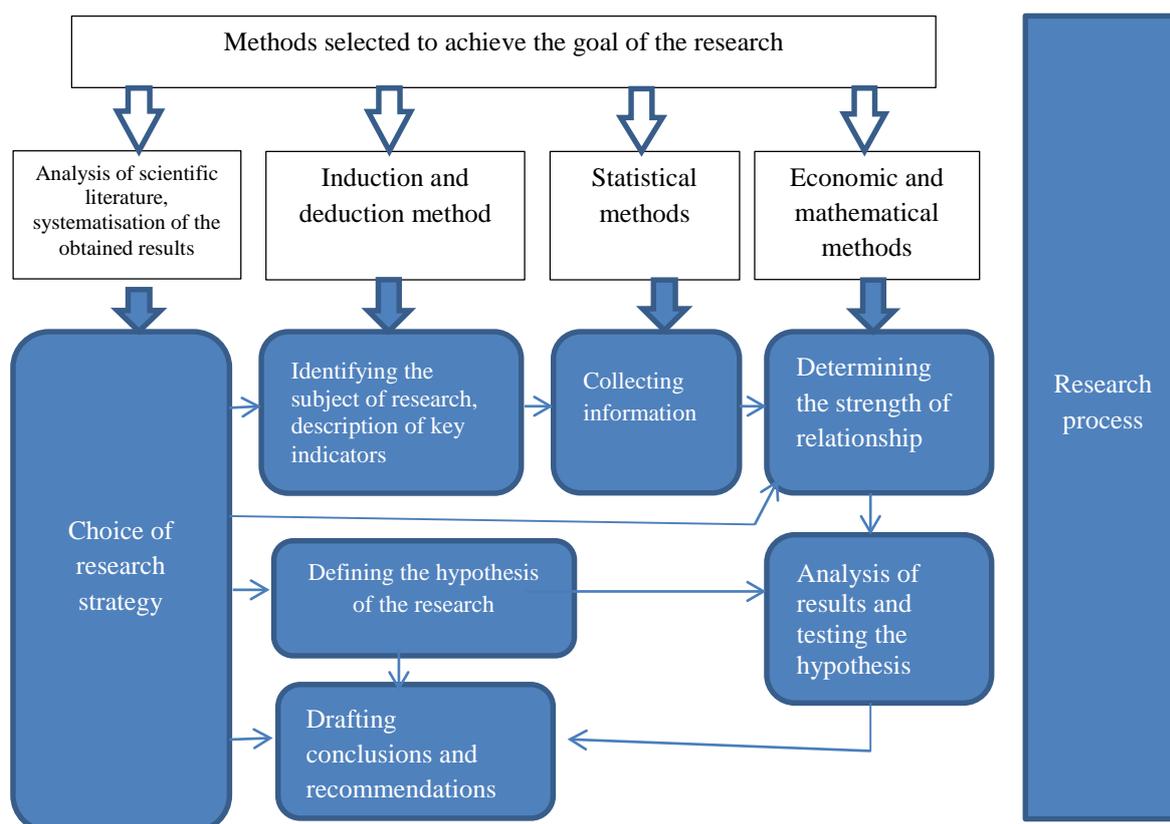
Having been inspired by the study on stock prices in the Tehran Stock Exchange, the authors shall include an assessment of the correlation between working capital and stock prices of the companies listed on the Nasdaq OMX Riga in this article.

### **Methodology**

The methodology of the research relates to the aim set and the tasks to be accomplished, that is, to analyse the research published in scientific literature on working capital and its correlation with the stock price or share price, to set the research hypothesis, to collect the data necessary for its examination, to make

calculations, and to evaluate the obtained results by making conclusions and developing recommendations for future research. The general scheme of the methodology is given in Figure 1.

The scientific literature review showed that the range of research in the field of working capital is quite wide. Often, the significance of working capital management is emphasised, and the impact of different work capital management strategies on stock prices is assessed by means of regression equations (Pouraghajan, Taghipouran, & Bavandi, 2015). However, such calculations require internal company information that is not available to an external investor. Without aggravating the complexity of the general question unduly whether the working capital can be used for valuing company stocks, the authors have chosen to verify the correctness of the underlying assertion by formulating the following hypothesis in this research study: changes in working capital are closely related to the changes of companies' stock prices on Nasdaq OMX Riga in a specific period.



*Figure 1 Research methodology (author-created)*

To test the hypothesis, the authors selected 15 Latvian and Estonian joint stock companies listed on the official list of Nasdaq OMX Riga. The currency used in the financial reports burdened the use of data from Lithuanian joint stock

companies. Only after the changeover to the euro, the financial statements of Lithuanian companies on the official list (starting in 2015) are available in this currency, although the authors chose the period from 2011 to 2017 as the research period. Therefore, the Lithuanian joint stock companies were not included in the cohort. Since the official list included 33 listed companies, the research cohort constituted 45% of the general population, thus allowing to evaluate the results obtained with sufficient reliability.

