

Different Working Capital Policies and the Profitability of a Firm

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Abstract

This study examines if there is a difference between the Profitability of Jordanian industrial companies which have a low cash conversion cycle and the Profitability of those which have a high cash conversion cycle. Moreover, eight indexes have been developed to help the investor and the manager of the company in Jordan in to make their decisions. To achieve the objectives of the study, a sample of 45 Jordanian industrial companies listed at Amman Stock Exchange (ASE) was studied. The study covered the period from 2000 to 2007. T-Tests and Mann-Whitney-U Tests were used to test the four hypotheses of the study. It was concluded that there was a statistically significant difference among the companies that have a high cash conversion cycle and those which have a low cash conversion cycle. Eight indexes of performance differed between companies with high cash conversion cycles and companies with low cash conversion cycles.

Keywords: cash conversion cycle, profitability, index

1. Introduction

The global economy has witnessed the worst crisis since the thirties of the last century and as the global crisis began in the developed countries, particularly in the United States of America, most of economic sectors were affected, especially the industrial sector. For example, the car industry sector suffered a great liquidity crisis represented by an inability to pay short-term obligations which led to the collapse of the auto giant General Motors (GM).

The crisis has since spread to Arab countries but less severely and Jordan has been affected by the crisis like the rest of the Arab countries. The industrial sector in Jordan is one of its most important economic sectors as its contribution to GDP for the year 2008 was about 24.5%. This sector has been affected by the global crisis, as the national exports in 2009 decreased by 11.7% from 2008 (Ministry of Industry and Trade of Jordan, website). Exports of potash, fertilizers and clothing were biggest losers in this decrease. This, combined with the stresses of banks in granting loans, has resulted in a decline in liquidity and managing the working capital has become one of the most important things that should be of interest to companies so as not be exposed to the risk of bankruptcy. So it has become necessary to work to find the means by which the industrial public shareholding companies should deal with managing working capital in order to increase the profitability of these companies and their value and to ensure their survival and continuity, as working capital represents 51% of the industrial sector total assets according to (Sabri, 2010). And this percentage is supported by the one that has been concluded in (Al-Naif, 2005) of 55%. This percentage is high compared with the result of (Hill, 2009) of a study made in the United States of America which indicated that the proportion of working capital to total assets is 22%.

Working capital is considered to be as a criterion of the debtor's ability to repay its obligations in case of liquidation but the new view of liquidity is based on the continuity of the company and does not depend on the liquidation of the assets traded and instead depends on the cash flows that result from these assets (Fess, 1966). The cash conversion cycle is defined "as a comprehensive measure of working capital as it shows the time lag between expenditure for the purchases of raw materials and the collection of sales of finished goods" (Uyar, 2009). Managers should know the cash conversion cycle for their companies and not only the final profits for their companies (Hutchison, et. al, 2007).

It is worth mentioning that the issue of working capital management has not received much attention in the

literature of financial management compared to investment decisions and long-term financing, although the management of working capital consumes a lot of time and attention by the chief financial officer. The managers of working capital are interested in managing each element of current assets and current liabilities in order to achieve a balance between liquidity and profitability. This study tries to find if there is a difference between the profitability of the Jordanian industrial companies that have a low cash conversion cycle and profitability of the Jordanian industrial companies which have a high cash conversion cycle. As well, this studies aims to clarify the difference in the profitability of industrial companies that may exist when the inventory period, the accounts payable, and accounts receivable period differ. In order to know the best way of managing the working capital in the Jordanian industrial companies it is necessary to know how to increase profitability and a company's value. Cash conversion cycle was used to measure the working capital, as the cash conversion cycle is better than conventional measures which are based on the concept of liquidation. A weighted average index will be developed, which can be used as a reference point for investors in evaluating the company.

2. Literature Review

This section is a summary of empirical literatures. In their articles the authors of these researches introduced the different objectives, different methodologies that were used, and finally the different results of the studies. (Jose et. al, 1996) They examined the relationship between profitability measures and the management of ongoing liquidity. This is also the major objective of (Deloof, 2003). According to (Kieschnick, et.al, 2008) they have provided the first empirical study of the relationship between corporate working capital management and firm value, as well as the first examination of how agency costs influence this relationship. After them, Luo and his associates studied whether and how working capital efficiency (measured by cash conversion cycle) affects future firm performance and firm value, another objective they added (Luo, et.al, 2009). Mohamad and Saad in their study aim to explore the effects of working capital on both Market Valuation and Profitability in Malaysia (Mohamad and Saad, 2010). Uyar set industry benchmarks for cash conversion cycles (CCC) of merchandising and manufacturing companies (Uyar, 2009). On the other hand, Uyar also examines the relationship between the length of the CCC and the size of the firms (Uyar, 2009). Another measure was introduced by Afza and Nazir in their study that investigates the relative relationship between the aggressive/conservative working capital policies and profitability as well as risk of firms (Afza and Nazir, 2007). Also, Weinraub and Visscher in their study looked at ten diverse industry groups over an extended time period to examine the relative relationship between aggressive and conservative working capital practices (Weinraub and Visscher, 1998).

