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Return on Asset and Return on Equity Effects of Net Operating Cycle: Jordanian Study

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Abstract
One indicator of short-term liquidity uses the activity ratios as a liquidity measure. The net operating cycle of a firm is the sum of the number of days it takes to sell inventory and the number of days until the resulting receivables are converted to cash subtracting the number of days of payables.
The current study aims to inspect the effect of the net operating cycle on the profitability of Jordanian services' sector represented by return on asset (ROA) and return on equity (ROE) during the period from 2009 until 2013.
The results of the study shows that there is no significant effect of net operating cycle on health care and hotels sectors' return on asset (ROA), there is no significant effect of net operating cycle on health care sectors' return on asset (ROA) and there is no significant effect of net operating cycle on hotels sectors' return on asset (ROA). Also the results indicates that there is no significant effect of net operating cycle on health care and hotels sectors' return on equity (ROE), there is no significant effect of net operating cycle on health care sectors' return on equity (ROE) and there is no significant effect of net operating cycle on hotels sectors' return on equity (ROE).
Keywords: Net Operating Cycle, Return on Asset (ROA), Return on Equity (ROE), Amman Stock Exchange (ASE).

1. Introduction

Financial statements report both firms' position at a point of time and operations over some past period. However, the real value of financial statements lies in the fact that they can be used to help predict future earnings, dividends, and free cash flow. (Brigham, F., et al. 2005)

Activity analysis serves to evaluate both the quality and liquidity of financial statement elements (both assets and liabilities) as part of performing credit analysis. Examination of these components is frequently used synonymously with measurements of efficiency. (Financial Accounting & Reporting, 2002)

The dimension of liquidity refers to speed with which assets are converted into cash or require payment. The liquidity is often measured in terms of turnover, the number of times either assets are collected or sold or liabilities are paid. (Financial Accounting & Reporting, 2002)

Equity investors are concerned with firm's ability to generate, sustain, and increase profits. Profitability can be measured by return on investment (ROI), relates profits to the investment required to generate them such as: return on asset (ROA) and return on equity (ROE).

The concept of which the firm profitability is affected by the changes in net operating cycle in recent years has obtained much attention among the researchers around the world. The studies have been focused on a linear relationship between net operating cycle and different performance indicators in the understudy firms, and mostly suggested a shorter net operating cycle for increase of profitability in these firms. (Valahzaghard, M., et al. 2014)

The current study will try to investigate the process through which the firm performance is influenced by the changes in net operating cycle mentioned by (Valahzaghard, M., et al. 2014), by applying the study on the profitability of Jordanian services' sector represented by return on asset (ROA) and return on equity (ROE) during the period from 2009 until 2013.

2. Previous Studies

The relationship of a tool in working capital management known as a net operating cycle, , with profitability, liquidity and debt structure was represented by Tulay, Y.,et al. (2002) study that covered the period from 1995 to 2000 and applied on 167 firms whose stocks are listed on the Istanbul Stock Exchange (ISE). The four variables were examined comparatively on the basis of period, industry and firm size. It was examined that the relationships of these variables and the impact of the net operating cycle**,** liquidity and debt structure on the companies' profitability y. The results showed that net operating cycle is positively related to liquidity ratios and negatively related to return on asset (ROA) and return on equity (ROE). High leverage ratio affected adversely the liquidity and profitability of the company. There is no statistically significant relationship between the net operating cycle and the leverage ratio. There was no significant difference in the net operating cycle on the basis of period, but it differs on the basis of sector and firm size.

The relationship between the length of the net operating cycle and the profitability and size of the

firms, beside set industry benchmarks for net operating cycle of merchandising and manufacturing companies was investigated by Uyar, Ali (2009) study which the data were collected from the financial statements of the corporations listed on the Istanbul Stock Exchange (ISE) for the year 2007. The researcher used ANOVA and Pearson correlation analyses for empirical investigation. The results showed that the retail/wholesale industry had the lowest mean value of the net operating cycle, and the textile industry had highest mean value of the net operating cycle. Also the findings showed that there is a significant negative correlation between the net operating cycle and the firm size and the profitability. The results were not generalized to non-listed companies, and the sample consists of merchandising and manufacturing companies. Therefore, the results were valid for those industries. The presented industry benchmarks to the firms to evaluate their net operating cycle performance.