For calculations, the following data were selected from each company's annual financial reports: current assets, current liabilities, total liabilities, equity, retained profit, and weighted average stock price. In order to compare the results of the calculations for various joint stock companies, they were divided into 5 groups: four groups according to the industry and the basic activity, while the fifth group included all the other companies. The companies included in the cohort, their scope and changes in stock prices on a year-by-year basis are summarised in Table 1.

*Table 1 Stock price changes of the companies listed on Nasdaq OMX Riga (EUR)  
(author-created based on the Financial reports of 15 listed companies of Nasdaq OMX Riga (2011-2017))*

No	Company	Industry	2011	2012	2013	2014	2015	2016	2017	$\bar{y}$
1.	Arco Vara	Real estate development	3.79	1.82	1.49	1.11	0.99	1.20	1.38	<b>1.68</b>
2.	Merco Ehitus	Real estate development	7.49	6.04	6.96	7.33	8.47	8.44	9.27	<b>6.71</b>
3.	Pro Kapital	Real estate development	1.70	2.15	2.27	2.50	2.34	2.11	2.00	<b>2.15</b>
4.	Grindeks	Pharmacy	8.22	6.67	8.23	7.90	6.07	4.62	7.11	<b>6.96</b>
5.	Olainfarm	Pharmacy	3.49	4.42	7.06	5.93	7.11	8.51	8.05	<b>6.37</b>
6.	Harju Elekter	Production of engineering and telecom systems	2.87	2.55	2.69	2.69	2.82	2.67	3.94	<b>2.89</b>
7.	SAF Tehnika	Production of engineering and telecom systems	3.25	3.25	1.85	1.91	2.73	3.42	5.72	<b>3.16</b>
8.	Nordecon	Construction and engineering	1.16	1.02	1.13	1.02	1.05	1.14	1.30	<b>1.12</b>

9.	Tallinna Kaubamaja	Wholesale and resale of goods	5.77	5.59	5.67	5.15	6.07	7.25	9.23	<b>6.39</b>
10.	Silvano Fashion	Production of women's lingerie	3.12	3.00	2.71	1.94	1.36	2.17	2.71	<b>2.43</b>
11.	Baltika	Clothing retail	0.81	0.43	0.74	0.49	0.36	0.29	0.29	<b>0.49</b>
12.	PR Foods	Production of fish products	0.84	0.69	0.68	0.70	0.55	0.37	0.60	<b>0.63</b>
13.	Tallink Grupp	Maritime transportation	0.71	0.66	0.94	0.74	0.68	0.83	0.91	<b>0.78</b>
14.	Ekspress Grupp	Media and publishing	1.32	1.04	1.13	1.03	1.28	1.27	1.30	<b>1.20</b>
15.	Tallinna Vesi	Water supply and wastewater collection and treatment services	7.76	7.91	10.42	12.91	13.88	14.12	11.81	<b>11.26</b>

From the data obtained, working capital was calculated as the difference between current assets and current liabilities. Graphical analysis was carried out to obtain an initial view of trends in working capital and stock price changes. The resulting images (See Figure 2 for example) indicated a possible correlation between the two variables.

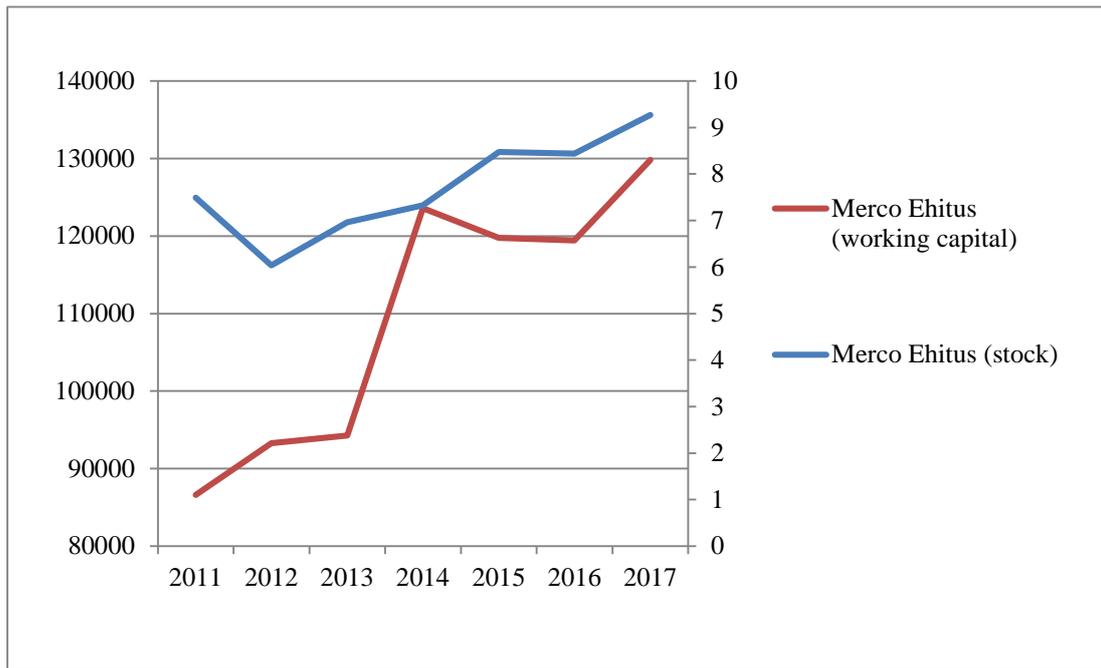
The standard deviation was calculated to characterize the data sets (Wackerly, Mendenhall, & Sheaffer, 2008):