Jose et al. Provide the cornerstone methodology that was followed. They utilize cash conversion cycle, measure liquidity, both return on assets and return on equity are used in their study to measure profitability and for the analysis they used correlation analysis, nonparametric data analysis, and multiple regression (Jose,et. al,1996). And (Abdul Raheman and Nasr, 2007) used net operating profitability, which the same as gross operating income. On the other hand (Uyar,2009), set industry benchmarks for cash conversion cycle, in order to investigate whether there is a significant difference among industries in terms of the CCC, one-way ANOVA analysis with a Duncan test from Post-Hoc tests was conducted. (Afza and Nazir, 2007) in their study used current assets as a percentage of total assets to measure investment Policies (Conservative/Aggressive). While (Jose, et al., 1996) indicate that a firm may adopt an aggressive working capital management policy with a low cash conversion cycle, and a conservative one with a high cash conversion cycle. This measure we used in our research. Finally, (Smith, et. al, 1997) in his article presented some empirical findings on associations between traditional and alternative working capital measures of liquidity and ROI.

The main result in (Deloof, 2003) is that the coefficient of the cash conversion cycle variable is negative. It is, however, not significantly different from zero. On the other hand (Luo, et.al, 2009), find that the efficiency of a firm's working capital management has a lasting impact on firm performance and (Uyar, 2009) found that there is a significant negative correlation between the CCC and the profitability. (Garcia-Teruel and Martinez-Solano, 2007) indicate that shortening the cash conversion cycle also improves the firm's profitability. (Nobanee, AlHajja, 2009) suggest that managers can increase profitability of their firms by shortening the cash conversion cycle, the receivable collection period and the inventory conversion period. In contrast (Lyroudi and Lazaridis, 2000) in their study found that the cash conversion cycle was positively related to the return on assets and the net profit margin. And (Vishnani and Shah, 2007) found that the majority of companies in their study (14 out of 23) revealed a positive correlation and four out of these 14 companies demonstrated a significant correlation.

(Smith, et.al, 1997) quick ratios did not display the expected negative association with ROI in the chi-square tests. The chi-square statistics, although contrary to the theory, indicated a positive association. According to (Jose, et al, 1996), Soenen 1993 does not find a consistent relationship between the net trade cycle and the total rate of return on assets for a wide range of industries. As for (Afza and Nazir, 2007) they found the negative

relationship between working capital policies and profitability. (Jose, et al., 1996) introduce a strong case can be that argues that more aggressive liquidity management (lower CCC) is associated with higher profitability for several industries, (Hill, et al, 2009) and their results indicate that increases in sales growth and sales volatility causes firms to manage operating working capital more aggressively. The results of these analyses indicated that the cash conversion cycle was more effective than the current ratio in diagnosing the health of each company's working capital cash flows. One of the studies that has been applied to Jordanian companies is (Al-Naif, 2005) it aims to develop a model for determining investment in working capital (current assets) as well as in its components (i.e. cash, receivables and inventory). (Eljelly, 2004) in his study empirically examines the relation between profitability and liquidity on a sample of companies in Saudi Arabia.

This research contributes to the literature in several ways. First, this research depends on the Jordanian industrial companies data listed in ASE. Second, it tries to find if there is a difference between the profitability of the Jordanian industrial companies that have low cash conversion cycles and profitability of the Jordanian industrial companies which have high cash conversion cycles. The research also aims to clarify the difference in the profitability of industrial companies that may exist when the inventory period, the accounts payable and accounts receivable period differ. And finally, the important point of this research is to provide industry companies listed in the ASE an Index (benchmarks), so that firms are able to evaluate their own performance, and prevent themselves from probable liquidity problems before it is too late. In this research a Weighted Average Index was developed. Contrastingly, (Hutchison, et al., 2007) and (Uyar, 2009) in their study they used the average of the CCC, not the Weighted Average Index.