The impact of the single components of net operating cycle, specifically number of days of sales outstanding, number of days of inventory on hand and number of days of payables on firm profitability which measured by operating income and stock market return was represented by Karadagli, Ece (2013) study by using pooled panel analysis for the period from 2001 to 2010. Moreover, the study investigated the possible effects of group affiliation on the impact of net operating cycle and its components on firm profitability. The results revealed that shortening of net operating cycle and its single three components improve firm profitability in terms of both accounting and market measures of performance. The results also showed that both the affiliated and the unaffiliated firms can enhance firm performance in terms of both performance measures through shortening their net operating cycles, this effect was stronger for unaffiliated firms and hence working capital management seems to be more important for them.

The effect of net operating cycle on Swedish small and medium-sized enterprises' (SMEs) performance was presented by Yazdan, F., et al. (2014) study which applied over the period from 2008 to 2011. The study analyzed cross-sectional panel data covering 13,797 SMEs by used a seemingly unrelated regression (SUR) model. It revealed that net operating cycle significantly affected profitability. Also, the firm performance significantly affected by the firm-level control variables size, age, and industry affiliation.

3. Hypotheses

In order to study the effect of the net operating cycle on the return on asset (ROA) and return on equity (ROE) of Jordanian services' sector for the period from 2009 to 2013, the researcher will test the following hypotheses:

First Main Hypothesis

H_{01}: There is no significant effect of net operating cycle on health care and hotels sectors' return on asset (ROA).

Sub Hypothesis

H_{11}: There is no significant effect of net operating cycle on health care sectors' return on asset (ROA).
H_{12}: There is no significant effect of net operating cycle on hotels sectors' return on asset (ROA).

Second Main Hypothesis

H_{02}: There is no significant effect of net operating cycle on health care and hotels sectors' return on equity (ROE).

Sub Hypothesis

H_{12}: There is no significant effect of net operating cycle on health care sectors' return on equity (ROE).
H_{22}: There is no significant effect of net operating cycle on hotels sectors' return on equity (ROE).

4. Research Methodology

This study aims to investigate the impact of net operating cycle on return on asset (ROA) and return on equity (ROE). This is as an empirical study in health care sector and hotels sector based on Jordanian data. The study population consisted of all health care firms' and hotels listed at Amman Stock Exchange (ASE) during the period (2009-2013). In addition, the required financial data for the study factors / variables will be gathered from the database of ASE available online during the study period. The database of ASE is based on the annual firm reports of the studied firms. Thereby, source of data is database of ASE. Besides; quantitative strategy has been adopted for this study. This is because the study wants to explore the impact of net operating cycle on ROA and ROE. Also, the study wants to explore the relation and the strength of the relation amongst the factors / variables discussed in this study. Thus, the study is based on use the Statistical Package for Social Sciences (SPSS v. 20), were the study has been used Correlation and Simple Regression analysis to test the hypotheses.

4.1. The Research Sample

The study investigates financial reports for 6 Jordanian services' sectors listed on the Amman Stock Exchange

(ASE) for the period from 2009 to 2013

4.2. Variables of the Study

4.2.1. Dependent Variables- Return on Asset (ROA), Return on Equity (ROE)

Return on Asset (ROA)*:* Measure the profitability relative to funds invested in the company by common stockholders, preferred stockholders, and suppliers of debt financing. (Financial Reporting and Analysis, 2012)
It can be calculated as follow:

$$\textbf{Return on Asset (ROA)} = \frac{\textbf{Net Income}}{\textbf{Average Total Assets}}$$ (Financial Reporting and Analysis, 2012) (1)

Return on Equity (ROE): Measures the return per owner dollar invested. (Financial Decision Making, 2015)
It can be calculated as follow:

$$\textbf{Return on Equity (ROA)} = \frac{\textbf{Net Income}}{\textbf{Average Total Equity}}$$ (Financial Reporting and Analysis, 2012) (2)

