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MEASURING EFFICIENCY OF WORKING CAPITAL MANAGEMENT: INDEX METHOD

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Abstract

Effective working capital management is of great importance for the firms in order to carry out their daily operations flawlessly, to ensure adequate profit, to avoid the difficulty in paying debts and to have a high competitive power against competitors in the sector. When analyzed on sectoral basis, it is seen that the retail sector needs a large amount of working capital to perform its daily operations. Additionally, it is a must for effective working capital management, especially in the retail sector, to determine the amount of current assets and current debt in an optimum level and to make the right decisions about the proportion of the total assets to be composed of current and fixed assets. At this point, the main purpose of this study is to determine the working capital management efficiency levels of the firms listed on Borsa Istanbul (BIST) Retail Trade sector. In order to achieve this purpose, 8 listed firms are analyzed for the period from 2010 to 2019 by using Index method developed by Bhattacharya (1997). In this method; firstly performance index, utilization index and efficiency index values are calculated as the basic components of this method, and then the working capital management efficiency levels of the analyzed firms are determined. The obtained findings show whether firms are performing an effective working capital management. According to these findings; some suggestions are made regarding the current assets, liabilities and sales levels of the firms. This study gives a different perspective by using the Index method instead of considering cash conversion cycle (traditional working capital management efficiency index) in the measurement of the working capital management efficiency across the Turkish retail industry.

Keywords: *Working Capital Management, Efficiency, Index Method.*

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1. INTRODUCTION

Working capital constitutes a certain part of the overall capital needed by firms to finance their short-term needs or current assets such as cash, securities, trade receivables and stocks. Funds invested in current assets move in a certain cycle, these funds are continuously converted into cash and this cash obtained afterwards is converted back into other current asset items. At this point, it is possible to state that working capital management plays an important role in the financial management decisions of the firms as well as capital budgeting and capital structuring decisions. While capital budgeting and capital structuring decisions mainly refer to the decisions taken at the point of managing long-term investments and returns of the firms, working capital management mostly focuses on the decisions of the firms' short-term fund needs and short-term investments. Considering the sectoral importance level of working capital management, it is seen that these decisions directly affect the profitability and liquidity level especially in manufacturing, trade and distribution firms and are vital for the success of these sectors. The reason for the direct impact in question is that the total amount of assets returned by these firms' accounts for more than half of their total assets. Therefore, even if the profitability of a firm is constantly positive, an ineffective working capital management can lead firms to bankruptcy (Garg, 2015: 4).

Effective working capital management also includes the planning and control process for current assets and current liabilities in order to eliminate the risk of failing to pay short-term debts and to prevent excessive investment in current assets (Eljelly, 2004: 48). The components of efficient working capital management are the management of accounts receivables, accounts payables, business inventories and business cash. Receivables management basically refers to credit policies that include appropriate credit terms, standards and collection standards at the point of providing cash flow to the business. The payables management involves establishing favorable credit terms between the business and creditors and suppliers. In inventories management, it is aimed to determine the optimal stock amount depending on the stock turnover at the point of minimizing the amount of cash allocated to stocks. And finally, cash management covers the optimal cash level needed to perform daily operations without ignoring the holding costs. Cash management also aims to maximize the amount of cash not invested in fixed assets and stocks to avoid insolvency (Kipronoh and Mweta, 2018: 84-85).

The amount of working capital required by each sector appears depending on the operating cycle in that sector. Here, what is meant by the concept of operating cycle; it is the number of days between the period of investment made in stocks and the period when income

is obtained from those stocks. In the retail sector, this operating cycle is often longer, as large amounts of stocks must be invested over a period of time long before sales take place. This is especially true for businesses operating from a particular workplace (building or shop), as they need large stocks to open a particular store. At this point, retail firms should have the amount of working capital to cover their short-term expenses, as they cannot immediately sell the stocks they have, and should not rely on the sales income that will be obtained later to cover these expenses (Gupta and Gupta, 2019).

The rest of this paper is as follows: The second section, overviews the related literature on the working capital management. The third section includes the research method, data set and empirical findings. Finally, discussion is made and conclusions are reported in the last section.