3. Research Methodology

The study relied on data from the Amman Stock Exchange (ASE) in the period from 2000 to 2007, the period that preceded the global financial crisis that started in 2008. A sample of companies was selected in the light of the following conditions: the company hasn't undergone merging or acquisition, it has not been placed under liquidation during the period of study, its financial year is ended annually on 31/12, to it was established before the year 2000, and its necessary data is available for the purposes of this study. The number of companies that met these conditions was 45 companies. This sample was divided into two categories in order to examine the four hypotheses of the study, these hypotheses were:

The first hypothesis: there is no difference in profitability between the companies with a high inventory period and those with a low inventory period. The second: there is no difference in profitability between the companies with high accounts payable and those with low accounts payables. The third: there is no difference in profitability between the companies with high accounts receivables and those with low accounts receivables. And the fourth hypothesis: there is no difference in profitability between the companies with high cash conversion cycles and those with low cash conversion cycles. The study uses five variables and they are: return on assets (ROA), inventory period (INVP), accounts payables (APP), accounts receivables (ACRP), cash conversion cycle (CCC). And the descriptive statistic was used to describe the sample of the study and a percentile was used to delete outliers values. Table 1 shows how they were measured.

Table 1. The five variables in the study and how they measured

Variable Name	Notation	Description
Return on Assets	ROA	Net Income / Total Assets
Inventory Period	INVP	$(\text{inventories} \times 365) / \text{cost of sales}$
Accounts payables Period	APP	$(\text{Accounts payables} \times 365) / \text{cost of sales}$
Accounts Receivables Period	ACRP	$(\text{accounts receivables} \times 365) / \text{sales}$
Cash Conversion Cycle	CCC	$\text{Inventory Period} + \text{Accounts Receivables Period} - \text{Accounts Payables period}$

A T-Test was used to examine the first, the second and the third hypotheses, the fourth was examined by both (T-Test & Mann-Whitney-U Test) because one of the two series doesn't follow a normal distribution. Concerning the eight suggested indexes the following method was used to construct each of them and has been improved by the researcher.

First: The Calculation Weighted Average.

$$\text{Weighted Average } I_t = I_1 \times (I_1 \div \sum I_t) + I_2 \times (I_2 \div \sum I_t) + \dots + I_i \times (I_i \div \sum I_t)$$

Where I: Represents the variables, for example INVP. I_1 : INVP for the first company. This is repeated for all companies in the sample. $\sum I_t$: The total of I for each company of the sample for the year t.

Second: The Calculation of the weighted average index in points.

$$\text{Weighted average Index in Points}_{(t)} = (\text{Weighted Average } I_t \div \text{Weighted Average } I_{\text{for 2000}}) \times 100.$$

Where the weighted average Index in Points $_{(t)}$: Weighted average Index in Points for the year t. Weighted Average I for 2000: Select the year 2000 as the base period.

The new role of the financial function is as a system of information to fulfill the needs of investors, managers of companies, and other parties. This study improved such a methodology to fulfill this objective and then produced eight benchmarks that may present the suitable information.

4. Results and Analysis

Table 2 shows the descriptive statistic. There were some high values so percentiles were used to delete outlier values(as shown in table 3). After deletion in table 2 it was shown that the average of cash conversion cycles was about 235 day, the average of (ROA) was 0.044, the highest value was 20%, the lowest value was -30%, and the highest value of the inventory period was 15115.7 days, which refers to Amana For Agr. & Industrial Investment Company because cost of sales was 22929 Jordan Dinar (JD), inventory 949553(JD). And the highest value of receivables period was 1034.1 days which also refers to Amana For Agr.& Industrial Investment Company accounts receivables 70597 (JD) and sales 24919(JD).

Table 2. Descriptive statistics

Descriptive statistics before						
	N	Minimum	Maximum	Mean	Std. Deviation	
ROA	360.0	-0.5	0.3	0.043	0.1	
INVP	360.0	2.1	15115.7	300.9	1019.8	
APP	360.0	1.6	21888.6	243.1	1498.2	
ACRP	360.0	1.9	1423.7	121.4	162.1	
CCC	360.0	-12661.9	12953.8	179.2	1070.5	
Descriptive statistics after						
	N	Minimum	Maximum	Mean	Std. Deviation	
ROA	355.0	-0.3	0.2	0.044	0.1	
INVP	355.0	10.4	15115.7	262.7	868.7	
APP	355.0	2.4	13698.6	156.8	823.9	
ACRP	354.0	3.2	1034.1	112.6	122.3	
CCC	357.0	-2406.6	12953.8	235.1	716.9	