The difference in the two denominators is total liabilities. ROE will therefore always be greater than ROA. (Financial Decision Making, 2015)

4.2.2. Independent variable- Net Operating Cycle

Net Operating Cycle: describes the flow of cash out of a business and back into it again as a result of normal trading operations.
Cash goes out to pay for supplies, wages and salaries and other expenses, although payments can be delayed by taking some credit. A business might hold inventory for a while and then sell it. Cash will come back into the business from the sales, although customers might delay payment by themselves taking some credit. (ACCA, 2010)
It can be calculated as follow:

Net Operating Cycle = Number of days of inventory on hand (DOH) + Number of days of sales outstanding (DSO) –number of days of payables. (3)

4.3. Data Analysis and Results

In order to achieve the study objectives, the study checked some of the pre-requisites of a certain key statistical application. The study data is checked for Normality by Normality test (Shapiro-Wilk test), and the result for this test was been the study data is normally distributed.

4.3.1. Descriptive Data Analysis

The current study has been used measures of central tendency through mean, standard deviation, the lowest and highest values. This is in order to describe and explain the nature of data and characteristics of data of this study. The study used these measures due to the commonly used in previous studies. The following sections explain the result of these measures according to variables of this study respectively:

- **Net Operating Cycle:**

The following table shows the result of measures of central tendency (mean, standard deviation, the lowest and highest value).

Table (1), Net Operating Cycle

Sector	Net Operating Cycle				
	2009	**2010**	**2011**	**2012**	**2013**
- Heath Care Sector	99.80	99.31	130.32	142.99	67.65
Minimum	**67.65**				
Maximum	**142.99**				
Mean	**108.014**				
Std. Deviation	**29.55**				
- Hotels Sector	-12.89	-9.06	-4.38	-20.02	-15.98
Minimum	**-20.02**				
Maximum	**-4.38**				
Mean	**-12.466**				
Std. Deviation	**6.05**				

Table 1 shown the results of the descriptive data analysis for the study period (2009 – 2013), it can be concluded on the basis of mean values that the maximum mean for Net Operating Cycle during the study period was (108.014) for Heath Care Sector, and the minimum mean for Net Operating Cycle during the study period was (-12.466), and this is for Hotels Sector. Besides, the standard deviation was (29.55; 6.05respectively). Also, the lowest and highest values in Heath Care Sector data were 67.65; 142.99respectively). The lowest and highest values in for Hotels Sector data were (-20.02; -4.38respectively). The reason for this conclusion is the fact that the global financial crisis (August, 2008) may be affected the Net Operating Cycle during the study period.

- **Return On Asset (ROA):**

This study has discussed the return on asset (ROA) variable in Heath Care Sector and Hotels Sector, case of Jordan. The following table shows the result of measures of central tendency (mean, standard deviation, the lowest and highest value) for health care and hotels sectors' return on asset (ROA) during the study period (2009-2013).

Table (2), Return on Asset (ROA)

Sector	ROA				
	2009	**2010**	**2011**	**2012**	**2013**
- Heath Care Sector	-1.43	3.04	2.08	6.13	3.86
Minimum	**-1.43**				
Maximum	**6.13**				
Mean	**2.736**				
Std. Deviation	**2.768**				
- Hotels Sector	3.60	2.94	1.44	1.41	2.07
Minimum	**1.41**				
Maximum	**3.60**				
Mean	**2.292**				
Std. Deviation	**0.959**				

The above table shown that the lowest values of health care and hotels sectors' return on asset (ROA) were (-1.43; 1.41respectively) during the study period (2009-2013). Also, the highest values of it were (6.13; 3.60) during the study period for health care sector and hotels sector respectively. The mean for health care sectors' ROA during the study period was (2.736), and the mean for hotels sectors' ROA also was (2.292), with the standard deviation (2.768; 0.959 respectively).

- **Return On Equity (ROE):**

The following table shows the result of measures of central tendency (mean, standard deviation, the lowest and highest value) for study sectors' return on equity (ROE) during the study period.