2. LITERATURE REVIEW

Many studies have been found in the literature to determine the effectiveness of working capital management. The working capital management efficiency index method, which is the subject of studies conducted in various countries such as Pakistan, Iran, Malaysia and Turkey, as well as mostly in India, has been used to calculate the working capital management efficiency levels of firms operating in many sectors such as cement, pharmaceutical, chemical, non-metal minerals and base metal, capital goods, fast moving consumer goods sector. Some of the studies in question are listed below:

Afza and Nazir (2011) measured the efficiency levels of working capital management of 22 cement firms in Pakistan by using Index method developed by Bhattacharya (1997) for the period of 1988-2009. According to the results, it was seen that the analyzed firms performed well during the 20 years considered. Additionally, the analysis results showed that the efficiency index average was greater than 1 in 18 years.

Valipour and Jamshidi (2012) investigated whether there was a relationship between the efficiency indexes of working capital management and efficiency of the assets by considering 72 listed firms operating in pharmaceutical, chemical, non-metal minerals and base metal industries. Performance index of working capital management, utilization index of working capital management, efficiency index of working capital management and cash conversion cycle were considered as independent variables. Profit before interest and taxes to total assets was measured as dependent variable and capital structure, sales growth, company size, and the ratio of financial assets to all assets were adopted as control variables. Regression analysis

results showed that each working capital management efficiency index had a significant and positive effect on the efficiency of the assets in the discussed firms, while no significant impact of cash conversion cycle.

Kaur and Singh (2013) also examined the working capital management efficiency by adopting Index method for the period of 2000-2010. Using a sample of 14 firms operating in capital goods sector in India, the findings revealed that the firms under discussion managed their working capital efficiently and utilized from their current assets in generating sales. A study by Kavitha and Shanmugam (2015), the working capital efficiency levels of 21 large and 17 small Indian pharmaceutical firms were measured by using Index method over the period of 2002-2012. The study concluded that small firms managed their current assets and working capital more efficiently than the large firms during the period under consideration.

Kasiran et al. (2016) analyzed the efficiency of working capital management of 24 small and medium sized firms (SMEs) listed in SME Corporation of Malaysia for the period of 2010-2013. By using Index method, total efficiency index of the working capital management was measured and the findings showed that SMEs were less efficient in managing their working capital. In the same vein, Marie and Azhagaiah (2016) aimed to measure the efficiency levels of working capital management of 15 listed firms operating in Indian fast moving consumer goods sector in their study. They adopted Index method in determining the efficiency levels of working capital management over the period of 2003-2015. The empirical results showed that the working capital management of the so-called firms was quite good and that average sector efficiency index was bigger than 1 for 9 years out of 12.

Using a sample of 15 firms operating in pharmaceutical sector, Prasad and Lakshmi (2018) evaluated the efficiency of working capital management by adopting Index method over the period of 2006-2016. According to Index method; they concluded that 10 firms performed well in managing their working capital and 5 firms had to improve their ability to manage working capital. Kandil Goker (2019) aimed to reveal the change in working capital management efficiency for the sample of 19 firms listed on Borsa Istanbul Sustainability Index continuously since 2015, before and after being included in the sustainability index, and to determine whether the resulting mathematical difference was statistically significant. As a result of the efficiency determinations made using the Index method, it was observed that the working capital efficiency of the companies decreased after entering the sustainability index. Similarly, Guler and Konuk (2019) determined the working capital efficiency levels of 21 firms listed on Borsa Istanbul over the period of 2009-2016. For this purpose, Index method was used

and the performances of the firms were determined in terms of effectively managing the total current assets and each sub-account group separately.

3. RESEARCH METHOD

In this study, Bhattacharya's efficiency method has been used to monitor and measure the effectiveness of working capital management. Bhattacharya (1997) developed a composed index showing the total efficiency level including performance index and utilization index in order to determine the efficiency of working capital management. The total efficiency index is calculated by multiplying the performance index and the utility index (Bhattacharya, 2007: 218-220):

$$PI = \frac{I_s \sum_{i=1}^{n} \frac{W_{i(t-1)}}{W_i}}{N} \ (Performance\ index\ of\ working\ capital\ management)$$

$$UI = \frac{A_{t-1}}{A_t} \ (Utilization\ index\ of\ working\ capital\ management)$$

$$EI = PI * UI \ (Efficiency\ index\ of\ working\ capital\ management)$$

Where:

- A: $Current\ assets/Total\ assets$
- I_s: S_t/S_{t-1}
- W_i: $Each\ current\ assets\ item$
- N: $Number\ of\ current\ assets\ items$
- i: $1,2,3,\ldots..N$

Working capital management utilization index value shows the degree to which a firm benefits from its current assets. An increase in current assets due to an increase in sales means that current assets are used effectively. The index in question shows the level at which a firm evaluates its current assets as a whole at the point of achieving its sales goals. If total current assets show a higher increase compared to the increase in sales, the degree of utilization of current assets will be increased compared to sales. Thus, it will be possible to shorten the operating cycle of firms by increasing the degree of utilization. This index is desired to be greater than 1 or 1, and if this is the case, it seems that the firm may effectively perform its functions indicates that the firm may perform its functions effectively. Within the scope of this study, cash and securities, trade receivables, stocks and other current assets have been taken into account in the calculation of the utilization index. Working capital management

performance index value refers to the relationship between sales and current assets items. If this value is greater than 1, the proportional increase in the sales of the firm is higher than the average of the proportional increase in each working capital item, so it may be concluded that the working capital management is effective. Working capital management efficiency index value is obtained by multiplying performance and utilization index values and shows the working capital management operations of firms as a whole. As with other index values, the fact that the efficiency index value is higher than 1 means that the firm manages its working capital effectively.

4. ANALYSIS

In this study, 8 firms listed on BIST Retail Trade sector constitute the sample of the study over the period of 2010-2019. Although the number of firms operating in the so-called sector was 12, 2 of these firms' data could not be achieved before 2015, and 2 of these firms' net sales amounts were 0 in some years. Therefore, these 4 firms were excluded from the analysis. Table 1 shows the working capital utilization index, performance index and the efficiency index values of the analyzed firms:

Table 1- Working Capital Management Index Values of the Analyzed Firms

Firm	Utilization Index Values												
	2019	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**Mean**	**Min**	**Max**
1	0,25	0,86	1,04	0,99	0,97	0,82	0,86	1,01	0,71	0,90	0,84	0,25	1,04
2	0,98	0,97	0,91	0,94	1,01	1,06	1,00	0,98	0,94	0,93	0,97	0,91	1,06
3	1,05	1,03	0,86	1,15	0,93	0,96	0,87	0,88	1,30	0,88	0,99	0,86	1,30
4	1,07	1,18	0,84	1,08	0,78	0,94	0,88	1,19	1,17	1,15	**1,03**	0,78	1,19
5	1,11	1,76	2,51	0,67	0,81	0,86	1,10	1,13	0,70	1,35	**1,20**	0,67	2,51
6	1,05	1,03	0,91	0,95	1,00	1,30	1,06	1,06	1,09	1,00	**1,05**	0,91	1,30
7	0,71	0,96	1,14	1,43	0,95	1,20	1,25	0,79	0,76	0,97	**1,02**	0,71	1,43
8	1,25	0,99	0,91	0,94	1,20	1,06	0,86	1,08	0,92	1,15	**1,04**	0,86	1,25
Firm	Performance Index Values												
	2019	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**Mean**	**Min**	**Max**
1	0,81	1,77	1,37	1,27	1,45	1,36	1,17	1,24	1,07	1,26	**1,28**	0,81	1,77
2	1,21	1,46	1,20	1,20	1,28	1,35	1,24	1,14	1,21	1,23	**1,25**	1,14	1,46
3	1,33	1,55	1,47	1,33	1,47	1,23	1,08	1,37	1,58	1,13	**1,35**	1,08	1,58
4	1,35	1,67	1,08	1,25	0,99	1,42	1,18	3,55	1,37	1,35	**1,52**	0,99	3,55
5	1,39	2,67	2,31	1,88	1,83	1,05	1,45	1,30	0,93	1,50	**1,63**	0,93	2,67
6	1,45	1,17	1,15	1,23	1,29	1,52	1,35	1,43	1,37	1,11	**1,31**	1,11	1,52
7	1,00	1,64	1,86	1,60	1,01	1,75	1,63	1,34	1,13	1,11	**1,41**	1,00	1,86
8	1,92	1,40	1,25	1,17	1,62	1,36	1,08	1,24	1,28	1,56	**1,39**	1,08	1,92
Firm	Efficiency Index Values												
	2019	**2018**	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**	**2011**	**2010**	**Mean**	**Min**	**Max**
1	0,20	1,52	1,42	1,25	1,41	1,11	1,01	1,25	0,76	1,13	**1,11**	0,20	1,52
2	1,19	1,42	1,09	1,13	1,30	1,43	1,24	1,12	1,14	1,14	**1,22**	1,09	1,43