Table 3. Frequencies

Frequencies						
Statistics						
		ROA	INVP	APP	ACRP	CCC
N	Valid	360.0	360.0	360.0	360.0	360.0
	Missing	0.0	0.0	0.0	0.0	0.0
Percentiles	1.0	-0.2	10.0	2.4	3.2	-2988.6
	99.0	0.2	5642.8	6533.7	1047.3	1374.3

After deleting outlier values and dividing the sample into two parts according to (INVP, APP ACRP, and CCC), the results were what is shown in tables 4, 5, 6 and 7 that all follow the normal distribution except the companies which have a high cash conversion cycle. The four hypotheses of the study were examined, Table 8. shows that

the T-test value which was 5.75 for the first hypothesis is statistically significant at the level 1% so null hypothesis is refused and the alternative hypothesis is accepted. Table 4 shows that the average of ROA for the companies which have a low INVP was more than the ROA average of those companies which have a high INVP as the average value of ROA for each was 7% and 2% respectively. Concerning the second hypothesis, Table 9 shows that the T-test value was 3.78 and it is statistically significant at the level 1%. Table 5 shows that the average of ROA for the companies which have a low APP equals 6% and the ROA average of those companies which have a high APP equal 3%. Concerning the third hypothesis, table 10 shows that the T-test value was 5.45 and it is statistically significant at the level 1%. Table 6 shows that the average of ROA for the companies which have a low ACRP was more than the ROA average of those companies which have a high ACRP. Finally, the fourth hypothesis was examined by (T-test & Mann-Whitney-U Test). Table 11 shows that the T-test value was 3.33 and is statistically significant at the level 1%. And (Mann-Whitney-U Test) showed that Z value is -3.22 and its statistically significant at 1%. Table 7 showed that the average of ROA for the companies which have a low cash conversion cycle equals 6%, and the ROA average of those companies which have a high cash conversion cycle equals 3%.

Table 4. INVP sorting for company profit

One-Sample Kolmogorov-Smirnov Test and descriptive – INVP			
		roa1	roa2
N		171.00	175.00
Normal Parameters(a,b)	Mean	0.07	0.02
	Std. Deviation	0.07	0.07
Most Extreme Differences	Absolute	0.07	0.09
	Positive	0.04	0.05
	Negative	-0.07	-0.09
Kolmogorov-Smirnov Z		0.86	1.23
Asymp. Sig. (2-tailed)		0.46	0.10
A	Test distribution is Normal.		
B	Calculated from data.		

Table 5. APP sorting for company profit

One-Sample Kolmogorov-Smirnov Test and descriptive – APP			
		roa1	roa2
N		173.00	174.00
Normal Parameters(a,b)	Mean	0.06	0.03
	Std. Deviation	0.06	0.08
Most Extreme Differences	Absolute	0.10	0.05
	Positive	0.10	0.04
	Negative	-0.10	-0.05
Kolmogorov-Smirnov Z		1.33	0.68
Asymp. Sig. (2-tailed)		0.06	0.74
A	Test distribution is Normal.		
B	Calculated from data.		

Table 6. ACRP sorting for company profit

One-Sample Kolmogorov-Smirnov Test and descriptive – ACRP			
		roa1	roa2
N		175.00	172.00
Normal Parameters(a,b)	Mean	0.06	0.02
	Std. Deviation	0.07	0.07
Most Extreme Differences	Absolute	0.06	0.10
	Positive	0.04	0.05
	Negative	-0.06	-0.10
Kolmogorov-Smirnov Z		0.83	1.33
Asymp. Sig. (2-tailed)		0.50	0.06
A	Test distribution is Normal.		
B	Calculated from data.		

Table 7. CCC sorting for company profit

One-Sample Kolmogorov-Smirnov Test and descriptive – CCC			
		roa1	roa2
N		173.00	174.00
Normal Parameters(a,b)	Mean	0.06	0.03
	Std. Deviation	0.07	0.07
Most Extreme Differences	Absolute	0.05	0.13
	Positive	0.03	0.07
	Negative	-0.05	-0.13
Kolmogorov-Smirnov Z		0.63	1.71
Asymp. Sig. (2-tailed)		0.82	0.01
A	Test distribution is Normal.		
B	Calculated from data.		