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}} \tag{1}$$

Where  $\sigma$  – standard deviation,  
 $x$  – variable value,  
 $\bar{x}$  – mean value of the variable,  
 $n$  – number of cases.

Since the mean values of working capital and stock prices are very different and the interpretation of standard deviations is cumbersome, it is useful to calculate the coefficient of variation  $V$ , thus expressing the percentage of dispersion.

$$V = \frac{\sigma}{x} * 100 \tag{2}$$



**Figure 2 Trends of working capital and stock price changes of JSC Merco Ehitus**  
 (author-created based on the Financial reports of 15 listed companies of Nasdaq OMX Riga (2011-2017))

Pair correlation was used to measure the strength of relationship assuming that the correlation between a factorial value (working capital) and a final value (stock price) is linear. Using the SPSS program, Pearson’s correlation coefficient was calculated (Wackerly, Mendenhall, & Sheaffer, 2008):

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}} \quad , \quad (3)$$

Where  $r$  – correlation coefficient,  
 $y$  – dependent variable,  
 $x$  – independent variable,  
 $\bar{y}$  – mean of the dependent variable,  
 $\bar{x}$  – mean of the dependent variable.

The correlation coefficient indicates a strong relationship if its absolute value is between 0.7 and 0.9, while if  $r$  is above 0.5 and below 0.69, then the factorial and final traits are closely related. A lower coefficient value indicates a weak or insignificant strength of the relationship.

## **Research Results**

Initially, the strength of the relationship was determined by means of correlation analysis regarding stock prices and calculated working capital. Among 15 joint stock companies studied using the probability of error of 0.05, a strong relationship was identified only in three cases, whereas a medium strong relationship was observed for two joint stock companies, which totaled approximately 33%. Correlation coefficients were compared as per industry groups, which generally did not point to similar correlation trends among joint stock companies operating in one industry. For example, out of the three real estate developer companies, only one company (JSC Pro Kapital) achieved a high strength of relationship value of -0.828, while the correlation coefficients of the other two were insignificant. In this case, the negative correlation coefficient indicates to different directions of the trend of the variables, id est, the stock price increases (see Table 2), but the value of working capital decreases in the reviewed period in general. Only the correlation coefficient of all the joint stock companies (Harju Elekter, SAF Tehnika, Nordecon) producing different telecommunication and electrical engineering systems pointed at a strong correlation or a medium strong correlation in one case. Thus, no unambiguous and general conclusion can be drawn regarding the direct impact of changes in working capital on the stock price.

Having expanded the conditions of the proposed hypothesis, calculations of the correlation coefficient were performed for three more pairs of variables to assess whether the stock price changes depend on the amount of liabilities, the amount of equity, and the amount of retained profit. The results showed that a strong or moderate relationship existed between the stock prices and total liabilities in 47% of cases that could be explained by the fact that the use of borrowed capital to finance economic activity increased the profitability of equity. An analysis of stock price correlation with equity or retained profit yielded similar results, namely, for five joint stock companies, the absolute value of the correlation coefficient exceeded 0.5; moreover, it was very similar in both pair correlation calculations in four cases. These results are not unexpected, as retained profit is a constituent of the equity; hence it influences its changes significantly. All the calculation results are summarised in Table 2, where the coloured correlation coefficients show a significant or strong relationship between the variables. One must note that for JSC Nordecon moderate strength of the relationship between stock price changes was found with all the four variables, while for the other four companies it was insignificant in all the cases, whereas three high correlation coefficients were found for three joint-stock companies. In two cases, two R-values were significant, but for five companies only one of the four coefficients was significant.