Table (3), Return on Equity (ROE)

Sector	ROE				
	2009	**2010**	**2011**	**2012**	**2013**
- Heath Care Sector	-3.27	2.68	1.76	8.46	4.10
Minimum	**-3.27**				
Maximum	**8.46**				
Mean	**2.746**				
Std. Deviation	**4.232**				
- Hotels Sector	3.82	2.78	0.33	-0.90	0.24
Minimum	**-0.90**				
Maximum	**3.82**				
Mean	**1.254**				
Std. Deviation	**1.964**				

The above table shown that the lowest values of health care sectors' return on equity (ROE) was (-3.27), and the lowest values of hotels sectors' return on equity (ROE) was (-0.90) during the study period (2009-2013). Also, the highest values of ROE were (8.46; 3.82) during the study period for health care sector and hotels sector respectively. The mean for health care sectors' ROE was (2.746), and the mean for hotels sectors' ROE was (1.254) during the study period, besides, the standard deviation (4.242; 1.964 respectively).

- **Correlations between Variables**

Based on health care sector and hotels sector data in Jordan, during the study period (2009-2013).Spearman correlation test has been used in this study in order to find the relationship between the study variables / factors. The result of this test as follows:

Table (4), Correlations between Variables

		Net Operating Cycle	ROA	ROE
Net Operating Cycle	Pearson Correlation Sig. (2-tailed)	1		
ROA	Pearson Correlation Sig. (2-tailed)	.192 .596	1	
ROE	Pearson Correlation Sig. (2-tailed)	.332 .348	.977 .000	1

According to the basis of P-Values in Spearman correlation test that shown in the above table 4, there is a positive correlation (high correlation) between ROA and ROE (0.977) and it is under the significance level (of 0.05). Besides, there is no significance correlation between Net Operating Cycle and ROA (0.192), and between Net Operating Cycle and ROE (0.332).

- **Hypotheses Testing**

On the basis of the measured data by Simple Regression analysis to test the hypotheses in this study, the following parts show the result of this test according to each hypothesis, both main and sub-hypotheses.

First Main Hypothesis

H01: There is no significant effect of net operating cycle on health care and hotels sectors' return on asset (ROA).

This study aims to investigate the impact of net operating cycle on Jordanian health care and hotels sectors' return on asset (ROA), based on the period (2009-2013). Moreover, the following table 5 shows the result of Simple Regression test in order to achieve the objective of this study.

Table (5), First Main Hypothesis

Beta	R Square	Adjusted R Square	T	Sig.
.192	**.037**	**-.084**	**0.553**	**.596**

The table 5 indicated that the correlation of net operating cycle and Jordanian health care and hotels sectors' ROA, is calculated to be (.192), and the significance level for this hypothesis(0.596) shown that it is greater than the Significance level (0.05), hence null hypothesis (H01) is accepted. Besides, R^2value of the full model regression is (0.037). Thereby, there is no significant impact of net operating cycle on Jordanian health care and hotels sectors' ROA during the study period (2009-2013).

First Sub-Hypotheses:

H011: There is no significant effect of net operating cycle on health care sectors' return on asset (ROA)

This hypothesis looks at the impact of net operating cycle on Jordanian health care sectors' return on asset (ROA), based on the period (2009-2013). The current study is based on use the Simple Regression test, and the result of this test as follows:

Table (6), First Sub Hypothesis

Beta	R Square	Adjusted R Square	T	Sig.
.276	**.076**	**-.232**	**.497**	**.653**

From the above table, the correlation of net operating cycle and Jordanian health care sectors' ROA is calculated to be (.276), and the significance level for this hypothesis(0.653) shown that it is greater than the Significance level (0.05), hence null hypothesis (H011) is accepted.R^2value of the full model regression is(0.076). Thereby, there is no significant impact of net operating cycle on Jordanian health care sectors' ROA during the study period.

H012: There is no significant effect of net operating cycle on hotels sectors' return on asset (ROA).