Table 8. T-test for the first hypothesis

		Mean	Std. Deviation	Std. Error Mean				
N	171	0.07	0.07	0.01				
	175	0.02	0.07	0.01				
Levene's Test for Equality of Variances		t-test for Equality of Means						
F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	
	0.38	0.54	5.75	344	0	0.04	0.01	0.03
			5.75	343.79	0	0.04	0.01	0.03

Table 9. T-test for the second hypothesis

N	Mean	Std. Deviation	Std. Error Mean				
173	0.06	0.06	0				
174	0.03	0.08	0.01				
Levene's Test for Equality of Variances		t-test for Equality of Means					
F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower
10.04	0	3.78	345	0	0.03	0.01	0.01
		3.78	332.26	0	0.03	0.01	0.01

Table 10. T-test for the third hypothesis

N	Mean	Std. Deviation	Std. Error Mean				
175	0.06	0.07	0.01				
172	0.02	0.07	0.01				
Levene's Test for Equality of Variances		t-test for Equality of Means					
F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower
0	0.98	5.45	345	0	0.04	0.01	0.03
		5.45	343.87	0	0.04	0.01	0.03

Table 11. T-test for the fourth hypothesis

N	Mean	Std. Deviation	Std. Error Mean				
173	0.06	0.07	0.01				
174	0.03	0.07	0.01				
Levene's Test for Equality of Variances		t-test for Equality of Means					
F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower
0.71	0.4	3.33	345	0	0.03	0.01	0.01
		3.33	344.98	0	0.03	0.01	0.01

Table 12. Mann-Whitney-U Test for the fourth hypothesis

Test Statistics(a)	
	ROA
Mann-Whitney U	12041
Wilcoxon W	27266
Z	-3.2215867
Asymp. Sig. (2-tailed)	0.0012748
A	Grouping Variable: VAR00002

Table 13. Ranks

Ranks	VAR00002	N	Mean Rank	Sum of Ranks
ROA	1	173	191.3988439	33112
	2	174	156.7011494	27266
	Total	347		

Concerning the indexes, tables 14 to 21 show the eight indexes; there are two indexes for each INVP, APP, ACRP, and CCC. Table 21 shows the weighted average of cash conversion in days for the companies which have a high cash conversion cycle for the years of the study (2000 – 2007). For example, the weighted average of cash conversion cycle for 2005 is 392 days and this average is considered to be high compared with the overall average which is 235, this rise is due to the companies that have a high cash conversion cycle and take a higher weight and therefore a higher value.

Table 14. Weighted index- for low INVP period

145.4	2000		
132.2	2001	90.90	2001
172.8	2002	118.84	2002
113.3	2003	77.94	2003
126.5	2004	87.00	2004
106.8	2005	73.44	2005
114.8	2006	78.92	2006
152.6	2007	104.94	2007

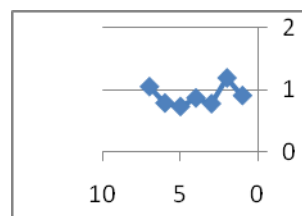


Table 15. Weighted index- for high INVP period

1285.9	2000		
3180.7	2001	247.4	2001
257.6	2002	20.0	2002
625.6	2003	48.6	2003
625.1	2004	48.6	2004
349.6	2005	27.2	2005
796.6	2006	62.0	2006
1144.1	2007	89.0	2007

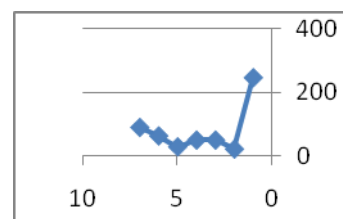


Table 16. Weighted index- for low APP period

69.0	2000		
55.6	2001	80.61	2001
43.9	2002	63.58	2002
55.7	2003	80.67	2003
55.3	2004	80.19	2004
44.8	2005	64.96	2005
43.5	2006	63.05	2006
53.9	2007	78.12	2007

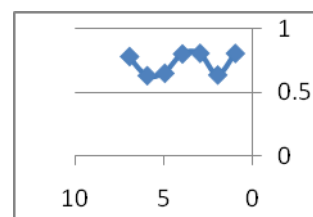


Table 17. Weighted index- for high APP period

2670	2000		
3274	2001	122.62	2001
19844	2002	743.32	2002
2225	2003	83.33	2003
2734	2004	102.43	2004
11841	2005	443.54	2005
292	2006	10.92	2006
2498	2007	93.58	2007