3	1,40	1,58	1,28	1,53	1,36	1,18	0,94	1,21	2,05	0,99	**1,35**	0,94	2,05
4	1,44	1,97	0,91	1,34	0,77	1,32	1,04	4,24	1,60	1,55	**1,62**	0,77	4,24
5	1,54	4,69	5,80	1,27	1,49	0,90	1,60	1,46	0,65	2,02	**2,14**	0,65	5,80
6	1,52	1,20	1,04	1,16	1,29	1,99	1,43	1,51	1,49	1,12	**1,38**	1,04	1,99
7	0,71	1,58	2,12	2,29	0,96	2,10	2,03	1,05	0,86	1,08	**1,48**	0,71	2,29
8	2,40	1,38	1,14	1,10	1,95	1,44	0,94	1,33	1,18	1,79	**1,46**	0,94	2,40

5. DISCUSSION

By considering the utilization index values on a firm basis, it is observed that firm no.1 has an index value above 1 only 2 years, firm no.2 has an index value above 1 for only 3 years, firm no. 3 and 7 have an index value above 1 for 4 years, firm no.4 and 5 have an index value above 1 for 6 years, firm no.6 has an index value above1 for 8 years, and firm no. 8 has an index value above 1 for 5 years. When the index values are analyzed on a yearly basis; it is observed that the numbers of firms are 5 in 2019 and 2012; 4 in 2018, 2014 and 2013 and 3 in 2017, 2016, 2015 and 2011 with the utilization index above 1. So it may be concluded that 2012 and 2019 are the most thriving years because the highest number of firms with a utilization index value of more than 1 belongs to these years. Looking at the yearly average values, it is seen that all firms except for firm no. 1, 2 and 3 have a utilization index value above 1 and these values vary from 0.84 to 1.20. The lowest average value belongs to the firm no.1 and the highest average value belongs to the firm no.5. At this point, it is possible to say that firm no.1 cannot make use of current assets effectively enough to make sales.

As can be seen from Table 1; during the 10-year review period, the working capital performance index values of the firms numbered 2, 3,6,7,8 are above 1. Although firm no. 1 has a performance index value below 1 in 2019, firm no.4 in 2015, and firm no. 5 in 2011, these values are very close to 1. In addition, it is seen that the average values of all firms in the period 2010-2019 are above 1, firm no.1 has the minimum value of 0.81, whereas firm no.4 has the maximum value of 3.55. Therefore, based on the average performance values of the firms included in the analysis, it is possible to understand that the firms under discussion perform their sales above the amount of working capital and manage each current asset item effectively.

Finally, when the working capital efficiency index of the firms (overall efficiency index value) is examined, the number of firms with working capital efficiency index below 1 is 2 in 2019, 2015 and 2013, 1 in 2017, 2014 and 2010, and 3 in 2011. In the remaining years, it is seen that the efficiency index values of all firms are above 1. Therefore, 2011 is determined as the year in which at least (5) firms effectively manage their working capital, while 2018, 2016 and 2012 are considered as the years when all companies effectively manage their working

capital. When the efficiency index values are considered on a firm basis, it is seen that firm no. 2 and 6 have a value above 1 continuously by the 8-year period. Looking at the average values among the firms; it is understood that firm no. 5 has the highest value with 2.14, and firm no. 1 has the lowest value with 1.11. Additionally, it is possible to state that the reason for the high difference between the annual average minimum and maximum values of firm no. 4 is the 2-fold increase in stocks and trade receivables from 2012 to 2013. A similar situation is also valid for the firm no. 5; the underlying reason of this situation is the 4-fold decrease in the other current assets item from 2016 to 2017. Considering the results of the study as a whole, it is concluded that the analyzed firms have an effective working capital management over the 8-year period and that certain stability is achieved at this point.