This hypothesis aims to investigate the impact of net operating cycle on Jordanian hotels sectors' return on asset (ROA), this is during the period (2009-2013). The result of the Simple Regression as follows:

Table (7), Second Sub Hypothesis

Beta	R Square	Adjusted R Square	T	Sig.
.095	**.009**	**-.321**	**0.165**	**.879**

R^2 value of the model regression is (0.009) at Beta value of(0.095), thereby the correlation of net operating cycle and Jordanian hotels sectors' ROA is calculated to be (.095), which is greater than significance level of (0.05), so it provides enough evidence that the model is not significant. As a conclusion, there is no significant impact of

net operating cycle on Jordanian hotels sectors' ROA during the study period (null hypothesis is accepted).

Second Main Hypothesis

H02: There is no significant effect of net operating cycle on health care and hotels sectors' return on equity (ROE).

In order to investigate the impact of net operating cycle on Jordanian health care and hotels sectors' return on equity (ROE), the study is based on Simple Regression test to achieve the objective of this study. Based on the period (2009-2013).The following table 6 shows the result of Simple Regression test.

Table (8), Second Main Hypothesis

Beta	R Square	Adjusted R Square	T	Sig.
.332	.110	-.001	0.996	.348

The table 6 indicated that the correlation of net operating cycle and Jordanian health care and hotels sectors' ROE is calculated to be (.332), and the significance level for this hypothesis (0.348) shown that it is greater than the Significance level (0.05). Besides, R^2value of the full model regression is (0.110). Thereby, there is no significant impact of net operating cycle on Jordanian health care and hotels sectors' ROE during the study period (2009-2013), hence null hypothesis (H01) is accepted.

Second Sub-Hypotheses:

H021: There is no significant effect of net operating cycle on health care sectors' return on equity (ROE)

The hypothesis looks at the impact of net operating cycle on Jordanian health care sectors' return on equity (ROE), during the period (2009-2013). The current study is based on use the Simple Regression test, and the result of this test as follows:

Table (9), First Sub Hypothesis

Beta	R Square	Adjusted R Square	T	Sig.
.346	.120	-.174	.639	.568

The above table shown the result of Simple Regression test for the current hypothesis, besides, the correlation of net operating cycle and Jordanian health care sectors' ROE is calculated to be (.346), and the significance level for this hypothesis (0.568) shown that it is greater than the Significance level (0.05), hence null hypothesis (H021) is accepted. In addition, R^2value of the full model regression is (0.120). Finally, there is no significant impact of net operating cycle on Jordanian health care sectors' ROE during the study period (2009-2013).

H022: There is no significant effect of net operating cycle on hotels sectors' return on equity (ROE).

In order to investigate the impact of net operating cycle on Jordanian hotels sectors' return on equity (ROE) during the period (2009-2013), the study has used the Simple Regression test and the result of it as follows:

Table (10), Second Sub Hypothesis

Beta	R Square	Adjusted R Square	T	Sig.
.346	.120	-.173	0.639	.568

R^2 value of the model regression is (0.120) at Beta value of (0.346), thereby the correlation of net operating cycle and Jordanian hotels sectors' ROE is calculated to be (.346), which is greater than significance level of (0.05), so it provides enough evidence that the model is not significant. As a conclusion, there is no significant impact of net operating cycle on Jordanian hotels sectors' ROE during the study period (2009-2013), in other words null hypothesis is accepted.

6. Summary and Conclusion

This study is achieved to approve if there is an effect of net operating cycle on the profitability of Jordanian services' sector represented by return on asset (ROA) and return on equity (ROE) during the period from 2009 until 2013.

The following table shows the result of test the study hypotheses, both main and sub hypotheses.

Table (11), Conclusion

Hypothesis	Result
H01: There is no significant effect of net operating cycle on health care and hotels sectors' return on asset (ROA).	Null hypothesis is accepted
H011: There is no significant effect of net operating cycle on health care sectors' return on asset (ROA)	Null hypothesis is accepted
H012: There is no significant effect of net operating cycle on hotels sectors' return on asset (ROA).	Null hypothesis is accepted
H02: There is no significant effect of net operating cycle on health care and hotels sectors' return on equity (ROE).	Null hypothesis is accepted
H021: There is no significant effect of net operating cycle on health care sectors' return on equity (ROE)	Null hypothesis is accepted
H022: There is no significant effect of net operating cycle on hotels sectors' return on equity (ROE).	Null hypothesis is accepted

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