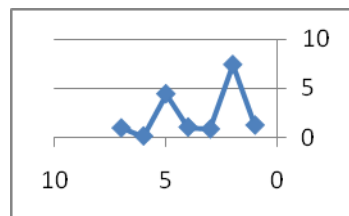


Table 18. Weighted index- for low ACRP period

76.41	2000		
75.30	2001	98.55	2001
78.25	2002	102.40	2002
71.52	2003	93.59	2003
71.54	2004	93.62	2004
67.87	2005	88.82	2005
59.64	2006	78.06	2006
73.76	2007	96.53	2007

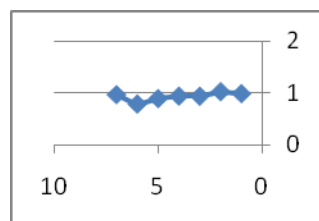


Table 19. Weighted index- for high ACRP period

278	2000		
651	2001	233.99	2001
674	2002	242.29	2002
494	2003	177.57	2003
294	2004	105.70	2004
365	2005	131.03	2005
167	2006	60.15	2006
182	2007	65.43	2007

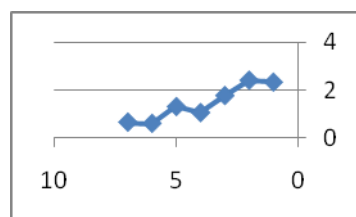


Table 20. Weighted index- for low CCC period

341.2	2000		
-7651.3	2001	-2242	2001
-23222	2002	-6805	2002
5319.1	2003	1559	2003
-347719	2004	-101898	2004
-15485	2005	-4538	2005
716.3	2006	210	2006
10952.5	2007	3210	2007

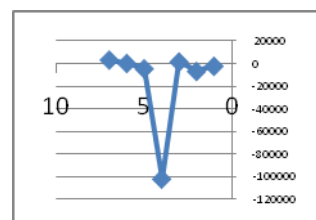
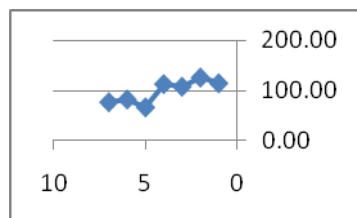


Table 21. Weighted index- for high CCC period

473	2000		
541	2001	114.32	2001
594	2002	125.55	2002
510	2003	107.71	2003
533	2004	112.75	2004
319	2005	67.37	2005
392	2006	82.90	2006
367	2007	77.56	2007



5. Conclusion

The inverse relationship can be explained because decreasing the cash conversion cycle keeps borrowing capacity for the company and because the facility will need little cash in the short term, it means that a low level of internal cash has been invested (Charlton, et.al, 2002) and this increases when cash conversion cycle is low. This indicates that the company is more efficient in managing the cash flow because it rotates the working capital several times. This result agrees with (Jose, et.al, 1996), (Wang, 2002), and (Uyar, 2009) which indicated that aggressive policy increases profitability. Also it agrees with (Al-Naif, 2005) which was conducted in Jordan. The profitability of the companies with low accounts receivables periods was higher than companies with high accounts receivable periods this result is consistent with the findings of the (Deloof, 2003), (Samiloglu and Demirgunes, 2008). Perhaps there is a positive relationship between the credit period granted by the industrial companies of Jordan and the rate of bad debts and we can therefore say that the increase in bad debt affects profitability negatively. It should be noted that the relationship between profitability and accounts payables is negative and that what was concluded in (Padachi, 2006) and (Deloof, 2003) who conducted their studies on Belgium companies. What explains the inverse relation is that when a company delays the payment of accounts payable, this may expose them to a fine of delay and harm their reputation and may lead to loss of cash discount and then reduce their profitability.

Table 15 shows the weighted average index for high INVP in points which in turn shows decline in the year 2007 since the year 2000, the base year, with an amount of 11%. This indicates an improvement in managing INVP for industrial companies. The decline in the weighted index for high INVP in points can also be explained during the years of the study through the chart in table 15. The main goal for the development of these indexes is to provide information to the Industrial Company. With them we can also compare, for example, the CCC and the index annually. As we can also compare CCCs over time. The next step is for the Jordanian industrial companies and investors to take into account these indexes. An investment decision can rely upon the index as a basis for comparison between the cash conversion cycles of an industrial company listed on the Amman Stock Exchange. It is necessary for managers to use an aggressive policy in the management of working capital and also to work to reduce the accounts receivable and inventory period because this will lead to the increased profitability of the company.

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