**Table 2 Stock price correlation with working capital, total liabilities, and retained profit**  
(author-created based on the Financial reports of 15 listed companies of Nasdaq OMX Riga (2011-2017))

No	Company	Industry	Working capital	Liabilities	Equity	Retained Profit
1.	Arco Vara	Real estate development	0.299	0.054	0.848	0.862
2.	Merco Ehitus	Real estate development	-0.053	-0.037	-0.540	-0.450
3.	Pro Kapital	Real estate development	-0.828	-0.895	0.170	0.297
4.	Grindeks	Pharmacy	0.086	-0.578	0.236	-0.085
5.	Olainfarm	Pharmacy	0.513	0.212	0.402	0.240
6.	Harju Elekter	Prod. of engineering and telecom systems	0.837	0.775	0.072	0.946
7.	SAF Tehnika	Prod. of engineering and telecom systems	0.751	0.337	0.813	0.800
8.	Nordecon	Construction and engineering	0.588	0.611	-0.667	-0.538
9.	Tallinna Kaubamaja	Wholesale and resale of goods	-0.275	-0.598	-0.049	-0.571
10.	Silvano Fashion	Production of women`s lingerie	0.031	0.264	0.238	-0.455
11.	Baltika	Clothing retail	-0.057	0.337	0.363	-0.248
12.	PRFoods	Production of fish products	-0.133	0.484	0.480	-0.199
13.	Tallink Grupp	Maritime transportation	-0.389	0.595	-0.315	-0.136
14.	Ekspress Grupp	Media and publishing	-0.207	-0.361	-0.367	-0.230
15.	Tallinna Vesi	Water supply and wastewater collection	-0.212	-0.934	0.664	0.664

After analysing the standard deviations of the studied variable sets, it is concluded that the variation coefficient values that indicate the percentage of the dispersion are easier to interpret. If the variation coefficient does not exceed 33%, then the set is homogeneous, and finding a corresponding function of the trend and the relationship between the final feature and the factorial feature is easier. In order to verify the correctness of this statement, the variation coefficients for those five joint stock companies whose correlation between stock price and working capital reached a significant level were compared. The data shows that for only two joint stock companies (Pro Kapital, Olainfarm) the dispersion of both variable cohort sets is in line with the above-mentioned condition (see Table 3). However,

JSC Harju Elekter with the highest correlation coefficient of 0.837 has a working capital dispersion of 64%, while the dispersion of stock price is only 16%.

*Table 3 Stock price and working capital correlation and variability indicators (author-created based on the Financial reports of 15 listed companies of Nasdaq OMX Riga (2011-2017))*

No	Company	Industry	Working capital		Share price		Correlation
			Standard deviation	Coefficient of variation (%)	Standard deviation	Coefficient of variation (%)	
1.	Pro Kapital	Real estate development	39653	15	0.2580	12	-0.828
2.	Olainfarm	Pharmacy	6686	22	1.8581	29	0.513
3.	Harju Elekter	Production of engineering and telecom systems	8626	64	0.4747	16	0.837
4.	SAF Tehnika	Production of engineering and telecom systems	890	1	1.2974	41	0.751
5.	Nordecon	Construction and engineering	3665	77	0.9945	89	0.588

Nordecon’s variation indexes for working capital and stock price are very high, that is 77% and 89% respectively, but the correlation coefficient shows a moderately strong relationship of 0.588. This is likely to indicate that the correlation between stock prices and working capital values of the companies listed on the Riga Stock Exchange is non-linear. Hence, the set hypothesis must be rejected, as only one-third of the cases studied provided positive results. An expanded study is needed to determine what other factors affect stock prices. The conclusions of other scientists pointed at that, such as “The concept of working capital as a hindrance to financial performance is a complete change in attitude from earlier conventional wisdom. However, working capital has never actually contributed to a company’s profits or losses: instead, it just sits on the balance sheet awaiting disposition.” (Sagner, 2014.).

## Conclusions

While looking for easy-to-use approaches to stock pricing where they are not listed on the stock exchange and based on the results of research published in the scientific literature, the authors chose to underpin working capital as a baseline and a readily quantifiable indicator from the financial statements and to assess the possible correlation between working capital and stock price changes. The hypothesis of the strong relationship between those two variables was tested.

Having assumed that the correlation was linear and calculated the correlation coefficient according to the data of 15 companies listed on the official list of Nasdaq OMX Riga from 2011 to 2017, it was found that the correlation between working capital and stock price could be considered strong or noticeable in 33% of cases, while in other cases, the strength of relationship was insignificant. Similar results were also obtained for stock price changes as a final feature of a variable versus total liabilities, equity, and retained profit. Thus, the initially proposed hypothesis has not been confirmed.

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