6. CONCLUSION

Fluctuations in the global markets have a significant impact on the supply chains of the firms, and liquidity is the most important tool for them to survive in times of adverse economic conditions. At this point, an effective working capital management prevents the loss of business assets by creating added value for the firm. It creates a positive effect on profitability by enabling the owned assets to be used in other investments. In this way, the cash flow cycle becomes systematic; creating a downward effect on the cost of capital, and this increases the firm value. Current assets have an important place in maintaining the operations of the firms in each sector. Especially in retail and wholesale sector, this level of importance rises to very high levels, and in these sectors, firms allocate more funds for current assets. The level of importance of working capital management in financial management is extremely high due to the long time to be devoted to the management of current assets items, the share of working capital investments in total investments and the close relationship between working capital and business volume or firm profitability. Because of this significant impact of working capital management in the retail sector, this study has examined the levels of working capital management effectiveness of retail firms whose shares are traded on the stock exchange. For this purpose, the working capital management efficiency levels of the firms operating in BIST Retail Trade sector are measured over the period of 2010-2019. For the analysis, the working capital efficiency index method, which shows both the performance and the level of utilization of working capital elements, has been used, and the working capital management activities of the analyzed firms have been evaluated. The results of the study showed that the average values of the firms considered have of 1 or more than 1 at both year and firm level in terms of all three indexes. Therefore, it is possible to state that the analyzed 8 firms have an effective working

capital management in the period under consideration and they can make sufficient use of the current assets owned in the generation of sales. Future studies may consider larger sample size and longer time period for analyzing thoroughly.

References

Afza, T. & Nazir, M. S. (2011). 'Working capital management efficiency of cement sector of Pakistan', *Journal of Economies and Behavioral Studies*, 2 (5), pp. 223-235.

Bhattacharya, H. (2007). *Total management by ratios: an analytic approach to management control and stock market valuations.* 2nd edition, New Delhi: Sage publications.

Eljelly, A. M. A. (2004). 'Liquidity-profitability tradeoff: an empirical investigation in an emerging market', *International Journal of Commerce and Management*, 48-61.

Garg, M. (2015) *Working capital management*. India: Educreation publishing.

Guler, E. & Konuk, F. (2019) 'An alternative tool in the working capital efficiency measurement: index method', *Accounting and Finance Journal*, 84, pp. 35.48.

Gupta, R. K. & Gupta, H. (2019). *Working capital management and finance: a handbook for bankers and finance managers.* 3rd edition, Notion Press.

Kandil Goker, I. E. (2019). 'Analysis of working capital efficiency of companies quoted in sustainability index by index method', *International Symposium On Current Developments In Science, Technology And Social Sciences*, 20-22 December, Ankara, pp. 599-608.

Kasiran, F. W., Mohamad, N. A. & Chin, O. (2016). 'Working capital management efficiency: a study on the small medium enterprise in Malaysia', *Procedia Economics and Finance*, 35, pp. 297-303.

Kaur, H. V. & Singh, S. (2013) 'Managing working capital efficiency in capital goods sector in India', *Global Business Review*, 14 (2), pp. 343-355.

Kavitha, R. & Shanmugam, R. (2015). 'A study on working capital management efficiency', *International Journal of Engineering and Management Research*, 5 (3), pp. 196-208.

Kipronoh, P. & Mweta, T. (2018). 'Overview of working capital management: effective measures in managing working capital components to entrepreneurs', *European Journal of Business and Management, 10* (7), pp. 83-86.

Marie, A. A. & Azhagaiah, R. (2016). 'Efficiency of working capital management: empirical evidence from Indian fast moving consumer goods industry', *Pacific Business Review International*, 9 (6), pp. 10-26

Prasad, S. R. & Lakshmi, B. H. (2018). 'Working capital management efficiency: a study on selected pharmaceutical companies in India', *International Journal of Information and Computing Science*, 5 (1), pp. 40-45.

Valipour, H. & Jamshidi, A. (2012). 'Determining the optimal efficiency index of working capital management and its relationship with efficiency of assets in categorized industries: evidence from Tehran stock exchange (TSE), *Advances in Management & Applied Economics*, 2 (2), pp. 191-209.